Appendix A

MRC Timber Management Plan and Attachments

Table of Contents

Attachments

Attachment A—Landscape Planning
Attachment B—EIS/PTEIR Growth and Yield Modeling - Alternatives Modeling
Attachment C—Sample PTHP
Attachment D—Rule-By-Rule Description for Alternate Standards
Attachment E—PTHP Checklist

1 INTRODUCTION

Mendocino Redwood Company (MRC) was formed in 1998 and consists of approximately 229,000 acres of redwood and Douglas-fir forest. From the beginning, MRC's purpose has been to demonstrate that it is possible to manage productive forestlands with a high standard of environmental stewardship while operating a successful business. Our original stewardship goal has evolved into a goal of restoring under-stocked areas of our forestlands to a selectively managed redwood and Douglas-fir forest. Additional stewardship objectives include: (1) improving aquatic and upslope habitat; (2) providing protection for old-growth trees; (3) maintaining clean water in the streams and rivers on the forestlands; (4) and contributing to community well-being; and (5) producing a long-term, sustainable timber supply.

In 2000, MRC was evaluated by and received certificates from two of the Forest Stewardship Council's (FSC's) accredited certifiers located in the U.S.: Scientific Certification Systems of Oakland, California, and the Richmond, Vermont-based SmartWood Program of the Rainforest Alliance. The FSC is an international, independent, non-profit organization that promotes responsible forestry. FSC Certification is awarded when an independent evaluation of a forest company's practices meets the highest standards for environmentally and socially responsible forestry. The FSC has the backing of the world's leading environmental groups, including the World Wildlife Fund, Natural Resources Defense Council, The Wilderness Society and Greenpeace. In 2005 and 2010, MRC was re-certified as a well-managed forest by Scientific Certification Systems and the SmartWood Program of the Rainforest Alliance (all certificates are evaluated annually with a comprehensive re-evaluation every 5 years).

Habitat conservation planning has been active on the lands of MRC since the previous landowner, Louisiana-Pacific (LP), started the process in the 1990s. While LP did not complete the Habitat Conservation Plan (HCP) planning process for the lands within this Timber Management Plan (TMP), MRC started its own HCP planning process in 1999. During 2002, MRC also opted to complete a Natural Communities Conservation Plan (NCCP) in conjunction with an HCP. California Department of Fish and Game (CDFG) is the agency responsible for the approval of the NCCP, and MRC opted to work with this same agency to get approval on a Long Term Streambed Alteration Agreement (called the Master Agreement for Timber Operations, or MATO), utilizing the NCCP and the Environmental Impact Report (EIR) as the analysis tools for the approval of the MATO. In 2005, MRC opted to utilize the California Forest Practice Rules (CFPRs; 14 CCR, also FPRs), Article 6.8, 1092, Program EIR to reach a long term programmatic agreement with the California Department of Forestry and Fire Protection (CAL FIRE) for its overall management goals, including the conservation measures within the HCP/NCCP and MATO. Finally, in 2007, MRC achieved a resolution from the North Coast Regional Water Quality Control Board, (Resolution No. R1-2007-0034) for a "Collaborative Effort to Develop Ownership-Wide Waste Discharge Requirements (OWDRs) for Timber Harvesting Activities Conducted by the Mendocino Redwood Company on Their Lands in Mendocino and Sonoma Counties." The Regional Water Board and MRC will develop Ownership-wide Waste Discharge Requirements that include by reference the water quality control measures contained in the HCP/NCCP. The intent is that the waste discharge requirements will: 1) incorporate the HCP/NCCP water quality measures; 2) protect the beneficial uses of waters on MRC's land that could be affected by MRC's activities; and 3) comply with the Porter-Cologne Act, the Basin Plan, and the Clean Water Act. The analysis in the EIS/PTEIR may support issuance of the waste discharge permits.

This TMP is designed to address those issues related to the FPRs and the Forest Practice Act. CAL FIRE, as the lead agency responsible for implementation of the FPRs, will review and—if determined by the Director of CAL FIRE that the management of the timberlands achieves the resource protection goals within Public Resources Code (PRC) §§ 4513, 4551, 4561 and 4581—certify the Program Timberland Environmental Impact Report (PTEIR).

This TMP addresses the requirement of the FPRs for a forest landowner to achieve "Maximum Sustained Production of High Quality Timber Products" (MSP; 14 CCR § 913.11). The MSP rule requires that forest landowners owning ≥ 50,000 acres are required to submit an MSP document to CAL FIRE. This planning document must include methodologies and results of the timberland owner's planning effort to achieve MSP and Long-Term Sustained Yield (LTSY). Landowners can demonstrate MSP through:

- An Option A, that addresses management effects on timber resources while considering watersheds, fisheries, wildlife, recreation, employment, and more. An Option A must demonstrate a balance of growth and harvest over time within the assessment area. The non-timber resources are thoroughly analyzed in individual site plans, Timber Harvest Plans (THPs). The THPs are submitted to CAL FIRE individually, rather than in the overall Option A document (14 CCR § 913.11(a)).
- A Sustained Yield Plan (SYP), which addresses management effects on timber, watersheds, fisheries, and wildlife. Non-timber resources are provided a thorough analysis in an SYP. SYPs comply with the California Environmental Quality Act (CEQA) under the umbrella of the Forest Practices Rules and Act (14 CCR § 913.11[b]) and the functional equivalent process per PRC § 21080.5 and 14 CCR § 15251(a).
- A PTEIR that addresses impacts and provides mitigation for those impacts resulting from timber operations. The environmental analysis is addressed within the PTEIR document, and the TMP demonstrates MSP and LTSY.

In summary, MRC will utilize the TMP, HCP/NCCP, MATO and OWDRs to provide for the regulatory framework and all of the necessary management guidelines for MRC's "covered lands" land base, and the PTEIR will analyze and address the impacts resulting from the timber operations and related activities on the covered lands. The covered lands include roughly 213,000 acres out of the 229,000 acres that MRC owns. The other 16,000 acres will have a separate Option A document developed for them and are not included in the HCP/NCCP.

Previously, MRC has utilized "Option A" to demonstrate MSP for all of the ownership. MRC's initial Option A was submitted as an attachment to THP 1-99-505-MEN, and was approved in 2000. MRC updated the planning strategy and a subsequent Option A was submitted under THP 1-07-145, and this updated Option A was approved in 2008.

The 2008 Option A was updated to include a new landscape planning strategy. This provided: (1) increased operational efficiency, (2) reduced environmental impacts, and (3) increased habitat complexity across these forestlands. The 2008 Option A incorporated key components of the developing HCP/NCCP, such as new wildlife tree strategies. Including key components within the Option A enabled MRC to “field test” these developing measures prior to HCP/NCCP implementation. The key updates in the 2008 Option A included:

- Establishment of harvest blocks: Harvest blocks were developed by grouping adjacent stands (an approximately 30-acre block of similar vegetation type) into an effective management block. Each harvest block was assigned a 5-year period, with a total of four 5-year periods making an entire harvest cycle of 20 years.
- Reduced road use: Harvest blocks were built around existing and planned road networks. The result is a reduction in miles of road used per harvest activity.
- Compatibility with each stand’s unique characteristics: Silviculture was designed to provide flexibility in addressing the particular restoration or harvest need of each stand.
- Longer intervals between harvests: Harvest interval increased from 10 years in the previous Option A to 20 years in the updated Option A.
- Increased aquatic and terrestrial habitat for sensitive species: Increased harvest intervals and decreased road use provides for less disturbance and better habitat for terrestrial species. Increased protections for riparian corridors from the previous Option A should provide improved aquatic habitat.

While the harvest planning strategy used within the TMP is very similar to that implemented in the 2008 Option A, the PTEIR is being utilized to present a more holistic approach to the management of MRC’s forestlands, using standards for habitat improvement and restoration efforts outlined in the HCP/NCCP, MATO, and this TMP. A combined Environmental Impact Statement (EIS) and PTEIR analyze the impacts associated with the operations proposed in all of these documents, which were developed over 10 years of negotiations with the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), CDFG, North Coast Regional Water Quality Control Board, and CAL FIRE. The joint EIS/PTEIR will address both state actions (issuance of Natural Communities Conversation Plan Act take authorization, approval of the MATO, and certification of PTEIR based on the TMP) and federal actions (issuance of Endangered Species Act incidental take permits). Certification of the PTEIR by the CAL FIRE will allow the North Coast Regional Water Quality Control Board to issue OWDRs for the covered lands of the HCP/NCCP.

Section 14 CCR § 1092.32 describes the requirement to maintain MSP under the provisions of the PTEIR after certification of the PTEIR. MSP will be shown using the following key metrics:

- Harvest levels.
- Growth of conifer inventory.
- Silvicultures applied.
- Assessment of non-timber values such as fish and wildlife, related to the long term sustainability of the forest.

1.1 Planning Approach

MRC's planning approach is primarily targeted towards maintaining and improving habitat conditions for terrestrial and aquatic species, being a successful business, and improving community well being. This approach is also compatible with the FPRs; the FSC's Pacific Coast Standards; and the goals, objectives, and conservation measures of our proposed HCP/NCCP.

The goals and objectives listed above are the key building blocks of our planning strategy. Initially, MRC needed to better define and understand patterns and trends in our forest management and forestlands, so we divided MRC's ownership into 15 compartments, or "Sustainability Units." The Sustainability Units are 22,000 acres or less, watershed-based, and were delineated so that each unit would comprise lands that share a common history, have similar environmental variables, and are affected by similar social concerns. This geographic stratification increases the resolution and the overall accuracy of the inventory estimates. Sustainability Units are the basis for assessing forest inventory, growth, and harvest.

Our approach to silviculture and harvest is based on the Sustainability Units. Each Sustainability Unit has been divided into four separate groupings of Harvest Blocks, dispersed in a proportional manner across planning watersheds. The grouping of Harvest Blocks represents a 5-year management period. Individual Harvest Blocks are managed on average, every 20 years. By extending average harvest intervals to 20 years, MRC has tried to reduce effects due to harvesting frequency. Our professional forestry staff developed the design of "Harvest Blocks" based on on-the-ground knowledge and aerial photo interpretation. These Harvest Blocks establish what is commonly referred to as "area control."

Area control is an essential part of sustainable forest management. Without area control, a landowner could intensify harvest in only the best stocked areas of the land base, and still meet a sustained harvest. Using volume control *and* area control insures that harvests are not just concentrated on only the best stocked lands, but the harvests also are spread throughout the land base, reducing the intensity of harvest in any particular watershed. This also directs MRC's operations to include lands for harvest that were poorly managed in the past and could use some form of restoration, such as thinning, vegetation management, or reforestation.

The longer interval between harvests is accompanied with a silviculture strategy that is appropriate for regenerating the forest and managing vegetation competition, which is primarily tanoak. MRC will continue to incorporate restoration harvest methods, such as rehabilitation and variable retention, to hasten the development of conifer-dominated stands.

Accountability is essential to this plan. MRC will monitor and report the acres harvested on the forestlands by 5-year periods to ensure that the company is meeting the standards established in this plan. MRC will continue to report the forest inventory and harvest volume on an annual basis.

1.2 Assessment Area

This TMP covers the majority of the forestlands owned by MRC. The covered forestlands are comprised of approximately 213,000 acres situated in the western portion of Mendocino County in the redwood forests of northwestern California. These areas are referred to as “covered lands.” There are approximately 16,000 acres of MRC’s lands that are excluded from the HCP/NCCP, TMP, and EIS/PTEIR, located in scattered parcels throughout Mendocino and northern Sonoma counties. These areas were excluded from the HCP/NCCP, TMP, and EIS/PTEIR for two main reasons: (1) they are outliers and will be difficult to manage under the HCP/NCCP, and (2) management of these areas will be more heavily influenced by neighbors, or outside influences, than those MRC properties connected to larger tracts of land.

Covered lands are situated south of the Humboldt County line, west of Highway 101, north of the Sonoma County line, and east of the Pacific Ocean. The forestlands are located in two distinct areas: the Rockport Tract, just south of the Humboldt County line and the major ownership block, starting at the north in the headwaters of the Noyo River, and proceeding south towards just south of the ridge between the Garcia and the Gualala River in southern Mendocino County, east of the Pacific Ocean, and west of Highway 101. Within the covered lands, MRC owns about 1,000 acres of the Gualala River watershed, in the northern areas near the divide with the Garcia River.

Covered lands are in the watersheds of the following significant rivers: South Fork Eel River, Noyo River, Big River, Albion River, Navarro River, Garcia River, Gualala River and the Russian River. Other significant, but smaller, watersheds include Elk Creek, Greenwood Creek, Alder Creek, Hollowtree Creek, Cottaneva Creek, and Juan Creek.

Most of the covered lands are young-growth stands of redwood and Douglas-fir, mixed conifers and hardwoods, or mixed hardwoods. MRC’s vegetation types are described within the HCP/NCCP and within Attachment A of this TMP. In general, the habitat ranges from oak savannah in the eastern portion of the ownership, nearest to Ukiah, to older second-growth redwood and Douglas-fir forests near the coast. Due to the harvest history of the ownership, begun in the late 1800s, the average forest condition is second-growth conifer forest with a moderate to high degree of tanoak composition.

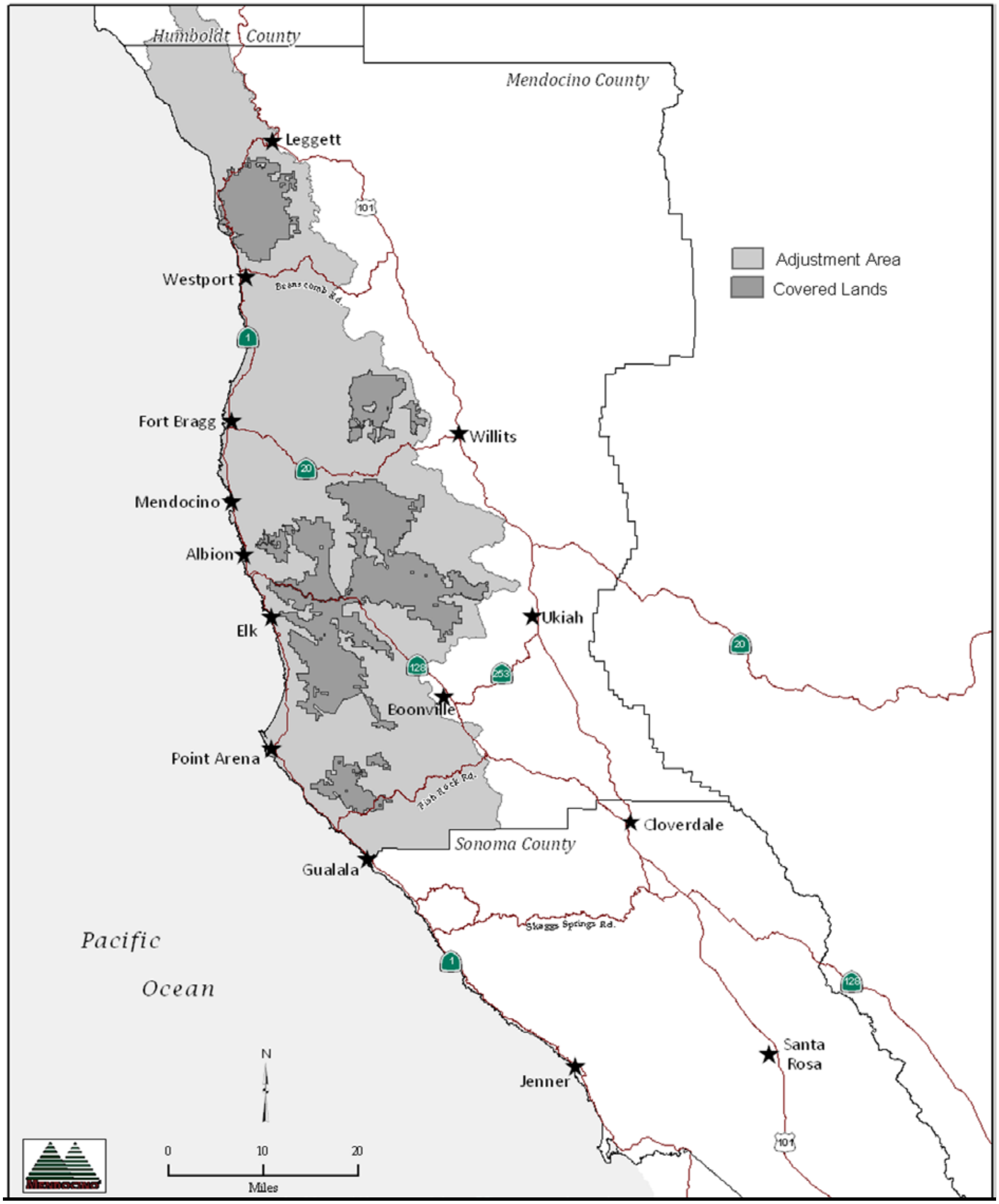

Figure 1. Mendocino Redwood Company Covered Lands and Adjustment Area. (The adjustment area encompasses the plan area as well as land adjacent to the plan area—primarily commercial timberland—from which MRC may add or delete covered lands.)

Table 1. Acres by Land Cover Types on Mendocino Redwood Company's Ownership**.**

Land Cover Types	**Gross Acres***
Redwood/Douglas-fir	134,023
Mixed Conifers and Hardwoods	68,312
Mixed Hardwoods	4,005
Brush and Grassland	2,061
Douglas-fir	2,146
Oak Woodlands	1,084
Pygmy Forest	454
Redwood/Monterey Pine	449
Tanoak	209
Rocky Outcrops	63
Water, swamps	30
*Gross Acres include the roads that traverse the land cover types.	

Areas of landscape features are approximate. Many landscape features in whole or part are not surveyed. Errors may be present due to differences in sources of base layers of landscape features from county, state, federal, and MRC reporting.

The range in elevation on MRC covered lands is from sea level to 3,400 feet. Average daily temperatures range from a high of 66.5 degrees (Fahrenheit) during July to a low of 43.6 degrees (Fahrenheit) in December. Annual precipitation ranges from 50 to 80 inches. MRC's covered lands lie within the rugged Coast Range province that is underlain by marine sandstones of the Franciscan Formation.

Previous companies that have operated on the covered lands include: The Union Lumber Co., Albion Lumber Co., Mendocino Lumber Co., Rockport Redwood Co., L.E. White L.C., Holms Lumber Co., Southern Pacific Land Company, Masonite Corporation, and Louisiana-Pacific Corporation.

Early harvest efforts started at the mouths of watersheds and progressed upstream and up-slope to the ridgelines. Initial logging activities generally clearcut the old growth forests, then burned the slash while the logs were still on the ground before yarding them downhill to the river systems. Oxen were used to pull logs to mills or river systems. The rivers served as the transportation routes to the mills. Subsequent entries into the forests further inland were commonly accomplished with steam donkeys and railroads. During the 1940s, crawler tractors replaced steam donkeys with the yarding of logs and trucks replaced railroads with the delivery of logs to the mills. Clearcutting continued to be a common harvest method.

Tax laws in the 1940s and 1950s encouraged landowners to remove 70% of their conifer stocking resulting in harvests that removed the larger, healthier trees. Little effort followed harvesting to ensure that the areas harvested were stocked with conifers and able to grow amidst competition from hardwoods. The result of this 'high-grading' is that portions of the forest consist of unnaturally high densities of tanoak. High-intensity fires associated with burning slash and catastrophic wildfire (Comptche Fire in 1931, for example) also favored the establishment and rapid growth of tanoak. It has been hypothesized that the intensity associated with the Comptche Fire was due to high levels of lying dead wood associated with shake operations in the forest. This condition limits the ability of redwoods and Douglas-fir to achieve desired stocking levels. We have focused our effort on restoring these forests to conifer-dominated conditions. This work is ongoing through this plan's silvicultural strategies.

1.3 Long-term Sustained Yield

LTSY is defined in the FPRs (14 CCR § 895.1) as "the average growth sustainable by the inventory predicted at the end of a 100-year planning horizon." This section outlines the approach to harvesting, related growth and overall inventory levels over this 100-year period to meet LTSY. LTSY must be demonstrated to meet the requirements of MSP under 14 CCR § 913.11. This requirement is necessary for the state of California's forestlands to maintain high quality timber products over a long horizon.

Only growth associated with forested land (timber sites 1 through 5) were included for this LTSY analysis. A timber site is a value given to a plot of land based on its productive capability. A low number denotes very high productive capacity, while site 5 denotes very poor capacity, such as rocky areas. Of the approximately 213,000 acres of covered lands, 4,753 acres were excluded from this analysis due to their timber site.

Conifer LTSY was 739 board feet per acre, per year, or 150 million board feet per year over covered lands. The LTSY considers growth from all forested land, regardless of the harvest level applied to individual stands. Some of the important outcomes of our planning approach include:

- Conifer volumes continue to increase throughout the planning horizon. At the end of the planning period, a majority of areas where growth exceeds harvest occur in sensitive stands, such as watercourse buffers; while the majority of "non-sensitive" covered lands maintain a balance of growth and harvest.
- Allowable harvest levels are always less than the calculated LTSY.
- The maximum harvest percentage of growth is 82% in any 5-year planning period. The average harvest throughout the 100-year planning horizon is 67% of growth. This statistic indicates a continual improvement of the forestlands.
- Conifer inventory will be twice the level at 2045 than it was when MRC acquired the property—this was an initial goal of MRC set in 1998 when the company initially formed.
- MRC has developed a 20-year entry time period for harvest of covered lands. This limits harvest to 25% of the covered lands over each five-year period. For instance, in our first five-year period, we will be limited to a total of approximately 53,000 acres available for harvest (since our current acreage is approximately 213,000).

The LTSY was calculated with the use of computer models described in detail in the Landscape Planning discussion (Attachment A, below)

Table 2 displays the summary of conifer inventory, growth, and harvest projected for MRC's ownership. Note that for purposes of assessing conifer harvest, we have considered only 2008–2010 (effectively a 3-year planning period) for the first period volume harvest.

Table 2. Modeled Inventory, Growth, and Harvest by 5-year Period*

5-Year Period	Conifer Inventory	Conifer Growth	Conifer Harvest	Harvest as a Percent of Growth	Harvest as a Percent of Inventory (Annual)
1	2,603,697,022	469,740,842	198,819,322	42%	1.53%
2	2,874,618,539	489,650,759	289,770,722	59%	2.02%
3	3,074,498,578	516,167,003	313,342,929	61%	2.04%
4	3,277,322,651	545,449,023	321,913,932	59%	1.96%
5	3,500,857,740	575,195,081	310,040,679	54%	1.77%
6	3,766,012,145	608,799,705	314,879,820	52%	1.67%
7	4,059,932,031	637,291,535	367,758,052	58%	1.81%
8	4,329,465,512	664,231,990	435,054,796	65%	2.01%
9	4,558,642,706	672,358,452	451,006,470	67%	1.98%
10	4,779,994,688	676,458,758	452,862,540	67%	1.89%
11	5,003,590,904	681,921,960	458,900,235	67%	1.83%
12	5,226,612,627	686,396,514	477,032,959	69%	1.83%
13	5,435,976,180	691,617,855	535,182,936	77%	1.97%
14	5,592,411,100	701,256,859	534,423,481	76%	1.91%
15	5,759,244,479	712,053,235	532,418,750	75%	1.85%
16	5,938,878,961	721,841,922	545,549,067	76%	1.84%
17	6,115,171,813	726,057,866	592,135,444	82%	1.94%
18	6,249,094,238	732,055,155	597,048,774	82%	1.91%
19	6,384,100,617	739,179,845	589,994,391	80%	1.85%
20	6,533,286,075	749,285,738	603,569,033	81%	1.85%

* All inventory data are in net board feet (Scribner short log), unless otherwise specified.

1.3.1 Summary of inventory and growth and yield methods

The following section summarizes MRC's inventory analysis and growth and yield modeling. A more detailed explanation is included in Attachment A. MRC's inventory data and projections of growth and harvest are important components in the calculation of LTSY. MRC's timber inventory data is derived from two levels of forest stratification. First, the covered lands are divided into "Sustainability Units" as described under Section1.1, Planning Approach.

Second, individual stands within the Sustainability Units are assigned a vegetation label (or stratum), based on species composition, tree size, and stand density. Sample plots are installed in the vegetation strata to obtain estimates of forest conditions. Plots are allocated to each stratum in order to meet statistical confidence targets by Sustainability Unit (+/- 10% with 90% confidence interval for net conifer volume). MRC's current inventory estimates are based on over 19,000 temporary sample plots.

The simulation model used to estimate growth in the forest is CRYPTOS (Cooperative Redwood Yield Project Timber Output Simulator). CRYPTOS ‘grows’ each tree in a tree list based on the tree species, crown canopy, and competition, as well as the site conditions in each stand. CRYPTOS also estimates forest mortality. Growth estimates of the forest include assumptions on regeneration of new trees after harvest. Harvest is simulated in the model which allows the application of numerous silvicultural applications to be “tested” against the unique set of vegetation, site class, and sensitivity levels in each stand. These “tests” are useful in overall predictions on growth and yield over time, however field application of silvicultural methods during PTHP preparation will, by necessity, make changes on silvicultural methods from modeled predictions due to site-specific circumstances.

The use of a simulation model has enabled MRC to compare multiple scenarios with different management strategies to identify the best scenario to meet our objectives. The simulation model provides a prediction of periodic inventory, harvest, growth, and habitat levels over time. A more detailed description of the growth model is included in Attachment A.

Conifer growth in a forest is influenced by site conditions, stocking levels, management of competition, and age of the trees in the forest. The high growth rate (as a percentage of the existing inventory) in the early periods in our forest is related to the young age of the trees in the forest. The growth rate (as a percentage of existing inventories) slows as the average tree size increases while the average growth per acre increases throughout the life of this plan (Table 3).

Table 3. Conifer Growth over 100-Year Planning Horizon.

5-Year Period	Conifer Inventory	Conifer Growth	Conifer Growth per Acre per Year (Board Feet)	Conifer Growth as a Percent of Inventory (Average Annual)
1	2,603,697,022	469,740,842	463	3.6%
2	2,874,618,539	489,650,759	483	3.4%
3	3,074,498,578	516,167,003	509	3.4%
4	3,277,322,651	545,449,023	538	3.3%
5	3,500,857,740	575,195,081	567	3.3%
6	3,766,012,145	608,799,705	600	3.2%
7	4,059,932,031	637,291,535	628	3.1%
8	4,329,465,512	664,231,990	655	3.1%
9	4,558,642,706	672,358,452	663	2.9%
10	4,779,994,688	676,458,758	667	2.8%
11	5,003,590,904	681,921,960	672	2.7%
12	5,226,612,627	686,396,514	677	2.6%
13	5,435,976,180	691,617,855	682	2.5%
14	5,592,411,100	701,256,859	691	2.5%
15	5,759,244,479	712,053,235	702	2.5%
16	5,938,878,961	721,841,922	712	2.4%
17	6,115,171,813	726,057,866	716	2.4%
18	6,249,094,238	732,055,155	722	2.3%

19	6,384,100,617	739,179,845	729	2.3%
20	6,533,286,075	749,285,738	739	2.3%

* All inventory data are in net board feet (Scribner short log), unless otherwise specified.

1.3.2 Methodology to determine MSP

The methodology to determine MSP is to calculate growth for the next 100 years with constraints that reflect operating policies to protect non-timber resources and sustainable timber management (while LTSY is determined on a 100-year horizon, and is shown as such on the preceding pages, the HCP/NCCP and EIS/PTEIR is proposing an 80-year length for state and federal permitting time-frames.) We use a set of computer models that are collectively referred to as a landscape planning model to accomplish this. MRC's landscape planning methodology is based on developing virtual forest stands that are geographically based and have a unique identifier that connects spatial information in MRC's Geographic Information Systems (GIS) to tabular data in Microsoft Access databases. Each stand contains information (vegetation, sensitivity, site class, harvest timing) that assists in inventory estimates and guides the activity in the growth and yield simulations. Stands include the following information:

- Vegetation Type – Each stand is placed into strata based on tree species, size, and density. This is used to determine inventory sampling frequency and to assign tree lists to stands for inventory reporting and for growth and yield modeling.
- Site Class – Site class is used to assign site indices to trees based on their species. This sets the growth trajectory for each tree in the tree list.
- Sensitivity Codes – Sensitivity codes direct the stand toward appropriate silviculture techniques according to MRC policies and any laws related to management. More information is provided in the section below entitled "Limits on MSP by Consideration of Other Forest Resources."
- Timing Choices – Harvest timing is hard coded in MRC's growth and yield modeling. This controls the number of acres harvested in a given 5-year period and establishes logical harvest blocks that minimize road use.

Both growth and harvesting simulations occur within a Visual Basic program that "reads" data from Microsoft Access databases. Our landscape planning model is an iterative process, with the goal of identifying the blend of silviculture methods and return frequency that achieve our management objectives while utilizing MRC management policies. Some of the important management objectives and policies considered in MRC's landscape modeling include:

- A non-declining inventory at the ownership level. Growth always exceeds harvest in each of the 5-year planning periods.
- Reliance on uneven-age management techniques. Long-term silviculture management will rely on single-tree and group selection.
- Restoration of forested stands with high levels of tanoak competition. Many stands will require early restorative activities to achieve adequate stocking levels for selection management. These restorative harvests will include variable retention, rehabilitation, transition, and seed tree removal.

- Development and maintenance of desired habitat conditions. The approach to growth and harvest included the development and maintenance of desired structural conditions in the forest.
- Appropriate management of sensitive areas (described in detail in the HCP/NCCP). Sensitive areas include Aquatic Management Zones (AMZs), rock outcrops, special habitat areas, etc.

The following tables and charts display data related to the calculation of MSP on MRC forestlands. All data displayed is the result of the growth and yield simulation using MRC's landscape planning model.

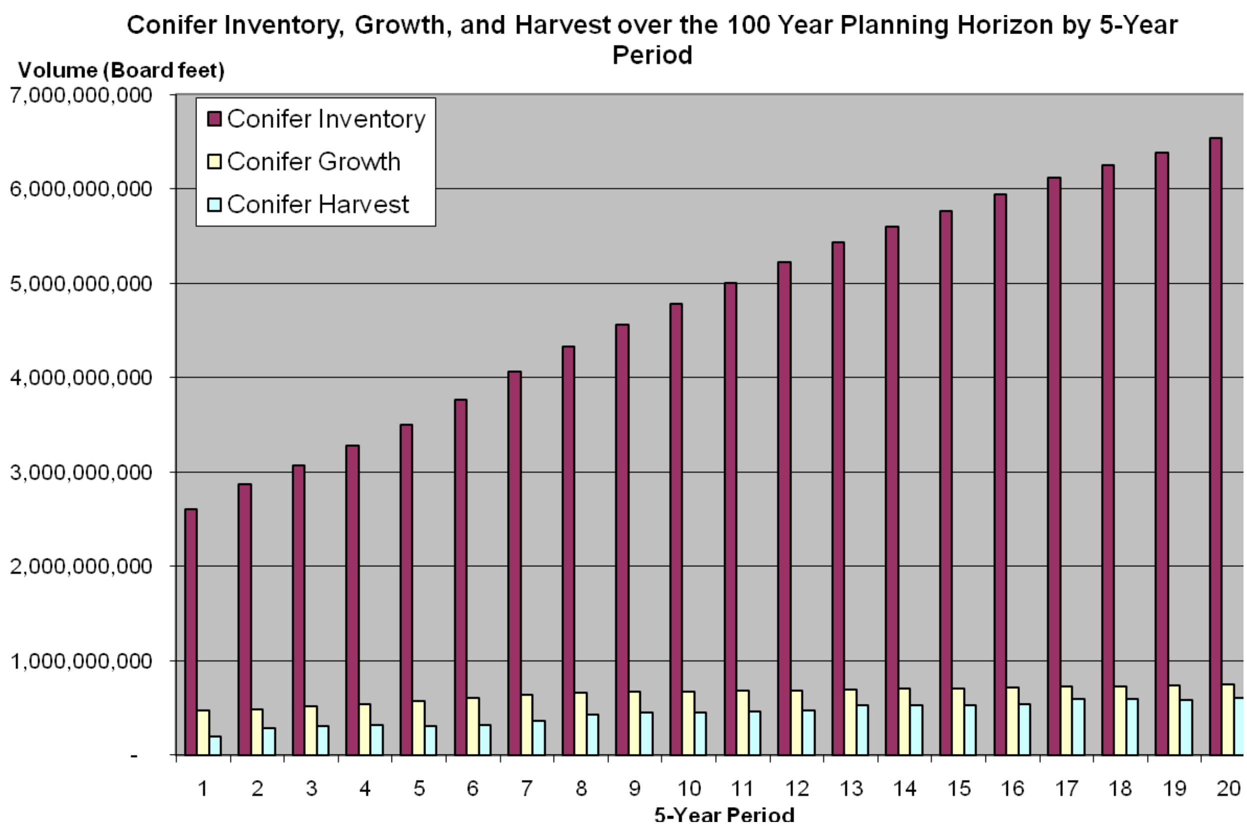

Chart 1: Modeled Conifer Inventory, Growth, and Harvest by 5-Year Period
This chart displays the trend of increasing inventory levels and the relationship between growth and harvest over the 100-year planning period.

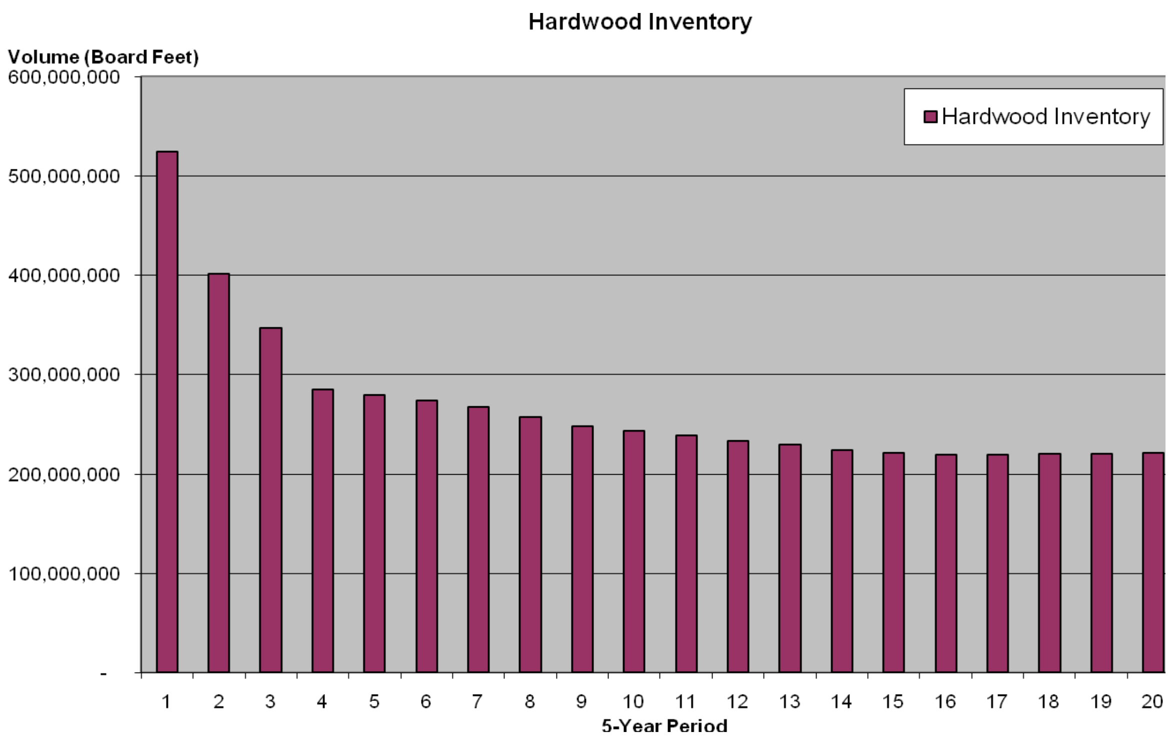

Chart 2: Modeled Hardwood Inventory, Growth and Harvest by 5-Year Period
It is the intent of MRC management to restore the forest to conifer-dominated conditions. Hardwoods remain an important component of the forest in subsequent periods.

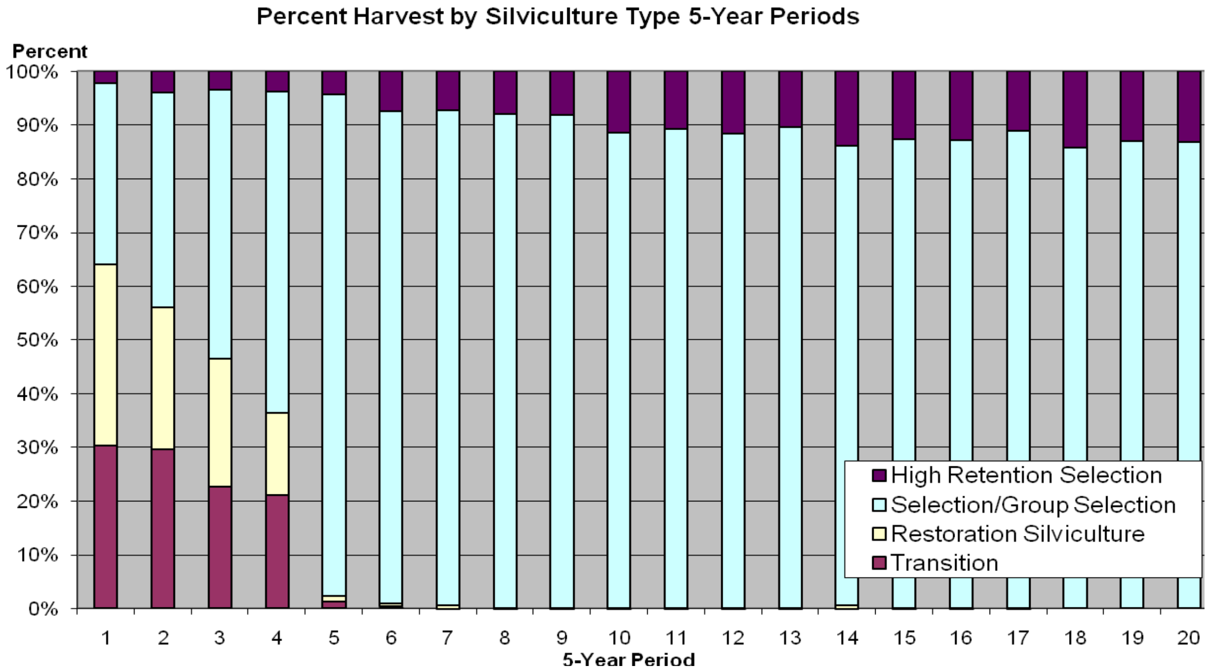

Chart 3: Projected Acres by Silvicultural Method by 5-Year Period
The overall percentages of silviculture methods incorporated by 5-year period are shown above. Restoration silviculture includes rehabilitation, seed-tree removal, and variable retention.

Table 4. Acres Harvested by Silviculture Type.

5-Year Period	Selection/Group Selection	High Retention Selection	Transition	Restoration Silviculture
1	10,251	676	9,158	10,253
2	15,302	1,496	11,277	10,077
3	18,388	1,301	8,327	8,735
4	20,270	1,272	7,146	5,202
5	36,903	1,720	452	413
6	38,010	3,062	148	200
7	38,554	3,035	-	225
8	39,041	3,369	-	71
9	41,892	3,714	-	104
10	39,751	5,127	-	55
11	40,386	4,851	-	25

5-Year Period	Selection/Group Selection	High Retention Selection	Transition	Restoration Silviculture
12	40,561	5,328	-	61
13	43,884	5,126	-	170
14	40,598	6,575	-	224
15	41,007	5,986	-	55
16	40,936	6,018	-	65
17	44,298	5,553	-	18
18	40,930	6,838	-	-
19	41,089	6,202	-	-
20	41,131	6,296	-	-

* Restoration silviculture is performed on stands that have less than desirable conifer stocking and are usually impacted by hardwood competition

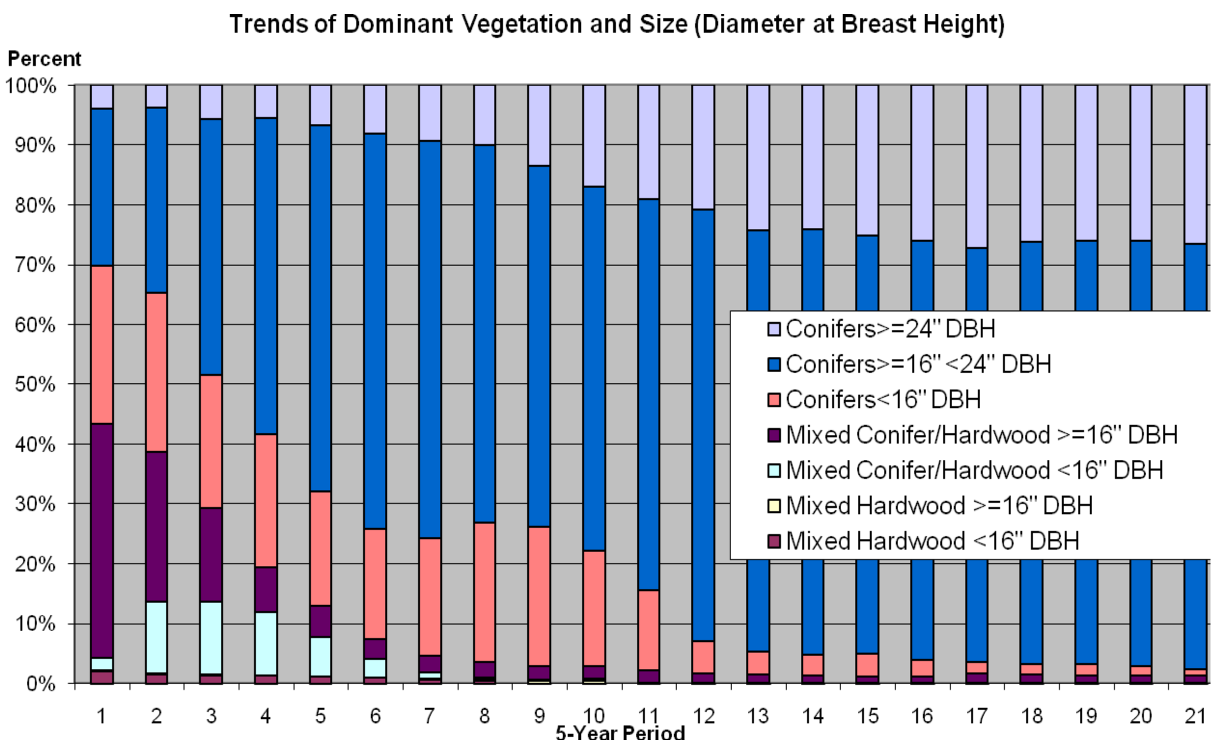

Chart 4: Trends of Dominant Vegetation and Size by 5-Year Period

The chart above displays the trends of species and size class over the planning period.

1.3.3 Stand vigor, site occupancy and regeneration considerations

Ensuring adequate site occupancy, maintaining good stand vigor, and making provisions for adequate regeneration are all provisions for ensuring MSP. These are related to the conditions found in the forest after a harvest operation is complete. MRC's retention and restocking guidelines are designed to create future healthy stands for continued timber production and improved wildlife habitat.

Regeneration activities on MRC lands include site preparation and tree planting. Timber stand improvement (TSI) work is completed to maintain optimal site occupancy, and includes vegetative management and pre-commercial thinning. TSI vegetation management is designed to improve conditions for the growth of conifer seedlings on a site that has been harvested where openings exist in the forest canopy. TSI thinning is designed to maintain and enhance an already well-stocked stand, mainly through density control. The details of modeling regeneration activities are discussed with each silviculture method in the Landscape Planning Attachment. TSI thinning work has been sporadic and unpredictable on MRC's landscape, and is not modeled, however this method has been applied at a significantly higher rate from 2008 through 2012 than previously during MRC's ownership.

All silviculture regimes are designed to ensure good stand vigor. Furthermore, it is MRC policy that the selection of trees for harvest on partial cuts prioritizes diseased and suppressed trees prior to removing co-dominant and dominant trees, unless the tree provides favorable structural elements for wildlife.

Hardwoods are modeled for management, or control, within each of the silviculture regimes. The targeted hardwood basal area retention level is 15 square feet, per acre, of trees greater than 6 inches diameter at breast height (dbh), in each stand following harvest, where there was at least that much hardwood component to begin with. This is to ensure that hardwoods remain part of the complex structural conditions MRC is seeking to promote in the forest stands. Approximately 40% of MRC's lands have hardwood levels above desired conditions. The hardwoods are typically the dominant overstory species in these stands—stands which exhibit characteristics of being conifer dominated in the past. It is MRC's goal to restore the majority of these stands to a species mix that more closely resembles the conditions that existed prior to commercial logging activities. Adjacent old-growth forests, such as Hendy and Montgomery Woods, present forest conditions unaffected by logging activities. These forests help the company to envision what the natural forest conditions were on the property.

There are hardwood stands scattered across the covered lands that do not show any evidence of ever containing conifers in significant amounts. These stands will not be converted to conifer production. The majority of these particular areas is typically dominated by true oaks or mixed hardwood types, and they are most likely to be present in some of the eastern extremes of the property, or in very small locations spread throughout the ownership, such as within rock outcrops. There are also scattered stands of hardwoods that historically were conifer dominated that will be left as hardwood dominated. These isolated stands are being left to insure that the current conditions of the majority of MRC lands are not entirely removed from the landscape.

While MRC recognizes the need to restore the majority of its lands to the historical condition of conifer domination, it also recognizes the current conditions as a unique community that should be preserved, just to a much less degree than currently.

1.4 Non-timber Value Considerations for MSP Determination

Non-timber forest values considered in the calculation of MSP include the conservation and improvement of terrestrial wildlife habitat, improvements to habitat adjacent to watercourses, and increased attention to community concerns such as viewshed, recreational opportunities, and economic vitality. Specific conservation strategies for terrestrial and aquatic species are described in detail within the HCP/NCCP. The above considerations impact the determination of MSP through the application of silviculture applications that are appropriate for the level of sensitivity in each stand. The goal of the silviculture applications is to ensure that the selected plan will achieve the targeted forest conditions and meet harvest constraints.

Modeling silviculture regimes includes establishing harvest triggers (MRC uses basal areas of hardwoods and conifers as triggers) and establishing retention standards (using both hardwood and conifer basal area). Fine tuning triggers and retention logic affect the size, density, and growth rates in the forest, which allows the development and maintenance of desired forest structural characteristics. Trigger and retention levels are used to represent the desired management in the field to develop vertical diversity, improve the recruitment of large woody debris, increase canopy closure close to watercourses, and rehabilitate poorly-stocked conifer stands. Detailed descriptions, trigger conditions, regeneration assumptions, retention, and re-entry specifications for MRC silviculture prescriptions are found in Attachment A. Table 5 below displays the acres constrained for non-timber values.

Table 5. Acres Constrained in Modeling Activities for Non-Timber Forest Values.

Forest Management Type	Descriptions	Total Gross Acres
Old Growth Management (Type I)	Description: Forest stands containing old-growth trees that have never been entered for timber harvest. These stands contain a wide variety of tree species, size classes and ages as well as very large redwoods and Douglas-fir. These stands serve as a natural model of a redwood ecosystem, providing a baseline to compare to the rest of the property. These areas are not harvested in the growth model.	104
Old Growth Management (Type II)	Description: Forest stands that have been previously harvested yet contain a significant level of old-growth trees. These areas are harvested using High Retention Selection in the growth model.	564
Class I and Large Class II Watercourse Buffers (Including Floodplains)	Description: Management buffers along fish-bearing watercourses and watercourses used for domestic water supply (Class I), watercourses that support non-fish aquatic life beneath a watershed area that exceeds 100 acres in size (Large Class II), and certain floodplains. Modeling assumed a conservative buffer width for modeling of 150 feet (horizontal distance from the centerline of the watercourse). The actual buffer widths that will be implemented in the field will vary based on slope. These areas are harvested using High Retention Selection in the growth model.	21,103
Small Class II Watercourses Buffers	Description: Small Class II watercourses that support aquatic life that are non-fish-bearing and have watershed area ≤100 acres in size. Modeling assumed a	5,852

Forest Management Type	Descriptions	Total Gross Acres
	conservative buffer width for modeling of 75 feet (horizontal distance from the centerline of the watercourse). The actual buffer widths that will be implemented in the field will vary based on slope. These areas are harvested using Selection silviculture in the growth model.	
Pygmy Forest	Description: Pygmy forests are rare and unique ecosystems that exist close to the Pacific Ocean shore. There are many rare plants which are found only in these vegetation communities, including dwarfed pines (Bolander pine). These areas are not harvested in the growth model.	162
Bishop Pine	Description: Bishop pine forests are rare and unique ecosystems that exist close to the Pacific Ocean shore. There are many rare plants which are found only in these vegetation communities. These areas are similar to Pygmy forest but lack Pygmy Cyprus and Bolander's pine. These areas are not harvested in the growth model.	319
Rock Outcrop	Description: Natural rock outcrops are a unique feature in the forested landscape. Some of these features may be suitable habitat for peregrine falcons. These areas are not harvested in the growth model.	63
Conservation Easement	Description: MRC has two separate conservation easements on the property where certain harvesting and development rights have been legally restricted. These areas are not harvested in the growth model.	462
Viewshed	Description: Viewsheds are important scenic areas in areas adjacent to State Parks, non-industrial neighbors, state highways, county roads, and the Skunk Train. These areas are harvested with Selection silviculture in the growth model.	3,656
Oak Woodlands	Description: Forested areas consisting largely of true oaks and madrone. These areas are not harvested in the growth model.	1,084
Lower Alder Creek Marbled Murrelet Management Area (Core Areas)	Description: Un-entered and second growth stands in Lower Alder Creek that support marbled murrelet nesting activities. These areas are not harvested in the growth model.	140
Lower Alder Creek Marbled Murrelet Management Area (Buffer Areas)	Description: Largely second-growth stands that surround marbled murrelet core nesting areas. These areas are harvested using a Medium Retention Selection silviculture in the growth model.	1178
Coastal Zone Special Treatment Areas	Description: Stands that have been identified from Coastal Commission maps. These areas are harvested using Medium Retention Selection in the growth model.	657
Northern Spotted Owl (NSO) (Core Area)	Description: Stands that have been identified as NSO core activity centers or nesting sites. These areas are not harvested in the growth model.	6874
Northern Spotted Owl (Buffer Area)	Description: Stands that have been identified as buffers surrounding NSO nesting sites. These areas are harvested using Selection silviculture in the growth model.	953
Point Arena Mountain Beaver	Description: Stands that have been identified as Point Arena Mountain Beaver habitat. These areas are not harvested in the growth model.	52
Carbon Sequestration	Description: Stands that are experimentally managed to maximize carbon sequestration. These areas are harvested using High Retention Selection in the growth model.	341

1.4.1 Regional economic vitality and employment considerations

MRC currently employs approximately 45 full-time and 10 part-time and seasonal workers. The seasonal work force tends to fluctuate depending on annual harvest levels, whereas the full-time employment remains relatively static, with some exceptions, such as the 2008 "Great Recession." This employed group represents a set of individuals with wide variety of scientific backgrounds and expertise. MRC's sister companies in the Ukiah area, with their associated mills, treating, and distribution businesses employ an additional 350 full-time and 20 to 30 part-time and seasonal workers. This number is more the bottom level of employment, as throughout the period of the EIS/PTEIR and HCP/NCCP, as harvest levels increase, an increase in employment is expected along the way. This is expected to be more pronounced in the milling and distribution side as harvest volumes increase. While the HCP/NCCP will precipitate hiring science staff for monitoring, the expected harvest acreage will remain fairly even, while the volume per acre increases.

In addition to the direct employment of MRC, MRC purchases products and engages in contracts with over 150 suppliers, most of which are located in Mendocino County. The value of MRC's contracts with these suppliers is over $15 million per year, and these contracts involve over 300 additional contractor employees. The majority of these contracts are involved in the logging and hauling operations. MRC partners closely with these contractors to ensure that forest management objectives are carried out in all aspects of operations on the ground. Partnering activities include joint training programs and greater involvement of contractors with timber harvest planning and layout.

As MRC improves the forest inventories and wildlife habitat on its land base, these successes will contribute to the stability and diversity of employment in our communities. Many employment opportunities are directly related to the forest products industry and the addition of value-added products.

The economic effects of MRC's harvest production activities on local economies can be analyzed by looking at direct and indirect employment and payrolls, local sales taxes, property taxes, and timber yield taxes. Multipliers are determined per million board feet of timber harvest to arrive at projected economic contributions.

Direct employment and payroll covers employees of MRC and their wages or salaries. It also covers employees of logging, trucking, and other contractors employed by MRC in the course of normal operations. Data collected from MRC manufacturing operations indicate that the direct employment per million board feet is 12.15 jobs. The jobs considered in this multiplier include foresters, biologists, watershed specialists, logging contractors, managers, and mill workers. Excluded from the calculation are contractors engaged in road construction and vegetation management. Also excluded are consultants, inspectors, and vendors associated with timber harvest. It also did not include all employees associated with the Calpella Distribution Center and the Ukiah wood treatment plant, which amount to 7.32 jobs per million board feet log scale. These jobs were considered in the regional employment multiplier considered below.

McKillop (1995) estimated a timber industry employment multiplier of 2 and an income multiplier of 1.6 per million board feet of timber harvested. McKillop and Spriggs (1993) estimated that $257 per year is collected in local sales tax for each job created directly and indirectly by timber harvesting in California, Oregon, and Washington. This amounts to $6,246 in sales tax revenue per million board feet harvested. The average yield tax per million board feet of conifer harvest in Mendocino County is estimated to be $13,630. Property taxes do not fluctuate with timber harvest. MRC pays property taxes for its timberlands, its related sawmills and other facilities. The analysis below only includes the property taxes paid as the result of a viable timber harvesting operation, such as those associated with the facilities. It does not include those taxes associated with the land since those taxes would be paid in the absence of a timber harvesting program. The following tables show the effect of timber harvest on the local economy per million board feet of conifers harvested.

Table 6. Multipliers used to estimate jobs, payrolls, and taxes resulting from MRC's forest management operations.

Multipliers per Million Board Feet of Timber Harvested					
Timber Jobs	**Regional Jobs**	**Timber Payrolls**	**Regional Payrolls**	**Yield Tax**	**Sales Tax**
12.2	24.3	$274,300	$438,600	$13,630	$6,246

Table 7. Estimated jobs, payrolls, and taxes per decade resulting from MRC's forest management operations.

Decade	Volume Harvested	Timber Jobs	Regional Jobs	Timber Payrolls ($)	Regional Payrolls ($)	Yield Tax ($)	Sales Tax ($)
1	488,590,044	5,966	11,883	134,132,700	214,475,400	6,665,070	3,054,294
2	635,256,862	7,747	15,431	174,180,500	278,511,000	8,655,050	3,966,210
3	624,920,500	7,625	15,188	171,437,500	274,125,000	8,518,750	3,903,750
4	802,812,847	9,797	19,513	220,262,900	352,195,800	10,944,890	5,015,538
5	903,869,009	11,029	21,967	247,967,200	396,494,400	12,321,520	5,646,384
6	935,933,194	11,419	22,745	256,744,800	410,529,600	12,757,680	5,846,256
7	1,069,606,417	13,054	26,001	293,501,000	469,302,000	14,584,100	6,683,220
8	1,077,967,816	13,152	26,195	295,695,400	472,810,800	14,693,140	6,733,188
9	1,189,184,218	14,506	28,893	326,142,700	521,495,400	16,206,070	7,426,494
10	1,193,563,425	14,567	29,014	327,514,200	523,688,400	16,274,220	7,457,724

1.4.2 Range and forage considerations

The structure and composition of the vegetation on MRC's ownership is diverse. The dominant vegetation type is forest (primarily composed of redwood, Douglas-fir, and tanoak). Forest structure and composition is dynamic, due to harvesting activities and forest succession. A portion of the forested landscape will consist of forage species as the result of harvest. The actual acreage of forage may decrease as the result of using of uneven-aged silviculture. Grasslands currently represent approximately 4% of MRC's ownership. Some of these lands were forested prior to conversion attempts earlier in the century. Native American fire management also had a role in the current grassland distribution. Some of these grasslands are gradually returning to forest cover as a result of fire exclusion and reforestation. There are no specific model constraints or policies to manage range and forage, however MRC is currently engaged with a local Native American tribe to reduce encroaching Douglas-fir on an area that was maintained as oak savannah through Native American burning practices prior to European intervention. This is located on about 5 acres in the lands near Ukiah.

1.4.3 Special modeling constraints

Although the silviculture prescriptions, described above under 1.4, will be utilized throughout the TMP, for modeling and MSP projections, some adaptations were necessary to most accurately state growth and yield over time. These are modeled as limitations on the amount of harvest that can occur in any entry.

The first example of a special modeling constraint modeled in the MSP model run are AMZ buffers for Class I, Large Class II, and Small Class II streams. MRC's GIS and Inventory staff placed the appropriate buffer around each stream (dependent on class) and developed individual polygons for each buffer (a forest stand). When a harvest is possible in one of these polygons, the model reviews the tree data within each stand to determine if it meets the criteria for harvest. If the basal area of conifers within the stand meets the pre-harvest triggers described in Chapter 8 of the HCP/NCCP—the stand can be harvested in the model, and retention of trees within the stand will meet required post-harvest conditions within Chapter 8. However, the AMZ stand must also meet one other condition—it can only be harvested if the stand immediately "up-slope" of the AMZ stand also can be harvested. What this means is that the model does not show harvest yields within AMZ stands (which, over time will have substantial timber volume) unless the adjacent stand meets its own harvest triggers. This special constraint limits MRC's overall available harvest yield because it takes into consideration real-world operational limitations. Most companies would never cable log through a stand only to log the AMZ stand below it, however, if not constrained this special way in the model, one could still "count" on the AMZ yield and apply it to the overall yield available in a given year. There are certainly some AMZ conservation measures that MRC is unable to model—including large woody debris input due to falling trees into the streams; however these conservation measures are expected to have insignificant effects on growth and yield outputs for modeling.

The second example of conservation measures that necessitated intensive modeling adaptations were the Terrain Stability Units (TSUs) developed within the HCP/NCCP to protect sensitive slopes. MRC developed TSUs to address sediment control and the potential for mass wasting to occur on covered lands (see HCP/NCCP Chapter 8 for more details). MRC consulted with a professional geologist, who utilized aerial photos with some field verification to delineate TSUs across the covered lands. During the operations of the project, there is an expectation that the delineations will change over time as the aerial photo assessments are validated with more ground visits. During the initial aerial photo assessment and delineation, each TSU polygon is assigned a hazard rating from 1–8, with 1 being the "highest" hazard, or most likely to undergo a mass wasting event.

Each TSU hazard rating has associated conservation measures within the HCP/NCCP, such as the requirement to maintain a percentage of canopy cover in "high hazard" (TSUs 1, 2, and 3). TSUs 1, 2, and 3 require maintaining a minimum of 50% of existing forest canopy; while TSUs 4, 5, and 8 have no requirement for canopy retention. TSUs 6 and 7 also require retention of a minimum of 50% of existing forest canopy; however, these TSUs are rare across covered lands. TSU 6 is defined as an area with active or dormant earth flow or earth flow complex. TSU 7 is similarly defined and limited to a few areas of the plan which are historically dominated by oak woodlands and grasslands. As part of MRC's conservation measures for natural communities (see HCP/NCCP Chapter 9 for more details), MRC has proposed to avoid intensive forest management in these areas.

Given the geographical limitations of TSUs 6 and 7 and the limited constraints applied in TSUs 4, 5, and 8, MRC determined that these TSUs would have negligible effects on our yield model. For this reason, special constraints to TSUs 4, 5, 6, 7 and 8 were not included in our modeling efforts. TSUs 1, 2, and 3 were included due to their specific requirement to maintain 50% over-story canopy, and also because these 3 TSUs cover about 30% of the covered lands. The high hazard TSUs do not correspond to the delineation of stand boundaries. This is because the stand boundaries were delineated based on vegetation types, and the TSUs were delineated based on slope, slope condition, soil types, and aerial interpretation of landscape features. Because of these two different styles of interpretation, MRC determined that splicing up the vegetation stands and creating smaller, individual forest stands for each TSU 1, 2, and 3 polygon would be infeasible for several reasons. First, these TSU units often cross multiple stand and special area boundaries and would require us to split individual stands into 3 or 4 additional stands. These stands would be far too small to address as manageable forest units. Additionally, the number of stands we use to model would grow exponentially, causing modeling efforts to slow dramatically and become unwieldy. Finally, as field validation occurs, we expect delineations and assignment of hazard ratings for each unit to change, though we do expect the approximate acreages of stands assigned each TSU hazard rating to remain the same. What this means is that the actual TSU boundary will be determined during field planning, and the actual TSU boundaries are expected to change from the ones delineated at present; however, over the entire covered lands, the acreage of the high hazard TSUs is expected to remain static.

To model canopy retention in TSUs 1, 2, and 3 assess the percentage of each stand covered by a TSU 1, 2, or 3 polygon, MRC assigned special modeling constraints to mimic the 50% canopy retention requirement based on the proportion of each stand covered by the TSU:

Table 8. Timber modeling constraints for TSUs 1, 2, and 3.

Proportion of stand in TSU	Constraint applied
0-25%	None
26-50%	Limited to transition silviculture
> 50%	Limited to selection silviculture

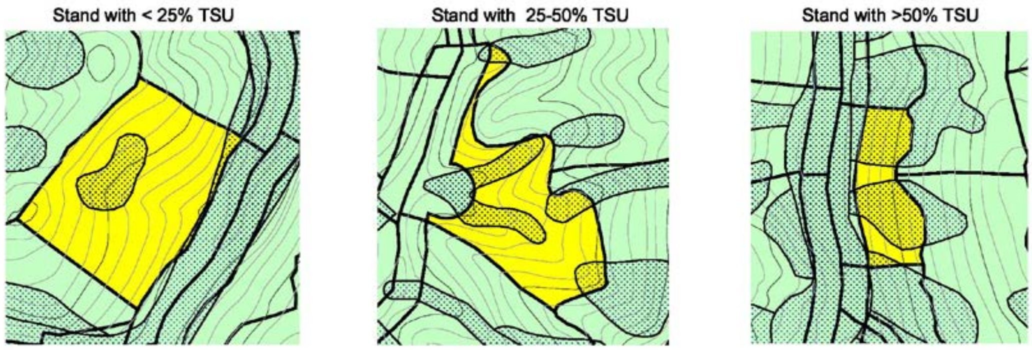

Figure 2. Illustration of stands with various proportions of TSUs contained within them.

1.4.4 Herbicide use

Herbicide use can be, and currently is, an important tool in the restoration of the MRC forestlands. Although not specified as a covered activity in the HCP/NCCP, MRC will continue to utilize this management tool while operating under the EIS/PTEIR. What this means is that MRC will not have the ability to "take" covered species while applying herbicides. This is a more protective strategy toward species protection, partaken by MRC due, not just because of the social sensitivity of the issue, but because of the fairly rapid pace of herbicide research and development. This pace, which provides research information on both old products, and new developing products, makes it very hard to predict necessary conservation measures to protect covered species, if herbicide use was a covered activity in the HCP/NCCP. The discussion below is from the combined MRC/HRC website (www.mrc.com), so references to HRC have been omitted.

A key component of our forest management is to restore the conifer balance on our forestlands. Mendocino Redwood Company has an imbalance of hardwoods and conifers on a large portion of its forestlands. Herbicides are a key tool in restoring the conifer balance and also in controlling invasive, exotic plant species. Accordingly, MRC uses herbicides more commonly to promote redwood and Douglas-fir while reducing the density of tanoak (a native hardwood). The restoration of conifers on MRC forestlands is technically challenging and will take many years.

There are many reasons for the current imbalance of hardwoods on MRC forestlands. First, MRC has had to play "catch up" in order to grapple with forest conditions that were inherited from previous land owners and past land use. In the early part of the 20th century, persistent burning to convert forests to pastures produced thousands of acres of grass and brush. Tanoak was often the first and only tree species to re-occupy these sites when reverted back to forest. Once disturbed by cutting or burning, tanoak trees sprout aggressively; they rapidly overtake conifer seedlings and suppress regeneration of the redwood and Douglas-fir forest. Second, the past practice of "high-grading" – removing the best conifer trees from a forest and leaving only smaller ones along with the tanoak allowed tanoak to out-compete the conifers and become the dominant tree species.

MRC uses herbicides as part of their forest restoration either to restore the conifer balance or control invasive, exotic plants. These herbicides are applied manually on a plant-by-plant basis. Manual applications include both "foliar" and "frill" treatments. In a foliar application, a competing tanoak tree is cut down and a follow-up crew returns and applies an herbicide mixture to the stump sprouts. For exotic species control, crews apply herbicide mixtures to individual invasive plants. A frill treatment entails cutting through the bark of the hardwood and applying herbicide to its cambium (the thin layer that moves water and food between roots and the top of the tree).

The use of herbicides is regulated by the Mendocino County Agricultural Commission; as well as the North Coast Regional Water Quality Control Board. We require all contractors employed for vegetation management to use protective gear and to confine applications of herbicides to use during appropriate weather conditions. We follow strict guidelines that meet and often exceed government regulatory requirements; these guidelines include:

- *Only using herbicides to address ecological imbalances on our forestlands;*
- *Applying herbicides manually on a plant-by-plant basis with fully-trained applicators who report herbicide usage to the County Agricultural Commissioner;*
- *Actively control invasive, exotic plants to protect native forest species working in cooperation with the Bureau of Land Management, state parks, and other landowners;*
- *Applying herbicides only outside watercourse protection zones of Class I and Class II streams and more than 25 feet from a Class III watercourse;*

Early on, MRC set an ambitious target to reduce its use of herbicides by 60% over 4 years. While this goal was not completely achieved, MRC did reduce herbicide use by 44% in 2000-2002 and by 48.5% in 2003. MRC continues to search for methods to reduce our needs for herbicides. In fact, MRC has tested and monitored several herbicide alternatives including eucalyptus oil, neem oil, and wheat gluten. So far, however, these alternative methods are not as effective and are more costly than the herbicides used today. In some stands where tanoak is less pervasive, MRC can use chainsaw cutting to reduce tanoak competition. It is likely that this method of control will be continued in these stands as an effective, non-chemical treatment for tanoak control.

In the future, the annual herbicide use will vary dependent on the level of harvest and which forest stands are chosen for restoration. The trend, however, is a reduction in herbicide use over the long-term. We are committed to phasing out the use of chemical herbicides as a routine management tool in keeping with Forest Stewardship Council principles as we transition towards uneven-aged silvicultural regimes.

From our past experience, we recognize that it is currently unrealistic to exclude herbicides as a management option. Nevertheless, we are committed to exploring alternatives for herbicides. Until better solutions become available that are practical, environmentally suitable, and economical, we will continue to use herbicides responsibly and in a limited fashion to:

- *Restock conifer stands previously impacted by hardwood competition;*
- *Promote conifer growth where there has been no effective vegetation management;*

- *Foster conifer growth where it is being retarded;*
- *Contain non-native invasive plants; and*
- *Conduct experiments that could further reduce herbicide use.*

1.5 Silvicultural Considerations

MRC will use the following silvicultural treatments when harvesting timber for non-AMZ stands. The chart below gives a general overview of what stands will get which treatment. For AMZs and other constrained stands, MRC uses special selection silviculture, meant to model the intended constraint on the stand.

Table 9. General decision logic in selecting silvicutural methods.

<table>
<tr><th rowspan="2">Conifer Stocking
(Basal Area (square feet) per Acre)</th><th colspan="3">Hardwood Stocking (Basal Area (square feet) per Acre)</th></tr>
<tr><th>>60</th><th>20-60</th><th><20</th></tr>
<tr><td>>125</td><td colspan="3">Selection, Group Selection, Alternative Group Selection</td></tr>
<tr><td>105-125</td><td>Restoration Variable</td><td colspan="2"></td></tr>
<tr><td>50-105</td><td>Retention
(Conifers must be large)</td><td colspan="2">(Alternative) Transition</td></tr>
<tr><td><50</td><td colspan="2">Rehabilitation</td><td>Alternative Seed Tree Removal
(Conifers must be Large)</td></tr>
<tr><td colspan="4">The trend in silviculture implementation will migrate stands toward a condition where they can continuously be managed under Selection and Group Selection methods. Each silviculture method has a 20 year re-entry period.</td></tr>
</table>

1.5.1 Selection, Group Selection, or Alternative Group Selection

1.5.1.1 Description

Selection, Group Selection, or Alternative Group Selection will be used in stands that are well-stocked with conifers. The purpose of harvesting using the Selection, Group Selection, or Alternative Group Selection methods is to produce logs, adjust age classes to ensure strong growth in a structurally diverse (including trees in excess of 80 years) stand, maintain an uneven age condition, allow for effective regeneration, and reduce competitive forces in the stand. Generally, Selection will be chosen if the stand is composed of younger trees with the intent to thin trees and maintain uneven-aged composition while Group Selection will be chosen for older stands and stands with high hardwood competition to address conifer regeneration.

1.5.1.2 Harvesting conditions

The stand (typically a discrete geographic unit 30 acres or less) is the spatial basis for determining if the forest unit meets the trigger conditions for the Selection, Group Selection, or Alternative Group Selection silvicultures. The Selection and Group Selection silvicultures are initiated if the average conifer basal area stocking exceeds 105 square feet per acre. The Alternative Group Selection silviculture is initiated if the average pre-harvest conifer basal area stocking exceeds 105 square feet per acre and harvesting of hardwoods will result in greater than 20% of the stand in group clearings. Although the opening size will not exceed 2.5 acres, as per the current FPRs, the removal of hardwoods may create a condition of greater than 20% of the stand has small group clearings.

1.5.1.3 Retention conditions

Large trees (> 16 inches dbh) will be retained at approximately 40 square feet per acre, averaged across the stand. The general goal in retaining large trees is to select for trees that have full crowns, are capable of seed production, and represent the best phenotypes in the stand. Exceptions to this goal include retention of trees for wildlife and/or structural purposes. These trees may not have full crowns, may not be capable of seed production, and may not represent the best phenotypes in the stand.

The post harvest stocking standard will have at least 75 square feet of conifer basal area per acre in the areas outside the groups and no more than 20% of the stand will be in group openings, unless Alternative Group Selection is applied. Hardwoods will be retained at the level of approximately 15 square feet per acre of trees greater than 6 inches dbh, provided they were a component of the pre-harvest stand. Conifers will be planted, if necessary, to ensure adequate site dominance of conifers and to add an additional age class.

1.5.2 Transition and alternative transition

1.5.2.1 Description

The Transition Silviculture is used in stands that are unbalanced in terms of their age class distribution and/or species composition (particularly between hardwoods and conifers). Trees will be removed individually and in small groups to adjust size classes, reduce competition, and improve the structural diversity of conifers. Stands managed with Transition are usually followed up with Selection or Group Selection 20 years later. In no case will Transition be used more than twice in the same stand.

1.5.2.2 Harvesting conditions

The basis for determining if the stand meets the trigger conditions for the Transition silviculture is the stand (typically a discrete unit 30 acres or less) and is based on the average conifer basal area stocking being between 60 square feet and 105 square feet on a per acre basis across the stand. No more than 20% of the stand may be cleared in small group openings to provide for natural or artificial regeneration. Areas that have openings greater than 20% prior to harvest, such as where past grazing has removed Douglas-fir and grasslands now exist, can still be treated with the Transition method as long as not more than 20% of new openings are created through the harvest, and the retention targets below are met. The Alternative Transition silviculture is initiated if the average conifer basal area stocking is between 60 and 105 square feet per acre and harvesting of hardwoods will result in greater than 20% of the stand in group clearings.

1.5.2.3 Retention conditions

Large trees (> 16 inches dbh) will be retained at approximately 10 square feet per acre, averaged across the stand. The general goal in retaining large trees is to select for trees that have full crowns, are capable of seed production, and represent the best phenotypes in the stand. Exceptions to this goal include retention of trees for wildlife and/or structural purposes. These trees may not have full crowns, may not be capable of seed production, and may not represent the best phenotypes in the stand.

The post harvest stocking standard will have at least 50 square feet of conifer basal area per acre, outside of group openings created through the harvest. Hardwoods will be retained at the level of approximately 15 square feet per acre, provided they were a component of the preharvest stand. If natural regeneration is unlikely, due to the pre-harvest stand having too few, or no seed trees, new openings created through the harvest will be planted. Outside of new group openings, conifers will be planted, if necessary, to ensure adequate site dominance of conifers and to add an additional age class.

1.5.3 Rehabilitation

1.5.3.1 Description

Rehabilitation will be used in stands that are capable of growing conifers, but have high levels of hardwood stocking that impede the establishment and/or growth of conifers, or are stocked with non-countable conifer trees (usually trees with less than 30% crown, that are very stunted, etc—this is very limited). In either case, these stands do not meet the stocking standards defined in 14 CCR § 912.7. The purpose of the implementation of this silviculture activity is to enhance the productivity of the stand.

1.5.3.2 Harvesting conditions

The basis for determining if the stand meets the trigger conditions for the Rehabilitation silviculture is the stand (typically a discrete unit 30 acres or less) and is based on the average conifer basal area stocking being less than 50 square feet of basal area per acre and in need of management to hasten the recovery of productive conifer stands. These stands also do not meet the stocking standards of 14 CCR § 912.7(b)(1).

1.5.3.3 Retention conditions

Large trees (> 16 inches dbh) will be retained at approximately 5 square feet per acre, averaged across the stand. The general goal in retaining large trees is to select for trees that have full crowns, are capable of seed production, and represent the best phenotypes in the stand. Exceptions to this goal include retention of trees for wildlife and/or structural purposes. These trees may not have full crowns, may not be capable of seed production, and may not represent the best phenotypes in the stand. If the retention targets for trees > 16 inches dbh are not present prior to harvest, then all trees > 16 inches dbh will be left where there numbers are deficient.

The post harvest stocking standard will have at least 5 square feet of conifer basal area per acre, averaged across the stand, and may include openings where hardwood competition has been reduced that will be planted. Hardwoods will be retained at the level of approximately 15 square feet per acre, provided they were a component of the pre-harvest stand. Conifers will be planted to ensure adequate site dominance of conifers.

1.5.4 Restoration variable retention

1.5.4.1 Description

Restoration Variable Retention is used where mature conifers are present in a stand that has a high level of hardwood competition. It may also be used in older second-growth stands that, because of disease or senescence, cannot maintain a leave stand of at least 50 square feet of countable trees after harvest. The purpose of the implementation of this silviculture activity is to enhance the productivity of the stand. The intent of this silviculture activity is to reduce hardwood competition, harvest merchantable conifer volume while retaining structural elements (trees, snags, logs, etc.) for integration into the post-harvest stand. The silviculture activity will retain large trees to provide a seed source, and will create a condition for favorable growth of young conifers, either planted or existing prior to the harvest. Retention of structural elements will be either aggregated or dispersed in the stands, or through a combination of both. Focal areas for retention include unstable areas, wet areas, unique habitat features, and important viewsheds.

1.5.4.2 Harvesting conditions

The basis for determining if the forested area meets the trigger conditions for the Restoration Variable Retention silviculture is the stand (typically a discrete geographic unit 30 acres or less, which is bound by the standard Watercourse and Lake Protections Zones (WLPZs) if adjacent to a watercourse) and is based on the average conifer basal area in trees larger than 16 inches dbh being between 25 square feet and 125 square feet per acre across the stand. Additionally, the hardwood stocking must be greater than 60 square feet of basal area per acre. Restoration Variable Retention is typically used only once in the life of a stand.

The stands that are harvested with a Restoration Variable Retention harvest are re-entered in 20-years and are managed with the Transition or Selection methods. These methods will continue to retain structural elements in perpetuity. These silviculture methods will harvest up to 50% of the retained trees that were retained during the Restoration Variable Retention harvest.

1.5.4.3 Retention conditions

Retention conditions will be driven by the pre-harvest stand conditions and may vary from stand to stand. At a minimum the following retention will occur

- Aggregated retention in portions of the stand requiring additional measures (areas greater than 150 feet from a Class I Watercourse, or greater than the Class II standard widths of 50, 75 or 100 feet (depending on slope), class III AMZs, TSUs, hardwood patches). (TSUs, or Terrain Stability Units are a categorization of a land area based on terrain similarity, mass wasting potential, and sediment delivery risk.)
- Dispersed retention will be made up of countable conifer regeneration < 12 inches dbh, trees left for
- TSU constraints, snags, old growth trees, wildlife trees, recruitment trees and/or screen trees as per the HCP/NCCP.

- If the above two retention standards, singly or in combination, do not equate to the following standards, than either aggregated retention or dispersed retention in the form of trees > 16 inches dbh need to be added to meet the following minimum standards.
  - Aggregated Retention must equate to a minimum of 10% of the pre-harvest stand, exclusive of Class I and Class II standard width WLPZ acres. These retention methods increase due to the size of the Variable Retention (VR) unit as follows:

Aggregated Retention	*Maximum Size Harvest Area*
> 10% Area	30 Acres
> 15% Area	40 Acres
> 20% Area	60 Acres
> 25% Area	80 Acres
> 30% Area	120 Acres
> 40% Area	200 Acres

  - Dispersed retention shall equate at least 10 square feet of basal area per acre with conifers representing at least 10 square feet. These retention methods increase due to the size of the VR unit as follows:

Dispersed Retention	*Maximum Size Harvest Area*
> 20% of 912.7 (b)(2)	30 Acres
> 30% of 912.7 (b)(2)	40 Acres
> 35% of 912.7 (b)(2)	60 Acres
> 45% of 912.7 (b)(2)	80 Acres
> 55% of 912.7 (b)(2)	120 Acres
> 75% of 912.7 (b)(2)	200 Acres

  - For areas with a combination of dispersed and aggregated retention types for determination of permissible unit size, the percentage of basal area in dispersed retention portions of the combination area may be reduced proportionately to the area in aggregated retention indicated in the above.
  - A minimum of 15 square feet of hardwoods of at least 6 inches dbh will be retained if they were present prior to harvest.
- As discussed above, although the unit sizes may vary on the ground, the modeling utilized the stands layer, which are typically 30 acres or less, and utilized some average basal area retention to try and capture overall variability of the ownership.

1.5.5 Seed tree removal, alternative seed tree removal

1.5.5.1 Description

Seed Tree Removal will be used in stands with scattered predominant trees amidst an understory condition in which the conifer regeneration is generally adequate and not in need of thinning. Alternative Seed Tree Removal is used when the same conditions apply with a need to thin a dense understory of young trees in areas too small to map.

1.5.5.2 Harvesting conditions

Harvest operations using this silviculture will harvest no more than 15 predominant trees or 50 square feet of conifers averaged across the stand per acre (whichever is achieved first). Harvesting may include thinning trees among the regenerated stand (understory) to promote growth and improve health. The stand will be considered for a Transition or Selection harvest approximately 20 years later.

The stand is the basis for determining if the forest unit meets the trigger conditions (typically a discrete geographic unit 30 acres or less). There are two requirements to trigger this harvest: an average conifer basal area in trees < 16 inches dbh of 10 to 60 square feet per acre and a well-stocked younger cohort (trees < 16 inches dbh). Alternative Seed Tree Removal will be applied when there are areas of young growth conifers underneath the seed trees where thinning will maintain or increase the average stand diameter.

1.5.5.3 Retention conditions

Large trees (> 16 inches dbh) will be retained at approximately 5 square feet per acre, averaged across the stand. The general goal in retaining large trees is to select for trees that have full crowns, are capable of seed production, and represent the best phenotypes in the stand. Exceptions to this goal include retention of trees for wildlife and/or structural purposes. These trees may not have full crowns, may not be capable of seed production, and may not represent the best phenotypes in the stand.

The post-harvest stocking standard will have at least 15 square feet of conifer basal area per acre, averaged across the stand, and may include openings where hardwood competition has been reduced that will be planted. Hardwoods will be retained at the level of approximately 15 square feet per acre, provided they were a component of the pre-harvest stand. Conifers will be planted to ensure adequate site dominance of conifers.

1.5.6 Special selection

Special Selection is used for stands that have constraints. Constraints are built-in restrictions to harvest for such items as AMZs and NSO habitat retention to emulate conservation measures applied on the ground. Although normal harvest prescriptions will be utilized on the ground, such as selection, the Special Selection silviculture is applied in the model to reflect the higher retention guidelines to be used to meet the conservation guidelines within the HCP/NCCP.

Special Selection stands typically have higher retention standards than that of typical selection silviculture.

1.5.7 Site preparation (also see 3.6)

Site preparation is utilized by MRC to increase the opportunities for stocking and tree growth. Site preparation, either manually or through controlled burning, can open up areas for conifer planting that were historically conifer dominated, but are now occupied by other, non-coniferous species. Due to the specific conditions that must be present for many site preparation activities, no modeling efforts were undertaken to capture potential increased stocking, growth, and yield. Site preparation activities are opportunistic by nature, and are not a standard practice utilized in uneven-aged management. Unlike even-aged management, where practices such as controlled burning can be implemented on a regular schedule, both manual and fire-related site preparation occurs sporadically due to MRC's desire to promote stocking throughout its landscape and due to the irregularity of MRC's stands. Site preparation may be utilized in all silvicultural prescriptions described above, to increase conifer stocking, or decrease competing vegetation, in areas where conifers were the dominant species historically.

While MRC has practiced very little controlled burning, outside of slash piles generated from logging or brush piling, MRC recognizes that this practice can be important for both stocking and ecological reasons. The presence of fire within the coast ecosystem cannot be ignored, as many species natural to the landscape depend on fire for continued survival. MRC may still utilize this method, for either ecological purposes or site preparation in the future.

Site preparation must follow all of the conservation measures described within the HCP/NCCP. For areas on the landscape where either specific conservation measures do not address, or no covered species are present to warrant conservation measures, MRC foresters will follow the practices and described within the HCP/NCCP Appendix E, Sections E.6 and E.8, and under 14 CCR § 915. The checklist will be utilized to provide the site preparation addendum under 14 CCR § 915.4. The standards from the 2012 FPRs (CAL FIRE 2012) concerning site preparation will be followed in areas not specifically addressed within the HCP/NCCP.

1.6 MSP Monitoring

MRC is in a continual process of improving its knowledge about the forest resource. The projections described in this TMP serve as a set of hypotheses under which the company will operate until better information becomes available that challenge the hypotheses. The improved information may alter either the baseline data, used for modeling future forest harvests and forest conditions, or the models themselves, used for projecting the baseline data through a set of management activities. The efforts employed to increase our knowledge serve as a monitoring tool and a feedback loop to the hypotheses presented in this TMP. Efforts aimed at increasing our understanding of the forestlands include:

- Re-measurement of permanent growth plots
- Sampling of post-harvest stands
- Experiments with different vegetation management alternatives

- Watershed analysis work
- Wildlife inventories and monitoring
- Ecosystem relationships studies
- Monitoring planting efforts

Tracking of the hypotheses related to silviculture is accomplished by tracking actual harvest activities with predicted harvest activities. The following reports are pertinent to the modeling of the TMP and will be provided to CAL FIRE on an annual basis:

- Harvest volume by silviculture prescription
- Harvest acres by silviculture prescription
- Current inventory estimates

Since the acquisition of inventory and growth data is an ongoing management activity, it is anticipated that the underlying assumptions of the baseline inventory and rate of growth will improve over time. While the impact of these adjustments is not expected to change the projections of harvest in this plan, certain circumstances would require a review by the CAL FIRE and may trigger a revision of the document. They are:

- A deviation from average harvest acreage projections in any 10-year period which exceeds 10 percent.
- A change of ownership which results in either an increase or a decrease to MRC's covered lands ownership by the amount prescribed in the HCP/NCCP, Chapter 1 and the Implementation Agreement for the HCP/NCCP (Appendix A of the HCP/NCCP). Any change, as described within the aforementioned chapters that necessitates an amendment for the HCP/NCCP may require an addendum to the EIS/PTEIR, a supplement to the EIS/PTEIR, or possibly a new EIS/PTEIR. Any change in the land base that was determined would only necessitate a minor modification to the HCP/NCCP would not precipitate an amendment to the EIS/PTEIR. Such instances will be evaluated on a case-by-case basis consistent with 14 CCR § 15162(a).
- A change of forest conditions from catastrophic events that result in an Unforeseen Circumstance, as described within the HCP/NCCP, Chapter 14.
- A negative deviation greater than 10 percent from the baseline inventory estimates, or modeled projections, as the result of ongoing inventory and growth monitoring (see Table 2).

MRC will notify CAL FIRE should any of the conditions stated above become fact.

2 IMPLEMENTATION VIA PROGRAM TIMBER HARVEST PLAN (PTHP)

MRC will primarily be using a checklist-based PTHP for submitting harvest plans to CAL FIRE for approval. The content and submittal of the PTHPs will be in accordance with 14 CCR § 1092. The checklist portion of the PTHP is to show that it is in conformance with the EIS/PTEIR, FPRs, HCP/NCCP, OWDRs and the MATO. A sample PTHP has been included as Attachment C, *Sample PTHP*. The final form and checklist will not be finalized until prior to certification of the PTEIR, to fully incorporate all of the measures arising from any revisions from the public draft EIS/PTEIR.

The Board of Forestry and Fire Protection (BOF) and CAL FIRE provided a Guidance Document for the preparation and review of Program Timberland Environmental Impact Reports (*Guidance in the Preparation and Review of Program Timberland Environmental Impact Reports*) dated November 4, 2009 (BOF and CAL FIRE 2009). As stated in this guidance document, the CAL FIRE Director will review a PTHP and will determine the following:

- *"PTHP is in compliance with the PTEIR and PTHP rules (CCR Article 6.8);*
- *that the activities proposed under the PTHP are within the scope of the analysis conducted in the PTEIR; and*
- *that the PTEIR provides the disclosure, impacts analysis and mitigation and avoidance measures required under CEQA."*

To determine whether a PTHP is "within scope" of the PTEIR, the Director will determine if one or more of the following exist:

- *"activities proposed in the PTHP could result in significant environmental impacts not considered in the PTEIR;*
- *substantial changes have occurred leading to significant environmental impacts not covered in PTEIR; or*
- *new information becomes available regarding impacts or mitigation showing:*
  - *the PTHP would have impacts not disclosed in the PTEIR;*
  - *impacts would be substantially more intensive/extensive than shown in PTEIR;*
  - *mitigations and/or alternatives found to be infeasible at the time the PTEIR was certified are now found to be feasible; or*
  - *new feasible mitigations or alternatives not previously considered are identified."*

If the Director finds that a PTHP is "out of scope" of the PTEIR, the plan submitter may use one of the following options:

- *"the PTHP may be modified to be within the scope of the PTEIR;*
- *the PTHP may be withdrawn and a THP submitted; or,*

- *an addendum, supplement or subsequent PTEIR (CCR §§ 15162 to 15164) may be prepared and certified by CAL FIRE to address out of scope issues and a new PTHP submitted."*

It is MRC's intent to utilize the PTHP for all of its timber operations within the covered lands, and is utilizing this TMP, the HCP/NCCP, and the EIS/PTEIR process to ensure that the 80-year term of the HCP/NCCP and EIS/PTEIR has been thoroughly reviewed, with the possibility of future rule changes having been adequately addressed and mitigated. It is always possible that unforeseen rule changes necessitated by outside influences, such as new listed Threatened or Endangered species, may precipitate the need to submit THPs in the future, however, MRC has taken great strides to anticipate future rule changes in the HCP/NCCP and TMP. Minor changes in the FPRs are expected by MRC during the term of the EIS/PTEIR, as a natural process of decision making by the public or its representatives, or Board of Forestry and Fire Protection actions. The 80-year term of the HCP/NCCP and the EIS/PTEIR will likely experience normal changes in resource protection standards due to research, public opinion, changes in wood utilization, and any additional number of potential outside pressures. Therefore, MRC has researched the issues surrounding forest management in and around its ownership for the last 30 years while developing the HCP/NCCP and this TMP and feels that the property-wide plan presented in this document, the other documents, and the analysis within the EIS/PTEIR look as far into the future as possible to anticipate future resource protection standards. This allows MRC to maximize the protections for the various resources, and minimize the need to revise the documents in the future or prepare a new or revised EIS/PTEIR.

3 MRC'S OPERATIONAL STANDARDS WITHIN THE TMP and EIS/PTEIR

In proposing operational standards in this plan, MRC uses current FPRs, as well as HCP/NCCP measures and other standards that differ from current FPRs.

The discussion and description beginning with 3.2 below follow the basic outline as the FPRs. These are:

- Definitions (subchapter 1, Article 1)
- Ratings and Standards (subchapters 4, 5 and 6, Article 2)
- Cumulative Impacts Assessment Checklist and Technical Rule Addendum No. 2 (subchapters 4, 5 and 6, Article 2)
- Silvicultural Methods
- Harvesting Practices and Erosion Control (subchapters 4, 5 and 6, Article 4)
- Site Preparation (subchapters 4, 5 and 6, Article 5)
- Water Course and Lake Protection (subchapters 4, 5 and 6, Article 6)
- Hazard Reduction (subchapters 4, 5 and 6, Article 7)
- Fire Protection (subchapters 4, 5 and 6, Article 8)
- Wildlife Protection Practices (subchapters 4, 5 and 6, Article 9)
- Logging Roads and Landing (subchapters 4, 5 and 6, Article 12)
- Archaeological and Historical Resources Protection (subchapters 4, 5 and 6, Article 14)

Each section discusses MRC's proposed operational standards, whether current FPRs or alternate standards. In addition, there is discussion of MRC's proposed alternate standards, rare plants, improving the effectiveness of prescriptions and addressing site-specific impacts not analyzed in the EIS/PTEIR.

3.1 Alternate Standards

Because MRC is preparing a TMP, and the EIS/PTEIR analyzes all aspects of its operations, including those not directly pertaining to the HCP/NCCP, MRC may propose "alternate standards" that vary from the FPRs. This process is described within 14 CCR § 1092(b) and is further clarified within CAL FIRE's Guidance Document (Board of Forestry and Fire Protection and CAL FIRE 2009). The preparation of alternate standards based on site-specific criteria allows the landowner to develop resource prescriptions based on the individual and unique site characteristics of the ownership. Because MRC developed a thorough resource protection model based primarily on the HCP/NCCP, it has decided to utilize alternate standards for many of the current FPRs.

The following scenarios reflect how MRC proposes alternate standards in relation to the FPRs:

- Use the current rule as it is at the time of EIS/PTEIR certification, without adhering to any future changes to that rule;
- Use an HCP/NCCP standard in place of the FPR standard, including future rule changes; and
- Use an alternate standard other than the FPR standard, including future rule changes.

Within the CAL FIRE guidance document, processes for proposing alternate standards are discussed under two main themes: (1) rule-by-rule, and (2) resource-based. MRC uses a hybrid of both methods for alternate standards. Assessment of impacts is performed based on MRC's management actions, in their entirety, which involves considering the use of a suite of current FPRs in combination with alternate standards. This is the resource-based portion of the hybrid alternate standards analysis. It is contained in the EIS/PTEIR for each resource affected. TMP Attachment D lists: (1) each specific FPR to which MRC proposes an alternate standard; (2) MRC's alternate standards; (3) references to the pertinent document used to provide the rationale for the proposed alternate standard; and (4) a list of the resource areas in the EIS/PTEIR for which effects of the alternate standard are analyzed. This is the rule-by-rule portion of the hybrid alternate standards analysis.

While the TMP can anticipate possible future rule changes and propose mitigations to either maintain the rule in place or propose something different to the current rule, the EIS/PTEIR must analyze whether the proposed standard provides a level of protection that is equal to or better than the standard current rule or equal to or better than a potential future rule (such as a rule that is being developed by the Board of Forestry and Fire Protection, but is not currently adopted). Equal or better protection means that implementation of the alternate standards will result in effects that are less than significant to the resources to which the alternate standards apply. With this in mind, MRC has proposed the alternate standards, including instances of using the current rule as it is at the time of EIS/PTEIR certification, without adhering to any future changes to that rule.

3.2 Definitions

MRC will continue to use most of the definitions contained in 14 CCR § 895.1. However, MRC proposes alternative definitions within the HCP/NCCP which are reflective of the 10-year collaborative effort between MRC, USFWS, NMFS, CDFG, the North Coast Regional Water Quality Control Board, and CAL FIRE. These alternate definitions can be found on pages D-3 through D-13 of TMP Attachment D and will replace only the following definitions in 14 CCR § 895.1:

1. Activity Center	2. Bankfull Stage	3. Buffer Zone
4. Channel Migration Zone	5. Confined Channel	6. Equipment Exclusion Zone
7. Flood Prone Area	8. Functional Foraging Habitat	9. Functional Nesting Habitat
10. Functional Roosting Habitat	11. Historic Road	12. Inner Gorge
13. Mainline Road	14. Northern Spotted Owl Breeding Season	15. Owl Habitat
16. Permanent Watercourse Crossing	17. Pre-existing Large Wood	18. Seasonal Road
19. Temporary Road	20. Type A Owl Habitat	21. Type B Owl Habitat
22. Type C Owl Habitat	23. Winter Period	

3.3 Ratings and Standards

MRC will operate under these current rules and all future changes to rules located in the Ratings and Standards sections, beginning on 14 CCR § 911. These ratings and standards have been fully incorporated into MRC's proposed project.

3.4 Cumulative Effects Analysis - The EIS/PTEIR analysis of the HCP/NCCP, TMP and MATO will be used to meet the overall objectives of 14 CCR §§ 898, 898.1, 912.9 Cumulative Impacts Assessment Checklist and Technical Rule Addendum No. 2.

On page 13 within the CAL FIRE PTEIR guidance document (BOF and CAL FIRE 2009), it states:
"PTHPs are not required to contain the Cumulative Effects Analysis required in typical THPs (THP Section IV: Technical Rule Addendum II) (CCR § 1092.09) and instead rely upon the cumulative effects analysis found in the PTEIR (CCR § 1092(c), 1092.01(b), 1092.01(c)). Mitigations developed in the PTEIR to address cumulative effects are implemented in the PTHP through the PTHP Checklist (see PTHP Checklist Development, below). The cumulative effects

analysis in the PTEIR is largely guided by CEQA Guidelines §15130. In addition, the PTEIR preparer may wish to consider the cumulative effects assessment methodologies found in the Board of Forestry Technical Rule Addendum II (CCR §§ 912.9, 932.9, 952.9).

A periodic update to the cumulative effects analysis will be necessary to reflect changes (past, present and reasonably foreseeable projects) that have been approved since the PTEIR was certified. This may be accomplished through specific mitigations in the PTEIR to ensure that cumulative effects do not occur that are required in the Mitigation Monitoring and Reporting Plan (see Mitigation Monitoring and Reporting Plan (MMRP) discussion) and documented prior to PTHP approval in the PTHP Checklist. Depending on the level of activity anticipated the MMRP may require updates to occur at regular intervals (e.g., annually, decadally) or after significant activity occurs."

The EIS/PTEIR analyzes cumulative impacts throughout the primary and secondary assessment areas. The analysis is based on looking at the effects of implementation of the TMP, HCP/NCCP and MATO, representing the project as a whole, over its proposed 80-year term, while comparing the project's effects to those of other alternative actions. MRC currently assesses cumulative impacts on a THP-by-THP basis, and utilizes individual CalWater planning watersheds as the assessment area for the THP. The EIS/PTEIR analysis used the entire project area (spanning over 50 planning watersheds) over the term of the project (80 years) as the basis for assessment of impacts. This approach provides a more thorough, broad-scale evaluation of cumulative effects across MRC's covered lands (primary assessment area) and the secondary assessment area (lands MRC may include at a later time).

The long-term, project-wide assessment will provide a landscape-level approach to cumulative impacts assessment. The EIS/PTEIR analyzes cumulative effects using several different spatial scales, including larger watershed basins, inventory blocks, and Sustainability Units. The EIS/PTEIR analysis approach to the potential cumulative impacts of the project allows CAL FIRE and the wildlife agencies to address each resource at the most biologically appropriate scale. An analysis based on individual planning watersheds for northern spotted owls, for instance, fails to address impacts on spotted owl productivity; while a landscape-wide analysis (i.e., covered lands) provides the appropriate scale to evaluate such impacts.

3.5 Silvicultural Methods

MRC proposes to maintain most of the FPRs relating to silviculture at the time of EIS/PTEIR certification, without adhering to any future changes to those rules. There are some minor modifications requested for alternate standards under the silvilcultural rules where either the HCP/NCCP contains additional protections or where the TMP has modeled MSP utilizing slightly differing practices.

These alternate standards can be found on pages D-14 through D-51 of TMP Attachment D and will primarily maintain (or modify) the following rule sections in 14 CCR § 913:

1. blank	2. blank	3. blank	4. 913.1(a)(2)

5. 913.1(a)(2)(A)	6. 913.1(a)(2)(B)	7. 913.1(a)(2)(C)	8. 913.1(a)(2)(D)
9. blank	10. blank	11. blank	12. blank
13. blank	14. 913.1(a)(6)*	15. 913.1(a)(7)	16. 913.1(c)*
17. 913.1(c)(2)*	18. 913.2(a)	19. 913.2(a)(1)	20. 913.2(a)(2)
21. 913.2(a)(2)(A)	22. 913.2(a)(2)(A)(1)	23. 913.2(a)(2)(A)(2)	24. 913.2(a)(2)(A)(3)
25. 913.2(a)(2)(A)(4)	26. 913.2(a)(2)(B)	27. 913.2(a)(2)(B)(1)*	28. 913.2(a)(2)(B)(2)*
29. 913.2(a)(2)(B)(3)	30. 913.2(a)(2)(B)(4)	31. 913.2(a)(3)	32. 913.2(a)(4)
33. 913.2(a)(5)	34. 913.2(b)*	35. 913.2(b)(1)*	36. 913.2(b)(2)
37. 913.2(b)(3)	38. 913.2(b)(4)	39. 913.2(b)(5)	40. 913.2(b)(6)*
41. 913.2(b)(7)*	42. 913.2(b)(8)	43. 913.3(b)	44. 913.3(b)(1)
45. 913.3(b)(2)	46. 913.3(b)(3)	47. 913.4	48. 913.4(a)*
49. 913.4(b)	50. 913.4(b)(1)	51. 913.4(b)(2)	52. 913.4(d)
53. 913.4(d)(1)	54. 913.4(d)(2)	55. 913.4(d)(3)	56. 913.4(d)(3)(A)
57. 913.4(d)(3)(B)	58. 913.4(d)(3)(C)	59. 913.4(d)(3)(D)	60. 913.4(d)(3)(E)
61. 913.4(d)(3)(F)	62. 913.4(d)(3)(G)	63. 913.4(d)(3)(H)	64. 913.4(d)(3)(I)
65. 913.4(d)(3)(J)	66. 913.4(d)(3)(K)	67. 913.4(d)(4)	68. 913.4(d)(5)
69. 913.4(d)(6)	70. 913.4(d)(7)	71. 913.4(d)(8)	72. 913.4(d)(9)
73. 913.4(d)(10)	74. 913.4(d)(11)	75. 913.4(d)(12)	76. 913.4(d)(13)
77. 913.4(d)(14)	78. 913.4(d)(15)	79. 913.4(d)(16)	80. 913.6
81. 913.6(a)	82. 913.6(b)	83. 913.6(b)(1)	84. 913.6(b)(1)(A)
85. 913.6(b)(1)(B)	86. 913.6(b)(1)(C)	87. 913.6(b)(2)	88. 913.6(b)(3)
89. 913.6(b)(4)	90. 913.6(b)(5)	91. 913.6(b)(5)(A)	92. 913.6(b)(5)(B)
93. 913.6(b)(6)	94. 913.6(b)(6)(A)	95. 913.6(b)(6)(B)	96. 913.6(b)(6)(C)
97. 913.6(c)	98. 913.6(d)		

*These rule sections will either use an HCP/NCCP standard in place of the FPR standard, including future rule changes or will use an alternate standard other than the FPR standard, including future rule changes. The remaining rule sections will be maintained at the time of PTEIR certification, without adhering to any future changes to those rules.

The following current rule sections apply with no applicable alternate standards:

1. 913.3(a)	2. 913.7

3.6 Harvesting Practices and Erosion Control

Harvesting practices and constraints are described throughout this TMP, the HCP/NCCP, and the MATO. The conservation measures prescribed within Chapters 8–11 and Appendix E of the HCP/NCCP describe measures that affect harvesting and erosion control practices. The MATO describes practices specifically related to the bed, bank, or channel of a stream (these exact practices are also duplicated within the HCP/NCCP). These alternate standards can be found on pages D-51 through D-82 of TMP Attachment D and will primarily modify (or maintain in a few instances) the following rule sections in 14 CCR § 914:

1. 914.1(a)	2. 914.1(c)	3. 914.1(d)	4. 914.2(d)	5. 914.2(f)
6. blank	7. 914.2(f)(1)(i)	8. 914.2(f)(1)(ii)	9. 914.2(f)(1)(iii)	10. blank
11. 914.2(f)(2)(i)	12. blank	13. blank	14. blank	15. blank
16. 914.2(i)	17. 914.3	18. 914.3(a)*	19. 914.6	20. 914.6(a)
21. 914.6(a)(1)	22. 914.6(a)(2)	23. 914.6(b)	24. 914.6(c)	25. 914.6(d)
26. 914.6(e)	27. 914.6(f)	28. 914.6(g)*	29. 914.6(h)*	30. 914.6(i)
31. 914.7(a)	32. 914.7(b)	33. 914.7(b)(3)	34. 914.7(b)(4)	35. 914.7(b)(5)
36. 914.7(b)(7)	37. 914.7(b)(9)	38. 914.7(b)(10)	39. 914.7(b)(11)	40. 914.8(d)
41. 914.8(e)				

*These rule sections will be maintained at the time of PTEIR certification, without adhering to any future changes to those rules. The remaining rule sections will either use an HCP/NCCP standard in place of the FPR standard, including future rule changes or will use an alternate standard other than the FPR standard, including future rule changes.

The following current rule sections apply with no applicable alternate standards:

1. 914.1(b)	2. 914.2(a)-(c)	3. 914.2(e)	4. 914.3(b)-(e)	5. 914.5
6. 914.8(a)-(c)				

3.7 Site Preparation (also see 1.5.7)

The proposed maintenance of current rules as alternate standards, in addition to measures for high hazard TSUs included in the HCP/NCCP, were designed to provide a suite of measures with greater overall protection for these resources. The standards from the 2012 FPRs concerning site preparation will be followed in areas not specifically addressed within the HCP/NCCP. These alternate standards can be found on pages D-82 through D-87 of TMP Attachment D and will primarily maintain the following rule sections in 14 CCR § 915:

1. 915	2. 915.1(a)	3. 915.1(b)	4. 915.1(c)	5. 915.1(d)

6. 915.2(a)	7. 915.2(b)	8. 915.3(a)	9. 915.3(b)	10. 915.3(c)

There are no current site preparation rule sections with no applicable alternate standards:

3.8 Watercourse and Lake Protection

In general, MRC's watercourse protection standards are implemented as AMZs under the HCP/NCCP. These AMZs will supplant the Watercourse and Lake Protections Zones (WLPZs) of the standard FPRs. The bulk of the conservation strategy for AMZs is described within Chapter 8 of the HCP/NCCP. The HCP/NCCP conservation measures for aquatic habitat provide a suite of protection measures around rivers, streams, flood plains, seeps, springs, and other aquatic type habitats. The watercourse protections of the HCP/NCCP have been designed to address the issues and concerns specific to MRC's covered lands. The protection measures are designed to provide for cleaner, colder, and more structurally complex aquatic environments than exist currently. These measures include: establishment of coho "core" watershed, AMZ buffer conservation measures, large woody debris (LWD) placement through physical input, protections of existing LWD within the streams, protections of inherently unstable areas from failure by tree retention and soil stabilization measures, and road improvements which reduce sediment input. In addition to aquatic geophysical resources, the protection measures in the HCP/NCCP have been specifically designed to provide protection for the following species: Chinook salmon, steelhead salmon, coho salmon, coastal tailed frog, California red-legged frog, and northern red-legged frog.

MRC's HCP/NCCP addresses surface soil erosion through its conservation measures listed under Chapter 8 and Appendix E. High hazard TSUs address areas of high slope failure probability across the landscape
Chapter 13 within the HCP/NCCP is MRC's monitoring plan for the 80-year term of the project. For watercourse protections, MRC is proposing nearly equal amounts of alternate standards and 2012 maintained rules, related to the overall conservation program of the HCP/NCCP or MATO measures. These alternate standards can be found on pages D-88 through D-121 of TMP Attachment D and will modify or maintain the following rule sections in 14 CCR § 916:

1. 916.2(b)	2. 916.3	3. 916.3(a)	4. 916.3(c)	5. 916.3(c)(1)*
6. 916.3(c)(2)	7. 916.3(c)(3)	8. 916.3(c)(4)	9. blank	10. 916.3(d)
11. 916.3(e)	12. blank	13. 916.3(g)	14. 916.4	15. 916.4(b)
16. blank	17. 916.4(b)(3)	18. 916.4(b)(4)	19. blank	20. 916.4(b)(6)*
21. 916.4(c)	22. 916.4(c)(1)	23. blank	24. 916.4(c)(3)	25. 916.4(d)
26. blank	27. 916.4(f)	28. 916.5	29. 916.5(a)	30. blank
31. blank	32. 916.5(a)(3)	33. 916.5(b)	34. 916.5(c)	35. 916.5(d)
36. 916.5(e)	37. blank	38. blank	39. blank	40. blank
41. blank	42. blank	43. 916.5(e)	44. 916.5(e)	45. 916.5(e)

		"(G"	"H"	"I"
46. blank	47. 916.7	48. blank	49. 916.7(b)	50. 916.7(c)
51. 916.11(a)				

*These rule sections will be maintained at the time of PTEIR certification, without adhering to any future changes to those rules. The remaining rule sections will either use an HCP/NCCP or MATO standard in place of the FPR standard, including future rule changes or will use an alternate standard other than the FPR standard, including future rule changes.

The following current rule sections apply with no applicable alternate standards:

1. 916.3(b)	2. 916.4(c)(4)	3. 916.10		

3.9 Hazard Reduction

Also see site preparation, above. For this section, MRC proposes alternate standards in the Lower Alder Creek Management Area (LACMA) which is designed to be greater than the standard rules. This highly sensitive area is located in extremely rugged terrain, and special treatments to avoid any possibility of wildfire have been incorporated into the HCP/NCCP. A description of the LACMA and other marbled murrelet protections are found within Chapter 10 of the HCP/NCCP. These alternate standards can be found on pages D-122 through D-124 of TMP Attachment D and will modify or maintain the following rule sections in 14 CCR § 917:

1. blank	2. 917.2(a)	3. 917.2(b)	4. 917.2(c)	5. blank

The following current rule sections apply with no applicable alternate standards:

1. 917.5	2. 917.7	3. 917.9	4. 917.10	

3.10 Fire Protection

There are no alternate standards proposed to the fire protection rules.

3.11 Wildlife Protection Practices

The HCP/NCCP has been developed to protect a variety of plant, aquatic and terrestrial species with the involvement of NMFS, USFWS and CDFG over a decade of negotiations with MRC. The two BOF Sensitive Species that are covered within the HCP/NCCP are Northern Spotted Owl (NSO) and Marbled Murrelet (MAMU). While the other BOF sensitive species (bald eagle, golden eagle, great blue heron, great egret, northern goshawk, osprey, peregrine falcon, California condor, and great gray owl) do not have alternate standards proposed within the TMP, the overall protections measures within the HCP/NCCP are expected to either benefit these species or not detract from the current protection measures. MRC will follow all current and future rules changes related to BOF sensitive species not specifically covered under the HCP/NCCP. Two federally listed, non-BOF sensitive, terrestrial species are provided coverage under the HCP/NCCP. The California red-legged frog and the Point Arena mountain beaver have designated conservation measures described within Chapters 8 and 10 (for the frog species) and Chapter 10 (for the mountain beaver). Both state-listed and non-listed botanical species are provided coverage under the HCP/NCCP. Chapter 11 provides the conservation strategies for botanical species protections, and Chapter 9 provides protection to natural communities on the covered lands. MRC's wildlife tree retention practices designated within Chapter 9 of the HCP/NCCP policy requires that snags be left (with the exception of safety concerns), similar to the FPRs.

The HCP/NCCP provides coverage for the following species:

- Point Arena Mountain Beaver
- Northern Spotted Owl
- Marbled Murrelet
- Northern Red-legged Frog
- California Red-legged Frog
- Tailed Frog
- Coho Salmon
- Steelhead Salmon
- Chinook Salmon
- Numerous plant species listed within Chapter 11 of the HCP/NCCP

With the approval of the HCP/NCCP and issuance of the Incidental Take Permits (ITPs), the conservation strategy for the above species will be set on an 80-year course for species protections.

3.11.1 Take of northern spotted owl (NSO) and protective measures

Take, as intended under 14 CCR § 919.10, is allowed within the HCP/NCCP. With approval of the HCP/NCCP, an ITP will be in effect on the covered lands of MRC's property. The ITP does not grant permission for direct killing of an NSO, and take in the HCP/NCCP is related to habitat modification after the breeding season is completed in any given year. Most of MRC's covered lands provided habitat suitable for NSO in the past, however many acres of MRC's lands have low populations of NSOs, while other areas have what are considered to be moderate to high population densities. The HCP/NCCP is designed to balance the populations over the entire covered lands by creating more mature forest conditions throughout the ownership.

3.11.2 Take of marbled murrelet (MAMU) and protective measures

Like the NSO, MRC's HCP/NCCP provides for specific conservation measures for MAMU, described in detail in Chapter 10. As with NSO, take is limited to habitat modification only. Currently, MRC's only known population of MAMU resides within the Lower Alder Creek area, and the HCP/NCCP provides for very strict operations in and near this area, in what is termed the "Lower Alder Creek Management Area," or LACMA. As the AMZs mature, and primary and secondary MAMU trees are left across the landscape, the covered lands are projected to increase habitat availability for this species.

3.11.3 Late-succession forest stands

MRC's HCP/NCCP, Chapter 9, describes conservation measures for old-growth forests down to a 3-acre size, unlike the definition under 895.1, which denotes a minimum size of 20 acres. Although the terms "old growth" and "late succession" are not always synonymous, the wildlife agencies and MRC developed the old-growth protection measures within the HCP/NCCP to protect late successional forests.

MRC also provides for protection of individual old-growth trees, as defined within Chapter 9. These single trees provide for unique habitat conditions for non-listed species, such as bats and rodents, and provide denning structures for many species within the basal hollows present on many of these types of trees. The screen tree policies defined with Chapter 9 are designed not only to protect the individual old-growth trees, but to provide for pockets of habitat for both covered and non-covered species.

These alternate standards can be found on pages D-124 through D-135 of TMP Attachment D and will modify or maintain the following rule sections in 14 CCR § 919:

1. 919.2(b)	2. 919.2(c)	3. 919.2(d)	4. 919.4*	5. 919.9
6. blank	7. blank	8. blank	9. blank	10. blank
11. blank	12. 919.11	13. 919.16(a)	14. 919.16(a)(1)	15. 919.16(a)(2)
16. 919.16(a)(3)	17. 919.16(a)(4)	18. 919.16(a)(5)	19. 919.16(a)(6)	20. 919.16(b)

*This rule section will be maintained at the time of PTEIR certification, without adhering to any future changes to those rules. The remaining rule sections will either use an HCP/NCCP standard in place of the FPR standard, including future rule changes.

The following current rule sections apply with no applicable alternate standards:

1. 919.1	2. 919.3	3. 919.5

3.12 Logging Roads and Landings

MRC's HCP/NCCP describes practices for all logging roads, landings, and skid roads within Appendix E. Appendix E is the road plan for MRC's covered lands. The road plan specifies road standards for the covered lands and has been developed with agency input during development of the HCP/NCCP. Conservation measures to protect covered species that are also related to roads and landings are specifically described within Chapters 8–11 of the HCP/NCCP. So, while Appendix E describes overall practices for road construction and maintenance, Chapters 8–11 provide for site-specific measures concerning covered species protections. These alternate standards can be found on pages D-136 through D-175 of TMP Attachment D and will modify or maintain the following rule sections in 14 CCR § 923:

1. 923	2. 923(d)	3. 923(e)*	4. 923(f)
5. 923.1(a)	6. 923.1(c)	7. 923.1(d)	8. 923.1(e)
9. 923.1(f)*	10. 923.1(g)	11. 923.1(g)(1)	12. 923.1(g)(2)
13. 923.1(g)(3)	14. 923.1(h)	15. 923.1(j)	16. 923.2(b)
17. 923.2(c)	18. 923.2(f)*	19. 923.2(g)*	20. 923.2(h)
21. 923.2(i)	22. 923.2(j)	23. 923.2(k)*	24. 923.2(l)
25. 923.2(m)	26. 923.2(n)	27. 923.2(o)	28. 923.2(p)
29. 923.2(q)	30. 923.2(r)	31. 923.2(s)	32. 923.2(t)
33. 923.2(v)	34. blank	35. blank	36. 923.3(b)*
37. 923.3(c)	38. blank	39. 923.3(d)(1)*	40. 923.3(d)(2)*
41. 923.3(e)	42. 923.3(f)*	43. 923.3(g)	44. 923.4(a)
45. 923.4(b)	46. 923.4(c)	47. 923.4(d)	48. 923.4(f)
49. 923.4(g)	50. 923.4(h)	51. 923.4(i)	52. 923.4(l)
53. 923.4(m)	54. 923.4(n)	55. 923.4(o)	56. 923.5(a)*
57. 923.5(b)	58. 923.5(c)*	59. 923.5(d)*	60. 923.5(e)*
61. blank	62. 923.5(f)(1)*	63. 923.5(f)(2)*	64. 923.5(f)(3)*
65. 923.5(f)(4)*	66. 923.5(g)*	67. 923.5(h)	68. 923.8
69. 923.8(a)	70. 923.8(b)	71. 923.8(c)	72. 923.8(d)*
73. 923.8(e)*	74. 923.9	75. 923.9(a)*	76. 923.9(b)*
77. blank	78. 923.9(c)(2)*	79. 923.9(c)(3)	80. 923.9(c)(3)(A)*
81. 923.9(c)(3)(B)*	82. 923.9(d)*	83. 923.9(e)*	

*This rule section will be maintained at the time of PTEIR certification, without adhering to any future changes to those rules. The remaining rule sections will either use an HCP/NCCP standard in place of the FPR standard, including future rule changes.

The following current rule sections apply with no applicable alternate standards:

1. 923.1(i)	2. 923.2(d)	3. 923.2(e)	4. 923.2(u)
5. 923.4(e)	6. 923.4(j)	7. 923.6	8. 923.7

MRC's overall roads goal is to lessen the amount of a permanent road base and utilize roads with low maintenance erosion control features. Over time, the culverted road crossings will diminish, and rocked crossings with seasonal use restrictions will become more prevalent. Rocked fords allow for less maintenance and need for inspections and provide for a water conveyance system with a lower propensity for sediment input into streams.

Appendix E utilizes a specific maintenance schedule for all of MRC's road types. New roads or features will have the most rigorous inspection schedule, while roads that had been decommissioned will have the least. Even fully decommissioned roads will have a feedback loop to provide for adaptive management techniques. The overall approach is to have roads that require less routine maintenance.

3.13 Archaeological and Historical Resources Protection

No alternate standards to the FPRs are proposed concerning archaeological resources, however, the EIS/PTEIR is reviewed by the State Historic Preservation Officer per the requirements contained in the National Historic Preservation Act. MRC has a property-wide sensitivity study that was first developed and initiated by Louisiana-Pacific (LP). The initial study was created by Archaeologist Mark Gary for LP in 1990. There were updates in 1996, 2001, 2006 and 2011. Each update includes information on survey and site recordings since the previous update.

3.14 Rare Plants

The FPRs remain relatively silent in regards to rare plants, with the exception of 14 CCR § 898.2 and the rule sections pertaining to exemptions and timberland conversions. However, CEQA requires a thorough analysis of a project's possible impacts to rare plant resources. MRC's HCP/NCCP provides protections for up to 31 species of rare plants, including one state endangered plant species and one state threatened plant species. No federally threatened or endangered plants are covered by the HCP/NCCP, nor are any such federally listed plants known to occur within the covered lands. Eleven of the plant species are currently known to occur within the covered lands, and measures are included for the remaining 20 if they are found at a later date. Chapter 11 of the HCP/NCCP, "Conservation Measures for Rare Plants," is dedicated to rare plant species survey requirements and conservation standards.

3.15 Improving Effectiveness of Prescriptions and Addressing Site-Specific Impacts not Analyzed in the PTEIR

All PTHPs will go through a State agency review process, which will include an office review and, if CAL FIRE deems it necessary, a field inspection. The main purpose of a field inspection will be to discuss how best to apply the applicable prescriptions contained within the CFPRs, PTEIR, HCP/NCCP, TMP, MATO and OWDR to each PTHP. Though the state and federal lead agencies, responsible agencies, trustee agencies, and MRC worked to develop the best possible protection measures for all situations, there are specific resource areas where professional advice may improve the application and thus the effectiveness of the prescriptions at specific sites. The following resource areas often benefit from the on-the-ground knowledge of foresters, inspectors, geologists, hydrologists, and biologists: (1) roads, landings, and associated drainage structures and facilities; and (2) unstable areas. The review process afforded by the office review and, if necessary, a field inspection, provides an opportunity for MRC and reviewing agency staff to discuss how best to apply conservation measures for these resources based on site-specific conditions and constraints.[1]

This process is most appropriate for occurrences where consultation with experts or responsible or trustee agencies is required, and where analysis and mitigation would be too speculative to be

[1] Measures required by the HCP/NCCP may be changed only if allowed by the HCP/NCCP and in accordance with any applicable HCP/NCCP procedures.

fully addressed in the PTEIR. The PTEIR was developed to address all known and reasonably foreseeable impacts across MRC's covered lands. However, over time, certain impacts that have not been adequately addressed in the PTEIR could be identified in some PTHPs. Hence, in the review process we have included steps to identify these impacts and to determine how they will be avoided or minimized, including specific steps to identify and avoid or minimize any new, potentially significant impacts to sensitive plant species or Species of Special Concern that are not covered under our HCP/NCCP. This PTHP review process addresses: (1) identification, avoidance and minimization of significant project-specific (i.e., PTHP-specific) impacts to sensitive plant species that are not covered in the HCP/NCCP or adequately addressed in the PTEIR; (2) identification, avoidance and minimization of significant project-specific impacts to sensitive wildlife species that are not covered in the HCP/NCCP or adequately addressed in the PTEIR; (3) identification, avoidance and minimization of potentially significant environmental impacts that were too speculative to address in detail in the PTEIR; and (4) those situations where neither the TMP nor the PTEIR fully developed mitigation measures that avoid or minimize potentially significant environmental impacts (e.g., PTHP conditions are different from those evaluated in the TMP or PTEIR) identified in the PTHP.

I. For newly listed plants on the CRPR[2] list:

1) In consultation with CDFG, MRC will add List 1 or 2 plants (or of the same approximate level if the CRPR plant rankings change) to our proposed survey coverage for a PTHP if they:
    i) Have appropriate habitat within the PTHP area, and
    ii) Are within or adjacent to the accepted range of the plant.

2) If any of these plants are discovered during the survey process, in order to avoid or minimize any impacts to a less than significant level, they will receive a 50-ft no disturbance buffer (outside of existing roads) unless CDFG:
    i) Concurs that minimization or avoidance can be provided with a smaller buffer;
    ii) Provides substantial evidence that a larger buffer is necessary to avoid or minimize any impact; or
    iii) Concurs that a buffer is not necessary and that site-specific habitat retention will avoid or minimize any impact.

II. For Species of Special Concern:

1) If CAL FIRE, in consultation with CDFG, determines that implementation of the PTHP could result in a potentially significant effect to a Species of Special Concern that was not adequately addressed in the PTEIR, and determines that there are feasible measures that would avoid or minimize the potentially significant impact, MRC will incorporate them into the PTHP to ensure that the impact is avoided or reduced to a less than significant level. These measures may include, but are not necessarily limited to:
    i) Surveys that can be used to identify focused avoidance and minimization measures,

[2] CRPR = California Rare Plant Rank, a designation assigned by the California Department of Fish & Game.

ii) Habitat retention measures; and/or
iii) Seasonal disturbance buffers.

MRC and CDFG will communicate at least annually to share the most current information regarding Species of Special Concern for purposes of identifying avoidance and minimization measures.

2) If CAL FIRE concludes that the PTEIR did not include evaluation of a resource that may be significantly impacted and the PTEIR does not include feasible mitigation measures for the impact:
    i) MRC may revise the PTHP to avoid or minimize the new impact to a point where clearly no significant impact would occur;
    ii) CAL FIRE may require MRC to supplement the PTEIR analysis to address the new impact, in which case the PTHP (and subsequent PTHPs) will rely on the supplemental analysis in the PTEIR; or
    iii) MRC may utilize the standard THP process for timber operations instead of the PTHP process.

III. For all other potentially significant environmental impacts that arise in a PTHP that are not adequately addressed in the PTEIR:

1) If CAL FIRE or MRC identify a potentially significant adverse environmental impact in a PTHP that was not adequately addressed in the PTEIR, they will consult with the appropriate lead agency, responsible agency, or trustee agency and determine if existing PTEIR mitigation measures to avoid or minimize similar impact(s) can be feasibly refined or adapted to address on-site PTHP conditions. If existing avoidance or minimization measures are feasible for this purpose, MRC will incorporate them into the PTHP to ensure that the impact is avoided or reduced to a less than significant level.

2) If CAL FIRE concludes that the PTEIR did not include evaluation of a resource that may be significantly impacted and the PTEIR does not include feasible mitigation measures for the impact:
    i) MRC may revise the PTHP to avoid or minimize the new impact to a point where clearly no significant impact would occur;
    ii) CAL FIRE may require MRC to supplement the PTEIR analysis to address the new impact, in which case the PTHP (and subsequent PTHPs) will rely on the supplemental analysis in the PTEIR; or
    iii) If MRC does not supplement the PTEIR analysis, it may utilize the standard THP process for timber operations instead of the PTHP process.

4 REFERENCES

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Attachment A - Landscape Planning

Landscape Planning refers to the suite of inventory databases, forest growth models, habitat models, and GIS programs that enable the analysis and presentation of current and projected forest conditions. Many efforts are made to ensure an approach that reflects actual on-the-ground conditions and constraints. The Landscape Planning approach is designed to allow planners to assess the effects of a broad range of management activities at the stand level, watershed units, and the ownership. Examples of the types of review provided through this approach include:

- Conifer and hardwood stocking levels on a periodic basis.
- Area harvested on a periodic basis.
- Forest structure types (habitat) on a periodic basis.

Stands – The Basis of Landscape Planning

Stands are smallest geographic units (polygons) in Landscape Planning. The size and extent of stands is based on vegetation, topography, and sensitivity attributes, as well as regulatory considerations. Inventory information can be interpreted at the stand level. That information can be grown and harvested in growth and yield simulations. Reports of all management activities can be prepared at the stand level. Critical information stored in the relational databases for each stand includes:

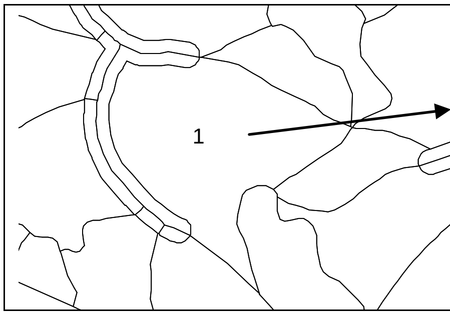
- Stand Identifier
- Acres
- Vegetation Codes
- Sensitivity (watercourse buffers, old growth stands, spotted owls, etc.).
- Site Class
- Harvest Timing

Each of these attributes will be described independently below. The management activities identified in Landscape Planning databases and models can be mapped using GIS and monitored on the ground to validate model outputs.

I-A. Stand Delineation

Stands are identified using aerial photos, drawn on a base map, assigned a unique identifier, and digitized into the GIS. Stands are manageable units that are accessible by a road or cable system and limited by ridges and/or watercourse buffers. Each stand is assigned a unique identifier so it can be ‘joined’ to relational databases (Table 1). Generally, the minimum mapping unit for stands is 20 acres, unless the stand has a particular sensitivity (such as a watercourse) or a sharp contrast in vegetation. Sensitivity constraints reduce the minimum mapping unit to an appropriate size to represent the sensitivity. Watercourse stands can be less than an acre since watercourse buffers are linked to the adjacent, upslope stand. A sharp contrast in vegetation could result in a minimum mapping unit of 10 acres.

Table 1. Example of relationship between stands in the GIS and stands in a relational database. The image on the left displays a stand with a unique identifier (1). Information about the stand is stored in a relational database.



Stand	Acres	Vegetation	Sensitivity	Site Class	Harvest Timing
1	25	CH2D	00010	III	10
2	14	RD3L	10001	III	5

I-B. Acres

Acres are calculated in the GIS and exported to the relational database. Acres are stored as gross acres (the total acres within the polygon) and net acres (an adjustment assigned to each stand to account for roads and landings that are not part of the forested stand). The road deduction assigned to all stands is 3% since roads and landings have been computed to represent approximately 3% of the ownership's area. It is the net acres that are used to expand per acre estimates of volume, habitat, and other features to larger scale units (planning watersheds, Sustainability Units, ownership).

I-C. Vegetation

Each stand is assigned a vegetation label that forms the basis of a stratified sample. Sampling generates tree lists that are used to estimate inventories of many forest variables, such as volume, density, basal area, and habitat conditions. Vegetation labels are determined for each stand from aerial photos or field visits. The vegetation label consists of a species class code, a size class code, and a density class code. Figure 1 below displays how vegetation labels are assigned to each stand.

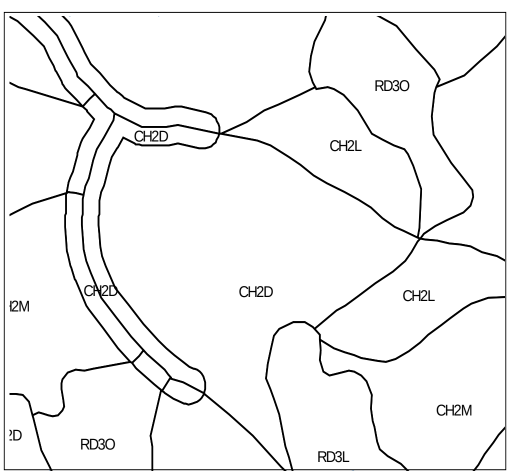


Figure 1. Example of how vegetation labels are assigned to each stand.

Tree lists for the stands that have been sampled are generated from the plots within the stand. Tree lists are developed for stands that have not been cruised by assigning all plots for a given stratum to the un-sampled stands of the same stratum.

Vegetation Classification Rules and Symbology – Introduction

Vegetation is classified according to a stand's species composition, the dominant size of the trees in the stand, and the canopy closure, or density, of the stand. The system has been developed to address mixed age stands and even age stands. Rules for classification have been created to reduce ambiguity in labeling stands. Standards have been established to ensure that vegetation classification is consistent.

Vegetation Classification Rules and Symbology – Determining Size Classes

Size classification is the first component of vegetation classification to be determined. A diameter size class label is assigned to each of the forested stands. Vegetation polygons are classified into one of five "diameter at breast height (dbh)" classes (Table 2).

Table 2. Class assignments for Diameter at Breast Height (dbh) ranges.

Class	dbh
1	0–8 inches
2	8–16 inches
3	16–24 inches
4	24–32 inches
5	>32 inches

Rules have been developed to assign a size class to each vegetation polygon which accounts for trees of many age classes and many diameter classes (Table 3).

Table 3. Decision matrix for determining dominant diameter class.

Is total tree cover greater than 5%? Of the stand's area?	No →	Are there at least 300 trees per acre? No → Non-forest; Yes ↓ Size Class = 1
↓ Yes		
Do the trees greater than 32" (Size Class 5) dbh comprise more than 50% of the total basal area in the stand?	Yes →	Size Class = 5
↓ No		
Do the trees greater than 24 inches (Size Class 4 and 5) dbh comprise more than 50% of the total basal area in the stand?	Yes →	Size Class = 4
↓ No		
Do the trees greater than 16 inches (Size Class 3, 4 and 5) dbh comprise more than 50% of the total basal area in the stand?	Yes →	Size Class = 3
↓ No		
Do the trees greater than 8" (Size Class 2, 3, 4 and 5) dbh comprise more than 50% of the total basal area in the stand?	Yes →	Size Class = 2
↓ No		
Size Class = 1		

Vegetation Classification Rules and Symbology – Species Classification

Vegetation polygons that have 5 percent or more of their area covered by tree crowns are classified as forest and will be labeled with a three-part labeling system that includes species, size, and density. The vegetation labels are developed for inventory purposes. They are not intended to define natural communities. Definitions and symbols for each are as follows.

Species Classification – Non-Forest Symbols

Vegetation polygons that have less than 5 percent of their area covered by tree crowns should be classified as non-forest and will be labeled with one of the following symbols, depending on the predominant cover. Table 4 displays the vegetation symbols applied to stands that do not have forest cover, or the forest cover is a non-timber species.

Table 4. Vegetation symbols assigned to non-forest stands.

BR	Brush – Chaparral
GR	Grass and Meadows
BG	Bare ground, including rocks and watercourse beds
WA	Water
PG	Pygmy Forest
GX	Oak Woodland
RK	Rock Outcrop
BP	Bishop Pine Forest

A forested polygon is labeled with an appropriate conifer or hardwood species symbol when 70 percent or more of the basal area in the stand can be attributed to that species. If no one species represents 70 percent or more of the basal area, a mixed-species symbol will be used.

Species Classification – Dominant-Conifer Species Symbols

Table 5. Vegetation labels assigned to stands that have at least 70 percent of the stand's basal area in the conifer species identified.

RW	Coast redwood
DF	Douglas-fir

Species Classification – Dominant-Hardwood Species Symbols

Table 6. Vegetation labels assigned to stands that have at least 70 percent of the basal area is in the species identified.

AL	Alder
TO	Tanoak
LO	Live oak
BO	Black oak
MO	Madrone

Species Classification – Two-Species Symbols (Conifers)

Table 7. Vegetation labels assigned to stands where no one conifer species has 70 percent of the stand's basal area, but two species combined do have at least 70 percent of the basal area and each of the dominant species constitute at least 30 percent of the overall basal area.

RD	Redwood/Douglas-fir
RM	Redwood/Monterey Pine

Species Classification – Two-Species Symbols (Conifers and Hardwoods)

Table 8. Vegetation labels assigned to stands where conifer species do not comprise 70 percent or more of the stand's basal area. The stand is comprised of a mixture of species that make up 70 percent of the basal area and each of the dominant species (species groups) constitutes at least 30 percent of the overall basal area.

CH	Conifer/Hardwood mix
MH	Mixed Hardwood – Upland Broadleaf Forest
RE	Redwood/Eucalyptus

Vegetation Classification Rules and Symbology – Density Classification

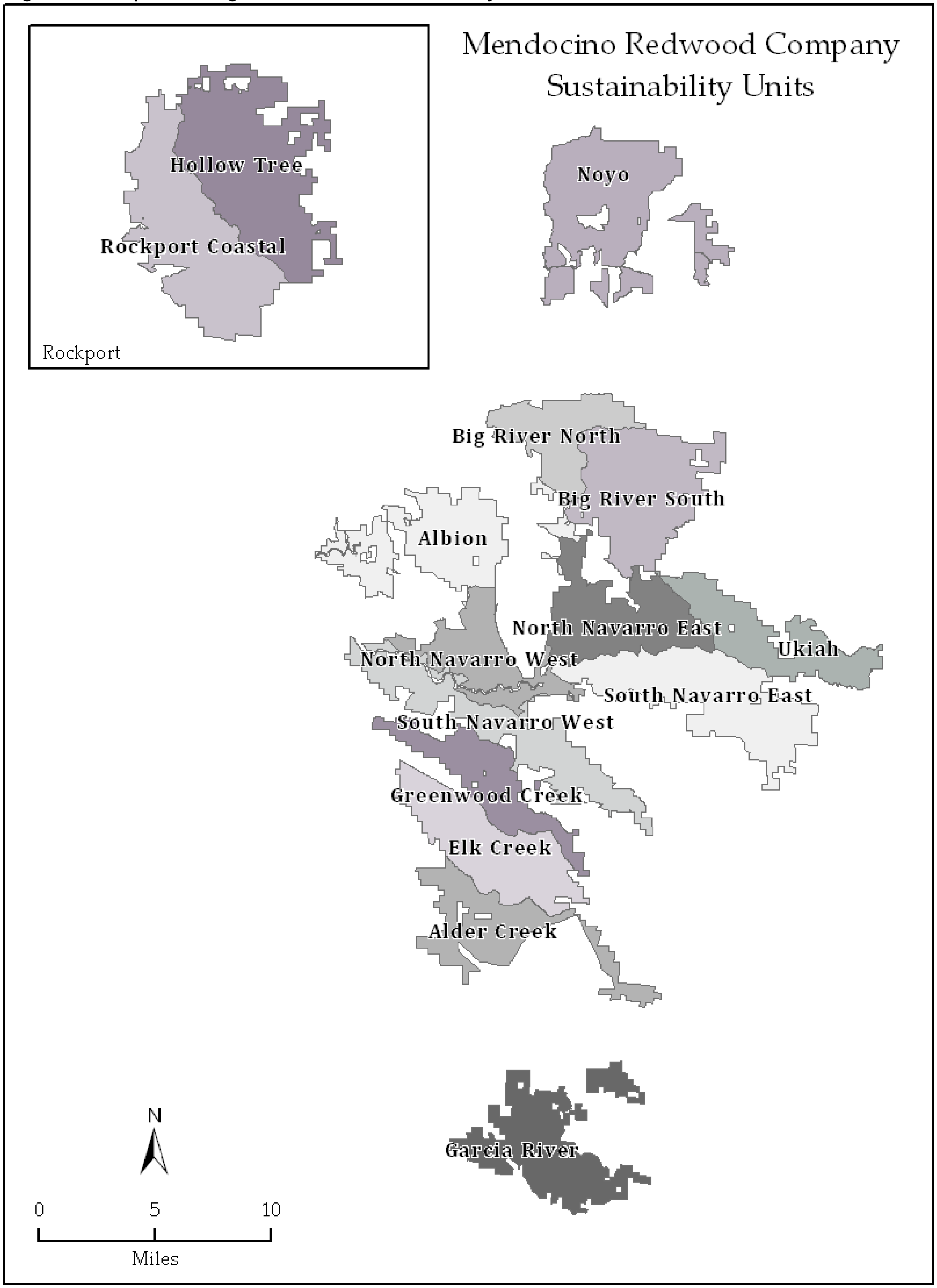
Table 9. Density classes are based the canopy closure of all trees greater than 8 inches dbh for Size Class 2 and above. All trees are considered for the canopy closure estimates in Size Class 1 stands.

Canopy Cover	Description	Code
0 – 20 %	Open Canopy Coverage	O
20 – 40%	Low Canopy Coverage	L
40 – 60%	Medium Canopy Coverage	M
60 – 80%	Dense Canopy Coverage	D
80 – 100%	Extremely Dense Canopy Coverage	E

Sampling Methodology

The ownership is broken into smaller units called Sustainability Units. Sustainability Units are the basis for sampling and deriving confidence targets. They also serve as the basis for assessing timber sustainability. Sustainability Units were developed by aggregating planning watershed boundaries that contain similar environmental characteristics. The largest Sustainability Unit is approximately 20,000 acres in size. The sampling goal is to be within 10% of the net board foot volume within the Sustainability Unit at the 90% confidence interval. Figure 2 shows the Sustainability Units.

Figure 2. Map showing location of Sustainability Units.



II-A Stratified Sampling

The vegetation labels, or strata, that are assigned to a stand using photo interpretation or field visits are the basis for a stratified sampling system. Strata types with higher expected volume levels are sampled at a higher intensity (more stands sampled) than strata types with lower volume levels, since the principal goal of sampling is to derive confidence in volume estimates.

II-B. Selecting Stands for Sampling

Stands are randomly selected for sampling across a Sustainability Unit and/or planning watersheds. No effort is made to separate sensitivity classes within a vegetation stratum for sampling. The application of management policies (treatments) to stands of the same vegetation stratum in different sensitivity classes results in different outcomes for the vegetation. Vegetation labels are updated when stands are harvested or, at least every 20 years if a stand is not harvested.

Sampling priorities are identified at the beginning of each calendar year based on an assessment of the number and age of plots that represent each stratum within each planning watershed. MRC has established a goal of having at least 30 plots in 3 different stands for each planning watershed in a Sustainability Unit for strata that are estimated to have at least 100 square feet of conifer basal area. The goal for strata that are estimated to have less than 100 square feet of conifer basal area, but at least 30 square feet of conifer basal area, is 20 plots in 2 different stands. Strata that are estimated to have less than 30 square are assigned 10 plots in 2 different stands.

II–C Sampling Procedure

The allocation of plots is based on an effort to achieve an estimate that has adequate confidence to represent the stand being cruised and to distribute the plots in enough stands of a given stratum to represent potential variation between polygons, thus achieving a higher level of confidence at the stratum level. We have determined that 10 plots are adequate for the stand level confidence and 20 to 50 plots are adequate for the stratum level confidence. The variation in the number of plots is based on the anticipated volume in the stratum and the proportion the stratum represents in the overall inventory. A stratum with a high anticipated volume that represents a high proportion of the acres will be allocated more plots than a stratum that represents a small proportion of the acres and has low volume.

Points (plot centers) are located on the stand map at the appropriate chain intervals that evenly distributes the desired number of plots throughout the stand along cardinal bearings. Once in the field, an entry point to the first plot is determined. Common entry points are landmarks such as landings, watercourse crossings or other identifiable stand boundaries. This point will be the anchor point from which all cruise lines will be established. A GPS coordinate is taken (if possible) and directions to the first plot are written on flagging displayed at the entry point. Plot locations will be referenced by flagging that identify the plot number and specify directions to the next plot.

II-D Data Collection at Plots

The plots are sampled using a set of nested plots. All trees equal to or greater than six inches (Diameter at Breast Height) are sample with a variable radius plot. A fixed 10th acre plot is used to measure down logs and brush cover. A 100th acre fixed plot is used to tally trees smaller than 6 inches.

1) **<u>Trees</u> greater than six inches are measured if they fall in the variable radius plot. The basal area factor (BAF) selected for the stand is based on getting, on the average, five to six trees 'in' per plot. Trees will be tallied and measured in a clockwise direction beginning at a North line.**

2) <u>Species</u>: Species are coded on the plot sheets with the codes shown in Table 10.

Table 10. Codes and scientific names for common species found in Mendocino Redwood Company's forests.

Species Code	Common Name
AL	Red Alder
BM	Big Leaf Maple
BO	Black Oak
BP	Bishop pine
CB	California Bay
DF	Douglas-fir
EU	Eucalyptus
GC	Golden chinquapin
GF	Grand fir
LO	Live Oak
MO	Madrone
MP	Monterey pine
NM	California Nutmeg
PY	Pacific yew
RW	Redwood
SP	Sugar pine
SS	Sitka spruce
TO	Tanoak
UK	Unknown
WH	Western Hemlock
WM	Wax Myrtle
WO	White Oak

3) <u>Diameter at Breast Height</u> (dbh) Diameters are measured at a point 4.5 feet above the ground level or root collar on the uphill side of the tree. Measurement accuracy is to the nearest inch. In the case of irregularities

in dbh, such as swelling, bumps, depressions, branches, etc., diameters are measured immediately above the irregularity at the place where it ceases to affect the normal stem form.

4) Height. Total height is measured on all trees on every third plot starting with the first plot. If the angle from level to the point of measurement exceeds 45 degrees (i.e., 100% or 66 topo), the distance from the measured tree must be increased to reduce the angle. At least 30% of the total trees should have height measurements while emphasizing a good distribution throughout the diameter classes. A regression equation is derived from the measured trees to estimate the unmeasured tree heights. Species that are uncommon in a particular stand should be measured for height if they are in any plot, since the sample size for developing a regression estimator might be inadequate.

5) Height to Crown Base (HTCB*)*. This measurement provides an estimate of the total crown area. The measurement is taken on every tree that is measured for height. The measurement is taken from the base of the tree to the visually balanced base of the crown, since tree crowns are often irregular.

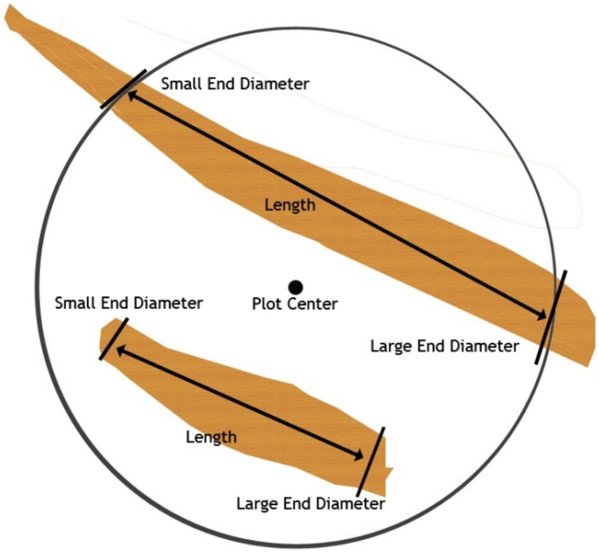
6) Status. A status code is entered for each tree. Status codes describe the physical condition of the tree (Table 11).

Table 11. Status codes for trees sampled.

Status Codes		
Code	Features	Description
L	Live	Default code for trees with normal form.
S	Snag	Standing trees that are dead.
H	Live Snag	Standing trees that retain little live component – mostly dead.
W	Old growth	Old growth trees.
R	Snag Recruitment	Trees that will be retained for future snags.
P	Broken Top	Trees that are not snags or old growth and are not of normal form.
P	Dead Top	
P	Forked	
P	Suppressed	

7) Down Logs. Down logs are measured on every plot. The sample area for downed logs is a fixed 1/10th acre plot (37.2 feet radius). Down logs must meet the following criteria to be sampled:
- The log must have an average diameter of at least six inches (as determining by summing the large end diameter and the small end diameter and dividing by two),
- The log must have a length of at least ten feet, for average diameters less than 16 inches, or
- a length of at least six feet, for average diameters greater than 15.9".

Figure 3. Figure displays how downed logs are measured on each plot.



Down logs are determined to be either hard (no material gives way when kicked, sound when kicked is a thud) or soft (material falls of when kicked, sound is muffled). Hard logs generally have the top intact, the bark on, and the wood is sound. Soft logs usually have a broken top, the bark is sloughing off, and the wood is decaying. A status code 'H' is applied to hard down logs and a status code 'S' is applied to soft down logs.

8) <u>Regeneration</u>. Trees less than 6 inches dbh are tallied on every plot. The sample area measured for regeneration is a fixed 1/100th acre plot (11.8 feet radius). Record all conifers and hardwoods by species and tally seedlings and saplings in two size classes: 0-2.9 inch dbh and 3-5.9 inch dbh.

9) <u>Shrub Cover</u>. Shrubs are defined as any plant species less than 10 feet tall with crown diameters equal to at least 75% of the height. The measurement is derived from an ocular estimate of the shrub cover within a 1/10th acre plot (37.2 feet radius). The dominant shrub species is recorded along with the following density codes shown in Table 12:

Table 12. Density codes for understory vegetation sampled on each plot.

Density Code	Description of Understory Coverage	Percent Coverage of Understory
O	Open	0 – 19.9%
L	Low	20 – 49.9 %
M	Medium	40 – 59.9 %
D	Dense	60 – 79.9 %
E	Extremely Dense	80 – 100%

Table 12: Additional Notes. Any further information concerning the stand being cruised can be extremely important. Items that should be noted are the location of skid trails, springs, watercourses and historical artifacts. Wildlife observations should also be noted, such as woodrat nests, bird nests, owls, raptors, mountain lions, and bears.

II – E Site Index Sampling

Site trees are sampled to derive an estimate of the height of the co-dominant trees (by species) at age 50. Stands that share similar environmental variables, particularly soil are grouped together into various site classes. The site indices derived from sampling are used to assign an average site index for each species to the stands that share the same site class. The current data applies site index estimates to an ownership stratification of site classes.

Approximately 3 to 5 trees per stand are selected for site trees and measured for species, dbh, height, HTCB, and age. Selected site trees are conifer trees that display no deformities and are in a co-dominant position in the stand. The trees measured for site index are averaged for each species. The allocation of site index to the landscape is based on expanding the results of the estimated site index from the sampled trees to other stands within the Planning Watershed based on soil stratification.

II – F Measurement Tolerance Standards

Listed below (Table 13) are the tolerance standards that will be used to evaluate the accuracy of field measurements. MRC performs inventory sampling with company personnel. Periodic check cruises are performed by senior inventory staff to ensure the following standards are being met.

Table 13. Tolerance standards allowed for each measurement theme.

Measurement	Tolerance
Percent slope	±10%
Percent brush cover	±20%
Species identification	±1% of the total trees recorded
Diameter at breast height	±1.0 in.
Total tree height	±5 ft
Height to crown base	±10 ft
Breast height age	±5 yr

II – G Inventory Updates

Maintaining a forest inventory requires consideration of changes to the basis of the estimates over time. These changes result from forest growth, harvesting events, and natural disturbances. The inventory is updated in the first quarter of each calendar year. Annual reports are produced after updating the inventory. This section discusses the methodology used in updating inventory records.

Growth – All plots 10 years of age or less are ‘grown’ on an annual basis using the CRYPTOS (Cooperative Redwood Yield Project’s Timber Output) growth model. Any plot older than 10 years of ages is deleted from the inventory database records. This is to minimize an over-reliance on the growth model for maintaining the inventory. Growth modeling is described in later sections. The growth assigned to each plot is based on the age of the plot.

Harvested Stands – A harvested stand is placed into a vegetation stratum based on an ocular examination of the stand in the field, using the vegetation typing rules described in Section I-C above. The existing tree list for the stratum (in the same planning watershed) is applied to the stand.

Natural Disturbances - A natural disturbance has a similar effect on a stand as a harvest. They are treated in the same way as a harvest in terms of making adjustments to strata assignments and applying the appropriate tree lists.

Stand strata assignments are examined and updated every 20 years regardless of whether a stand is harvested or not. This helps to maintain integrity with the strata label assigned to the stand, as growth can be irregular between stands with the same vegetation label.

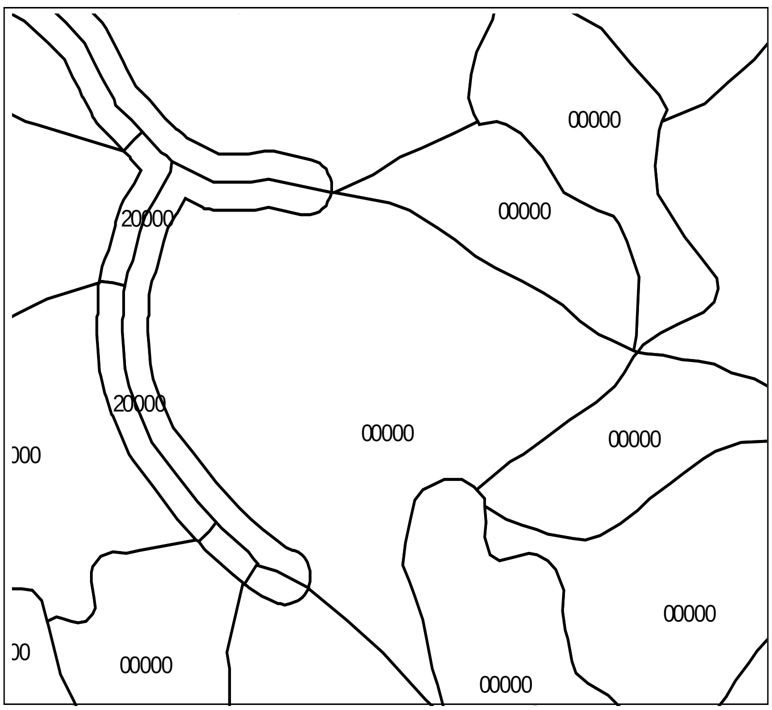
III Growth and Yield Modeling

Growth and yield modeling projects the tree lists derived from inventory sampling through time (forest growth) and management activities (harvest) over a long period of time (100 years in this case). The growth model used in this TMP planning effort uses the CRYPTOS equations for height and diameter growth, crown recession, and mortality. CRYPTOS estimates growth for 5-year timeframes. The model is set to ‘harvest’ stands (if they are scheduled for harvest) before they are grown. This is a more conservative approach to estimating harvest volumes than growing the stands before they are harvested, since the harvest estimate doesn't consider the real growth that occurs in the forest for periods 2 through 5 in any five-year planning period. Projected inventory, harvest estimates, and growth estimates are reported for every 5 year period in this TMP.

III-A Stand Sensitivity Attributes

Each stand is assigned a code that indicates any special management considerations for the stand. The code allows maps to be made that display the geographic extent of the sensitive areas. The codes also direct the stands to silviculture strategies in growth and yield modeling that are consistent with management policies. Figure 4 displays a set of stands with their respective concern codes.

Figure 4. Map displaying how a sensitivity code is assigned to each stand.



The sensitivity code consists of five digits. Each digit indicates a specific theme. Table 14 displays the key to the sensitivity code.

Table 14. Key to the sensitivity code assigned to each stand. As an example, a stand with a code of 20000 has watercourse sensitivity (Large Class II) and has no visual, special considerations, wildlife, or vegetation sensitivities.

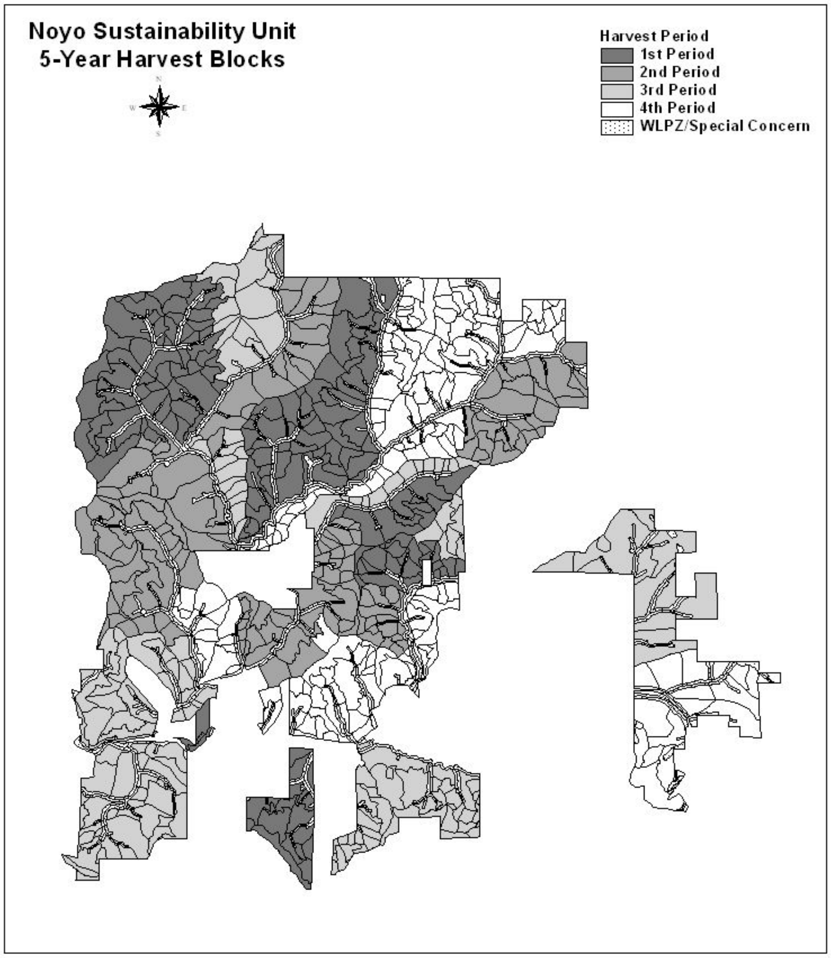
Watercourse		Visual		Special Considerations		Wildlife		Vegetation	
0	No Concern	0	No Concern	0	No Concern	0	No Concern	0	No Concern
1	Class I	1	Special Viewshed	1	Special Treatment Area	1	Spotted Owl – Level I	1	Old Growth – Type I
2	Large Class II	2		2	Deeded Conservation Easement	2	Spotted Owl – Level II	2	Pygmy Forest
3	Class I Floodplain	3		3	Non-deeded special conservation	3	Spotted Owl – Level III	3	Old Growth – Type II
4	Class II Floodplain	4		4	Carbon Management	4	Marbled Murrelet	4	Rock and Talus
5	Floodplain	5		5	MaMu Easement	5	Point Arena Mountain Beaver	5	Oak Woodland
6	Small Class II	6		6	TSU 25-50%	6	Spotted Owl – Level I/Marbled Murrelet/Point Arena Mountain Beaver	6	Low site
7		7		7	TSU >50%	7	Spotted Owl – Level I/Marbled Murrelet	7	Old Growth Buffer
8		8		8		8	Marbled Murrelet Buffer	8	Brush/Grass/Bare Ground/Water
9		9		9		9	Spotted Owl – Level I/Point Arena Mountain Beaver	9	Bishop Pine

Many stands have multiple concerns. Management activities in these stands default to the most conservative treatment. Table 15 describes the various forest conditions found on Mendocino Redwood Company along with the model formulation of silviculture regimes. Table 18 describes silviculture and model decision logic allowed for stands within the sensitivity class.

III-B Harvest Timing

Each stand is attributed with a harvest period (5-year periods) of 0, 5, 10, and 15. This establishes the initial harvest period for each stand. Subsequent harvests within the stand are based on the re-entry period assigned to each silviculture regime. All silviculture regimes in this plan have the same re-entry period (20-years). This facilitates the use of area control, referred to as Harvest Blocks, which are based on dividing the Sustainability Units into four near equal geographic parts. This facilitates an even and efficient flow of harvest. The careful establishment of Harvest Blocks minimizes the use of roads and allows for the longest period of rest to areas not scheduled for harvest. Figure 5 displays how the Harvest Blocks are established for a portion of the 'Noyo' Sustainability Unit.

Figure 5. Example of harvest blocks (conceptual) in the Noyo Sustainability Unit.



III-C Silviculture

The general goal of the all silviculture methods is to restore and maintain conifer-dominated stands where appropriate – (oak woodland management has a different focus, for example) that are structurally diverse. For stands that do not have any specific sensitivity, Selection and Group Selection are considered the 'steady state' silviculture methods once conifer-dominated conditions have been developed. Restoration harvests (all silviculture methods other than Selection and Group Selection) are used no more than twice in the life of a stand.

The conifer retention levels modeled are intended to address Forest Practice Rule standards and the Wildlife Tree retention of the HCP/NCCP.

MRC's landscape model 'grows' and 'harvests' trees in 5-year periods. A stand is only considered for harvest and the silviculture logic applied to the stand if the stand is scheduled for harvest in the specific period. Possible silviculture regimes for any particular stand are based on the stand's specific sensitivity constraints, if any. Stands constrained for a particular sensitivity usually have only one possible regime available. Non-constrained stands are assigned a silviculture regime based on a decision hierarchy. The decision hierarchy results in a silviculture selection that is based on conifer and hardwood stocking criteria. Some stands do not meet any of the criteria and fall into a 'no harvest' category and are reviewed at the next entry cycle – 20 years later.

The modeled retention for the proposed action is described below.

Table 15. Selection/ Group Selection

The Alternative Group Selection is identified as an alternative method of achieving Maximum Sustained Production due to the allowance of group clearings greater than 20% of the post-harvest stand (14 CCR 913.2 (a)(4)*)*. The conifer stocking retention standards will meet the Forest Practice Rule retention standards per 913.2.

Model Decision Logic

Triggers and Retention	*Conifer Basal Area by Diameter Class*				*Total Conifer BA Retained*	*Hardwood BA*
	0 - 16"	*16 - 24"*	*24 - 32"*	*>32"*		
Triggers	>=105					
Average Retention	30	40			70	15

Transition

The Alternative Transition silviculture method is identified as an alternative method of achieving Maximum Sustained Production due to the harvest of hardwoods resulting in group clearings that are greater than 20 percent of the post-harvest plan area (stand) (14 CCR 913.2(b)(7). The Transition method follows standard Forest Practice Rule guidelines (14 CCR 913.2b).

Model Decision Logic

Triggers and Retention	*Conifer Basal Area by Diameter Class*				*Total Conifer BA Retained*	*Hardwood BA*
	0 - 16"	*16 - 24"*	*24 - 32"*	*> 32"*		
Triggers	>60<105					
Average Retention	40	10			50	15

Rehabilitation

The rehabilitation method described here does not include any alternative methods to the standard silviculture practices.

Model Decision Logic

Triggers and Retention	*Conifer Basal Area by Diameter Class*				*Total Conifer BA Retained*	*Hardwood BA*
	0 - 16"	*16 - 24"*	*24 - 32"*	*> 32"*		
Triggers	>=30<50					
Average Retention	0	5			5	15

Restoration Variable Retention

The Restoration Variable Retention method does not include any alternative methods to the standard silviculture practices (14 CCR 913.4(d)(16)).

Triggers and Retention	*Conifer Basal Area by Diameter Class*				*Total Conifer BA Retained*	*Hardwood BA*
	0 - 16"	*16 - 24"*	*24 - 32"*	*> 32"*		
	20	10				>60

Average Retention	20	10			30	15
Seed Tree Removal						
The Alternative Seed Tree Removal silviculture method is identified as an alternative method of achieving Maximum Sustained Production due to the allowance of thinning among the regenerated stand. All other applications of this silviculture method meet the description of this method and restrictions defined in 14 CCR 913.1 (7)(c)(2).						
Model Decision Logic						
Triggers and Retention	*Conifer Basal Area by Diameter Class*				*Total Conifer BA Retained*	*Hardwood BA*
	0 - 16"	*16 - 24"*	*24 - 32"*	*>32"*		
Triggers	> 10	> 10 < 60				
Average Retention	10	5			15	15

Table 16 describes the various silviculture regimes used in this landscape plan (for non-sensitive stands) and their general application based on stocking levels of conifers and hardwoods. This page can be used by MRC staff, agency staff, and the public to understand the general 'rules of the road' related to silviculture operations.

Table 16. General Decision Logic in Selecting Silviculture Methods

Conifer Stocking (Basal Area (square feet) per Acre)	**Hardwood Stocking (Basal Area (square feet) per Acre)**		
	>60	**20-60**	**<20**
>125	**Selection, Group Selection, Alternative Group Selection**		
105-125	**Restoration Variable**	**Selection, Group Selection, Alternative Group Selection**	
50-105	**Retention (Conifers must be large)**	**(Alternative) Transition**	
<50	**Rehabilitation**		**Alternative Seed Tree Removal (Conifers must be Large)**
The trend in silviculture implementation will migrate stands toward a condition where they can continuously be managed under Selection and Group Selection methods. Each silviculture method has a 20 year re-entry period.			

Table 17 describes the generalized retention standards assigned to silviculture regimes.

Table 17. Quick Reference Guide to Generalized Retention Minimums for Conifers for Non-Constrained Stands

Silviculture	Conifer Basal Area Retention (per Acre)	Other
Selection	75	
(Alternate) Group Selection	60*	An alternate group selection is used where the harvest of hardwoods results in more than 20% of the stand in group clearings**.
(Alternative) Transition	50	An alternate transition is used where the harvest of hardwoods results in more than 20% of the stand in group clearings**.
Restoration Variable Retention	20	
(Alternative) Seed Tree Removal	15	An alternative seed tree removal is used when thinning operations occur in the regenerated stand. The area to which this is applied must meet the retention standards for commercial thinning activities, defined in the Forest Practice Rules.
Rehabilitation	5	

*The stand will average 75 square feet of conifer basal area per acre outside of group clearings. Group Selection is the preferred silviculture to promote conifer regeneration where needed.
**For the purposes of implementation of this plan, “group clearings” are stated in the California Practice Rules are defined as areas of 0.25 to 2.5 acres where harvest results in stocking below the minimum stocking standards (14 CCR 912.7 (b)(2)). If there are no operations in an area with less than the minimum stocking, the area is not considered a group clearing.

Table 18: Silviculture Descriptions and Model Decision Logic For Specific Sensitive Areas

Silviculture	*Triggers and Retention*	*Conifer Basal Area by Diameter Class* 0-16"	16-24"	24-32"	>32"	*Total Conifer Trigger / BA Retained*	*Hardwood BA*	Descriptions
Silviculture Regimes for Stands with Special Constraints								
Selection (High Retention)	Triggers	>260				>260		Class I and Large Class II Watercourse Buffers (Inner and Middle Bands - set at 150 ft.)
	Average Retention	25	75	100sq.ft. + 20% of largest trees		200	55	
Selection-Carb (High Retention)	Triggers	>240				>240		Carbon Sequestration
	Average Retention	50	50	50	50	200	15	
Selection MR (MaMu Buffers)	Triggers	>=130				>=130		MaMu Buffer Stands. These stands will be managed to retain and promote larger trees.
	Average Retention	30	30	30	30	120	15	
Selection (NSO Buffers)	Triggers	>=105				>=105		NSO Buffer stands adjacent to "No Harvest" core areas.
	Average Retention	20	25	20	10	75	15	
Selection (OG Type II)	Triggers	>=160				>=160		Selection employed for Old Growth Type II stands.
	Average Retention	50	50	25	25	150	15	
Selection TSU (Terrain Stability Units)	Triggers	>=105				>=105		Terrain Stability Units. TSU 1 and TSU 2 can only be harvested under Selection silviculture. TSU 3 can trigger Transition silviculture if >25 and < 50% of stand is covered by TSU 3. These stands (identified on the ground) may be harvested with other silvicutures depending on site specific conditions. Selection and Transition silvicultures were employed for modeling purposes.
	Average Retention	20	25	20	10	75	15	
Selection (Floodplain)	Triggers	>300				>300		Areas identified as floodplain by watershed analysis
	Average Retention	75	75	75	75	300	55	
Selection (Visual)	Triggers	>=105				>=105		Stands selected to retain aesthetic values
	Average Retention	20	25	20	10	75	15	
Selection (Small Class II)	Triggers	>=105				> 105		Small Class II Watercourse Stands - set at 75 ft. retention.
	Average Retention	20	25	20	10	75	15	
Selection (Coastal Zone STA)	Triggers	> 130				> 130		Coastal Zone Special Treatment Areas
	Average Retention	20	50	40	10	120	15	

No Harvest		NSO Core Stands, Marbled Murrelet Core Stands, Type I Old Growth Stands, Pygmy Forest, Rock Outcrops, Brush. Also for special concern stands that don't meet the trigger conditions for harvest.

Structure Classes

Stratification of the forest cover into units that share common features is accomplished using a variety of tools, including aerial photos and other forms of remote sensing. The units, or strata, derived from stratification are the basis for field sampling activities designed to obtain tree lists that represent the forested condition for each stratum. Distinct tree lists are produced from sampling for each planning watershed (sub-watersheds defined by the State of California) from sampling. Therefore, the tree list for a given stratum in one planning watershed is distinct, albeit similar, from that of a stratum with the same label in another planning watershed.

Forest structural conditions have strong associations with habitat value. MRC's landscape planning tools include a component in the Growth and Yield model that classifies forest vegetation into groupings or classes of forest structure classes. Forest structure classes are based on:

- Species dominance
- Size dominance
- Density of the forest

The structure classes are fewer in number than the total number of vegetation strata. The purpose with identifying structure classes is to combine forested areas into similar vegetation units for habitat purposes, not for determining levels of timber stocking. Although highly correlated to vegetation strata, forest structure classes are computed from empirical data acquired from field samples. While both vegetation strata and forest structure classes are based on the same set of rules, strata are assigned a priori (before sampling) and structure classes are computed a posteriori (post sampling).

MRC developed this system for determining structure classes in order to understand both the current condition of the forest and changes to forest structure resulting from forest growth and harvesting activities. The system was developed as an alternative to the California WHR (Wildlife Habitats Relationship) model because the WHR system was developed for even-aged management, where trees in a forest stand are very close to the same size and age. MRC manages its forest with uneven age harvesting. This means that there are trees from more than one age and size group in forested stands at all times. WHR determines the size of the forest stand utilizing an average. Averaging works well for forested stands where the distribution of tree sizes within a stand is minimal. It does not describe the condition of a forest with a wide distribution of sizes, as in uneven age management. A crosswalk was developed to address NSO habitat, WHR, and Successional stages. For a given structure class, a specific habitat is assigned. For example, structure class 10 would be labeled as Foraging NSO habitat, have a WHR of MHC4M, and would be classified as Mid-Successional. Table 19 below shows the crosswalk between structure class and other habitat designations.

Table 19. Structure Class and Habitat Relationships.

Structure Class	NSO Habitat	Dominant WHR	Successional Stage
0	Non_Suitable	N/A	Non Timber
1	Non_Suitable	MHW2P	Early Successional
2	Non_Suitable	MHW4P	Mid Successional
10	Foraging	MHC4M	Mid Successional
11	Non_Suitable	MHC2D	Early Successional
12	Foraging	MHC4D	Mid Successional
13	Non_Suitable	RDW2P	Early Successional
14	Non_Suitable	RDW4S	Mid Successional
15	Non_Suitable	RDW5P	Mid Successional
16	Non_Suitable	RDW5P	Mid Successional
17	Foraging	RDW3M	Mid Successional
18	Foraging	RDW4M	Mid Successional
19	Foraging	RDW5M	Mid Successional
20	Foraging	RDW5M	Advanced Successional
21	Foraging	RDW3D	Mid Successional
22	Roosting/Nesting	RDW4D	Mid Successional
23	Roosting/Nesting	RDW5D	Advanced Successional
24	Roosting/Nesting	RDW6D	Advanced Successional

Attachment B – EIS/PTEIR Growth and Yield Modeling - Alternatives Modeling Attachment: Includes No-Action, Proposed, Alternatives A, B and C

Simulation Model

The simulation model used to estimate growth and yield on MRC timberlands is CRYPTOS (Cooperative Redwood Yield Research Project). For each tree in a list of tree species, CRYPTOS “grows” and estimates forest mortality, crown canopy, and competition, as well as the site conditions in each stand. Growth estimates of the forest include assumptions on regeneration of new trees after harvest. Harvest is simulated in the model. This allows the application of a myriad of silvicultural applications to be tested against a unique set of vegetation, site class, and sensitivity levels in each stand. The use of a simulation model has enabled MRC to compare multiple scenarios with different management strategies and identify the best scenario to meet our objectives. The simulation model provides a prediction of periodic inventory, harvest, growth, and habitat levels over time

Growth and yield modeling projects the tree lists derived from inventory sampling through time (forest growth) and management activities (harvest) over a long period of time (100 years in this case). The growth model used in the PTEIR planning effort uses the CRYPTOS equations for height and diameter growth, crown recession, and mortality. CRYPTOS estimates growth for 5-year timeframes. The model is set to ‘harvest’ stands (if they are scheduled for harvest) before they are grown. This is a more conservative approach to estimating harvest volumes than growing the stands before they are harvested, since the harvest estimate doesn’t consider the real growth that occurs in the forest for years 2 through 5 in any 5-year planning period. Projected inventory, harvest estimates, and growth estimates are reported every 5 years.

For the EIS/PTEIR, 5 management alternatives were modeled:

1. No Action (No HCP/No Permit)
2. Proposed Action (HCP/NCCP)
3. Alternative A (Enhanced HCP/NCCP)
4. Alternative B (Reserves)
5. Alternative C (HCP Only and Shorter ITP Term – HCP 40 yrs)

Tables 1-4 display the modeling logic used to determine silviculture activity for each alternative. A stand must be scheduled for harvest for the silviculture logic to be considered. Possible silviculture regimes for any particular stand are based on the stand’s specific sensitivity constraints, if any. Constrained stands have usually only one possible regime available. Non-constrained stands are assigned a silviculture regime based on a decision hierarchy. The stand continues through the set of regimes if the stand does not trigger the first regime in the decision hierarchy. If the stand’s conditions do not meet any of the trigger conditions it receives a ‘no harvest’ and is reviewed at the next entry cycle.

The retention displayed in the table below shows the ‘desired’ distribution of basal area by diameter classes. Few stands will initially be at the desired distribution of diameter classes. In such cases, the model will retain the sum of the specified retention and distribute the retention to those size classes that meet or exceed the specified retention level. The model will not harvest below the desired condition by size class. The following tables display the silviculture triggers and retention used in the growth and yield model for non-constrained (no specific sensitivity) and constrained stands.

Table 1 - No Action Alternative

Silviculture Descriptions and Model Decision Logic								
Silviculture	***Triggers and Retention***	***Conifer Basal Area by Diameter Class***				***Total Conifer Trigger / BA Retained***	***Hardwood BA Trigger / Retention***	**Descriptions**
		0-16"	***16-24"***	***24-32"***	***>32"***			
Silviculture Regimes for Stands with no Special Constraints (Matrix Stands)								
Selection	Triggers		>=120			>=120	0	
	Average Retention	50	30	5	5	90	15	
Selection (Stepped Approach	Triggers	>=220				>=220	0	
	Average Retention	45	65	20	10	140	15	
Selection (Grp)	Triggers	>=100 and <120				>=100 and <120	0	
	Average Retention	50	30	5	5	90	15	
Transition	Triggers	>=60 <100				>=60 <100	0	
	Average Retention	25	15	5	5	50	15	These silviculture regimes are employed for stands with no special constraints.
Variable Retention (Restoration)	Triggers	>20 sq. ft Conifer >16" dbh and total Con BA <120 and >60 sq. ft. Hardwoods >0" dbh				<120	>60	
	Average Retention	10	0	5	5	20	15	
Rehabilitation	Triggers	>5				>5	0	
	Average Retention	0	0	2	3	5	15	
Seed Tree Removal	Triggers	>5	>10			>15	0	
	Average Retention	5	0	5	5	15	15	
No Harvest								Matrix stands that do not meet the basal area harvest triggers.

No Action Alternative

Silviculture Descriptions and Model Decision Logic								
Silviculture	***Triggers and Retention***	***Conifer Basal Area by Diameter Class***				***Total Conifer Trigger / BA Retained***	***Hardwood BA***	**Descriptions**
		0-16"	***16-24"***	***24-32"***	***>32"***			
Silviculture Regimes for Stands with Special Constraints								
Selection (High Retention2)	Triggers	>230				>230		Class I Watercourse Stands (Buffer 150 ft.)
	Average Retention	70	70	20	20	180	55	
Selection (High Retention3)	Triggers	>180				>180		Large Class II Watercourse Stands (Buffer 150 ft.)
	Average Retention	50	40	15	15	120	55	
Selection (High Retention)	Triggers	>260				>260		Small Class II Watercourse Stands (Buffer 75 ft.)
	Average Retention	50	50	50	50	200	55	
Selection - Carb (High Retention)	Triggers	>240				>240		Stands selected for carbon sequestration.
	Average Retention	50	50	50	50	200	15	
Selection (Medium Retention-OG)	Triggers	>160				>160		Type II Old Growth Stands
	Average Retention	50	50	25	25	150	15	
Selection (NSO & MaMu Buffers)	Triggers	>=105				>=105		Stands selected as NSO and MaMu buffers
	Average Retention	50	30	5	5	75	15	
Selection (Floodplain)	Triggers	>300				>300		Areas identified as floodplain by watershed analysis
	Average Retention	75	75	75	75	300	55	
Selection (Visual)	Triggers	>=105				>=105		Stands selected to retain aesthetic values
	Average Retention	50	30	5	5	75	15	
Selection (Coastal Zone STA)	Triggers	>=120				>=120		Coastal Zone Stands

	Average Retention	20	35	35	10	100	15	
No Harvest								NSO Core Stands, Marbled Murrelet Core Stands, Type I Old Growth Stands, Pygmy Forest, Rock Outcrops, Brush. Also for special concern stands that don't meet the trigger conditions for harvest.

Table 2 - Proposed Alternative (HCP/NCCP)

Silviculture Descriptions and Model Decision Logic								
Silviculture	***Triggers and Retention***	***Conifer Basal Area by Diameter Class***				***Total Conifer Trigger / BA Retained***	***Hardwood BA Trigger / Retention***	**Descriptions**
		0-16"	***16-24"***	***24-32"***	***>32"***			
Silviculture Regimes for Stands with no Special Constraints (Matrix Stands)								
Selection	Triggers	>=105				>=105	0	These silviculture regimes are employed for stand with no special constraints.
	Average Retention	20	25	20	10	75	15	
Transition	Triggers		>=50 <105			>=50 <105	0	
	Average Retention	35	10	2	3	50	15	
Rehabilitation	Triggers	>15				>15	0	
	Average Retention	10	0	2	3	15	15	
Variable Retention (Restoration)	Triggers	>20 sq. ft Conifer >16" dbh and total Con BA <105 and >60 sq. ft. Hardwoods >0" dbh				<105	>60	
	Average Retention	10	0	5	5	20	15	
Seed Tree Removal	Triggers	>5	>10			>15	0	
	Average Retention	5	0	5	5	15	15	
No Harvest								

Proposed Alternative (HCP/NCCP)

Silviculture Descriptions and Model Decision Logic								
Silviculture	***Triggers and Retention***	***Conifer Basal Area by Diameter Class***				***Total Conifer Trigger / BA Retained***	***Hardwood BA***	**Descriptions**
		0-16"	***16-24"***	***24-32"***	***>32"***			
Silviculture Regimes for Stands with Special Constraints								
Selection (High Retention)	Triggers	>260				>260		Class I and Large Class II Watercourse Buffers (Inner and Middle Bands - set at 150 ft.)
	Average Retention	25	75	100sq.ft. + 20% of largest trees		200	55	
Selection-Carb (High Retention)	Triggers	>240				>240		Carbon Sequestration
	Average Retention	50	50	50	50	200	15	
Selection MR (MaMu Buffers)	Triggers	>=130				>=130		MaMu Buffer Stands. These stands will be managed to retain and promote larger trees.
	Average Retention	30	30	30	30	120	15	
Selection (NSO Buffers)	Triggers	>=105				>=105		NSO Buffer stands adjacent to "No Harvest" core areas.
	Average Retention	20	25	20	10	75	15	
Selection (OG Type II)	Triggers	>=160				>=160		Selection employed for Old Growth Type II stands.
	Average Retention	50	50	25	25	150	15	
Selection TSU (Terrain Stability Units)	Triggers	>=105				>=105		Terrain Stability Units. TSU 1 and TSU 2 can only be harvested under Selection silviculture. TSU 3 can trigger Transition silviculture if >25 and < 50% of stand is covered by TSU 3. These stands (identified on the ground) may be harvested with other silvicutures depending on site specific conditions. Selection and Transition silvicultures were employed for modeling purposes.
	Average Retention	20	25	20	10	75	15	
Selection (Floodplain)	Triggers	>300				>300		Areas identified as floodplain by watershed analysis
	Average Retention	75	75	75	75	300	55	
Selection (Visual)	Triggers	>=105				>=105		Stands selected to retain aesthetic values
	Average Retention	20	25	20	10	75	15	
Selection (Small Class II)	Triggers	>=105				>105		Small Class II Watercourse Stands - set at 75 ft. retention.
	Average Retention	20	25	20	10	75	15	
Selection (Coastal Zone STA)	Triggers	>130				>130		Coastal Zone Special Treatment Areas
	Average Retention	20	50	40	10	120	15	

No Harvest		NSO Core Stands, Marbled Murrelet Core Stands, Type I Old Growth Stands, Pygmy Forest, Rock Outcrops, Brush. Also for special concern stands that don't meet the trigger conditions for harvest.

Table 3 - Enhanced HCP (Alternative A)

Silviculture Descriptions and Model Decision Logic								
Silviculture	***Triggers and Retention***	***Conifer Basal Area by Diameter Class***				***Total Conifer Trigger / BA Retained***	***Hardwood BA Trigger / Retention***	**Descriptions**
		0-16"	***16-24"***	***24-32"***	***>32"***			
Silviculture Regimes for Stands with no Special Constraints (Matrix Stands)								
Selection	Triggers	>=105				>=105	0	These silviculture regimes are employed for stands with no special constraints.
	Average Retention	20	25	20	10	75	15	
Transition	Triggers		>=50 <105			>=50 <105	0	
	Average Retention	35	10	2	3	50	15	
Rehabilitation	Triggers	>15				>15	0	
	Average Retention	10	0	2	3	15	15	
Variable Retention (Restoration)	Triggers	>20 sq. ft Conifer >16" dbh and total Con BA <105 and >60 sq. ft. Hardwoods >0" dbh				<105	>60	
	Average Retention	10	0	5	5	20	15	
Seed Tree Removal	Triggers	>5	>10			>15	0	
	Average Retention	5	0	5	5	15	15	
No Harvest								

Enhanced HCP (Alternative A)

Silviculture Descriptions and Model Decision Logic								
Silviculture	***Triggers and Retention***	***Conifer Basal Area by Diameter Class***				***Total Conifer BA Retained***	***Hardwood BA***	**Descriptions**
		0 - 16"	***16 - 24"***	***24 - 32"***	***>32 "***			
Silviculture Regimes for Stands with Special Constraints								
Selection (High Retention)	Triggers	>260				>260		Small Class II Watercourse Stands
	Average Retention	50	50	50	50	200	55	
Selection-Carb (High Retention)	Triggers	>240				>240		Carbon Sequestration
	Average Retention	50	50	50	50	200	55	
Selection MR (NSO & MaMu Buffers)	Triggers	>=130				>=130		Selected stands that are adjacent to NSO core areas. MaMu buffer stands will be managed to retain and promote larger trees.
	Average Retention	30	30	30	30	120	15	
Selection (OG Type II)	Triggers	>=160				>=160		Selection employed for Old Growth Type II stands.
	Average Retention	50	50	25	25	150	15	
Selection TSU (Terrain Stability Units)	Triggers	>=105				>=105		Terrain Stabilty Units. TSU 1 and TSU 2 can only be harvested under Selection silviculture. TSU 3 can trigger Transition silviculture if >30 and < 50% of stand is covered by TSU 3. These stands (identified on the ground) may be harvested with other silvicutures depending on site specific conditions. Selection and Transition silvicultures were employed for modeling purposes.
	Average Retention	20	25	20	10	75	15	
Selection (Floodplain)	Triggers	>300				>300		Areas identified as floodplain by watershed analysis
	Average Retention	75	75	75	75	300	55	
Selection	Triggers	>=105				>=105		Stands selected to retain aesthetic values
	Average Retention	20	25	20	10	75	15	
Selection (Coastal Zone STA)	Triggers	>130				>130		Coastal Zone Special Treatment Areas
	Average Retention	20	50	40	10	120	15	

No Harvest		Class I and Large Class II Watercourses, NSO Core Stands, Marbled Murrelet Core Stands, Type I and Type II Old Growth Stands, Pygmy Forest, Rock Outcrops, Brush. Also for special concern stands that don't meet the trigger conditions for harvest.

Table 4 - Reserves Alternative (Alternative B)

Silviculture Descriptions and Model Decision Logic									
Silviculture	***Triggers and Retention***	***Conifer Basal Area by Diameter Class***				***Total Conifer Trigger / BA Retained***	***Hardwood BA Trigger / Retention***	**Descriptions**
		0-16"	***16-24"***	***24-32"***	***>32"***			
Silviculture Regimes for Stands with no Special Constraints (Matrix Stands)								
Clearcut	Triggers		>=80			>=120	0	These silviculture regimes are employed for stands with no special constraints.
	Average Retention	0	0	0	0	0	15	
Commercial Thin	Triggers	>=100				>=100	0	
	Average Retention	25	25	25	25	100	15	
Rehabilitation	Triggers	>15				>15	0	
	Average Retention	10	0	2	3	15	15	
Seed Tree Removal	Triggers	>5	>10			>15	0	
	Average Retention	5	0	5	5	15	15	
No Harvest								

Reserves Alternative (Alternative B)

Silviculture Descriptions and Model Decision Logic								
Silviculture	***Triggers and Retention***	***Conifer Basal Area by Diameter Class***				***Total Conifer Trigger / BA Retained***	***Hardwood BA Trigger / Retention***	**Descriptions**
		0-16"	***16-24"***	***24-32"***	***>32"***			
Silviculture Regimes for Stands with Special Constraints								
Selection (High Retention)	Triggers	>160				>160		Class I and Large Class II Watercourse Buffers outside of reserves. (Inner and Middle Bands)
	Average Retention	75	75	5	5	160	55	
Selection-Carb (High Retention)	Triggers	>240				>240		Carbon Sequestration outside of reserves.
	Average Retention	50	50	50	50	200	15	
Selection (OG Type I)	Triggers	>=260				>=260		Old Growth Type I outside of reserves.
	Average Retention	50	50	50	50	200	15	
Selection (Floodplain)	Triggers	>300				>300		Areas identified as floodplain by watershed analysis outside of reserves.
	Average Retention	75	75	75	75	300	55	
Selection	Triggers	>=105				>=105		Stands selected to retain aesthetic values
	Average Retention	20	25	20	10	75	15	
Selection (Small Class II)	Triggers	>=95				>95		Small Class II Watercourse Stands outside of reserves.
	Average Retention	40	30	10	5	85	15	
Selection (Coastal Zone STA)	Triggers	>130				>130		Coastal Zone Special Treatment Areas outside of reserves.
	Average Retention	20	50	40	10	120	15	
No Harvest								NSO Reserves, MaMu Reserves, MaMu/Point Arena Mtn. Beaver Reserves, Pygmy Forest, Rock Outcrops, Brush. Also for special concern stands that don't meet the trigger conditions for harvest.

40 Year HCP Alternative (Alternative C)

Modeling constraints for this alternative are the same as for the proposed action, with only a forty year term, as compared to the 80 year term of the proposed action.

Variable Retention (Restoration)

Description
This regime is utilized primarily to rotate stands with low conifer basal area and relatively high hardwood basal area back to a conifer dominated stand. The regime is considered an even-aged regime and is employed only in upslope stands with no special constraints. Pockets of the pre-harvest stand are retained to provide habitat structure and forest complexity. The stand will be managed using uneven-age silviculture in successive entries.

Timing Options
The regime is available for harvest for the first six decades. The re-entry period is 20-30 years.

Trigger Conditions
Stands must have between 50 square feet and 120 square feet of conifer basal area per acre. The stand must also have at least 60 square feet of hardwood basal area per acre. The regime is considered for mixed conifer and hardwood stands and mixed hardwood stands. The stand must have 50% or more of its overall basal area in trees greater than 16 inches to be considered for harvest.

Residual Stand Conditions
The modeled retention is 20% of both the conifer and hardwood pre-harvest basal area, representing both species and size distribution found in the pre-harvest stand.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime.
Assumptions The growth model assumes that post-harvest stands are regenerated with 300 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood trees and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees 'grow' in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
Hardwoods are modeled for management within each of the silviculture regimes. The targeted hardwood basal area retention level is 15 square feet per acre in each stand following harvest. This is to ensure that hardwoods remain part of the complex structural conditions we are seeking in our stands.

Rehabilitation

Description

The rehabilitation regime is reserved for those stands experiencing excessive hardwood competition. This regime is considered as an even-aged regime. Rehabilitation removes the hardwood competition and allows conifer regeneration to take place. Successive harvests will incorporate uneven-aged silviculture.

Timing Options

The regime is available throughout the planning horizon. Subsequent harvest will be treated with uneven-age silviculture. The minimum re-entry period is 30 years.

Trigger Conditions

Stands must have less than 50 square feet of conifer basal area

per acre and more than 50 square feet of hardwood basal area per acre***.*** The regime is considered for mixed conifer and hardwood stands and mixed hardwood stands. The stand must have 50% or more of its overall basal area in trees larger than 8” dbh.

Residual Stand Conditions

Minimum conifer basal area retention is 10 square feet of conifer basal area per acre. Minimum hardwood retention is 15 square feet of hardwood basal area per acre.

Regeneration

Natural regeneration and planted seedlings are assumed for this regime.
Assumptions The growth model assumes that post-harvest stands are regenerated with 300 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood trees and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control

Hardwoods are modeled for management within each of the silviculture regimes. The targeted hardwood basal area retention level is 15 square feet per acre in each stand following harvest. This is to ensure that hardwoods remain part of the complex structural conditions we are seeking in our stands.

Transition

Description
The goal of the transition regime is to develop uneven-aged stands from even-aged stands and/or to improve stocking levels in understocked stands.

Timing Options
The regime is available throughout the planning horizon. Subsequent harvest will be treated with selection silviculture. The minimum re-entry period is 20 years.

Trigger Conditions
Stands must have between 60-105 square feet of conifer basal area per acre to be selected for transition. Stands must also have less than 60 square feet of hardwood basal area per acre. The regime is considered for conifer-dominated stands, mixed conifer/hardwood stands, and mixed harwood stands. Stands must have 50% or more of its overall basal area in trees larger than 16 inches dbh. Hardwood harvest is triggered if hardwood basal area exceeds 15 square feet of basal area per acre. Stands that have a portion (25-50%) of their area within a TSU 3 unit may also be harvested with this regime if there is high basal area (60 square feet) in hardwoods.

Residual Stand Conditions
Minimum conifer basal area retention is 50 square feet of conifer basal area per acre. Minimum hardwood retention is 15 square feet of hardwood basal area per acre.

Regeneration
The stand is assumed to have 200 seedlings per acre, representing the pre-harvest conifer species mix. The small trees 'grow' in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
Hardwoods are modeled for management within each of the silviculture regimes. The targeted hardwood basal area retention level is 15 square feet per acre in each stand following harvest. This is to ensure that hardwoods remain part of the complex structural conditions we are seeking in our stands.

Selection (High Retention)

Description
The goal of this regime is to create and maintain dense, multistoried, uneven-aged stands with a variety of diameter classes. The regime is considered for stands with 50% or more of the stands overall basal area in trees greater than 16 inches dbh. The regime is applied to sensitive areas, such as watercourse buffers.

Timing Options
The regime is available throughout the planning horizon. If the stand is a watercourse buffer, it cannot be harvested unless the adjacent upslope stand is harvested. The minimum re-entry period is dependent on the specific alternative.

Trigger Conditions

Trigger conditions vary among alternatives. Plese refer to the ***Silviculture Descriptions and Model Decision Logic*** tables for each alternative.. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

Residual Stand Conditions

Minimum conifer basal area retention is dependent on the specific alternative. Under the “Proposed” and “Enhanced HCP-Alt A” alternative, there is the additional retention of 20% of the largest trees in the stand. The basal area retention simulates a canopy closure of at least 70% and a presence of large trees. In general, all hardwoods will be retained.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 40 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
No vegetation control is modeled with this regime.

Selection

Description
The goal of this regime is to create and maintain continuous cover of multistoried, uneven-aged stands with a variety of diameter classes. The regime is applied to stands that are not experiencing a high level of hardwood competition. The regime is designed to develop and maintain a variety of age classes.

Timing Options
The regime is available for harvest throughout the planning horizon. The minimum re-entry period is 20 years.

Trigger Conditions
Stands must have a minimum of 105 square feet of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

Residual Stand Conditions
Minimum conifer basal area retention is 75 square feet of conifer basal area per acre. If hardwoods are harvested, retention is 15 square feet of basal area per acre.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 100 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
Vegetation management will occur if hardwoods comprise greater than 15 square feet per acre.

Seed Tree removal

Description
The seed tree removal regime is the final step in rotating the stand that preceded it. Seed trees are removed when the younger stand established in part by the seed trees fully occupies the stand. While considered an even-aged regime, the developing stand will be treated in subsequent treatments with uneven-age silviculture.

Timing Options
The regime is available for harvest for the first four decades.

Trigger Conditions
Stands must have between 15 and 60 square feet of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. The stand must have 50% or more of its overall basal area in trees larger than 16 inches dbh, with a vigourous and well stocked understory satnd of smaller trees. Hardwood harvest is triggered if the hardwood basal area exceeds 15 square feet per acre. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

Residual Stand Conditions
Minimum conifer basal area retention is 15 square feet of conifer basal area per acre. If hardwoods are harvested, retention is 15 square feet of basal area per acre.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 250 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
Vegetation management will occur if hardwoods comprise greater than 15 square feet per acre.

Selection (Stepped Approach)

Description
The goal of this regime, used only within the No Action, is to create and maintain continuous cover of multistoried, uneven-aged stands with a variety of diameter classes. The regime is applied to upslope stands that have a high basal area and are not experiencing a high level of hardwood competition. The regime is designed to develop and maintain a variety of age classes.

Timing Options
The regime is available for harvest throughout the planning horizon. The minimum re-entry period is 20 years.

Trigger Conditions
Stands must have a minimum of 220 square feet of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

Residual Stand Conditions
Minimum conifer basal area retention is 90 square feet of conifer basal area per acre. If hardwoods are harvested, retention is 15 square feet of basal area per acre.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 100 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
Vegetation management will occur if hardwoods comprise greater than 15 square feet per acre.

Selection (Grp)

Description
The goal of this regime is to create and maintain continuous cover of multistoried, uneven-aged stands with a variety of diameter classes. The regime is applied to stands that are not experiencing a high level of hardwood competition. The regime is designed to develop and maintain a variety of age classes.

Timing Options
The regime is available for harvest throughout the planning horizon. The minimum re-entry period is 10 years.

Trigger Conditions
Stands must have a minimum of 100 square feet and less 120 square feet of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

Residual Stand Conditions
Minimum conifer basal area retention is 90 square feet of conifer basal area per acre. If hardwoods are harvested, retention is 15 square feet of basal area per acre.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 100 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
Vegetation management will occur if hardwoods comprise greater than 15 square feet per acre.

Selection (High Retention2)

Description
The goal of this regime is to create and maintain dense, multistoried, uneven-aged stands with a variety of diameter classes. The regime is considered for stands with 50% or more of the stands overall basal area in trees greater than 16 inches dbh. The regime is applied to sensitive areas, such as watercourse buffers.

Timing Options
The regime is available throughout the planning horizon. If the stand is a watercourse buffer, it cannot be harvested unless the adjacent upslope stand is harvested. The minimum re-entry period is 20 years.

Trigger Conditions
Stands must have a minimum of 230 square feet of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

Residual Stand Conditions
Minimum conifer basal area retention is 180 square feet of conifer basal area per acre. This simulates a canopy closure of at least 70% and a presence of large trees. In general, all hardwoods will be retained.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 40 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
No vegetation control is modeled with this regime.

Selection (High Retention3)

Description
The goal of this regime is to create and maintain dense, multistoried, uneven-aged stands with a variety of diameter classes. The regime is considered for stands with 50% or more of the stands overall basal area in trees greater than 16 inches dbh. The regime is applied to sensitive areas, such as watercourse buffers.

Timing Options
The regime is available throughout the planning horizon. If the stand is a watercourse buffer, it cannot be harvested unless the adjacent upslope stand is harvested. The minimum re-entry period is 20 years.

Trigger Conditions

Stands must have a minimum of 260 square feet of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

Residual Stand Conditions

Minimum conifer basal area retention is 200 square feet of conifer basal area per acre. Under the “Proposed” alternative, there is the additional retention of 20% of the largest trees in the stand. This simulates a canopy closure of at least 70% and a presence of large trees. In general, all hardwoods will be retained.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 40 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
No vegetation control is modeled with this regime.

Selection_Carb (High Retention)

Description
The goal of this regime is to create and maintain dense, multistoried, uneven-aged stands with a variety of diameter classes. A select project area was defined for testing carbon sequestration.

Timing Options
The regime is available throughout the planning horizon. If the stand is a watercourse buffer, it cannot be harvested unless the adjacent upslope stand is harvested. The minimum re-entry period is 20 years.

Trigger Conditions
Stands must have a minimum of 240 square feet of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

Residual Stand Conditions
Minimum conifer basal area retention is 200 square feet of conifer basal area per acre. This simulates a canopy closure of at least 70% and a presence of large trees.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 40 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
No vegetation control is modeled with this regime.

Selection (Medium Retention - OG)

Description
The goal of this regime is to create and maintain dense, multistoried, uneven-aged stands with a variety of diameter classes. The regime is considered for stands with 50% or more of the stands overall basal area in trees greater than 16 inches dbh. This regime is applied to Type II Old Growth stands.

Timing Options
The regime is available throughout the planning horizon. If the stand is a watercourse buffer, it cannot be harvested unless the adjacent upslope stand is harvested. The minimum re-entry period is 20 years.

Trigger Conditions

Stands must have a minimum of 160 square feet of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

Residual Stand Conditions

Minimum conifer basal area retention is 150 square feet of conifer basal area per acre. This simulates a canopy closure of at least 60% and a presence of large trees. All residual old growth trees are retained. If pre-harvest basal area in hardwoods exceeds 15 suare feet, then 15 square feet of basal area will be retatained.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 40 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
Hardwoods will be reduced to 15 square feet of basal area.

Selection (OG Type I)

Description
The goal of this regime is to create and maintain dense, multistoried, uneven-aged stands with a variety of diameter classes. The regime is considered for stands with 50% or more of the stands overall basal area in trees greater than 16 inches dbh. This regime is applied to Type I Old Growth stands.

Timing Options
The regime is available throughout the planning horizon. If the stand is a watercourse buffer, it cannot be harvested unless the adjacent upslope stand is harvested. The minimum re-entry period is 20 years.

Trigger Conditions

Stands must have a minimum of 260 square feet of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

Residual Stand Conditions

Minimum conifer basal area retention is 200 square feet of conifer basal area per acre. This simulates a canopy closure of at least 60% and a presence of large trees. All residual old growth trees are retained. If pre-harvest basal area in hardwoods exceeds 15 suare feet, then 15 square feet of basal area will be retatained.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 40 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
Hardwoods will be reduced to 15 square feet of basal area.

Selection (NSO & MaMu Buffers)

Description
The goal of this regime is to create and maintain continuous cover of multistoried, uneven-aged stands with a variety of diameter classes. The regime is applied to stands that are not experiencing a high level of hardwood competition. The regime is designed to develop and maintain a variety of age classes.

Timing Options
The regime is available for harvest throughout the planning horizon. The minimum re-entry period is 20 years.

Trigger Conditions
Stands must have a minimum of 105 square feet of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

Residual Stand Conditions
Minimum conifer basal area retention is 75 square feet of conifer basal area per acre. If hardwoods are harvested, retention is 15 square feet of basal area per acre.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 100 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
Vegetation management will occur if hardwoods comprise greater than 15 square feet per acre.

Selection (Floodplain)

Description
The goal of this regime is to create and maintain dense, multistoried, uneven-aged stands with a variety of diameter classes. The regime is considered for stands with 50% or more of the stands overall basal area in trees greater than 16 inches dbh. The regime is applied to sensitive areas, such as watercourse buffers. This regime is applied to a unique group of stands that were identified as being within a floodplain.

Timing Options
The regime is available throughout the planning horizon. If the stand is a watercourse buffer, it cannot be harvested unless the adjacent upslope stand is harvested. The minimum re-entry period is 20 years.

Trigger Conditions
Stands must have a minimum of 300 square feet of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

Residual Stand Conditions
Minimum conifer basal area retention is 300 square feet of conifer basal area per acre. Under the "Proposed" alternative, there is the additional retention of 20% of the largest trees in the stand. This simulates a canopy closure of at least 70% and a presence of large trees. In general, all hardwoods will be retained.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 40 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees 'grow' in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
No vegetation control is modeled with this regime.

Selection (Visual)

Description
The goal of this regime is to create and maintain continuous cover of multistoried, uneven-aged stands with a variety of diameter classes. The regime is applied to stands that are not experiencing a high level of hardwood competition. The regime is designed to develop and maintain a variety of age classes. A select group of stands were identified adjacent to public roads, etc. and will be managed for aesthetic purposes.

Timing Options
The regime is available for harvest throughout the planning horizon. The minimum re-entry period is 20 years.

Trigger Conditions

Stands must have a minimum of 105 square feet of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

Residual Stand Conditions

Minimum conifer basal area retention is 75 square feet of conifer basal area per acre. If hardwoods are harvested, retention is 15 square feet of basal area per acre.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 100 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
Vegetation management will occur if hardwoods comprise greater than 15 square feet per acre.

Selection (Coastal Zone STA)

Description
The goal of this regime is to create and maintain continuous cover of multistoried, uneven-aged stands with a variety of diameter classes. The regime is applied to stands that are not experiencing a high level of hardwood competition. The regime is designed to develop and maintain a variety of age classes. A select group of stands were identified within the Coastal Zone Special Treatment Area and will be managed with selection silviculture only.

Timing Options
The regime is available for harvest throughout the planning horizon. The minimum re-entry period is 20 years.

Trigger Conditions

Stands must have a minimum of 120 square feet of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

Residual Stand Conditions

Minimum conifer basal area retention is 100 square feet of conifer basal area per acre. If hardwoods are harvested, retention is 15 square feet of basal area per acre.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 100 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
Vegetation management will occur if hardwoods comprise greater than 15 square feet per acre.

Selection TSU (Terrain Stability Units)

Description
The goal of this regime is to create and maintain continuous cover of multistoried, uneven-aged stands with a variety of diameter classes. The regime is applied to stands that are not experiencing a high level of hardwood competition. The regime is designed to develop and maintain a variety of age classes. This regime applies to stands within identified TSU units that have 50% or more of the area within a TSU 3 unit.

Timing Options
The regime is available for harvest throughout the planning horizon. The minimum re-entry period is 20 years.

Trigger Conditions
Stands must have a minimum of 105 square feet of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

Residual Stand Conditions
Minimum conifer basal area retention is 75 square feet of conifer basal area per acre. If hardwoods are harvested, retention is 15 square feet of basal area per acre.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 100 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
Vegetation management will occur if hardwoods comprise greater than 15 square feet per acre.

Selection (Small Class II)

Description
The goal of this regime is to create and maintain continuous cover of multistoried, uneven-aged stands with a variety of diameter classes. The regime is applied to stands that are not experiencing a high level of hardwood competition. The regime is designed to develop and maintain a variety of age classes. This regime applies to stands identified as small class II watercourses.

Timing Options
The regime is available for harvest throughout the planning horizon. The minimum re-entry period is 20 years.

Trigger Conditions
Stands must have a minimum of 105 square feet of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

Residual Stand Conditions
Minimum conifer basal area retention is 75 square feet of conifer basal area per acre. If hardwoods are harvested, retention is 15 square feet of basal area per acre.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 100 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
Vegetation management will occur if hardwoods comprise greater than 15 square feet per acre.

Clearcut

Description
This regime is utilized in the “Reserves” alternative to rotate stands under an even-aged regime.

Timing Options
The regime is available for harvest throughout the planning horizon. The rotation cycle is 60 years.

Trigger Conditions
Stands must have greater than120 square feet of conifer basal area per acre. The regime is considered for mixed conifer and hardwood stands and mixed hardwood stands. The stand must have 80 square feet of basal area or more of its overall basal area in trees greater than 16 inches to be considered for harvest.

Residual Stand Conditions
All conifers greater than 6” dbh are harvested. 15 square feet of hardwoods are retained if present in the pre-harvest stand.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime.
Assumptions The growth model assumes that post-harvest stands are regenerated with 300 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood trees and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
Hardwoods are modeled for management within each of the silviculture regimes. The targeted hardwood basal area retention level is 15 square feet per acre in each stand following harvest.

Commercial Thin

Description
The goal of this regime is to thin clearcut stands to achieve optimal spacing, growth, and maintain or enhance the average diameter. This regime is considered even-aged as it is an intermediate step in the clearcut cycle

Timing Options
The regime is applied midway (30 years) between 60 year clearcut events.

Trigger Conditions
Stands must have greater than of 100 square feet of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

Residual Stand Conditions
Minimum conifer basal area retention is 100 square feet of conifer basal area per acre. If hardwoods are harvested, retention is 15 square feet of basal area per acre.

Regeneration
Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 10 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 foot height growth per year until the tree achieves 10 feet in height, upon which the trees are assumed to have a dbh of 4 inches. At this point the small trees are subject to competition and mortality.

Vegetation Control
Vegetation management will occur if hardwoods comprise greater than 15 square feet per acre.

Structure Classes

Stratification of the forest cover into units that share common features is accomplished using a variety of tools, including aerial photos and other forms of remote sensing. The units, or strata, derived from stratification are the basis for field sampling activities designed to obtain tree lists that represent the forested condition for each stratum. Distinct tree lists are produced from sampling for each planning watershed (sub-watersheds defined by the State of California) from sampling. Therefore, the tree list for a given stratum in one planning watershed is distinct, albeit similar, from that of a stratum with the same label in another planning watershed.

Forest structural conditions have strong associations with habitat value. MRC's landscape planning tools include a component in the Growth and Yield model that classifies forest vegetation into groupings or classes of forest structure classes. Forest structure classes are based on:

- Species dominance
- Size dominance
- Density of the forest

The structure classes are fewer in number than the total number of vegetation strata. The purpose with identifying structure classes is to combine forested areas into similar vegetation units for habitat purposes, not for determining levels of timber stocking. Although highly correlated to vegetation strata, forest structure classes are computed from empirical data acquired from field samples. While both vegetation strata and forest structure classes are based on the same set of rules, strata are assigned a priori (before sampling) and structure classes are computed a posteriori (post sampling).

MRC developed this system for determining structure classes in order to understand both the current condition of the forest and changes to forest structure resulting from forest growth and harvesting activities. The system was developed as an alternative to the California WHR (Wildlife Habitats Relationship) model because the WHR system was developed for even-aged management, where trees in a forest stand are very close to the same size and age. MRC manages its forest with uneven age harvesting. This means that there are trees from more than one age and size group in forested stands at all times. WHR determines the size of the forest stand utilizing an average. Averaging works well for forested stands where the distribution of tree sizes within a stand is minimal. It does not describe the condition of a forest with a wide distribution of sizes, as in uneven age management. A crosswalk was developed to address NSO habitat, WHR, and Successional stages. For a given structure class, a specific habitat is assigned. For example, structure class 10 would be labeled as Foraging NSO habitat, have a WHR of MHC4M, and would be classified as Mid-Successional.

Attachment C – Sample PTHP

FOR ADMIN. USE ONLY
Amendments-date & S or M

1.	________	7.	________
2.	________	8.	________
3.	________	9.	________
4.	________	10.	________
5.	________	11.	________
6.	________	12.	________

PROGRAM TIMBER HARVESTING PLAN

STATE OF CALIFORNIA
DEPARTMENT OF FORESTRY AND FIRE PROTECTION
RM-64 (02-05)

Filed in accordance with
PROGRAM TIMBERLAND
ENVIRONMENTAL IMPACT REPORT

FOR ADMIN. USE ONLY

THP No. ____________

Dates Rec'd ____________

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Date Filed ____________

Date Approved ____________

Date Expires ____________

Extensions 1) [ ] 2) [ ]

No ____________

Located at ____________

This Program Timber Harvesting Plan (PTHP) form, when properly completed, is designed to comply with the Forest Practice Act (FPA), the Board of Forestry and Fire Protection rules and above listed Program Timberland Environmental Impact Report (PTEIR). See separate instructions for information on completing this form. NOTE: The form must be printed legibly in ink or typewritten. The PTHP is composed of this form, required maps, completed checklist, required verifying documents and a confidential archaeological section. If more space is necessary to answer a question, continue the answer in an attachment to the PTHP form. If writing an electronic version, insert additional space for your answer. Please distinguish answers from questions by *font change*, **bold** or underline.

This PTHP conforms to my/our plan and upon approval; I/we agree to conduct harvesting in accordance therewith. Consent is hereby given to the Director of Forestry and Fire Protection, and his or her agents and employees, to enter the premises to inspect timber operations for compliance with the Forest Practice Act, Forest Practice Rules and the PTEIR.

1a. TIMBER OWNER(S) OF RECORD: Name Mendocino Redwood Company, LLC

Address P.O. Box 996

City Ukiah **State** CA **Zip** 95482 **Phone** (707) 463-5110

Signature ____________ **Date** ____________

NOTE: The timber owner is responsible for payment of a yield tax. Timber Yield Tax information may be obtained at the Timber Tax Section, MIC: 60, State Board of Equalization, P.O. Box 942879, Sacramento, California 94279-0060; phone 1-800-400-7115; BOE Web Page at http://www.boe.ca.gov

2. TIMBERLAND OWNER(S) OF RECORD: Name Same as #1 (TIMBER OWNER(S) OF RECORD)

Address ____________

City ____________ **State** ______ **Zip** ______ **Phone** ____________

Signature ____________ **Date** ____________

3. LICENSED TIMBER OPERATOR(S): Name Unknown. Will be amended prior to start up of operations. **Lic. No.** ______

(If unknown, so state. You must notify CDF of LTO prior to start of operations)

Address ____________

City ____________ **State** ______ **Zip** ______ **Phone** ____________

Signature ________________ **Date** ________

NOTE: The RPF must provide verification that the LTO has been briefed by the RPF or his/her supervised designee on the contents and operational requirements of the PTHP prior to the start of operations. Ref Title 14 CCR 1092.09(k)

4. **PLAN SUBMITTER(S): Name** Same as #1 (TIMBER OWNER(S) OF RECORD)

Address ________________

City ________ **State** ____ **Zip** ______ **Phone** ________

(Submitter must be from 1, 2, or 3 above. He/she must sign below. Ref. Title 14 CCR 1092.04 (e).)

Signature ________________ **Date** ________

5. **a. List person to contact on-site who is responsible for the conduct of the operation. If unknown, so state and name must be provided for inclusion in the PTHP prior to start of timber operations.**

Name ________________

Address ________________

City ________ **State** ____ **Zip** ______ **Phone** ________

b. [ ] Yes [ ] No Will the timber operator be employed for the construction and maintenance of roads and landings during conduct of timber operations? If no, who is responsible?

____

c. Who is responsible for erosion control maintenance after timber operations have ceased and until certification of the Work Completion Report? If not LTO, then written agreement must be provided per 1050(c).

6. **a) Expected commencement date of timber operations:**
   [ ] date of PTHP conformance, or [ ] ________ **(date)**

   b) Expected date of completion of timber operations:
   [ ] 3 years from date of PTHP conformance, or [ ] ________ **(date)**

7. **The timber operations will occur within the:**

[X] COAST FOREST DISTRICT

[ ] Coastal Zone, no Special Treatment Area ________

[ ] Special Treatment Area(s), type and identify:

[ ] Other ________

8. **Location of the timber operation by legal description:**

Base and Meridian: [ ] Mount Diablo [ ]Humboldt [ ] San Bernardino

Section	Township	Range	Acreage	County	Assessors Parcel Number*
				Mendocino	
				Mendocino	
				Mendocino	

TOTAL ACREAGE ________ **(Logging Area Only)** *** Optional**

Planning Watershed: CALWATER Version, Identification Number, and Name:
USGA Quadrangle Map Name and Date:
Attach any maps as required by 1092.09 and PTEIR at the end of the form.

9. **a. Check the Silvicultural methods or treatments allowed by the rules and the PTEIR that are to be applied under this PTHP. If more than one method or treatment will be used show boundaries on map and list approximate acreage for each.**

[ ] Clearcutting	____	ac.	[ ] Shelterwood Prep. Step	____	ac.	[ ] Seed Tree Seed Step	____	ac.
			[ ] Shelterwood Seed Step	____	ac.	[ ] Seed Tree Removal Step	____	ac.
			[ ] Shelterwood Removal Step	____	ac.			
[ ] Selection	____	ac.	[ ] Group Selection	____	ac.	[ ] Transition	____	ac.

[ ] Commercial Thinning	____	ac.	[ ] Sanitation Salvage	____	ac.
[ ] Special Treatment Area	____	ac.	[ ] Rehabilitation of Understocked Areas	____	ac.
[ ] Alternative	____	ac.	[ ] Conversion	____	ac.
[ ] Fuelbreak	____	ac.	[ ] Non-timberland Area	____	ac.
[ ] Variable Retention	____	ac.			

Total acreage ____ ac. (Explain if total is different from that listed in 8.)

b. If Selection, Group Selection, Commercial Thinning, Sanitation Salvage or Alternative methods are selected, the post harvest stocking levels (differentiated by site if applicable) must be stated. Note mapping requirements of 14 CCR 1092.09(l)(2).

10. **Indicate type of yarding systems and equipment to be used:**

	GROUND BASED		CABLE		SPECIAL
a)	[ ] Tractor, including end/long lining	d)	[ ] Cable, ground lead	g)	[ ] Animal
b)	[ ] Rubber tired skidder, Forwarder	e)	[ ] Cable, high lead	h)	[ ] Helicopter
c)	[ ] Feller buncher	f)	[ ] Cable, Skyline	i)	[ ] Other:

*** All tractor operations restrictions apply to ground based equipment.**

11. **Erosion Hazard Rating: Indicate Erosion Hazard Ratings present on PTHP. (Must match EHR worksheets)**
Low [ ] Moderate [ ] High [ ] Extreme [ ]

If more than one rating is checked, areas must be delineated on map to 20 acres in size (10 acres for high and extreme EHRs in the Coast District).

12. **a. [ ]Yes [ ] No** **Are there any landowners within 1000 feet downstream of the PTHP boundary whose ownership adjoins or includes a class I, II, or IV watercourse(s) which receives surface drainage from the proposed timber operations? If yes, the requirements of 14 CCR 1092.07 apply. Proof of notice should be attached to the PTHP. If No, 11 b. need not be answered.**

b. [ ]Yes [ ] No **Is an exemption requested of the notification requirements of 1092.07? If yes, explanation and justification for the exemption must be attached to the PTHP. Specify if you are requesting an exemption from the letter, the newspaper notice or both.**

c. [ ]Yes [ ] No **Was any information received on domestic water supplies that required additional mitigation beyond that required by standard Watercourse and Lake Protection rules? If yes, list site specific measures to be implemented by the LTO.**

13. **a. [ ]Yes [ ] No** **Is a confidential archaeological addendum as defined in 895.1 attached? If no, complete subsection b. and c. If yes, you may disregard b., but must complete c.**

b. [ ]Yes [ ] No **If archaeology was covered in the PTEIR, an archaeological survey has been conducted of the PTHP area according to current rules and no additional sites were found.**

c. [ ]Yes [ ] No **Are there any archaeological or historical sites located in the PTHP area? If yes, protection measures are contained in a confidential attachment to the PTHP.**

14. **a. [ ]Yes [ ] No** **Will timber operations cause any significant adverse impacts to occur to any threatened or endangered plant or animal species in the area of the PTHP?**

b. [ ]Yes [ ] No **Will timber operations be conducted in compliance with an accepted "no take" or authorized incidental "take" procedure, either of which has authorization or concurrence of a wildlife agency acting within its authority under state or federal endangered species acts for a listed species? If yes, then describe the species and applicable permit or procedure.**

NOTE: See the CDF Mass Mailing, 07/02/1999, section on "CDF Guidelines for Species Surveys and Mitigations" to complete these questions.

15. **a. [ ]Yes [ ] No** **Are there any unique areas in the areas of the PTHP? If yes, list the area and any special provisions.**

16. **a. [ ]Yes [ ] No Are there any practices that are deviations from the standard operational rules which were reviewed under the certified PTEIR? If yes, the deviations and required practices must be listed in the attached checklist.**

17. **a. [ ]Yes [ ] No Are there any operational practices which deviate from the standard rules that were not reviewed under the PTEIR but which are allowed in the rules? If yes provide description, location, explanation and justification.**

18. **RPF preparing the PTHP:** **RPF Number** ____________

Name ______________________________

Address ______________________________

City ____________________ **State** ______ **Zip** __________ **Phone** ______________

a. **[ ]Yes [ ] No** **I have notified the plan submitter(s), in writing, of their responsibilities pursuant to Title 14 CCR 1092.11 of the Forest Practice Rules.**

b. **[ ]Yes [ ] No** **I have notified the timberland owner of their responsibilities for compliance with the Forest Practice Act and, where applicable, Board rules, regarding site preparations, stocking, and maintenance of roads, landings, and erosion control facilities.**

c. **I have the following authority and responsibilities for preparation or administration of the PTHP and timber operation. (Include both work completed and work remaining to be done):**

d. **Additional required work requiring an RPF which I do not have the authority or responsibility to perform:**

e. **I certify that I, or my supervised designee, personally inspected the PTHP area and that the proposed timber operations are within the scope of the environmental analysis contained in the PTEIR and therefore will not result in any significant environmental impacts beyond those addressed in the PTEIR. There have been no physical environmental changes in the PTHP area that are so significant as to require any addendum or supplement to the PTEIR.**

Signature: ______________________________ **Date** ______________

DIRECTOR OF FORESTRY AND FIRE PROTECTION

This Program Timber Harvesting Plan conforms to the rules and regulations of the Board of Forestry, the Forest Practice Act, and the PTEIR:

By:

Signature: ____ **Date** __________________

Printed name: ____ **Date** __________________

Attachment D – Proposed Alternate Standards to the 2012 CFPRs
Rule-By-Rule Spreadsheet

Introduction

The 2012 California Forest Practice Rules (CFPRs) (14 CCR §1092[b]) authorize CAL FIRE to accept alternate standards in a PTHP where it has been demonstrated in a PTEIR that the alternate standard provides resource protections that are equal to or better than the current operational standard ("rule") and that its implementation would have a less than significant impact on the environment. Also, where future changes in the CFPRs occur, the current operational standards (2012 CFPRs) may be accepted by CAL FIRE as alternate standards where the PTEIR has similarly demonstrated the resource protection provided by the current rule (or multiple rules) would result in a less than significant impact on the environment. To demonstrate equal or better protections and less than significant impacts, the analysis of alternate standards in this EIS/PTEIR relies on a "resource-based" analysis approach, as described in *Guidance in the Preparation and Review of Program Timberland Environmental Impact Reports* (BOF and CAL FIRE 2009).

The spreadsheet contained in this appendix provides the following information:

(1) The CFPR (2012) section number corresponding to each rule for which MRC proposes an alternate standard.
(2) The text of the current (2012) rule that the alternate standard will replace.
(3) A description of the proposed alternate standard. In cases where MRC proposes to maintain the current (2012) rule for the duration of its requested 80-year HCP/NCCP term, this is indicated with, "Maintain the current (2012) CFPR standard."
(4) The document (i.e., HCP/NCCP, TMP, MATO) in which the alternate standard is found, with Chapter or Section reference.
(5) The location in the EIS/PTEIR (section number and title) of the effects analysis or analyses that pertain(s) to the alternate standard.
(6) Rules or portions of rules for which an alternate standard is not proposed, and thus an analysis is unnecessary (e.g., a rule heading that introduces a list of subrules), are shaded in gray.

The EIS/PTEIR analyzes the environmental effects of ITP issuance and implementation of MRC's proposed HCP/NCCP, TMP, and long-term streambed alteration agreement (the Master Agreement for Timber Operations, or MATO) (collectively, the Proposed Action), as well as alternatives to the Proposed Action. The Proposed Action, Alternative A, and Alternative C include alternate standards as integral components of the conservation and management measures in the HCP, NCCP, TMP, and MATO. By analyzing the environmental effects of the full suite of conservation and management measures in the proposed HCP, NCCP, TMP, and MATO, the EIS/PTEIR provides a resource-based analysis of the effects of implementing the proposed alternate standards. In cases where MRC proposes to maintain the current (2012) operational standard for the duration of the 80-year HCP/NCCP term, the analysis of effects is based on the implementation of the current standard as part of the full suite of conservation and management measures. In the event the BOF adopts a new standard that supersedes the current (2012) standard, the current standard would become an alternate standard. At that time, an additional evaluation would be required to determine whether maintaining the 2012 standard would continue to provide adequate protection to the resource(s) to ensure that any environmental impacts are less than significant.

For each applicable resource, a summary of the alternate standards analysis is provided at the end of the Environmental Effects and Mitigation subsection of Section 3 of the EIS/PTEIR. For example, the alternate standards analysis for Aquatic and Riparian Habitats and Species of Concern is summarized in Section 3.4.3.

ATTACHMENT D - Proposed Alternate Standards to the 2012 CFPRs

(Gray shading indicates rule headings - no alternate standard proposed)

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
Subchapter 1				
Article 1				
895				
895.1. Definitions				
895.1 (Activity Center)	**Activity Center** means a known northern spotted owl site documented from detections, pursuant to the USFWS document "Protocol For Surveying Proposed Management Activities That May Impact Northern Spotted Owls" revised March 17, 1992.	An activity center (AC) is a location pin-pointed on a map where a single owl or pair of owls nests or consistently roosts during the breeding season.	HCP/NCCP - Chapter 10.3.1; TMP - 3.2 Definitions; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
895.1 (Activity Center)(a)	An activity center is established by:			
895.1 (Activity Center)(a)(1)	Resident Single Status is established by:			
895.1 (Activity Center)(a)(1)(A)	The presence or response of a single owl within the same general area on three or more occasions within a breeding season, with no response by an owl of the opposite sex after a complete survey.	MRC utilizes a decision tree (identified in Figure K-4) to determine the location of the Activity Center for a NSO in a given year.	HCP/NCCP - Chapter K.5.4; TMP - 3.2 Definitions; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
895.1 (Activity Center)(a)(1)(B)	Multiple responses over several years (i.e., two responses in year one and one response in year 2, from the same general area).	MRC will establish pair status if: 1) a male and female are heard or observed (either initially or through their movement) in proximity (< ¼ mile apart) to each other on the same visit; 2) the male takes a mouse to the female; 3) the female is observerved on a nest; 4) one or both adults are observed with young. MRC will establish resident single status if: 1) there is a presence or response of a single owl within the same general area on 3 or more occasions within a breeding season, with no response by an owl of the opposite sex after a complete survey; 2) there are multiple responses over several years (e.g., 2 responses in Year-1 and 1 response in Year-2, from the same general area). Northern spotted owl conservation measures.	HCP/NCCP - K.5.2.6.3; TMP - 3.2 Definitions; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
895.1 (Activity Center)(a)(2)	Pair Status Unknown is where the presence or response of two birds of the opposite sex is detected but pair status cannot be determined and where at least one member must meet the resident single requirements.	MRC will establish status unknown if there is a response of a male and/or female which does not meet any of the above (above cell) category definitions.	HCP/NCCP - K.5.2.6.3; TMP - 3.2 Definitions; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
895.1 (Activity Center)(a)(3)	Pair Status wherein a male and female are heard and/or observed (either initially or through their movement) in proximity (less than one-quarter mile apart) to each other on the same visit; or a male takes a mouse to a female; or a female is detected on the nest; or one or both adults are observed with young.	MRC will establish pair status if: 1) a male and female are heard or observed (either initially or through their movement) in proximity (< ¼ mile apart) to each other on the same visit; 2) the male takes a mouse to the female; 3) the female is observerved on a nest; 4) one or both adults are observed with young.	HCP/NCCP - K.5.2.6.3; TMP - 3.2 Definitions; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
895.1 (Activity Center)(a)(4)	Unoccupied Status where no responses have been obtained from a previously identified northern spotted owl activity center after 3 years of survey, barring other evidence to the contrary. An activity center with unoccupied status will not be considered an activity center when it has been evaluated and a determination made by the Director. The determination shall be based upon available information on survey history, habitat conditions within the home range, and changes to habitat that may have occurred since the northern spotted owl site was first identified.	For high and moderate protection territories; maintain a nest-site core area through at least 3 breeding seasons; maintain a roost site core area through at least 3 breeding seasons unless in year 0 a spotted owl is detected 1 time only in the roost site. For territories with limited protection; surround a spotted owl’s most recent activity center with a 500 ft buffer during the breeding season. An owl territory, unoccupied for 3 consecutive years, is considered abandoned.	HCP/NCCP - Chapter 10.3.1.3.2; HCP/NCCP - Chapter 10.3.1.2.2 - Methodology for determining productivity after HCP/NCCP commencement; TMP - 3.2 Definitions; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
895.1 - Active Nest	**Active Nest** means a bird nest site at which breeding efforts have recently occurred as determined by the Department of Fish and Game, as specified below:	Maintain a nest-site core area through at least 3 breeding seasons. For high and moderate protection territories; maintain a nest-site core area through at least 3 breeding seasons. For territories with limited protection; surround a spotted owl’s most recent activity center with a 500 ft buffer during the breeding season.	HCP/NCCP - Chapter 10.3.1.3.2; HCP/NCCP - 10.3.1.3-2 - (northern spotted owl mobile activity centers protection) The HCP/NCCP was developed specifically for MRC's property with the input from federal and state resource agencies. All definitions were developed to meet or exceed the 2012 CFPRs; TMP - 3.2 Definitions; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
895.1 - Bankfull Stage	**Bankfull stage** means the stage that occurs when discharge fills the entire channel cross section without significant inundation of the adjacent floodplain, and has a recurrence interval of 1.5 to 2.0 years.	**Bankfull disharge** Discharge that just fills a stream to its banks. Bankfull discharge occurs approximately every 1 to 2 years and is generally considered to be the primary channel-forming discharge.	HCP/NCCP - Chapter 16; TMP - 3.2 Definitions; TMP - 3.11 Wildlife Protection Practices	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
895.1 - Buffer Zone	**Buffer Zone** means the area of protection surrounding a nest tree in which timber operations must be conducted in accordance with the provisions set forth in these regulations. A buffer zone does not constitute a special treatment area.	The area of protection surrounding a special resource in which timber operations are limited or prohibited.	HCP/NCCP - Chapter 16; TMP - 3.2 Definitions; TMP - 3.11 Wildlife Protection Practices	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
895.1 - Channel Migration Zone	**Channel Migration Zone** means the area where the main channel of a watercourse can reasonably be expected to shift position on its floodplain laterally through avulsion or lateral erosion during the period of time required to grow forest trees from the surrounding area to a mature size, except as modified by a permanent levee or dike. The result may be the loss of beneficial functions of the riparian zone or riparian habitat (see Figure 1).	Current boundaries of bankfull channel along with the portion of the floodplain that is likely to become part of the active channel in the next 50 years.	HCP/NCCP - Chapter 16; TMP - 3.2 Definitions; TMP - 3.11 Wildlife Protection Practices	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
895.1 - Confined Channel	**Confined Channel** means a watercourse with an incised channel that does not shift position on a floodplain, the channel has no contiguous flat, flood prone areas, and the width of the valley floor is less than 2 times the channel width at bankfull stage.	**Confined reaches** Stream or river segments that have relatively constrained, well-defined channels, with narrow flood plains; often in mountainous areas and having a steep gradient.	HCP/NCCP - Chapter 16; TMP - 3.2 Definitions; TMP - 3.11 Wildlife Protection Practices	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
895.1 - Critical Period	**Critical Period** means the time of year when the special timber operations practices set forth in these regulations are required to minimize nesting disturbance to a species of special concern.	For operational purposes and by agreement between MRC and the wildlife agencies, the breeding season for northern spotted owls is February 1–August 31. Conservation measures for breeding season do not apply under the following conditions: 1) northern spotted owls are either non-nesting or absent; 2) completed nesting but no fledglings; 3) fledglings in high or moderate protection areas out of nest for 2 weeks; 4) fledglings in limited protection capable of sustained flight; or 5) disturbance-only operations within 1,000 ft of high or moderate owls after July 31.	HCP/NCCP - 10.3.1.3.1. The HCP/NCCP was developed specifically for MRC's property with the input from federal and state resource agencies. All definitions were developed to meet or exceed the 2011 CFPRs; TMP - 3.2 Definitions; TMP 3.11 Wildlife Protection Practices; TMP 3.11 Take of Northern Spotted Owl	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
895.1 - Equipment Exclusion Zone (EEZ)	**Equipment Exclusion Zone (EEZ)** means the area, as explained in the THP, where heavy equipment associated with timber operations is totally excluded for the protection of water quality, the beneficial uses of water, and/or other forest resources.	The area where heavy equipment associated with timber operations is totally excluded for the protection of water quality, the beneficial uses of water, and/or other forest resources.	HCP/NCCP - Chapter 16; TMP - 3.2 Definitions; TMP - 3.8 Watercourse and Lake Protection; TMP 3.11 Wildlife Protection Practices	3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
895.1 - Functional Foraging Habitat	**Functional Foraging Habitat** is dependent upon the presence and availability of prey on the forest floor or in the canopy; presence of accessible perching limbs; and adjacency to stands with canopy closures >40%. Average stem diameter is usually >6" D.B.H. for hardwoods and >11" D.B.H. for conifers among dominants, and codominants, and the total overhead canopy closure, including intermediate trees is at least 40%. Where overall canopy closure is >80%, foraging habitat is limited to areas with ample flight space below limbs and among stems. Foraging habitat in smaller size classes and lower percentage canopy closures must be justified by local information.	The MRC HCP/NCCP uses the term “foraging habitat.” Table 10-8 shows the 24 MRC structure classes and their assigned spotted owl habitat types. In general, nesting/roosting habitat has trees at least 11 in dbh and more than 40% canopy closure.	HCP/NCCP - 10.3.1.2.3 - (Methodology for defining spotted owl habitat); TMP - 3.2 Definitions; TMP 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
895.1 - Functional Nesting Habitat	**Functional Nesting Habitat** means habitat with a dominant and codominant tree canopy closure of at least 40% and a total canopy (including dominant, codominant, and intermediates) of at least 60%. Usually the stand is distinctly multi-layered with an average stem diameter in dominant, and codominant conifers, and hardwoods >11" D.B.H. The stand usually consists of several tree species (including hardwoods) of mixed sizes. All nests, snags, down logs, and decadent trees shall also be considered as part of the habitat. Nesting substrates are provided by broken tops, cavities, or platforms such as those created by a hawk or squirrel nest, mistletoe broom, or accumulated debris. Owls are known to occasionally nest in less than optimal habitat. Nesting areas may also be associated with characteristics of topographic relief and aspect which alter microclimates.	The MRC HCP/NCCP uses the term “nesting/roosting habitat.” Table 10-8 shows the 24 MRC structure classes and their assigned spotted owl habitat types. In general, nesting/roosting habitat has trees at least 11 in dbh and more than 60% canopy closure.	HCP/NCCP - 10.3.1.2.3 - (Methodology for defining spotted owl habitat); TMP - 3.2 Definitions; TMP 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
895.1 - Functional Roosting Habitat	**Functional Roosting Habitat** during the territorial breeding season, consists of stands where average stem diameter is >11" D.B.H. among dominant and codominant trees. Hardwood and conifers provide an average of at least 40% canopy closure but the stand can have a high degree of variability. Stand size and configuration must be sufficient to provide multiple perch sites which are suitable for protection from various environmental conditions, including wind, heat, and precipitation.	The MRC HCP/NCCP uses the term “nesting/roosting habitat.” Table 10-8 shows the 24 MRC structure classes and their assigned spotted owl habitat types. In general, nesting/roosting habitat has trees at least 11 in dbh and more than 60% canopy closure.	HCP/NCCP - 10.3.1.2.3 - (Methodology for defining spotted owl habitat); TMP - 3.2 Definitions; TMP 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
895.1 - Historic Road	**Historic Road** means an existing road, including associated landings and watercourse crossings, that is not part of the permanent road network and that has not been maintained or proactively abandoned.	**Historic Road** A road built before 1972 that is currently impassable, may not have been actively decommissioned, and for which there are no current or future plans to manage as part of the road system.	HCP/NCCP – Appendix E, E.2.1(#5) - Standards for road classification; TMP - 3.2 Definitions; 3.12 Logging Roads and Landings	3.2 and 4.2 Geology, Soils, and Geomorphology
895.1 - Inner Gorge	**Inner Gorge** means a geomorphic feature formed by coalescing scars originating from landsliding and erosional processes caused by active stream erosion. The feature is identified as that area beginning immediately adjacent to the stream channel below the first break in slope.	**Inner Gorge** A geomorphic feature formed by coalescing scars that originate from landslide and erosion processes caused by active stream erosion. Inner gorge is that area of stream bank immediately adjacent to the stream channel. Its side slope is generally over 65% and occurs below the first break in slope above the active stream channel.	HCP/NCCP - Chapter 16; TMP - 3.2 Definitions; TMP - 3.6 Harvesting and Erosion Control; TMP - 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology, Soils, and Geomorphology
895.1 - Mainline Road	**Mainline road** means roads on non federal lands that are used as the primary route for the transportation of forest products that are fed by arterial (secondary) haul roads.	**Mainline roads** Major arteries for log transportation that are generally used at least 3 out of every 5 years. A mainline road is: a) typically a permanent road but can be seasonal, b) exempt from conservation measures for noise disturbance, and c) mapped in the HCP/NCCP Atlas.	HCP/NCCP – Appendix E, E.2.1 (#6) (Standards for road classification); TMP - 3.2 Definitions; 3.12 Logging Roads and Landings	3.2 and 4.2 Geology, Soils, and Geomorphology

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
895.1 - Northern Spotted Owl Breeding Season	**Northern Spotted Owl Breeding Season** means the period February 1 through July 31 for the Coast Forest District and February 1 through August 31 for the Northern Forest District.	For operational purposes and by agreement between MRC and the wildlife agencies, the breeding season for northern spotted owls is February 1–August 31.	HCP/NCCP - 10.3.1.3.1; TMP - 3.2 Definitions; TMP 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
895.1 - Owl Habitat	**Owl Habitat** means Type A, B, or C owl habitat or those areas with functional foraging habitat, functional nesting habitat, and functional roosting habitat which support the owl's biological needs for breeding, sheltering, and feeding. An area of habitat could have characteristics which support all of the functional needs for nesting, roosting, and foraging or a combination of those functions. Because owls are known to occasionally inhabit less than optimal forest structure, local information can be used to justify the modification of functional habitat definitions.	**Suitable spotted owl habitat** is the forest vegetation with age class, species of trees, structures, sufficient area and adequate food source to meet some or all of the life needs of the northern spotted owl. This excludes areas such as rocky outcrops and pygmy forest.	HCP/NCCP Chapter 16; TMP - 3.2 Definitions; TMP 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
895.1 - Permanent Watercourse Crossing	**Permanent Watercourse Crossing** means a watercourse crossing that will be constructed to accommodate the estimated fifty-year flood flow and will remain in place when timber operations have been completed.	Maintain the current (2012) CFPR standards, plus the increased standards of the 2012 ASP rules. For Watercourse crossing in watersheds with Listed Anadramous Salmonids - Design all new watercourse crossings, such as bridges and culverts which are to remain in place for one or more winter periods (except for vented fords), to a minimum hydraulic capacity in order to safely pass a flow with a return interval of 100 years, including sediment and debris load.	HCP/NCCP, Appendix E, E.2.7 (#1) (Standards for hydrological design); TMP - 3.2 Definitions; 3.12 Logging Roads and Landings	3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
895.1 - Pre-existing Large Wood in Class III watercourses in watersheds with listed anadromous salmonids (a)-(b)	**Pre-existing Large Wood means, for Class III watercourses in watersheds with listed anadromous salmonids: (a)** a log or tree segment that is (i) at least 12 inches or greater in diameter outside bark when measured at the small end, (ii) at least six feet in length, (iii) in contact with the ground, and (iv) present prior to timber operations; **(b)** a root wad that is (i) at least 12 inches or greater in diameter outside bark when measured at the base of the trunk, (ii) in contact with the ground, and (iii) present prior to timber operations.	**Large Woody Debris (LWD)** Any piece(s) of large woody debris (e.g., dead boles, limbs, and large root mass) on the ground in forest stands or in streams. For terrestrial LWD, downed logs or fallen trees greater than 16 in mean diameter and longer than 10 ft. For instream LWD, it is any piece of wood functioning for habitat development or stream channel stability in a watercourse.	HCP/NCCP - Chapter 16; TMP - 3.2 Definitions; TMP - 3.8 Watercourse and Lake Protection	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
895.1 - Seasonal Road	**Seasonal Road** means a road which is planned and constructed as part of a permanent transportation facility where: 1) commercial hauling may be discontinued during the winter period, or 2) the landowner desires continuation of access for fire control, forest management activities, Christmas tree growing, or for occasional or incidental use for harvesting of minor forest products, or similar activities. These roads have a surface adequate for hauling of forest products in the non-winter periods, and in the extended dry periods or hard frozen conditions occurring during the winter period; and have drainage structures, if any, at watercourse crossing which will accommodate the fifty-year flood flow. Some maintenance usually is required.	**Seasonal Road** A road which is planned and constructed as a permanent transportation facility. These roads are ones for which a) commercial hauling is discontinued during the winter period except when the risk of sediment delivery is low, b) landowners may access the road for fire control, forest management, occasional harvesting of minor forest products, and other necessary activities, c) permanent drainage structures are located at watercourse crossings, and d) use is seasonal with moderate intensity.	HCP/NCCP – Appendix E, E.2.1 (#2) (Standards for road classification); TMP - 3.2 Definitions; 3.12 Logging Roads and Landings	3.2 and 4.2 Geology, Soils and Geomorphology; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
895.1 - Temporary Road	**Temporary Road** means a road that is to be used only during the timber operation. These roads have a surface adequate for seasonal logging use and have drainage structures, if any, adequate to carry the anticipated flow of water during the period of use.	**Temporary Road** A road used only during the timber operation. These roads, which are not main haul roads out of a tract, have a) surfaces adequate for seasonal logging, b) drainage structures, if any, which will be removed prior to the winter period or designed to be self-maintaining, and low, sporadic use which periodically can become more intense.	HCP/NCCP – Appendix E, E.2.1 (#3) (Standards for road classification); TMP - 3.2 Definitions; 3.12 Logging Roads and Landings	3.2 and 4.2 Geology, Soils and Geomorphology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
895.1 - Type A Owl Habitat	**Type A Owl Habitat** means timber stands that have as a minimum the following characteristics for live-tree structure:	Not applicable.	MRC's HCP/NCCP does not utilize Type A, B, or C owl habitat; however, MRC covers the required resource with our complete conservation plan for northern spotted owls (HCP/NCCP Chapter 10). As noted above, MRC utilizes definitions for NSO habitat typing developed with the wildlife agencies expertise and input.	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
895.1 - Type B Owl Habitat	**Type B Owl Habitat** means timber stands that have as a minimum the following characteristics for live tree structure.	Not applicable.	MRC's HCP/NCCP does not utilize Type A, B, or C owl habitat; however, MRC covers the required resource with our complete conservation plan for northern spotted owls (HCP/NCCP Chapter 10). As noted above, MRC utilizes definitions for NSO habitat typing developed with the wildlife agencies expertise and input.	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
895.1 - Type C Owl Habitat	**Type C Owl Habitat** means timber stands that have as a minimum the following characteristics for live-tree structure:	Not Applicable.	MRC's HCP/NCCP does not utilize Type A, B, or C owl habitat; however, MRC covers the required resource with our complete conservation plan for northern spotted owls (HCP/NCCP Chapter 10). As noted above, MRC utilizes definitions for NSO habitat typing developed with the wildlife agencies expertise and input.	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
895.1 - Winter Period	**Winter Period** means the period between November 15 to April 1, except as noted under special County Rules at 14 CCR, Article 13 § 925.1, 926.18, 927.1, and 965.5.	**Winter period** is from October 15 - May 1. It is divided into 3 parts: early - from Oct 15 until streamflow responds directly to precipitation, requires at least 4 inches of cumulative rainfall in the rain year; mid - from the end of the early period until March 31, and late - from April 1 to May 1.	HCP/NCCP – Appendix E, E.6.1 (#10)- Standards for general use; TMP - 3.2 Definitions; 3.12 Logging Roads and Landings	3.2 and 4.2 Geology, Soils, and Geomorphology, 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
Article 3	**Silvicultural methods**			
913.1	The following types of regeneration methods are designed to replace a harvestable stand with well spaced growing trees of commercial species. Evenaged management systems shall be applied with the limitations described by this rule:	Maintain the current (2012) CFPR standard. The TMP describes all silvicultural methods used to attain LTSY and MSP. The HCP/NCCP mandates certain conservation measures that retain more conifer stocking than the minimum standards of the 2012 CFPRs.	TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.4 Silvicultural Methods; TMP - Appendix A - Landscape Planning	3.9 and 4.9 Timber Resources
913.1(a)(2)	The regeneration harvest of evenaged management shall be limited to 20 acres for tractor yarding. Aerial or cable yarding may be 30 acres. Tractor yarding may be increased to 30 acres where the EHR is low and the slopes are < 30%. The RPF may propose increasing these acreage limits to a maximum of 40 acres, and the Director may agree where measures contained in the THP provide substantial evidence that the increased acreage limit does any one of the following:	Maintain the current (2012) CFPR standards for use for the Variable Retention Special Presciption.	TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.4 Silvicultural Methods	3.2 and 4.2 Geology, Soils and Geomorphology; 3.3 and 4.3 Hydrology and Water Quality; 3.9 and 4.9 Timber Resources
913.1(a)(2)(A)	by using additional on-site mitigation measures, reduces the overall detrimental effects of erosion thereby providing better protection of soil, water, fish and/or wildlife resources; or	Maintain the current (2012) CFPR standards for use for the Variable Retention Special Presciption.	TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.4 Silvicultural Methods; TMP - 3.7 Watercourse and Lake Protection; TMP - 3.10 Wildlife Protection Practices; TMP - Appendix A - Landscape Planning	3.2 and 4.2 Geology, Soils and Geomorphology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.6 and 4.6 Terrestrial Habitats and Wildlife Species of Concern
913.1(a)(2)(B)	provides for the inclusion of "long corners"; or	Maintain the current (2012) CFPR standards for use for the Variable Retention Special Presciption.	TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Consideration; TMP - 3.4 Silvicultural Methods; TMP - Appendix A - Landscape Planning	3.3 and 4.3 Hydrology and Water Quality; 3.9 and 4.9 Timber Resources
913.1(a)(2)(C)	create a more natural logging unit by taking maximum advantage of the topography; or	Maintain the current (2012) CFPR standards for use for the Variable Retention Special Presciption.	TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Consideration; TMP - 3.4 Silvicultural Methods; TMP - Appendix A - Landscape Planning	3.3 and 4.3 Hydrology and Water Quality; 3.9 and 4.9 Timber Resources
913.1(a)(2)(D)	will increase long-term sustained yield; or	Maintain the current (2012) CFPR standards for use for the Variable Retention Special Presciption.	TMP 1.3 Long Term Sustained Yield; TMP - Appendix A - Landscape Planning	3.3 and 4.3 Hydrology and Water Quality; 3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.1(a)(6)	Special consideration for aesthetic enjoyment shall be given to selection of silvicultural treatments and timber operations within 200 feet of the edge of the traveled surface of any permanent road maintained by the County, or the State.	Visual resources are modeled for selection along state and county roads. HCP/NCCP Conservation Measure C§9.4.3.1-3 “Protect a 15- ft buffer that retains at least 75% of the basal area of conifers in the Type I old-growth stand.” Hendy Woods is considered a Type I stand hence MRC’s adjacent property (along the Philo-Greenwood County Road) would require additional retention. Conservation objective O§9.6.2.2-2, “Conserve 3274 acres of uncommon natural communities by limiting MRC activities within them (136 ac of pygmy forest; 319 ac of Bishop pine; 1084 ac of oak woodlands; 1669 ac of grasslands; 67 acres of salt marsh).” Much of the pygmy forest area is adjacent to the Albion Ridge Road. Also, MRC’s covered lands along Highway 1 in the Rockport tract have much of Cottaneva Creek adjacent to them as well as the Navarro River along Highway 1, both are Class Is and require increased protections. Also, along Highway 128, the density of Level 1 and Level 2 spotted owls increase in proximity to Highway 128, resulting in increase protections (high and moderate conservation measures for spotted owls).	HCP/NCCP - 9.4.3.1; 9.6.2.; 8.2.3.1.1; 10.3.1.3.1TMP - Visual resources are modeled for selection along state and county roads as well as the Skunk Train. HCP/NCCP measures require retention for wildlife purposes as well; TMP - 1.4 Non-Timber Value Considerations for MSP Determination; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations;TMP - 3.5 Silvicultural Methods; TMP - Appendix A - Landscape Planning	3.14 and 4.14 Visual Resources
913.1(a)(7)	Special consideration for aesthetic enjoyment and protection of adjacent stand vigor shall be given to the selection of silvicultural methods and timber operations within 200 feet of adjacent non-federal lands not zoned TPZ.	Maintain the current (2012) CFPR standard.	TMP - Visual resources are modeled for selection along state and county roads as well as the Skunk Train, which includes some non-TPZ lands. TMP - 1.4 Non-Timber Value Considerations for MSP Determination; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Appendix A - Landscape Planning	3.14 and 4.14 Visual Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.1(c)	The seed tree regeneration method involves the removal of a stand in one harvest except for well distributed seed trees of desired species which are left singly or in groups to restock the harvested area. The seed step is utilized to promote natural reproduction from seed and to initiate the establishment of an evenaged stand. The removal step may be utilized to remove the seed trees after a fully stocked stand of reproduction has become established.	TMP - MRC may also employ commercial thinning in dense stands of conifer in the understory of a seed tree removal step in pockets too small to map. These commercially thinned patches will meet the standards of 913.3(a)(1). TMP - 1.5.5 Seed Tree Removal, Alternative Seed Tree Removal.	TMP - 1.5.5 Seed Tree Removal, Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.1(c)(2)	**Seed Tree Removal Step** Not more than 15 predominant trees per acre may be removed in the seed tree removal step. Not more than 50 sq. ft. of basal area of predominant trees per acre may be removed in the seed tree removal step. The seed tree removal step may be utilized when the regeneration present exceeds the minimum stocking requirements set forth in 14 CCR § 912.7(b)(1) . Regeneration shall not be harvested under the seed tree method unless the trees are dead, dying or diseased or substantially damaged during timber operations. The minimum stocking standards of 14 CCR § 912.7(b)(1) shall be met immediately upon completion of operations. The seed tree removal step shall only be used once in the life of the stand unless otherwise agreed to by the Director. If the extent and intensity of the soil and vegetation disturbance caused by the harvest is similar to what would have been caused by a clearcut, the size limitations, separation (spacing) by logical logging unit requirements, and yarding equipment limitations of 14 CCR § 913.1(a) are applicable.	TMP - MRC may also employ commercial thinning in dense stands of conifer in the understory of a seed tree removal step in pockets too small to map. These commercially thinned patches will meet the standards of 913.3(a)(1). TMP - 1.5.5 Seed Tree Removal, Alternative Seed Tree Removal.	TMP - 1.5.5 Seed Tree Removal, Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.2(a)	**Selection** Under the selection regeneration method, the trees are removed individually or in small groups sized from .25 acres to 2.5 acres.	Maintain the current (2012) CFPR standards.	TMP - 1.5.1 Selection, Group Selection and Alternative Group Selection; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.2(a)(1)	Trees to be harvested or trees to be retained shall be marked by or under the supervision of the RPF prior to felling operations. When openings greater than .25 acres will be created, the boundaries of the small group(s) may be designated in lieu of marking individual trees within the small group areas. A sample area must be marked prior to a preharvest inspection for evaluation. The sample area shall include at least 10% of the harvest area up to a maximum of 20 acres per stand type which is representative of the range of conditions present in the area.	Maintain the current (2012) CFPR standard.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.1 Selection, Group Selection and Alternative Group Selection; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.2(a)(2)	Post harvest stand stocking levels shall be stated in the THP. The level of residual stocking shall be consistent with maximum sustained production of high quality timber products. In no case shall stocking be reduced below the following standards:	Maintain the current (2012) CFPR standard.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.1 Selection, Group Selection and Alternative Group Selection; TMP - 1.3 Long Term Sustained Yield TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.2(a)(2)(A)	Selection System.	Maintain the current (2012) CFPR standard.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.1 Selection, Group Selection and Alternative Group Selection; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.2(a)(2)(A)(1)	On Site I lands at least 125 square feet per acre of basal area shall be retained.	Maintain the current (2012) CFPR standard.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.1 Selection, Group Selection and Alternative Group Selection; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.2(a)(2)(A)(2)	On Site II and III lands at least 75 square feet per acre of basal area shall be retained.	Maintain the current (2012) CFPR standard.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.1 Selection, Group Selection and Alternative Group Selection; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.2(a)(2)(A)(3)	On Site IV and V lands at least 50 square feet per acre of basal area shall be retained.	Maintain the current (2012) CFPR standard.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.1 Selection, Group Selection and Alternative Group Selection; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.2(a)(2)(A)(4)	Unless the plan submitter demonstrates how the proposed harvest will achieve MSP pursuant to 14 CCR § 913.11 (a) or (b), the residual stand shall contain sufficient trees to meet at least the basal area, size, and phenotypic quality of tree requirement specified under the seed tree method.	Maintain the current (2012) CFPR standard.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.1 Selection, Group Selection and Alternative Group Selection; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning; The TMP acts as an SYP (The TMP provides MSP information similar to Option's A or B)	3.9 and 4.9 Timber Resources
913.2(a)(2)(B)	Group Selection.	Maintain the current (2012) CFPR standard.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.1 Selection, Group Selection and Alternative Group Selection; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.2(a)(2)(B)(1)	At least 80% of the stocked plots must meet the Basal Area stocking standards of 14 CCR § 913.2(a)(2)(A)	Note, due to HCP/NCCP constraints, often stands will receive treatment resulting in greater retention than the post harvest stocking described here. The post harvest stocking standard will have a required minimum basal area of conifer, per acre in the areas outside the groups and no more than 20% of the stand will be in group openings, unless Alternative Group Selection is applied.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.1 Selection, Group Selection and Alternative Group Selection; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.2(a)(2)(B)(2)	Not more than 20% of the stocked plots may meet stocking standards utilizing the 300 point count standard with trees that are at least 10 (ten) years old.	The post harvest stocking standard will have a required minimum basal area of conifer, per acre in the areas outside the groups and no more than 20% of the stand will be in group openings, unless Alternative Group Selection is applied.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.1 Selection, Group Selection and Alternative Group Selection; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.2(a)(2)(B)(3)	An RPF or supervised designee may offset up to 8 plots per 40 plots where those plot centers are initially placed within small group clearings created during the current harvest. Unless substantially damaged by fire, the RPF or supervised designee shall not exclude small group clearings created by previous timber harvesting from the stocking survey.	Maintain the current (2012) CFPR standard.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.1 Selection, Group Selection and Alternative Group Selection; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.2(a)(2)(B)(4)	Unless the plan submitter demonstrates how the proposed harvest will achieve MSP pursuant to 14 CCR § 913.11 [933.11, 953.11] (a) or (b), the residual stand shall contain sufficient trees to meet at least the basal area, size, and phenotypic quality of tree requirements specified under the seed tree method.	Maintain the current (2012) CFPR standard.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.1 Selection, Group Selection and Alternative Group Selection; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning; The TMP acts as an SYP (the TMP provides MSP information similar to Options A or B)	3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.2(a)(3)	Within any THP, small group clearings under the selection method shall be separated by a logical logging area.	Maintain the current (2012) CFPR standard.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.1 Selection, Group Selection and Alternative Group Selection; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.2(a)(4)	Following completion of timber operations (including site preparation) not more than 20 percent of the THP area harvested by this method shall be covered by small group clearings.	Maintain the current (2012) CFPR standard. The post harvest stocking standard will have a required minimum basal area of conifer, per acre in the areas outside the groups and no more than 20% of the stand will be in group openings, unless Alternative Group Selection is applied.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.1 Selection, Group Selection and Alternative Group Selection; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods	3.9 and 4.9 Timber Resources
913.2(a)(5)	Exceptions to stocking standards in 14 CCR § 913.2(a)(2), [933.2(a)(2), 953.2(a)(2)] above may be granted only when proposed by the RPF and explained and justified in the plan, but in no case will the exceptions be less than specified in 14 CCR § 912.7 (b)(2), [932.7(b)(2), 952.7(b)(2)]. Exceptions may only be granted when the RPF clearly demonstrates that the existing stand will grow substantially less than both the potential site productive capacity and the proposed post harvest stand.	Maintain the current (2012) CFPR standard.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.1 Selection, Group Selection and Alternative Group Selection; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.2(b)	**Transition.** The transition method may be used to develop an unevenaged stand from a stand that currently has an unbalanced irregular or evenaged structure. The transition method involves the removal of trees individually or in small groups from irregular or evenaged stands to create a balanced stand structure and to obtain natural reproduction.	TMP describes all methods used and ability to attain MSP. The Alternative Transition silviculture is initiated if the average conifer basal area stocking is between 60 and 105 square feet per acre and harvesting of hardwoods will result in greater than 20% of the stand in group clearings.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.2 Transition and Alternative Transition; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.2(b)(1)	Area for determination of preharvest seed tree retention levels shall be no greater than 20 acres in size.	MRC uses its designated forest stands as the area for determination of seed tree retention levels. MRC's mean stand size is approximately 20 acres, but stands vary from that size based on logical harvest units and mapping out units of similar vegetation types. See TMP, Appendix A, Item 1-A, Stand Delineation for a description of how MRC delineates its stand boundaries.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.2 Transition and Alternative Transition; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning ; TMP - Attachment A, Item 1-A, Stand Delineation for a description of how MRC delineates its stand boundaries	3.9 and 4.9 Timber Resources
913.2(b)(2)	This method is to be used to increase stocking and improve the balance of age classes so as to allow the residual stand to be managed by the selection regeneration method. This method shall not be used more than two times for a stand. The RPF shall delineate areas previously treated by the transition method on the plan map.	Maintain the current (2012) CFPR standard.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.2 Transition and Alternative Transition; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.2(b)(3)	Stands suitable for the transition method contain adequate quantity and quality of seed producing trees to provide adequate regeneration for new age classes. Stands suitable for this method shall have no more than 50 sq. ft. of basal area greater than the selection basal area standards.	Maintain the current (2012) CFPR standard.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.2 Transition and Alternative Transition; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.2(b)(4)	Trees to be harvested or trees to be retained shall be marked by or under the supervision of a RPF before felling operations. A sample area must be marked before the preharvest inspection for evaluation. The sample area shall include at least 10% of the harvest area up to a maximum of 20 acres per stand type which is representative of the range of conditions present.	Maintain the current (2012) CFPR standard.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.2 Transition and Alternative Transition; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.2(b)(5)	Immediately following the completion of timber operations, the minimum basal area standards in 14 CCR § 912.7(b)(2) shall be met.	Maintain the current (2012) CFPR standard.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.2 Transition and Alternative Transition; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.2(b)(6)	**[Coast only]** The post-harvest residual stand shall contain at least 15 square feet of basal area per acre of seed trees at least 12 inches dbh or greater for timber sites I, II or III; or 12 square feet of basal area per acre of seed trees 12 inches dbh or greater for timber sites IV or V., except for timber sites I with Coast Redwood. For timber sites I with Coast Redwood, the post-harvest residual stand shall contain sufficient seed trees to meet at least the basal area, size and phenotypic quality of the leave tree requirements specified under the seed tree method (14 CCR § 913.1(c)(1)(A)). Unless obviously stocked, these basal area requirements will be determined from sampling averaged across each harvested area required in 14 CCR § 913.2(b)(1). Unless the plan submitter demonstrates how the proposed harvest will achieve MSP pursuant to 14 CCR § 913.11(a) or (b), where present in the preharvest stand, disease free, undamaged seed trees 18 inches dbh or greater shall be retained post harvest until the stand exceeds the minimum seed tree requirements of 14 CCR § 913.1(c)(1)(A). The seed trees shall be full crown, capable of seed production and representative of the best phenotypes available in the pre-harvest stand.	TMP - Large trees (> 16 inches dbh) will be retained at approximately 10 square feet per acre, averaged across the stand. The general goal in retaining large trees is to select for trees that have full crowns, are capable of seed production, and represent the best phenotypes in the stand. Exceptions to this goal include retention of trees for wildlife and/or structural purposes. These trees may not have full crowns, may not be capable of seed production, and may not represent the best phenotypes in the stand.	TMP modeling and silviculture descriptions utilized this standard; TMP - 1.5.2 Transition and Alternative Transition; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.2(b)(7)	Following completion of timber operations (including site preparation) not more than 20 percent of the Plan area harvested by this method shall be occupied by small group clearings.	The Alternative Transition silviculture is initiated if the average conifer basal area stocking is between 60 and 105 square feet per acre and harvesting of hardwoods will result in greater than 20% of the stand in group clearings.	TMP - 1.5.2 Transition and Alternative Transition; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.2(b)(8)	The Plan Submitter must provide the Director sufficient information such as growth and stand description to demonstrate that the standards of the selection regeneration method will be met by the third and subsequent entries of Plan areas harvested by the transition method.	Maintain the current (2012) CFPR standard.	TMP - 1.5.2 Transition and Alternative Transition; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning.	3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.3(b)	**Sanitation-Salvage.** Sanitation is the removal of insect attacked or diseased trees in order to maintain or improve the health of the stand. Salvage is the removal of only those trees which are dead, dying, or deteriorating, because of damage from fire, wind, insects, disease, flood, or other injurious agent. Salvage provides for the economic recovery of trees prior to a total loss of their wood product value. Sanitation and salvage may be combined into a single operation. The following requirements apply to the use of the sanitation-salvage treatment:	Maintain the current (2012) CFPR standard.	HCP/NCCP C§9.2.3.1-3; HCP/NCCP C§9.2.3.1-4; HCP/NCCP C§10.3.3.3-7; HCP/NCCP Section 14.3.7 MRC Response to fire describes how MRC's conservation measures will be adapted in areas impacted by fires of differing sizes; including increase the number of snags to be retained. HCP/NCCP Section 14.5.2 describes how MRC's conservation measures will be adapted in areas with heavy windthrow damage. HCP/NCCP Section 14.9.2 describes how MRC's conservation measures will be adapted in areas with pathogen and pests. Harvesting dead, dying and diseased trees are restricted through conservation measures of the HCP/NCCP, and provide for equal or greater protection to the resources; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - 3.8 Watercourse and Lake Protection; TMP - Wildlife Protection Practices; TMP - Attachment A - Landscape Planning.	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern, 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern; 3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.3(b)(1)	The RPF shall estimate in the THP the expected level of stocking to be retained upon completion of operations.	Maintain the current (2012) CFPR standard.	HCP/NCCP - Conservation Chapters (8-11) and Chapter 14 - Changed Circumstances - HCP/NCCP HCP/NCCP C§9.2.3.1-3; HCP/NCCP C§9.2.3.1-4; HCP/NCCP C§10.3.3.3-7; HCP/NCCP Section 14.3.7 MRC Response to fire describes how MRC's conservation measures will be adapted in areas impacted by fires of differing sizes; including increase the number of snags to be retained. HCP/NCCP Section 14.5.2 describes how MRC's conservation measures will be adapted in areas with heavy windthrow damage. HCP/NCCP Section 14.9.2 describes how MRC's conservation measures will be adapted in areas with pathogen and pests Harvesting dead, dying and diseased trees are restricted through conservation measures of the HCP/NCCP, and provide for equal or greater protection to the resources; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - 3.8 Watercourse and Lake Protection; TMP - Wildlife Protection Practices; TMP - Attachment A - Landscape Planning.	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern, 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern; 3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.3(b)(2)	Immediately upon completion of operations, the area shall meet the stocking standards of 14 CCR 912.7(b) unless explained and justified in the plan. If stocking is to be met immediately following completion of operations, a report of stocking shall be filed within 6 months of completion. If this standard cannot be met, the area must be planted during the first planting season following completion of operations and the minimum stocking standards of 14 CCR 912.7(b)(1) must be met within 5 years following completion of operations.	Maintain the current (2012) CFPR standard.	HCP/NCCP - Conservation Chapters (8-11) and Chapter 14 - Changed Circumstances - Harvesting dead, dying and diseased trees are restricted through conservation measures of the HCP/NCCP, and provide for equal or greater protection to the resources; HCP/NCCP C§9.2.3.1-3; HCP/NCCP C§9.2.3.1-4; HCP/NCCP C§10.3.3.3-7;HCP/NCCP Section 14.3.7 MRC Response to fire describes how MRC's conservation measures will be adapted in areas impacted by fires of differing sizes; including increase the number of snags to be retained. HCP/NCCP Section 14.5.2 describes how MRC's conservation measures will be adapted in areas with heavy windthrow damage. HCP/NCCP Section 14.9.2 describes how MRC's conservation measures will be adapted in areas with pathogen and pests TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - 3.8 Watercourse and Lake Protection; TMP - Wildlife Protection Practices; TMP - Attachment A - Landscape Planning.	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern, 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern; 3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.3(b)(3)	Trees to be harvested or trees to be retained shall be marked by or under the supervision of an RPF prior to felling operations. When openings greater than 0.25 acres will be created, the boundaries of the small group(s) may be designated in lieu of marking individual trees within the small group areas. A sample area must be marked prior to a preharvest inspection for evaluation. The sample area shall include at least 10% of the area, up to a maximum of 20 acres per stand type, whichever is less, which is representative of the range of conditions present in the area. The Director may waive the marking requirement for the remainder of the THP area when explained and justified in the THP.	Maintain the current (2012) CFPR standard.	HCP/NCCP - Conservation Chapters (8-11) and Chapter 14 - Changed Circumstances - Harvesting dead, dying and diseased trees are restricted through conservation measures of the HCP/NCCP, and provide for equal or greater protection to the resources; HCP/NCCP C§9.2.3.1-3; HCP/NCCP C§9.2.3.1-4; HCP/NCCP C§10.3.3.3-7;HCP/NCCP Section 14.3.7 MRC Response to fire describes how MRC's conservation measures will be adapted in areas impacted by fires of differing sizes; including increase the number of snags to be retained. HCP/NCCP Section 14.5.2 describes how MRC's conservation measures will be adapted in areas with heavy windthrow damage. HCP/NCCP Section 14.9.2 describes how MRC's conservation measures will be adapted in areas with pathogen and pests TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - 3.8 Watercourse and Lake Protection; TMP - Wildlife Protection Practices; TMP - Attachment A - Landscape Planning.	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern, 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern; 3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.4	**Special Prescriptions -** The following special harvesting methods are appropriate under certain conditions:			
913.4(a)	**Special Treatment Area Prescriptions**. Special consideration in Special Treatment Areas shall be given to selection of a regeneration method or intermediate treatment compatible with the objectives for which the special area was established. Such areas shall be identified in the plan. To assure the integrity of legally designated historical and archaeological sites and legally designated ecological reserves, and that the objectives of the special treatment areas are met, the RPF and the Director may agree, after on-the-ground inspection, if requested by either party, on specific silvicultural and logging practices to protect such areas. The Director shall notify affected agencies or groups with expertise in the resource involved in the special treatment area of any such areas located during the THP review process.	Alternative for specifically noted STAs within the HCP/NCCP, otherwise accept changes: (1) MRC will place a 150-ft vegetative buffer around its border with the Type 1 Old growth in Hendy Woods State Park. The silviculture will follow the buffer prescription for Type I old growth stands (HCP/NCCP C§9.4.3.1-3). This is the only old-growth grove known to be directly adjacent to covered lands. The intent of this action is to provide additional protections for potential murrelet habitat. (2) MRC old growth conservation measures; (HCP/NCCP Sections 9.4.3.1; 9.4.3.2; and 9.4.3.3); (3) MRC northern spotted owl conservation measures, (HCP/NCCP Section 10.3.1.3.1); (4) Conservation measures for occupied murrelet stands, (HCP/NCCP Section 10.3.2.3.1 and 10.3.2.3.10); (5) Conservation measures for PAMB, (HCP/NCCP Section 10.3.3.3); (6) Road upgrade and controllable erosion repairs, (HCP/NCCP Section 8.3.3.2.1); (7) Cons. meas. for red-legged frog, (HCP/NCCP Section 10.2.2.3); (8) Cons. meas. for tailed frog, (HCP/NCCP Section 10.2.3.3); (9) Cons. meas. for LACMA, (HCP/NCCP Section 10.3.2.3.1); (10) Cons. meas. for rare plants, (HCP/NCCP Section 11.6 and 11.7); (11) Cons. meas. for natural communities (HCP/NCCP Section 9.6.1.3 and 9.6.2.3).	TMP - Hendy Woods State Park buffer for murrelet habitat (HCP/NCCP C§9.4.3.1-3), MRC old growth stands (HCP/NCCP C§9.4.3.1; HCP/NCCP C§9.4.3.2; and HCP/NCCP C§9.4.3.3), HCP/NCCP - MRC northern spotted owl conservation measures (HCP/NCCP C§10.3.1.3.1), marbled murrelet occupied protections (HCP/NCCP C§10.3.2.3.1 and HCP/NCCP C§10.3.2.3.10), PAMB protections (HCP/NCCP C§10.3.3.3), coho salmon core areas (HCP/NCCP C§8.3.2-5), red-legged frog (HCP/NCCP C§10.2.2.3) and TLF breeding habitat (HCP/NCCP C§10.2.3.3), LACMA (HCP/NCCP C§10.3.2.3.1), rare plants (HCP/NCCP C§11.6), natural communities (HCP/NCCP C§9.6.1.3 and 9.6.2.3); TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - 3.8 Watercourse and Lake Protection; TMP - Wildlife Protection Practices; TMP - Attachment A - Landscape Planning.	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.5 and 4.5 Vegetation and Plant Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern, 3.14 and 4.14 Visual Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.4(b)	**Rehabilitation of Understocked Area Prescription**. For the purposes of restoring and enhancing the productivity of commercial timberlands which do not meet the stocking standards defined in 14 CCR 912.7 [932.7, 952.7] prior to any timber operations on such lands, an area may be harvested provided it is restocked in accordance with Subsections (l) or (2). To facilitate restocking, a regeneration plan must be included in the THP. The regeneration plan shall include site preparation, method of regeneration, and other information appropriate to evaluate the plan.	Maintain the current (2012) CFPR standards.	TMP - 1.5.3 Rehabilitation; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern; 3.9 and 4.9 Timber Resources
913.4(b)(1)	If the area meets the standards of 14 CCR 912.7 within five years of completion of timber operations, the area shall be considered acceptably stocked, or shall be considered acceptably stocked if it contains at least 10 planted countable trees for each tree harvested on sites I, II, and III, and 5 planted countable trees for each tree harvested on site IV and V.	Maintain the current (2012) CFPR standard.	TMP - 1.5.3 Rehabilitation; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(b)(2)	On understocked timberlands where no countable conifer trees are to be harvested and the broadleaf species are not designated for management, the area shall be planted to equal or exceed the stocking standards of 14 CCR 912.7(b)(1) and shall be considered acceptably stocked if within five years of completion of timber operations it contains at least an average point count of 150 of Group A species on all site classifications.	Maintain the current (2012) CFPR standard	TMP - 1.5.3 Rehabilitation; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.4(d)	**Variable Retention.** Variable retention is an approach to harvesting based on the retention of structural elements or biological legacies (trees, snags, logs, etc.) from the pre-harvest stand for integration into the post-harvest stand to achieve various ecological, social and geomorphic objectives. The major variables in the variable retention harvest system are retention types, densities, and spatial arrangement of retained structures; aggregated retention is the retention of structures or biological legacies as intact forest patches within the harvest unit; dispersed retention is the retention of structures or biological legacies in a dispersed or uniform pattern. Retained trees may be intended to become part of future stands managed by the Selection regeneration method. Retained trees are often designated as decadent tree or snag recruitment hence not ever intended for harvest. Regeneration after harvest outside of aggregated retention patches may be obtained by direct seeding, planting, sprouting, or by natural seedfall.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(d)(1)	In the plan, the RPF shall describe in sufficient detail to provide for review and evaluation: the trees and elements retained, the objectives intended to be achieved by retention, the distribution and quantity of retained trees, the intended time period of retention, and any potential future conditions or events the RPF believes would allow harvest of retained trees. The RPF may explain and justify, and the Director may approve a plan which indicates up to 50% of retained trees are intended for harvest during future Intermediate Treatments of the regenerated portion of the harvest area where such harvest(s) are consistent with stated Variable Retention objectives.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern; 3.9 and 4.9 Timber Resources

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913.4(d)(2)	The retention standards for Dispersed Retention shall be measured in average basal area per acre. Where retention is aggregated in groups (greater than or equal to one-tenth acre), percentage of harvest unit area shall be the standard. Sum of all areas within groups divided by harvest unit acres will be used to determine percentage of aggregated retention in the harvest unit. Area and trees located within any standard width WLPZ will be excluded from calculating retention.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern; 3.9 and 4.9 Timber Resources
913.4(d)(3)	The following retention standards shall be met:			
913.4(d)(3)(A)	Minimum dispersed Variable Retention standard is 20 percent of the Resource Conservation Standards basal area levels stated in 14 CCR § 912.7, 10 percent of harvest area in aggregated retention or combinations thereof. Variable Retention harvests at the minimum retention level shall be limited to 30 acres.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern; 3.9 and 4.9 Timber Resources
913.4(d)(3)(B)	Table 1 shall be used for Determining the Maximum Size Harvest Area for Variable Retention. For areas with a combination of dispersed and aggregated retention types for determination of permissible unit size, the percentage of basal area in dispersed retention portions of the combination area may be reduced proportionately to the area in aggregated retention indicated in Table 1.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(d)(3)(C)	Aggregated retention areas that conform to the definition of Late Succession Forest Stands under 14 CCR § 895.1, with the exception of the minimum 20 acre threshold size, may be counted as contributing 1.5 times the acres they actually occupy toward providing retention.	Maintain the current (2012) CFPR standard. Utilize conservation measures in the HCP/NCCP and extra stocking in the TMP to meet or exceed this rule.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(d)(3)(D)	Retention trees classified as Dunning's Class 3, 4, 5, or 7 which exceed the size standards of 14 CCR § 912.7 [932.7, 952.7] may be counted as contributing 1.5 times their actual basal area toward providing retention.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources

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913.4(d)(3)(E)	Retention standards shall be met on each 20-acre maximum area(s) within each harvest unit. Retention standards may be met by either dispersed, aggregated or a combination of the two types of retention.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(d)(3)(F)	Unless explained and justified by the RPF in the plan, and approved by the Director, no point within the harvest area where retention standards are met by dispersed retention shall be more than 300 feet from a retention tree.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(d)(3)(G)	With the exception of 14 CCR § 913.4 [933.4, 953.4] (d)(3)(J) below, the average height of dispersed retention trees shall be at least the average height of dominants and codominants of like species in the pre-harvest stand.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(d)(3)(H)	For areas where the plan relies on natural seedfall to obtain regeneration, dispersed retention trees shall meet the standards of 14 CCR § 913.1(c)(1). Where retention is aggregated, retained aggregates shall meet the standards of Commercial Thinning required under 14 CCR § 913.3 (a) including (a)(1)(A) or (a)(1)(B).	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(d)(3)(I)	Where specific WHR habitat elements are insufficient to provide functional wildlife habitat, the RPF may explain and justify and the Director may approve alternatives to the standards of subsections 14 CCR § 913.4(d)(3)(G) and (H).	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern; 3.9 and 4.9 Timber Resources
913.4(d)(3)(J)	Decadent and Deformed Trees of Value to Wildlife, and Snags which meet the standards of 14 CCR § 912.7(b)(3)(A,B or C) and 14 CCR § 912.7(c) may be counted to meet up to 15 square feet of basal area per acre of retention in excess of the minimum variable retention standards (ref. 14 CCR § 913.4 (d)(3)(A)).	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern; 3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.4(d)(3)(K)	Trees shall be retained for at least 50 years unless a shorter period of time is described in the plan, explained and justified by the RPF, and approved by the Director.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(d)(4)	Retention standards shall be met immediately after harvest and if retention trees are to be used to meet stocking, at the time the stocking report is approved.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(d)(5)	The stocking standards of 14 CCR § 912.7 [932.7, 952.7](b)(1) shall be met within five years following completion of operations.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(d)(6)	Retention trees shall be protected to the extent feasible during timber operations consistent with 14 CCR §§ 914.1; 914.2(e); 914.3; 915.2; 915.3 and 917.7.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(d)(7)	The plan shall indicate the estimated average pre-harvest and post-harvest basal area by species and diameter class. Diameter class designations shall be grouped in no greater than 6" classes.	Maintain the current (2012) CFPR standard.	HCP/NCCP - Conservation Chapters (8-11); TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.4(d)(8)	Where retention is aggregated in groups, the RPF shall provide in the plan a general description of group locations and/or a map showing the approximate location of the groups. This information shall be provided for each logging unit.	Maintain the current (2012) CFPR standard.	HCP/NCCP - Conservation Chapters (8-11); HCP/NCCP - Sections 8.2.3.1.2 - 8.2.3.1.10; 8.2.3.2.2 - 8.2.3.2.5; 8.2.3.3.2 - 8.2.3.3.4; 8.3.3.1.2; 8.3.3.1.3; 9.2.3.1; 9.3.3.1; 9.4.3.1; 9.4.3.2; 9.4.3.3; 10.3.1.3.1; and 10.3.2.3.1; Note – these are conservation measures that may result in greater basal area retention than what is required under current CFPRs and will direct in some cases where groups can occur. TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(d)(9)	All trees to be harvested or all retention trees shall be marked by, or under the supervision of, an RPF prior to felling operations. Where timber harvesting does not occur within retained aggregates, the boundaries of retained aggregates may be designated in lieu of marking individual trees within retained aggregates. A sample area must be marked prior to a pre-harvest inspection for evaluation. The sample area shall include at least 10% of the harvest area for each stand type represented in the range of conditions present in the area. Where necessary to evaluate the proposed retention, the Director may require additional marking before plan approval.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.4(d)(10)	To facilitate restocking, a regeneration plan must be included in the plan. The regeneration plan shall include site preparation, method of regeneration, and other information appropriate to evaluate the plan. Site preparation activities shall be designed to protect retention elements and maintain ground cover to the extent practicable while at the same time result in seedling establishment on the site and encourage long-term site occupancy of the regenerated trees.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(d)(11)	Another Variable Retention harvest may not be applied to the Variable Retention harvest area for at least 50 years for Class I, 60 years for Class II or III, or 80 years for Class IV and V site class lands after acceptance by the Director of the completion report except as specified in: (i) a THP that has been approved pursuant to 14 CCR § 913.11 (a), (ii) an SYP, (iii) a TMP or, (iv) an NTMP).	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(d)(12)	Within ownership boundaries, no logical logging unit contiguous to a previously harvested Variable Retention harvest area may be harvested by a Variable Retention method unless the previously harvested Variable Retention unit has an approved report of stocking and the dominant and codominant trees, not counting retention trees, average at least five years of age or average at least five feet tall and three years of age from the time of establishment on the site either by the planting or by natural regeneration. If these standards are to be met with trees that were present at the time of the harvest, there shall be an interval of not less than five years following the completion of operations before adjacent Variable Retention management may occur.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.4(d)(13)	A Regeneration Method Used in Evenaged Management, other than Shelterwood Preparatory Step, may not be applied to the Variable Retention harvest area for at least 50 years for Class I, 60 years for Class II or III, or 80 years for Class IV and V site class lands after acceptance by the Director of the completion report.	Maintain the current (2012) CFPR standard.	HCP/NCCP - Conservation Chapters (8-11); HCP/NCCP Sections 2.3.1.2 - 8.2.3.1.10; 8.2.3.2.2 - 8.2.3.2.5; 8.2.3.3.2 - 8.2.3.3.4; 8.3.3.1.2; 8.3.3.1.3; 9.2.3.1; 9.3.3.1; 9.4.3.1; 9.4.3.2; 9.4.3.3; 10.3.1.3.1; and 10.3.2.3.1; Note – these are conservation measures that may result in longer return intervals for any even-aged management steps than what is required under current CFPRs. TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(d)(14)	Within an ownership, at least 10 years must pass after a Variable Retention harvest that exceeds the size standards of 14 CCR § 913.1 (a)(2) before a Regeneration Method Used in Evenaged Management, other than Shelterwood Preparatory Step, may occur in an adjacent logical harvest area.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(d)(15)	Within an ownership, the separation requirements and adjacency limitations of 14 CCR § 913.1(a)(3, 6 and 7) shall apply equally to Variable Retention harvest areas and evenaged regeneration units.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.4(d)(16)	Alternative Prescriptions proposed under 14 CCR § 913.6 may not reference Variable Retention as the most nearly feasible method (ref. 14 CCR § 913.6 (b)(3 and 4)). Alternative Prescriptions which approach but do not fully meet the minimum standards of Variable Retention shall be considered Alternatives to a Regeneration Method Used in Evenaged Management.	Maintain the current (2012) CFPR standard.	TMP - 1.5.4 Restoration Variable Retention; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.6	**All Inclusive - Alternative Prescriptions**			
913.6(a)	An alternative prescription shall be included in a THP when, in the judgment of the RPF, an alternative regeneration method or intermediate treatment offers a more effective or more feasible way of achieving the objectives of Section 913 [933, 953] than any of the standard silvicultural methods provided in this Article.	Maintain the current (2012) CFPR standard. ALSO - TMP specifically lists which Alternative Prescriptions are allowed.	TMP - 1.5.1 Alternative Group Selection; TMP - 1.5.2 Alternative Transition; TMP - 1.5.5 Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.6(b)	An alternative prescription, as defined in 14 CCR 895.1, shall normally contain at least the following information:			
913.6(b)(1)	A description of the stand before timber operations, including:	Maintain the current (2012) CFPR standard. ALSO - TMP specifically lists which Alternative Prescriptions are allowed.	TMP - 1.5.1 Alternative Group Selection; TMP - 1.5.2 Alternative Transition; TMP - 1.5.5 Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.6(b)(1)(A)	The RPF's professional judgment of the species composition of the stand before harvest.	Maintain the current (2012) CFPR standard. ALSO - TMP specifically lists which Alternative Prescriptions are allowed.	TMP - 1.5.1 Alternative Group Selection; TMP - 1.5.2 Alternative Transition; TMP - 1.5.5 Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.6(b)(1)(B)	The RPF's professional judgment of the current stocking on the area expressed in basal area or a combination of basal area and point count.	Maintain the current (2012) CFPR standard. ALSO - TMP specifically lists which Alternative Prescriptions are allowed.	TMP - 1.5.1 Alternative Group Selection; TMP - 1.5.2 Alternative Transition; TMP - 1.5.5 Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.6(b)(1)(C)	The RPF's estimate of the basal area per acre to be removed from the stand during harvest.	Maintain the current (2012) CFPR standard. ALSO - TMP specifically lists which Alternative Prescriptions are allowed.	TMP - 1.5.1 Alternative Group Selection; TMP - 1.5.2 Alternative Transition; TMP - 1.5.5 Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.6(b)(2)	A description of stand management constraints such as animal, insect, disease, or other natural damage, competing vegetation, harsh site conditions, or other problems which may affect stand management.	Maintain the current (2012) CFPR standard. ALSO - TMP specifically lists which Alternative Prescriptions are allowed.	TMP - 1.5.1 Alternative Group Selection; TMP - 1.5.2 Alternative Transition; TMP - 1.5.5 Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.6(b)(3)	A statement of which silvicultural method in the current District rules is most nearly appropriate or feasible and an explanation of why it is not appropriate or feasible.	Maintain the current (2012) CFPR standard. ALSO - TMP specifically lists which Alternative Prescriptions are allowed.	TMP - 1.5.1 Alternative Group Selection; TMP - 1.5.2 Alternative Transition; TMP - 1.5.5 Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.6(b)(4)	An explanation of how the proposed alternative prescription will differ from the most nearly feasible method in terms of securing regeneration; protection of soil, water quality, wildlife habitat, and visual appearance; and in terms of fire, insect and disease protection.	Maintain the current (2012) CFPR standard. ALSO - TMP specifically lists which Alternative Prescriptions are allowed.	TMP - 1.5.1 Alternative Group Selection; TMP - 1.5.2 Alternative Transition; TMP - 1.5.5 Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.2 and 4.2 Geology, Soils, and Geomorphology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.5 and 4.5 Vegetation and Plant Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern; 3.9 and 4.9 Timber Resources; 3.14 and 4.14 Visual Resources
913.6(b)(5)	A description of the stand expected after completion of timber operations, including the following:	Maintain the current (2012) CFPR standard. ALSO - TMP specifically lists which Alternative Prescriptions are allowed.	TMP - 1.5.1 Alternative Group Selection; TMP - 1.5.2 Alternative Transition; TMP - 1.5.5 Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.6(b)(5)(A)	The management objective under which the post-harvest stand is to be managed (evenaged, unevenaged, or neither);	Maintain the current (2012) CFPR standard. ALSO - TMP specifically lists which Alternative Prescriptions are allowed.	TMP - 1.5.1 Alternative Group Selection; TMP - 1.5.2 Alternative Transition; TMP - 1.5.5 Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.6(b)(5)(B)	The desired tree species composition of the post-harvest stand and the RPF's judgment as to the remaining stocking after harvest expressed as basal area or a combination of basal area and point count.	Maintain the current (2012) CFPR standard. ALSO - TMP specifically lists which Alternative Prescriptions are allowed.	TMP - 1.5.1 Alternative Group Selection; TMP - 1.5.2 Alternative Transition; TMP - 1.5.5 Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.6(b)(6)	The treatment of the stand to be used in harvesting including:	Maintain the current (2012) CFPR standard. ALSO - TMP specifically lists which Alternative Prescriptions are allowed.	TMP - 1.5.1 Alternative Group Selection; TMP - 1.5.2 Alternative Transition; TMP - 1.5.5 Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.6(b)(6)(A)	The guidelines to be used in determining which trees are to be harvested or left;	Maintain the current (2012) CFPR standard. ALSO - TMP specifically lists which Alternative Prescriptions are allowed.	TMP - 1.5.1 Alternative Group Selection; TMP - 1.5.2 Alternative Transition; TMP - 1.5.5 Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.6(b)(6)(B)	The type of field designation to be followed, such as marking, sample marking of at least 20 percent of the trees to be harvested or left, professional supervision of fallers or other methods; and	Maintain the current (2012) CFPR standard. ALSO - TMP specifically lists which Alternative Prescriptions are allowed.	TMP - 1.5.1 Alternative Group Selection; TMP - 1.5.2 Alternative Transition; TMP - 1.5.5 Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.6(b)(6)(C)	The site preparation and regeneration method and timetable to be used for restocking.	Maintain the current (2012) CFPR standard. ALSO - TMP specifically lists which Alternative Prescriptions are allowed.	TMP - 1.5.1 Alternative Group Selection; TMP - 1.5.2 Alternative Transition; TMP - 1.5.5 Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
913.6(c)	If an alternative prescription will have the practical on-the-ground effect of a clearcut, regardless of name or description, then the acreage limitations, and requirement for separation by a typical logging unit, yarding equipment limitations, exceptions, and stocking requirements for the clearcut regeneration method shall apply.	Maintain the current (2012) CFPR standard. ALSO - TMP specifically lists which Alternative Prescriptions are allowed.	TMP - 1.5.1 Alternative Group Selection; TMP - 1.5.2 Alternative Transition; TMP - 1.5.5 Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
913.6(d)	All trees to be harvested or all trees to be retained shall be marked by, or under the supervision of, an RPF prior to harvest. A sample area must be marked prior to the preharvest inspection for evaluation. The sample area shall include at least 10% of the harvest area to a maximum of 20 acres per stand type which is representative of the range of conditions present in the area. The Director may waive the requirements for the remainder of the area when explained and justified by the RPF in the THP.	Maintain the current (2012) CFPR standard. ALSO - TMP specifically lists which Alternative Prescriptions are allowed.	TMP - 1.5.1 Alternative Group Selection; TMP - 1.5.2 Alternative Transition; TMP - 1.5.5 Alternative Seed Tree Removal; TMP - 1.3 Long Term Sustained Yield; TMP - 1.5 Silvicultural Considerations; TMP - 3.5 Silvicultural Methods; TMP - Attachment A - Landscape Planning	3.9 and 4.9 Timber Resources
914.1(a)	To the fullest extent possible and with due consideration given to topography, lean of trees, landings, utility lines, local obstructions, and safety factors, trees shall be felled to lead in a direction away from watercourses and lakes.	Maintain the current (2012) CFPR standard, except for trees felled for the purpose of LWD recruitment. 1) Push standing trees into a watercourse with heavy equipment, as long as rootwads remain attached to LWD (HCP/NCCP C§8.2.3.6-4,); 2) Place a rootwad within a stream channel provided a rootwad exceeds the volume standard for key pieces (HCP/NCCP C§8.2.3.6-7).	HCP/NCCP C§8.2.3.6-4, HCP/NCCP C§8.2.3.6-7; TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
914.1(c)	Trees shall be felled in conformance with watercourse and lake protection measures incorporated in timber harvesting plans and consistent with Article 6 of these rules.	Maintain the current (2012) CFPR standard, except for trees felled for the purpose of LWD recruitment. HCP/NCCP C§8.2.3.6-10 -- Permit the placement as LWD of 1 tree designated for large tree retention within a 330 ft segment of an AMZ, if the watercourse does not meet the target for key piece loading. HCP/NCCP C§8.2.3.6-11 – Fell trees into a stream channel provided the length of the tree segment that will interact with the stream channel is at least 1.5 times the width of the bankfull channel. HCP/NCCP C§8.2.3.6-12 – Retain foliage from trees felled into a stream channel. HCP/NCCP C§8.2.3.6-13 – Do not place LWD pieces in one spot (i.e., within 100 ft of each other) without a site specific plan developed by an MRC fisheries biologist or hydrologist; notify the wildlife agencies in an annual report of the LWD placement; HCP/NCCP C§8.2.3.6-14 – Situate LWD to maximize the habitat benefit and minimize adverse effects. HCP/NCCP C§8.2.3.6-15 – Follow the guidelines in the CDFG *Salmonid Habitat Restoration Manual* when designing specific structures; otherwise ensure stability of LWD placement by following size requirements for key pieces (see HCP/NCCP Appendix G, G.3.3.1, *General methods for LWD recruitment*) and wedging LWD between riparian trees when possible. HCP/NCCP C§8.2.3.6-16 – Add LWD only during the course of PTHP activities, unless there is a site-specific plan. HCP/NCCP C§8.2.3.6-17 – Tag and mark LWD added to stream	HCP/NCCP C§8.2.3.6-10 through C§8.2.3.6-18; TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
		channels to allow MRC and the wildlife agencies to track it over time through instream monitoring programs. HCP/NCCP C§8.2.3.6-18 – Develop within the first 5 years of the HCP/NCCP and implement within the first 20 years of the HCP/NCCP an LWD placement plan for coho "core" watersheds.		
914.1(d)	Felling practices shall conform to requirements of *[14 CCR § 919.2]* to protect bird nesting sites.	HCP/NCCP C§10.3.1.3.1-7 – Mark and retain all known nest trees of northern spotted owls and protect them, if possible, with 4 screen trees. HCP/NCCP C§10.3.1.3.1-23 – Mark and retain all known nest trees of northern spotted owls and protect them with screen trees. HCP/NCCP C§10.3.1.3.1-38 – Mark and retain all known nest trees of northern spotted owls and protect them with screen trees. HCP/NCCP C§9.2.3.1-7 – Choose for recruitment trees those trees with the most characteristics valuable for wildlife. HCP/NCCP C§9.2.3.1-8 – Harvest in subsequent entries, trees marked with an "R" only if there is a tree within the same acre more likely to recruit to a snag in a shorter time. HCP/NCCP C§9.2.3.1-2 – Retain in general forested areas a minimum of 1 hard snag or recruitment tree on average per acre that is ≥ 16 in dbh and ≥ 30 ft tall; 1 hard snag or recruitment tree on average per acre that is ≥ 24 in dbh and ≥ 40 ft tall; 1 wildlife tree or recruitment tree on average per acre that is ≥ 16 in dbh and ≥ 30 ft tall.	HCP/NCCP – C§10.3.1.3.1-7; C§10.3.1.3.1-23; C§10.3.1.3.1-38; C§9.2.3.1-7; C§9.2.3.1-8; C§9.2.3.1-2. TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
914.2(d)	Heavy equipment shall not operate on unstable areas. If such areas are unavoidable, the RPF shall develop specific measures to minimize the effect of operations on slope instability. These measures shall be explained and justified in the plan and must meet the requirements of 14 CCR 914	TSU 1-2, Inner Gorge measures: HCP/NCCP C§8.3.3.1.2-1 – Do not construct or reconstruct roads or landings. HCP/NCCP C§8.3.3.1.2-2 – Do not construct watercourse crossings. HCP/NCCP C§8.3.3.1.2-3 – Decommission existing roads and landings when they are no longer needed. HCP/NCCP C§8.3.3.1.2-4 – Do not construct tractor trails. HCP/NCCP C§8.3.3.1.2-5 – Exclude tractor yarding equipment. HCP/NCCP C§8.3.3.1.2-6 – Do not harvest timber. LIMITS ON DEVIATION measures for TSU 1-2 Inner Gorge. HCP/NCCP C§8.3.3.1.2-11 – Allow construction and reconstruction of roads, skids trails, and landings within inner gorges only after notification to the wildlife agencies and review by a geologist. TSU 1 and 2 – Steep Streamside Slopes. HCP/NCCP C§8.3.3.1.2-12 – Do not construct new roads or landings. HCP/NCCP C§8.3.3.1.2-13 – Do not construct watercourse crossings. HCP/NCCP C§8.3.3.1.2-14 – Adhere to the standards in Appendix E, *Roads, Landings, and Skid Trails*, for reconstructed roads. HCP/NCCP C§8.3.3.1.2-15 – Decommission existing roads and landings when they are no longer needed. HCP/NCCP C§8.3.3.1.2-16 – Do not construct tractor trails. HCP/NCCP C§8.3.3.1.2-17 – Permit equipment on existing skids trails where other yarding methods could pose a greater risk of sediment delivery to a watercourse where one-time entry into the TSU is required to control erosion. LIMITS OF DEVIATION ON TSU 1 AND 2 –	HCP/NCCP C§8.3.3.1.2-1-6; C§8.3.3.1.2-11; C§8.3.3.1.2-12-17; C§8.3.3.1.2-21-22; C§8.3.3.1.2-1-4; C§8.3.3.1.3-10-11; HCP/NCCP Appendix E, E.2.2 #6-9. E.3 #3; TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.11 Wildlife Protection Practices	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.5 and 4.5 Vegetation and Plant Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
		STEEP STREAMSIDE SLOPES HCP/NCCP C§8.3.3.1.2-21 – Permit new construction of roads, skid trails, and landings only after a review and site specific design by a PG or a CEG. HCP/NCCP C§8.3.3.1.2-22 – Permit reconstruction of roads, skid trails, and landings across unstable areas within TSU1 or TSU2 (i.e. steep streamside slopes) only after obtaining approval of the wildlife agencies as well as a review and site specific design by a PG or CEG. TSU3 – STEEP DISSECTED TOPOGRAPHY HCP/NCCP C§8.3.3.1.3-1 – Do no construct or reconstruct a road to extend more than 50 ft across a headwall swale, excluding watercourse crossings. HCP/NCCP C§8.3.3.1.3-2 – Decommission existing roads and landing when they are no longer necessary. HCP/NCCP C§8.3.3.1.3-3 – Do not construct or reconstruct tractor trails. HCP/NCCP C§8.3.3.1.3-4 – Permit equipment on existing stable trails where other yarding methods could pose a greater risk of sediment delivery to a watercourse where a one-time entry into a TSU is required to control erosion.. LIMITS ON DEVIATION OF TSU 3 STEEP DISSECTED TOPOGRPAHY HCP/NCCP C§8.3.3.1.3-10 – Permit new construction of roads, skid trails, and landings only after a review and site specific design by a PG or a CEG. HCP/NCCP C§8.3.3.1.3-11 – Permit reconstruction of roads, skid trails, across unstable areas within TSU 3 only after obtaining approval of the wildlife agencies as well as a review and site specific design by a PG or CEG.		

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
		HCP/NCCP Appendix E, E.2.2 #6 – Do not construct roads near the bottom of steep and narrow canyons or in areas with high hazard for mass wasting unless (a) MRC obtains approval of both a California Licensed Geologist and an individual knowledgeable in the relevant aquatic resources, and b) placement of the road at this point has a lower risk for sediment delivery than placement at other locations. 7. Use logging systems that reduce excavation for roads and landings or placement of fills from roads and landings on dormant or historically active mass wasting features. 8. Do not construct roads on inner gorge slopes of Class I and Class II watercourses unless: a) MRC notifies the Wildlife Agencies and CGS 60 days prior to submittal of a THP that proposes road construction across an inner gorge, b) MRC includes with the THP a report submitted by a California CEG/PG of their investigation, evaluations, and recommendation according to Note 45 guidelines; c) MRC either resolves any concerns raised by the wildlife agencies within 60 days of their receipt of the MRC notification or the wildlife agencies do not contact MRC within those 60 days. 9. Do not construct roads or landings on historically active mass wasting features without approval of both a California Licensed Geologist and an individual knowledgeable in the relevant aquatic resources. HCP/NCCP Appendix E, E.3 #3 Adhere to the default conservation measures for a particular terrain stability unit (TSU) identified, on the ground, by an RPF or PF, or for a mass wasting feature on		

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		which MRC may construct a road or landing.		
914.2(f)	Tractor operations shall be subject to the following limitations:			
914.2(f)(1)(i)	Heavy equipment shall be prohibited where any of the following conditions are present: Slopes steeper than 65%.	TSU 1-2, Inner Gorge measures: HCP/NCCP C§8.3.3.1.2-1 – Do not construct or reconstruct roads or landings. HCP/NCCP C§8.3.3.1.2-2 – Do not construct watercourse crossings. HCP/NCCP C§8.3.3.1.2-3 – Decommission existing roads and landings when they are no longer needed. HCP/NCCP C§8.3.3.1.2-4 – Do not construct tractor trails. HCP/NCCP C§8.3.3.1.2-5 – Exclude tractor yarding equipment. HCP/NCCP C§8.3.3.1.2-6 – Do not harvest timber. LIMITS ON DEVIATION measures for TSU 1-2 Inner Gorge. HCP/NCCP C§8.3.3.1.2-11 – Allow construction and reconstruction of roads, skids trails, and landings within inner gorges only after notification to the wildlife agencies and review by a geologist. TSU 1 and 2 – Steep Streamside Slopes. HCP/NCCP C§8.3.3.1.2-12 – Do not construct new roads or landings. HCP/NCCP C§8.3.3.1.2-13 – Do not construct watercourse crossings. HCP/NCCP C§8.3.3.1.2-14 – Adhere to the standards in Appendix E, *Roads, Landings, and Skid Trails*, for reconstructed roads. HCP/NCCP C§8.3.3.1.2-15 – Decommission existing roads and landings when they are no longer needed. HCP/NCCP C§8.3.3.1.2-16 – Do not construct tractor trails. HCP/NCCP C§8.3.3.1.2-17 – Permit equipment on existing skids trails where other yarding methods	HCP/NCCP C§8.3.3.1.2-1-6; C§8.3.3.1.2-11; C§8.3.3.1.2-12-17; C§8.3.3.1.2-21-22; C§8.3.3.1.2-1-4; C§8.3.3.1.3-10-11; C§8.3.3.1.2-1-6; C§8.3.3.1.2-11; C§8.3.3.1.2-12-17; C§8.3.3.1.2-21-22; C§8.3.3.1.2-1-4; C§8.3.3.1.3-10-11; HCP/NCCP Appendix E, E.2.2 #6-9; HCP/NCCP Appendix E, E.3 #3; HCP/NCCP Appendix E, E.2.4 #7-9. TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.11 Wildlife Protection Practices	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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		could pose a greater risk of sediment delivery to a watercourse where one-time entry into the TSU is required to control erosion. LIMITS OF DEVIATION ON TSU 1 AND 2 – STEEP STREAMSIDE SLOPES HCP/NCCP C§8.3.3.1.2-21 – Permit new construction of roads, skid trails, and landings only after a review and site specific design by a PG or a CEG. HCP/NCCP C§8.3.3.1.2-22 – Permit reconstruction of roads, skid trails, and landings across unstable areas within TSU1 or TSU2 (i.e., steep streamside slopes) only after obtaining approval of the wildlife agencies as well as a review and site specific design by a PG or CEG. TSU3 – STEEP DISSECTED TOPOGRAPHY HCP/NCCP C§8.3.3.1.3-1 – Do not construct or reconstruct a road to extend more than 50 ft across a headwall swale, excluding watercourse crossings. HCP/NCCP C§8.3.3.1.3-2 – Decommission existing roads and landings when they are no longer necessary. HCP/NCCP C§8.3.3.1.3-3 – Do not construct or reconstruct tractor trails. HCP/NCCP C§8.3.3.1.3-4 – Permit equipment on existing stable trails where other yarding methods could pose a greater risk of sediment delivery to a watercourse where a one-time entry into a TSU is required to control erosion.. LIMITS ON DEVIATION OF TSU 3 STEEP DISSECTED TOPOGRPAHY HCP/NCCP C§8.3.3.1.3-10 – Permit new construction of roads, skid trails, and landings only after a review and site specific design by a PG or a CEG. HCP/NCCP C§8.3.3.1.3-11 – Permit		

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		reconstruction of roads, skid trails, across unstable areas within TSU 3 only after obtaining approval of the wildlife agencies as well as a review and site specific design by a PG or CEG. HCP/NCCP Appendix E, E.2.2 #6 – Do not construct roads near the bottom of steep and narrow canyons or in areas with high hazard for mass wasting unless (a) MRC obtains approval of both a California Licensed Geologist and an individual knowledgeable in the relevant aquatic resources and b) placement of the road at this point has a lower risk for sediment delivery than placement at other locations. 7. Use logging systems that reduce excavation for roads and landings or placement of fills from roads and landings on dormant or historically active mass wasting features. 8. Do not construct roads on inner gorge slopes of Class I and Class II watercourses unless: a) MRC notifies the Wildlife Agencies and CGS 60 days prior to submittal of a THP that proposes road construction across an inner gorge, b) MRC includes with the THP a report submitted by a California CEG/PG of their investigation, evaluations, and recommendation according to Note 45 guidelines; c) MRC either resolves any concerns raised by the wildlife agencies within 60 days of their receipt of the MRC notification or the wildlife agencies do not contact MRC within those 60 days. 9. Do not construct roads or landings on historically active mass wasting features without approval of both a California Licensed Geologist and an individual knowledgeable in the relevant aquatic resources. HCP/NCCP		

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		Appendix E, E.3 #3 Adhere to the default conservation measures for a particular terrain stability unit (TSU) identified, on the ground, by an RPF or PF, or for a mass wasting feature on which MRC may construct a road or landing. Appendix E, E.2.4 #7. Construct or reconstruct roads as full-benched cut (not fill) or remove fill prior to the winter period on slopes over 50% where cutbank stability is not an issue. Dispose of spoils not used in road construction in stable areas outside of an AMZ. Alternatively, construct roads with balanced cuts and fills, properly engineered or compacted in layers not to exceed a depth of 1 ft (0.3 m). Optionally, remove fills on decommissioned or temporary roads with the slopes recontoured prior to the winter period. #8. Construct roads on slopes over 40% with key fill material more than 4 ft in thickness unless an alternative design is proposed by a California Registered Geologist or the road is constructed as full-benched. #9. End-haul materials to a stable location and, when slopes are over 50% ensure that location is more than 100 ft from the boundary of an AMZ. **HCP/NCCP Appendix E, E.8.1 Standards for skid trails** 5.Exclude skid trail use in the following areas: c. Slopes steeper than 65%.		
914.2(f)(1)(ii)	Heavy equipment shall be prohibited where any of the following conditions are present: Slopes steeper than 50% where the erosion hazard rating is high or extreme.	HCP/NCCP: TSU 1-2, Inner Gorge measures: C§8.3.3.1.2-1 – Do not construct or reconstruct roads or landings. C§8.3.3.1.2-2 – Do not construct watercourse crossings.	HCP/NCCP C§8.3.3.1.2-1-6; HCP/NCCP C§8.3.3.1.2-11; HCP/NCCP C§8.3.3.1.2-12-17; HCP/NCCP C§8.3.3.1.2-21-22; HCP/NCCP C§8.3.3.1.2-1-4; HCP/NCCP C§8.3.3.1.3-10-11; HCP/NCCP C§8.3.3.1.2-	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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		C§8.3.3.1.2-3 – Decommission existing roads and landings when they are no longer needed. C§8.3.3.1.2-4 – Do not construct tractor trails. C§8.3.3.1.2-5 – Exclude tractor yarding equipment. C§8.3.3.1.2-6 – Do not harvest timber. LIMITS ON DEVIATION measures for TSU 1-2 Inner Gorge. C§8.3.3.1.2-11 – Allow construction and reconstruction of roads, skids trails, and landings within inner gorges only after notification to the wildlife agencies and review by a geologist. TSU 1 and 2 – Steep Streamside Slopes. C§8.3.3.1.2-12 – Do not construct new roads or landings. C§8.3.3.1.2-13 – Do not construct watercourse crossings. C§8.3.3.1.2-14 – Adhere to the standards in HCP/NCCP Appendix E, *Roads, Landings, and Skid Trails*, for reconstructed roads. C§8.3.3.1.2-15 – Decommission existing roads and landings when they are no longer needed. C§8.3.3.1.2-16 – Do not construct tractor trails. C§8.3.3.1.2-17 – Permit equipment on existing skids trails where other yarding methods could pose a greater risk of sediment delivery to a watercourse where one-time entry into the TSU is required to control erosion. LIMITS OF DEVIATION ON TSU 1 AND 2 – STEEP STREAMSIDE SLOPES C§8.3.3.1.2-21 – Permit new construction of roads, skid trails, and landings only after a review and site specific design by a PG or a CEG. C§8.3.3.1.2-22 – Permit reconstruction of roads, skid trails, and landings across unstable areas within TSU1 or TSU2 (i.e. steep streamside slopes) only after obtaining approval of the wildlife	1-6; HCP/NCCP C§8.3.3.1.2-11; HCP/NCCP C§8.3.3.1.2-12-17; HCP/NCCP C§8.3.3.1.2-21-22; HCP/NCCP C§8.3.3.1.2-1-4; HCP/NCCP C§8.3.3.1.3-10-11; Appendix E, E.2.2 #6-9, E.3 #3, E.2.4 #7-9; TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.11 Wildlife Protection Practices	

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		agencies as well as a review and site specific design by a PG or CEG. TSU3 – STEEP DISSECTED TOPOGRAPHY C§8.3.3.1.3-1 – Do not construct or reconstruct a road to extend more than 50 ft across a headwall swale, excluding watercourse crossings. C§8.3.3.1.3-2 – Decommission existing roads and landing when they are no longer necessary. C§8.3.3.1.3-3 – Do not construct or reconstruct tractor trails. C§8.3.3.1.3-4 – Permit equipment on existing stable trails where other yarding methods could pose a greater risk of sediment delivery to a watercourse where a one-time entry into a TSU is required to control erosion.. LIMITS ON DEVIATION OF TSU 3 STEEP DISSECTED TOPOGRPAHY C§8.3.3.1.3-10 – Permit new construction of roads, skid trails, and landings only after a review and site specific design by a PG or a CEG. C§8.3.3.1.3-11 – Permit reconstruction of roads, skid trails, across unstable areas within TSU 3 only after obtaining approval of the wildlife agencies as well as a review and site specific design by a PG or CEG. HCP/NCCP Appendix E, E.2.2 #6 – Do not construct roads near the bottom of steep and narrow canyons or in areas with high hazard for mass wasting unless (a) MRC obtains approval of both a California Licensed Geologist and an individual knowledgeable in the relevant aquatic resources and b) placement of the road at this point has a lower risk for sediment delivery than placement at other locations. 7. Use logging systems that reduce excavation for roads and		

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		landings or placement of fills from roads and landings on dormant or historically active mass wasting features. 8. Do not construct roads on inner gorge slopes of Class I and Class II watercourses unless: a) MRC notifies the Wildlife Agencies and CGS 60 days prior to submittal of a THP that proposes road construction across an inner gorge, b) MRC includes with the THP a report submitted by a California CEG/PG of their investigation, evaluations, and recommendation according to Note 45 guidelines; c) MRC either resolves any concerns raised by the wildlife agencies within 60 days of their receipt of the MRC notification or the wildlife agencies do not contact MRC within those 60 days. 9. Do not construct roads or landings on historically active mass wasting features without approval of both a California Licensed Geologist and an individual knowledgeable in the relevant aquatic resources. Appendix E, E.3 #3 Adhere to the default conservation measures for a particular terrain stability unit (TSU) identified, on the ground, by an RPF or PF, or for a mass wasting feature on which MRC may construct a road or landing. Appendix E, E.2.4 #7. Construct or reconstruct roads as full-benched cut (not fill) or remove fill prior to the winter period on slopes over 50% where cutbank stability is not an issue. Dispose of spoils not used in road construction in stable areas outside of an AMZ. Alternatively, construct roads with balanced cuts and fills, properly engineered or compacted in layers not to exceed a depth of 1 ft (0.3 m).		

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		Optionally, remove fills on decommissioned or temporary roads with the slopes recontoured prior to the winter period. #8. Construct roads on slopes over 40% with key fill material more than 4 ft in thickness unless an alternative design is proposed by a California Registered Geologist or the road is constructed as full-benched. #9. End-haul materials to a stable location and, when slopes are over 50%, ensure that location is more than 100 ft from the boundary of an AMZ. **Appendix E, E.8.1 Standards for skid trails** 5.Exclude skid trail use in the following areas: c. Slopes steeper than 50% where the hazard rating for soil erosion is high or extreme.		

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914.2(f)(1)(iii)	Heavy equipment shall be prohibited where any of the following conditions are present: Slopes over 50% which lead without flattening to sufficiently dissipate water flow and trap sediment before it reaches a watercourse or lake.	HCP/NCCP: TSU 1-2, Inner Gorge measures: C§8.3.3.31.2-1 – Do not construct or reconstruct roads or landings. C§8.3.3.1.2-2 – Do not construct watercourse crossings. C§8.3.3.1.2-3 – Decommission existing roads and landings when they are no longer needed. C§8.3.3.1.2-4 – Do not construct tractor trails. C§8.3.3.1.2-5 – Exclude tractor yarding equipment. C§8.3.3.1.2-6 – Do not harvest timber. LIMITS ON DEVIATION measures for TSU 1-2 Inner Gorge. C§8.3.3.1.2-11 – Allow construction and reconstruction of roads, skids trails, and landings within inner gorges only after notification to the wildlife agencies and review by a geologist. TSU 1 and 2 – Steep Streamside Slopes. C§8.3.3.1.2-12 – Do not construct new roads or landings. C§8.3.3.1.2-13 – Do not construct watercourse crossings. C§8.3.3.1.2-14 – Adhere to the standards in Appendix E, *Roads, Landings, and Skid Trails*, for reconstructed roads. C§8.3.3.1.2-15 – Decommission existing roads and landings when they are no longer needed. C§8.3.3.1.2-16 – Do not construct tractor trails. C§8.3.3.1.2-17 – Permit equipment on existing skids trails where other yarding methods could pose a greater risk of sediment delivery to a watercourse where one-time entry into the TSU is required to control erosion. LIMITS OF DEVIATION ON TSU 1 AND 2 – STEEP STREAMSIDE SLOPES C§8.3.3.1.2-21 – Permit new construction of roads, skid trails, and landings only after a review and site specific design by a PG or a CEG.	HCP/NCCP C§8.3.3.1.2-1-6; HCP/NCCP C§8.3.3.1.2-11; HCP/NCCP C§8.3.3.1.2-12-17; HCP/NCCP C§8.3.3.1.2-21-22; HCP/NCCP C§8.3.3.1.2-1-4; HCP/NCCP C§8.3.3.1.3-10-11;HCP/NCCP C§8.3.3.1.2-1-6; HCP/NCCP C§8.3.3.1.2-11; HCP/NCCP C§8.3.3.1.2-12-17; HCP/NCCP C§8.3.3.1.2-21-22; HCP/NCCP C§8.3.3.1.2-1-4; HCP/NCCP C§8.3.3.1.3-10-11; Appendix E, E.2.2 #6-9. E.3 #3 E.2.4 #7-9TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.11 Wildlife Protection Practices	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
		C§8.3.3.1.2-22 – Permit reconstruction of roads, skid trails, and landings across unstable areas within TSU1 or TSU2 (i.e. steep streamside slopes) only after obtaining approval of the wildlife agencies as well as a review and site specific design by a PG or CEG. TSU3 – STEEP DISSECTED TOPOGRAPHY C§8.3.3.1.3-1 – Do not construct or reconstruct a road to extend more than 50 ft across a headwall swale, excluding watercourse crossings. C§8.3.3.1.3-2 – Decommission existing roads and landings when they are no longer necessary. C§8.3.3.1.3-3 – Do not construct or reconstruct tractor trails. C§8.3.3.1.3-4 – Permit equipment on existing stable trails where other yarding methods could pose a greater risk of sediment delivery to a watercourse where a one-time entry into a TSU is required to control erosion.. LIMITS ON DEVIATION OF TSU 3 STEEP DISSECTED TOPOGRPAHY C§8.3.3.1.3-10 – Permit new construction of roads, skid trails, and landings only after a review and site specific design by a PG or a CEG. C§8.3.3.1.3-11 – Permit reconstruction of roads, skid trails, across unstable areas within TSU 3 only after obtaining approval of the wildlife agencies as well as a review and site specific design by a PG or CEG. Appendix E, E.2.2 #6 – Do not construct roads near the bottom of steep and narrow canyons or in areas with high hazard for mass wasting unless (a) MRC obtains approval of both a California Licensed Geologist and an individual knowledgeable in the relevant aquatic resources, and b) placement of		

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
		the road at this point has a lower risk for sediment delivery than placement at other locations. 7. Use logging systems that reduce excavation for roads and landings or placement of fills from roads and landings on dormant or historically active mass wasting features. 8. Do not construct roads on inner gorge slopes of Class I and Class II watercourses unless: a) MRC notifies the Wildlife Agencies and CGS 60 days prior to submittal of a THP that proposes road construction across an inner gorge, b) MRC includes with the THP a report submitted by a California CEG/PG of their investigation, evaluations, and recommendation according to Note 45 guidelines; c) MRC either resolves any concerns raised by the wildlife agencies within 60 days of their receipt of the MRC notification or the wildlife agencies do not contact MRC within those 60 days. 9. Do not construct roads or landings on historically active mass wasting features without approval of both a California Licensed Geologist and an individual knowledgeable in the relevant aquatic resources. Appendix E, E.3 #3 Adhere to the default conservation measures for a particular terrain stability unit (TSU) identified, on the ground, by an RPF or PF, or for a mass wasting feature on which MRC may construct a road or landing. Appendix E, E.2.4 #7. Construct or reconstruct roads as full-benched cut (not fill) or remove fill prior to the winter period on slopes over 50% where cutbank stability is not an issue. Dispose of spoils not used in road construction in stable areas outside of an AMZ.		

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
		Alternatively, construct roads with balanced cuts and fills, properly engineered or compacted in layers not to exceed a depth of 1 ft (0.3 m). Optionally, remove fills on decommissioned or temporary roads with the slopes recontoured prior to the winter period. #8. Construct roads on slopes over 40% with key fill material more than 4 ft in thickness unless an alternative design is proposed by a California Registered Geologist or the road is constructed as full-benched. #9. End-haul materials to a stable location and, when slopes are over 50% ensure that location is more than 100 ft from the boundary of an AMZ **Appendix E, E.8.1 Standards for skid trails** 5.Exclude skid trail use in the following areas: e. Slopes over 50% which lead without flattening to sufficiently dissipate water flow and trap sediment before it reaches a watercourse or lake. **NOTE:** MRC can, in this instance, use skid trails once to control sediment.		
914.2(f)(2)(i)	Heavy equipment shall be prohibited where any of the following conditions are present: On slopes between 50 percent and 65 percent where the erosion hazard rating is moderate, and all slope percentages are for average slope steepness based on sample areas that are 20 acres, or less if proposed by the RPF or required by the Director, heavy equipment shall be limited to: Existing tractor roads that do not require reconstruction, or	TSU 1-2, Inner Gorge measures: C§8.3.1.3.2-1 – Do not construct or reconstruct roads or landings. C§8.3.3.1.2-2 – Do not construct watercourse crossings. C§8.3.3.1.2-3 – Decommission existing roads and landings when they are no longer needed. C§8.3.3.1.2-4 – Do not construct tractor trails. C§8.3.3.1.2-5 – Exclude tractor yarding equipment. C§8.3.3.1.2-6 – Do not harvest timber. LIMITS ON DEVIATION measures for TSU 1-2 Inner Gorge. C§8.3.3.1.2-11 –	HCP/NCCP C§8.3.3.1.2-1-6; HCP/NCCP C§8.3.3.1.2-11; HCP/NCCP C§8.3.3.1.2-12-17; HCP/NCCP C§8.3.3.1.2-21-22; HCP/NCCP C§8.3.3.1.2-1-4; HCP/NCCP C§8.3.3.1.3-10-11; HCP/NCCP C§8.3.3.1.2-1-6; HCP/NCCP C§8.3.3.1.2-11; HCP/NCCP C§8.3.3.1.2-12-17; HCP/NCCP C§8.3.3.1.2-21-22; HCP/NCCP C§8.3.3.1.2-1-4; HCP/NCCP C§8.3.3.1.3-10-11; Appendix E, E.2.2 #6-9,. E.3 #3, E.2.4 #7-9; TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.11 Wildlife Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
		Allow construction and reconstruction of roads, skids trails, and landings within inner gorges only after notification to the wildlife agencies and review by a geologist. TSU 1 and 2 – Steep Streamside Slopes. C§8.3.3.1.2-12 – Do not construct new roads or landings. C§8.3.3.1.2-13 – Do not construct watercourse crossings. C§8.3.3.1.2-14 – Adhere to the standards in Appendix E, *Roads, Landings, and Skid Trails*, for reconstructed roads. C§8.3.3.1.2-15 – Decommission existing roads and landings when they are no longer needed. C§8.3.3.1.2-16 – Do not construct tractor trails. C§8.3.3.1.2-17 – Permit equipment on existing skids trails where other yarding methods could pose a greater risk of sediment delivery to a watercourse where one-time entry into the TSU is required to control erosion. LIMITS OF DEVIATION ON TSU 1 AND 2 – STEEP STREAMSIDE SLOPES C§8.3.3.1.2-21 – Permit new construction of roads, skid trails, and landings only after a review and site specific design by a PG or a CEG. C§8.3.3.1.2-22 – Permit reconstruction of roads, skid trails, and landings across unstable areas within TSU1 or TSU2 (i.e. steep streamside slopes) only after obtaining approval of the wildlife agencies as well as a review and site specific design by a PG or CEG. TSU3 – STEEP DISSECTED TOPOGRAPHY C§8.3.3.1.3-1 – Do not construct or reconstruct a road to extend more than 50 ft across a headwall swale, excluding watercourse crossings. C§8.3.3.1.3-2 – Decommission existing roads and	Practices	

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
		landing when they are no longer necessary. C§8.3.3.1.3-3 – Do not construct or reconstruct tractor trails. C§8.3.3.1.3-4 – Permit equipment on existing stable trails where other yarding methods could pose a greater risk of sediment delivery to a watercourse where a one-time entry into a TSU is required to control erosion.. LIMITS ON DEVIATION OF TSU 3 STEEP DISSECTED TOPOGRPAHY C§8.3.3.1.3-10 – Permit new construction of roads, skid trails, and landings only after a review and site specific design by a PG or a CEG. C§8.3.3.1.3-11 – Permit reconstruction of roads, skid trails, across unstable areas within TSU 3 only after obtaining approval of the wildlife agencies as well as a review and site specific design by a PG or CEG. Appendix E, E.2.2 #6 – Do not construct roads near the bottom of steep and narrow canyons or in areas with high hazard for mass wasting unless (a) MRC obtains approval of both a California Licensed Geologist and an individual knowledgeable in the relevant aquatic resources, and (b) placement of the road at this point has a lower risk for sediment delivery than placement at other locations. 7. Use logging systems that reduce excavation for roads and landings or placement of fills from roads and landings on dormant or historically active mass wasting features. 8. Do not construct roads on inner gorge slopes of Class I and Class II watercourses unless: a) MRC notifies the Wildlife Agencies and CGS 60 days prior to submittal of a THP that proposes road construction across an inner gorge, b) MRC includes		

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		with the THP a report submitted by a California CEG/PG of their investigation, evaluations, and recommendation according to Note 45 guidelines; c) MRC either resolves any concerns raised by the wildlife agencies within 60 days of their receipt of the MRC notification or the wildlife agencies do not contact MRC within those 60 days. 9. Do not construct roads or landings on historically active mass wasting features without approval of both a California Licensed Geologist and an individual knowledgeable in the relevant aquatic resources. Appendix E, E.3 #3 Adhere to the default conservation measures for a particular terrain stability unit (TSU) identified, on the ground, by an RPF or PF, or for a mass wasting feature on which MRC may construct a road or landing. Appendix E, E.2.4 #7. Construct or reconstruct roads as full-benched cut (not fill) or remove fill prior to the winter period on slopes over 50% where cutbank stability is not an issue. Dispose of spoils not used in road construction in stable areas outside of an AMZ. Alternatively, construct roads with balanced cuts and fills, properly engineered or compacted in layers not to exceed a depth of 1 ft (0.3 m). Optionally, remove fills on decommissioned or temporary roads with the slopes recontoured prior to the winter period. #8. Construct roads on slopes over 40% with key fill material more than 4 ft in thickness unless an alternative design is proposed by a California Registered Geologist or the road is constructed as full-benched. #9.		

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
		End-haul materials to a stable location and, when slopes are over 50% ensure that location is more than 100 ft from the boundary of an AMZ **Appendix E, E.8.1 Standards for skid trails** 7.Limit skid trails to existing, stable skid trails, that do not require reconstruction, in the following areas: a. Slopes between 50% and 65%, where the erosion hazard rating is moderate.		
914.2(i)	Where waterbreaks cannot effectively disperse surface runoff, other erosion controls shall be installed as needed.	TSU 1-2, Inner Gorge measures: C§8.3.3.1.2-4 – Do not construct tractor trails. C§8.3.3.1.2-5 – Exclude tractor yarding equipment. LIMITS ON DEVIATION measures for TSU 1-2 Inner Gorge. C§8.3.3.1.2-11 – Allow construction and reconstruction of roads, skids trails, and landings within inner gorges only after notification to the wildlife agencies and review by a geologist. TSU 1 and 2 – Steep Streamside Slopes. §8.3.3.1.2-16 – Do not construct tractor trails. C§8.3.3.1.2-17 – Permit equipment on existing skid trails where other yarding methods could pose a greater risk of sediment delivery to a watercourse where one-time entry into the TSU is required to control erosion. LIMITS OF DEVIATION ON TSU 1 AND 2 – STEEP STREAMSIDE SLOPES C§8.3.3.1.2-21 – Permit new construction of roads, skid trails, and landings only after a review and site specific design by a PG or a CEG. C§8.3.3.1.2-22 – Permit reconstruction of roads, skid trails, and landings across unstable areas within TSU1 or TSU2 (i.e. steep streamside slopes) only after	HCP/NCCP C§8.3.3.1.2-4 -5; HCP/NCCP C§8.3.3.1.2-11; HCP/NCCP C§8.3.3.1.2-16;-17; HCP/NCCP C§8.3.3.1.2-21-22; HCP/NCCP C§8.3.3.1.3-1 -4; HCP/NCCP C§8.3.3.1.3-10-11 TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.11 Wildlife Protection Practices	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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		obtaining approval of the wildlife agencies as well as a review and site specific design by a PG or CEG. TSU3 – STEEP DISSECTED TOPOGRAPHY C§8.3.3.1.3-1 – Do not construct or reconstruct a road to extend more than 50 ft across a headwall swale, excluding watercourse crossings. C§8.3.3.1.3-2 – Decommission existing roads and landing when they are no longer necessary. C§8.3.3.1.3-3 – Do not construct or reconstruct tractor trails. C§8.3.3.1.3-4 – Permit equipment on existing stable trails where other yarding methods could pose a greater risk of sediment delivery to a watercourse where a one-time entry into a TSU is required to control erosion.. LIMITS ON DEVIATION OF TSU 3 STEEP DISSECTED TOPOGRPAHY C§8.3.3.1.3-10 – Permit new construction of roads, skid trails, and landings only after a review and site specific design by a PG or a CEG. C§8.3.3.1.3-11 – Permit reconstruction of roads, skid trails, across unstable areas within TSU 3 only after obtaining approval of the wildlife agencies as well as a review and site specific design by a PG or CEG **Appendix E, E.8.1 Standards for skid trails** 10. Do not exceed the standards for distances between waterbreaks (see Table E-2). 11. Locate waterbreaks to allow water to be discharged into some form of vegetative cover, duff, slash, rocks, or less erodible material wherever possible; otherwise, decrease the spacing and add erosion-resistant materials to the outlets		

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		such as slash or straw. 12. Construct waterbreaks to provide for (a) unrestricted discharge at the lower end of the waterbreak so that water will not pool or overtop the waterbreak, and (b) unhindered spread of water to minimize erosion and encourage sediment to settle. 13. Cut waterbreaks diagonally, a minimum of 6 in. (15.2 cm) into the firm roadbed of the skid trail. 14. Construct waterbreaks to sufficient depth to prevent overland flow and concentration of water on the surface of a skid trail. 15. Space water breaks to control and distribute overland flow without causing rilling or gullies. 16. Keep a continuous firm embankment of at least 6 in. (15.2 cm) in height immediately adjacent to the down-road edge of the waterbreak cut. 17. Re-establish all natural drainage flow paths following skid trail use and assure no skid trail captures a natural watercourse.		
914.3	Cable Yarding - The following standards are applicable to cable yarding:			
914.3(a)	Due diligence shall be exercised in the installing, and operating, of cable lines so that residual trees will not incur unreasonable damage by such installation or use.	Maintain the current (2012) CFPR standards.	TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.11 Wildlife Protection Practices	3.2 and 4.2 Geology; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
914.6	Waterbreaks - The following standards are applicable to the construction of waterbreaks:			
914.6(a)	except as otherwise provided for in the rules:			
914.6(a)(1)	All waterbreaks shall be installed no later than the beginning of the winter period of the current year of timber operations.	1. Install waterbreaks (Appendix E, Table E.2) on seasonal roads prior to October 15, unless following standards for early and late winter periods: Early winter - interval from October 15th until streamflow responds directly to precipitation, this occurs when there is at least 4 in of cumulative precipitation in the water year; Mid-winter interval from end of early winter to March 31st; Late winter - interval from April 1 to May 1 (Appendix E, E.6.1 #10).	HCP/NCCP - Appendix E, E.6.1 Standards for General Use #10; TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
914.6(a)(2)	Installation of drainage facilities and structures is required from October 15 to November 15 and from April 1 to May 1 on all constructed skid trails and tractor roads prior to sunset if the National Weather Service forecast is a "chance" (30% or more) of rain within the next 24 hours.	1. Install drainage and erosion control facilities on all constructed skid trails and tractor roads prior to sunset if **one** of the following conditions apply: Condition A i. The National Weather Service forecasts for Fort Bragg a "chance" (30% or more) of rain within 24 hours; or ii. Rain exceeds 0.25 in. in a 24-hour period at Yorkville (or the nearest reporting station). Condition B Operation stoppage exceeds 24 hours. Condition C Winter operations have ceased. (Appendix E, E.6.5 #9).	HCP/NCCP - Appendix E, E.6.5 Standards for the late winter period; #9.TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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914.6(b)	Waterbreaks shall be constructed concurrently with the construction of firebreaks and immediately upon conclusion of use of tractor roads, roads, layouts, and landings which do not have permanent and adequate drainage facilities, or drainage structures.	E.6.1 (10) Install waterbreaks (Appendix E, Table E.2) on seasonal roads prior to October 15, unless following standards for early and late winter periods: Early winter: Interval from October 15 until streamflow responds directly to precipitation. This occurs when there is at least 4 in. of cumulative precipitation in the water year. Mid-Winter: Interval from the end of early winter to March 31. Late-Winter: Interval from April 1 to May 1. Install appropriate waterbreaks or rolling dips when a temporary road is not in use to limit accumulated runoff from the road prism that may increase erosion. Space waterbreaks to specifications in Appendix E, Table E.2. (E.6.2 #7). **Appendix E, E.8.1 Standards for skid trails** 8. Install all waterbreaks prior to October 15 unless MRC follows the standards for the early winter period. **(E.6.3 Standards for early winter period)**	HCP/NCCP - Appendix E, E.6.2, Standards for temporary road use, #7). TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
914.6(c)	Distances between waterbreaks shall not exceed the following standards: (see table p. 62 2012 CFPR)	Maintain the current (2012) CFPR standards; HCP/NCCP reference - See Table E-2, page E-9, Appendix E.	HCP/NCCP - Appendix E; Table E-2 Maximum Distance between Waterbreaks. HCP/NCCP Appendix E, Section E.2.7 Standards for road and landing surface drainage. TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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914.6(d)	Cable roads that are so deeply cut as to divert and carry water away from natural drainage patterns for more than 100 feet shall have waterbreaks installed on them at 100 feet intervals, or other appropriate erosion control measure may be applied if specified in the plan.	Install waterbreaks on a cable road only when the cable roads are (a) cut deeply enough to divert water and carry water for distances greater than 100 ft without dispersing, or (b) able to deliver cable road runoff into a watercourse. Appendix E, E.8.2 #1.	HCP/NCCP - Appendix E, E.8.2 Standards for cable yarding erosion control, #1. TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
914.6(e)	Waterbreaks shall be installed at all natural watercourses on tractor roads and firebreaks regardless of the maximum distances specified in this section, except where permanent drainage facilities are provided.	Use a prepared watercourse crossing, such as a bridge, culvert, or temporary culvert, to protect the watercourse from siltation, where tractor roads cross a watercourse in which water may be present during the life of the crossing, keep the number of watercourse crossings to a minimum. HCP/NCCP Appendix E, E.8.1, #4.	HCP/NCCP - Appendix E, Section E.8.1. Standards for skid trails #4. TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
914.6(f)	Waterbreaks shall be located to allow water to be discharged into some form of vegetative cover, duff, slash, rocks, or less erodible material wherever possible, and shall be constructed to provide for unrestricted discharge at the lower end of the waterbreak so that water will be discharged and spread in such a manner that erosion shall be minimized. Where waterbreaks cannot effectively disperse surface runoff, including where waterbreaks on roads and skid trail cause surface run-off to be concentrated on downslopes, roads or skid trails, other erosion controls shall be installed as needed to comply with Title 14 CCR 914 [934, 954].	Locate waterbreaks to prevent road drainage from discharging directly into a watercourse, wet area, seep, spring, or onto mass wasting hazards. This requires discharge into some form of vegetative cover, duff, slash, rocks, or less erodible material wherever possible. Construct a waterbreak to provide for unrestricted discharge at its lower end, so that water will be spread and delivery of eroded soils will be minimized. 2 Do not exceed the distances between waterbreaks outlined in Table E 2. Decrease waterbar spacing at locations where there is evidence of rills or sediment deposition at the waterbar outlets that exceeds the filter capacity of the site. HCP/NCCP Appendix E, E.2.6 #4.	HCP/NCCP - Appendix E, E.2.6 Standards for road and landing surface drainage, #4. TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
914.6(g)	Waterbreaks shall be cut diagonally a minimum of 15.2 cm (6 inches) into the firm roadbed, cable road, skid trail or firebreak surface and shall have a continuous firm embankment of at least 15.2 cm (6 in.) in height immediately adjacent to the lower edge of the waterbreak cut.	Maintain the current (2012) CFPR standard.	HCP/NCCP - Standards provided in Appendix E (E.8.1 #14-16; E.8.2 #1b)., and Chapter 8 (8.3.3.2); TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
914.6(h)	Waterbreaks or any other erosion controls on skid trails, cable roads, layouts, firebreaks, abandoned roads, and site preparation areas shall be maintained during the prescribed maintenance period and during timber operations as defined in PRC Sections 4527 and 4551.5 so that they continue to function in a manner which minimizes soil erosion and slope instability and which prevents degradation of the quality and beneficial uses of water. The method and timing of waterbreak repair and other erosion control maintenance shall be selected with due consideration given to the protection of residual trees and reproduction and the intent of 14 CCR 914 [934, 954].	Maintain the current (2012) CFPR standard.	HCP/NCCPAppendix E, E.4 Standards for Road Inspections and Maintenance; TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
914.6(i)	The prescribed maintenance period for waterbreaks and any other erosion control facilities on skid trails, cable roads, layouts, firebreaks, abandoned roads, and site preparation areas, shall be at least one year. The Director may prescribe a maintenance period extending as much as three years after filing of the work completion report in accordance with 14 CCR 1050.	1) Conduct 5 inspections over 5 years after work completion on all seasonal roads and associated road points constructed, reconstructed, or decommissioned (Table E-4); 3) Conduct at least 1 inspection of a new temporary road each year for a period of 4 years following construction (Table E-4); 4) Inspect permanent roads annually; 6) Conduct informal inspections annually. Informal inspections are for roads actively being used beyond the 5-year timeline; MRC will record only problems areas; 7) Make repairs, using hand tools, at the time of discovery, if feasible, or within 24 hours after initial damage to the road surface, drainage facilities, water bars, or water crossings to eliminate the likelihood of related sediment reaching Class I, II or III waters. (HCP/NCCP Appendix E, E.4.1 #1, 3, 4, 6 and 7).	HCP/NCCP Appendix E, E.4 Standards for Road Inspections and Maintenance; TMP - 3.6 Harvesting Practices and Erosion Control ; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
914.7(a)	Mechanical site preparation and timber harvesting, shall not be conducted unless a winter period operating plan is incorporated in the timber harvesting plan and is followed, or unless the requirements of subsection (c) are met. Cable, helicopter and balloon yarding methods are exempted.	Appendix E, E.2.19.1, E.6.3, E.6.4, E.6.5 and E.9: Winter work standards in Appendix E (Standards for early winter period; Standards for mid-winter period, Standards for late winter period).	HCP/NCCP - Appendix E; TMP - 3.6 Harvesting Practices and Erosion Control ; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
914.7(b)	The winter period operating plan shall include the specific measures to be taken in winter timber operations to minimize damage due to erosion, soil movement into watercourses and soil compaction from felling, yarding, loading, mechanical site preparation, and erosion control activities. A winter period operating plan shall address the following subjects:	Appendix E, E.2.19.1, E.6.3, E.6.4, E.6.5 and E.9: Winter work standards in Appendix E (Standards for early winter period; Standards for mid-winter period, Standards for late winter period).	HCP/NCCP - Appendix E; TMP - 3.6 Harvesting Practices and Erosion Control ; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
914.7(b)(3)	Yarding system (constructed skid trails)	Appendix E, E.2.19.1, E.6.3, E.6.4, E.6.5 and E.9: Winter work standards in Appendix E (Standards for early winter period; Standards for mid-winter period, Standards for late winter period).	HCP/NCCP - Appendix E; TMP - 3.6 Harvesting Practices and Erosion Control ; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
914.7(b)(4)	Operating period	Appendix E, E.2.19.1, E.6.3, E.6.4, E.6.5 and E.9: Winter work standards in Appendix E (Standards for early winter period; Standards for mid-winter period, Standards for late winter period).	HCP/NCCP - Appendix E; TMP - 3.6 Harvesting Practices and Erosion Control ; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
914.7(b)(5)	Erosion control facilities timing	Appendix E, E.2.19.1, E.6.3, E.6.4, E.6.5 and E.9: Winter work standards in Appendix E (Standards for early winter period; Standards for mid-winter period, Standards for late winter period).	HCP/NCCP - Appendix E; TMP - 3.6 Harvesting Practices and Erosion Control ; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
914.7(b)(7)	Ground conditions (soil moisture conditions, frozen).	Appendix E, E.2.19.1, E.6.3, E.6.4, E.6.5 and E.9: Winter work standards in Appendix E (Standards for early winter period; Standards for mid-winter period, Standards for late winter period).	HCP/NCCP - Appendix E; TMP - 3.6 Harvesting Practices and Erosion Control ; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
914.7(b)(9)	Operations within the WLPZ	Appendix E, E.2.19.1, E.6.3, E.6.4, E.6.5 and E.9: Winter work standards in Appendix E (Standards for early winter period; Standards for mid-winter period, Standards for late winter period).	HCP/NCCP - Appendix E; TMP - 3.6 Harvesting Practices and Erosion Control ; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
914.7(b)(10)	Equipment use limitations	Appendix E, E.2.19.1, E.6.3, E.6.4, E.6.5 and E.9: Winter work standards in Appendix E (Standards for early winter period; Standards for mid-winter period, Standards for late winter period).	HCP/NCCP - Appendix E; TMP - 3.6 Harvesting Practices and Erosion Control ; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
914.7(b)(11)	Known unstable areas	Appendix E, E.2.19.1, E.6.3, E.6.4, E.6.5 and E.9: Winter work standards in Appendix E (Standards for early winter period; Standards for mid-winter period, Standards for late winter period).	HCP/NCCP - Appendix E; TMP - 3.6 Harvesting Practices and Erosion Control ; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
914.8(d)	Watercourse crossing facilities not constructed to permanent crossing standards on tractor roads shall be removed before the beginning of the winter period. If a watercourse crossing is to be removed, it shall be removed in accordance with 14 CCR § 923.3 [943.3, 963.3], subsection (d).	Appendix E, E.8.1 **Standards for Skid Trails**: 18.Remove all watercourse crossings prior to October 15 or follow the standards for the early winter period.	HCP/NCCP - Appendix E; TMP - 3.6 Harvesting Practices and Erosion Control ; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
914.8(e)	If the watercourse crossing involves a culvert, the minimum diameter shall be stated in the THP and the culvert shall be of a sufficient length to extend beyond the fill material.	Appendix E, E.8.1 **Standards for Skid Trails**: 4. Use a prepared watercourse crossing, such as a bridge, culvert, or temporary culvert, to protect the watercourse from siltation, where tractor roads cross a watercourse in which water may be present during the life of the crossing.	HCP/NCCP - Appendix E; TMP - 3.6 Harvesting Practices and Erosion Control ; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
915	Site preparation shall be planned and conducted in a manner which encourages maximum timber productivity, minimizes fire hazards, prevents substantial adverse effects to soil resources and to fish and wildlife habitat, and prevents degradation of the quality and beneficial uses of water. The following provisions shall be applied in a manner which complies with this standard.	Maintain the current (2012) CFPR standard.	TMP - 1.5.7 and 3.6 - Site Preparation; TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; HCP/NCCP - Standards related to TSUs (8.3.3.1 Mass Wasting), aquatic resources (8.4.2 Conservation measures for hydrologic change; 8.3.3.2 Roads, skid trails, and landings; 8.2.3 Class I and Large Class II AMZ; 8.2.3.2 Small Class II AMZ; 8.2.3.3. Class III AMZ; 8.2.3.5 Wetlands, wet meadows, wet areas, seeps, and springs; terrestrial wildlife (10.3.1.3 Conservation measures for northern spotted owls; 10.3.2.3 Conservation measures for marbled murrelet; 10.3.3.3 Conservation measures for Point Arena mountain beaver); terrestrial wildlife habitat (9.2.3 Conservation measures for snags, downed wood, and wildlife trees; 9.3.3 Conservation measures for hardwoods; 9.4.3 Conservation measures for old growth trees; 9.5.3 Conservation measures for rocky outcrops), aquatic wildlife (10.2.1.3 Conservation measures for Chinook salmon, coho salmon, and steelhead; 10.2.2.3 Conservation measures for red-legged frog; 10.2.3.3 Conservation measures for coastal tailed frog), and natural comunities (9.6.1.3 Conservation measures for common natural communities; 9.6.2.3 Conservation measures for uncommon natural communities)will address impacts to fish, water, and wildlife while the TMP will address all potential adverse impacts.	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern; 3.9 and 4.9 Timber; 3.10 and 4.10 Hazards

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
915.2(b)	Broadcast burning shall not fully consume the larger organic debris which retains soil on slopes and stabilizes watercourse banks. The Director may approve exceptions to this requirement when such exceptions are explained and justified in the THP and the exceptions would provide for the protection of the beneficial uses of water or control erosion to a standard at least equal to that which would result from application of the standard rule.	Maintain the current (2012) CFPR standard.	TMP - 1.5.7 and 3.6 - Site Preparation; TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; HCP/NCCP - Standards related to TSUs, (8.3.3.1 Mass Wasting), aquatic resources (8.4.2 Conservation measures for hydrologic change; 8.3.3.2 Roads, skid trails, and landings; 8.2.3 Class I and Large Class II AMZ; 8.2.3.2 Small Class II AMZ; 8.2.3.3. Class III AMZ; 8.2.3.5 Wetlands, wet meadows, wet areas, seeps, and springs;, terrestrial wildlife (10.3.1.3 Conservation measures for northern spotted owls; 10.3.2.3 Conservation measures for marbled murrelet; 10.3.3.3 Conservation measures for Point Arena mountain beaver);, terrestrial wildlife habitat (9.2.3 Conservation measures for snags, downed wood, and wildlife trees; 9.3.3 Conservation measures for hardwoods; 9.4.3 Conservation measures for old growth trees; 9.5.3 Conservation measures for rocky outcrops), aquatic wildlife 10.2.1.3 Conservation measures for Chinook salmon, coho salmon, and steelhead; 10.2.2.3 Conservation measures for red-legged frog; 10.2.3.3 Conservation measures for coastal tailed frog), and natural communities Conservation measures for common natural communities; 9.6.2.3 Conservation measures for uncommon natural communities) will address impacts to fish, water, and wildlife while the TMP will address all potential adverse impacts	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
915.3(a)	Site preparation activities shall comply with the watercourse and lake protection requirements in 14 CCR Article 6 and 917.3 [937.3, 957.3].	Maintain the current (2012) CFPR standard.	TMP - 1.5.7 and 3.6 - Site Preparation; TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; HCP/NCCP - Standards related to TSUs, (8.3.3.1 Mass Wasting), aquatic resources (8.4.2 Conservation measures for hydrologic change; 8.3.3.2 Roads, skid trails, and landings; 8.2.3 Class I and Large Class II AMZ; 8.2.3.2 Small Class II AMZ; 8.2.3.3. Class III AMZ; 8.2.3.5 Wetlands, wet meadows, wet areas, seeps, and springs;, terrestrial wildlife (10.3.1.3 Conservation measures for northern spotted owls; 10.3.2.3 Conservation measures for marbled murrelet; 10.3.3.3 Conservation measures for Point Arena mountain beaver); terrestrial wildlife habitat (9.2.3 Conservation measures for snags, downed wood, and wildlife trees; 9.3.3 Conservation measures for hardwoods; 9.4.3 Conservation measures for old growth trees; 9.5.3 Conservation measures for rocky outcrops), aquatic wildlife 10.2.1.3 Conservation measures for Chinook salmon, coho salmon, and steelhead; 10.2.2.3 Conservation measures for red-legged frog; 10.2.3.3 Conservation measures for coastal tailed frog), and natural communities Conservation measures for common natural communities; 9.6.2.3 Conservation measures for uncommon natural communities) will address impacts to fish, water, and wildlife while the TMP will address all potential adverse impacts	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
915.3(b)	Site preparation activities shall comply with the wildlife and habitat protection provisions of 14 CCR Article 9.	Maintain the current (2012) CFPR standard.	TMP - 1.5.7 and 3.6 - Site Preparation; TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; HCP/NCCP - Standards related to TSUs, (8.3.3.1 Mass Wasting), aquatic resources (8.4.2 Conservation measures for hydrologic change; 8.3.3.2 Roads, skid trails, and landings; 8.2.3 Class I and Large Class II AMZ; 8.2.3.2 Small Class II AMZ; 8.2.3.3. Class III AMZ; 8.2.3.5 Wetlands, wet meadows, wet areas, seeps, and springs;, terrestrial wildlife (10.3.1.3 Conservation measures for northern spotted owls; 10.3.2.3 Conservation measures for marbled murrelet; 10.3.3.3 Conservation measures for Point Arena mountain beaver); terrestrial wildlife habitat (9.2.3 Conservation measures for snags, downed wood, and wildlife trees; 9.3.3 Conservation measures for hardwoods; 9.4.3 Conservation measures for old growth trees; 9.5.3 Conservation measures for rocky outcrops), aquatic wildlife 10.2.1.3 Conservation measures for Chinook salmon, coho salmon, and steelhead; 10.2.2.3 Conservation measures for red-legged frog; 10.2.3.3 Conservation measures for coastal tailed frog), and natural communities Conservation measures for common natural communities; 9.6.2.3 Conservation measures for uncommon natural communities) will address impacts to fish, water, and wildlife while the TMP will address all potential adverse impacts	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.5 and 4.5 Vegetation and Plant Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

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915.3(c)	Site preparation shall be performed in a manner which does not deleteriously affect species which are threatened, endangered, or designated by the Board as species of special concern. The Director may allow exceptions to this standard in the plan, after consultation with the Department of Fish and Game pursuant to the California Endangered Species Act (F&G Code 2050-2098).	Maintain the current (2012) CFPR standard.	TMP - 1.5.7 and 3.6 - Site Preparation; TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; HCP/NCCP - Standards related to TSUs, (8.3.3.1 Mass Wasting), aquatic resources (8.4.2 Conservation measures for hydrologic change; 8.3.3.2 Roads, skid trails, and landings; 8.2.3 Class I and Large Class II AMZ; 8.2.3.2 Small Class II AMZ; 8.2.3.3. Class III AMZ; 8.2.3.5 Wetlands, wet meadows, wet areas, seeps, and springs; terrestrial wildlife (10.3.1.3 Conservation measures for northern spotted owls; 10.3.2.3 Conservation measures for marbled murrelet; 10.3.3.3 Conservation measures for Point Arena mountain beaver); terrestrial wildlife habitat (9.2.3 Conservation measures for snags, downed wood, and wildlife trees; 9.3.3 Conservation measures for hardwoods; 9.4.3 Conservation measures for old growth trees; 9.5.3 Conservation measures for rocky outcrops), aquatic wildlife 10.2.1.3 Conservation measures for Chinook salmon, coho salmon, and steelhead; 10.2.2.3 Conservation measures for red-legged frog; 10.2.3.3 Conservation measures for coastal tailed frog), and natural communities Conservation measures for common natural communities; 9.6.2.3 Conservation measures for uncommon natural communities) will address impacts to fish, water, and wildlife while the TMP will address all potential adverse impacts	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.5 and 4.5 Vegetation and Plant Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

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Article 6	Watercourse and Lake Protection			
916.2(b)	The State's waters are grouped into four classes based on key beneficial uses. These classifications shall be used to determine the appropriate protection measures to be applied during the conduct of timber operations. The basis for classification (characteristics and key beneficial uses) are set forth in 14 CCR § 916.5 [936.5, 956.5], Table 1 and the range of appropriate protective measures applicable to each class are contained in 14 CCR §§ 916.3 [936.3, 956.3], 916.4 [936.4, 956.4], and 916.5 [936.5, 956.5] and 916.9 [936.9, 956.9] when the plan is in a planning watershed with listed anadromous salmonids.	Maintain the current (2012) CFPR standard.	HCP/NCCP - Definition of watercourse classes (8.2.1.1.2); TMP 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
916.3	The quality and beneficial uses of water shall not be unreasonably degraded by timber operations. During timber operations, the timber operator shall not place, discharge, or dispose of or deposit in such a manner as to permit to pass into the water of this state, any substances or materials, including, but not limited to, soil, silt, bark, slash, sawdust, or petroleum, in quantities deleterious to fish, wildlife, or the quality and beneficial uses of water. All provisions of this article shall be applied in a manner which complies with this standard.	Maintain the current (2012) CFPR standard.	TMP 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.10 and 4.10 Hazards and Hazardous Substances
916.3(a)	When there is reasonable expectation that slash, debris, soil, or other material resulting from timber operations, falling or associated activities, will be deposited in Class I and Class II waters below the watercourse or lake transition line or in watercourses which contain or conduct Class IV water, those harvest activities shall be deferred until equipment is available for its removal, or another procedure and schedule for completion of corrective work is approved by the Director.	Maintain the current (2012) CFPR standard.	TMP 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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916.3(c)	The timber operator shall not construct or reconstruct roads, construct or use tractor roads or landings in Class I, II, III or IV watercourses, in the WLPZ, marshes, wet meadows, and other wet areas unless when explained and justified in the THP by the RPF, and approved by the Director, except as follows:	Exclude all equipment in Class I and Large Class II AMZs and restrict equipment in Class III AMZs unless there is an allowable use. (C§8.2.3.1.8-1) ALLOWABLE USE: MRC may construct – only rarely (perhaps once every 3 years, lessening over time) and after obtaining approval of the wildlife agencies – a new skid trail, landing, or designate skid trail if: alternatives would create a greater risk and magnitude of sediment delivery; all mitigations, approved by the wildlife agencies, are fully implemented; All trees felled for construction of these new facilities in an AMZ within the inner and middle bands have the “key piece size” logs set aside for LWD placement, either in the vicinity of the new facilities or near watercourse sections deficient in LWD. MRC may construct – only rarely (perhaps once every 3 years, lessening over time) and after obtaining approval of the wildlife agencies – new roads to watercourse approaches within an AMZ, if: the road does not parallel a watercourse; each approach on either side of a watercourse does not exceed 200 ft; all trees felled for construction of these new facilities in an AMZ within the inner and middle bands have the “key piece size” logs set aside for LWD placement, either in the vicinity of the new facilities or near watercourse sections deficient in LWD. MRC may construct – only rarely (perhaps once every 3 years, lessening over time) and after obtaining approval of the wildlife agencies – a road segment not associated with a crossing or approach to a crossing if: alternatives would create a greater risk and	HCP/NCCP C§8.2.3.1.8-1; HCP/NCCP C§8.2.3.2.5-1 ; HCP/NCCP C§8.2.3.3.5-2; HCP/NCCP C§8.2.3.5.1-1 and HCP/NCCP C§8.2.3.5.1-2 HCP/NCCP C§8.2.3.5.2-2 and HCP/NCCP C§8.2.3.5.2-3; TMP 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
		magnitude of sediment delivery; all mitigations approved by the wildlife agencies are fully implemented; all trees felled for construction of these new facilities in an AMZ within the inner and middle bands have the “key piece		

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
916.3(c)(1)	At prepared tractor road crossings as described in 914.8(b) [934.8(b), 954.8(b)].	Maintain the current (2012) CFPR standard.	TMP 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
916.3(c)(2)	Crossings of Class III watercourses which are dry at the time of timber operations.	C§8.2.3.3.5-2 – Limit all heavy equipment unless there is an allowable use. ALLOWABLE USE – MRC may construct new truck and skid trail crossings if: alternatives would create a greater risk and magnitude of sediment delivery.	TMP 3.8 Watercourse and Lake Protection; Equipment exclusion in Class III AMZs; HCP/NCCP C§8.2.3.3.5-2	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
916.3(c)(3)	At existing road crossings.	CLASS I and LARGE CLASS II - C§8.2.3.1.8 -1 Exclude all equipment in Class I and Large Class II AMZs and restrict equipment in Class III AMZs unless there is an allowable use. ALLOWABLE USE: *Erosion control or restoration:* MRC may use a skid trail or landing one-time-only to control erosion or conduct restoration. Upon completing operations, we will decommission the skid trail or landing. *Existing skid trails, landings, or skid trail crossings:* MRC may use – only rarely (perhaps 4 times a year) – an existing skid trail, landing, or designated skid trail crossing that does not require any reconstruction if alternatives would create a great risk and magnitude of sediment delivery; perched material is pulled back from landings and that landings shaped to prevent rill erosion by draining them into a rocked face outlet; surface areas ≥ 25 ft^2 are mulched, rocked, or covered in slash compacted by a tractor. *Existing Roads:* MRC may use and maintain existing	HCP/NCCP C§8.2.3.1.8-1; HCP/NCCP C§8.2.3.2.5-1; HCP/NCCP C§8.2.3.3.5-2; TMP 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
		roads in AMZs. HCP/NCCP Appendix E, E.2.5 #3 **Class I and Class II** MRC may use an existing landing that does not require any reconstruction, if relevant conservation measures (C§8.2.3.1.8-1) are applied (this would include landings with existing crossings). SMALL CLASS II. HCP/NCCP C§8.2.3.2.5-1– Exclude all equipment unless there is an allowable use *Erosion control or restoration:* MRC may use a skid trail or landing one-time-only to control erosion or conduct restoration. Upon completing operations, we will decommission the skid trail or landing. *Existing skid trails, landings, or skid trail crossings:* MRC may use – only rarely (perhaps 4 times a year) – an existing skid trail, landing, or designated skid trail crossing that does not require any reconstruction if alternatives would create a great risk and magnitude of sediment delivery; perched material is pulled back from landings and that landings shaped to prevent rill erosion by draining them into a rocked face outlet; surface areas ≥ 25 ft^2 are mulched, rocked, or covered in slash compacted by a tractor. *Existing Roads:* MRC may use and maintain existing roads in AMZs. HCP/NCCP Appendix E, E.2.5 #3 **Class I and Class II** MRC may use an existing landing that does not require any reconstruction, if relevant conservation measures		

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		(C§8.2.3.1.8-1) are applied (this would include landings with existing crossings). CLASS III C§8.2.3.3.5-2 – Limit all heavy equipment use unless there is an allowable use. ALLOWABLE USE: *Existing skid trails and landings:* MRC may use stable, existing skid trails and landings. We will mulch or slash skid trails and landings upon completion of operations or before the winter period, whichever comes first. *Existing roads:* MRC may use and maintain existing roads. Appendix E, E.2.5 #3 **Class III** MRC may use stable existing landings.		
916.3(c)(4)	At new tractor and road crossings approved as part of the Fish and Game Code process (F&GC 1600 et seq.).	HCP/NCCP Appendix T; Item VI; Notification for authorization to proceed (“subnotifications”).	HCP/NCCP Appendix T, Item VI: Notification for authorization to proceed (“subnotifications”). TMP 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
916.3(d)	Vegetation, other than commercial species, bordering and covering meadows and wet areas shall be retained and protected during timber operations unless explained and justified in the THP and approved by the Director. Soil within the meadows and wet areas shall be protected to the maximum extent possible.	C§8.2.3.5.1-1 – Maintain a 25-ft EEZ (excluding existing roads) around wetlands, wet meadows, and wet areas that are more than 10 ft^2 and less than 50 ft^2 in surface area. C§8.2.3.5.1-2 – Maintain a 50-ft EEZ (excluding existing roads) around wetlands, wet meadows, and wet areas that are more than 50 ft2 in surface area. C§8.2.3.5.2-3 Apply a 50-ft EEZ (excluding existing roads) and a 50% canopy retention requirement to seeps or springs that do not drain into a defined watercourse and are unable to deliver sediment to higher order streams.	HCP/NCCP C§8.2.3.5.1-1; HCP/NCCP C§8.2.3.5.1-2; HCP/NCCP C§8.2.3.5.2-3	3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.5 and 4.5 Vegetation and Plant Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
916.3(e)	Trees cut within the WLPZ shall be felled away from the watercourse by pulling or other mechanical methods if necessary, in order to protect the residual vegetation in the WLPZ. Exceptions may be proposed in the THP and used when approved by the Director.	Maintain the current (2012) CFPR standard. EXCEPT Alternative ONLY for placing LWD in streams; otherwise maintain 2012 CFPR rule. Alternative standard: C§8.2.3.1.7-4 Follow 1 of these practices when trees, within the first 10 ft of the watercourse channel, are removed for cable corridors: leave trees in the AMZ for LWD; place tres in the active channel as per the instream LWD enhancement guidelines, if feasible. C§8.2.3.2.4-4 – Follow 1 of these practices when trees, within the first 10 ft of the watercourse channel, are removed for cable corridors: leave the trees in the AMZ for LWD; place trees in the active channel as per the instream LWD enhancement guidelines, if feasible. 8.2.3.6-4 (Push standing trees into a watercourse with heavy equipment, as long as rootwads remain attached to LWD), -10 (Permit the placement as LWD of 1 tree designated for large tree retention within a 330 ft segment of an AMZ, if the watercourse does not meet the target for key piece loading), and -11 (Fell trees into a stream channel provided the length of the tree segment that will interact with the stream channel is at least 1.5 times the width of the bankfull channel. **NOTE:** This primarily refers to trees cut for a cable corridor.	TMP 3.8 Watercourse and Lake Protection; HCP/NCCP C§8.2.3.1.7-4; HCP/NCCP C§8.2.3.2.4-4; 8.2.3.6 LWD placement	3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.5 and 4.5 Vegetation and Plant Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
916.3(f)	Where less than 50% canopy exists in the WLPZs of Class I and II waters before timber operations, only sanitation salvage which protects the values described in 14 CCR 916.4(b) [936.4(b), 956.4(b)] shall be allowed.	**HCP/NCCP C§8.2.3.4 AMZ restoration treatments** C§8.2.3.2.2-1: Maintain, on average, 50% canopy over the width of the AMZ within 330 ft (100 m) segments.	HCP/NCCP C§8.2.3.1.2-1; HCP/NCCP C§8.2.3.2.2-1 ; TMP 3.7 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
916.3(g)	Recruitment of large woody debris for instream habitat shall be provided by retaining at least two living conifers per acre at least 16 inches diameter breast high and 50 ft. tall within 50 ft. of all Class I and II watercourses.	CLASS I AND LARGE CLASS II AMZ: C§8.2.3.1.4-1 Retain a percentage of the largest trees based on channel sensitivity to LWD. High sensitivity: retain 30% in inner band, 15% in middle band. Moderate sensitivity: retain 20% in inner band, 10% in middle band. Low sensitivity: retain 10% in inner band, 5% in middle band.	HCP/NCCP C§8.2.3.1.4-1; TMP 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
916.4	**Watercourse and Lake Protection**			
916.4(b)	The standard width of the WLPZ and/or the associated basic protection measures shall be determined from Table I (14 CCR 916.5 [936.5, 956.5]) or Section 916.4(c) [956.4(c), 956.4(c)], and shall be stated in the plan. A combination of the rules, the plan, and mitigation measures shall provide protection for the following: a. Water temperature control, b) streambed and flow modification by large woody debris, c) filtration of organic and inorganic material, d) upslope stability, e) bank and channel stabilization, f) spawning and rearing habitat for slamonids, g) vegetation structure and diversity for wildlife habitat, possibly including but not limited to: 1) vertical diversity, 2) migration corridor, 3) nesting, roosting, and escape, 4) food abundance, 5) microclimate modification, 6) snags, and 7) surface cover.	**HCP/NCCP C§8.2.3.1.1-1.** Establish AMZ widths by watercourse class and slope class. **Class I** 0-30% -- inner 0-50 ft, middle 50-100 ft, outer 100-130 ft; Slope class 30-50% inner 0-50 ft; middle 50-130 ft; outer 130-150 ft; Slope class >50% inner 0-50 ft; middle 50-150 ft; outer 150-190 ft. **Large Class II** Slope class 0-30% inner 0-25 ft; middle 25-50 ft; outer 50-100 ft; Slope class 30-50% inner 0-25 ft; middle 25-75 ft; outer 75-130 ft; Slope class >50% Inner 0-25 ft; middle 25-100 ft; outer 100-150 ft. **HCP/NCCP C§8.2.3.1.2**-1 Develop or retain canopy in the inner, middle, and outer band of the AMZ: inner band 85% canopy; middle band 70% canopy; outer band 50% canopy. **HCP/NCCP C§8.2.3.1.3-1** Retain in Site Class I, post harvest, 240 ft^2/ac or 75% of the pre-harvest basal area, whichever is greater. **HCP/NCCP C§8.2.3.1.3-2** Retain in Site Class II or	HCP/NCCP C§8.2.3.1.1-1; HCP/NCCP C§8.2.3.1.2-1; HCP/NCCP C§8.2.3.1.3-1-3; HCP/NCCP C§8.2.3.1.4-1 HCP/NCCP C§8.2.3.1.5-1-5; HCP/NCCP C§8.2.3.5.1-15-18; HCP/NCCP C§8.2.3.5.1-25-27; HCP/NCCP C§8.2.3.1.7-1-4; HCP/NCCP C§8.2.3.2.1-1; HCP/NCCP C§8.2.3.2.2-1; HCP/NCCP C§8.2.3.2.3-1-3; HCP/NCCP C§8.2.3.2.4-1-4; HCP/NCCP C§8.2.3.3.1-1; HCP/NCCP C§8.2.3.3.2-1; HCP/NCCP C§8.2.3.3.3-1-3; HCP/NCCP C§8.2.3.3.4-1-3 TMP 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

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		III, post-harvest, 200 ft^2/ac or 75% of the pre-harvest basal area, whichever is greater. **HCP/NCCP C§8.2.3.1.3-3** Retain in Site Class IV and V, post-harvest, 160 ft^2/ac or 75% of the pre-harvest basal area, whichever is greater. **HCP/NCCP C§8.2.3.1.4-**1 Retain a percentage of the largest trees based on channel sensitivity to LWD: High sensitivity: retain 30% in inner band, 15% in middle band; Moderate sensitivity: retain 20% in inner band, 10% in middle band; Low sensitivity: retain 10% in inner band, 5% in middle band. **HCP/NCCP C§8.2.3.1.5-1** Apply silvicultural treatments to develop or maintain late seral forest conditions, such as thinning from below or individual tree selection. **HCP/NCCP C§8.2.3.1.5-2** Use high retention selection that meets basal area and canopy requirements. **HCP/NCCP C§8.2.3.1.5-3** Maintain or increase conifer dominance – if necessary, by controlling hardwoods. **HCP/NCCP C§8.2.3.1.5-4** Ensure that redwood clonal groups or "clumps" have no more than 50% of their stems greater than 8 in dbh removed per entry. **HCP/NCCP C§8.2.3.1.5-5** Do not harvest trees from the inner band if shelterwood or seed tree removal occurs in the outer band for that rotation. **HCP/NCCP C§8.2.3.1.5-15** Apply silvicultural treatments to develop or maintain late seral forest conditions, such as thinning from below or individual tree selection. **HCP/NCCP C§8.2.3.1.5-16** Use high retention selection that meets basal area and canopy requirements. **HCP/NCCP C§8.2.3.1.5-17** Maintain or increase		

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		conifer dominance – if necessary, by controlling hardwoods. **HCP/NCCP C§8.2.3.1.5-18** Do not harvest from the middle band if shelterwood or seed tree removal occurs in the outer band for that rotation, unless this is an AMZ restoration harvest. **HCP/NCCP C§8.2.3.1.5-25** Maintain or increase conifer dominance – if necessary by controlling hardwoods. **HCP/NCCP C§8.2.3.1.5-26** Maintain, on average, 50% canopy within 330 ft (100 m) sections. **HCP/NCCP C§8.2.3.1.5-27** Limit harvest openings to ¼ acre in size. **HCP/NCCP C§8.2.3.1.7-1** Retain all trees whose trunks (a) are within 10 ft of te bankfull channel or within 10 ft of a watercourse or lake transition zone where there is no delineated bankfull channel; or (b) have roots visible in the bank; or (c) provide anchor to an over-hanging bank, unless it is necessary to remove trees to create a cable corridor. **HCP/NCCP C§8.2.3.1.7-2** Start the 10-ft retention zone at the landward edge of an undercut bank, using visual determination. **HCP/NCCP C§8.2.3.1.7-3** Ensure that redwood clonal groups or "clumps" have no more than 50% of their greater than 8 in dbh removed per entry. **HCP/NCCP C§8.2.3.1.7-4** Follow 1 of these practices when trees, within the frst 10 ft of the watercourse channel, are removed for cable corridors: leave the trees in the AMZ for LWD; place trees in the active channel as per the instream LWD enhancement guidelines, if feasible. **SMALL CLASS IIS HCP/NCCP C§8.2.3.2.1-1** - Establish AMZ widths – 0-30% slope = 50 ft; 30-50% slope = 75		

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		ft; > 50% slope = 100 ft. **HCP/NCCP C§8.2.3.2.2-1** Maintain, on average, 50% canopy over the width of the AMZ within 330 ft (100 m) segments. **HCP/NCCP C§8.2.3.2.3-1** Maintain or enhance uneven-aged conditions. **HCP/NCCP C§8.2.3.2.3-2** Harvest so that trees are dispersed in a relatively uniform manner. **HCP/NCCP C§8.2.3.2.3-3** Maintain or increase conifer dominance – if necessary, by controlling hardwoods. **HCP/NCCP C§8.2.3.2.4-1** Retain all trees whose trunks (a) are within 10 ft of the bankfull channel or within 10 ft of a watercourse or lake transition zone where there is no delineated bankfull channel; or (b) have roots visible in the bank; or (c) provide anchor to an over-hanging bank, unless it is necessary to remove trees to create a cable corridor. **HCP/NCCP C§8.2.3.2.4-2** Start the 10-ft retention zone at the landward edge of an undercut bank, using visual determination. **HCP/NCCP C§8.2.3.2.4-3** Ensure the redwood clonal groups or "clumps" have no more than 50% of their stems greater than 8 in dbh removed per entry. **HCP/NCCP C§8.2.3.2.4-4** Follow 1 of these practices when trees, within the first 10 ft of the watercourse channel, are removed for cable corridors: leave the trees in the AMZ for LWD; place trees in the active channel as per the instream LWD enhancement guidelines, if feasible. **CLASS III HCP/NCCP C§8.2.3.3.1-1** Establish AMZ widths: 0-30% slope = 25 ft; >30% slope = 50 ft. **HCP/NCCP C§8.2.3.3.2-1** Maintain, on average, 50% canopy over the width of		

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		the AMZ in the 330 ft (100 m) sections. **HCP/NCCP C§8.2.3.3.3-1** Maintain or enhance uneven-aged conditions. **HCP/NCCP C§8.2.3.3.3-2** Harvest so that trees are dispersed in a relatively uniform manner. **HCP/NCCP C§8.2.3.3.3-3** Maintain or increase conifer dominance – if necessary, by controlling hardwoods. **HCP/NCCP C§8.2.3.3.4-1** Retain all trees whose trunks (a) are within 10 ft of the bankfull channel, or (b) have roots visible in the bank, or (c) provide anchor to an over-hanging bank, unless it is necessary to remove trees to create a cable corridor or thin a redwood clonal group. **HCP/NCCP C§8.2.3.3.4-2** Start the 10 ft retention zone at the landward edge of an undercut bank. **HCP/NCCP C§8.2.3.3.4-3** Ensure that redwood clonal groups or "clumps" have no more than 50% of their stems > 8 in dbh removed per entry.		
916.4(b)(3)	The width of the WLPZ shall be measured along the surface of the ground from the watercourse or lake transition line or in the absence of riparian vegetation from the top edge of the watercourse bank.	HCP/NCCP C§8.2.3.1.1-1 *** Measured along the slope distance from the bankfull channel or channel migration boundary. See definition of bankfull channel.	TMP 3.8 Watercourse and Lake Protection; HCP/NCCP C§8.2.3.1.1-1	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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916.4(b)(4)	Slopes shall be measured in percent for the proposed WLPZ. If topography within the proposed WLPZ is variable, segments of the proposed WLPZ should be segregated by slope class as indicated in Table I, 14 CCR 916.5 [936.5, 956.5].	**HCP/NCCP C§8.2.3.1.1-1.** Establish AMZ widths by watercourse class and slope class. **Class I** 0-30% -- inner 0-50 ft, middle 50-100 ft, outer 100-130 ft; Slope class 30-50% inner 0-50 ft; middle 50-130 ft; outer 130-150 ft; Slope class >50% inner 0-50 ft; middle 50-150 ft; outer 150-190 ft. **Large Class II** Slope class 0-30% inner 0-25 ft; middle 25-50 ft; outer 50-100 ft; Slope class 30-50% inner 0-25 ft; middle 25-75 ft; outer 75-130 ft; Slope class >50% Inner 0-25 ft; middle 25-100 ft; outer 100-150 ft.. **SMALL CLASS IIs HCP/NCCP C§8.2.3.2.1-1** - Establish AMZ widths – 0-30% slope = 50 ft; 30-50% slope = 75 ft; > 50% slope = 100 ft. **CLASS III HCP/NCCP C§8.2.3.3.1-1** Establish AMZ widths: 0-30% slope = 25 ft; >30% slope = 50 ft	HCP/NCCP C§8.2.3.1.1-1; HCP/NCCP C§8.2.3.2.1-1; CLASS III HCP/NCCP C§8.2.3.3.1-1 ; TMP 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
916.4(b)(6)	Within the WLPZ, at least 75% surface cover and undisturbed area shall be retained to act as a filter strip for raindrop energy dissipation, and for wildlife habitat. This percentage may be adjusted to meet site specific conditions when proposed by the RPF and approved by the Director or where broadcast burning is conducted under the terms of a project type burning permit and in compliance with 14 CCR 915.2(b) [935.2(b), 955.2(b)].	Maintain the current (2012) CFPR standard.	TMP 3.8 Watercourse and Lake Protections	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

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916.4(c)	The protection and WLPZ widths for Class III and Class IV waters shall prevent the degradation of the downstream beneficial use of water and shall be determined on a site-specific basis.	**HCP/NCCP C§8.2.1.1.2.** Watercourse classification and AMZ: Definition: **Aquatic Management Zone** (AMZ) is the strip along Class I, Class II, and Class III watercourses where MRC will manage riparian function. (Note: The Forest Practice Rules use the term Watercourse and Lake Protection Zone (WLPZ) to describe the riparian protection area.) HCP/NCCP C§8.2.3.3.1-1: Establish (ClassIII) AMZ widths. 0-30% slope = 25 ft > 30% slope = 50 ft	HCP/NCCP Section 8.2.3.3 Describes protections for Class III AMZs including band width, canopy, equipment limitations, etc. Class IV Table 8-1 (Watercourse Definitions, Footnoe 3, Modifications to the classifications are as follows: (a) Class I does not include domestic water sources though MRC will protect domestic water sources per CCR 916.5. addition to this rule, the HCP/NCCP measures (Chapter 8) overall were designed to have an overall net positive impact on providing filter strips within AMZs and providing for wildlife habitat; TMP 3.8 Watercourse and Lake Protections	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
916.4(c)(1)	Where operations occur adjacent to Class III watercourses, the RPF shall designate in the THP an equipment limitation zone (ELZ) of at least 25 feet where sideslope steepness is less than 30% and at least 50 feet where sideslope steepness is 30% or greater unless explained and justified otherwise in the THP and approved by the Director. Class III watercourses within logging areas where the EHR is Low and the slopes are less than 30% shall not require an ELZ unless proposed by the RPF or required by the Director. The RPF shall describe the limitations on the use of heavy equipment in the THP. Where appropriate to protect the beneficial uses of water the RPF shall describe additional protection measures which may include surface cover retention, vegetation protection and timber falling limitations. The location of the areas of heavy equipment use in any ELZ shall be clearly described in the plan, or flagged or marked on the ground before the preharvest inspection. When necessary to protect the beneficial use of water, the RPF shall designate and the Director may require a WLPZ for Class III and Class IV waters or an ELZ for Class IV waters.	**HCP/NCCP C§8.2.1.1.2.** Watercourse classification and AMZ: Definition: **Aquatic Management Zone** (AMZ) is the strip along Class I, Class II, and Class III watercourses where MRC will manage riparian function. (Note: The Forest Practice Rules use the term Watercourse and Lake Protection Zone (WLPZ) to describe the riparian protection area.) C§8.2.3.3.1-1: Establish (ClassIII) AMZ widths. 0-30% slope = 25 ft > 30% slope = 50 ft HCP/NCCP C§8.2.3.3.5-2. Limit all heavy equipment unless there is an allowable use. **ALLOWABLE USE** *Existing skid trails and landings:* MRC may use stable, existing skid trails and landings. We will mulch or slash skid trails and landings upon completion of operations or before the winter period, whichever comes first. *Existing roads:*	HCP/NCCP 8.2.3.3 Describes protections for Class III watercourses. In addition to this rule, the HCP/NCCP measures (Chapter 8) overall were designed to have an overall net positive impact on providing filter strips within AMZs and providing for wildlife habitat; TMP 3.8 Watercourse and Lake Protections	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
		MRC may use and maintain existing roads. *New roads:* MRC may construct new roads that do not parallel an AMZ. *New landings:* MRC may construct—only rarely (perhaps once a year)—a new landing within an AMZ if - Alternatives would create a greater risk and magnitude of sediment delivery. -All mitigations, approved by the wildlife agencies, are fully implemented. -All trees felled in an AMZ for construction of these new facilities have the "key piece size" logs set aside for LWD placement, either in the vicinity of the new facilities or in the nearest Class I or Class II watercourse deficient in LWD. *New truck road crossings and skid trail crossings:* MRC may construct new truck road and skid trail crossings if -Alternatives would create a greater risk and magnitude of sediment delivery. -All trees felled in an AMZ for construction of these new facilities have the "key piece size" logs set aside for LWD placement, either in the vicinity of the new facilities or in the nearest Class I or Class II watercourse deficient in LWD. HCP/NCCP C§8.2.3.3.6-1. Treat, for erosion control, areas of exposed mineral soil which are (a) at least 100 ft^2 in size and (b) not on a running surface, with mulch, grass seed, slash, or other appropriate material; for running surfaces, see Appendix E, *Roads,*		

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		Landings, and Skid Trails.		
916.4(c)(3)	Soil deposited during timber operations in a Class III watercourse other than at a temporary crossing shall be removed and debris deposited during timber operations shall be removed or stabilized before the conclusion of timber operations, or before October 15. Temporary crossings shall be removed before the winter period, or as approved by the Director.	#2.Re-install temporary Class II and Class III crossings, which require activity in the active channel, after April 1, if the crossing is dry; otherwise, re-install the temporary crossings when the channel is dry or after May 15, whichever condition occurs first. Remove the temporary crossings before the threshold for cumulative precipitation is met. **NOTE:** For temporary crossings installed prior to June 1, size the pipes to convey a 50-year storm. 8. Use temporary crossings up to October 15; use of temporary crossings can occur after October 15 but they must adhere to the standards for the early winter period or to prescriptions within the MSAA. 11. Restore, after use, the watercourse channel at the site of the temporary watercourse crossing to its approximate original configuration with all fill material removed from the site except for alluvial gravels.	HCP/NCCP - Appendix E, E.2.9 Standards for temporary watercourse crossings #2.Re-install temporary Class II and Class III crossings, which require activity in the active channel, after April 1, if the crossing is dry; otherwise, re-install the temporary crossings when the channel is dry or after May 15, whichever condition occurs first. Remove the temporary crossings before the threshold for cumulative precipitation is met. NOTE: For temporary crossings installed prior to June 1, size the pipes to convey a 50-year storm. #8. Appendix E, E.2.9 Standards for temporary watercourse crossings; TMP - 1.5.7 and 3.6 Site Preparation; TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
916.4(d)	Heavy equipment shall not be used in timber falling, yarding, or site preparation within the WLPZ unless such use is explained and justified in the THP and approved by the Director.	**HCP/NCCP C§8.2.3.1.8-1** Exclude all equipment in Class I and Large Class II AMZs and restrict equipment in Class III AMZs unless there is an allowable use. ALLOWABLE USE: MRC may use – only rarely (perhaps 4 times a year) – an existing skid trail, landing, or designated skid trail crossing that does not require reconstruction if: alternatives would create a greater risk and magnitude of sediment delivery; perched material is pulled back from landings and the landings shaped to prevent rill erosion by draining them	HCP/NCCP C§8.2.3.1.8-1; HCP/NCCP C§8.2.3.2.5-1; HCP/NCCP C§8.2.3.3.5-1; TMP - 1.5.7 and 3.6 Site Preparation; TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.7 Aquatic Habitat and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
		onto a rocked surface outlet; surface areas > 25 ft^2 are mulched, rocked, or covered in slash compacted by a tractor; ALLOWABLE USE: MRC may construct – only rarely (perhaps once every three years, lessening over time) and after obtaining approval of the wildlife agencies – a new skid trail, landing, or designated skid trail crossing if: alternatives would create a greater risk and magnitude of sediment delivery; all mitigation, approved by the wildlife agencies, are fully implemented; all trees felled for construction of these new facilities in an AMZ within the inner and middle bands have the "key piece size" logs set aside for LWD placement, either in the vicinity of the new facilities or near watercourse sections deficient in LWD. **HCP/NCCP C§8.2.3.2.5-1** Exclude all equipment unless there is an allowable use (Small Class II). Allowable use: MRC may use – only rarely (perhaps 4 times a year) – an existing skid trail, landing, or designated skid trail crossing that does not require reconstruction if: alternatives would create a greater risk and magnitude of sediment delivery; perched material is pulled back from landings and the landings shaped to prevent rill erosion by draining them onto a rocked surface outlet; surface areas > 25 ft^2 are mulched, rocked, or covered in slash compacted by a tractor; ALLOWABLE USE: MRC may construct – only rarely (perhaps once every three years, lessening over time) and after obtaining approval of the wildlife agencies – a new skid trail, landing, or designated skid trail crossing		

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		if: alternatives would create a greater risk and magnitude of sediment delivery; all mitigation, approved by the wildlife agencies, are fully implemented; all trees felled for construction of these new facilities in an AMZ within the inner and middle bands have the "key piece size" logs set aside for LWD placement, either in the vicinity of the new facilities or near watercourse sections deficient in LWD. **HCP/NCCP C§8.2.3.3.5-2** Limit all heavy equipment unless there is an allowable use (Class III). Allowable use: MRC may use stable, existing skid trails and landings. We will mulch or slash skids trails and landings upon completion of operations or before the winter period whichever comes first. MRC may construct new roads that don't parallel an AMZ. MRC may construct – only rarely (perhaps once a year) – a new landing within an AMZ if: alternatives would create a greater risk and magnitude of sediment delivery; all mitigations, approved by the wildlife agencies, are fully implemented; all trees felled in an AMZ for construction of these new facilities have the "key piece size" logs set aside for LWD placement, either in the vicinity of the new facilities or in the nearest Class I or Class II watercourse deficient in LWD *New truck road crossings and skid trail crossings:* MRC may construct new truck road and skid trail crossings if Alternatives would create a greater risk and magnitude of sediment delivery. All trees felled in an AMZ for construction of these new facilities have the "key piece size" logs set aside for		

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
		LWD placement, either in the vicinity of the new facilities or in the nearest Class I or Class II watercourse deficient in LWD.		
916.4(f)	Subsection (d) does not apply to (1)-(4) below. Subsection (e) does not apply to (2)-(4) below. (1) At prepared tractor road crossings as described in 914.8(b) [934.6(b), 954.8(b)]. (2) Crossings of Class III watercourses which are dry at the time of timber operations. (3) At existing road crossings. (4) At new tractor and road crossings approved as part of the Fish and Game Code Process (F&GC 1600 et seq.).	**HCP/NCCP C§8.2.3.1.8-1** Exclude all equipment in Class I and Large Class II AMZs and restrict equipment in Class III AMZs unless there is an allowable use. ALLOWABLE USE: *Erosion control or restoration:* MRC may use a skid trail or landing one-time-only to control erosion or conduct restoration. Upon completing operations, we will decommission the skid trail or landing. MRC may use – only rarely (perhaps 4 times a year) – an existing skid trail, landing, or designated skid trail crossing that does not require reconstruction if: alternatives would create a greater risk and magnitude of sediment delivery; perched material is pulled back from landings and the landings shaped to prevent rill erosion by draining them onto a rocked surface outlet; surface areas > 25 ft^2 are mulched, rocked, or covered in slash compacted by a tractor; ALLOWABLE USE: *Erosion control or restoration:* MRC may use a skid trail or landing one-time-only to control erosion or conduct restoration. Upon completing operations, we will decommission the skid trail or landing. MRC may construct – only rarely (perhaps once every three years, lessening over time) and after obtaining approval of the wildlife agencies – a new skid trail, landing, or designated	HCP/NCCP C§8.2.3.1.8-1 ; HCP/NCCP C§8.2.3.2.5-1; HCP/NCCP C§8.2.3.3.5-2; TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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		skid trail crossing if: alternatives would create a greater risk and magnitude of sediment delivery; all mitigation, approved by the wildlife agencies, are fully implemented; all trees felled for construction of these new facilities in an AMZ within the inner and middle bands have the "key piece size" logs set aside for LWD placement, either in the vicinity of the new facilities or near watercourse sections deficient in LWD. **HCP/NCCP C§8.2.3.2.5-1** Exclude all equipment unless there is an allowable use (Small Class II). Allowable use: MRC may use – only rarely (perhaps 4 times a year) – an existing skid trail, landing, or designated skid trail crossing that does not require reconstruction if: alternatives would create a greater risk and magnitude of sediment delivery; perched material is pulled back from landings and the landings shaped to prevent rill erosion by draining them onto a rocked surface outlet; surface areas > 25 ft^2 are mulched, rocked, or covered in slash compacted by a tractor; ALLOWABLE USE: *Erosion control or restoration:* MRC may use a skid trail or landing one-time-only to control erosion or conduct restoration. Upon completing operations, we will decommission the skid trail or landing. MRC may construct – only rarely (perhaps once every three years, lessening over time) and after obtaining approval of the wildlife agencies – a new skid trail, landing, or designated skid trail crossing if: alternatives would create a greater risk and magnitude of sediment delivery; all mitigation,		

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		approved by the wildlife agencies, are fully implemented; all trees felled for construction of these new facilities in an AMZ within the inner and middle bands have the "key piece size" logs set aside for LWD placement, either in the vicinity of the new facilities or near watercourse sections deficient in LWD. **HCP/NCCP C§8.2.3.3.5-2** Limit all heavy equipment unless there is an allowable use (Class III) Allowable use: MRC may use stable, existing skid trails and landings. We will mulch or slash skids trails and landings upon completion of operations or before the winter period whichever comes first. MRC may construct new roads that don't parallel an AMZ. MRC may construct – only rarely (perhaps once a year) – a new landing within an AMZ if: alternatives would create a greater risk and magnitude of sediment delivery; all mitigations, approved by the wildlife agencies, are fully implemented; all trees felled in an AMZ for construction of these new facilities have the "key piece size" logs set aside for LWD placement, either in the vicinity of the new facilities or in the nearest Class I or Class II watercourse deficient in LWD.		

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916.5	The following procedure for determining WLPZ widths and protective measures shall be followed:			
916.5(a)	The following information shall be determined from field investigation:			
916.5(a)(3)	The side slope classes for the individual class of waters to be protected (e.g. < 30%, 30-50%, >50%), where side slope is measured from the watercourse or lake transition line to a point 100 feet upslope from the watercourse or lake transition line, or, in the absence of riparian vegetation, from the top of the watercourse bank where slope configurations are variable, a weighted average method shall be used to determine sideslope percent.	**HCP/NCCP C§8.2.3.1.1-1.** Establish AMZ widths by watercourse class and slope class. **Class I** 0-30% -- inner 0-50 ft, middle 50-100 ft, outer 100-130 ft; Slope class 30-50% inner 0-50 ft; middle 50-130 ft; outer 130-150 ft; Slope class >50% inner 0-50 ft; middle 50-150 ft; outer 150-190 ft. **Large Class II** Slope class 0-30% inner 0-25 ft; middle 25-50 ft; outer 50-100 ft; Slope class 30-50% inner 0-25 ft; middle 25-75 ft; outer 75-130 ft; Slope class >50% Inner 0-25 ft; middle 25-100 ft; outer 100-150 ft.. Footnote *** Measured along the slope distance from bankfull channel or channel migration zone boundary. **SMALL CLASS IIs HCP/NCCP C§8.2.3.2.1-1** - Establish AMZ widths – 0-30% slope = 50 ft; 30-50% slope = 75 ft; > 50% slope = 100 ft. **CLASS III HCP/NCCP C§8.2.3.3.1-1** Establish AMZ widths: 0-30% slope = 25 ft; >30% slope = 50 ft	HCP/NCCP C§8.2.3.1.1-1; HCP/NCCP C§8.2.3.2.1-1; HCP/NCCP C§8.2.3.3.1-1; TMP 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
916.5(b)	The beneficial uses noted from the field investigations in subsection (a) shall be compared to the characteristics or key beneficial uses listed in Row 1 of Table I (14 CCR 916.5 [936.5, 956.5]) to determine the water classes (e.g. I, II, III, IV, Row 2).	HCP/NCCP - Table 8-1 covers Class I-III watercourses. HCP/NCCP Section 8.2.3.5 describes protections for and characteristic of wetlands, wet meadows, wet areas, seeps, and springs.	HCP/NCCP - Table 8-1 covers Class I-III watercourses. HCP/NCCP Section 8.2.3.5 describes protections for and characteristic of wetlands, wet meadows, wet areas, seeps, and springs/wetlands, wet meadows, and wet areas; and seeps and springs; TMP 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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916.5(c)	The standard protection zone width differentiated by slope classes determined in Subsection (a) are shown in Rows 4-7, Table I (14 CCR 916.5 [936.5, 956.5]). These widths may be modified as stated in 14 CCR 916.4(b)(5) [936.4(b)(5), 956.4(b)(5)].	**HCP/NCCP C§8.2.3.1.1-1.** Establish AMZ widths by watercourse class and slope class. **Class I** 0-30% -- inner 0-50 ft, middle 50-100 ft, outer 100-130 ft; Slope class 30-50% inner 0-50 ft; middle 50-130 ft; outer 130-150 ft; Slope class >50% inner 0-50 ft; middle 50-150 ft; outer 150-190 ft. **Large Class II** Slope class 0-30% inner 0-25 ft; middle 25-50 ft; outer 50-100 ft; Slope class 30-50% inner 0-25 ft; middle 25-75 ft; outer 75-130 ft; Slope class >50% Inner 0-25 ft; middle 25-100 ft; outer 100-150 ft.. Footnote *** Measured along the slope distance from bankfull channel or channel migration zone boundary. **SMALL CLASS IIs HCP/NCCP C§8.2.3.2.1-1** - Establish AMZ widths – 0-30% slope = 50 ft; 30-50% slope = 75 ft; > 50% slope = 100 ft. **CLASS III HCP/NCCP C§8.2.3.3.1-1** Establish AMZ widths: 0-30% slope = 25 ft; >30% slope = 50 ft **HCP/NCCP C§8.2.3.1.1-1.** For Class I and Large Class IIs, width of the middle boundary is extended 20-25 feet if cable or helicopter yarding systems are used adjacent to the Class I or Large Class II AMZ.	HCP/NCCP C§8.2.3.1.1-1; HCP/NCCP C§8.2.3.2.1-1; HCP/NCCP C§8.2.3.3.1-1 ; TMP 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
916.5(d)	The alphabetical letter designations A through I in Rows 4-7, Table 1 14 CCR 916.5 [936.5, 956.5], and described in subsection (e) to Table I indicate the standard protective measures to be applied to the classes of water as determined in subsection (b) above.	**Class I** and **Large Class II HCP/NCCP C§8.2.3.1.2**-1 Develop of retain canopy in the inner, middle, and outer band of the AMZ: inner band 85% canopy; middle band 70% canopy; outer band 50% canopy. **HCP/NCCP C§8.2.3.1.3-1** Retain in Site Class I, post harvest, 240 ft^2/ac or 75% of the pre-harvest basal area, whichever is greater. **HCP/NCCP C§8.2.3.1.3-2** Retain in Site Class II or III, post-	HCP/NCCP C§8.2.3.1.2-1; HCP/NCCP C§8.2.3.1.3-1-3; HCP/NCCP C§8.2.3.1.4-1 HCP/NCCP C§8.2.3.1.5-1-5; HCP/NCCP C§8.2.3.5.1-15-18; HCP/NCCP C§8.2.3.5.1-25-27; HCP/NCCP C§8.2.3.1.7-1-4; HCP/NCCP C§8.2.3.2.2-1; HCP/NCCP C§8.2.3.2.3-1-3; HCP/NCCP C§8.2.3.2.4-1-4; HCP/NCCP C§8.2.3.3.2-1; HCP/NCCP C§8.2.3.3.3-1-3; HCP/NCCP C§8.2.3.3.4-1-4; TMP 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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		harvest, 200 ft^2/ac or 75% of the pre-harvest basal area, whichever is greater. **HCP/NCCP C§8.2.3.1.3-3** Retain in Site Class IV and V, post-harvest, 160 ft^2/ac or 75% of the pre-harvest basal area, whichever is greater. **HCP/NCCP C§8.2.3.1.4-**1 Retain a percentage of the largest trees based on channel sensitivity to LWD: High sensitivity: retain 30% in inner band, 15% in middle band; Moderate sensitivity: retain 20% in inner band, 10% in middle band; Low sensitivity: retain 10% in inner band, 5% in middle band. **HCP/NCCP C§8.2.3.1.5-1** Apply silvicultural treatments to develop or maintain late seral forest conditions, such as thinning from below or individual tree selection. **HCP/NCCP C§8.2.3.1.5-2** Use high retention selection that meets basal area and canopy requirements. **HCP/NCCP C§8.2.3.1.5-3** Maintain or increase conifer dominance – if necessary, by controlling hardwoods. **HCP/NCCP C§8.2.3.1.5-4** Ensure that redwood clonal groups or “clumps” have no more than 50% of their stems greater than 8 in dbh removed per entry. **HCP/NCCP C§8.2.3.1.5-5** Do not harvest trees from the inner band if shelterwood or seed tree removal occurs in the outer band for that rotation. **HCP/NCCP C§8.2.3.1.5-15** Apply silvicultural treatments to develop or maintain late seral forest conditions, such as thinning from below or individual tree selection. **HCP/NCCP C§8.2.3.1.5-16** Use high retention selection that meets basal area and canopy requirements. **HCP/NCCP C§8.2.3.1.5-17** Maintain or increase conifer dominance – if necessary, by		

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		controlling hardwoods. **HCP/NCCP C§8.2.3.1.5-18** Do not harvest from the middle band if shelterwood or seed tree removal occurs in the outer band for that rotation, unless this is an AMZ restoration harvest. **HCP/NCCP C§8.2.3.1.5-25** Maintain or increase conifer dominance – if necessary by controlling hardwoods. **HCP/NCCP C§8.2.3.1.5-26** Maintain, on average, 50% canopy within 330 ft (100 m) sections. **HCP/NCCP C§8.2.3.1.5-27** Limit harvest openings to ¼ acre in size. **HCP/NCCP C§8.2.3.1.7-1** Retain all trees whose trunks (a) are within 10 ft of te bankfull channel or within 10 ft of a watercourse or lake transition zone where there is no delineated bankfull channel; or (b) have roots visible in the bank; or (c) provide anchor to an over-hanging bank, unless it is necessary to remove trees to create a cable corridor. **HCP/NCCP C§8.2.3.1.7-2** Start the 10-ft retention zone at the landward edge of an undercut bank, using visual determination. **HCP/NCCP C§8.2.3.1.7-3** Ensure that redwood clonal groups or "clumps" have no more than 50% of their greater than 8 in dbh removed per entry. **HCP/NCCP C§8.2.3.1.7-4** Follow 1 of these practices when trees, within the frst 10 ft of the watercourse channel, are removed for cable corridors: leave the trees in the AMZ for LWD; place trees in the active channel as per the instream LWD enhancement guidelines, if feasible. **SMALL CLASS IIs HCP/NCCP C§8.2.3.2.2-1** Maintain, on average, 50% canopy over the width of the AMZ within 330 ft (100 m) segments.		

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		HCP/NCCP C§8.2.3.2.3-1 Maintain or enhance uneven-aged conditions. **HCP/NCCP C§8.2.3.2.3-2** Harvest so that trees are dispersed in a relatively uniform manner. **HCP/NCCP C§8.2.3.2.3-3** Maintain or increase conifer dominance – if necessary, by controlling hardwoods. **HCP/NCCP C§8.2.3.2.4-1** Retain all trees whose trunks (a) are within 10 ft of the bankfull channel or within 10 ft of a watercourse or lake transition zone where there is no delineated bankfull channel; or (b) have roots visible in the bank; or (c) provide anchor to an over-hanging bank, unless it is necessary to remove trees to create a cable corridor. **HCP/NCCP C§8.2.3.2.4-2** Start the 10-ft retention zone at the landward edge of an undercut bank, using visual determination. **HCP/NCCP C§8.2.3.2.4-3** Ensure the redwood clonal groups or “clumps” have no more than 50% of their stems greater than 8 in dbh removed per entry. **HCP/NCCP C§8.2.3.2.4-4** Follow 1 of these practices when trees, within the first 10 ft of the watercourse channel, are removed for cable corridors: leave the trees in the AMZ for LWD; place trees in the active channel as per the instream LWD enhancement guidelines, if feasible. **CLASS III HCP/NCCP C§8.2.3.3.2-1** Maintain, on average, 50% canopy over the width of the AMZ in the 330 ft (100 m) sections. **HCP/NCCP C§8.2.3.3.3-1** Maintain or enhance uneven-aged conditions. **HCP/NCCP C§8.2.3.3.3-2** Harvest so that trees are dispersed in a relatively uniform manner. **HCP/NCCP**		

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		C§8.2.3.3.3-3 Maintain or increase conifer dominance – if necessary, by controlling hardwoods. **HCP/NCCP C§8.2.3.3.4-1** Retain all trees whose trunks (a) are within 10 ft of the bankfull channel, or (b) have roots visible in the bank, or (c) provide anchor to an over-hanging bank, unless it is necessary to remove trees to create a cable corridor or thin a redwood clonal group. **HCP/NCCP C§8.2.3.3.4-2** Start the 10 ft retention zone at the landward edge of an undercut bank. **HCP/NCCP C§8.2.3.3.4-3** Ensure that redwood clonal groups or "clumps" have no more than 50% of their stems > 8 in dbh removed per entry.		
916.5(e)	The letter designations shown in the "Protective Measures and Widths" column in Table I correspond to the following:			
916.5(e) "G"	To protect water temperature, filter strip properties, upslope stability, and fish and wildlife values, at least 50% of the overstory and 50% of the understory canopy covering the ground and adjacent waters shall be left in a well distributed multi-storied stand composed of a diversity of species similar to that found before the start of operations. The residual overstory canopy shall be composed of at least 25% of the existing overstory conifers. Species composition may be adjusted consistent with the above standard to meet on-site conditions when agreed to in the THP by the RPF and the Director.	**Class I HCP/NCCP C§8.2.3.1.2-1** Develop of retain canopy in the inner, middle, and outer band of the AMZ: inner band 85% canopy; middle band 70% canopy; outer band 50% canopy. **HCP/NCCP C§8.2.3.1.5-3** Maintain or increase conifer dominance – if necessary, by controlling hardwoods. **HCP/NCCP C§8.2.3.1.5-17** Maintain or increase conifer dominance – if necessary, by controlling hardwoods. **HCP/NCCP C§8.2.3.1.5-25** Maintain or increase conifer dominance – if necessary by controlling hardwoods. **HCP/NCCP C§8.2.3.1.5-26** Maintain, on average, 50% canopy within 330 ft (100 m) sections.	HCP/NCCP C§8.2.3.1.2-1; HCP/NCCP C§8.2.3.1.5-3; HCP/NCCP C§8.2.3.5.1-17; HCP/NCCP C§8.2.3.5.1-25-26; TMP 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
916.5(e) "H"	At least 50% of the understory vegetation present before timber operations shall be left living and well distributed within the WLPZ to maintain soil stability. This percentage may be adjusted to meet on-site conditions when agreed to in the THP by the RPF and the Director. Unless required by the Director, this shall not be construed to prohibit broadcast burning with a project type burning permit for site preparation.	HCP/NCCP **Large Class II** Develop of retain canopy in the inner, middle, and outer band of the AMZ: inner band 85% canopy; middle band 70% canopy; outer band 50% canopy. **HCP/NCCP C§8.2.3.1.5-3** Maintain or increase conifer dominance – if necessary, by controlling hardwoods. **HCP/NCCP C§8.2.3.1.5-17** Maintain or increase conifer dominance – if necessary, by controlling hardwoods. **HCP/NCCP C§8.2.3.1.5-25** Maintain or increase conifer dominance – if necessary by controlling hardwoods. **HCP/NCCP C§8.2.3.1.5-26** Maintain, on average, 50% canopy within 330 ft (100 m) sections. **SMALL CLASS IIs HCP/NCCP C§8.2.3.2.2-1** Maintain, on average, 50% canopy over the width of the AMZ within 330 ft (100 m) segments. **HCP/NCCP C§8.2.3.2.3-3** Maintain or increase conifer dominance – if necessary, by controlling hardwoods.	HCP/NCCP C§8.2.3.1.2-1; HCP/NCCP C§8.2.3.1.5-3; HCP/NCCP C§8.2.3.5.1-17; HCP/NCCP C§8.2.3.5.1-25-26; HCP/NCCP C§8.2.3.2.2-1; HCP/NCCP C§8.2.3.2.3-1-3; TMP 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
916.5(e) "I"	To protect water temperature, filter strip properties, upslope stability, and fish and wildlife values, at least 50% of the total canopy covering the ground shall be left in a well distributed multi-storied stand configuration composed of a diversity of species similar to that found before the start of operations. The residual overstory canopy shall be composed of at least 25% of the existing overstory conifers. Due to variability in Class II watercourses these percentages and species composition may be adjusted to meet on-site conditions when agreed to by the RPF and the Director in the THP.	**CLASS III HCP/NCCP C§8.2.3.3.2-1** Maintain, on average, 50% canopy over the width of the AMZ in the 330 ft (100 m) sections. **HCP/NCCP C§8.2.3.3.3-3** Maintain or increase conifer dominance – if necessary, by controlling hardwoods.	HCP/NCCP C§8.2.3.3.2-1; HCP/NCCP C§8.2.3.3.3-3; TMP 3.8 Watercourse and Lake Protection	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
916.7	Within the watercourse and lake protection zone adjacent to Class I and Class II waters, areas where mineral soil exceeding 800 continuous square feet in size, exposed by timber operations, shall be treated for reduction of soil loss. Treatment shall be done prior to October 15th except that such bare areas created after October 15th shall be so treated within 10 days, or as agreed to by the Director. Stabilization measures shall be included and explained in the THP or other required notices. Stabilization measures shall be selected that will prevent significant movement of soil into Class I and II waters and may include, but need not be limited to, mulching, rip-rapping, grass seeding, or chemical soil stabilizers.	HCP/NCCP Class I and Large Class IIs C§8.2.3.1.9-1 Treat, for erosion control, areas of exposed mineral soil which are (a) at least 100 ft^2 in size and (b) not on a running surface, with mulch, grass seed, slash, or other appropriate material. HCP/NCCP Small Class IIs C§8.2.3.2.7-1 Treat, for erosion control, areas of exposed mineral soil which are (a) at least 100 ft^2 in size and (b) not on a running surface, with mulch, grass seed, slash, or other appropriate material.	HCP/NCCP C§8.2.3.1.9-1; HCP/NCCP C§8.2.3.2.7-1; TMP 3.8 Watercourse and Lake Protection. PTHP checklist	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
916.7(b)	Where mineral soil has been exposed by timber operations on approaches to watercourse crossings of Class I or II waters, or Class III waters if an ELZ or WLPZ is required, the disturbed area shall be stabilized to the extent necessary to prevent the discharge of soil into watercourses or lakes in amounts deleterious to the quality and beneficial uses of water.	HCP/NCCP Class I and Large Class IIs C§8.2.3.1.9-1 Treat, for erosion control, areas of exposed mineral soil which are (a) at least 100 ft^2 in size and (b) not on a running surface, with mulch, grass seed, slash, or other appropriate material; for running surfaces, see Appendix E, *Roads, Landings, and Skid Trails*. HCP/NCCP Small Class IIs C§8.2.3.2.7-1 Treat, for erosion control, areas of exposed mineral soil which are (a) at least 100 ft^2 in size and (b) not on a running surface, with mulch, grass seed, slash, or other appropriate material; for running surfaces, see Appendix E, *Roads, Landings, and Skid Trails*. HCP/NCCP Class IIIs C§8.2.3.3.6-1 Treat, for erosion control, areas of exposed mineral soil which are (a) at least 100 ft^2 in size and (b) not on a running surface, with mulch, grass seed, slash, or other appropriate material; for running surfaces, see Appendix E, *Roads, Landings, and Skid Trails*.	HCP/NCCP C§8.2.3.1.9-1; HCP/NCCP C§8.2.3.2.7-1; TMP 3.8 Watercourse and Lake Protection. PTHP checklist	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
916.7(c)	Where necessary to protect beneficial uses of water from timber operations, protection measures, such as seeding, mulching, or replanting, shall be specified to retain and improve the natural ability of the ground cover within the standard width of the WLPZ to filter sediment, minimize soil erosion, and stabilize banks of watercourses and lakes.	HCP/NCCP Appendix E, E.2.4 #19 - Use straw mulch, slash, or equivalent material on fill faces within an AMZ (Appendix E, E.10). E.2.6; #2 - Use suitable energy dissipators (i.e., durable material sized to remain in place during high flows) on drainage structures and drainage facilities of roads or landings to prevent discharge on erodible fill or other erodible material #3 - Install slash, rock, rip-rap, or other suitable material prior to winter on the outlet of all road or landing drainage structures within 100 ft of a watercourse and with less than 90% vegetation buffer (i.e., less than 90% of the ground has vegetative cover). This will create a sediment trap or filter for a watercourse.	HCP/NCCP - Appendix E, .2.4 Standards for road prism #19; E.2.6, Road and Landing Surface Drainage #2, 3; Standards for road and landing surface drainage, E.2.4 Standards for road prism #19; TMP - 3.6 Harvesting Practices and Erosion Control; TMP - 3.8 Watercourse and Lake Protections; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
916.11(a)	Where timber operations will be conducted within a WLPZ, the Director may require a post-harvest evaluation of the effectiveness of the mitigations and practices designed to protect the watercourse(s) or lake(s) as a condition of plan approval. The Director shall require such an evaluation if the necessity for the evaluation is supported by substantial evidence in the record. This evidence may include, but is not limited to, potential land failures, accelerated rate of road construction or harvesting within a watershed, concentration or intensity of harvesting activity near watercourses, and potential for accelerated windthrow. The design and implementation of the evaluation shall be done in consultation with the Director, the RWQCB or DFG, and THP submitter, and the sufficiency of the information requested by the Director shall be judged in light of reasonableness and practicality. The evaluation may utilize procedures including, but not limited to: (1) Procedures for effectiveness and implementation monitoring, (2) Existing landowner monitoring programs, or (3) Photographic monitoring	HCP/NCCP 13.5.1.1-1 Timber Inventory: Riparian Stands; 13.5.1.1-2 Timber Inventory: Riparian Canopy;13.5.1.1-3) Watershed Analysis: LWD Conditions; 13.5.1.1.4 Watershed Analysis: Shade Conditions; 13.5.1.1-5 Stream Temperature; 13.5.2.1-1 Watershed Analysis: Mass Wasting; 13.5.3.1-1 Focus Watersheds: Mass Wasting; 13.5.3.1-2 Road Inventory: Sediment Prevention; 13.5.3.1-2 Watershed Analysis: Sediment Prevention; 13.5.5.1-1 Water Drafting; 13.6.1.1.-1 Anadromous Salmonid Presence ASMB; 13.6.1.1-2 Anadromous Salmonid Distribution	HCP/NCCP - Monitoring: 13.5.1.1-1; 13.5.1.1-2; 13.5.1.1-3; 13.5.1.1-4; 13.5.1.1-5; 13.5.2.1-1; 13.5.2.1-2; 13.5.3.1-1; 13.5.3.1-2; 13.5.5.1-1; 13.6.1.1-1; 13.6.1.1-2 TMP - 3.0 Operational standards; TMP - 3 Operational standards	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
917.2(a)	Except in the *[High-Use Subdistrict of the Southern Forest District,]* Southern Subdistrict of the Coast Forest District and Coastal Commission Special Treatment Areas of the Coast Forest District, the following standards shall apply to the treatment of slash created by timber operations within the plan area and on roads adjacent to the plan area, but excluding appurtenant roads. Lopping for fire hazard reduction is defined in 14 CCR 895.1. Slash to be treated by piling and burning shall be treated not later than April 1 of the year following its creation, or within 30 days following climatic access, or as justified in the plan.	Maintain the current (2012) CFPR standards EXCEPT for the Lower Alder Creek Habitat Area (LACHA). HCP/NCCP C§10.3.2.3.1-8 Treat logging debris –- between September 15th and March in the 1st year following harvest conducted in LACHA –- with means approved by the wildlife agencies, such as: 1) Lopping slash so that a minimal amount remains as ladder fuels. 2) Removing trees < 24 in. dbh to a landing 3) Cutting the top 50 ft off any tree > 24 in. dbh and removing this 50-ft segment to a landing.4) Bucking and limbing, in the forest, any segments of tree stems remaining on the ground. 5) Lopping any residual slash >30 in. after the above operations have been completed. C§10.3.2.3.1-27 Treat logging debris – between September 15th and March 24th in the 1st year following any harvest conducted in LACHA – which means approved by the wildlife agencies, such as: removing felled trees <24 in dbh to a landing; cutting the top of 50 ft off any felled tree > 24 in dbh and removing this 50-segment to a landing; bucking and limbing, in the forest, any segments of tree stems remaining on the ground; lopping any residual slash, after the above operations have been completed, that is more than 30 in.	HCP/NCCP - Measures 10.3.2.3.1-8; 10.3.2.3.1-27; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern; 3.10 and 4.10 Hazards and Hazardous Substances

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
917.2(b)	Except in the *[High-Use Subdistrict of the Southern Forest District,]* Southern Subdistrict of the Coast Forest District and Coastal Commission Special Treatment Areas of the Coast Forest District, the following standards shall apply to the treatment of slash created by timber operations within the plan area and on roads adjacent to the plan area, but excluding appurtenant roads. Lopping for fire hazard reduction is defined in 14 CCR 895.1. Within 100 feet of the edge of the traveled surface of public roads, and within 50 feet of the edge of the traveled surface of permanent *[and seasonal; Southern]* private roads open for public use where permission to pass is not required, slash created and trees knocked down by road construction or timber operations shall be treated by lopping for fire hazard reduction, piling and burning, chipping, burying or removal from the zone.	Maintain the current (2012) CFPR standards, EXCEPT for the LACHA. HCP/NCCP C§10.3.2.3.1-8 Treat logging debris -- between September 15th and March in the 1st year following harvest conducted in LACHA -- with means approved by the wildlife agencies, such as: 1) Lopping slash so that a minimal amount remains as ladder fuels. 2) Removing trees < 24 in. dbh to a landing 3) Cutting the top 50 ft off any tree > 24 in. dbh and removing this 50-ft segment to a landing.4) Bucking and limbing, in the forest, any segments of tree stems remaining on the ground. 5) Lopping any residual slash >30 in. after the above operations have been completed. C§10.3.2.3.1-27 Treat logging debris – between September 15th and March 24th in the 1st year following any harvest conducted in LACHA – which means approved by the wildlife agencies, such as: removing felled trees <24 in dbh to a landing; cutting the top of 50 ft off any felled tree > 24 in dbh and removing this 50-segment to a landing; bucking and limbing, in the forest, any segments of tree stems remaining on the ground; lopping any residual slash, after the above operations have been completed, that is more than 30 in.	HCP/NCCP - Measures 10.3.2.3.1-8; 10.3.2.3.1-27; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern; 3.10 and 4.10 Hazards and Hazardous Substances

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917.2(c)	Except in the *[High-Use Subdistrict of the Southern Forest District,]* Southern Subdistrict of the Coast Forest District and Coastal Commission Special Treatment Areas of the Coast Forest District, the following standards shall apply to the treatment of slash created by timber operations within the plan area and on roads adjacent to the plan area, but excluding appurtenant roads. Lopping for fire hazard reduction is defined in 14 CCR 895.1. All woody debris created by timber operations greater than one inch but less than eight inches in diameter within 100 feet of permanently located structures maintained for human habitation shall be removed or piled and burned; all slash created between 100-200 feet of permanently located structures maintained for human habitation shall be lopped for fire hazard reduction, removed, chipped or piled and burned; lopping may be required between 200-500 feet where unusual fire risk or hazard exist as determined by the Director or the RPF.	Maintain the current (2012) CFPR standards, EXCEPT for the LACHA. HCP/NCCP C§10.3.2.3.1-8 Treat logging debris -- between September 15th and March in the 1st year following harvest conducted in LACHA -- with means approved by the wildlife agencies, such as: 1) Lopping slash so that a minimal amount remains as ladder fuels. 2) Removing trees < 24 in. dbh to a landing 3) Cutting the top 50 ft off any tree > 24 in. dbh and removing this 50-ft segment to a landing.4) Bucking and limbing, in the forest, any segments of tree stems remaining on the ground. 5) Lopping any residual slash >30 in. after the above operations have been completed. C§10.3.2.3.1-27 Treat logging debris – between September 15th and March 24th in the 1st year following any harvest conducted in LACHA – which means approved by the wildlife agencies, such as: removing felled trees <24 in dbh to a landing; cutting the top of 50 ft off any felled tree > 24 in dbh and removing this 50-segment to a landing; bucking and limbing, in the forest, any segments of tree stems remaining on the ground; lopping any residual slash, after the above operations have been completed, that is more than 30 in.	HCP/NCCP - Measures 10.3.2.3.1-8; 10.3.2.3.1-27; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern; 3.10 and 4.10 Hazards and Hazardous Substances

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
919.2(b)	During timber operations, nest tree(s), designated perch trees(s), screening tree(s), and replacement trees(s), shall be left standing and unharmed except as otherwise provided in these following rules.	Maintain the current (2012) CFPR standards, EXCEPT for the NSO. HCP/NCCP C§10.3.1.3.1-7 – Mark and retain all known nest trees of northern spotted owls and protect them, if possible, with 4 screen trees. NSO territories with moderate protection C§10.3.1.3.1-23 -- Mark and retain all known nest trees of northern spotted owls and protect them with screen trees. NSO territories with limited protection C§10.3.1.3.1-38 – Mark and retain all known nest trees of northern spotted owls and protect them with screen trees. 9.2.1.3 Wildlife trees are: old growth trees, primary murrelet trees, trees in which the diameter of the entrance hole leading to a cavity is greater than 3 in and 10 ft or more above the ground; trees over 24 in dbh with basal hollows that are more than 12 in in any horizontal dimension and extend at least 6 in vertically inside the cavity from the topmost point of the entrance hole; trees with known raptor nests, granary trees. C§9.2.3.1-13 Retain all wildlife trees. (See notes for details on exclusions).	HCP/NCCP - 10.3.1.3.1-7; 10.3.1.3.1-23; 10.3.1.3.1-38; 10.3.2.3.10-1-6; 9.2.1.3 and 9.2.3.1-13; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
919.2(c)	Timber operations shall be planned and operated to commence as far as possible from occupied nest trees unless explained and justified by the RPF in the THP.	Maintain the current (2012) CFPR standards EXCEPT for the NSO, MAMU and LACHA. **HCP/NCCP C§10.3.1.3.1-11** Conduct only the following operations within 1000 ft (305 m) of a current spotted owl activity center: use of mainline haul roads and maintenance of mainline haul roads as designated in the HCP/NCCP Atlas (Maps 14A-C); **HCP/NCCP C§10.3.1.3.1-12** Permit helicopter operations, including service landings only 2640 ft (805 m) or more from a spotted owl activity center, measured and marked according to map distance. NSO territories with moderate protection – breeding season. **HCP/NCCP C§10.3.1.3.1-27** Conduct only the following operations within 1000 ft (305 m) of the current activity center: use of mainline haul roads and maintenance of mainline haul roads as designated in the HCP/NCCP Atlas (MAPS 14A-C); use of public roads; use and maintenance of existing MRC roads that (1) are located at least the same distance from the current spotted owl activity center as a public road or mainline haul road; or (2) are existing seasonal roads ≥ 500 ft (152 m) from the current activity center and in use during the time the spotted owl territory has been active; use of pickups and ATVs on existing roads; use of a road if an owl pair is upgraded from limited to moderate protection and has successfully reproduced while the AC was within 500 ft (152 m) of the road. **HCP/NCCP C§10.3.1.3.1-28** Permit helicopter operations – including service	HCP/NCCP C§10.3.1.3.1-11; HCP/NCCP C§10.3.1.3.1-12; HCP/NCCP C§10.3.1.3.1-27; HCP/NCCP C§10.3.1.3.1-28; HCP/NCCP C§10.3.1.3.1-39; HCP/NCCP C§10.3.1.3.1-40; HCP/NCCP C§10.3.1.3.1-42; HCP/NCCP C§10.3.2.3.1-1; HCP/NCCP C§10.3.2.3.1-2; HCP/NCCP C§10.3.2.3.10-1; HCP/NCCP C§10.3.2.3.10-4; HCP/NCCP C§10.3.2.3.10-5; HCP/NCCP C§10.3.2.3.10-6; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
		landings – that are at least 2640 ft (805 m) from an activity center, measured and marked according to map distance. NSO territories with limited protection, breeding season; breeding season **HCP/NCCP C§10.3.1.3.1-39** Protect a 500 ft (152 m) no-harvest buffer during the breeding season. **HCP/NCCP C§10.3.1.3.1-40** Permit helicopter operations – including service landings – that are at least 1320 ft (402 m) from an activity center. Non-breeding season. **HCP/NCCP C§10.3.1.3.1-42** Mark and retain all known nest trees of northern spotted owls and protect them with screen trees. Lower Alder Creek Core Area **HCP/NCCP C§10.3.2.3.1-1** Prohibit forest management operations, including timber harvest and road building. **HCP/NCCP C§10.3.2.3.1-2** Prohibit public entry into a core area, e.g., for firewood cutting or recreation. Occupied murrelet habitat in the Murrelet Habitat Zones (MHZ). **HCP/NCCP C§10.3.2.3.10-1** Limit approaches to at least a distance of 0.25 mi (0.4 km) from identified habitat tree(s) unless it involves (a) maintenance or landing on mainline haul routes, (b) the use of non-mainline roads if they are further away from an identified habitat trees than the mainline roads, (c) use of a vehicles ≤ 1 ton on existing seasonal or permanent roads; or (d) all terrain vehicles (ATVs) on existing trails. **HCP/NCCP C§10.3.2.3.10-4** Permit helicopters at least 0.50 mile (0.8 km) from identified habitat trees. **HCP/NCCP C§10.3.2.3.10-5** Conduct blasting at least 1 mile (1.6 km) from identified		

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
		habitat trees. **HCP/NCCP C§10.3.2.3.10-6** Conduct all maintenance and hauling within 0.25 miles of identified habitat trees only 2 hours after sunrise to 2 hours before sunset.		
919.2(d)	When an occupied nest site of a listed bird species is discovered during timber operations, the timber operator shall protect the nest tree, screening trees, perch trees, and replacement trees and shall apply the provisions of subsections (b) and (c) above and shall immediately notify the Department of Fish and Game and the Department of Forestry and Fire Protection. An amendment that shall be considered a minor amendment to the timber harvesting plan shall be filed reflecting such additional protection as is agreed between the operator and the Director after consultation with the Department of Fish and Game.	Maintain the current (2012) CFPR standards EXCEPT for the NSO, MAMU and LACHA. **HCP/NCCP C§10.3.1.3.1-11** Conduct only the following operations within 1000 ft (305 m) of a current spotted owl activity center: use of mainline haul roads and maintenance of mainline haul roads as designated in the HCP/NCCP Atlas (Maps 14A-C); **HCP/NCCP C§10.3.1.3.1-12** Permit helicopter operations, including service landings only 2640 ft (805 m) or more from a spotted owl activity center, measured and marked according to map distance. NSO territories with moderate protection – breeding season. **HCP/NCCP C§10.3.1.3.1-27** Conduct only the following operations within 1000 ft (305 m) of the current activity center: use of mainline haul roads and maintenance of mainline haul roads as designated in the HCP/NCCP Atlas (MAPS 14A-C); use of public roads; use and maintenance of existing MRC roads that (1) are located at least the same distance from the current spotted owl activity center as a public road or mainline haul road; or (2) are existing seasonal roads ≥ 500 ft (152 m) from the current activity center and in use during the time the spotted owl territory has been active; use of pickups and ATVs	HCP/NCCP C§10.3.1.3.1-11; HCP/NCCP C§10.3.1.3.1-12; HCP/NCCP C§10.3.1.3.1-27; HCP/NCCP C§10.3.1.3.1-28; HCP/NCCP C§10.3.1.3.1-39; HCP/NCCP C§10.3.1.3.1-40; HCP/NCCP C§10.3.1.3.1-42; HCP/NCCP C§10.3.2.3.1-1; HCP/NCCP C§10.3.2.3.1-2; HCP/NCCP C§10.3.2.3.10-1; HCP/NCCP C§10.3.2.3.10-4; HCP/NCCP C§10.3.2.3.10-5; HCP/NCCP C§10.3.2.3.10-6; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
		on existing roads; use of a road if an owl pair is upgraded from limited to moderate protection and has successfully reproduced while the AC was within 500 ft (152 m) of the road. **HCP/NCCP C§10.3.1.3.1-28** Permit helicopter operations – including service landings – that are at least 2640 ft (805 m) from an activity center, measured and marked according to map distance. NSO territories with limited protection, breeding season; breeding season **HCP/NCCP C§10.3.1.3.1-39** Protect a 500 ft (152 m) no-harvest buffer during the breeding season. **HCP/NCCP C§10.3.1.3.1-40** Permit helicopter operations – including service landings – that are at least 1320 ft (402 m) from an activity center. Non-breeding season. **HCP/NCCP C§10.3.1.3.1-42** Mark and retain all known nest trees of northern spotted owls and protect them with screen trees. Lower Alder Creek Core Area **HCP/NCCP C§10.3.2.3.1-1** Prohibit forest management operations, including timber harvest and road building. **HCP/NCCP C§10.3.2.3.1-2** Prohibit public entry into a core area, e.g., for firewood cutting or recreation. Occupied murrelet habitat in the Murrelet Habitat Zones (MHZ). **HCP/NCCP C§10.3.2.3.10-1** Limit approaches to at least a distance of 0.25 mi (0.4 km) from identified habitat tree(s) unless it involves (a) maintenance or landing on mainline haul routes, (b) the use of non-mainline roads if they are further away from an identified habitat trees than the mainline roads, (c) use of a vehicles ≤ 1 ton on existing seasonal or permanent roads; or		

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		(d) all terrain vehicles (ATVs) on existing trails. **HCP/NCCP C§10.3.2.3.10-4** Permit helicopters at least 0.50 mile (0.8 km) from identified habitat trees. **HCP/NCCP C§10.3.2.3.10-5** Conduct blasting at least 1 mile (1.6 km) from identified habitat trees. **HCP/NCCP C§10.3.2.3.10-6** Conduct all maintenance and hauling within 0.25 miles of identified habitat trees only 2 hours after sunrise to 2 hours before sunset.		
919.4	Where significant adverse impacts to non-listed species are identified, the RPF and Director shall incorporate feasible practices to reduce impacts as described in 14 CCR 898.	Maintain the current (2012) CFPR standards.	HCP/NCCP; TMP 3 Operational Standards; PTEIR analysis	3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern; 3.5 and 4.5 Vegetation and Plant Species of Concern; 3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
919.9	Northern Spotted Owl. Every proposed timber harvesting plan, NTMP, conversion permit, Spotted Owl Resource Plan, or major amendment located in the Northern Spotted Owl Evaluation Area or within 1.3 miles of a known northern spotted owl activity center outside of the Northern Spotted Owl Evaluation Area shall follow one of the procedures required in subsections (a)-(g) below for the area within the THP boundary as shown on the THP map and also for adjacent areas as specified within this section. The submitter may choose any alternative (a)-(g) that meets the on-the-ground circumstances. The required information shall be used by the Director to evaluate whether or not the proposed activity would result in the "take" of an individual northern spotted owl. When subparagraphs (a), (b), (c) or (f) are used, the Director, prior to approval of a THP, shall consult with an SOE and conduct an independent review. An SOE may aid the RPF in fulfilling the requirements within subdivision (g). The SOE may make written recommendations regarding whether the retained habitat configuration and protection measures proposed in the THP will prevent a take of the owl. In consultation with the SOE, the Director may adjust standards established by this section based on site specific circumstances in a manner which is consistent with information collected on owl behavior in California, and the prohibitions of the Federal Endangered Species Act.	Maintain the current (2012) CFPR standards.	MRC will utilize 919.9(d). HCP/NCCP Conservation measures for northern spotted owl by protection level. See HCP/NCCP 10.3.1.3.1 (measures are too numerous to list here). Appendix K.5.1 Surveying covers requirements for survey prior to implementing operations (measures are too numerous to list here). Section 13.2.1.1 Compliance under the Programmatic Timber Harvest Plan (PTHP); Section 12.3.6 Covers assessment of take for northern spotted owl. Covers compliance sections to be included in PTHP including #5, The PTHP will include maps of the following information, where relevant, as enforceable language in Section 2 of the PTHP: Northern spotted owl: Previous 3 activity centers per territory within 0.7 miles of the PTHP area and within 0.5 miles of appurtenant roads; protection level of each activity center; and pre- and post-harvest habitat maps and acreages for territories within 0.7 miles of the PTHP area. Section 12.3.6 covers assessment of take for the Northern spotted owl. TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

2012 CFPR Rule No.	**2012 CFPR Rule**	**Proposed Alternate Standard**	**Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)**	**Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)**
919.11	Where there is evidence of an active murrelet site in or adjacent to the THP area, as defined in "*Addendum to Surveying Marbled Murrelets at Inland Forested Sites: A Guide for California Coastal Forests*" C.J. Ralph, April 1991 or where there is evidence of a potential impact to a murrelet, the Director shall consult with DFG as to whether the proposed THP will result in a "take" or "jeopardy" (pursuant to the California Endangered Species Act) of the murrelet before the Director may approve or disapprove a THP. Biological Assessments submitted with the THP that are prepared according to the Department of Fish and Game Guidelines for Consultation (F&GC Sec. 2090) shall be provided to the DFG during consultation. If DFG determines jeopardy or a take will occur as a result of operations proposed in the THP, the Director shall disapprove the THP unless the THP is accompanied by authorization by a wildlife agency acting within its authority under state or federal endangered species acts.	Marbled Murrelet is covered under the HCP/NCCP, which provides for incidental take of the species. Extensive requirements are outlined in **HCP/NCCP C§10.3.2**, which are too numerous to include here, including survey efforts and convervation measures.	HCP/NCCP C§10.3.2; Section 12.3.7 discusses assessment of take of marbled murrelets. TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
919.16(a)	When late succession forest stands are proposed for harvesting and such harvest will significantly reduce the amount and distribution of late succession forest stands or their functional wildlife habitat value so that it constitutes a significant adverse impact on the environment as defined in Section 895.1, the RPF shall provide habitat structure information for such stands. A statement of objectives over time shall be included for late succession forest stands on the ownership. The THP, SYP, or NTMP shall include a discussion of how the proposed harvesting will affect the existing functional wildlife habitat for species primarily associated with late succession forest stands in the plan or the planning watershed, as appropriate, including impacts on vegetation structure, connectivity, and fragmentation. The information needed to	Type I old growth - **HCP/NCCP C§9.4.3.1-1** Do not harvest in previously unharvested stands of old growth. Section 12.3.7 discusses assessment of take of marbled murrelets. **HCP/NCCP C§9.4.3.1-2** Pursue conservation easement to permanently protect old-growth stands. **HCP/NCCP C§9.4.3.1-3** Protect a 150 ft buffer that retains at least 75% of the basal area of conifers in the Type I old growth stand. **HCP/NCCP C§9.4.3.1-4** Obtain approval of the wildlife agencies before initiating any burning in old-growth stands. **HCP/NCCP C§9.4.3.1-5** Cooperate with the wildlife agencies, on their own initiative, decide to re-introduce ecological burns in old-growth	HCP/NCCP Chapter 9 - 9.4.3.1-9.4.3.3 - Conservation measures for previously un-harvested old growth stands, previously harvested old growth stands, individual old growth trees; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
	address this subsection shall include, but is not limited to:	stands. Type II old growth - **HCP/NCCP C§9.4.3.2-1** Harvest using single-tree selection to maintain and increase mean stand diameter. **HCP/NCCP C§9.4.3.2-2** Maintain screen trees for old-growth trees and mark them with an "R" so that they are retained during harvest. **HCP/NCCP C§9.4.3.2-3** Follow these procedures, if a trees to be screened does not have at least 4 screen trees, in order to assess and retain screen trees: use 2 times the canopy spread as the distance within which to assess and retain potential screen trees; ensure that a potential screen tree is the tallest tree in the assessment quadrant and at least ½ the height of the tree to be screened. **HCP/NCCP C§9.4.3.2-4** Permit harvesting of a screen tree only if (a) there are at least 6 screen trees with intermingling limbs; (b) felling will not damage the tree to be screened; and (c) removing the harvested tree will not damage the tree to be screened. **HCP/NCCP C§9.4.3.2-5** Preserve all individual old-growth tree identified by size, characteristics, and dbh. **HCP/NCCP C§9.4.3.2-6** Obtain the approval of the wildlife agencies before initiating any burning in old-growth stands. **HCP/NCCP C§9.4.3.2-7** Cooperate if the wildlife agencies, on their own initiative, decide to re-introduce ecological burns in old-growth stands. Residual old growth trees **HCP/NCCP C§9.4.3.3-**1 Protect and preserve individual old-growth trees, both conifers and hardwoods. **HCP/NCCP C§9.4.3.3-2.** Retain all screen trees around individual old-		

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		growth trees per the guidelines in **HCP/NCCP C§9.4.3.2-2** and **HCP/NCCP C§9.4.3.2-3**.		
919.16(a)(1)	A map(s) showing: A) late succession forest stands within the planning watershed and any other stands that provide functional wildlife habitat for species primarily associated with late succession forest stands that are on the ownership, B) those stands which are currently proposed to be harvested, and C) known stands on other ownerships.	See measures contained under 919.16(a) above.	HCP/NCCP Chapter 9 - 9.4.3.1-9.4.3.3 - Conservation measures for previously un-harvested old growth stands, previously harvested old growth stands, individual old growth trees; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
919.16(a)(2)	A list of fish, wildlife and listed species known to be primarily associated with the late succession forest stands in the planning watershed(s) compiled by the RPF or supervised designee using the "California Wildlife Habitat Relationships System" (WHR), the California Natural Diversity Database, and local knowledge of the planning watershed.	See measures contained under 919.16(a) above.	HCP/NCCP Chapter 9 - 9.4.3.1-9.4.3.3 - Conservation measures for previously un-harvested old growth stands, previously harvested old growth stands, individual old growth trees; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
919.16(a)(3)	Description of functional wildlife habitat elements that are important for fish, wildlife and listed species primarily associated with late succession forest stands within the planning watershed(s).	See measures contained under 919.16(a) above.	HCP/NCCP Chapter 9 - 9.4.3.1-9.4.3.3 - Conservation measures for previously un-harvested old growth stands, previously harvested old growth stands, individual old growth trees; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
919.16(a)(4)	A description of the structural characteristics for each late succession forest stand and any other stands that provide functional wildlife habitat for species primarily associated with late succession forest stands within the planning watershed including a discussion of important functional wildlife habitat elements identified in (3). Methods used to develop the description, which may be an ocular estimate, shall also be described.	See measures contained under 919.16(a) above.	HCP/NCCP Chapter 9 - 9.4.3.1-9.4.3.3 - Conservation measures for previously un-harvested old growth stands, previously harvested old growth stands, individual old growth trees; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

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919.16(a)(5)	A description of the functional wildlife habitat objectives, such as anticipated long-term landscape patterns, stand structure for late succession forest stands and any other stands that provide functional wildlife habitat for species primarily associated with late succession forest stands, and a discussion of anticipated recruitment procedures for important functional wildlife habitat elements. Coordination of functional wildlife habitat objectives on landscape features among ownerships within mixed-ownership planning watersheds is encouraged.	See measures contained under 919.16(a) above.	HCP/NCCP Chapter 9 - 9.4.3.1-9.4.3.3 - Conservation measures for previously un-harvested old growth stands, previously harvested old growth stands, individual old growth trees; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
919.16(a)(6)	An analysis of the long-term significant adverse effects on fish, wildlife, and listed species known to be primarily associated with late succession forests.	See measures contained under 919.16(a) above.	HCP/NCCP Chapter 9 - 9.4.3.1-9.4.3.3 - Conservation measures for previously un-harvested old growth stands, previously harvested old growth stands, individual old growth trees; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern
919.16(b)	Where timber operations will result in long-term significant adverse effects on fish, wildlife, and listed species known to be primarily associated with late succession forests in a THP, SYP, NTMP or planning watershed, feasible mitigation measures to mitigate or avoid such long-term significant adverse effects shall be described and incorporated in the THP, SYP or NTMP. Where long-term significant adverse effects cannot be avoided or mitigated, the THP, SYP, or NTMP shall identify the measures that will be taken to reduce those remaining effects and provide reasons for overriding concerns pursuant to 14 CCR Section 898.1 (g), including a discussion of the alternatives and mitigation considered.	See measures contained under 919.16(a) above.	HCP/NCCP Chapter 9 - 9.4.3.1-9.4.3.3 - Conservation measures for previously un-harvested old growth stands, previously harvested old growth stands, individual old growth trees; TMP - 3.11 Wildlife Protection Practices	3.6 and 4.6 Terrestrial Habitat and Wildlife Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
923	**Logging Roads and Landings**			
923(d)	Avoidance of routes near the bottoms of steep and narrow canyons, through marshes and wet meadows, on unstable areas, and near watercourses or near existing nesting sites of threatened or endangered bird species	HCP/NCCP– Conservation measures for TSU1 and TSU2 - Inner Gorge **HCP/NCCP C§8.3.3.1.2-1** Do not construct or reconstruct roads or landings. Conservation measures for TSU1 and TSU2 Steep Streamside Slopes. **HCP/NCCP C§8.3.3.1.2-12** Do not construct new roads or landings. Limits on deviation from Habitat Conservation Measures on TSU1 and TSU2 Steep Streamside Slopes **HCP/NCCP C§8.3.3.1.2-21** Permit new construction of roads, skid trails, and landings only after a review and site specific design by a PG or CEG. **HCP/NCCP C§8.3.3.1.2-22** Permit reconstruction of roads, skid trails, and landings across unstable areas within TSU1 and TSU2 (i.e., steep streamside slopes) only after obtaining approval of the wildlife agencies as well as review and site specific design by a PG or CEG. Conservation measures for wetlands, wet areas, and wet meadows. **HCP/NCCP C§8.2.3.5.1-1** Maintain a 25-ft EEZ (excluding existing roads) around wetlands, wet meadows, and wet areas whose surface area is > 10 ft^2 and < 50 ft^2. **HCP/NCCP C§8.2.3.5.1-2** Maintain a 50-ft EEZ (excluding existing roads) around wetlands, wet meadows, and wet areas that are more than 50 ft^2 in surface area. NOTE: MRC must obtain approval of our aquatic biologist before equipment can enter the EEZ of a wet area, wetland, or wet meadow, making them a potential equipment limitation zone. **HCP/NCCP C§8.2.3.5.2-3** Apply	HCP/NCCP C§8.3.3.1.2-1; HCP/NCCP C§8.3.3.1.2-12; HCP/NCCP C§8.3.3.1.2-21; HCP/NCCP C§8.3.3.1.2-22; HCP/NCCP C§8.2.3.5.1-2; HCP/NCCP C§8.2.3.5.2-3; Appendix E, E.2.2. #9; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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		a 50-ft EEZ (excluding existing roads) and a 50% canopy retention requirement to seeps or springs that do not drain into a defined watercourse and are unable to deliver sedimentation to higher order streams. NOTE: MRC must obtain approval of our aquatic biologist before equipment can enter the EEZ of a wet area, wetland, or wet meadow, making them a potential equipment limitation zone. HCP/NCCP Appendix E, E.2.2. #9 Do not construct roads or landings on historically active mass wasting features without the approval of both a California Licensed Geologist and an individual knowledgeable in the relevant aquatic resources. HCP/NCCP Appendix E, E.2.3 #2 - Make road design conform to topography to minimize disturbance to the natural environment. #3 - Do not construct roads through seeps, springs, or wet meadows unless the route is the only alternative that will minimize disturbance to these and other adjacent topographical features. Consult with MRC wildlife biologists prior to operations to determine if covered species are using the topographical feature. Drain seeps, springs, or wet meadows as close as possible to their original site. #4 - Build roads on natural benches, flat slopes, and areas of stable soils using soil type (K-factor) maps to minimize effects on watercourses. #8 - Design roads to avoid, if feasible, other sensitive biological and habitat resources, namely plants, fish, and wildlife, in addition to the considerations given above.		

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923(e)	Minimization of the number of watercourse crossings	Maintain the current (2012) CFPR standards.	HCP/NCCP Appendix E, E.2.2. #1; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923(f)	Location of roads on natural benches, flatter slopes and areas of stable soils to minimize effects on watercourses	HCP/NCCP - Appendix E, E.2.3 #4 Build roads on natural benches, flat slopes, and areas of stable soils using soil type (K-factor) maps to minimize effects on watercourses.	HCP/NCCP Appendix E, E.2.3 #4; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.1(a)	All logging roads shall be located and classified on the THP map as permanent, seasonal, or temporary. Road failures on existing roads which will be reconstructed shall also be located on the THP map. In addition to the requirements of 14 CCR 1034(x), the probable location of those landings which require substantial excavation or which exceed one quarter acre in size, shall be shown on the THP map	HCP/NCCP – Appendix E, E.2.1 Standards for road classification – 1. Permanent: a road planned and constructed as an all-season component of the MRC transportation system. These roads, which are generally main haul roads out of a tract have: a. surface suitable for trucks to haul forest products throughout the entire winter period. B. Permanent drainage structures at watercourse crossings to prevent turbid water from entering streams. C. Year-round use. 2. Seasonal: a road planned and constructed as a seasonal component of the MRC transportation system. A. Commercial hauling is discontinued during the winter period, except when the risk of sediment delivery is low; for example, hauling may occur during the winter period on seasonal ridge roads which have no watercourse crossings and are hydrologically disconnected from any watercourse. B. Access is for fire control, forest management, occasional harvesting of minor forest products, and other necessary activities. C. Permanent drainage structures are located at watercourse crossings. D. Moderate use occurs during the dry season.	HCP/NCCP Appendix E, E.2.1 - road classification definitions; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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		3. Temporary: a road used only during timber operations. These roads, which are not main haul roads out of a tract have: a. Surfaces adequate for seasonal logging. B. Drainage structures, if any, which will be removed prior to the winter period or designated to be self-maintaining. C. Low, sporadic, use which periodically can become more intense. 4. Decommissioned: a road permanently removed from use. These roads: A. Are impassable to any motorized vehicle. B. Provide permanent, maintenance-free drainage. C. Minimize concentration of runoff, soil erosion, and slope instability. D. Promote native conifer regeneration. 5. Historic: a road built before 1972 that is currently impassable, may not have been actively decommissioned, and for which there are no current or future plans to manage as part of the road system. These roads: A. Will not be opened, rehabilitated, or used, based on a review of the sediment delivery consequences and feasibility of repair. B. Will include railroad grades from historic logging that are not currently converted to a haul road. 6. Mainline: major arteries for log transportation that are generally used at least 3 out of every 5 year. A mainline road is: A. Typically a permanent road, but can be seasonal. B. Exempt from conservation measures for noise disturbance. C. Mapped in the HCP/NCCP Atlas.		

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923.1(c)	Logging Roads and Landings shall be planned and located, when feasible, to avoid unstable areas. The Director shall approve an exception if those areas are unavoidable, and site-specific measures to minimize slope instability due to construction are described and justified in the THP.	Site Specific Loactions - HCP/NCCP– Conservation measures for TSU1 and TSU2 - Inner Gorge **HCP/NCCP C§8.3.3.1.2-1** Do not construct or reconstruct roads or landings. Conservation measures for TSU1 and TSU2 Steep Streamside Slopes. **HCP/NCCP C§8.3.3.1.2-12** Do not construct new roads or landings. Limits on deviation from Habitat Conservation Measures on TSU1 and TSU2 Steep Streamside Slopes **HCP/NCCP C§8.3.3.1.2-21** Permit new construction of roads, skid trails, and landings only after a review and site specific design by a PG or CEG. **HCP/NCCP C§8.3.3.1.2-22** Permit reconstruction of roads, skid trails, and landings across unstable areas within TSU1 and TSU2 (i.e., steep streamside slopes) only after obtaining approval of the wildlife agencies as well as review and site specific design by a PG or CEG General Locations HCP/NCCP Appendix E, E.2.2. #9 Do not construct roads or landings on historically active mass wasting features without the approval of both a California Licensed Geologist and an individual knowledgeable in the relevant aquatic resources. HCP/NCCP Appendix E, E.2.3 #4 Build roads on natural benches, flat slopes, and areas of stable soils using soil type (K-factor) maps to minimize effects on watercourses.	HCP/NCCP C§8.3.3.1.2-1; HCP/NCCP C§8.3.3.1.2-12; HCP/NCCP C§8.3.3.1.2-21; HCP/NCCP C§8.3.3.1.2-22; Appendix E, E.2.2. #9; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
923.1(d)	Where roads and landings will be located across 100 feet or more of lineal distance on any slopes over 65% or on slopes over 50% which are within 100 ft. of the boundary of a WLPZ, measures to minimize movement of soil and the discharge of concentrated surface runoff shall be incorporated in the THP. The Director may waive inclusion of such measures where the RPF can show that slope depressions, drainage ways, and other natural retention and detention features are sufficient to control overland transport of eroded material. The Director may require end-hauling of material from areas within 100 ft. of the boundary of a WLPZ to a stable location if end hauling is feasible and is necessary to protect water quality. The Director shall require maintenance provisions in the THP for drainage structures and facilities provided that such maintenance is feasible and necessary to keep roadbeds and fills stable.	HCP/NCCP – Appendix E, E.2.4 #7. Construct or reconstruct roads as full-benched cut (no fill) or remove fill prior to the winter period, on slopes over 50% where cutbank stability is not an issue. Dispose of spoils not used in road construction in stable areas outside of an AMZ. Alternatively, construct roads with balanced cuts and fills, properly engineered or compacted in layers not to exceed a depth of 1 ft (0.3 m). MRC may remove fills on decommissioned and temporary roads with the slopes recontoured prior to the winter period. Refer to Appendix E, E.2.18 for information on spoil disposal.	HCP/NCCP Appendix E, E.2.4 #7 - General description of road layout; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.1(e)	New logging roads shall not exceed a grade of 15% except that pitches of up to 20% shall be allowed not to exceed 500 continuous feet (152.4 m). These percentages and distances may be exceeded only where it can be explained and justified in the THP that there is no other feasible access for harvesting of timber or where in the Northern or Southern Districts use of a gradient in excess of 20% will serve to reduce soil disturbance.	HCP/NCCP - Appendix E, E.2.4 #6 Do not construct roads with a grade that exceeds 15%., although (a) MRC can construct pitches of up to 20% for 500 continuous feet (152.4 m). b. MRC can exceed these percentages and distances if (i) there is no other access for harvesting of timber when considering sediment production and economic concerns (i.e., steeper road grades equate to less road construction and, therefore, less cost) or (ii) use of a gradient in excess of 20% will reduce road length and avoid a watercourse. c. MRC will minimize construction of through-cut road prisms (in lengths greater than those specified for water breaks) on new roads with gradients greater than 15% and, to the extent feasible, will remove through-cuts on existing roads with gradients greater than 15%. d. MRC will rock the surface of the through-cut when it is not feasible to limit the through-cut per Appendix E, E.2.4, 6c. e. MRC may construct roads that have a gradient ≥20% and a length of 500 ft or more within areas that may deliver sediment to a watercourse as long as we pave the roads to prevent runoff and sediment delivery.	HCP/NCCP Appendix E, E.2.4 Standards for road prism, #6; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.1(f)	Roads and landings shall be planned so that an adequate number of drainage facilities and structures are installed to minimize erosion on roadbeds, landing surfaces, sidecast and fills	Maintain the current (2012) CFPR standards.	HCP/NCCP Appendix E, E.2.6 Standards for road and landing surface drainage (#1-9); E.2.7 Standards for hydrological design #1-4; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.1(g)	Unless exceptions are explained and justified in the THP, general planning requirements for roads shall include:			
923.1(g)(1)	Logging roads shall be planned to a single-lane width compatible with the largest type of equipment used in the harvesting operation with turnouts at reasonable intervals	HCP/NCCP - Appendix E, E.2.4 #1 Construct new seasonal and temporary roads as single lanes, not to exceed 16 ft. (4.8 m) in width except where required below.	HCP/NCCP Appendix E, E.2.4 Standards for road prism; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.1(g)(2)	Roads shall be planned to achieve as close a balance between cut volume and fill volume as is feasible.	HCP/NCCP - Appendix E, E.2.4 #10 Balance a road's cut-volume with its fill-volume, when roads are not full-bench construction.	HCP/NCCP Appendix E, E.2.4 #10; Standards for road prism; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.1(g)(3)	When roads must be planned so that they are insloped and ditched on the uphill side, drainage shall be provided by use of an adequate number of ditch drains	HCP/NCCP - Appendix E, E.2.4 #16) Use an insloped road prism when it is necessary to protect fill slopes (i.e., permanent water crossings) or prevent mass wasting from concentrated road drainage. On existing insloped roads with ditch-relief culverts, space the culverts along the road no more than 600-800 feet apart on road segments with gradients less than 4 percent or 400-600 feet apart on road segments with gradients greater than 4%. If gullies occur, shorten the spacing or re-locate the culvert. See ditch relief culvert setion of HCP/NCCPfor specifics (E.2.14).	HCP/NCCP Appendix E, E.2.4 #16; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.1(h)	Road construction shall be planned to stay out of Watercourse and Lake Protection Zones. When it is a better alternative for protection of water quality or other forest resources, or when such roads are the only feasible access to timber, exceptions may be explained and justified in the THP and shall be agreed to by the Director if they meet the requirements of this subsection	HCP/NCCP - Appendix E, E.2.2 #2) Follow the standards (C§8.2.3.1.8-1 and C§8.2.3.2.5-1) for road use and construction in AMZs: Exclude all equipment in Class I and Large Class II AMZs unless there is an allowable use. **ALLOWABLE USE:** *Erosion control or restoration* MRC may use a skid trail or landing one-time-only to control erosion or conduct restoration. Upon completing	HCP/NCCP Appendix E, E.2.2 Standards for laying out roads and landings (#2).; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	**2012 CFPR Rule**	**Proposed Alternate Standard**	**Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)**	**Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)**
		operations, we will decommission the skid trail or landing. *Existing skid trails, landings, or skid trail crossings* MRC may use—only rarely (perhaps 4 times a year)—an existing skid trail, landing, or designated skid trail crossing that does not require any reconstruction, if: Alternatives would create a greater risk and magnitude of sediment delivery. Perched material is pulled back from landings and the landings shaped to prevent rill erosion by draining them into a rocked face outlet. Surface areas >25 ft^2 are mulched, rocked, or covered in slash compacted by a tractor. *New skid trails, landings, or skid trail crossings* MRC may construct —only rarely (perhaps once every 3 years, lessening over time) and after obtaining approval of the wildlife agencies—a new skid trail, landing, or designated skid trail crossing if: Alternatives would create a greater risk and magnitude of sediment delivery. All mitigations, approved by the wildlife agencies, are fully implemented. All trees felled for construction of these new facilities in an AMZ within the inner and middle bands have the “key piece size” logs set aside for LWD placement, either in the vicinity of the new facilities or near watercourse sections deficient in LWD. *Existing Roads* MRC may use and maintain existing roads in AMZs.		

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		New Roads MRC may construct— only rarely (perhaps once every 3 years, lessening over time)—new roads to watercourse approaches within an AMZ if: The road does not parallel a watercourse. Each approach on either side of a watercourse does not exceed 200 ft. All trees felled for construction of these new facilities in an AMZ within the inner and middle bands have the "key piece size" logs set aside for LWD placement, either in the vicinity of the new facilities or near watercourse sections deficient in LWD. MRC may construct— only rarely (perhaps once every 3 years, lessening over time) and after obtaining approval of the wildlife agencies —a road segment not associated with a crossing or an approach to a crossing if: Alternatives would create a greater risk and magnitude of sediment delivery. All mitigations, approved by the wildlife agencies, are fully implemented. All trees felled in an AMZ for construction of these new facilities have the "key piece size" logs set aside for LWD placement, either in the vicinity of the new facilities or near watercourse sections deficient in LWD. *Watercourse crossing construction* MRC may use equipment to construct watercourse crossings.		

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923.1(j)	If logging roads will be used from the period of October 15 to May 1, hauling shall not occur when saturated soil conditions exist on the road.	HCP/NCCP - Appendix E, E.6.3; E.6.4; E.6.5 Standards are too numerous to list here- please refer to HCP/NCCP document.	HCP/NCCP Appendix E, E.6.3 Standards for early winter period; E.6.4 Standards for mid-winter period; E.6.5 Standards for late winter period. TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.2(b)	Where a road section which is greater than 100 feet in length crosses slopes greater than 65%, placement of fill is prohibited and placement of sidecast shall be minimized to the degree feasible. The Director may approve an exception where site specific measures to minimize slope instability, soil erosion, and discharge of concentrated surface runoff are described and justified in the THP	HCP/NCCP - Appendix E, E.2.4 #7 Construct or reconstruct roads as full-benched cut (no fill) or remove fill prior to the winter period, on slopes over 50% where cutbank stability is not an issue. Dispose of spoils not used in road construction in stable areas outside of an AMZ. Alternatively, construct roads with balanced cuts and fills, properly engineered or compacted in layers not to exceed a depth of 1 ft (0.3 m). MRC may remove fills on decommissioned and temporary roads with the slopes recontoured prior to the winter period. Refer to E.2.14 for information on spoil disposal.	HCP/NCCP - Appendix E, E.2.4 #7; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.2(c)	On slopes greater than 50%, where the length of road section is greater than 100 ft., and the road is more than 15 ft. wide (as measured from the base of the cut slope to the outside of the berm or shoulder of the road) and the fill is more than 4 ft. in vertical height at the road shoulder for the entire 100 feet the road shall be constructed on a bench that is excavated at the proposed toe of the compacted fill and the fill shall be compacted. The Director may approve exception to this requirement where on a site-specific basis if the RPF has described and justified an alternative practice that will provide equal protection to water quality and prevention of soil erosion.	HCP/NCCP - Appendix E, E.2.4 #1 Construct new seasonal and temporary roads as single lanes, not to exceed 16 ft. (4.8 m) in width except where required below. #2 Construct traveled surfaces to a maximum width of 14 ft (3.6 m) unless MRC requires additional width for (a) alignment, (b) safety, and (c) equipment. #7 Construct or reconstruct roads as full-benched cut (no fill) or remove fill prior to the winter period, on slopes over 50% where cutbank stability is not an issue. Dispose of spoils not used in road construction in stable areas outside of an AMZ. Alternatively, construct roads with balanced cuts and fills, properly engineered or compacted in layers not to exceed a depth of 1 ft (0.3 m). MRC may remove fills on decommissioned and temporary roads with the slopes recontoured prior to the winter period. Refer to Apprndix E, E.2.14 for information on spoil disposal.	HCP/NCCP Chapter 8 and Appendix E - General description of road layout; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.2(f)	On slopes greater than 35 percent, the organic layer of the soil shall be substantially disturbed or removed prior to fill placement. The RPF may propose an exception in the THP and the Director may approve the exception where it is justified that the fill will be stabilized.	HCP/NCCP - Appendix E, E.3 #9.	HCP/NCCP - Appendix E, E.3 #9 Appendix E - Prevent the footing of a road or landing from rotting away by removing or scarifying the organic layer of the soils during road and landing construction (especially on slopes greater than 35%) and later placing the fill. TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.2(g)	Excess material from road construction and reconstruction shall be deposited and stabilized in a manner or in areas where downstream beneficial uses of water will not be adversely affected.	HCP/NCCP - Appendix E E.2.4 #9 (End-haul materials to a stable location and, when slopes are over 50%, ensure that location is more than 100 ft from the boundary of an AMZ), E.2.18 #2 (Do not locate spoil piles (a) near streams or where sidecast, tailing, or sediment-laden runoff can reach a watercourse or (b) within an AMZ unless topography prevents runoff from entering a watercourse) and #3 (Cover spoil piles in AMZs to minimize risk of sediment delivery to watercourses.)	HCP/NCCP - Appendix E, E.2.4 #9, E.2.18 #2 and #3; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.2(h)	Drainage structures and facilities shall be of sufficient size, number and location to carry runoff water off of roadbeds, landings and fill slopes. Drainage structures or facilities shall be installed so as to minimize erosion, to ensure proper functioning, and to maintain or restore the natural drainage pattern. Permanent watercourse crossings and associated fills and approaches shall be constructed where feasible to prevent diversion of stream overflow down the road and to minimize fill erosion should the drainage structure become plugged.	HCP/NCCP - Appendix E, E.2.7 Standards for hydrological design; E.2.8 Consideration for choosing watercourse corssing type; E.2.9 Standards for temporary watercourse crossings; E.2.10 Standards for fords; E.2.11 Standards for vented fords; E.2.12 Considerations for fords, E.2.12 Standards for watercourse culverts; E.2.14 Standards for ditch relief.	HCP/NCCP - Appendix E - road design; TMP - 3.12 Logging Roads and Landings E.2.7 Standards for hydrological design; E.2.8 Consideration for choosing watercourse corssing type; E.2.9 Standards for temporary watercourse crossings; E.2.10 Standards for fords; E.2.11 Standards for vented fords; E.2.12 Considerations for fords, E.2.12 Standards for watercourse culverts; E.2.14 Standards for ditch relief	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.2(i)	Where there is evidence that soil and other debris is likely to significantly reduce culvert capacity below design flow, oversize culverts, trash racks, or similar devices shall be installed in a manner that minimizes culvert blockage	HCP/NCCP - Appendix E, E.2.13 #3) Install oversize culverts, drop inlets, trash racks, or similar devices when there is evidence that soil and other debris is likely to significantly reduce culvert capacity below design flow in order to minimize culvert blockage.	HCP/NCCP Appendix E - road design; TMP - 3.12 Logging Roads and Landings E.2.13 #3	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.2(j)	Waste organic material, such as uprooted stumps, cull logs, accumulations of limbs and branches, and unmerchantable trees, shall not be buried in road fills. Wood debris or cull logs and chunks may be placed and stabilized at the toe of fills to restrain excavated soil from moving downslope.	HCP/NCCP - Appendix E, E.3 #5) Do not bury organic waste, such as uprooted stumps, cull logs, accumulations of limbs and branches, or non-merchantable trees in the main body of road or landing fills. Use this solid waste, if necessary, to provide for downslope sediment filtration except at prepared crossings, including crossing approaches.	HCP/NCCP - Appendix E - road design; TMP - 3.12 Logging Roads and Landings E.3 #5	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.2(k)	Logging roads shall be constructed without overhanging banks	Maintain the current (2012) CFPR standards.	TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.2(l)	Any tree over 12 inches (30.5 cm) d.b.h. with more than 25% of the root surface exposed by road construction, shall be felled concurrently with the timber operations.	HCP/NCCP - Appendix E, E.3 #7) Fell any tree over 12 in (30.5 cm) dbh with more than 25% of the root surface exposed by road or landing construction, as needed to ensure road safety and slope stability.	HCP/NCCP - Chapter 8 and Appendix E - road design; TMP - 3.12 Logging Roads and Landings E.3 #7	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.2(m)	Sidecast or fill material extending more than 20 ft. (6.1 m) in slope distance from the outside edge of the roadbed which has access to a watercourse or lake which is protected by a WLPZ shall be seeded, planted, mulched, removed, or treated as specified in the THP, to adequately reduce soil erosion.	HCP/NCCP - Appendix E, E.3 #11) Seed, plant, mulch, remove, or treat sidecast or fill material with access to a watercourse or lake (see E.10). #12) Ensure that the slope created from sidecast or fill material is no steeper than 65%.	HCP/NCCP - Chapter 8 and Appendix E - road design; TMP - 3.12 Logging Roads and Landings E.3 #11	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.2(n)	All culverts at watercourse crossings in which water is flowing at the time of installation shall be installed with their necessary protective structures concurrently with the fill, construction and reconstruction of logging roads. Other permanent drainage structures shall be installed no later than October 15. For construction and reconstruction of roads after October 15, drainage structures shall be installed concurrently with the activity.	HCP/NCCP - Appendix E, E.3 #4) Install the necessary protective structures on all culverts at watercourse crossings in which water is flowing at the time of installation. This should be concurrent with the placement of crossing's fill material. Install other permanent drainage structures no later than October 15. Adhere to early winter period standards for construction and reconstruction of roads after October 15.	HCP/NCCP - Chapter 8 and Appendix E - road design; TMP - 3.12 Logging Roads and Landings E.3 #4	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.2(o)	Drainage structures and drainage facilities on logging roads shall not discharge on erodible fill or other erodible material unless suitable energy dissipators are used. Energy dissipators suitable for use with waterbreaks are described in 14 CCR 914.6(f) [934.6(f), 954.6(f)].	HCP/NCCP - Appendix E, E.2.6 # 4 Locate waterbreaks to prevent road drainage from discharging directly into a watercourse, wet area, seep, spring, or onto mass wasting hazards. This requires discharge into some form of vegetative cover, duff, slash, rocks, or less erodible material wherever possible. Construct a waterbreak to provide for unrestricted discharge at its lower end, so that water will be spread and delivery of eroded soils will be minimized.	HCP/NCCP - Appendix E - E.2.6 # 4 road design; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.2(p)	Where roads do not have permanent and adequate drainage, the specifications of Section 914.6 [934.6, 954.6] shall be followed.	HCP/NCCP - See Appendix E for specifics. E.2.6 Standards for road and landing surface drainage; Table E-1 Recommended Rolling Dip Dimensions; Table E-2 Maximum Distance Between Waterbreaks.	HCP/NCCP - Chapter 8 and Appendix E - road design; TMP - 3.12 Logging Roads and Landings E.2.6 Standards for road and landing surface drainage Table E-1 Recommended Rolling Dip Dimensions Table E-2 Maximum Distance Between Waterbreaks	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.2(q)	Drainage facilities shall be in place and functional by October 15. An exception is that waterbreaks do not need to be constructed on roads in use after October 15 provided that all such waterbreaks are installed prior to the start of rain that generates overland flow	HCP/NCCP - Appendix E, E.3 #4 Install the necessary protective structures on all culverts at watercourse crossings in which water is flowing at the time of installation. This should be concurrent with the placement of crossing's fill material. Install other permanent drainage structures no later than October 15. Adhere to early winter period standards for construction and reconstruction of roads after October 15.	HCP/NCCP - Chapter 8 and Appendix E - Standards for roads construction timing; E.3 #4 TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.2(r)	No road construction shall occur under saturated soil conditions, except that construction may occur on isolated wet spots arising from localized ground water such as springs, provided measures are taken to prevent material from significantly damaging water quality.	HCP/NCCP - Appendix E, E.6.3 #12. Do not construct new roads, skid trails or landings when precipitation is sufficient to generate overland flow off the road, skid trail, or landing. E.6.4 #3. Do not construct, reconstruct, or abandon roads. E.6.5 #17. Do not proceed with construction when precipitation is sufficient to generate overland flow off the road and deliver sediment to a watercourse.	HCP/NCCP - Appendix E: E.6.3, E.6.4, E.6.5; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.2(s)	Completed road construction shall be drained by outsloping, waterbreaks and/or cross-draining before October 15. If road construction takes place from October 15 to May 1, roads shall be adequately drained concurrent with construction operations.	HCP/NCCP - Appendix E, E.3 #4) Install the necessary protective structures on all culverts at watercourse crossings in which water is flowing at the time of installation. This should be concurrent with the placement of crossing's fill material. Install other permanent drainage structures no later than October 15. Adhere to early winter period standards for construction and reconstruction of roads after October 15. SEE SECTIONS E.6.3-E.6.5 for winter operating requirements	HCP/NCCP - Chapter 8 and Appendix E – E.6.3 Standards for early winter period; E.6.4 Standards for mid-winter period, E.6.5 Standards for late winter period; E.3 Standards for road and landing construction and reconstruction; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.2(t)	Roads to be used for log hauling during the winter period shall be, where necessary, surfaced with rock in depth and quantity sufficient to maintain a stable road surface throughout the period of use. Exceptions may be proposed by the RPF, justified in the THP, and found by the Director to be in conformance with the requirements of this subsection.	HCP/NCCP – Appendix E, E.2.5 #1) Ensure that rock used on road surfaces is of sufficient competence and depth based on the season, timing, and intensity of use and is not a source of sediment. E.2.5 #2a) Surface permanent roads within the inner and middle bands of Class I and Large Class II AMZ or within the AMZ of a Small Class II or Class III watercourses with rock or pavement to minimize fine sediment discharging into watercourses. #2c) Install waterbars on all other roads in the AMZ with anticipated winter access; space the waterbars at 50 ft intervals for grades over 5% and at 75 ft intervals for grades below 5%. Place additional filters (straw or slash) on outlets of waterbars or installed sumps. Lay 5 ft of straw along the drain side of a road and shape the road to minimize water concentration.E.2.5 #4) 4. Surface permanent road surfaces with rock or pavement to allow year-round use. Minimum rock depth is 6 in (15 cm) E.2.5 #6) Surface roads used for log or rock hauling during the winter period with rock or pavement unless (a) the road does not cross a watercourse, (b) the road does not drain to a watercourse, and (c) the road is greater than 200 feet from a watercourse.	HCP/NCCP - Chapter 8 and Appendix E - Standards for road and landings surfaces; E.2.5. TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.2(v)	Road construction activities in the WLPZ, except for stream crossings or as specified in the THP, shall be prohibited.	HCP/NCCP - Chapter 8: C§8.2.3.1.8-1: *New skid trails, landings, or skid trail crossings* MRC may construct—only rarely (perhaps once every 3 years, lessening over time) and after obtaining approval of the wildlife agencies—a new skid trail, landing, or designated skid trail	HCP/NCCP - Chapter 8 and C§8.2.3.1.8-1; HCP/NCCP C§8.2.3.2.5-1; HCP/NCCP C§8.2.3.3.5-2. Appendix E, E.2.2. TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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		crossing if: -Alternatives would create a greater risk and magnitude of sediment delivery. -All mitigations, approved by the wildlife agencies, are fully implemented. -All trees felled for construction of these new facilities in an AMZ within the inner and middle bands have the "key piece size" logs set aside for LWD placement, either in the vicinity of the new facilities or near watercourse sections deficient in LWD. *New Roads* MRC may construct— only rarely (perhaps once every 3 years, lessening over time)—new roads to watercourse approaches within an AMZ if: -The road does not parallel a watercourse. -Each approach on either side of a watercourse does not exceed 200 ft. -All trees felled for construction of these new facilities in an AMZ within the inner and middle bands have the "key piece size" logs set aside for LWD placement, either in the vicinity of the new facilities or near watercourse sections deficient in LWD. MRC may construct— only rarely (perhaps once every 3 years, lessening over time) and after obtaining approval of the wildlife agencies —a road segment not associated with a crossing or an approach to a crossing if -Alternatives would create a greater risk and magnitude of sediment delivery. -All mitigations, approved by the wildlife agencies, are fully implemented. All trees felled in an AMZ for		

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		construction of these new facilities have the “key piece size” logs set aside for LWD HCP/NCCP C§8.2.3.2.5-1 *New skid trails, landings, or skid trail crossings* MRC may construct —only rarely (perhaps once every 3 years, lessening over time) and after obtaining approval of the wildlife agencies—a new skid trail, landing, or designated skid trail crossing if: -Alternatives would create a greater risk and magnitude of sediment delivery. -All mitigations, approved by the wildlife agencies, are fully implemented. -All trees felled for construction of these new facilities within the inner and middle bands of an AMZ have the “key piece size” logs set aside for LWD placement, either in the vicinity of the new facilities or near watercourse sections deficient in LWD. *New Roads* MRC may construct new roads to watercourse approaches within an AMZ if: -The road does not parallel a watercourse. -Each approach on either side of a watercourse does not exceed 200 ft. -All trees felled for construction of these new facilities in an AMZ within the inner and middle bands have the “key piece size” logs set aside for LWD placement, either in the vicinity of the new facilities or near watercourse sections deficient in LWD. MRC may construct— only rarely (perhaps once every 3 years, lessening		

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		over time) and after obtaining approval of the wildlife agencies—a road segment not associated with a crossing or an approach to a crossing if -Alternatives would create a greater risk and magnitude of sediment delivery. -All mitigations, approved by the wildlife agencies, are fully implemented. -All trees felled in an AMZ for construction of these new facilities have the "key piece size" logs set aside for LWD placement, either in the vicinity of the new facilities or near watercourse sections deficient in LWD. *Construction of watercourse crossings* MRC may use equipment to construct watercourse crossings. Appendix E, E.2.2 MRC may construct new roads and watercourse approaches within an Class I and Large and Small Class II AMZ if: (a) The road does not parallel a watercourse. AND (b) Each approach on either side of a watercourse does not exceed 200 ft. in Class I and Large Class II AMZ and 150 ft in Small Class II AMZ. MRC may construct new roads exceeding 200 feet in the Large Class I and Large and Small Class II AMZ if: a) The road is not associated with a watercourse crossing AND (b) The conservation measures in HCP/NCCP C§8.2.3.1.8-1 are applied. For Class III AMZ, MRC may construct new truck road crossings AND MRC may construct new roads that do not parallel an AMZ.		

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923.3(b)	The number of crossings shall be kept to a feasible minimum.	Maintain the current (2012) CFPR standards.	HCP/NCCP - Appendix E, E.2.2 #1; Management Agreement for Timber Operations (MATO); TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.3(c)	Drainage structures on watercourses that support fish shall allow for unrestricted passage of all life stages of fish that may be present, and shall be fully described in the plan in sufficient clarity and detail to allow evaluation by the review team and the public, provide direction to the LTO for implementation, and provide enforceable standards for the inspector.	Appendix T – MATO describes process and requirements for detailing water crossings, PTHP checklist includes requirements for crossing information; Appendix E, E.2.9 #7 (Construct temporary crossings on Class I watercourses to allow for movement of juvenile anadromous salmonids upstream or downstream of the crossing) Appendix E, E.2.13 #2 (Allow for (a) upstream and downstream passage of fish or listed aquatic species during any life stage and (b) the natural movement of bedload to form a continuous bed through the culvert, when installing permanent culverts in Class I watercourses (NMFS 2001).	Appendix T – MATO describes process and requirements for detailing water crossings, PTHP checklist includes requirements for crossing information; Appendix E.2.9 #7 Standards for temporary watercourse crossings; E.2.13 #2 Standards for watercourse culverts; TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.3(d)(1)	When watercourse crossings, other drainage structures, and associated fills are removed the following standards shall apply: Fills shall be excavated to form a channel that is as close as feasible to the natural watercourse grade and orientation, and that is wider than the natural channel	Maintain the current (2012) CFPR standards.	TMP - 3.8 Watercourse and Lake Protection; 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.3(d)(2)	When watercourse crossings, other drainage structures, and associated fills are removed the following standards shall apply: The excavated material and any resulting cut bank shall be sloped back from the channel and stabilized to prevent slumping and to minimize soil erosion. Where needed, this material shall be stabilized by seeding, mulching, rock armoring, or other suitable treatment.	Maintain the current (2012) CFPR standards.	TMP - 3.8 Watercourse and Lake Protection; 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.3(e)	All permanent watercourse crossings that are constructed or reconstructed shall accommodate the estimated 100-year flood flow, including debris and sediment loads	HCP/NCCP - Appendix E, E.2.7 #2. Upgrade, within the initial 30 years of the HCP/NCCP, watercourse culverts that currently could not pass a flow with a return interval of 50 years to one that will pass a flow with a return interval of 100 years. Upgrade all culverts with less than a 50-year return period to ones with a 100-year return period. Upgrade non-functioning culverts that have a 50 to 100 year flow return period to a 100 year flow return period. Leave remaining culverts in place until (a) a road inventory determines they are rusted through; (b) road and crossing inspections indicate they are in need of repair or replacement; (c) they are not passing flood flows; or (d) they are a priority for replacement to meet objectives for controllable erosion. Install diversion protection, when equipment is in the area, on culverts that do not meet a 50-year return flow and that are not schedule for replacement based on criteria in 8.3.3.2.1, E.2.13, and E.2.14. E.2.10 #6 (Build a dip in the road at the axis of the rocked ford. Dish out the outside face of the fill material at the ford and armor it with rock large enough to withstand a 100-year flow. Size the rock to be non-transportable; rock size should exceed the size of the substrate upstream and downstream of the crossing under similar channel conditions (gradient, confinement, etc.)) and #13, (Armor the downstream fill face with large rock capable of handling a 100-year flow event. Size the rock to be non-transportable; determine the size by reviewing the stream substrate upstream and downstream of the	HCP/NCCP - Appendix E, Appendix E.2.7 #2 Standards for hydrological design; E.2.10 #6 and #13, E.2.11 #2 and #5, E.2.13 #9 and #15 and E.2.15 #5 and 11; TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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		crossing. Generally, the rock should be 6 – 24 in. with a mean diameter of 12 in. Ensure there is a mix of different size rocks to fill the voids between the large rocks. If a fill face has a slope greater than 50%, place rocks into a deepened keyway at the bottom of the fill prism. Preferably place all keyways at least 24 in. below the outfall stream grade). E.2.11 #2 (Build a dip in the road at the axis of the vented ford. Dish out the outside face of the fill material at the ford and armor it with rock large enough to withstand a 100-year flow. Size the rock to be non-transportable. Determine the size by checking the substrate up and down the stream. Surface the road with rock to a depth of at least a 6 in. (15 cm). Armor the bed of the road with rock that extends past the width of the dip) and #5 (Armor the fill faces with rock large enough to accommodate a 100-year flow. Size the rock to be non-transportable, generally 6 -24 in. with a mean diameter of 12 in. Determine the size by checking the substrate up and down the stream. Provide for a mix of different size rocks to fill the voids between any large rocks. Place rocks in a deepened keyway at the bottom of the fill prism, if the downstream fill face is over 50%), E.2.13 #9 (Place rock or other suitable armor material around the inlet of a watercourse culvert. Construct rip-rap, when used, to remain in place during 100-year flows and to extend at least as high as the top of the culvert. Extend rip-rap as “wing walls” on inlets for a sufficient distance upstream to prevent bank erosion) and #15 (Protect fill faces at inlets and outlets, which will		

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		be exposed to the design flow, from stream flow erosion by armoring that consists of graded rock rip-rap or other non-erodible material and by design (e.g., concrete head wall). Rip-rap culvert outfalls, if necessary, in a U-shaped channel, with clean material of sufficient size to remain in place during a 100-year peak flow event. Set rip-rap in the active channel downstream of the culvert below stream grade in order to allow the natural accumulation and transport of bedload at stream grade) and E.2.15 #5 (Provide erosion protection for bridge abutments, piers, and watercourse banks influenced by the hydraulic conditions of the bridge, at least up to the level of a 100-year flow or to the edge of the terrace or the topographic bench the bridge rests on), and #11 (Ensure that the freeboard (i.e., the distance between the water level and the lowest part of a bridge superstructure) exceeds 100-year flow levels, unless there are other design considerations, approved by the wildlife agencies, such as the need for large amounts of fill for the abutments).		

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923.3(f)	Watercourse crossings and associated fills and approaches shall be constructed or maintained to prevent diversion of stream overflow down the road and to minimize fill erosion should the drainage structure become obstructed. The RPF may propose an exception where explained in the THP and shown on the THP map and justified how the protection provided by the proposed practice is at least equal to the protection provided by the standard rule.	HCP/NCCP - Appendix E, E.2.7 Standards for Hydrological Design #4 Construct or maintain permanent watercourse crossings and associated fills and approaches to prevent diversion of stream overflow down the road and to minimize fill erosion if (a) the drainage structure becomes obstructed; (b) road and crossing inspections indicate they are in need of repair or replacement; (c) they are not passing flood flows; or (d) they are a priority for replacement to meet objectives for controllable erosion.	HCP/NCCP - Appendix E, E.2.7 Standards for Hydrological Design #4; TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.3(g)	All new permanent culverts on Class I watercourses, where fish are always or seasonally present or where fish habitat is restorable, shall be planned, designed and constructed to allow upstream and downstream passage of fish or listed aquatic species during any life stage and for the natural movement of bedload to form a continuous bed through the culvert and shall require an analysis and specifications demonstrating conformance with the intent of this section and subsection.	HCP/NCCP - Appendix E, E.2.13 #2 Allow for (a) upstream and downstream passage of fish or listed aquatic species during any life stage and (b) the natural movement of bedload to form a continuous bed through the culvert, when installing permanent culverts in Class I watercourses.	HCP/NCCP - Appendix E, E.2.13 Standards for watercourse culverts, #2; TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.4(a)	The prescribed maintenance period for erosion controls on permanent and seasonal roads and associated landings and drainage structures which are not abandoned in accordance with 14 CCR 923.8 [943.8, 963.8] shall be at least one year. The Director may prescribe a maintenance period extending up to three years in accordance with 14 CCR 1050	HCP/NCCP - Appendix E, E.4.1 #1 Conduct 5 inspections over 5 years after work completion on all seasonal roads and associated road points constructed, reconstructed, or decommissioned (Table E-3). And see MATO Attachment A, II.B.22 and II.D.Table-1 for more detail.	HCP/NCCP - Appendix E, E.4.1 #1: MATO Attachment A, II.B.22 and II.D.Table-1; TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.4(b)	Upon completion of timber operations, temporary roads and associated landings shall be abandoned in accordance with 14 CCR 923.8 [943.8, 963.8].	HCP/NCCP - Appendix E, E.6.2 #1-7 Standards for temporary road use.	HCP/NCCP - Appendix E, E.6.2 #1-7Standards for temporary road use; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.4(c)	Waterbreaks shall be maintained as specified in 14 CCR 914.6 [934.6, 954.6].	HCP/NCCP - Appendix E, E.4.1 #7-8. 7. Make repairs, using hand tools, at the time of discovery, if feasible, or within 24 hours after initial damage to the road surface, drainage facilities, water bars, or water crossings to eliminate the likelihood of related sediment reaching Class I, Class II or Class III waters. 8. Schedule repairs requiring more than hand tools during those times when heavy equipment can access the site—according to winter and wet weather operating guidelines.	HCP/NCCP - Appendix E, E.2.6 #7 Standards for road and landing surface drainge TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.4(d)	Unless partially blocked to create a temporary water source, watercourse crossing facilities and drainage structures, where feasible, shall be kept open to the unrestricted passage of water. Where needed, trash racks or similar devices shall be installed at culvert inlets in a manner which minimizes culvert blockage. Temporary blockages shall be removed by November 15.	HCP/NCCP - Appendix E, E.4.1 #7 Make repairs, using hand tools, at the time of discovery, if feasible, or within 24 hours after initial damage to the road surface, drainage facilities, water bars, or water crossings to eliminate the likelihood of related sediment reaching Class I, Class II, or Class III waters. E.2.13 #5 Design watercourse culverts so that, if they plug, the water is diverted directly across the road and back into the watercourse channel. If the culvert already exists without this design or a site cannot incorporate this design in the construction, then build a rolling dip to catch the diverted water, if the culvert plugs, and send it back into the channel. E.2.14 #9 Design ditch-relief culverts with controllable sediment so that, if they plug, the water is diverted directly across the road. If the culvert already exists without this design or a site cannot incorporate this design in the construction, then build, if feasible, a rolling dip to catch the diverted water (in the event the culvert plugs) and send it across the road.	HCP/NCCP - Appendix E, E.4.1 Road Inspection Schedule #7; E.2.13 Standards for watercourse culverts #5; E.2.14 #9; TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.4(g)	Temporary roads shall be blocked or otherwise closed to normal vehicular traffic before the winter period	HCP/NCCP - Appendix E, E.6.2 Standards for temporary road use #2. Close temporary roads prior to October 15, if feasible.	HCP/NCCP - Appendix E, E.6.2 Standards for temporary road use #2; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.4(h)	During timber operations, road running surfaces in the logging area shall be treated as necessary to prevent excessive loss of road surface materials by, but not limited to, rocking, watering, chemically treating, asphalting or oiling	HCP/NCCP - Appendix E, E.2.5 #7 Treat the running surfaces of roads used for timber operations, e.g., by rocking, watering, chemically treating, asphalting, oiling, etc, to prevent excessive loss of road surface materials.	HCP/NCCP - Appendix E, E.2.5 Standards for road and landing surfaces #7; TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.4(i)	Soil stabilization treatments on road or landing cuts, fills, or sidecast shall be installed or renewed, when such treatment could minimize surface erosion which threatens the beneficial uses of water.	HCP/NCCP - Appendix E, E.3 #11 Seed, plant, mulch, remove, or treat sidecast or fill material with access to a watercourse or lake.	HCP/NCCP - Appendix E, E.3 Standards for road and landing construction and reconstruction #11; TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.4(l)	Each drainage structure and any appurtenant trash rack shall be maintained and repaired as needed to prevent blockage and to provide adequate carrying capacity. Where not present, new trash racks shall be installed if there is evidence that woody debris is likely to significantly reduce flow through a drainage structure	HCP/NCCP - Appendix E, E.2.13 #3 Install oversize culverts, drop inlets, trash racks, or similar devices when there is evidence that soil and other debris is likely to significantly reduce culvert capacity below design flow in order to minimize culvert blockage. #5) Design watercourse culverts so that, if they plug, the water is diverted directly across the road and back into the watercourse channel. If the culverts already exist without this design or a site cannot incorporate this design in the construction, then build a rolling dip to catch the diverted water, if the culvert plugs, and send it back into the channel. E.4.1 #1-8 describes inspection schedule for roads.	HCP/NCCP - Appendix E, E.2.13 Standards for watercourse culverts; #3 and #5. E.4.1 Road inspection schedule (#1-8).; TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.4(m)	Inlet and outlet structures, additional drainage structures (including ditch drains), and other features to provide adequate capacity and to minimize erosion of road and landing fill and sidecast to minimize soil erosion and to minimize slope instability shall be repaired, replaced, or installed wherever such maintenance is needed to protect the quality and beneficial uses of water	HCP/NCCP - Appendix E, E.4.2 1) Base decisions for road maintenance on inspections (E.4.1) and on the priority of the road repair (Table E.4). 2) Maintain all roads and road points, constructed or upgraded, at their road class designation (permanent, seasonal, temporary, and abandoned). 3) Do not sidecast material from road grading into watercourses.	HCP/NCCP - Appendix E, E.4.2 Road and road point maintenance #1-3. TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.4(n)	Permanent watercourse crossings and associated approaches shall be maintained to prevent diversion of stream overflow down the road should the drainage structure become plugged. Corrective action shall be taken before the completion of timber operations or the drainage structure shall be removed in accordance with 14 CCR Section 923.3(d) [943.3(d), 963.3(d)].	HCP/NCCP - Appendix E, E.2.13 #5 Design watercourse culverts so that, if they plug, the water is diverted directly across the road and back into the watercourse channel. If the culvert already exists without this design or a site cannot incorporate this design in the construction, then build a rolling dip to catch the diverted water, if the culvert plugs, and send it back into the channel.	HCP/NCCP - Appendix E, E.2.13 #5 – standards for watercourse culverts; TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.4(o)	Except for emergencies and maintenance needed to protect water quality, use of heavy equipment for maintenance is prohibited during wet weather where roads or landings are within a WLPZ	MATO Attachment A, II.D.12 12. Routine maintenance a. Routine maintenance that does not include work in the active channel is not seasonally restricted. Routine and occasional maintenance that includes work in the active channel and is not necessary for assuring design flow conveyance capacity or the structural integrity of a crossing is restricted according to Section I.E. 1.) Obstruction removal. MRC may remove debris, trash, rubbish, flood-deposited woody and herbaceous vegetation, fallen trees, branches, sediment, and other obstructions that reduce a crossings flow conveyance capacity and / or endanger a permanent crossing at any time. MRC shall inform DFG if obstruction removal extends further than 50 feet or 5 times the active channel width (as measured in the first upstream channel unaffected by any backwater influence from the crossing), whichever is less, upstream and downstream from the facility's footprint. 2.) Non-emergency obstruction removal that requires heavy equipment in the flowing water or off the road's prism requires notice. HCP/NCCP Chapter 8 C§8.2.3.1.8-1 *Existing Roads* MRC may use and maintain existing roads in AMZs. C§8.2.3.2.5-1 *Existing Roads* MRC may use and maintain existing roads in AMZs. C§8.2.3.3.5-2	MATO Attachment A, II.D.12 12. Routine maintenance, HCP/NCCP Chapter 8 HCP/NCCP C§8.2.3.1.8-1, HCP/NCCP C§8.2.3.2.5-1 and HCP/NCCP C§8.2.3.3.5-2 TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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		MRC may use and maintain existing roads.		
923.5(a)	On slopes greater than 65%, no fill shall be placed and sidecast shall be minimized to the degree feasible. The Director may approve an exception if, site specific measures to minimize slope instability, soil erosion, and discharge of concentrated surface runoff are described and justified in the THP	Maintain the current (2012) CFPR standards.	TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.5(b)	On slopes greater than 50%, fills greater than 4 ft. in vertical height at the outside shoulder of the landing shall be: 1) constructed on a bench that is excavated at the proposed toe of the fill and is wide enough to compact the first lift, and 2) compacted in approximately 1 ft. lift from the toe to the finished grade. The RPF or supervised designee shall flag the location of this bench or the RPF shall provide a description of the bench location (narrative or drawing) in the THP for fills meeting the above criteria, where the length of landing section is greater than 100 feet. The RPF may propose an exception in the THP and the Director may approve the exception where it is justified that the landing will be stabilized	Maintain the current (2012) CFPR standards.	TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.5(c)	Waste organic material, such as uprooted stumps cull logs, accumulations of limbs and branches, or unmerchantable trees, shall not be buried in landing fills. Wood debris or cull logs and chunks may be placed and stabilized at the toe of landing fills to restrain excavated soil from moving downslope.	HCP/NCCP - Appendix E, E.3 Standards for road and landing construction and reconstruction. #5. Do not bury organic waste, such as uprooted stumps, cull logs, accumulations of limbs and branches, or non-merchantable trees in the main body of road or landing fills. Use this solid waste, if necessary, to provide for downslope sediment filtration except at prepared crossings, including crossing approaches.	HCP/NCCP - Appendix E, E.3 Standards for road and landing construction and reconstruction. #5. TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.5(d)	Constructed landings shall be the minimum in width, size, and number consistent with the yarding and loading system to be used. Landings shall be no larger than one-half acre (.202 ha) unless explained and justified in the THP	HCP/NCCP - Appendix E, E.2.3 Considerations in laying out roads and landings #5-6. 5. Limit landings to the fewest number necessary to conduct yarding operations, so there will be the least amount of stand damage. 6. Restrict landings to the minimum size necessary, based on equipment and worker safety requirements.	HCP/NCCP - Appendix E, E.2.3 Considerations in laying out roads and landings #5-6. TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.5(e)	No landing construction shall occur under saturated soil conditions.	HCP/NCCP - Appendix E, E.6.3 Standards for early winter period #1; Conduct tractor yarding or use of tractors, graders, excavators, and other heavy equipment for construction of fire breaks, roads, landings, or tractor roads only during extended dry, rainless periods with low antecedent soil wetness (no more than ½ in. of rain in the previous 24-hour period, as reported by the National Weather Service for Fort Bragg) and when soils are not saturated. E.6.4 Standards for the mid-winter period #1; Do not conduct tractor yarding or heavy equipment use for construction of fire breaks, road reconstruction, landing construction, or construction of roads or skid trails. E.6.5 Standards for the late winter period #2. Do not conduct tractor yarding or use tractors for construction of fire breaks, road construction/reconstruction, landing construction, or the construction of tractor roads within a Class I or Large Class II AMZ.	HCP/NCCP - Appendix E, E.6.3 Standards for early winter period #1; E.6.4 Standards for the mid-winter period #1; E.6.5 Standards for the late winter period #2. TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.5(f)(1)	The following specifications shall be met upon completion of timber operations for the year or prior to October 15, whichever occurs first: Overhanging or unstable concentrations of slash, woody debris and soil along the downslope edge or face of the landings shall be removed or stabilized when they are located on slopes over 65% or on slopes over 50% within 100 ft. of a WLPZ.	HCP/NCCP - Appendix E, E.3 #10 Remove overhanging or unstable concentrations of slash, woody debris, and soil along the downslope edge or face of roads or landings when located on slopes over 50% unless the slash piles are intended for winter burning.	HCP/NCCP - Appendix E, E.3 Standards for road and landing construction #10.; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.5(f)(2)	The following specifications shall be met upon completion of timber operations for the year or prior to October 15, whichever occurs first: Any obstructed ditches and culverts shall be cleaned.	Maintain the current (2012) CFPR standards.	TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.5(f)(3)	Landings shall be sloped or ditched to prevent water from accumulating on the landings. Discharge points shall be located and designed to reduce erosion.	Maintain the current (2012) CFPR standards.	TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.5(f)(4)	Sidecast or fill material extending more than 20 feet in slope distance from the outside edge of the landing and which has access to a watercourse or lake shall be seeded, planted, mulched, removed or treated as specified in the THP to adequately reduce soil erosion.	HCP/NCCP - Appendix E, E.3 Standards for road and landing construction; E.3 #10 Remove overhanging or unstable concentrations of slash, woody debris, and soil along the downslope edge or face of roads or landings when located on slopes over 50% unless the slash piles are intended for winter burning. #11. Seed, plant, mulch, remove, or treat sidecast or fill material with access to a watercourse or lake (see E.10).	HCP/NCCP - Appendix E, E.3 Standards for road and landing construction; #10 and 11; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.5(g)	On slopes greater than 35%, the organic layer of the soil shall substantially removed prior to fill placement.	HCP/NCCP - Appendix E, E.3 #9 Prevent the footing of a road or landing from rotting away by removing or scarifying the organic layer of the soils during road and landing construction (especially on slopes greater than 35%) and later placing the fill.	HCP/NCCP - Appendix E, E.3 Standards for road and landing construction and reconstruction #9.; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.5(h)	When landings are constructed after October 15 they shall be adequately drained concurrent with construction operations and shall meet the requirements of (f)(1) through (f)(4) of this subsection upon completion of operations at that landing.	Maintain the current (2012) CFPR standards for the timing, however use the following alternate standards to replace (f)(1) and (f)(4): Replace (f)(1) with HCP/NCCP Appendix E, E.3 #10 Remove overhanging or unstable concentrations of slash, woody debris, and soil along the downslope edge or face of roads or landings when located on slopes over 50% unless the slash piles are intended for winter burning. Appendix E, E.3 Standards for road and landing construction; Replcae (f)(4) with E.3 #10 Remove overhanging or unstable concentrations of slash, woody debris, and soil along the downslope edge or face of roads or landings when located on slopes over 50% unless the slash piles are intended for winter burning. AND #11. Seed, plant, mulch, remove, or treat sidecast or fill material with access to a watercourse or lake (see E.10).	HCP/NCCP - Appendix E, E.3 #10 and #11 - Standards for road and landing surfaces #3; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.8	Abandonment of roads, watercourse crossings and landings shall be planned and conducted in a manner which provides for permanent maintenance-free drainage, minimizes concentration of runoff, soil erosion and slope instability, prevents unnecessary damage to soil resources, promotes regeneration, and protects the quality and beneficial uses of water. General abandonment procedures shall be applied in a manner which satisfies this standard and include the following:	HCP/NCCP - MRC replaces the term abandonment with decommissioning. Appendix E, E.2.1 #4 Decommissioned: a road that will never be used again. These roads: a) Are impassable to any motorized vehicle, b) Provide permanent, maintenance-free drainage, c) Minimize concentration of runoff, soil erosion, and slope instability, d) Promote native conifer regeneration.	HCP/NCCP - Appendix E, E.2.1 Standards for Road Classification; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.8(a)	Blockage of roads so that standard production four wheel-drive highway vehicles cannot pass the point of closure at the time of abandonment.	HCP/NCCP - Appendix E, E.5.1 #4 Block decommissioned roads, when necessary, using appropriate barriers to prohibit the use of motorized vehicles.	HCP/NCCP - Appendix E, E.5.1 -Standards for road, skid trail, and landing decommissioning #4; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.8(b)	Stabilization of exposed soil on cuts, fills, or sidecast where deleterious quantities of eroded surface soils may be transported in a watercourse.	HCP/NCCP - Appendix E, E.5.1 #9 Slope back excavated material and any resulting cut bank from the channel and stabilize it to prevent slumping and soil erosion. Stabilize this material by seeding, mulching, armoring with rock, or by other suitable treatments (see E.10) and #9) Pull or shape fills or sidecast, where necessary, to prevent discharge of materials into watercourses.	HCP/NCCP - Appendix E, E.5.1 -Standards for road, skid trail, and landing decommissioning #9; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.8(c)	Grading or shaping of road and landing surfaces to provide dispersal of water flow.	HCP/NCCP - Appendix E, E.5.1 #5 Out-slope road, skid trail, and landing surfaces and remove berms, unless (a) doing the work is likely to cause more sediment delivery than not doing the work or (b) doing the work would remove large amounts of established vegetation in close proximity to a watercourse.	HCP/NCCP - Appendix E, E.5.1 -Standards for road, skid trail, and landing decommissioning #5; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.8(d)	Pulling or shaping of fills or sidecast where necessary to prevent discharge of materials into watercourses due to failure of cuts, fills, or sidecast.	HCP/NCCP - Appendix E, E.5.1 Standards for road, skid trail, and landing decommission. #5 and #11: #5 - Out-slope road, skid trail, and landing surfaces and remove berms, unless (a) doing the work is likely to cause more sediment delivery than not doing the work or (b) doing the work would remove large amounts of established vegetation in close proximity to a watercourse. #11 - Pull or shape fills or sidecast, where necessary, to prevent discharge of materials into watercourses.	HCP/NCCP - Appendix E, E.5.1 Standards for road, skid trail, and landing decommission. #5 and #11; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.8(e)	Removal of watercourse crossings, other drainage structures, and associated fills in accordance with 14 CCR 923.3(d). Where it is not feasible to remove drainage structures and associated fills, the fill shall be excavated to provide an overflow channel which will minimize erosion of fill and prevent diversion of overflow along the road should the drainage structure become plugged.	HCP/NCCP - Appendix E, E.5.1 #5, #6, #8, #9, #10 and #11: #5 - Out-slope road, skid trail, and landing surfaces and remove berms, unless (a) doing the work is likely to cause more sediment delivery than not doing the work or (b) doing the work would remove large amounts of established vegetation in close proximity to a watercourse. #6 - Remove all watercourse crossings. #8 - Excavate fills in the watercourse crossing to form a channel that is as close as possible to the natural watercourse grade and orientation, and that is wider than the natural channel. #9 - Slope back excavated material and any resulting cut bank from the channel and stabilize it to prevent slumping and soil erosion. Stabilize this material by seeding, mulching, armoring with rock, or by other suitable treatments (E.10). #10 - Re-establish natural flow paths of surface drainage. #11 - Pull or shape fills or sidecast, where necessary, to prevent discharge of materials into watercourses.	HCP/NCCP - Appendix E, E.5.1 #5, #6, #8, #9, #10 and #11 -Standards for Road, skid trail, and landing decommission; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.9	**Roads and Landings in Watersheds with Listed Anadromous Salmonids** In addition to all other district Forest Practice Rules, the following requirements shall apply in any planning watershed with listed anadromous salmonids, except in watersheds with coho salmon. In watersheds with coho salmon, the standards listed under 923.9.1 [943.9.1] and 923.9.2 [943.9.2] shall apply:			

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923.9(a)	Where logging road or landing construction or reconstruction is proposed, the plan shall state the locations of, and specifications for, logging road or landing abandonment or other mitigation measures to minimize the adverse effects of long-term site occupancy of the transportation system within the watershed.	Maintain the current (2012) CFPR standards.	PTHP checklist requires this. TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.9(b)	Unless prohibited by existing contracts with the U.S.D.A. Forest Service or other federal agency, new and reconstructed logging roads shall be no wider than a single-lane compatible with the largest type of equipment specified for use on the road, with adequate turnouts provided as required for safety. The maximum width of these roads shall be specified in the plan. These roads shall be outsloped where feasible and drained with water breaks or rolling dips (where the road grade is inclined at 7 percent or less), in conformance with other applicable Forest Practice Rules	HCP/NCCP - Appendix E, E.2.4 #1, #2 and #3: #1-Construct new seasonal and temporary roads as single lanes, not to exceed 16 ft. (4.8 m) in width except where required below. #2-Construct traveled surfaces to a maximum width of 14 ft (3.6 m) unless MRC requires additional width for (a) alignment, (b) safety, and (c) equipment. #3-Narrow existing roads to a maximum width of 14 ft (3.6 m) at controllable erosion sites.	HCP/NCCP - Appendix E, E.2.4 #1, #2 and #3. TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.9(c)(2)	The following shall apply on slopes greater than 50% that have access to a watercourse or lake: Where cutbank stability is not an issue, roads may be constructed as a full-benched cut (no fill). Spoils not utilized in road construction shall be disposed of in stable areas with less than 30 percent slope and outside of any WLPZ, EEZ, or ELZ designated for watercourse or lake protection. The Director, with concurrence from other responsible agencies, may waive inclusion of these measures where the RPF can show that slope depressions and other natural retention and detentions feature are sufficient to control overland transport of eroded material.	HCP/NCCP - Appendix E, Appendix E.2.4 Standards for road prism #7. #7-Construct or reconstruct roads as full-benched cut (no fill) or remove fill prior to the winter period on slopes over 50% where cutbank stability is not an issue. Dispose of spoils not used in road construction in stable areas outside of an AMZ. Alternatively, construct roads with balanced cuts and fills, properly engineered or compacted in layers not to exceed a depth of 1 ft (0.3 m). Optionally, remove fills on decommissioned and temporary roads with the slopes recontoured prior to the winter period. Refer to Appendix E, E.2.18 for information on spoil disposal.	HCP/NCCP - Appendix E, Appendix E.2.4 Standards for road prism #7. TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

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923.9(c)(3)	The following shall apply on slopes greater than 50% that have access to a watercourse or lake: Logging roads may be constructed with balanced cuts and fills: if			
923.9(c)(3)(A)	Properly engineered, or	HCP/NCCP - Appendix E, E.2.4 Standards for road prism #7. #7-Construct or reconstruct roads as full-benched cut (no fill) or remove fill prior to the winter period on slopes over 50% where cutbank stability is not an issue. Dispose of spoils not used in road construction in stable areas outside of an AMZ. Alternatively, construct roads with balanced cuts and fills, properly engineered or compacted in layers not to exceed a depth of 1 ft (0.3 m). Optionally, remove fills on decommissioned and temporary roads with the slopes recontoured prior to the winter period. Refer to E.2.18 for information on spoil disposal.	HCP/NCCP - Appendix E, E.2.4 Standards for road prism #7. TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.9(c)(3)(B)	Fills are removed and the slopes recontoured prior to the winter period.	Appendix E.2.4 Standards for road prism #7. #7-Construct or reconstruct roads as full-benched cut (no fill) or remove fill prior to the winter period on slopes over 50% where cutbank stability is not an issue. Dispose of spoils not used in road construction in stable areas outside of an AMZ. Alternatively, construct roads with balanced cuts and fills, properly engineered or compacted in layers not to exceed a depth of 1 ft (0.3 m). Optionally, remove fills on decommissioned and temporary roads with the slopes recontoured prior to the winter period. Refer to Appendix E, E.2.18 for information on spoil disposal.	HCP/NCCP - Appendix E, E.2.4 Standards for road prism #7. TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

2012 CFPR Rule No.	2012 CFPR Rule	Proposed Alternate Standard	Location of Alternate Standard (i.e., Document and Chapter Reference in HCP/NCCP, TMP, etc.)	Location of Effects Analysis in EIS/PTEIR (Resource Section[s] and Title)
923.9(d)	In addition to the provisions listed under 14 CCR § 923.1 [943.1, 963.1], subsection (e), all permanent or seasonal logging roads with a grade of 15% or greater that extend 500 continuous feet or more shall have specific erosion control measures stated in the plan.	Maintain the current (2012) CFPR standards.	TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern
923.9(e)	Where logging road networks are remote or are located where the landscape is unstable, where crossing fills over culverts are large, or where logging road watercourse crossing drainage structures and erosion control features historically have a high failure rate, drainage structures and erosion control features shall be oversized, designed for low maintenance, reinforced, or removed before the completion of the timber operation. The method of analysis and the design for crossing protection shall be included in the plan.	Maintain the current (2012) CFPR standards.	TMP - 3.8 Watercourse and Lake Protection; TMP - 3.12 Logging Roads and Landings	3.2 and 4.2 Geology; 3.3 and 4.3 Hydrology and Water Quality; 3.4 and 4.4 Aquatic and Riparian Habitats and Species of Concern

Attachment E

MRC PTHP checklist

Mitigation measures	Y	N	NA
I. Watercourse and Lake Protections			
1. Class I and Large Class II Watercourses			
A. Aquatic Management Zone band widths			
i. Inner band width 0-50 feet?	☐	☐	☐
ii. Slope Class 0-30%			
a. Middle band width 50-100 feet?	☐	☐	☐
b. Outer band width 100-130 feet?	☐	☐	☐
ii. Slope Class 30-50%			
a. Middle band width 50-130 feet?	☐	☐	☐
b. Outer band width 130-150 feet?	☐	☐	☐
iii. Slope class > 50%			
a. Middle band width 50-150 feet for tractor yarding?	☐	☐	☐
b. Middle band width 50-125 feet for cable or helicopter yarding?	☐	☐	☐
c. Outer band width 150-190 feet for tractor yarding?	☐	☐	☐
d. Outer band width 125-190 feet for cable or helicopter yarding?	☐	☐	☐
B. Large Class II Watercourse band width			
i. Inner band width 0-25 feet?	☐	☐	☐
ii. Slope Class 0-30%			
a. Middle band width 25-50 feet?	☐	☐	☐
b. Outer band width 50-100 feet?	☐	☐	☐
ii. Slope Class 30-50%			
a. Middle band width 25-75 feet?	☐	☐	☐
b. Outer band width 75-130 feet?	☐	☐	☐
iii. Slope Class 50-100%			
a. Middle band width 25-100 feet for tractor yarding?	☐	☐	☐
b. Middle band width 25-75 feet for cable or helicopter yarding?	☐	☐	☐
c. Outer band width 100-150 feet for tractor yarding?	☐	☐	☐
d. Outer band width 75-150 feet for cable or helicopter yarding?	☐	☐	☐
C. Canopy retention in watercourse bands			
i. Inner band maintains 85% canopy post-harvest?	☐	☐	☐
ii. Middle band maintains 70% canopy post-harvest?	☐	☐	☐
iii. Outer band maintains 50% canopy post-harvest?	☐	☐	☐
D. Basal area retention for inner and middle band			
i. Site Class I			
a. Pre-harvest minimum condition ≥ 300 ft^2/ac conifer basal area?	☐	☐	☐
b. Retains 240 ft^2/ac or 75% pre-harvest conifer bas area whichever is greater?	☐	☐	☐

ii. Site Class II or III			
a. Pre-harvest minimum condition ≥ 260 ft^2/ac conifer basal area?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
b. Retains 200 ft^2/ac or 75% pre-harvest conifer BA, whichever is greater?	☐	☐	☐
iii. Site Class IV or V			
a. Pre-harvest minimum condition ≥ 220 ft^2/ac conifer basal area?	☐	☐	☐
b. Retains 160 ft^2/ac or 75% pre-harvest BA, whichever is greater?	☐	☐	☐
E. Largest Tree Retention			
i. Retain largest trees based on channel sensitivity to LWD			
a. High sensitivity			
1. Retained 30% in inner band?	☐	☐	☐
2. Retained 15% in middle band?	☐	☐	☐
b. Moderate sensitivity			
1. Retained 20% in inner band?	☐	☐	☐
2. Retained 10% in middle band?	☐	☐	☐
c. Low sensitivity			
1. Retained 10% in inner band?	☐	☐	☐
2. Retained 5% in middle band?	☐	☐	☐
F. Exchanging Retention Trees requested? Explanation required in PTHP if yes.	☐	☐	☐
G. Silviculture – inner and middle bands			
i. Silviculture treatment used to develop late seral forest conditions?	☐	☐	☐
ii. High retention selection used?	☐	☐	☐
iii. Maintained or increased conifer dominance?	☐	☐	☐
iv. No more than 50% of stems in redwood clumps >8 in removed (inner band)?	☐	☐	☐
v. No trees harvested if outer band used STR or SWR?	☐	☐	☐
vi. No sanitation or salvage of LWD in bank full channel?	☐	☐	☐
vii. Retained all downed LWD in AMZ unless AMZ met LWD targets?	☐	☐	☐
viii. Snags retained in AMZ (no snags harvested)?	☐	☐	☐
ix. Salvage harvest planned in AMZ? (requires agency approval)	☐	☐	☐
H. Silviculture – outer band			
i. Maintained or increased conifer dominance?	☐	☐	☐
ii. Maintained 50% canopy within 330 feet sections?	☐	☐	☐
iii. Harvest openings limited to ¼ acre size?	☐	☐	☐
iv. No sanitation or salvage of LWD in bank full channel?	☐	☐	☐
v. Retained all downed LWD in AMZ unless AMZ met LWD targets?	☐	☐	☐
vi. Salvage harvest planned?	☐	☐	☐
1. Concurrence from DFG?	☐	☐	☐
2. Adjacent upslope stand is no harvest?	☐	☐	☐
I. Flood-prone zones Class I			
i. Retains 300 ft^2/ac or 75% pre-harvest conifer bas area whichever is greater?	☐	☐	☐
ii. Middle bands extended to break in slope at base of slope?	☐	☐	☐
iii. Equipment excluded except on existing roads or for road decommissioning?	☐	☐	☐

	Y	N	NA
J. Stream bank Stability			
i. Retained all trees with trunks:			
Mitigation measures	**Y**	**N**	**NA**
a. Within 10 feet of bank full channel?	☐	☐	☐
b. Within 10 feet of watercourse or lake transition zone?	☐	☐	☐
c. With roots visible in the bank?	☐	☐	☐
d. That provide anchor to an over-hanging bank?	☐	☐	☐
ii. 10 foot retention zone started at the landward edge of undercut banks?	☐	☐	☐
iii. When trees within the first 10 feet of channel are removed for cable corridors			
a. Trees left in the AMZ for LWD?	☐	☐	☐
b. Trees placed in active channel per in-stream LWD enhancement guidelines?	☐	☐	☐
K. Equipment Exclusion			
i. Equipment excluded in AMZs?	☐	☐	☐
a. If yes, list allowable uses:			
L. Bare soil			
i. Treated areas of exposed mineral soil that are at least 100 ft^2 in size?	☐	☐	☐
M. Cable Corridors			
i. Felled trees left in AMZ for LWD or placed in active channel?	☐	☐	☐
ii. Trees harvested in cable corridor only if:			
a. AMZ meets requirements for canopy and basal area?	☐	☐	☐
b. Tree is not one of the largest retention trees?	☐	☐	☐
c. Stream meets LWD targets?	☐	☐	☐
2. Small Class IIs			
A. Aquatic Management Zone width			
i. AMZ is 50 feet for 0-30% slope?	☐	☐	☐
ii. AMZ is 75 feet for 30-50% slope?	☐	☐	☐
iii. AMZ is 100 feet for tractor yarding on 50-100% slopes?	☐	☐	☐
iv. AMZ is 75 feet for cable or helicopter yarding on 50-100% slopes?	☐	☐	☐
B. Canopy retention is 50% over width of AMZ in 330 foot segments?	☐	☐	☐
C. Silviculture			
i. Maintained or enhanced uneven-aged conditions?	☐	☐	☐
ii. Post-harvest retention trees will be dispersed in uniform manner?	☐	☐	☐
iii. Maintained or increased conifer dominance?	☐	☐	☐
iv. No sanitation or salvage of LWD in bank full channel?	☐	☐	☐
v. Retained all downed LWD in AMZ unless AMZ met LWD targets?	☐	☐	☐
vi. Salvage harvest planned?	☐	☐	☐
a. Concurrence from DFG?	☐	☐	☐
D. Stream bank Stability			
i. Retained all trees with trunks:			
a. Within 10 feet of bank full channel?	☐	☐	☐
b. Wthin 10 feet of watercourse or lake transition zone?	☐	☐	☐

c. With roots visible in the bank?	☐	☐	☐
d. That provide anchor to an over-hanging bank?	☐	☐	☐
ii. 10 foot retention zone started at the landward edge of undercut banks?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
iii. No more than 50% of stems in redwood clumps >8 in removed	☐	☐	☐
iv. When trees within the first 10 feet of channel are removed for cable corridors			
a. Trees left in the AMZ for LWD?	☐	☐	☐
b. Trees placed in active channel per in-stream LWD enhancement guidelines?	☐	☐	☐
E. Equipment Exclusion			
i. Equipment excluded in AMZs?	☐	☐	☐
a. If no, list allowable uses:			
F. Soil Pipes			
i. Equipment excluded from area between Class II and swale if soil pipes exist?	☐	☐	☐
ii. Used only existing skid trails or roads?	☐	☐	☐
iii. Drainage from roads and skid trails dispersed throughout swales?	☐	☐	☐
G. Bare Soil			
i. Treat areas of exposed mineral soil that are at least 100 ft^2 in size?	☐	☐	☐
3. Class III AMZ			
A. Aquatic Management Zone width			
i. AMZ is 25 feet for 0-30% slope?	☐	☐	☐
ii. AMZ is 50 feet for >30% slope?	☐	☐	☐
B. Maintain 50% canopy over the width of the AMZ in 300 feet?	☐	☐	☐
C. Silviculture			
i. Maintained or enhanced uneven-aged conditions?	☐	☐	☐
ii. Post-harvest retention trees will be dispersed in uniform manner?	☐	☐	☐
iii. Maintained or increased conifer dominance?	☐	☐	☐
iv. No sanitation or salvage of LWD in bank full channel?	☐	☐	☐
v. Retained all downed LWD in AMZ unless AMZ met LWD targets?	☐	☐	☐
vi. Salvage harvest planned?	☐	☐	☐
a. Concurrence from CDFG?	☐	☐	☐
D. Stream bank Stability			
i. Retained all trees with trunks:			
a. Within 10 feet of bank full channel?	☐	☐	☐
b. With roots visible in the bank?	☐	☐	☐
c. That provide anchor to an over-hanging bank?	☐	☐	☐
ii. 10 foot retention zone started at the landward edge of undercut banks?	☐	☐	☐
iii. No more than 50% of stems in redwood clumps >8 in removed	☐	☐	☐
E. Equipment Limitation			
i. Adhered to standard in Appendix E and Appendix T?	☐	☐	☐
ii. Equipment limited in AMZs?	☐	☐	☐
a. If no, list allowable uses:			

F. Bare Soil			
i. Treat areas of exposed mineral soil that are at least 100 ft^2 in size?	☐	☐	☐
ii. Running surfaces of truck roads treated per Appendix E (E.2.5)?	☐	☐	☐
G. Soil Pipes			
Mitigation measures	**Y**	**N**	**NA**
i. When there is evidence of soil pipes, trees will not be felled to collapse them?	☐	☐	☐
ii. Only existing skid trails or roads used?	☐	☐	☐
iii. Heavy equipment will avoid soil pipes?	☐	☐	☐
iv. Heavy equipment only to cross soil pipes at existing crossings?	☐	☐	☐
v. Drainage from roads and skid trails dispersed throughout swales?	☐	☐	☐
vi. Transported fill removed upon completion of operations?	☐	☐	☐
4. Restoration Treatments in AMZs			
A. Conservation measures for bank stability are followed?	☐	☐	☐
B. Treatments in coho stream AMZs:			
i. Temperatures at or above the threshold?	☐	☐	☐
ii. Water flows July through September?	☐	☐	☐
iii. Concurrence from Wildlife Agencies?	☐	☐	☐
C. Restoration not used in inner gorge (IG) or within 25 feet of IG break in slope?	☐	☐	☐
D. Restoration not used on historically active mass wasting hazards?	☐	☐	☐
i. If no, was treatment approved by California Registered Geologist?	☐	☐	☐
ii. If no, will treatment retain 70% canopy cover?	☐	☐	☐
E. Within TSU 1, 2, or 3, was 50% canopy retained?	☐	☐	☐
i. If no, were operations approved by a California Registered Geologist?	☐	☐	☐
F. EEZs applied except for brush crushing operations?	☐	☐	☐
G. 70% canopy retained in inner bands of Class I and Large Class IIs?	☐	☐	☐
H. All conifers > 12” retained?	☐	☐	☐
I. Is percentage of restored stream length greater than allowed (Table 8-10, 11)?	☐	☐	☐
J. Stream temperature values determined within ¼ mile downstream of site?	☐	☐	☐
K. Is AMZ restoration harvest limited through monitoring of this stream?	☐	☐	☐
L. Is the restoration within the first 10 years of HCP implementation?	☐	☐	☐
M. Is the restoration within a 303(d) list watershed?	☐	☐	☐
5. Brush crushing in AMZs			
A. Brush crushing only on slopes < 30%?	☐	☐	☐
B. Tractor blades raised when brush-crushing?	☐	☐	☐
C. At least 95% of ground cover retained?	☐	☐	☐
D. Not conducted within 25 feet of bank full channel of Class I or II?	☐	☐	☐
E. Not conducted within 10 feet of bank full channel of Class III?	☐	☐	☐
F. Will areas be planted with DF and RW, no more than 12 ft apart?	☐	☐	☐
G. Will overstory be removed within inner zone during brush-crushing?	☐	☐	☐
H. Will conifers > 6” dbh be retained?	☐	☐	☐
I. Will this operation push stream length brush-crushed over 5% in the decade?	☐	☐	☐

	Y	N	NA
J. Is this operation within the first 40 years of the HCP/NCCP?	☐	☐	☐
6. Wetlands, Wet Areas, and Wet Meadows			
A. 25 foot EEZ (excluding roads) around features > 10 ft^2 and < 50 ft^2 in surface area?	☐	☐	☐
B. 50 foot EEZ (excluding roads) around features > 50 ft^2 in surface area?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
C. Within EEZ, retained greatest of 50 ft^2 basal area or 50% of pre-harvest basal area?	☐	☐	☐
D. Trees felled away from EEZ?	☐	☐	☐
E. Trees that were felled to remediate safety concerns left in place?	☐	☐	☐
F. Sanitation or salvage harvest planned?	☐	☐	☐
G. LWD retained?	☐	☐	☐
H. Water drafting sites to be surveyed for covered species?	☐	☐	☐
7. Seeps and Springs			
A. Seeps and springs within Class I or II watercourse protected?	☐	☐	☐
B. AMZ boundary extended to include seeps or springs if near or draining into AMZ?	☐	☐	☐
C. Seeps and springs that do not drain into watercourse and do not deliver sediment			
i. Applied 50 foot EEZ	☐	☐	☐
ii. Retain 50% canopy cover	☐	☐	☐
iii. Consulted with biologist if need to enter EEZ with heavy equipment?	☐	☐	☐
D. Trees felled away from seeps or springs?	☐	☐	☐
E. Trees felled for safety reasons left in place?	☐	☐	☐
F. Within EEZ, retained greatest of 50 ft^2 basal area or 50% of pre-harvest basal area?	☐	☐	☐
G. Sanitation or salvage harvest planned?	☐	☐	☐
H. LWD retained?	☐	☐	☐
I. Water drafting sites to be surveyed for covered species?	☐	☐	☐
8. LWD placement			
A. Trails bladed to trees?	☐	☐	☐
B. Any new roads or skid trails to be build to place LWD?	☐	☐	☐
C. Soil disturbance minimal when placing LWD in watercourse?	☐	☐	☐
D. Standing trees used for LWD pushed into watercourse with heavy equipment?	☐	☐	☐
E. Requirements for wood placed in watercourses as LWD			
i. If root wad is attached			
a. Diameter is at least 80% of the key piece diameter?	☐	☐	☐
b. Is at least as long as the bank full channel?	☐	☐	☐
ii. If root wad is not attached			
a. Meets key piece size requirements for diameter and length?	☐	☐	☐
b. Is at least as 1.5 times bank full channel width?	☐	☐	☐
F. If root wad exceeds volume standard for key pieces, root wad placed in stream channel?	☐	☐	☐

G. Exceeded target number for key pieces by more than 300%?	☐	☐	☐
H. Downed wood used from AMZ?	☐	☐	☐
I. AMZ exceeds downed wood target?	☐	☐	☐
J. AMZ meets target for key piece loading?	☐	☐	☐
K. Placement of 1 tree as LWD within each 300 feet segment of AMZ?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
L. For trees felled into channel length of tree that interacts with stream is 1.5 times width of bank full channel?	☐	☐	☐
M. Foliage retained on trees felled into channel?	☐	☐	☐
N. LWD pieces placed within 100 feet of one another?	☐	☐	☐
i. If yes, site-specific plan developed by MRC expert?	☐	☐	☐
O. LWD placement follows guidelines in CDFG Salmonid Restoration Manual?	☐	☐	☐
i. If no, ensured stability of LWD placement?	☐	☐	☐
P. LWD added to stream channel tagged and marked?	☐	☐	☐
Q. Plan follows LWD placement plan for coho core watersheds?	☐	☐	☐
R. First entry into stand following HCP/NCCP implementation?	☐	☐	☐
S. Basal area retention standards reduced by basal area of felled for LWD placement?	☐	☐	☐
II. Sediment control			
1. TSU 1 and TSU 2 – Inner Gorge			
A. Roads			
i. Roads or landings constructed or re-constructed?	☐	☐	☐
ii. Watercourse crossings constructed?	☐	☐	☐
iii. Existing roads and landings decommissioned when no longer needed?	☐	☐	☐
B. Tractor Trails			
i. Tractor trails constructed?	☐	☐	☐
C. Tractor yarding			
i. Yarding equipment excluded?	☐	☐	☐
D. Timber Harvest			
i. Timber harvested?	☐	☐	☐
ii. 50% canopy maintained on slopes which contribute flow to inner gorge?	☐	☐	☐
E. Site Preparation and Burning			
i. Site preparation or burning planned?	☐	☐	☐
F. Limits on deviation from conservation measures above			
i. Retained at least 70% canopy and 15 ft^2 of conifers ≥18 in dbh per acre?	☐	☐	☐
ii. Ensured that trees are evenly dispersed across slope after timber harvest?	☐	☐	☐
a. If no, assessment revealed that inner gorge is stable?	☐	☐	☐
iii. Construction and reconstruction of roads			
a. Wildlife agencies notified?	☐	☐	☐
b. Reviewed by a geologist?	☐	☐	☐
2. TSU 1 and 2 – Steep Streamside Slopes			

A. Roads			
i. Roads or landings constructed?	☐	☐	☐
ii. Watercourse crossings constructed?	☐	☐	☐
iii. Followed standards in HCP/NCCP Appendix E for reconstructed roads?	☐	☐	☐
iv. Existing roads and landings decommissioned when no longer needed?	☐	☐	☐
v. Tractor trails constructed?	☐	☐	☐
B. Tractor Yarding			
Mitigation measures	**Y**	**N**	**NA**
i. Equipment on existing stable trails			
a. Other yarding methods would pose a greater risk of sediment delivery?	☐	☐	☐
b. One time entry is required to control erosion?	☐	☐	☐
C. Timber Harvest			
i. 50% overstory canopy retained in portions of unit extending above AMZ?	☐	☐	☐
ii. Retained 15 ft^2 of conifers ≥18 in dbh per acre?	☐	☐	☐
iii. Tree evenly distributed in the portion above the AMZ post-harvest?	☐	☐	☐
D. Site Preparation and Burning			
i. Site preparation or burning planned?	☐	☐	☐
E. Limits on deviation from conservation measures above			
i. Construction of new roads designed and reviewed by PG or CEG?	☐	☐	☐
ii. Construction and reconstruction of roads			
a. Wildlife agencies notified?	☐	☐	☐
b. Reviewed by a geologist?	☐	☐	☐
iii. Trees are evenly distributed across slope post-harvest in TSU1 and TSU2?	☐	☐	☐
iv. Shelterwood or seed tree removal proposed outside inner and middle bands?	☐	☐	☐
a. First time proposed in this stand since HCP/NCCP implementation?	☐	☐	☐
b. Retains 50% overstory canopy?	☐	☐	☐
3. TSU 3 – Steep Dissected Topography			
A. Roads			
i. Construction of reconstruction of roads across more than 50 ft of headwall swale, excluding watercourse crossings?	☐	☐	☐
ii. Existing roads and landings decommissioned when no longer needed?	☐	☐	☐
B. Tractor Trails			
i. Tractor trails constructed or reconstructed?	☐	☐	☐
C. Tractor Yarding			
i. Equipment on existing stable trails			
a. Other yarding methods would pose a greater risk of sediment delivery?	☐	☐	☐
b. One time entry is required to control erosion?	☐	☐	☐
D. Timber Harvest			
i. Retained 50% overstory canopy?	☐	☐	☐
ii. 15 ft^2 of conifers ≥18 in dbh per acre dispersed evenly across the TSU?	☐	☐	☐
iii. Retention emphasized in axis of headwall swales?	☐	☐	☐
E. Site Preparation			

i. Site preparation or burning planned?	☐	☐	☐
F. Limits on deviation from conservation measures above			
i. Shelterwood or seed tree removal proposed outside inner and middle bands?	☐	☐	☐
a. First time proposed in this stand since HCP/NCCP implementation?	☐	☐	☐
ii. 50% canopy retained on headwall swales?	☐	☐	☐
iii. Construction of roads, skid trails, and landings reviewed by PG or CEG?	☐	☐	☐
4. TSU 4 and 5 - Non-dissected, Low Relief Topography			
Mitigation measures	**Y**	**N**	**NA**
A. Roads			
i. Roads and landings maintained and constructed per standards in Appendix E?	☐	☐	☐
B. Tractor Trails			
i. Tractor trails maintained and constructed per standards in Appendix E?	☐	☐	☐
C. Tractor Yarding			
i. Tractor yarding limited to the fewest number of trails necessary?	☐	☐	☐
5. TSU 6 – Earthflow Complexes			
A. Roads			
i. Constructing new roads on earthflow complexes?	☐	☐	☐
ii. Roads and landings maintained so water is not concentrated on slide materials?	☐	☐	☐
iii. Slides			
a. Increased of created cuts into slide body, outside of normal maintenance?	☐	☐	☐
b. Placed fill material on a slide body, outside of normal maintenance?	☐	☐	☐
B. Tractor Yarding			
i. New tractor trails minimized?	☐	☐	☐
ii. Disruption from equipment to natural drainage of the earthflow avoided?	☐	☐	☐
C. Timber Harvest			
i. 50% canopy maintained, distributed across the TSU?	☐	☐	☐
D. Site Preparation and Burning			
i. Existing overstory canopy disturbed?	☐	☐	☐
ii. Drainage disrupted with heavy equipment?	☐	☐	☐
6. TSU 7 - Accelerated Creep Terrain			
A. Roads			
i. Water concentration on soils minimized (preventing gully erosion)?	☐	☐	☐
B. Tractor Trails			
i. Tractors trails maintained, constructed, and reconstructed to avoid the risk of mass wasting?	☐	☐	☐
C. Tractor Yarding			
i. Water concentration on soils minimized (preventing gully erosion)?	☐	☐	☐
D. Timber Harvest			
i. 50% canopy maintained, distributed across the TSU?	☐	☐	☐
E. Site Preparation and Burning			
i. Existing overstory canopy disturbed?	☐	☐	☐

ii. Drainage disrupted with heavy equipment?	☐	☐	☐
7. TSU 8 – Ohlsen Ranch Formation			
A. Roads and Tractor Trails			
i. All roads and skid trails with a risk of sediment delivery managed as “extreme” erosion hazards?	☐	☐	☐
ii. Spacing between waterbars and rolling dips is 50 feet?	☐	☐	☐
iii. Outlets of waterbars and rolling dips slash packed or mulched?	☐	☐	☐
8. Historically active landslides			
Mitigation measures	**Y**	**N**	**NA**
A. Roads			
i. Roads or landings constructed or reconstructed?	☐	☐	☐
ii. Existing roads maintained so excessive water is not concentrated onto slide materials?	☐	☐	☐
B. Tractor Trails			
i. Tractor trails constructed?	☐	☐	☐
ii. Excessive water drainage not concentrated from skid trails onto rockslide materials?	☐	☐	☐
C. Tractor Yarding			
i. Equipment limited to existing stable trails or roads?	☐	☐	☐
D. Timber Harvest			
i. Timber harvest planned?	☐	☐	☐
E. Site Preparation and Burning			
i. Heavy equipment to be used?	☐	☐	☐
ii. Equipment limited on dormant slides to existing stable trails and roads?	☐	☐	☐
F. Limits on deviation from conservation measures above			
i. Harvest retains at least 50% canopy with trees evenly disperse across landslide?	☐	☐	☐
III. Terrestrial Habitat			
1. Snags and Wildlife Trees within a PTHP			
A. Class I and Large Class IIs			
i. Retained 1 hard snag or recruitment tree per acre ≥16 in dbh and ≥30 ft tall?	☐	☐	☐
ii. Retained 2 hard snags or recruitment trees per acre ≥24 in dbh and ≥40 ft tall?	☐	☐	☐
iii. Retained 1 wildlife tree or recruitment tree per acre ≥16 in dbh and ≥30 ft tall?	☐	☐	☐
B. General Forested Areas			
i. Retained 1 hard snag or recruitment tree per acre ≥16 in dbh and ≥30 ft tall?	☐	☐	☐
ii. Retained 1 hard snag or recruitment tree per acre ≥24 in dbh and ≥40 ft tall?	☐	☐	☐
iii. Retained 1 wildlife tree or recruitment tree per acre ≥16 in dbh and ≥30 ft tall?	☐	☐	☐
C. If sanitation/salvage operations, retained 1 additional hard snag 16 in dbh and ≥30 ft tall per acre?	☐	☐	☐
D. Snags felled:			
i. Presented safety hazards?	☐	☐	☐
ii. Created excessive fuel loads?	☐	☐	☐
iii. Part of a sanitation/salvage PTHP or exemption?	☐	☐	☐

iv. Safety hazards			
a. Very large hard snag (>36 in dbh and > 20 ft tall) to be cut?	☐	☐	☐
1. Notification of wildlife tree agencies?	☐	☐	☐
b. Snag > 16 in dbh and > 30 ft tall cut?	☐	☐	☐
1. Cut at least 4 feet above the ground?	☐	☐	☐
2. Left in place?	☐	☐	☐
c. Snag > 16 in dbh and > 30 ft tall cut by LTO for fuel wood?	☐	☐	☐
E. Snags harvested in LACMA not left as downed wood (discretion of WA)?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
F. Snags and wildlife trees prevented from being lost during prescribed burning?	☐	☐	☐
G. Recruitment trees chosen as those with the most characteristics for wildlife?	☐	☐	☐
H. Trees marked with "R" only harvested if tree within same acre more likely to recruit to a snag in shorter period?	☐	☐	☐
I. Snags, wildlife trees, and recruitment trees assessed within a silvicultural unit using only contiguous silvicultural units?	☐	☐	☐
J. Less than 50% of recruitment trees in each unit are hardwoods?	☐	☐	☐
K. All wildlife trees retained?	☐	☐	☐
i. Any trees harvested >24 in dbh with healed over basal hollows?	☐	☐	☐
ii. Any stump sprouts harvested growing over basal hollows?	☐	☐	☐
iii. Any former raptor nest trees harvested (nest no longer evident)?	☐	☐	☐
iv. Is stand exceedingly dense with wildlife trees with limited wildlife valuable?	☐	☐	☐
a. Alternative conservation measures proposed?	☐	☐	☐
2. Downed Wood			
A. Harvesting downed wood in Class I and Large Class II AMZs, extended protection areas for NSOs?	☐	☐	☐
i. Retained 6 pieces of downed wood/acre >16" average diameter; ≥ 6 ft long; derived from at least 3 trees?	☐	☐	☐
B. Harvesting in downed wood in general forested areas	☐	☐	☐
i. Retained 5 pieces of downed wood/acre >16" average diameter; ≥ 6 ft long; derived from at least 3 trees?	☐	☐	☐
C. Wood harvested embedded in bed or bank of any watercourse?	☐	☐	☐
D. Hollow logs and hollow standing trees retained?	☐	☐	☐
E. Non-commercial firewood harvest allowed on roads and landings only?	☐	☐	☐
F. Non-commercial downed wood > 16" average diameter and ≥ 6 foot left on forest floor?	☐	☐	☐
G. Returned all pieces of wood > 24 in. average diameter to forest floor prior to completing landing operations?	☐	☐	☐
3. Hardwood Retention - AMZs			
A. Hardwoods managed in riparian stands?	☐	☐	☐
i. If yes, does management enhance riparian or in-stream habitats?	☐	☐	☐

ii. If yes, does management establish cable corridors for harvesting operations?	☐	☐	☐
iii. If yes, does management create safer working conditions?	☐	☐	☐
iv. If yes, will management retain boles of felled hardwood to provide woody debris?	☐	☐	☐
4. Hardwood Retention – General Areas			
A. Hardwoods ≥ 15 ft^2/ac of hardwoods > 6 in dbh pre-harvest?	☐	☐	☐
i. If yes, retained ≥ 15 ft^2/ac of hardwoods > 6 in dbh post-harvest?	☐	☐	☐
ii. If no, prohibited treatment of hardwood > 6 in db?	☐	☐	☐
B. Hardwood trees ≥ 24 in dbh constitute ≤ 20% of basal area of harvest unit?	☐	☐	☐
i. If no, retained all hardwoods ≥ 24 in dbh?	☐	☐	☐
a. If no, were hardwoods removed for safety?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
b. If no, were hardwoods removed for road-right of way?	☐	☐	☐
c. If no, were hardwoods removed for yarding corridors?	☐	☐	☐
C. Were clusters of mast-producing hardwoods retained?	☐	☐	☐
D. True oaks and madrones > 18" dbh felled for safety, road right-of-way, or yarding corridors?	☐	☐	☐
i. If yes, left on the ground as downed wood?	☐	☐	☐
E. Trees that show significant evidence of wildlife use retained?	☐	☐	☐
F. Trees that provide valuable structural complexity or decay elements retained?	☐	☐	☐
G. Hardwoods retained in clumps including a variety of size classes?	☐	☐	☐
H. Hardwoods retained that surround large individual trees or those with significant wildlife value?	☐	☐	☐
I. Retained hardwood clumps where they enhance connectivity between wildlife habitats (i.e. AMZs and ridgelines)?	☐	☐	☐
J. Aggregate hardwood retention patches from previous VR units occur in unit?	☐	☐	☐
i. If yes, aggregate hardwood retention patches maintained?	☐	☐	☐
K. Oak woodlands or true oak forests proposed for harvest?	☐	☐	☐
i. If yes, is harvest planned to remove invasive conifers?	☐	☐	☐
L. Class I hardwood stands protected and identified?	☐	☐	☐
M. Class II hardwood stands proposed for harvest?	☐	☐	☐
i. On-the-ground assessment re-classified as Class III?	☐	☐	☐
5. Hardwood Representative Sample Areas			
A. Harvest proposed in HRSAs?	☐	☐	☐
i. If yes, maintain mixed-age stand of hardwoods as a result?	☐	☐	☐
ii. If yes, harvest results in maintenance of relative proportion of conifers to hardwoods?	☐	☐	☐
iii. If yes, meet the minimum stocking standards of TMP post-harvest?	☐	☐	☐
iv. If yes, adheres to any changes to CFPRs not covered by PTEIR?	☐	☐	☐
6. Type I Old Growth			
A. Type I old growth in or adjacent to plan area?	☐	☐	☐
i. Type I old growth proposed for harvest?	☐	☐	☐

ii. 150 foot buffer around Type I retains at least 75% of basal area of conifers in old growth stand?	☐	☐	☐
7. Type II Old Growth			
A. Type II old growth in plan area?	☐	☐	☐
i. Type II proposed for harvest?	☐	☐	☐
a. Single tree selection proposed?	☐	☐	☐
b. Harvest will maintain or increase mean stand diameter?	☐	☐	☐
c. Do all OG trees have at least 4 screen trees?	☐	☐	☐
1. If no, assessed additional screen trees with the following:			
A. Used 2 times canopy spread as distance to assess screen trees?	☐	☐	☐
B. Potential screen trees are tallest trees in each quadrant and at least ½ height of tree to be screened?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
d. Harvest of any screen trees proposed?	☐	☐	☐
1. Minimum of 6 screen trees retained with intermingling limbs?	☐	☐	☐
2. Felling screen trees will not damage tree to be screened?	☐	☐	☐
3. Removing harvested trees will not damage tree to be screened?	☐	☐	☐
e. All individual old growth trees retained?	☐	☐	☐
8. Residual Old-growth Trees			
A. All individual old growth trees retained?	☐	☐	☐
B. Do all OG trees have at least 4 screen trees?	☐	☐	☐
i. If no, assessed additional screen trees with the following:			
a. Used 2 times canopy spread as distance to assess screen trees?	☐	☐	☐
C. Potential screen trees are tallest trees in each quadrant and at least ½ height of tree to be screened?	☐	☐	☐
i. Harvest of any screen trees proposed?	☐	☐	☐
a. Minimum of 6 screen trees retained with intermingling limbs?	☐	☐	☐
b. Felling screen trees will not damage tree to be screened?	☐	☐	☐
c. Removing harvested trees will not damage tree to be screened?	☐	☐	☐
9. Rocky Outcrops			
A. Timber operations to occur within ½ mile of rocky outcrops?	☐	☐	☐
i. If yes, survey for peregrine falcons?	☐	☐	☐
B. Helicopter yarding to occur within 1 mile of rocky outcrops?	☐	☐	☐
i. If yes, survey for peregrine falcons?	☐	☐	☐
C. Plans to convert newly discovered outcrops to quarries?	☐	☐	☐
i. Surveys planned for sensitive species?	☐	☐	☐
a. If sensitive species are present, approval obtained from wildlife agencies before converting?	☐	☐	☐
D. Timber operations may occur within ¼ mile of peregrine falcon nest?	☐	☐	☐
i. If yes, consult with wildlife agencies for site-specific conservation measures?	☐	☐	☐
10. Common Natural Communities			
A. Timber management activities geared to restoring/maintaining coastal redwood/Douglas-fir?	☐	☐	☐

B. Timber management activities aimed toward restoring a balance of conifers-to-hardwoods?	☐	☐	☐
C. Timber management activities will result in maintaining existing stand dominance of native conifers other than redwood and Douglas-fir where this occurs?	☐	☐	☐
11. Uncommon Natural Communities			
A. Closed Cone Forest occurs in assessment area for activity?	☐	☐	☐
i. Activities conducted in closed cone forest?	☐	☐	☐
a. If yes, explain why not feasible to avoid?			
ii. Do activities in closed cone forest accumulate to over 5 acres of pygmy disturbed over the life of the plan?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
iii. Technical assistance requested from USFWS related to Lotis Blue Butterfly if activities to occur in closed cone forest?	☐	☐	☐
iv. Plans to apply surrogates for natural disturbance agents in closed cone forest?	☐	☐	☐
a. If yes, concurrence from wildlife agencies obtained?	☐	☐	☐
v. Historic roads within closed cone forest decommissioned, closed, and re-vegetated?	☐	☐	☐
B. Oak Woodlands or Natural Grasslands in assessment area for activity?	☐	☐	☐
i. Activities conducted in oak woodlands or natural grasslands?	☐	☐	☐
a. If yes, explain why not feasible to avoid?			
ii. Plans to apply surrogates for natural disturbance agents in oak woodland or natural grasslands?	☐	☐	☐
a. If yes, concurrence from wildlife agencies obtained?	☐	☐	☐
iii. Historic roads within oak woodlands or natural grasslands decommissioned, closed, and re-vegetated?	☐	☐	☐
iv. Activities to include harvesting encroaching Douglas-fir and avoiding replanting harvested area with conifers?	☐	☐	☐
C. Invasive Species			
i. Plan incorporates applicable elements of Invasive Plant Control Program and Invasive Animal Control Program?	☐	☐	☐
ii. If Invasive Plant Control Program and Invasive Animal Control Program are not completed, continued current control efforts?	☐	☐	☐
IV. Wildlife			
1. Red-legged frogs (RLF)			
A. Red-legged frog breeding site survey?	☐	☐	☐
i. Red-legged frogs documented breeding sites?	☐	☐	☐
a. Vegetation management after July 1?	☐	☐	☐
b. Vegetation management conducted only once every 3 years?	☐	☐	☐
c. Vegetation management limited to 50% of breeding site perimeter?	☐	☐	☐
ii. 25-50 foot EEZ or ELZ around wetlands, wet areas, wet meadows, seeps, and	☐	☐	☐

springs excluding existing roads?			
iii. 50 ft EEZ or ELZ around potential RLF breeding sites excluding existing roads?	☐	☐	☐
a. If there is a need to enter EEZ, conduct pre-project surveys?	☐	☐	☐
1. Documented RLF breeding sites?	☐	☐	☐
a. If yes, buffer remains EEZ?	☐	☐	☐
iv. Documented breeding sites?	☐	☐	☐
a. Drafting less than 50% of pond volume before July 1?	☐	☐	☐
b. Drafting less than 80% of pond volume after July 1?	☐	☐	☐
c. Will drafting occur when egg masses are present?	☐	☐	☐
d. Screen used will have a mesh size less than 1/8 in and an approach velocity of 0.33 ft/sec or less?	☐	☐	☐
v. Are all pump intakes screened and at least 6 in off the bottom of the waterbody?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
vi. Are new ponds constructed with fixtures that allow the pond to be drained if bullfrogs invade?	☐	☐	☐
vii. Bullfrog populations present in 1 or more red-legged frog breeding site in planning watershed of the project?	☐	☐	☐
a. Bullfrog masses removed from the site?	☐	☐	☐
b. Metamorphic bullfrogs removed at least once a week until their CPUE declines to < 1 bullfrog per hour?	☐	☐	☐
c. Pond drained manually or mechanically during bullfrog invasion (only if no red-legged frog larvae in the pond)?	☐	☐	☐
vii. Pre-project surveys conducted to determine the presence of covered aquatic species when proposing that heavy equipment enter into an EEZ or ELZ of any way feature?	☐	☐	☐
viii. Maintained at least 75% of both maximum depth and maximum total surface area of potential breeding sites as measure during baseline distribution?	☐	☐	☐
ix. Any habitat creation proposed by creating new ponds?	☐	☐	☐
x. Herbicide use proposed within 150 ft of habitat occupied by red-legged frogs or within an AMZ of a Class I or Class II stream?	☐	☐	☐
a. If yes, wildlife agency concurrence?	☐	☐	☐
2. Coastal Tailed Frogs			
i. 25-50 foot EEZ or ELZ around wetlands, wet areas, wet meadows, seeps, and springs excluding existing roads?	☐	☐	☐
ii. Pre-project surveys conducted to determine presence of covered aquatic species when proposing heavy equipment enter into the EEZ or ELZ of any wet feature (wet areas, seeps, springs, wet meadows, and wetlands)?	☐	☐	☐
iii. All basins or sub-basins with breeding coastal tailed frogs present designated as Large Class IIs regardless of their drainage size?	☐	☐	☐
iv. Herbicide use proposed within 150 ft of habitat occupied by coastal tailed frogs or within an AMZ of a Class I or Class II stream?	☐	☐	☐
a. If yes, wildlife agency concurrence?	☐	☐	☐
3. Northern Spotted Owls			

A. High Protection Territories			
i. Habitat			
a. Core area for all high protection territories of at least 80 contiguous acres which is 500 ft or more from the initial activity center and off-limits to harvest?	☐	☐	☐
b. Guidelines for core area			
1. Created a circular buffer around the initial activity center with a 500-ft radius?	☐	☐	☐
2. Selected 80 acres of contiguous nesting/roosting habitat if available?	☐	☐	☐
3. Supplemented any deficiencies in the desired 80 ac with the next best contiguous habitat?	☐	☐	☐
4. Habitat located on the same side of a topographic divide?	☐	☐	☐
c. Core areas within both covered lands and state parks in proportion to the amount of core are acreage on covered lands?	☐	☐	☐
d. Retained suitable habitat:			
1. Within 1,000 ft of the initial activity center?	☐	☐	☐
2. Within the extended protection area?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
3. Harvest within these two areas maintains mean stand diameter?	☐	☐	☐
e. Maintained at least 500 acres of suitable habitat within 0.7 miles of the activity center or maintained the existing suitable habitat, if prior to harvest, it is already less than 500 acres?	☐	☐	☐
f. Fire lines proposed within a core area?	☐	☐	☐
1. If yes, prior approval of the Wildlife Agencies granted?	☐	☐	☐
g. Marked and retained all known nest trees of northern spotted owls and protected them with 4 screen trees?	☐	☐	☐
h. Screen tree procedures			
1. Used 2 times the canopy spread as the distance within which to asses and retain potential screen trees?	☐	☐	☐
2. Selected as screen tree tallest tree in assessment quadrant which is at minimum ½ height of the tree to be screened (if no trees this tall, do not retain additional trees)?	☐	☐	☐
3. Selected screen trees in open non-screened quadrants?	☐	☐	☐
i. Harvest of screen trees proposed?	☐	☐	☐
1. If yes, are there at least 6 screen trees remaining for tree to be screened?	☐	☐	☐
2. If yes, felling will not damage the tree to be screened?	☐	☐	☐
3. If yes, removing the harvested tree will not damage the tree to be screened?	☐	☐	☐
j. New road construction proposed within core area?	☐	☐	☐
ii. Breeding Season			
a. Conduct only the following operations with 1,000 feet of a current spotted owl activity center:			
1. Use of mainline roads and maintenance of mainline haul roads?	☐	☐	☐
2. Use of public roads?	☐	☐	☐
3. Use and maintenance of existing MRC roads which are at least the same distance from the current AC as a public road or mainline haul road?	☐	☐	☐
4. Use of pickups and ATVs on existing roads?	☐	☐	☐
b. Helicopter operations, including landings, at least 2640 feet or more from a spotted owl activity center, measured and marked according to map distance?	☐	☐	☐
c. Logging vehicles will stop for safety reasons only when within 1,000 feet of a nest site known to be currently active (unless the vehicle is on the mainline road)?	☐	☐	☐

d. Prescribed burning proposed?	☐	☐	☐
1. Prescribed burning proposed within ¼ mile of an occupied activity center?	☐	☐	☐
2. If yes, approval of the wildlife agencies obtained prior to burning?	☐	☐	☐
e. Surveys to be completed prior to operations that could result in disturbance or reduction of suitable habitat?	☐	☐	☐
iii. Non-breeding Season			
a. Harvest and forest management prohibited in core area?	☐	☐	☐
b. Conduct only the following operations within the core area:			
1. Use and maintenance of existing roads?	☐	☐	☐
2. Re-construction of truck road only if all other alternative measures that might result in less impact have been exhausted?	☐	☐	☐
3. Use of cable corridors and tailholds:			
i. Felled only trees that may hang up cable lines?	☐	☐	☐
ii. Left all trees felled for the cable corridor on the forest floor?	☐	☐	☐
iii. Yarded logs only outside the core area?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
iv. Excluded nest and screen trees from felling?	☐	☐	☐
v. Felled trees for cable corridors away from nest and roost trees so that no damage can occur to nest trees, screen trees, or roost trees?	☐	☐	☐
c. Permit helicopter operations (including service landings) that are at least 1000 ft from activity center.	☐	☐	☐
B. Moderate Protection Territories			
i. Habitat			
a. Guidelines for core area			
1. Selected nesting/roosting over foraging habitat?	☐	☐	☐
2. Selected contiguous habitat over isolated habitat?	☐	☐	☐
3. Habitat located on the same side of a topographic divide?	☐	☐	☐
b. Core area at least 18 contiguous acres that are no harvest with a minimum distance of 500 feet to the initial activity center	☐	☐	☐
c. Retained suitable habitat within the extended protection area (500 ft beyond periphery of core area) prior to harvest and ensure that harvested areas maintain or increase pre-harvest mean stand diameter?	☐	☐	☐
d. Marked and retained all known nest trees of NSOs and protected them with screen trees?	☐	☐	☐
e. Permitted fire control lines for prescribed burning within the core area only with the approval of wildlife agencies.	☐	☐	☐
f. Maintained at least 500 ac of suitable habitat within 0.7 miles of the activity center or maintain existing suitable habitat, if, prior to harvest it was less than 500 acres?	☐	☐	☐
g. If core areas are both on and off covered lands, protected core areas in proportion to the amount of acreage on MRC covered lands?	☐	☐	☐
ii. Breeding Season			
a. Conducted only the following operations within 1000 ft of the current activity center?	☐	☐	☐
`1. Used mainline haul roads and maintenance of mainline haul roads as designated in the HCP/NCCP Atlas?	☐	☐	☐
2. Used public roads?	☐	☐	☐
3. Used and maintained existing MRC roads that are: (1) located at least the same distance from the current activity center as a public road or mainline haul road; or (2) are existing seasonal roads	☐	☐	☐

≥ 500 ft from the current activity center and in use during the time the territory has been active?			
4. Used a road if an owl pair is upgraded from limited to moderate protection and successfully reproduced while the AC was within 500 ft of the road?	☐	☐	☐
b. Permitted helicopter operations, including service landings, only if they are at least 2,640 ft from an activity center?	☐	☐	☐
c. Permitted prescribe burning within ¼ mile of an occupied activity center only with the approval of the Wildlife Agencies?	☐	☐	☐
d. Allow logging vehicles to stop only for safety reason when within 1,000 ft of a nest site known to be currently active, unless the vehicle is on a mainline road?	☐	☐	☐
e. Retained any trees felled for allowable maintenance in the forest adjacent to roads within the core area?	☐	☐	☐
f. Surveyed for spotted owls when operations could result in disturbance or reduction of suitable habitat?	☐	☐	☐
iii. Non-breeding Season			
a. Prohibit harvest or forest management within core area?	☐	☐	☐
b. Conduct only the following operations within the core area:			
1. Use of cable corridors and tailholds:			
Mitigation measures	**Y**	**N**	**NA**
a. Felled only trees that may hang up cable lines?	☐	☐	☐
b. Yarded logs only outside the core area?	☐	☐	☐
c. Excluded nest and screen trees from felling?	☐	☐	☐
d. Left all trees felled for cable corridor on the forest floor?	☐	☐	☐
e. Felled trees for cable corridors away from nest or roost trees to limit damage to these trees?	☐	☐	☐
2. Used and maintained existing roads?	☐	☐	☐
c. Permitted helicopter operations (including service landings) only if they are at least 1,000 feet from an activity center?	☐	☐	☐
d. Surveyed for spotted owls when operations could result in disturbance or reduction of suitable habitat?	☐	☐	☐
e. Construction of new roads inside the core area?	☐	☐	☐
f. If construction of new roads inside the core area occurs, will MRC maintain habitat thresholds?	☐	☐	☐
C. Limited Protection Territories			
i. Habitat			
a. Marked and retained all known nest trees of northern spotted owls and protected them with screen trees?	☐	☐	☐
ii. Breeding Season			
a. Protected a 500 ft no-harvest buffer during the breeding season?	☐	☐	☐
b. Permitted helicopter operations (including service landings) only if they are at least 1,320 feet from an activity center?	☐	☐	☐
c. Surveyed for spotted owls when operations could result in disturbance?	☐	☐	☐
D. NSO Territories Off Property			
i. Habitat			
a. Followed habitat protections for moderate territories for Level 4As?	☐	☐	☐
b. Followed habitat protections for limited territories for Level 4Bs?	☐	☐	☐
ii. Breeding and non-breeding season			

a. Followed breeding and non-breeding season protections for moderate protections for Level 4As?	☐	☐	☐
b. Followed breeding and non-breeding season protections for limited protections for Level 4Bs?	☐	☐	☐
E. NSO Territories On/Off Property			
i. Habitat			
a. Followed habitat protections for moderate territories?	☐	☐	☐
ii. Breeding Season			
a. Followed breeding season protections for moderate territories?	☐	☐	☐
iii. Non-breeding Season			
a. Followed non-breeding season protections for moderate territories?	☐	☐	☐
F. Mobile Activity Centers – high or moderate protections			
i. Breeding season protections are given to the most current activity center?	☐	☐	☐
ii. Maintained nest-site core areas through at least 3 breeding seasons?	☐	☐	☐
iii. Maintained roost-site core areas through at least 2 breeding seasons unless in year 0 a spotted owl is detected 1 time only in the roost site?	☐	☐	☐
G. Mobile Activity Centers – limited protections			
Mitigation measures	**Y**	**N**	**NA**
i. Most recent activity center surrounded with a 500-ft buffer during breeding season?	☐	☐	☐
4. Marbled Murrelets			
A. Lower Alder Creek Core Area			
i. Is operation located in Lower Alder Creek Management Area?	☐	☐	☐
a. Does project propose forest management or public entry into Lower Alder Creek Core Area?	☐	☐	☐
b. Does project proposed forest management in Lower Alder Creek Habitat Area?	☐	☐	☐
1. Timber management conducted to create and enhance habitat for marbled murrelets?	☐	☐	☐
2. Wildlife agency approval obtained before submitting this PTHP?	☐	☐	☐
3. Wildlife agency approval obtained before altering vegetation or maintaining roads?	☐	☐	☐
4. Wildlife agencies provided a map of the entire project areas before initiating activity?	☐	☐	☐
5. Fire control lines for prescribed burning only allowed with prior approval of the Wildlife Agencies?	☐	☐	☐
6. Logging debris treatment:			
A. Treatment occurred between September 15th and March 24th of first year following harvest?	☐	☐	☐
B. Treatment approved by the Wildlife Agencies?	☐	☐	☐
C. Slash lopped > 30 in high?	☐	☐	☐
D. Felled trees <24 in dbh removed to a landing?	☐	☐	☐
E. Top 50 ft off any felled tree > 24 in dbh cut off and removed to landing?	☐	☐	☐
F. All tree stems left on the ground bucked into smaller segments and limbed?	☐	☐	☐
7. Breeding season measures:			
A. MRC survey showed that murrelets are not occupying area within ¼ mile of proposed project?	☐	☐	☐
B. Operations do not occur within ¼ mile of core area periphery?	☐	☐	☐
C. Operations are at least 100 ft from potential habitat trees?	☐	☐	☐
D. Operations occur within period of 2 hours after sunrise to 2 hours before sunset?	☐	☐	☐

E. Vehicular traffic allowed within ¼ mile of core area periphery or 100 feet of potential murrelet habitat trees: if it involved maintenance and hauling on mainline haul routes; if it involves vehicles on existing seasonal or permanent roads which are 1 ton or less; or ATVs on existing roads?	☐	☐	☐
F. Prescribed burning within ¼ mile of LACHA only with approval of Wildlife Agencies?	☐	☐	☐
G. Helicopter operations permitted only if they are at least ½ mile from core area periphery and an MRC survey shows that murrelets are not occupying any area within ½ mile of helicopter operations?	☐	☐	☐
H. Blasting conducted only if: it is at least 1 mile from a core area periphery; it is within the time period of 2 hours after sunrise to 2 hours before sunset; and an MRC survey shows that murrelets are not occupying any area within 1 mile of the blasting?	☐	☐	☐
I. Road maintenance, and rock and log hauling only occurs during time 2 hours after sunrise to 2 hours before sunset?	☐	☐	☐
J. Public entry prohibited?	☐	☐	☐
8. Non-breeding season measures:			
A. Vehicular traffic allowed within 300 feet of core area periphery or 100 feet of potential murrelet trees only for (a) maintenance and hauling on mainline routes; (b) vehicles on existing seasonal or permanent roads which are 1 ton or less; or (c) ATVs on existing roads?	☐	☐	☐
B. Conduct timber operations only if (a) an MRC survey shows that murrelets are not occupying any area within 300 ft of a proposed project; (b) the project is at least 300 ft beyond a core area periphery; (c) operations are 100 ft away from potential habitat trees; and (d) the operations are within the time period 2 hours after sunrise to 2 hours before sunset?	☐	☐	☐
C. Cable corridor only created if: (a) MRC survey shows that murrelets are not occupying any areas within 300 ft of the cable corridor; (b) trees are felled away from potential habitat trees; and (c) operations are within the time period of 2 hours after sunrise to 2 hours before sunset?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
D. Helicopter operations occur only if they are at least 500 ft from a core area periphery shows that murrelets are not occupying any area within 500 ft of the operations?	☐	☐	☐
E. All maintenance and hauling will be conducted at (a) at least 300 ft from a core area periphery and (b) within the time period of 2 hours after sunrise to 2 hours before sunset?	☐	☐	☐
F. Operations will not reduce visibility on viewshed for radar monitoring sites?	☐	☐	☐
2. Is operation located in Lower Alder Creek Buffer Area (LACBA)?	☐	☐	☐
a. Does project propose forest management or public entry into Lower Alder Creek Buffer Area?	☐	☐	☐
1. Is timber operation conducted to provide buffering and protection for LACCA and LACBA?	☐	☐	☐
2. Has approval been obtained for proposed forest management from the Wildlife Agencies?	☐	☐	☐
3. Are fire control lines for prescribed fires proposed?	☐	☐	☐
A. If yes, has approval been obtained for fire control lines from the Wildlife Agencies?	☐	☐	☐
4. Is work proposed to alter vegetation, or to maintain, construct, or reconstruct roads?	☐	☐	☐
A. If yes, has approval been obtained for fire control lines from the Wildlife Agencies?	☐	☐	☐
5. Have wildlife agencies been provided a map of the entire project area?	☐	☐	☐
6. Logging debris treatment:			
A. Treatment occurred between September 15th and March 24th of first year following harvest?	☐	☐	☐
B. Treatment approved by the Wildlife Agencies?	☐	☐	☐
C. Slash lopped > 30 in high?	☐	☐	☐
D. Felled trees <24 in dbh removed to a landing?	☐	☐	☐
E. Top 50 ft off any felled tree > 24 in dbh cut off and removed to landing?	☐	☐	☐
F. All tree stems left on the ground bucked into smaller segments and limbed?	☐	☐	☐
7. Public entry prohibited?	☐	☐	☐
8. Breeding season measures:			
A. Conduct timber operations only if a MRC survey shows that murrelets are not occupying any area within a 1.4 mile buffer of the proposed project and the operations are (a) at least ¼ mile beyond a core area periphery; (b) at least 100 feet away from potential murrelet trees; and(c) operations are	☐	☐	☐

	Y	N	NA
within the time period 2 hours after sunrise to 2 hours before sunset?			
B. Vehicular traffic allowed within ¼ mile of core area periphery or 100 feet of potential murrelet trees only for (a) maintenance and hauling on mainline routes; (b) vehicles on existing seasonal or permanent roads which are 1 ton or less; or (c) ATVs on existing roads?	☐	☐	☐
c. Helicopter operations occur only if they are at least ½ mile from a core area periphery and an MRC survey shows that murrelets are not occupying any area within a ½ mile buffer of the helicopter operations?	☐	☐	☐
D. Blasting conducted only if: it is at least 1 mile from a core area periphery; it is within the time period of 2 hours after sunrise to 2 hours before sunset; and an MRC survey shows that murrelets are not occupying any area within 1 mile of the blasting?	☐	☐	☐
E. Prescribed burning planned within ¼ mile of LACBA?	☐	☐	☐
i. If yes, agency approval obtained?	☐	☐	☐
F. Maintenance and hauling will be conducted from 2 hours after sunrise to 2 hours before sunset?	☐	☐	☐
9. Non-breeding season measures:			
A. Conduct timber operations only if a MRC survey shows that murrelets are not occupying any area within 300 ft of the proposed project and the operations are (a) at least 300 ft beyond a core area periphery; (b) trees are felled way from potential habitat trees; and(c) operations are within the time period 2 hours after sunrise to 2 hours before sunset?	☐	☐	☐
B. Harvest occurs only to create a required cable corridor only if (a) an MRC survey shows that murrelets are not occupying any area within 300 ft of the cable corridor; (b) trees are felled away from potential habitat; and (c) operations are within the time period of 2 hours after sunrise to 2 hours before sunset?	☐	☐	☐
C. Timber operations to be conducted for opening a cable corridor?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
i. Trees to be felled away from potential habitat?	☐	☐	☐
ii. Operations are to occur within the time period of 2 hours after sunrise to 2 hours before sunset?	☐	☐	☐
D. Vehicular traffic will occur within 300 feet of a core area periphery or within 100 feet of potential murrelet habitat trees?			
i. Maintenance and hauling will occur on mainline routes?	☐	☐	☐
ii. One ton or less vehicles will be used on existing seasonal or permanent roads?	☐	☐	☐
iii. All terrain vehicles on existing roads?	☐	☐	☐
E. Helicopter operations planned?	☐	☐	☐
i. All operations occur at least 500 feet from a core area periphery?	☐	☐	☐
ii. MRC surveys to occur that show that murrelets are not occupying any area within 500 feet of helicopter operation?	☐	☐	☐
F. All maintenance and hauling to occur only within the period from 2 hours after sunrise to 2 hours before sunset?	☐	☐	☐
B. Murrelet Habitat Recruitment Stands (MHRS)			
i. Does project occur in or adjacent to a MHRS?	☐	☐	☐
a. Identify MHRS and note them in an attachment to THP?	☐	☐	☐
b. Harvest occurring in first 20 years of HCP/NCCP implementation?	☐	☐	☐
C. Occupied Murrelet Habitat in plan area or adjacent to plan?	☐	☐	☐
i. Breeding season measures			
a. Approaches limited to at least a distance of 0.25 miles from identified habitat tree(s)?	☐	☐	☐
1. Approaches within 0.25 miles from identified habitat tree(s) allowed and planned for maintenance and hauling on mainline routes?	☐	☐	☐
2. Approaches within 0.25 miles from identified habitat tree(s) allowed and planned for use of mainline roads if they are farther away from an identified habitat tree than the mainline road?	☐	☐	☐

3. Approaches within 0.25 miles from identified habitat tree(s) allowed and planned for use of a vehicle ≤ ton on existing seasonal or permanent roads?	☐	☐	☐
4. Approaches within 0.25 miles from identified habitat tree(s) allowed and planned for all terrain vehicles (ATVs) on existing trails?	☐	☐	☐
b. Prescribed burning planned within ¼ mile of occupied murrelet stands?	☐	☐	☐
1. Approval of wildlife agencies obtained?	☐	☐	☐
2. Fire control lines planned within occupied habitat?	☐	☐	☐
A. Approval of wildlife agencies obtained?	☐	☐	☐
c. Helicopter operations to occur at least 0.50 miles from identified habitat tree(s)?	☐	☐	☐
d. Blasting to be conducted at least 1 mile from identified habitat tree(s)	☐	☐	☐
e. Any maintenance and hauling to be conducted within 0.25 miles of identified habitat trees only from 2 hours after sunrise to 2 hours before sunset?	☐	☐	☐
ii. Non-Breeding season measures			
a. Conducted harvest operations and construction of new roads at least 300 ft away from identified habitat tree(s)?	☐	☐	☐
b. Helicopter operations to occur at least 500 ft from identified habitat tree(s)?	☐	☐	☐
c. Maintenance and hauling conducted within 300 ft of identified habitat tree(s) only from 2 hours after sunrise to 2 hours before sunset?	☐	☐	☐
D. Assessment of murrelet zone			
Mitigation measures	**Y**	**N**	**NA**
i. Any zone 1 area contained in plan area (show on map)?	☐	☐	☐
a. Zone 1 is defined as any area: (1) north of Juan Creek in Rockport; (2) any location in plan area that is within 5 miles of the coast; and (3) any area within the Lower Alder Creek planning watershed within 5-10 miles of the coast on the bottom third of the hill slope (measured from Class I or large Class II watercourse)?			
ii. Any zone 2 area contained in plan area (show on map)?	☐	☐	☐
a. Zone 2 is defined as any area excluding those in Zone 1 that is 5-10 miles from the coast and at the bottom third of a hill slope (measured from Class I or large Class II watercourse)?			
iii. Any zone 3 area contained in plan area (show on map)?	☐	☐	☐
a. Zone 3 is defined as: (1) any area that is > 10 miles from the coast or (2) any area that is 5-10 miles from coast and at upper 2/3 of a hill slope (measured from Class I or large Class II watercourse)?			
E. Defining areas of murrelet habitat requiring surveys or protection			
i. Within zone 1			
a. Any areas of high protection or requiring surveys (show on map)?	☐	☐	☐
1. High protection within zone 1 is: Type I and II old growth; any area with > 2 primary murrelet trees within 100 feet of each other			
b. Any areas of moderate protection or requiring surveys (show on map)?	☐	☐	☐
1. Moderate protection within zone 1 is any area with 2 primary murrelet trees within 100 feet of each other			
c. Any known areas of limited protection (no surveys required; show on map if known)?	☐	☐	☐
1. Low protection within zone 1 is any area with 1 primary murrelet tree or any number of secondary murrelet trees			

ii. Within zone 2			
a. Any areas of high protection or requiring surveys (show on map)?	☐	☐	☐
1. High protection within zone 2 is: Type I old growth			
b. Any areas of moderate protection or requiring surveys (show on map)?	☐	☐	☐
1. Moderate protection within zone 2 is: Type II old growth or > 2 primary murrelet trees within 100 feet of each other			
c. Any known areas of limited protection (no surveys required; show on map if known)?	☐	☐	☐
1. Low protection within zone 2 is: ≤ 2 primary murrelet trees within 100 feet of each other or any number of secondary trees?			
iii. Within zone 3			
a. No high protection assigned in Zone 3			
b. Any areas of moderate protection or requiring surveys (show on map)?	☐	☐	☐
1. Moderate protection within zone 3 is: Type I and II old growth or > 4 primary murrelet trees within 100 feet of each other			
c. Any known areas of limited protection (not surveys required; show on map if known)?	☐	☐	☐
1. Limited protection within zone 3 is: ≤ 4 primary murrelet trees within 100 feet of each other or any number of secondary trees.			
F. Surveys or protections			
Mitigation measures	**Y**	**N**	**NA**
i. All areas of high or moderate protections mapped and designated on PTHP?	☐	☐	☐
ii. Defined whether surveys or protections will be designated for each area mapped?	☐	☐	☐
iii. If surveys are to be used, will they follow the current protocol?	☐	☐	☐
iv. If surveys result in occupied behavior, will protections follow occupied murrelet habitat protections?	☐	☐	☐
G. High Protection Areas			
i. Breeding Season Conservation Measures			
a. Log trucks at least 200 feet away from identified habitat tree(s)?	☐	☐	☐
1. Will log trucks be used within 200 feet on mainline haul roads?	☐	☐	☐
b. Chainsaws, backhoes, cat skidders, dump trucks, log loaders, and bulldozers will be used at least 400 feet away from identified habitat trees?	☐	☐	☐
c. Rock drills jackhammers, large tree felling (dominants and codominants), jake brake on trucks, and yarder tower whistles at least 1,320 feet away from identified habitat trees?	☐	☐	☐
d. Helicopter operations will occur at least 0.25 miles away from potential habitat trees?	☐	☐	☐
e. Operations not defined above will be conducted at least 800 feet from potential habitat trees?	☐	☐	☐
f. Blasting will be conducted at least 1 mile away from potential habitat trees?	☐	☐	☐
ii. Non-breeding Season Conservation Measures			
a. Conduct harvest operations at least 100 feet away from primary habitat trees?	☐	☐	☐
1. Felling operations required for a cable corridor? (Allows for less than 100 ft distance from primary habitat trees)	☐	☐	☐

b. Harvest proposed 100—200 feet from primary habitat trees?	☐	☐	☐
1. 175 ft^2 conifer basal area retained post-harvest?	☐	☐	☐
2. 70% canopy cover retained post-harvest?	☐	☐	☐
3. If not meeting 1 and 2, approval obtained from wildlife agencies for alternative prescriptions?	☐	☐	☐
c. Helicopter operations are at least 300 feet from primary murrelet trees or known un-surveyed Type I and II old growth stands?	☐	☐	☐
d. All primary murrelet trees and screen trees will be retained?	☐	☐	☐
e. Harvest of secondary murrelet trees only if a ground survey has determined it is unlikely murrelets are occupying the identified trees or surrounding area?	☐	☐	☐
H. Moderate Protection Areas			
i. Breeding Season Conservation Measures			
a. Log trucks at least 200 feet away from identified habitat tree(s)?	☐	☐	☐
1. Will log trucks be used within 200 feet on mainline haul roads?	☐	☐	☐
2. Will log trucks be used on non-mainline roads that are further from the potential habitat trees than a mainline or public road?	☐	☐	☐
b. Chainsaws, backhoes, cat skidders, dump trucks, log loaders, and bulldozers will be used at least 400 feet away from identified habitat trees?	☐	☐	☐

Mitigation measures	**Y**	**N**	**NA**
c. Rock drills jackhammers, large tree felling (dominants and codominants), jake brake on trucks, and yarder tower whistles at least 1,320 feet away from identified habitat trees?	☐	☐	☐
d. Helicopter operations will occur at least 0.25 miles away from potential habitat trees?	☐	☐	☐
e. Operations not defined above will be conducted at least 400 feet from potential habitat trees?	☐	☐	☐
f. Blasting will be conducted at least 1 mile away from potential habitat trees by line of sight and at least 0.5 miles by map distance?	☐	☐	☐
ii. Non-breeding season measures			
a. Conduct harvest operations at least 75 feet away from primary habitat trees?	☐	☐	☐
1. Felling operations required for a cable corridor? (Allows for less than 75 ft distance from primary habitat trees)	☐	☐	☐
A. Trees to be felled away from potential habitat trees?	☐	☐	☐
B. All felled trees left on the ground?	☐	☐	☐
C. Avoid felling trees within 50 ft of potential habitat trees?	☐	☐	☐
b. Harvest proposed 75—200 feet from primary habitat trees?	☐	☐	☐
1. 175 ft^2 conifer basal area retained post-harvest?	☐	☐	☐
2. 60% canopy cover retained post-harvest?	☐	☐	☐
3. If not meeting 1 and 2, approval obtained from wildlife agencies for alternative prescriptions?	☐	☐	☐
c. Helicopter operations are at least 200 feet from primary murrelet trees or known un-surveyed Type I and II old growth stands?	☐	☐	☐
d. All primary murrelet trees and screen trees will be retained?	☐	☐	☐

e. Harvest of secondary murrelet trees only if a ground survey has determined it is unlikely murrelets are occupying the identified trees or surrounding area?	☐	☐	☐
I. Limited Protection			
i. All primary murrelet habitat trees retained?	☐	☐	☐
ii. Harvest of secondary murrelet trees only if a ground survey has determined it is unlikely murrelets are occupying the identified trees or surrounding area?	☐	☐	☐
5. Point Arena Mountain Beavers (PAMB)			
A. Is the PTHP in the PAMB assessment area?	☐	☐	☐
B. General			
i. Timber operations planned in any contiguous habitat area that is within 200 ft of active PAMB burrows or un-surveyed suitable PAMB habitat?	☐	☐	☐
a. Timber operations includes felling, yarding, and construction of fire lines			
b. Patches of habitat are contiguous only if they are less than 50 ft apart.			
ii. Road construction planned in any contiguous habitat area that is within 400 ft of active PAMB burrows or un-surveyed suitable PAMB habitat?	☐	☐	☐
iii. Salvage operations prohibited within 100 ft of known existing PAMB burrow systems?	☐	☐	☐
iv. Foot traffic that might cause burrow collapse prohibited within 25 ft of active PAMB burrow systems or un-surveyed potential PAMB habitat?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
a. This does not include entering the bounds of an active burrow system or un-surveyed potential habitat to survey for burrows or conducting monitoring.			
v. Trees to be felled away from un-surveyed potential PAMB habitat or active PAMB burrow systems?	☐	☐	☐
a. If not felling trees away from un-surveyed potential PAMB habitat or active PAMB burrow systems, have wildlife agencies approved an alternative treatment?	☐	☐	☐
vi. Construction and reconstruction of roads will maintain or enhance hydrologic conditions in the vicinity of PAMB burrow systems?	☐	☐	☐
a. If MRC will modify local hydrology, have wildlife agencies approved alternative treatment?	☐	☐	☐
vii. Construction of permanent barriers (including fences and permanent openings greater than 50 ft) which might disrupt dispersal or movement between occupied PAMB colonies planned?	☐	☐	☐
viii. Rodent control (including trapping) will be conducted?	☐	☐	☐
a. If yes, will rodent control occur at least 500 ft away from active PAMB burrows or un-surveyed potential PAMB habitat?	☐	☐	☐
b. If yes, will rodent control be conducted with individuals approved as PAMB surveyors?	☐	☐	☐
ix. Domestic dogs will be restrained in a 6 ft leash in areas containing PAMB burrow systems or un-surveyed potential habitat?	☐	☐	☐
x. Blasting to be conducted at least 500 ft away from an active PAMB burrow or un-surveyed potential PAMB habitat?	☐	☐	☐

xi. Prescribed burning at least 100 ft away from an active PAMB burrow or un-surveyed potential PAMB habitat?	☐	☐	☐
C. Breeding Season			
i. Use of heavy equipment off roads; tractor yarding; operation of log landings; loading of log trucks; and use of rock pits; all resulting in severe ground disturbance will occur at least 500 ft away from an active PAMB burrow or un-surveyed potential PAMB habitat?	☐	☐	☐
ii. Use and maintenance of existing roads for log hauling; chainsaw brushing or thinning of non-commercial trees; felling commercial trees; cable yarding; helicopter yarding; use of motorized vehicles; limbing and bucking; maintenance and re-fueling of heavy equipment; and construction or re-construction of roads; all causing above-ground noise and ground vibration will be conducted at least 100 feet from active PAMB burrow systems or unsurveyed potential habitat?	☐	☐	☐
a. Yarding logs in un-surveyed PAMB habitat and occupied PAMB habitat to occur (logs must be fully suspended above the habitat and yarding must occur 1 hour after sunrise and 1 hour prior to sunset)?	☐	☐	☐
iii. Any of the following operations to occur which can occur at any time and any distance from un-surveyed potential PAMB habitat and active PAMB burrow systems:			
Mitigation measures	**Y**	**N**	**NA**
a. Use of mainline haul roads for log hauling and maintenance of mainline roads as designated by various maps in the HCP/NCCP atlas?	☐	☐	☐
1. Maintenance includes actions necessary to use the roads, e.g. knocking down waterbars, grading, and watering. Maintenance does not include actions considered reconstruction of roads under the California Forest Practice Rules (CDF 2006, 14), such as changing the prism of the road. MRC must retain any trees felled for maintenance in forest adjacent to burrow systems or unsurveyed potential habitat.			
b. Use of public roads?	☐	☐	☐
c. Use and maintenance of MRC roads which are at least the same distance from a current active PAMB burrow as a public road or mainline haul road?	☐	☐	☐
d. Use of pickups and ATVs on roads?	☐	☐	☐
D. Non-Breeding Season			
i. Use of heavy equipment off roads; tractor yarding; operation of log landings; loading log trucks; use of rockpits; all resulting in severe ground disturbance will be conducted at least 100 ft away from an active PAMB burrow or un-surveyed potential PAMB habitat?	☐	☐	☐
a. If no, have agencies provided prior approval for proposed operations?	☐	☐	☐
ii. Chainsaw brushing or thinning of non-commercial trees; felling commercial trees; cable yarding; helicopter yarding; use of motorized vehicles; limbing and bucking; maintenance and re-fueling of heavy equipment; and construction and re-construction of roads; all resulting in above-ground noise and ground vibration) will occur at least 50 ft from an active PAMB burrow	☐	☐	☐

system or un-surveyed potential PAMB habitat.			
a. Yarding may occur above PAMB habitat as long as logs are fully suspended and yarding occurs during the time period of 1 hour after sunset to 1 hour before sunrise?	☐	☐	☐
iii. Any of the following operations to occur which can occur at any time and any distance from un-surveyed potential PAMB habitat and active PAMB burrow systems:			
a. Use of mainline roads for log hauling and maintenance of mainline roads as designated by various maps in the HCP/NCCP atlas?	☐	☐	☐
b. Use of public roads?	☐	☐	☐
c. Use and maintenance of MRC roads which are at least the same distance from a current active PAMB burrow as a public road or mainline haul road?	☐	☐	☐
d. Use of pickups and ATVs on roads?	☐	☐	☐
6. Covered Rare Plants			
A. Completed floristic surveys as required by the HCP/NCCP?	☐	☐	☐
B. Any Management Category 1 plants?	☐	☐	☐
i. Communications			
a. All field personnel working in the vicinity of the covered species occurrences, particularly operators of heavy equipment and those who apply pesticides, will be instructed to comply with conservation measures?	☐	☐	☐
ii. Core Occurrence Area			
Mitigation measures	**Y**	**N**	**NA**
a. Will a marking system that will persist throughout the term of the HCP/NCCP to designate environmentally sensitive areas along roads, such as core occurrence areas be installed prior to operations?	☐	☐	☐
b. Will the boundaries oF a core occurrence area be marked at regular intervals with painted t-posts, with stakes and colored flags, with clearly visible marks on retained trees, or with other means, so that the occurrence boundary maintains its integrity and is easily identifiable during activity and monitoring periods prior to operations?	☐	☐	☐
c. Will the outer limits for the core occurrence area be marked at least 5 ft beyond any visible parts (e.g. branches, surface roots) of a covered rare plant; using GPS data, if required, to define the core occurrence and ensure relocation if markers are damaged or removed prior to and during operations?	☐	☐	☐
d. Will the groups of plants within a core occurrence area be marked using methods described above to facilitate avoidance and monitoring prior to operations?	☐	☐	☐
e. Will operations be restricted to use of existing truck roads, landings, and rock pits, as well as any activities intended to conserve rare plants, such as weed control?	☐	☐	☐
f. Will operations avoid all activities, including those outside the core occurrence and buffer areas, which result in significant alterations in surface water hydrologic conditions within the core occurrence area and adversely affect covered rare plants?	☐	☐	☐
g. Will operations fall trees into core occurrence areas, only if required for worker safety?	☐	☐	☐

1. Will operations leave felled trees in core occurrence areas?	☐	☐	☐
2. If falling a tree into a core occurrence area is required, MRC will notify agencies before felling occurs (agencies have 15 working days to respond before MRC can proceed with planned falling operations)?	☐	☐	☐
h. Will operations require site preparation within designated core areas?	☐	☐	☐
1. Wildlife agency concurrence received prior to site preparation operations in core areas?	☐	☐	☐
i. Will operations avoid piling slash within designated core areas?	☐	☐	☐
iii. Buffer Widths			
a. Buffer width is 150 ft for forested sites and 50 ft for other sites?	☐	☐	☐
1. If buffer width is less, is it dues to topographic characteristics, silvicultural practices, or adjacent stand conditions?	☐	☐	☐
2. Approval of wildlife agencies obtained for buffer width less than 150 ft for forested sites or 50 ft for other sites?	☐	☐	☐
b. Outer edge of buffer marked with colored flagging or its equivalent, before operations begin?	☐	☐	☐
c. Outer edge of buffer will remain marked with colored flagging or its equivalent during operations?	☐	☐	☐
iv. Buffer Management During Timber Operations			
a. Only non-ground-disturbing types of site preparation occurring in buffer?	☐	☐	☐
b. Use silviculture that results in cover approximately equivalent to that found in the core occurrence area with the harvest at least meeting the basal area and canopy requirements (derived from Class I and Large Class II AMZ, inner and middle bands)?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
1. Obtain approval of wildlife agencies on exceptions for early successional species and others that prefer open conditions?	☐	☐	☐
c. Retain the approximate spatial and species mix and size distribution of tree species (conifers and hardwoods) found in the local area?	☐	☐	☐
d. Fell trees away from a core occurrence area whenever possible?	☐	☐	☐
e. Treat the buffer area as an ELZ, allowing for use of existing roads, landings, and rock pits?	☐	☐	☐
f. Avoid significantly altering the surface water hydrologic conditions in ways that could adversely affect covered rare plants?	☐	☐	☐
v. Invasive Pest Plant Management			
a. Control invasive pest plants within 50 ft of all covered rare plant individuals, using methods that are feasible and effective, and that minimize impacts to non-target species, during both the 1st and 2nd years following operations?	☐	☐	☐
vi. Take Proposed?	☐	☐	☐
a. Avoiding or minimizing take to the maximum degree possible?	☐	☐	☐
b. Take is required for normal operations?	☐	☐	☐
c. Take will occur on occurrences with > 250 individuals, except for roads, landings, and rock pits?	☐	☐	☐
d. Amount of take anticipated described in this PTHP?	☐	☐	☐
e Take will occur only during the period between seed set and breaking of dormancy?	☐	☐	☐

1. If this is not feasible, why not?			
vii.Take For Roads, Landings, and Rockpits proposed?	☐	☐	☐
a. Take of covered rare plant individuals growing in previously established roads, landings, and rock pits, if avoidance is infeasible:			
1. For occurrences < 250 individuals take is proposed for up to 2% of the individuals within a single occurrence?	☐	☐	☐
2. For occurrences of 251-500 individuals, take is proposed for up to 5% of the individuals within a single occurrence?	☐	☐	☐
3. For occurrences of > 500 individuals, take of up to 10% of the individuals within a single occurrence?	☐	☐	☐
4. Feasible minimization proposed? Including: minimizing grading of roadbed and roadsides; running logging trucks and other equipment in tire tracks only; enforcing seasonal restrictions; and applying other restrictions.	☐	☐	☐
b. Spread soil from road berms (which need to be removed for proper road drainage on which rare plants are growing) in roadside areas that MRC will manage as EEZs for a minimum of two years?	☐	☐	☐
c. Rare plants which are taken as part of operations activities and not translocated will be donated for scientific purposes if possible.	☐	☐	☐
viii. Take for All Other Operations proposed?	☐	☐	☐
a. Is take proposed on occurrences with > 250 individuals?	☐	☐	☐
b. Is take proposed on greater than 2% of individuals within a single occurrence?	☐	☐	☐
ix. Variances requested?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
a. Written approval obtained for wildlife agencies if requesting changes to core area management, buffer management, or buffer width?	☐	☐	☐
b. Variance is included in the PTHP for public comment?	☐	☐	☐
x. Translocation proposed?	☐	☐	☐
a. Non-compensatory proposed?	☐	☐	☐
1. Non-compensatory translocation proposed as part of PTHP?	☐	☐	☐
2. Wildlife agencies have been notified?	☐	☐	☐
3. Translocation location marked in the field and mapped in PTHP?	☐	☐	☐
4. Condition of PTHP to report in writing to the Wildlife Agencies the result of the translocation?	☐	☐	☐
b. Compensatory proposed?	☐	☐	☐
1. Compensatory translocation proposed as part of PTHP?	☐	☐	☐
2. Wildlife agencies have provided written approval included in PTHP?	☐	☐	☐
3. Translocation location marked in the field and mapped in PTHP?	☐	☐	☐
4. Condition of PTHP to report in writing to the Wildlife Agencies the result of the translocation?	☐	☐	☐
C. Any Management Category 2 Plant Occurrences?	☐	☐	☐
i. Communications			
a. All field personnel working in the vicinity of the covered species occurrences,	☐	☐	☐

particularly operators of heavy equipment and those who apply pesticides, will be instructed to comply with conservation measures?			
ii. Core Occurrence Area			
a. Will install a marking system along roads to designate environmentally sensitive areas, such as core occurrence areas; ensure the system persists throughout the period of operations?	☐	☐	☐
b. Will mark the boundaries of a core occurrence area at regular intervals with painted t-posts, with stakes and colored flags, with clearly visible marks on retained trees, or with other means, so that the occurrence boundary maintains its integrity and is easily identifiable during activity and monitoring period?	☐	☐	☐
c. Will mark the outer limits of core occurrence area at least 5 ft beyond any visible parts (e.g., branches, surface roots) of a covered rare plant; use GPS data, as required, to define the core occurrence and ensure relocation if markers are damaged or removed?	☐	☐	☐
d. Will mark groups of plants, within a core occurrence area as described above to facilitate avoidance and monitoring?	☐	☐	☐
e. Site preparation proposed within designated core areas?	☐	☐	☐
1. Wildlife agencies have provided concurrence if site preparation is proposed in core areas?	☐	☐	☐
f. Slash will be piled outside of designated core areas?	☐	☐	☐
iii. Buffer Width			
a. Proposed buffer width is 50 ft?	☐	☐	☐
1. If buffer width is less, is it dues to topographic characteristics, silvicultural practices, or adjacent stand conditions?	☐	☐	☐
2. Approval of wildlife agencies obtained for buffer width less than 50 ft?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
b. Outer edge of buffer marked with colored flagging or its equivalent, before operations begin?	☐	☐	☐
c. Outer edge of buffer will remain marked with colored flagging or its equivalent during operations?	☐	☐	☐
iv. Core Area Management during Timber Operations			
a. Post-harvest stands will meet the basal area and canopy requirements of the inner and middle bands of Class I and Large Class II AMZs?	☐	☐	☐
1. Obtain approval of wildlife agencies on exceptions for early successional species and others that prefer open conditions?	☐	☐	☐
b. Will retain the approximate distribution of conifers and hardwoods found in the core occurrence area?	☐	☐	☐
c. Trees to be felled away from the core occurrence area?	☐	☐	☐
d. Core occurrence area to be treated as an ELZ, allowing for use of existing roads, landings, and rock pits?	☐	☐	☐
e. Avoid significantly altering the surface water hydrologic conditions in ways that could adversely affect covered rare plants?	☐	☐	☐
v. Buffer Management During Timber Operations			
a. Ensure that post-harvest stands meet the basal area and canopy requirements of the inner and middle bands of Class I and Large Class II AMZs?	☐	☐	☐

1. Obtain approval of wildlife agencies on exceptions for early successional species and others that prefer open conditions?	☐	☐	☐
b. Retain the approximate distribution of trees (conifers and hardwoods) found in the local area?	☐	☐	☐
c. Trees to be felled away from core occurrence areas?	☐	☐	☐
d. Buffer treated as an ELZ, allowing for use of existing roads, landings, and rock pits?	☐	☐	☐
e. Avoid significantly altering the surface water hydrologic conditions in ways that could adversely affect covered rare plants?	☐	☐	☐
f. Sites will be prepared without creating ground disturbances?	☐	☐	☐
vi. Invasive Pest Plant Management			
a. Control invasive pest plants within 50 ft of all covered rare plant individuals, using methods that are feasible and effective, and that minimize impacts to non-target species, during both the 1st and 2nd years following operations?	☐	☐	☐
vii. Take Proposed?	☐	☐	☐
a. Avoiding or minimizing take to the maximum degree possible?	☐	☐	☐
b. Take is required for normal operations?	☐	☐	☐
c. Take will occur on occurrences with > 250 individuals, except for roads, landings, and rock pits?	☐	☐	☐
d. Amount of take anticipated described in this PTHP?	☐	☐	☐
e. Take will occur only during the period between seed set and breaking of dormancy?	☐	☐	☐
1. If this is not feasible, why not?			
f. Wildlife agencies consultation has occurred if normal operations require higher take than that listed below?	☐	☐	☐
vii. Take For Roads, Landings, and Rockpits proposed?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
a. Take of covered rare plant individuals growing in previously established roads, landings, and rock pits, if avoidance is infeasible:	☐	☐	☐
1. For occurrences < 250 individuals take is proposed for up to 5% of the individuals within a single occurrence?	☐	☐	☐
2. For occurrences of > 250 individuals, take of up to 10% of the individuals within a single occurrence?	☐	☐	☐
3. Feasible minimization proposed? Including: minimizing grading of roadbed and roadsides; running logging trucks and other equipment in tire tracks only; enforcing seasonal restrictions; and applying other restrictions.	☐	☐	☐
b. Spread soil from road berms (which need to be removed for proper road drainage on which rare plants are growing) in roadside areas that MRC will manage as EEZs for a minimum of two years?	☐	☐	☐
c. Rare plants which are taken as part of operations activities and not translocated will be donated for scientific purposes if possible.	☐	☐	☐
viii. Take for All Other Operations proposed?	☐	☐	☐
a. Is take proposed on occurrences with > 250 individuals?	☐	☐	☐
b. Is take proposed on greater than 5% of individuals within a single occurrence?	☐	☐	☐
ix. Variances proposed?	☐	☐	☐

a. Written approval obtained for wildlife agencies if requesting changes to core area management, buffer management, or buffer width?	☐	☐	☐
b. Variance is included in the PTHP for public comment?	☐	☐	☐
c. Variances are consistent with the objectives of the conservation strategy?	☐	☐	☐
x. Translocation proposed?	☐	☐	☐
a. Non-compensatory			
1. Non-compensatory translocation proposed as part of PTHP?	☐	☐	☐
2. Wildlife agencies have been notified?	☐	☐	☐
3. Translocation location marked in the field and mapped in PTHP?	☐	☐	☐
4. Condition of PTHP to report in writing to the Wildlife Agencies the result of the translocation?	☐	☐	☐
b. Compensatory			
1. Compensatory translocation proposed as part of PTHP?	☐	☐	☐
2. Wildlife agencies have provided written approval included in PTHP?	☐	☐	☐
3. Translocation location marked in the field and mapped in PTHP?	☐	☐	☐
4. Condition of PTHP to report in writing to the Wildlife Agencies the result of the translocation?	☐	☐	☐
D. Any Management Category 3 Plant Occurrences in Project Area?			
i. Communications			
a. All field personnel working in the vicinity of the covered species occurrences, particularly operators of heavy equipment and those who apply pesticides, will be instructed to comply with conservation measures?	☐	☐	☐
ii. Core Occurrence Areas			
Mitigation measures	**Y**	**N**	**NA**
a. Will mark the boundaries of a core occurrence area at regular intervals with painted t-posts, with stakes and colored flags, with clearly visible marks on retained trees, or with other means, so that the occurrence boundary maintains its integrity and is easily identifiable during activity and monitoring period?	☐	☐	☐
b. Will mark the outer limits of core occurrence area at least 5 ft beyond any visible parts (e.g., branches, surface roots) of a covered rare plant; use GPS data, as required, to define the core occurrence and ensure relocation if markers are damaged or removed?	☐	☐	☐
c. Limit losses of individual covered rare plants as feasible?	☐	☐	☐
d. Core occurrence area treated as an ELZ, allowing for use of existing roads, landings, and rock pits?	☐	☐	☐
e. Minimize significant alterations to surface water hydrologic conditions that could adversely affect covered rare plants?	☐	☐	☐
f. Minimize disturbance from site preparation and slash piles?	☐	☐	☐
iii. Buffer Widths			
a. Proposed buffer width is 50 ft?	☐	☐	☐

1. If buffer width is less, is it dues to topographic characteristics, silvicultural practices, or adjacent stand conditions?	☐	☐	☐
2. Approval of wildlife agencies obtained for buffer width less than 50 ft?	☐	☐	☐
b. Outer edge of buffer marked with colored flagging or its equivalent, before operations begin?	☐	☐	☐
c. Outer edge of buffer will remain marked with colored flagging or its equivalent during operations?	☐	☐	☐
iv. Core Management During Timber Operations			
a. Trees to be felled away from core occurrence areas?	☐	☐	☐
b. Minimize direct impacts where feasible by felling trees away from plants and by not skidding on plants?			
v. Buffer Management During Timber Operations			
a. Trees to be felled away from core occurrence areas?	☐	☐	☐
b. Buffer treated as an ELZ, allowing for use of existing roads, landings, and rock pits?	☐	☐	☐
c. Minimize significant alterations to the surface water hydrologic conditions that could adversely affect covered rare plants?	☐	☐	☐
vi. Invasive Plant Management			
a. Control invasive pest plants within 25 ft of all covered rare plant individuals, using methods that are feasible and effective and that minimize impacts to non-target species, during the first year following covered activities?	☐	☐	☐
vii. Take Proposed?	☐	☐	☐
a. Avoiding or minimizing take to the maximum degree possible?	☐	☐	☐
b. Take is required for normal operations?	☐	☐	☐
c. Take will occur on occurrences with > 250 individuals, except for roads, landings, and rock pits?	☐	☐	☐
d. Amount of take anticipated described in this PTHP?	☐	☐	☐
e. Take will occur only during the period between seed set and breaking of dormancy?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
1. If this is not feasible, why not?			
f. Wildlife agencies consultation has occurred if normal operations require higher take than that listed below?	☐	☐	☐
vii. Take For Roads, Landings, and Rockpits proposed?	☐	☐	☐
a. Take of covered rare plant individuals growing in previously established roads, landings, and rock pits, if avoidance is infeasible:	☐	☐	☐
1. For occurrences < 250 individuals take is proposed for up to 5% of the individuals within a single occurrence?	☐	☐	☐
2. For occurrences of > 250 individuals, take of up to 10% of the individuals within a single occurrence?	☐	☐	☐
3. Feasible minimization proposed? Including: minimizing grading of roadbed and roadsides; running logging trucks and other equipment in tire tracks only; enforcing seasonal restrictions; and applying other restrictions.	☐	☐	☐
b. Spread soil from road berms (which need to be removed for proper road drainage on which rare plants are growing) in roadside areas that MRC will manage as EEZs for a	☐	☐	☐

minimum of two years?			
c. Rare plants which are taken as part of operations activities and not translocated will be donated for scientific purposes if possible.	☐	☐	☐
viii. Take For All Other Covered Activities proposed?	☐	☐	☐
b. Is take proposed on occurrences with > 250 individuals?	☐	☐	☐
c. Is take proposed on greater than 10% of individuals within a single occurrence?	☐	☐	☐
ix. Variances proposed?	☐	☐	☐
a. Written approval obtained for wildlife agencies if requesting changes to core area management, buffer management, or buffer width?	☐	☐	☐
b. Variance is included in the PTHP for public comment?	☐	☐	☐
c. Variances are consistent with the objectives of the conservation strategy?	☐	☐	☐
x. Translocation proposed?	☐	☐	☐
a. Non-compensatory			
1. Non-compensatory translocation proposed as part of PTHP?	☐	☐	☐
2. Wildlife agencies have been notified?	☐	☐	☐
3. Translocation location marked in the field and mapped in PTHP?	☐	☐	☐
4. Condition of PTHP to report in writing to the Wildlife Agencies the result of the translocation?	☐	☐	☐
b. Compensatory			
1. Compensatory translocation proposed as part of PTHP?	☐	☐	☐
2. Wildlife agencies have provided written approval included in PTHP?	☐	☐	☐
3. Translocation location marked in the field and mapped in PTHP?	☐	☐	☐
4. Condition of PTHP to report in writing to the Wildlife Agencies the result of the translocation?	☐	☐	☐
E. Any Management Category 3 Plant Occurrences in Project Area?	☐	☐	☐
i. Communications			
Mitigation measures	**Y**	**N**	**NA**
a. All field personnel working in the vicinity of the covered species occurrences, particularly operators of heavy equipment and those who apply pesticides, will be instructed to comply with conservation measures?	☐	☐	☐
ii. Core Occurrence Areas			
a. Will mark the boundaries of a core occurrence area at regular intervals with painted t-posts, with stakes and colored flags, with clearly visible marks on retained trees, or with other means, so that the occurrence boundary maintains its integrity and is easily identifiable during activity and monitoring period?	☐	☐	☐
b. Will mark the outer limits of core occurrence area at least 5 ft beyond any visible parts (e.g., branches, surface roots) of a covered rare plant; use GPS data, as required, to define the core occurrence and ensure relocation if markers are damaged or removed?	☐	☐	☐
c. Avoid impacts to individual covered rare plants to the degree necessary to meet conservation objectives?	☐	☐	☐
iii. Limits of Take			

a. Ensure that number of individuals lost through incidental take is low enough so that a covered rare plant species qualifies for its current S rank or higher S rank?	☐	☐	☐
F. Longbeard Lichen			
i. Foresters and rare plant surveyors working on this plan have been trained to recognize pendant lichens that may be long-beard lichen?	☐	☐	☐
ii. Searched for, identify, and document long-beard lichen source and sink trees during rare plant surveys in this PTHP?	☐	☐	☐
iii. All source trees in PTHP with 3 or fewer source trees protected?	☐	☐	☐
iv. Protected 3-10 source trees in PTHP areas with more than 3 source trees?	☐	☐	☐
v. Protected source trees as wildlife trees, and protected some understory sink trees in the vicinity of the conserved source trees?	☐	☐	☐
vi. All locations and of source and sink trees, as well as the number and list of source trees to be protected is included in this PTHP document and accompanying maps?	☐	☐	☐
vii. Cutting and trimming of protected source trees is prohibited, except to ensure the safety of workers?	☐	☐	☐
viii. Screen trees maintained in the vicinity of source trees to buffer them from windthrow and other threats to provide an opportunity for dispersal of the Longbeard lichen?	☐	☐	☐
ix. If feasible, screen trees were selected within the dispersal range for long-beard lichen (16 ft) from a source tree, and whose retention will not cause source trees to be heavily shaded?	☐	☐	☐
x. Lichen samples test whenever possible to determine their identity?	☐	☐	☐
G. Humboldt Milk-vetch (HMV)			
i. Does HMV occur in the PTHP project area?	☐	☐	☐
ii. Communications			
Mitigation measures	**Y**	**N**	**NA**
a. All field personnel working in the vicinity of the covered species occurrences, particularly operators of heavy equipment and those who apply pesticides, will be instructed to comply with conservation measures?	☐	☐	☐
iii. Core Occurrence Area			
a. Marked the boundaries of a core occurrence area at regular intervals with painted t-posts, with stakes and colored flags, with clearly visible marks on retained trees, or with other means, so that he occurrence boundary maintains its integrity and is easily identifiable during activity and monitoring periods?	☐	☐	☐
b. Marked the outer limits of the core occurrence area at least 5 ft beyond any visible parts (e.g., branches, surface roots) of a covered rare plant; use GPS data, as required, to define the core occurrence and ensure relocation if markers are damaged or removed?	☐	☐	☐
c. Marked groups of plants within a core occurrence area, using methods described above, to facilitate avoidance and monitoring?	☐	☐	☐

	Y	N	NA
d. Avoided using site preparation within designated core areas unless the wildlife agencies occur?	☐	☐	☐
e. Avoided piling slash within designated core areas?	☐	☐	☐
iv. Core Management During Timber Operations			
a. Fell trees away from core occurrence areas, whenever possible, in order to create the least direct disturbance to individual plants?	☐	☐	☐
b. Establish an ELZ within a 25 ft radius of a core occurrence area's periphery?	☐	☐	☐
c. Planned use of existing roads, skid trails, landings, and rock pits within the ELZ surrounding the core occurrence area?	☐	☐	☐
d. Limit the road maintenance within the ELZ to grading of running surfaces and creation of drainage structures as required by this plan or the Forest Practice Rules?	☐	☐	☐
e. Spoils will be transported from the ELZ to no farther than 100 ft from the plan population unless required by this plan or the Forest Practice Rules?	☐	☐	☐
f. Spoils from the ELZ deposited on the outside edge of the road where impacts from traffic and grading are limited or if necessary across the road surface or on a turnout or landing?	☐	☐	☐
g. Roadside brushing and road day-lighting planned within ELZ (allowable use)?	☐	☐	☐
h. Road maintenance and other operations to occur between seed-set in the fall and breaking dormancy in the spring?	☐	☐	☐
1. If not feasible, why?			
i. Direct ignition or pile burning within ELZ planned?	☐	☐	☐
1. If planned, have the Wildlife Agencies concurred with proposed plan?	☐	☐	☐
j. Tree planting planned in a designated core area?	☐	☐	☐
k. Will operations avoid significantly altering surface water hydrologic conditions in ways that could adversely affect covered rare plants?	☐	☐	☐
v. Invasive Pest Plant Management			
a. Will plan result in controlling invasive pest plants within 100 ft of a designated core area, using methods that are feasible and effective and that minimize impacts to non-target species, during both the 1st and 2nd years following covered activities?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
vi. Take Proposed?	☐	☐	☐
a. Operations will avoid or minimize take to the maximum degree possible?	☐	☐	☐
b. Take is proposed as part of operations and is described in this PTHP?	☐	☐	☐
c. Activities causing take restricted to period between seed set and breaking dormancy?	☐	☐	☐
1. If not why not?	☐	☐	☐
d. Does take from normal operations required higher take than those specified in the take sections?	☐	☐	☐
1. Wildlife agencies consulted prior to submission of this PTHP?	☐	☐	☐
vii. Take for Roads, Landings, and Rockpits proposed?	☐	☐	☐
a. Is avoidance of HMV plants infeasible?	☐	☐	☐

b. Take proposed of HMV on previously established roads, landings, and rock pits?	☐	☐	☐
1. Occurrences with > 100 reproductive individuals?	☐	☐	☐
I. Take of up to 15% within a single occurrence per project?	☐	☐	☐
2. Occurrences with <100 reproductive individuals?	☐	☐	☐
I. Take of up to 10% within a single occurrence per project?	☐	☐	☐
c. If avoidance is infeasible:			
1. Does it include grading of roadbed or road slides?	☐	☐	☐
2. Running logging trucks and other equipment?	☐	☐	☐
d. Does take from normal operations required higher take than those specified in the take sections?	☐	☐	☐
1. Wildlife agencies consulted prior to submission of this PTHP?	☐	☐	☐
e. Soil spread from road berms in roadside areas that MRC will manage as EEZs for a minimum of 2 years (if rare plants are growing on road berms)?	☐	☐	☐
1. If these sites are not colonized by rare plants within 2 years, remove EEZ restrictions.			
2. If these sites are colonized by rare plants within 2 years, continue to manage them as EEZs as long as the rare plants persist in those locations.			
f. Rare plants which are taken as part of operations activities and not translocated will be donated for scientific purposes if possible.			
viii. Take for All Other Covered Activities proposed?	☐	☐	☐
a. Take for occurrences > 100 reproductive individuals?	☐	☐	☐
1. Take of up to 5% of the individuals within a single occurrence per stand entry?	☐	☐	☐
ix. Variances proposed?	☐	☐	☐
a. Written approval obtained for wildlife agencies if requesting changes to core area management, buffer management, or buffer width?	☐	☐	☐
b. Variance is included in the PTHP for public comment?	☐	☐	☐
c. Variances are consistent with the objectives of the conservation strategy?	☐	☐	☐
x. Translocation proposed?	☐	☐	☐
a. Non-compensatory			
1. Non-compensatory translocation proposed?	☐	☐	☐
2. Wildlife agencies notified prior to PTHP submission?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
3. Location of translocation marked and mapped in the field?	☐	☐	☐
4. Translocation described in writing?	☐	☐	☐
b. Compensatory			
1. Compensatory translocation proposed?	☐	☐	☐
2. Wildlife agencies approval prior to PTHP submission?	☐	☐	☐
3. Location of translocation marked and mapped in the field?	☐	☐	☐
4. Translocation described in writing, including describing future reporting on results and conclusions?	☐	☐	☐
7. Roads, Landings, and Skid Trails			
A. Roads, Landings, and Watercourse Crossings			
i. Road and Landing Design			
a. Road classification			

1. Roads designated as permanent are mapped?			
A. Roads planned and constructed as an all-season component of the MRC transportation system. Generally mainline haul roads and have: (1) surface suitable for trucks to haul forest products throughout the entire winter period; (2) permanent drainage structures at watercourse crossings to prevent turbid water from entering streams; and (3) year-round use.			
2. Roads designated as seasonal are mapped?			
A. Roads planned and constructed as a seasonal component of the MRC transportation system and have: (1) commercial hauling discontinued during the winter period except when the risk of sediment delivery is low; (2) access for fire control, forest management, occasional harvesting of forest products; (3) permanent drainage structure are located at existing watercourse crossings; and (4) moderate use occurs during the dry season.			
3. Roads designated as temporary are mapped?			
A. Roads used only during timber operations and have: (1) surfaces adequate for seasonal logging; (2) drainage structures; if any; which will be removed prior to the winter period or designated to be self-maintaining; and (3) low, sporadic use which can periodically become more intense.			
4. Roads designated to be decommissioned are mapped?			
A. Roads permanently removed from use; once decommissioned these roads: (1) are impassable to any motorized vehicle; (2) provide permanent, maintenance-free drainage; (3) minimize concentration of runoff, soil erosion, and slope instability; and (4) promote native conifer regeneration.			
5. Roads designated as historic are mapped?			
A. Roads built before 1972 that are currently impassable, may not have been actively decommissioned, and for which there are no current or future plans to manage as part of the road system, these roads: (1) will not be opened, rehabilitated, or used, based on a review of the sediment delivery consequences and feasibility of repair; and (2) will include railroad grades from historic logging that are not currently converted to a haul road.			
6. Roads designated as mainlines are mapped?			
A. Major arteries for log transportation that are generally used at least 3 out of every 5 years; a mainline road is: (1) typically a permanent road but can be seasonal; (2) exempt from the conservation measures for noise disturbance; and (3) mapped in the HCP/NCCP Atlas.			
b. Standards for laying out roads and landings			
1. Watercourse crossings minimized?			
2. Road use and construction in AMZs:			
A. Use and maintain existing roads in EEZ?			
Mitigation measures	**Y**	**N**	**NA**
B. Class I, Large Class II, and Small Class II AMZs			
i. New roads and approaches within AMZ do not parallel the watercourse?			
ii. Approaches on either side of the watercourse do not exceed 200 ft in Class I and Large Class II AMZs?			
iii. Approaches on either side of the watercourse do not exceed 150 feet in Small Class II AMZs?			
iv. New roads exceeding 200 ft in the AMZ are not associated with a watercourse crossing?			
C. Class III			
i. Construction of new roads that parallel watercourse?			
3. Key piece size logs from all trees felled for new road construction within the inner and middle bands of Class I and Large Class II watercourse and within AMZ of small Class II watercourse set aside?			
4. Key piece size logs placed in the vicinity of new facilities or near watercourse sections deficient in LWD?			

5. New landings in AMZ created?	☐	☐	☐
A. If yes, is landing temporary?	☐	☐	☐
B. If yes, does specific placement have a lower risk for sediment delivery than other locations outside the AMZ?	☐	☐	☐
6. Wildlife Agencies consulted prior to submission of PTHP for any new landings proposed in AMZ?	☐	☐	☐
7. Roads proposed to be constructed near the bottoms of steep and narrow canyons or in areas with high hazard for mass wasting?	☐	☐	☐
A. If yes, was approval obtained from both a California Licensed Geologist and an individual knowledgeable in the relevant aquatic resources?	☐	☐	☐
B. If yes, is proposed placement of the road resulting in lower risk for sediment delivery than placement at other locations?	☐	☐	☐
8. Logging systems proposed reduce excavation for roads and landings or placement of fills from roads and landings on dormant or historically active landslides?	☐	☐	☐
9. Road construction proposed on inner gorge slopes of Class I or Class II watercourses?	☐	☐	☐
A. If yes, were the Wildlife Agencies and CGS notified 60 days prior to submittal of this PTHP?	☐	☐	☐
B. If yes, is a report submitted by a California PG/CEG of their investigation, evaluations, and recommendations according to Note 45 guidelines submitted with this PTHP?	☐	☐	☐
C. If yes, have any concerns been raised by the Wildlife Agencies within 60 days of their receipt of notification?	☐	☐	☐
D. If Wildlife Agencies concerns have been raised, were they resolved by MRC and the Wildlife Agencies prior to submission of this PTHP?	☐	☐	☐
10. Landings or roads proposed for construction on historically active mass wasting features?	☐	☐	☐
A. If yes, approval obtained from both a California Licensed Geologist and an individual knowledgeable in the relevant aquatic resources?	☐	☐	☐
11. Will switchbacks be used on a hill slope greater than 50%?	☐	☐	☐
A. If switchbacks are proposed, will a professional geologist be consulted on the design?	☐	☐	☐
c. Considerations in laying out roads and landings			
1. Road networks systematically designed in PTHP to minimize total mileage?	☐	☐	☐
2. Road design conforms to topography to minimize disturbance to environment?	☐	☐	☐
3. Proposed roads to be constructed through seeps, springs, or wet meadows?	☐	☐	☐
A. If yes, is this route the only alternative to minimize disturbance to these and other adjacent topographical features?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
B. If yes, have MRC aquatic biologists been consulted to determine if covered species are using the topographical feature?	☐	☐	☐
C. If yes, will seeps, springs or wet meadows, be drained as close as possible to their original site?	☐	☐	☐
4. Will roads be built on natural benches, flat slopes, and areas of stables soils using soil type (K-factor) maps to minimize effects on watercourses?	☐	☐	☐
5. Will landings be limited to the fewest number necessary to conduct yarding operations, so there will be the least amount of stand damage?	☐	☐	☐
6. Will landings be restricted to the minimum size necessary, based on equipment and worker safety requirements?	☐	☐	☐
7. Is road design consistent with yarding systems utilized?	☐	☐	☐
8. Roads designed to avoid other sensitive biological and habitat resources?	☐	☐	☐
A. If no, why not?			

	Y	N	NA
9. Switchbacks avoided if hill slope is greater than 50%?	☐	☐	☐
A. If switchbacks are required, has professional geologist been consulted?	☐	☐	☐
d. Standards for road prism			
1. New seasonal and temporary roads constructed as single lanes, not to exceed 16 ft in width except where required in item 2?	☐	☐	☐
2. Traveled surfaces constructed to a maximum width of 14 ft unless MRC requires additional width for (a) alignment, (b) safety, and (c) equipment?	☐	☐	☐
3. Narrowed existing roads to a maximum width of 14 ft at controllable erosion sites?	☐	☐	☐
4. Turnouts located at reasonable intervals along the road alignment and follow all OSHA safety guidelines so that a minimum excavation or fill would be required to increase the road width?	☐	☐	☐
5. Avoid construction of through-cuts (in lengths greater than those specified for water breaks) in AMZs which are hydrologically connected to watercourses?	☐	☐	☐
A. If not feasible to avoid construction of these through-cuts, through cuts will be rocked?	☐	☐	☐
6. Roads constructed with a grade that exceeds 15%?	☐	☐	☐
A. If yes, are pitches less than 20% for 500 continuous feet?	☐	☐	☐
B. If yes, is there no other access for harvesting of timber when considering sediment production and economic concerns?	☐	☐	☐
C. If yes, will use of gradient in excess of 20% reduce road length and avoid crossing a watercourse?	☐	☐	☐
D. If yes, will MRC minimize construction of through-cut road prisms (in lengths greater than those specified for water breaks) on new roads with gradients greater than 15% and, to the extent feasible, will remove through-cut on existing roads with gradients greater than 15%?	☐	☐	☐
E. If yes, will MRC rock the surface of through-cut if it is not feasible to limit the through-cut?	☐	☐	☐
F. If yes, will MRC construct roads that have a gradient ≥ 20% and a length of 500 ft or more within areas that may deliver sediment to a watercourse as long as we pave the roads to prevent runoff and sediment delivery?	☐	☐	☐
7. Roads constructed or reconstructed as full benched cut (no fill) or remove fill prior to the winter period on slopes over 50% where cut bank stability is an issue?	☐	☐	☐
A. Spoils not used in road construction disposed of in stable areas outside of an AMZ?	☐	☐	☐
B. If not, roads constructed with balanced cuts and fills, properly engineered or compacted in layers not to exceed depth of 1 ft?	☐	☐	☐
8. Roads constructed on slopes over 40% with key fill material more than 4’ in thickness?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
A. If not, was an alternative proposed by a California Registered Geologist?	☐	☐	☐
B. If not, was the road constructed as full-benched?	☐	☐	☐
9. Materials to be end-hauled to a stable location?	☐	☐	☐
10. Slopes are over 50%?	☐	☐	☐
A. If yes, materials are end-hauled to a location more than 100 ft from the boundary of an AMZ?	☐	☐	☐
11. Each road’s cut volume was balanced with its fill-volume when roads are not full-benched construction?	☐	☐	☐
12. Cut slopes designed to minimize exposure of mineral soil through use of the maximum grade that will ensure hill-slope stability?	☐	☐	☐
13. Maximum feasible road grades employed to limit road lengths in AMZs?	☐	☐	☐
14. Out-sloped roads preferred design standard for all roads?	☐	☐	☐

15. Water breaks, such as rolling dips and water bars, incorporated into out-sloped road prism design?	☐	☐	☐
16. In-sloped roads used only where necessary to divert road drainage from an unstable area on the outside of a road or to allow for safe hauling?	☐	☐	☐
17. In-sloped roads used when necessary to protect fill slopes or prevent mass wasting from concentrated road drainage?	☐	☐	☐
18. Existing in-sloped roads with ditch-relief culverts - culverts spaced along the road no more than 600-800 ft apart on road segments with gradient less than 4% and 400-600 ft apart on road segments with gradients greater than 4%?	☐	☐	☐
19. On in-sloped roads with ditch-relief culverts – shortened spacing or re-located culverts if gullies occur?	☐	☐	☐
20. In-sloped roads converted to out-sloped roads where feasible?	☐	☐	☐
21. Used crowned road prisms with ditches and ditch relief culverts on roads with flatter slopes and large traffic loads or on fills requiring a high level of surface drainage?	☐	☐	☐
22. Used straw mulch, slash, or equivalent material on fill faces within an AMZ?	☐	☐	☐
23. Through-cuts minimized, especially long and steep cuts?	☐	☐	☐
e. Standards for road and landing surfaces			
1. Rock used on road surfaces is of sufficient competence and depth based on the season, timing, and intensity of use and is not a source of sediment?	☐	☐	☐
2. Road surfaces and inside ditches stabilized within the AMZ to prevent sediment delivery:			
A. Surfaced permanent roads within the inner and middle bands of Class I and Large Class II AMZ or within the AMZ of a Small Class II or Class III watercourse with rock or pavement to minimize fine sediment discharging into watercourses?	☐	☐	☐
B. Seasonal roads and temporary roads used during the year which are within the AMZ and without anticipated winter access are rocked or mulched with straw?	☐	☐	☐
C. Waterbars installed on all other roads in the AMZ with anticipated winter access?	☐	☐	☐
D. Waterbars spaced at 50 ft interval for grades over 5% and at 75 ft intervals for grades below 5%?	☐	☐	☐
E. Additional filters (straw or slash) placed on outlets of waterbars or installed sumps?	☐	☐	☐
F. Lay 5 ft of straw along the drain side of a road and shaped the road to minimize water concentration?	☐	☐	☐
G. Landings treated within an AMZ prior to October 15th or per winter standards after October 15th?	☐	☐	☐
H. Adhere to the following standards for landing use within an Class I and II AMZs			
I. Used existing landings that do not require reconstruction if relevant conservation measures area applied?	☐	☐	☐
ii. Constructed new landings if relevant conservation measures are applied and wildlife agencies concurred?	☐	☐	☐
I. Adhere to the following standards for landing use within Class III AMZs			
Mitigation measures	**Y**	**N**	**NA**
I. Used stable landings?	☐	☐	☐
II. Constructed new landings if relevant conservation measures are applied and the wildlife agencies concurred?	☐	☐	☐
3. Surfaced permanent roads with rock or pavement to a minimum rock depth of 6 inches?	☐	☐	☐
4. Surfaced approaches to drafting locations on a watercourse with rock to avoid generation of sediment unless the approach is within the bank full channel?	☐	☐	☐
5. Surfaced roads used for log or rock hauling during the winter period with rock or pavement?	☐	☐	☐
A. If not, does the road cross a watercourse?	☐	☐	☐
B. If not, does the road drain to a watercourse?	☐	☐	☐
C. If not, is the road greater than 200 feet from a watercourse?	☐	☐	☐

6. Running surfaces of roads used for timber operations treated to prevent excessive loss of road surface materials?	☐	☐	☐
7. Oil, asphalt, or chemical treatments are not allowed to run into watercourses?	☐	☐	☐
8. Oil, asphalt, or chemicals are stored where spillage or leakage could not run into a watercourse?	☐	☐	☐
f. Standards for road and landing surface drainage			
1. Used out-sloped roads with rolling dips as the preferred drainage structure for permanent and seasonal roads with grades less than 8%?	☐	☐	☐
2. Used suitable energy dissipators on drainage structures and drainage facilities of roads or landings to prevent discharge on erodible fill or other erodible material?	☐	☐	☐
3. Installed slash, rock, rip-rap, or other suitable material prior to winter on the outlet of all road or landing drainage structures within 100 ft of a watercourse with less than 90% vegetation buffer?	☐	☐	☐
4. Located water breaks to prevent road drainage from discharging directly into a watercourse, wet area, seep, or spring, or onto mass wasting hazards (must be discharged into some form of vegetative cover, duff, slash, rocks, or less erodible material wherever possible)?	☐	☐	☐
5. Water breaks constructed to provide for unrestricted discharge at its lower end, so that water will be spread and delivery of eroded soils will be minimized?	☐	☐	☐
6. Drainage from roads and landings is directed away from outside of mass wasting feature (i.e. at head, toe, or lateral margin of known mass wasting features)?	☐	☐	☐
7. Drained water running from wet areas, seeps, or springs onto a road to a stable location when there is: (a) a safety hazard, or (b) risk for damage to road and landing surfaces, or (c) potential for increased sediment delivery?	☐	☐	☐
A. If none of the conditions above occur – did you disturb wet area, seep, or spring?	☐	☐	☐
8. Exceeded distances between water breaks outline in Table E-2?	☐	☐	☐
9. Decreased water bar spacing at locations where there is evidence that rills or sediment at the water bar outlets exceeds the filter capacity of the site?	☐	☐	☐
10. Avoided concentration of 2 separate drainage areas into 1 channel?	☐	☐	☐
11. Constructed rolling dips and road relief culverts to discharge water in a manner that prevents creation or enlargement of gullies and subsequent discharge of sediment to a watercourse?	☐	☐	☐
g. Standards for hydrological design			
1. All new watercourse crossings, such as bridges and culverts, which are to remain in place one or more winter periods (except for vented fords), to a minimum hydraulic capacity in order to safely pass a flow with a return interval of 100 years, including sediment and debris load?	☐	☐	☐
A. Installed culverts at the same gradient as the natural stream channel?	☐	☐	☐
I. If no, armored outlets and installed energy dissipators to protect the road fill?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
B. Installed culverts with a camber or slight hump (between 1.5 to 3 in per 10 ft of culvert length) to counter the effects of sag once the culvert is buried in the stream bed and centered the camber under the middle of the pipe?	☐	☐	☐
C. Installed culverts so that they are aligned parallel to the natural channel to avoid angular deviation?	☐	☐	☐
D. Installed culverts so that the width of the constructed channel above the inlet is not excessively wide; the constructed channel is not more than 2X the diameter of the culvert?	☐	☐	☐
E. Culverts are at least as wide as the width of the active stream channel (i.e. the zone of active, annual streambed scour and deposition)?	☐	☐	☐
F. Extended culvert outlets at least 2 ft beyond the fill and preferably at least the length of 1 culvert diameter if this is greater?	☐	☐	☐

G. Sized culverts using a HW:D ratio of 0.67?	☐	☐	☐
I. If no, is the culvert diameter larger than the watercourse diameter?	☐	☐	☐
II. If no, is the culvert inlet beveled or mitered to conform to the fill slope and size to an HW:D ratio of 0.75?	☐	☐	☐
III. If no, is flared metal end section installed?	☐	☐	☐
IV. If no, do field conditions indicate that smaller culverts are likely to be more successful?	☐	☐	☐
V. If no, is culvert sizing, as measured on the discharge side of the culvert, increased by 6 inches for every 5 foot of fill above the culvert?	☐	☐	☐
2. Maps indicate culverts to be upgraded per first 30 years of implementation, because they could not currently pass a flow with a return interval of 50 years and have been upgraded culverts that could pass a flow with a return interval of 100 years? Map #:	☐	☐	☐
3. Maps indicate other culverts to be left in place until: (a) a road inventory determines they are rusted through; (b) road and crossing inspections indicate they are in need of repair or replacement; (c) they are not passing flood flows; or (d) they are a priority for replacement to meet objectives for controlled erosion? Map #:	☐	☐	☐
4. Install diversion protections when equipment is in the area on culverts not scheduled for replacement?	☐	☐	☐
5. Over-sized, reinforced, or removed drainage structures and erosion control features before the completion of timber operations when there is a risk for sediment delivery?	☐	☐	☐
6. Constructed or maintained permanent watercourse crossings and associated fills and approaches to prevent diversion of stream overflow down the road and to minimize fill erosion if: (a) the drainage structure becomes obstructed; (b) road and crossing inspections indicate they are in need of repair or replacement; (c) they are not passing flood flows; or (d) they are a priority for replacement to meet objectives for controllable erosion?	☐	☐	☐
h. Considerations for choosing watercourse crossing type			
1. Employed temporary crossings when there is no need for pick-up access after completion of operations?	☐	☐	☐
2. Fords employed typically on Small Class II and Class III watercourses where log hauling occurs, if the channel is dry and pick-up access is needed after operations?	☐	☐	☐
3. Vented fords designed for areas with: (a) minimal winter flows; (b) flows through the culvert; (c) flows across a road surface in locations that may not receive adequate winter monitoring?	☐	☐	☐
4. Vented fords installed and designed so that: (a) minimal water flows and (b) all flow passes through the vent during hauling?	☐	☐	☐
5. Used culverts on Large Class II or small watercourses if the channel is not dry during log hauling; install culverts so that they are accessible for winter monitoring and maintenance?	☐	☐	☐
6. Bridges are preferred crossing device for all Class I watercourses?	☐	☐	☐
i. Standards for temporary watercourse crossings			
Mitigation measures	**Y**	**N**	**NA**
1. Followed standards in MOTA?	☐	☐	☐
2. Re-installed temporary Class II and Class III crossings which required activity in the active channel after April 1, if the crossing was dry; otherwise, re-installed temporary crossings when the channel is dry or after May 15th whichever condition occurred first. Removed all temporary crossings prior to threshold for cumulative precipitation being met?	☐	☐	☐
3. Any temporary crossings installed prior to June 1st had pipes sized to convey a 50-year storm?	☐	☐	☐
4. Temporary crossings with culvert on Class I watercourses installed after June 1st?	☐	☐	☐
5. Log stringer bridges surfaced with a layer or rock over filter fabric or straw to prevent any	☐	☐	☐

material from entering the active channel during use?			
6. Did not install temporary crossings or construct watercourse crossings or upgrades on Class I watercourses prior to June 15 unless there is no activity within the channel?	☐	☐	☐
7. Temporary crossings on Class I watercourses installed before June 1st sized to pass a 50-year flow?	☐	☐	☐
8. Temporary crossings on Class I watercourses sized to allow for movement of juvenile anadromous salmonids upstream or downstream of the crossing?	☐	☐	☐
9. Temporary crossings used up to October 15th, use of temporary crossings after October 15th adhered to the standards for early winter period or to prescriptions within the MOTA?	☐	☐	☐
10. Culverts installed with rock or log fill when it is difficult to remove all fill material from locations that could deliver to a watercourse or from flow that could transport fill downstream?	☐	☐	☐
11. Culverts installed are of sufficient size to accommodate the largest projected flow during period of their intended use?	☐	☐	☐
12. Rock fill used in culvert installation is cleaned or washed so it is free of soil material?	☐	☐	☐
13. Crossings constructed with log fill so that they can be removed with minimal disturbance to streambeds or banks?	☐	☐	☐
14. Log fills used in crossings covered with filter fabric as well as straw mats or rock and roads surfaced with a local top fill?	☐	☐	☐
15. Top fill excavated prior to removal with mechanized equipment or hand tools and place the fill where it will not enter the channel?	☐	☐	☐
16. Logs removed to minimize further disturbance to banks when culverts are installed?	☐	☐	☐
17. Alternative process proposed with CDFG approval received?	☐	☐	☐
18. Pumped or diverted water around a temporary crossing to prevent sediment from being carried down to a watercourse during the installation or removal process?	☐	☐	☐
19. Restored watercourse channel at site of the temporary crossing (after use) to its approximate original configuration with all fill material removed from the site except for alluvial gravels?	☐	☐	☐
20. Excavated fills in the crossing to form a channel that is wider than the natural channel and as close as possible to the natural watercourse grade and orientation?	☐	☐	☐
21. Sloped excavated material, and any resulting cut bank, away from the channel?	☐	☐	☐
22. Stabilized excavated material by seeding, mulching, rocking, or other suitable treatment to prevent slumping and soil erosion?	☐	☐	☐
23. Restored aquatic habitat features removed during installation of temporary crossings or replaced them in equal quantities on-site or near-site?	☐	☐	☐
24. Re-spread, after culvert, removal, alluvial gravels to approximate conditions prior to culvert placement?	☐	☐	☐
j. Standards for fords			
1. Followed standards in MOTA?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
2. Fords installed in Class I watercourses?	☐	☐	☐
A. If installed, allowed under MOTA? Describe circumstances:	☐	☐	☐
3. Logs or rock to be hauled over ford when there is flowing water across the surface?	☐	☐	☐
A. If yes, allowed under the MOTA for Class I watercourse? Describe circumstances:	☐	☐	☐

4. Access limited over Class II fords for timber management to dry conditions in the watercourse during hauling periods? (ATVs, pick-ups if conditions not dry or if running surface will be dried by installation of a vented fordo r placement of rock over a temporary pipe)	☐	☐	☐
5. Culvert, rock drain, or other water conveyance facility placed in Class II or Class III fords to convey sub-surface flow through the fill or the rocked ford if there is evidence of significant sub-surface flow or year-round water flow from upstream seeps or springs?	☐	☐	☐
6. Dip built in the road at the axis of the rocked ford?	☐	☐	☐
A. Dished out the outside face of the fill material at the ford and armored it with rock large enough to withstand a 100-year flow?	☐	☐	☐
B. Rock sized to be non-transportable and should exceed the size of the substrate upstream and downstream of the crossing under similar channel conditions?	☐	☐	☐
7. Fords constructed by excavating beneath the roadbed to form an exaggerated dip and spillway under the crossing?	☐	☐	☐
A. Employed maximum feasible grades in the dip to allow access for ATVs, pick-ups, and log trucks and to minimize the fill area needed for the crossing?	☐	☐	☐
B. Provided in final road alignment a dip with a cross-sectional area greater than that required for a culvert at the same location?	☐	☐	☐
8. Surfaced the road with rock to at least a 6 in depth. Armored the bed of the road with rock extending past the dip?	☐	☐	☐
9. Placed a culvert, rock drain, or other water conveyance in the road fill to convey sub-surface flow through the fill of the rocked ford?	☐	☐	☐
10. Rocked road surface for a distance of at least 5 times the channel width (determining channel width upstream of the crossing)?	☐	☐	☐
11. Used at least 4-in rocks laid to a depth of 6 in on the road surface – compacted the rock into the channel at the crossing?	☐	☐	☐
12. Ford is composed of competent rock, generally greater than 3” an containing less than 20% fines for crossing where: (a) drainage areas is greater than 75 ac; (b) large amounts of fill are required; or (c) other on site factors exist that require a heightened level of concern?	☐	☐	☐
13. Road surface, road edge, and fill face armored wide enough to prevent flows from circumventing the channel and armored face, as well as from back-cutting the road?	☐	☐	☐
14. Included in the width the full extent of the road’s outside edge that may receive flow if the channel adjusts after operations?	☐	☐	☐
15. Allowed rock armoring to extend 2-6 inches above the outside edge of the road surface, but included a low point to control channel movements at the spillway thalweg?	☐	☐	☐
16. Armored the downstream fill face with large rock capable of handling a 100-year flood event?	☐	☐	☐
17. Rock in downstream fill faces sized to be non-transportable (as determined by reviewing the substrate upstream and downstream of crossing; rock should be 6-24 inches with mean diameter of 12 in with a mix of different size rocks to fill voids between large rocks)?	☐	☐	☐
18. If a fill face has slope > 50% placed rocks into deepened keyway at bottom of fill prisms?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
19. Keyways placed at least 24 in below outfall of stream grade?	☐	☐	☐
20. Replaced or upgraded existing fords that were properly functioning?	☐	☐	☐
k. Standards for vented fords			
1. Rocks or logs hauled over a vented ford if water is flowing across the surface?	☐	☐	☐
2. Dip in the road built at the axis of the vented ford?	☐	☐	☐
3. Outside face of the fill material at the ford dipped and armored with rock large enough to	☐	☐	☐

withstand a 100-year flow?			
4. Size of rock required for armoring determined by checking up stream and downstream?	☐	☐	☐
5. Rock on road surfaced to a depth of at least 6 inches?	☐	☐	☐
6. Armored the bed of the road with rock that extends past the width of the dip?	☐	☐	☐
7. Vented fords designed and installed so that (a) minimal water flows, and (b) all flow passes through the vent during hauling?	☐	☐	☐
8. Dip created that is at least 1.5 times the width of the upstream channel?	☐	☐	☐
9. Increased width to slow down water prior to going over the spill way to prevent back-cutting?	☐	☐	☐
10. Rocked the road surface 5 times wider than the channel?	☐	☐	☐
11. Determined channel width upstream of the crossing?	☐	☐	☐
12. Rocked road surface with at least 4 in rock at an approximate depth of 6 in?	☐	☐	☐
13. Compact rock into channel at the crossing?	☐	☐	☐
14. Armored fill faces with rock large enough to accommodate a 100-year flow?	☐	☐	☐
15. Sized rock to be non-transportable, generally 6-24 inches with a mean diameter of 24 inches?	☐	☐	☐
16. Determined size of rock by checking substrate up and downstream?	☐	☐	☐
17. Provided for a mix of different size rocks to fill the voids between any large rocks?	☐	☐	☐
18. Placed rocks in a deepened keyway at the bottom of the fill prism, if the downstream fill face is over 50%?	☐	☐	☐
19. Extended if desirable, rock armor 2-6 inches above the outside edge of the road surface?	☐	☐	☐
20. Created armor wide enough to prevent erosion to the sides of the armoring and back cutting?	☐	☐	☐
21. Vents sized to minimize the fill volume in the crossing while allowing for passage of a 10-year flow?	☐	☐	☐
22. Multiple pipes rather than single pipes used in order to minimize fill in the crossing?	☐	☐	☐
23. Vents are not steeper than the natural gradient of the channel?	☐	☐	☐
l. Considerations for fords			
1. Rocked fords used as the preferred structure for intermittent or ephemeral or for lightly travelled watercourses?	☐	☐	☐
m. Standards for watercourse culverts			
1. Followed standards in MOTA?	☐	☐	☐
2. Allowed for (a) upstream and downstream passage of fish or listed aquatic species during any life stage and (b) the natural movement of bedload to form a continuous bed through the culvert, when installing permanent culverts in Class I watercourses?	☐	☐	☐
3. Installed oversize culverts, drop inlets, trash racks, or similar devices when there is evidence that soil and other debris is likely to significantly reduce culvert capacity below design flow in order to minimize culvert blockage?	☐	☐	☐
4. Trash racks or drop inlets used on Class I watercourses?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
5. Watercourse culverts designed so that if they plug water is diverted directly across the road and back into the watercourse channel?	☐	☐	☐
6. If pre-existing culverts exist without this design or new culverts cannot meet this design built a rolling dip to catch the diverted water and send it back into the channel?	☐	☐	☐
7. Energy dissipators placed at the outlet of watercourse culverts and downspouts, unless they hinder fish passage or suitable channel armor is present?	☐	☐	☐

8. Energy dissipators a sufficient distance from the outlet of the culvert to slow flow and prevent scouring or erosion?	☐	☐	☐
9. Downspouts anchored at the culvert and at its base?	☐	☐	☐
10. Downspouts anchored at intervals no greater than 10 ft?	☐	☐	☐
11. Used a stable anchor for downspouts that included pipe, t-posts, concrete re-bar, wooden beams, and logs?	☐	☐	☐
12. Half-round downspouts installed?	☐	☐	☐
A. At least one size large than the culvert?	☐	☐	☐
B. Sized to accommodate the entire design flow from the culvert?	☐	☐	☐
C. In line with the culvert?	☐	☐	☐
D. Securely attached to at least 3 ribs in the culvert?	☐	☐	☐
E. Not cut or otherwise modified to create a hinge?	☐	☐	☐
13. Rock or other suitable armor material placed around the inlet of a watercourse culvert?	☐	☐	☐
14. Rip-rap, when used, constructed to remain in place during 100-year flows and to extend at least as high as the top of the culvert?	☐	☐	☐
15. Rip-rap extended as “wing walls” on inlets for a sufficient distance upstream to prevent bank erosion?	☐	☐	☐
16. Inlets tapered or flared on watercourse culverts with diameters greater than 30 in?	☐	☐	☐
17. Culverts with a 50-100 year flow left in place if they are functioning and subject to periodic inspection?	☐	☐	☐
18. Avoided installation of culverts with angles?	☐	☐	☐
19. Compacted fill faces by tractor-walking?	☐	☐	☐
A. Did site specific condition prohibit this?	☐	☐	☐
B. Compacted fill faces with a vibra-compactor, excavator, or other tools?	☐	☐	☐
20. Slash and mulch fill faces exceed an 80% slope?	☐	☐	☐
A. If yes, was fill face armored with rock, rip-rap, or concrete blocks?	☐	☐	☐
21. Fill faces protected at inlets and outlets, which will be exposed to the design flow, from stream flow erosion by armoring that consists of graded rock rip-rap or other non-erodible material by design?	☐	☐	☐
22. Culvert outfalls rip-rapped in a U-shaped channel, with clean material of a sufficient size to remain in place during a 100-year peak flow event?	☐	☐	☐
23. Rip-rap set in the active channel downstream of the culvert below stream grade in order to allow the natural accumulation and transport of bedload at stream grade?	☐	☐	☐
24. Culverts counter-sinked if the natural channel grade is less than 3% in order to allow for aggradation in the channel?	☐	☐	☐
n. Standards for ditch-relief culverts			
1. New ditch-relief culverts are at least 18 inches in diameter?	☐	☐	☐
2. Ditch-relief culverts placed at least at a grade 2% greater than the contributing road prism or a minimum of 10% so they are self-cleaning?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
3. Culverts placed with the inlet at a skew of 30-35% to the normal road alignment in order to improve water flow into the culvert?	☐	☐	☐
4. Spaced ditch-relief culverts 600-800 ft apart on road segments with gradients less than 4%?	☐	☐	☐
5. Spaced ditch-relief culverts 400-600 ft apart on road segments with gradients greater than 4%?	☐	☐	☐

6. Maximum of 150 ft between ditch-relief culverts if a road has more than a 10% gradient and is within 300 ft of a watercourse?	☐	☐	☐
7. Create less distance between ditch-relief culverts if soils or geology indicate that discharge may create a new channel or scour an existing channel?	☐	☐	☐
8. Spacing between ditch-relief culverts is sufficient to prevent water discharge onto a road-fill?	☐	☐	☐
9. Enough filter material exists in ditch-relief culverts to prevent sediment transport to a watercourse?	☐	☐	☐
10. Energy dissipaters placed at the outlet of ditch-relief culverts or downspouts?	☐	☐	☐
11. Extended energy dissipaters a sufficient distance from the outlet of the culvert to slow the flow and prevent scouring or erosion unless the culvert discharges to a stable location with little risk of surface or gully erosion?	☐	☐	☐
12. Ditch-relief culverts with controllable sediment designed so that, if they plug, the water is diverted directly across the road?	☐	☐	☐
13. If the culvert already exists without this design or a site cannot incorporate this design in the construction, than build (if feasible) a rolling dip to catch diverted water and send it across the road?	☐	☐	☐
14. Used downspouts?	☐	☐	☐
A. Anchor each downspout at the culvert and its base?	☐	☐	☐
B. Downspouts exceed 20 feet in length?	☐	☐	☐
C. Anchor downspouts at intervals no greater than 10 ft using a stable anchor?	☐	☐	☐
o. Standards for bridges			
1. Follow standards set forth in the MOTA?	☐	☐	☐
2. Bridge spans selected to avoid encroachment of bridge abutments or piers into flood prone areas?	☐	☐	☐
3. If there is a need to encroach into flood prone areas, were wildlife agencies consulted prior to construction?	☐	☐	☐
4. Bridges suspended where possible during installation across the watercourse using cables and heavy equipment or cables and corner blocks to avoid altering the stream bed and bank and crossing the wetted channel with heavy equipment?	☐	☐	☐
5. Bottom or toe of the bridge abutment placed so that the channel of the watercourse under the bridge is at least 1.25 times the width of the bank full channel?	☐	☐	☐
6. Provided erosion protection for bridge abutments, piers, and watercourse banks influenced by the hydraulic conditions of the bridge, at least up to the level of a 100-year flow or to the edge of a terrace or the topographic bench the ridge rests on?	☐	☐	☐
7. Dig built-up approaches to allow floods to flow over and around them?	☐	☐	☐
8. Align bridges perpendicular to the channel unless the road approach would require additional cutting or soil-disturbance in the hill slope to facilitate this alignment?	☐	☐	☐
9. Design approaches to bridges to prevent surface runoff and sediment form draining directly onto the bridge deck or into the watercourse?	☐	☐	☐
10. Incorporate road drainage into the bridge approaches to divert road runoff and filter sediments?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
11. Rock or pave approaches to prevent sediments from draining onto bridge deck or watercourse?	☐	☐	☐
12. Incorporated guardrails or bumper rails into bridges to safeguard bridge traffic?	☐	☐	☐
13. Bridges exceed 1:1 grade on bridge abutments unless the abutment is bedrock?	☐	☐	☐

A. If bridges exceed 1:1 grade used a retaining wall or other geotechnical design to stabilize the abutment slope?	☐	☐	☐
14. The freeboard (the distance between the water level and the lowest part of the bridge superstructure) exceeds 100-year flow levels?	☐	☐	☐
A. If not, was the additional design consideration approved by the Wildlife Agencies?	☐	☐	☐
15. Surfacing material for log stringer bridges is screened, washed, durable, clean rock if it is not otherwise planked, plated, or paved?	☐	☐	☐
16. Side-boards erected to retain the surface materials on the running surface?	☐	☐	☐
p. Considerations for bridges			
1. Bridges used on Class I streams?	☐	☐	☐
A. If not, why not?			
2. Bridges used for any non-class I streams?	☐	☐	☐
3. Any watercourse crossings that would require a 48 inch or larger diameter crossing utilizing bridges instead?	☐	☐	☐
q. Considerations for fill material for landings			
1. Fill placed on slopes > 50%?	☐	☐	☐
A. If yes, is there risk for sediment delivery?	☐	☐	☐
2. Greater than 4 ft (vertical height) of fill placed on slopes greater than 40%?	☐	☐	☐
A. If yes, were fills constructed on a bench, excavated at the proposed toe and wide enough to compact the first lift?	☐	☐	☐
B. If yes, were fills compacted to prevent sediment discharge in approximately 1 ft lift from the toe to the finished grade (compacted to 90%)?	☐	☐	☐
C. If yes, was all organic material precluded from fills?	☐	☐	☐
r. Standards for spoil piles, borrow areas, or soil disposal			
1. Erosion controlled in areas where there are large expanses of bare soil, such as spoil piles, borrow sites, and rock pits?	☐	☐	☐
2. When spoil disposal sites are placed on slopes, spread soils in lifts and compact them to develop strength in the materials?	☐	☐	☐
3. Spoils piles placed near streams; where side cast, tailing, or sediment-laden runoff can reach a watercourse; or within an AMZ unless topography prevents runoff from entering a watercourse?	☐	☐	☐
4. Spoils piles covered in AMZs to minimize risk of sediment delivery to watercourses?	☐	☐	☐
5. Stockpiled overburden from rock pit or borrow area for re-distribution over the site in order to take advantage of an on-site seed-bank?	☐	☐	☐
6. Identified disposal sites in advance to minimize impacts to biologically sensitive areas under emergency conditions or routine road maintenance?	☐	☐	☐
s. Standards for rock pits			
1. Existing rock pits utilized as part of the project?	☐	☐	☐
A. Restrictions for winter conditions			
I. In early winter, operations will cease when there is sufficient precipitation to generate overland flow off the road and deliver sediment to a watercourse?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
II. In early winter, operations resumed only under the following conditions: (a) there has been ½ in or less rainfall in the previous 24-hour period; and (b) there has been no rain in the current 24-hour period?	☐	☐	☐
III. In early winter, will install drainage structures and erosion control facilities if one of the following conditions apply: (a) the National Weather Service forecasts for Fort Bragg a "chance" of rain within 24-hours or rain exceeds 0.25 inches in a 24-hour period at Yorkville; (b) operation stoppage exceeds 24-hours; or (c)	☐	☐	☐

winter operations have ceased?			
IV. In early winter, do not remove overburden during periods of soil saturation?	☐	☐	☐
V. In early winter, cease removing overburden if 4 cumulative inches of rain has fallen in the water year?	☐	☐	☐
VI. In mid winter, cease operations where there is sufficient precipitation to generate overland flow off the road and deliver sediment to a watercourse?	☐	☐	☐
VII. In mid winter resume operations only under the following conditions: (a) there has been ½ in or less rainfall in the previous 24-hour period and (b) there has been no rain in the current 24-hour period?	☐	☐	☐
VIII. In mid winter, install drainage structures and erosion control facilities if one of the following conditions apply: (a) the National Weather Service forecasts for Fort Bragg a “chance” of rain within 24 hours and there has been no rain in the current 24-hour period; or (b) operation stoppage exceeds 24 hours; or (c) winter operations have ceased?	☐	☐	☐
IX. In late winter, cease operations when there is sufficient precipitation to generate overland flow off the road and deliver sediment to a watercourse?	☐	☐	☐
X. In later winter, resume operations only under the following conditions: (1) there has been ½ inch or less rainfall 48-72 hours ago; and (2) there has been no rain for the last 48 hours?	☐	☐	☐
XI. In later winter, install drainage structure and erosion control facilities if one of the following conditions apply: (a) the National Weather Service forecasts for Fort Bragg a “chance” of rain within 24 hours or rain exceeds 0.25 inches in a 24-hour period at Yorkville; or (b) operation stoppage exceeds 24-hours; or (c) winter operations have ceased?	☐	☐	☐
XII. Exceptions to winter operating period only if we need to immediately prevent sediment delivery to a watercourse where the volume of sediment is greater than the volume produced from rockpit excavation?	☐	☐	☐
B. Protections for covered species			
I. Followed protections measures regarding blasting near habitat of covered species: northern spotted owl; marbled murrelets, and Point Arena mountain beaver?	☐	☐	☐
II. Followed survey protocol in Appendix K for spotted owls and Appendix L for marbled murrelets?	☐	☐	☐
C. Expansion of rockpit footprint			
I. Conduct a rare plant survey prior to expansion of rockpit or storage area for overburden?	☐	☐	☐
II. Followed survey and protection protocols for covered species described within Chapters 8-11?	☐	☐	☐
III. Internal Archeological Report similar to those in a THP and record for the survey in the MRC GIS?	☐	☐	☐
IV. Submit any information on discovered sites to a professional archeologist for review and potential mitigations?	☐	☐	☐
V. Minimize the extent of the disturbed area necessary to produce the required rock material for 3 years or less?	☐	☐	☐
VI. Store overburden close to or on site so that it is available for reclamation operations?	☐	☐	☐
VII. Store overburden in a pit or below the grade of the rockpit floor to prevent sediment discharge to a watercourse?	☐	☐	☐
VIII. Overburden mulch stored above the grade of the rockpit floor?	☐	☐	☐
IX. Adhered to the following guidelines for overburden storage if it is not stored in a pit with no run-off to a watercourse: (a) if the ground slope is 0-30% store the overburden at least 50 ft from a Class I or Large Class II watercourse; (b) if the ground slope is 30-50%, store the overburden at least 75 ft from a Class I or Large Class II watercourse; or (c) if the ground slope is greater than 50%, store the overburden at least 100 ft from a Large Class I or Large Class II?	☐	☐	☐
X. Consulted with the wildlife agencies and obtained their approval for creation or expansion of any rockpit within 100 ft of a Class I watercourse or within 75 ft of a Large Class II watercourse?	☐	☐	☐
2. Development of new rockpits			
A. Pre-development field work			
I. Conducted a rare plant survey prior to rockpit development including prospective storage areas for overburden?	☐	☐	☐
II. Followed the survey and protection protocols for covered species described in Chapter 8-11?	☐	☐	☐
III. Prepared an internal Archeological Report similar to those in a THP and record the survey in the MRC GIS?	☐	☐	☐
IV. Submitted information on discovered sites to a professional archeologist for review and potential mitigations?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
V. New rockpits established within the AMZ of a Class I or Class II watercourse?	☐	☐	☐
VI. If new rockpits are established in AMZ of Class I or Class II, submitted to and received approval from Wildlife Agencies on a site specific erosion control plans for proposed rockpits within the AMZ of a Class I or Class II	☐	☐	☐

watercourse including measures for (a) placement of erosion control structures; (b) storage of overburden; (c) storage of fuel; and (d) maintenance of heavy equipment?			
B. New rockpits			
I. Developed rockpits in accordance with the above measures for rockpit use?	☐	☐	☐
II. Any removal of gravel from gravel bars?	☐	☐	☐
a. If yes, was this done in accordance with requirements in the MOTA?	☐	☐	☐
III. Followed the operational standards and restrictions specified in the MOTA?	☐	☐	☐
IV. Reclaimed rockpits once mining operations are complete according to site specific conditions and the intended use of the site?	☐	☐	☐
V. Applied the road or landing measures if the site is intended to be a road or landing, otherwise, sloped the site to stable angles?	☐	☐	☐
VI. Spread available overburden across the site and use it as a growth medium for planting native species?	☐	☐	☐
VII. Developed a site-specific drainage plan that will minimize the risk of sediment entering a watercourse?	☐	☐	☐
2. Standards for road and landing construction and reconstruction			
a. Adhered to the default conservation measures for a particular terrain stability unit identified on the ground by an RPF or PG or for a mass wasting features on which MRC may construct a road or landing?	☐	☐	☐
b. Installed the necessary protective structures on all culverts at watercourse crossings in which water is flowing at the time of installation?	☐	☐	☐
c. Necessary protective structures on all culverts placed concurrent with the placement of a crossing's fill material?	☐	☐	☐
d. Other permanent drainage structures placed no later than October 15th?	☐	☐	☐
e. Adhered to early winter period standards for construction and reconstruction of roads after October 15?	☐	☐	☐
f. Did not bury organic waste in the main body of road or landing fills?	☐	☐	☐
g. Used solid organic waste if necessary to provide for down slope sediment filtration except at prepared crossings, including crossing approaches?	☐	☐	☐
h. Restricted clearing limits to 60 ft total – generally, but not always 30 ft on either side of the centerline?	☐	☐	☐
i. Felled any tree over 12 in dbh with more than 25% of the root surface exposed by road or landing construction, if necessary to ensure road safety and slope stability?	☐	☐	☐
j. Constructed roads or landings without overhanging banks?	☐	☐	☐
k. Prevented footing of a road or landing from rotting away by removing or scarifying the organic layer of the soils during road and landing construction (especially on slopes greater than 35%) and later placing the fill?	☐	☐	☐
l. Removed overhanging or unstable concentrations of slash, woody debris, and soil along the down slope edge or face of roads or landings when located on slopes over 50% unless the slash piles are intended for winter burning?	☐	☐	☐
m. Seeded, planted, mulched, removed, or treated side cast or fill material with access to a watercourse or lake?	☐	☐	☐
n. Ensured that the slope created from side cast or fill material is no steeper than 65%?	☐	☐	☐
3. Standards for road inspections and maintenance			
a. Road inspection schedule			
Mitigation measures	**Y**	**N**	**NA**
1. Will conduct 5 inspections every 5 years after work completion on all seasonal roads and associated road points constructed, reconstructed, or decommissioned?	☐	☐	☐

2. Sites will not be surveyed if decommissioned roads no longer allow equipment access; instead perform informational surveys on decommissioned roads within 2 years to document problems for future decommissioning projects addressed as part of adaptive management?	☐	☐	☐
3. Will conduct at least 1 inspection of a new temporary road each year for a period of 4 years following construction?	☐	☐	☐
4. Will inspect permanent roads annually?	☐	☐	☐
5. Will inspect all roads with permanent structures (culverts or bridges) during the road inventory update at 10-year intervals unless a road is decommissioned or has maintenance-free structures?	☐	☐	☐
6. Will conduct informal inspections annually (informal inspections are for roads actively being used beyond the 5-year timeline; MRC will record only problem areas)?	☐	☐	☐
7. Will make repairs, using hand tools, at the time of discovery, if feasible, or within 24 hours after initial damage to the road surface, drainage facilities, water bars, or water crossings to eliminate the likelihood of related sediment reaching Class I, Class II, or Class III waters?	☐	☐	☐
8. Will schedule repairs requiring more than hand tools during those times when heavy equipment can access the site – according to winter and wet weather operating guidelines?	☐	☐	☐
b. Road and road point maintenance			
1. Based decisions for road maintenance on inspections and on the priority of the road repair?	☐	☐	☐
2. Maintain all roads and road points, constructed or upgraded, at their road class designation?	☐	☐	☐
3. Do not side cast material from road grading into watercourses?	☐	☐	☐
c. Priority maintenance			
1. Maintain all roads and road points to design standards?	☐	☐	☐
2. Comply with intended uses for all active roads and for restored road points?	☐	☐	☐
3. Performed restoration and enhancement work as needed to bring roads up to current design standards?	☐	☐	☐
4. Decommission roads that cannot be brought up to current design standards?	☐	☐	☐
4. Standards for road and landing decommissioning			
a. Decommissioning results in long-term maintenance-free drainage?	☐	☐	☐
b. Minimizes concentration of runoff, soil erosion, and slope instability?	☐	☐	☐
c. Promotes native vegetation regeneration?	☐	☐	☐
d. Prevents access by motorized vehicles?	☐	☐	☐
e. Standards for road, skid trail, and landing decommission			
1. Decommissioned roads, skid trails, or landings preferably prior to October 15th; after October 15th follow the standards for early-winter period?	☐	☐	☐
2. Notified CDFG when there is a risk of impacts to stream bed, bank, active channel, or aquatic habitat, including risks of elevated sediment delivery to the bank full channel?	☐	☐	☐
3. Roads were not decommissioned during the mid-winter period?	☐	☐	☐
4. Blocked decommissioned roads using appropriate barriers to prohibit the use of motorized vehicles?	☐	☐	☐
5. Out-sloped roads, skid trails, and landing surfaces and remove berms, unless (a) doing the work is likely to cause more sediment delivery than not doing the work or (b) doing the work would remove large amounts of established vegetation in close proximity to a watercourse?	☐	☐	☐
6. Removed all watercourse crossings?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
7. Employed salvage operations when covered fish species are present in Class I watercourses if MRC is decommissioning crossings that require heavy equipment in water?	☐	☐	☐

	Y	N	NA
8. Excavated fills in the watercourse crossing to form a channel that is as close as possible to the natural watercourse grade and orientation, and that is wider than the natural channel?	☐	☐	☐
9. Sloped back excavated material and any resulting cut bank from the channel and stabilize it to prevent slumping and soil erosion?	☐	☐	☐
10. Stabilized this material by seeding, mulching, armoring with rock, or by other suitable treatments?	☐	☐	☐
11. Re-established natural flow paths of surface drainage?	☐	☐	☐
12. Pulled or shaped fills or side cast where necessary to prevent discharge of materials into watercourses?	☐	☐	☐
13. Install appropriate water breaks or rolling dips to limit accumulated runoff from the road prism that may create increased erosion?	☐	☐	☐
14. Scarified or ripped road and landing surfaces to loosen compacted soil and facilitate regeneration, unless advanced regeneration on site is undisturbed by other decommissioning activities?	☐	☐	☐
15. Ensured that decommissioned roads are re-vegetated by natural or artificial means with woody vegetation with in 3 years after the decommissioning?	☐	☐	☐
16. Created a breeding site for red-legged frogs if a decommissioned road had a documented breeding site; the site should be of similar dimensions, created in the most appropriate location, and as close to the original site as possible?	☐	☐	☐
17. Planted a mix of native hardwood and conifer on disturbed areas where erosion can deliver to a watercourse; ensure the mix is appropriate for the vegetation type of the project area and is planted at the same density as in reforestation or as occurs naturally?	☐	☐	☐
18. Did not re-plant sections of old road bed which do not require decommissioning treatments or roadways that receive excessive shade?	☐	☐	☐
f. Standards for general use			
1. Restricted access to road during the winter period by the use of gates on roads leading into the MRC property?	☐	☐	☐
2. Closed temporary roads and associated landings prior to the winter period, unless the guidelines for the early and late winter periods are followed?	☐	☐	☐
3. Permitted ATV use on temporary roads during the closure periods?	☐	☐	☐
4. Patrolled road closures and areas with frequent public contact?	☐	☐	☐
5. Repaired gates rendered ineffective by vandalism, especially gates where trespassing is prevalent, to reduce unauthorized access?	☐	☐	☐
6. Granted permits for public access to MRC lands and roads?	☐	☐	☐
7. Did not haul logs or rock or use heavy equipment on roads where restrictions apply for northern spotted owls?	☐	☐	☐
8. Did not use heavy equipment or log trucks on seasonal roads during the mid-winter period unless repairs are needed or mid-winter guidelines can be met?	☐	☐	☐
9. Allowed the following exceptions to the operating measures for wet weather or winter: (a) hauling on paved road or (b) use of heavy equipment for immediate road repairs to prevent significant sediment delivery if left unattended?	☐	☐	☐
10. Installed water breaks on seasonal roads prior to October 15, unless following standards for early and late winter periods?	☐	☐	☐
g. Standards for temporary road use			
1. Followed MOTA specific standards of temporary road crossings?	☐	☐	☐
2. Closed temporary roads prior to October 15?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
3. Followed the standards for the early-winter period, if closing temporary roads after October 15^{th}?	☐	☐	☐

4. Out-sloped temporary road and landing surfaces and removed berms when not in use and prior to the mid-winter period?	☐	☐	☐
5. Removed all watercourse crossings with culverts unless the watercourse crossing is left maintenance-free or there is no controllable erosion?	☐	☐	☐
6. Pulled or shaped fills or side cast, when necessary, when a road is not in use to minimize discharge of materials into watercourses due to failure of cuts, fills, or side cast?	☐	☐	☐
7. Installed appropriate water breaks or rolling dips when a temporary road is not in use to limit accumulated runoff from the road prism that may increase erosion?	☐	☐	☐
h. Standards for early winter period			
1. Tractor yarding or use of tractors, graders, excavators, and other heavy equipment for construction of fire breaks, roads, landings, or tractor roads only during extended dry, rainless periods with low antecedent soil wetness (no more than ½ inch of rain in the previous 24-hour period, as reported by the National Weather Service for Fort Bragg) and when soils are not saturated?	☐	☐	☐
2. Will hauling or loading logs, constructing roads or landings, decommissioning roads, or using skid trails occur for a period of 24 hours after ½ inch of rain or more has fallen in the previous 24 hours, as reported by the National Weather Service in Fort Bragg?	☐	☐	☐
3. Will install drainage erosion control facilities on all constructed skid trails and tractor roads prior to sunset if: (a) National Weather Service forecasts for Fort Bragg a “chance” (30% or more) of rain within 24 hours; or (b) rain exceeds 0.25 inches in a 24-hour period at Yorkville (or the nearest reporting station); or (c) winter operations have ceased?	☐	☐	☐
4. Will provide mulch or cover to soil disturbed by road or skid trail construction within the AMZ that exceeds 100 contiguous sq. ft., if one of the following conditions apply: (a) National Weather Service forecasts for Fort Bragg a “chance” (30% of more) of rain within 24 hours; or (b) rain exceeds 0.25 inches in a 24-hour period at Yorkville (or the nearest reporting station); or (c) winter operations have ceased?	☐	☐	☐
5. Will keep on hand at the work site materials to mulch or cover exposed soils for immediate deployment during this period?	☐	☐	☐
6. Will disturb or remove the organic layer of the soils during road and landing construction especially on slopes greater than 35% and prior to fill placement in order to prevent the footing of the road or landing from rotting away?	☐	☐	☐
7. Will limit the size of road, skid trail, and landing use or construction to (a) whatever the operator can complete within 24 hours, including application of all erosion control practices, if the National Weather Service forecasts rainfall for Fort Bragg in the next 3 days; or (b) whatever the operator can complete in 3 days if there is no forecast of rain for the days of expected operations?	☐	☐	☐
8. Will stop tractor yarding or use of tractors, graders, excavators and other heavy equipment for construction of fire breaks, roads, landings, or tractor roads if (a) 4 inches of cumulative precipitation has occurred within the water year or (b) the National Weather Service forecasts for Fort Bragg a “chance” (30% or more) that precipitation will exceed this rain threshold? Sometimes, in the plan area, this occurs in early October, followed by extended dry periods up to November 15th. In these circumstances MRC may request, with approval of the wildlife agencies, an extension of logging activities until November 15th. This will allow MRC to complete some logging jobs and obviate the need to re-open the road system the following year in order to log the remaining volume.	☐	☐	☐
9. Will not grade more than once to obtain a drier running surface on short lengths of road (i.e. a contiguous length of less than 02.5 miles) before reincorporating any resulting beam back into the road surface; grade at least 24 hours before any forecasted rainfall?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
10. Leave all graded materials on the running surface of the road or dispose of them in a place where there is no possibility of delivery to a watercourse?	☐	☐	☐

	Y	N	NA
11. Cease hauling until the road is "truckable" i.e., in a condition that log trucks can operate, if it is necessary to grade more than ¼ mile?	☐	☐	☐
12. Keep only one skid trail system (all trails leading to one landing) open per piece of skidding equipment during the early winter periods?	☐	☐	☐
13. Ensure that skid trail systems are not too large meaning it can have drainage facilities and structures completely installed within 2 hours?	☐	☐	☐
14. Construction of new roads or skid trails will be in sections between watercourse crossing points and installation of all erosion controls and drainage systems on a section before moving to construct additional sections?	☐	☐	☐
15. Will construct outsloping and rolling dips prior to moving onto the next section of road?	☐	☐	☐
16. Will not construct new roads, skid trails, or landings when precipitation is sufficient to generate overland flow off the road, skid trail, or landing?	☐	☐	☐
17. Will haul logs on only one road (for each active landing) if a road has an unrocked surface?	☐	☐	☐
18. Will maintain hand-dug erosion control facilities?	☐	☐	☐
19. Will install drainage and erosion control facilities on all roads not used for hauling in the mid-winter period and stabilize road surfaces within the AMZ?	☐	☐	☐
20. Will not load and haul logs or conduct ground-based skidding of logs when: (a) vehicles can create ruts in the surface of the road, skid trail, or landing, i.e. when there is an indication of saturated soil; or (b) precipitation is sufficient to generate overland flow off the road and deliver sediment to the water?	☐	☐	☐
21. Will not resume road use under the above conditions until the road surface is dry (moisture is less than or equal to that found during normal watering [dust abatement] treatments or light rainfall; vehicles do not rut the road surface and there is no visible increase in turbidity in any drainage facility, construction/reconstruction site or road surface, any of which drains directly to Class I, II, or III waters?	☐	☐	☐
22. Will repair any damage from permitted use to a road surface, drainage facility, water bar, or stream crossing within at least 24 hours if precipitation is forecast in order to eliminate the likelihood of related sediment reaching Class I, Class II, or Class III watercourses?	☐	☐	☐
23. Will permit light vehicles (crew trucks, pickup trucks, ATVs, quadra-tracts, and motorcycles) during periods of wet weather?	☐	☐	☐
A. Will limit access to ATVs whenever rutting or the logging roads would occur (so that runoff is carried along the ruts) or waterbars would be breached (so that they no longer would function as intended) as a result of use by light vehicles?	☐	☐	☐
B. Will make repairs, using hand tools, at the time of discovery, if feasible, or within 24 hours of initial damage to the road surface, drainage facilities, water bars, or water crossings to eliminate the likelihood of related sediment reaching Class I, Class II, or Class III watercourses?	☐	☐	☐
i. Standards for the mid-winter period			
1. Will not conduct tractor yarding or heavy equipment use for construction fire breaks, road reconstruction, landing construction, or construction of roads or skid trails?	☐	☐	☐
2. Will not use landings within the AMZ for any forest harvest operations?	☐	☐	☐
3. Will not construct, reconstruct, or abandon roads?	☐	☐	☐
4. Will not use logging roads, tractor roads, or landings at any location where: (a) saturated soil conditions exist; (b) stable logging roads or landings do not exist; or (c) visibly turbid water from the road, landing, skid trail surface, or inside ditch may reach a watercourse or lake?	☐	☐	☐
5. Will limit the operation of log trucks and heavy equipment on roads and landings to permanent road surfaces with at least 6 inches rock surface unless the road does not drain to a watercourse and (a) is a ridge-top road; or (b) is greater than 200 feet from a watercourse?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
6. Will not use tractors within an AMZ except for longlines from an existing road within the AMZ	☐	☐	☐

or from outside of the AMZ?			
7. Will permit upgrading of a road surface to rock if no measurable rainfall has occurred within the last 5 days and no rain is forecast for the next 5 days; maintain the road surface (i.e. patch rock for less than 100 contiguous feet) at intervals allowed for log or rock hauling?	☐	☐	☐
8. Will not load or haul logs or rock when: (a) vehicles can create ruts in the surface of a road, skid trail, or landing, i.e., when there is an indication of saturated soil; or (b) precipitation is sufficient to generate overland flow off the road and deliver sediment to a watercourse?	☐	☐	☐
A. Once road use has ceased, do not resume use until the surface is dry?	☐	☐	☐
9. Will permit light vehicles (e.g., crew trucks, pickup trucks, ATVs, quadra-tracts, and motorcycles) during periods of wet weather?	☐	☐	☐
A. Limit access to ATV's whenever rutting of logging roads would occur (so that runoff is carried along the ruts) or waterbars would be breached (so that they no longer would function as intended) as a result of use by light vehicles?	☐	☐	☐
B. Make repairs, using hand tools, immediately if feasible or otherwise within 24 hours after initial damage to the road surface, drainage facilities, water bars, or water crossings has occurred in order to eliminate the likelihood of related sediment reaching Class I, Class II, or Class III watercourse?	☐	☐	☐
C. Perform emergency repairs when the risk for sediment delivery from the damage is higher than the risk for sediment delivery from the access for repair?	☐	☐	☐
j. Standards for the late winter period			
1. Will not install temporary crossings, conduct watercourse crossing construction or upgrades on Class I watercourses prior to June 15 unless there is no activity within the channel, e.g., placing a bridge where the abutments have already been constructed?	☐	☐	☐
2. Will not conduct tractor yarding or use tractors for construction of fire breaks, road construction/reconstruction, landing construction, or the construction of tractor roads within a Class I or Large Class II AMZ?	☐	☐	☐
3. Will not use logging roads, tractor roads, or landings at any location where visibly turbid water from the road, landing, skid trail surface, or inside ditch may reach a watercourse or lake?	☐	☐	☐
4. Will not load and haul logs or rock or conduct ground-based skidding of logs when: (a) vehicles can create ruts in the surface of a road, skid trail, or landing, i.e., when there is an indication or saturated soil; or (b) precipitation is sufficient to generate overland flow off the road and deliver sediment to a watercourse?	☐	☐	☐
A. Once road use has ceased due to the foregoing conditions, do not resume use unless the road surface is dry?	☐	☐	☐
5. Will not (a) load or haul logs or rock, (b) tractor yard, (c) construct roads and landings, or (d) abandon roads until at least 2 consecutive days elapse without rain, if one of the following conditions apply: (a) the National Weather Service reports that 0.5 inches of rain has fallen in Fort Bragg in the previous 24-hour period; or (b) rain exceeds 0.25 inches in a period at Yorkville (or the nearest reporting station)?	☐	☐	☐
6. Resume operations only after at least 2 consecutive days elapse without rain, if the following conditions apply: (a) the National Weather Service reports that 0.5 inches of rain has fallen in Fort Bragg in the previous 24-hour period; and (b) there has been no rain in Fort Bragg in the current 24-hour period?	☐	☐	☐
7. Will install temporary crossings only on one road per active landing on Small Class II or Class III watercourses?	☐	☐	☐
8. Size temporary crossings on Small Class II or Class II watercourses to pass a 25-year flow?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**

9. Will install drainage facilities and structures on all constructed skid trails and tractor roads prior to sunset if one of the following conditions apply: (a) The National Weather Service forecasts for Fort Bragg a “chance” (30% or more) of rain within 24 hours; or rain exceeds 0.25 inches in a 24-hour period at Yorkville (or the nearest reporting station); (b) operation stoppage exceeds 24 hours; or (c) winter operations have ceased?	☐	☐	☐
10. Provide mulch or cover on soil disturbed by road or skid trail construction within the AMZ that exceeds the 100 contiguous square feet and extends beyond the AMZ but is contiguous with the AMZ if one of the following conditions apply: (a) The National Weather Service forecasts for Fort Bragg a “chance” (30% or more) of rain within 24 hours; or rain exceeds 0.25 inches in a 24-hour period at Yorkville (or the nearest reporting station); (b) operation stoppage exceeds 24 hours; or (c) winter operations have ceased?	☐	☐	☐
11. Keep on hand at the work site materials to mulch or cover exposed soils for immediate deployment for this period?	☐	☐	☐
12. Keep open only one skid trail system can have drainage facilities and structures installed within 2 hours, i.e., that it is not too large?	☐	☐	☐
13. Ensure that a skid trail system can have drainage facilities and structures installed within 2 hours, i.e., that it is not too large?	☐	☐	☐
14. Do not grade more than once to obtain a drier running surface on short lengths of road (i.e., a contiguous length of less than 0.25 miles) before reincorporating any resulting berm back into the road system?	☐	☐	☐
15. Leave all graded materials on the running surface of the road or dispose of them in a place where there Is no possibility of delivery to a watercourse?	☐	☐	☐
16. Cease hauling until the road is “truckable”, i.e., in a condition that log trucks can operate, if it is necessary to grade more than one mile?	☐	☐	☐
17. Construct new roads in sections between watercourse crossing points and install all erosion controls and drainage systems before moving on to construct additional sections?	☐	☐	☐
18. Construct outsloping and rolling dips prior to moving onto the next section of new road construction?	☐	☐	☐
19. Do not proceed with construction when precipitation is sufficient to generate overland flow off the road and deliver sediment to a watercourse?	☐	☐	☐
20. Use slash or mulch to reduce soil loss prior to sunset if one of the following conditions apply: (a) the National Weather Service forecasts for Fort Bragg a “chance” (30% or more) of rain within 24 hours; or rain exceeds 0.25 inches in a 24-hour period at Yorkville (or the nearest reporting station; (b) operation stoppage exceeds 24 hours; or (c) winter operations have ceased?	☐	☐	☐
21. Install drainage and erosion control facilities prior to sunset according to the HER high rating, if one of the following conditions apply: (a) the National Weather Service forecasts for Fort Bragg a “chance” (30% or more) of rain within 24 hours; or rain exceeds 0.25 inches in a 24-hour period at Yorkville (or the nearest reporting station); or (b) operation stoppage exceeds 24 hours; or (c) winter operations have ceased?	☐	☐	☐
22. Permit light vehicles (e.g. crew trucks, pickup trucks, ATVs, quadra-tracts, and motorcycles) during periods of wet weather?	☐	☐	☐
A. Limit access to ATVs whenever rutting of the logging roads would occur (so that runoff is carried along the ruts) or waterbars would be breached (so that they no longer would function as intended) as a result of use by light vehicles?	☐	☐	☐
B. Make repairs, using a hand tools, at the time of the discovery, if feasible, or within 24 hours after initial damage to the road surface, drainage facilities, water bars, or water crossings to eliminate the likelihood of related sediment reaching Class I, Class II, or Class III watercourses?	☐	☐	☐
k. Standards for equipment maintenance and fueling			

Mitigation measures	Y	N	NA
1. Fuel and maintain heavy equipment at least (a) 100 ft from a watercourse, spring, seep, or wet area; (b) 500 ft from a current activity center of a spotted owl, and (c) 0.25 miles from an occupied marbled murrelet site, unless equipment breaks and MRC must repair it in place?	☐	☐	☐
2. Clean accidental spills immediately and dispose of hazardous waste according to applicable country, state, and federal laws?	☐	☐	☐
5. Standards for water drafting			
a. Class I and II watercourses, seeps, springs, wet lands/areas/meadows			
1. Use screen and mesh with the following specifications: (a) size: ≤ 3/32 inches for Class I watercourses and 1/8 inches for Class II watercourses; (b) approach velocity: ≤ 0.33 feet per second; and (c) pump rate: ≤ 350 gallons per minute?	☐	☐	☐
2. Clean screens as often as necessary to maintain an approach velocity ≤ 0.33 feet per second?	☐	☐	☐
3. Screens will be submerged completed?	☐	☐	☐
4. Screens supported above the streambed (set the screen on top of in-stream objects, such as rocks or use any other means)?	☐	☐	☐
5. Rock approaches to water drafting sites that are within the inner or middle band of the AMZ, unless the road is on a gravel surface within the floodplain?	☐	☐	☐
6. Rock approaches to the nearest upslope water bar or rolling dip to control sediment delivery?	☐	☐	☐
7. Ensure that bypass streamflows are at least 2 ft (cubed) per second and pump rate is no more than 10% of the instantaneous stream flow?	☐	☐	☐
8. Do not reduce the volume of the pool at the intake by 10% or more?	☐	☐	☐
9. Developed a water drafting plan if cannot comply with 7 and 8?	☐	☐	☐
A. Do not draft water when the depth of the immediate downstream riffle crest is ≤ 2.4 inches?	☐	☐	☐
B. Permit reduction of riffle crest depth below 2.4 inches at the outlet of the drafting pool if: (a) monitored by an RPF or hydrologist; (b) surface flow remains continuous over the riffle crest during the entire diversion episode; (c) diversion does not lower the flow over the next 2 downstream riffle crests more than ½ of their un-diverted depth; (d) diversion is limited to one site per stream and one truck at each site; 9e) diversion is ≥ 1 hour of riffle crest depth at unimpaired flow depths between diversion episodes?	☐	☐	☐
C. Do not decrease the wetted widths of habitat units by more than 25% or draft water if the stream channel within 30 bankfull widths downstream of the drafting site is intermittent as a result of diversion?	☐	☐	☐
D. Inspect the draw-down zones during the greatest effect of the diversion in the reach of the watercourse; an RPF will perform the inspection and CDFG may participate on-site such inspection will minimize the risk of salmonids stranding during subsequent diversion; use streambed materials from the thalweg to fill, with a hand tool, any low spots that become isolated during the draw-down; do not fill these areas until they are drained of water and confirmed to be free of covered species?	☐	☐	☐
E. Do not decrease pool riffle crest velocity below 1.0 ft per second, unless riffle crest depth is below 2.4 inches?	☐	☐	☐
F. Do not divert if water temperatures exceed 18 degree C at a location and coho salmon are present, do not divert if water temperatures exceed 20 degrees C if steelhead are present; measure water temperature at 1 ft depth or greater; temperature criteria do not apply from sunset until 10 am the next morning; place diversion intake, if feasible, downstream of the drafting pool's deepest point and at least 1/3 of the distance between the point and downstream riffle crest?	☐	☐	☐
G. Survey new or unsurveyed sites for development in Class II watercourses, wet areas, wetlands, wet meadows, seeps or springs for covered species during the optimum time for their detection; conduct an initial habitat survey; if there is suitable habitat; survey from the intake downstream to the confluence of the next stream but not more than 1500 ft; follow the conservation measures relevant to any detected covered species?	☐	☐	☐
i. Do not reduce the wetted width more than 50% below the point of the diversion, measure upstream of the diversion tank flow?	☐	☐	☐

Mitigation measures	**Y**	**N**	**NA**
ii. Ensure that bypass flows (instantaneous) are more than 50% of the unimpaired surface flow, determining un-diverted and bypass flow for compliance monitoring may be difficult in many locations; use buckets and stop watches if meters do not work?	☐	☐	☐
iii. Place the intake downstream of the drafting pool's deepest point, when channel morphology permits, at a point at least 1/3 the distance from the deepest point and the downstream riffle crest, do not place the intake at the deepest part of the pool?	☐	☐	☐
b. Ponds			
1. Use a screen with a mesh size less than 1/8 inch and an approach velocity of 0.33 ft/sec or less?	☐	☐	☐
2. Do not exceed a drafting rate of 350 gpm?	☐	☐	☐
3. Do not reduce average pool width by more than 10% when drafting from Class I ponds?	☐	☐	☐
4. Do not reduce the average pool width or depth by more than 50% when drafting from Class II ponds hydrologically connected to watercourses (including subsurface flow)?	☐	☐	☐
5. Do not reduce average pool width (defined as the pool width at the start of drafting for the season) by more than 50% prior to July 1 or 80% on or after July 1, when drafting and re-drafting from hydrologically isolated Class II ponds?	☐	☐	☐
6. Limit water drafting on documented red-legged frog breeding habitats (both natural and man-made): (a) apply appropriate date restrictions; (b) locate pump intakes away from the emergent vegetation and elevated at least 6 in above the substrate, if not using Class I designated screens; (c) do not draft when egg masses of red-legged frogs are present?	☐	☐	☐
7. Conduct pond maintenance and dredging after July 1 to allow red-legged tadpoles to metamorphose and leave the pond before disturbance?	☐	☐	☐
8. Do not conduct vegetation management more than once every 3 years?	☐	☐	☐
9. Limit vegetation management to 50% of a site's perimeter?	☐	☐	☐
10. Build all new upslope ponds with drain fixtures in case bullfrogs invade?	☐	☐	☐
c. Dust abatement plans			
1. Investigated additional Class 2 watercourses as potential sources of water drafting in order to reduce the amount of water taken from class 1 watercourses?	☐	☐	☐
2. Considered lignin or magnesium chloride for dust abatement under any of the following conditions: (a) on mainline roads where tracked equipment will not be operating on the road surface, (b) on road gradients that are generally less than 10% and have few tight turns for treatment to be effective; or (c) on other surfaces where lignin or magnesium chloride treatments are more cost effective than water?	☐	☐	☐
3. Considered other products that become available for road surface treatment, if their use if reasonable, feasible, and cost-effective?	☐	☐	☐
4. Planned harvest entries to use as few roads as possible by concentrating harvest operations in a given year and allowing multiple THP's to use the same haul road, if feasible?	☐	☐	☐
5. Considered use of non-surface flows, if feasible, including off channel pools, existing wells, and spring which do not hydrologically connect to watercourses?	☐	☐	☐
6. Watered roads early or late in the day to reduce evaporation rate of water on roads?	☐	☐	☐
7. Coordinated harvest operations with Licensed Timber Operators (LTOs) to reduce watering of roads, e.g., schedule cable and tractor yarding units to use a road simultaneously?	☐	☐	☐
6. Standards for skid trails and yarding			
a. Standards for skid trails			
1. Limited skid trails in number and width to the minimum necessary for removal of logs?	☐	☐	☐
2. Used stable existing skid trails, where possible, instead of constructing new ones unless the existing trails pose greater risk for sediment delivery?	☐	☐	☐
3. Kept the number of watercourse crossings to a minimum?	☐	☐	☐

Mitigation measures	Y	N	NA
4. Used a prepared watercourse crossing, such as a bridge, culvert, or temporary culvert, to protect the watercourse from siltation, where tractor roads cross a watercourse in which water may be present during the life of the crossing?			
5. Excluded skid trail use in the following areas:			
A. Class I and II AMZ unless (i) the skid trail is for a single entry for restoration and erosion control or (ii) the skid trail poses a lower risk for sediment delivery than alternative locations or alignments?			
B. Toes of historically active rockslides or earthflows unless there is a field review by both a California Licensed Geologist, according to Note 45 of the California Department of Conservation, and an individual knowledgeable in the relevant aquatic resources?			
C. Slopes steeper than 65%?			
D. Slopes steeper than 50% where the hazard rating for soil erosion is high or moderate?			
E. Slopes over 50% which lead without flattening to sufficiently dissipate water flow and trap sediment before it reaches a watercourse or lake (can use skid trails once in this instance to control sediment)?			
6. Followed the conservation measures for inner gorge slopes?			
7. Limited skid trails to existing, stable skid trails that do not require reconstruction in the following areas:			
A. Slopes between 50% and 65% where the erosion hazard rating is moderate?			
B. TSU 1, TSU 2, or TSU 3 that are not inner gorge slopes?			
C. Toe of dormant rockslides or earthflows?			
D. Historically active (active within the last 100 years) mass wasting features unless there is a field review approved by both a California Licensed Geologist, according to Note 45 of the California Department of Conservation, and an individual knowledgeable in the relevant aquatic resources of concern?			
8. Installed all waterbreaks prior to October 15 unless MRC follows the standards for the early winter period?			
9. Did not disturb the soil, other than for road or landing maintenance intended to prevent erosion or mass wasting, with tractors or cables under excessively wet ground conditions that could result in substantial soil compaction and erosion?			
10. Did not exceed the standards for distances between waterbreaks?			
11. Located waterbreaks to allow water to be discharged into some form of vegetative cover, duff, slash, rocks, or less erodible material whenever possible; otherwise, decrease the spacing and add erosion-resistant materials to the outlets such as slash or straw?			
12. Constructed waterbreaks to provide for (a) unrestricted discharge at the lower end of the waterbreak so that water will not pool or overtop the waterbreak, and (b) unhindered spread of water to minimize erosion and encourage sediment to settle?			
13. Cut waterbreaks diagonally, a minimum of 6 inches into the firm roadbed of the skid trail?			
14. Constructed waterbreaks to sufficient depth to prevent overland flow and concentration of water on the surface of a skid trail?			
15. Spaced water breaks to control and distribute overland flow without causing rilling or gullies?			
16. Keep a continuous firm embankment of at least 6 inches in height immediately adjacent to the down-road edge of the waterbreak cut?			
17. Re-established all natural drainage flow paths following skid trail use and assure no skid trail captures a natural watercourse?			
18. Removed all watercourse crossings prior to October 15 or follow the standards for the early winter period?			
19. Excavated fills in the watercourse crossing to form a channel that is as close as possible to the natural watercourse grade and orientation and that is wider than the natural channel?			

	Y	N	NA
20. Sloped back excavated material and any resulting cut bank from the channel and stabilize it to prevent slumping and minimizing soil erosion?	☐	☐	☐
21. Stabilized excavated material near crossings by rock-armoring or other treatments?	☐	☐	☐
Mitigation measures	**Y**	**N**	**NA**
22. Treated all bare areas, excluding roads, which are: (a) at least 100 ft^2 and (b) within the AMZ or (c) beyond the AMZ but contiguous with it?	☐	☐	☐
b. Standards for cable yarding erosion control			
1. Installed waterbreaks on a cable road only when the cable roads are (a) cut deeply enough to divert water and carry water for distances greater than 100 ft without dispersing or (b) able to deliver cable road runoff into a watercourse?	☐	☐	☐
A. Spaced the waterbreaks at 100 ft intervals to ensure water disperses before becoming erosive?	☐	☐	☐
B. Cut waterbreaks diagonally a minimum of 6 inches into the cable road and keep a continuous firm embankment of at least 6 inches in height immediately adjacent to the down-road edge of the waterbreak cut?	☐	☐	☐
2. Install waterbreaks by hand if the ground site is not designated for heavy equipment?	☐	☐	☐
3. Treated bare soil exposed by cable roads for at least 100 ft^2 that is (a) within the AMZ or (b) beyond the AMZ but contiguous with it?	☐	☐	☐

Appendix B

Species Profiles for Aquatic and Terrestrial Wildlife Species of Concern

1 FISH

1.1 Roach (Navarro and Gualala)

Scientific Name: *Lavinia symmetricus navarroensis* (Navarro)/*Lavinia symmetricus parvipinnis* (Gualala)
Federal Status: (none)
State Status: Species of Special Concern

1.1.1 Distribution

A variety of subspecies of the California roach (*Lavinia symmetricus*) are found throughout the Sacramento-San Joaquin river system as well as coastal drainages ranging from northern California to Santa Barbara County (Moyle 2002). The Gualala roach and the Navarro roach are both recognized subspecies of the California roach, with a localized distribution within the primary and secondary assessment areas. The Gualala roach occur in the Gualala River drainage in southern Mendocino and northern Sonoma Counties. The Gualala roach has not been recorded within the primary assessment area but is found in the secondary assessment area with documented occurrences in the Gualala and McGuire Ridge United States Geological Survey (USGS) quadrangles (Moyle 2002, CDFG 2009a). Within the primary assessment area, the Navarro roach occurs in the Navarro river basin (Moyle 2002, CDFG 2009a). In the secondary assessment area, Navarro roach occur in the Russian River and are documented in the Elk USGS quadrangle (CDFG 2009a).

1.1.2 Life history

Roach generally reach sexual maturity by the second year, at which time they average 1.8 in (45 mm) standard length. However, in the Russian and Navarro rivers they grow much faster, and can attain sizes of 3.2–3.7 in (80–95 mm) by the third year (Moyle 2002). Reproduction generally occurs from March to June, but may continue into July (Moyle 2002). Spawning takes place when the water is approximately 61°F (16°C) (Murphy 1948, Moyle 2002). During spawning, fish move in schools into shallow areas with moderate flow and medium-sized gravel substrate (Moyle 2002). Eggs (typically 250–2,000) are deposited in the gravel where they hatch within 2–3 days, and the fry remain in the gravel until they are free-swimming.

1.1.3 Habitat associations

Roach are habitat generalists, but are typically found in small, warm intermittent streams, with dense concentrations often in isolated pools (Moyle 2002, Moyle et al. 1982, Taylor et al. 1982). They also inhabit cold, clear, well-aerated streams, human- modified habitat, and the main channels of larger rivers. Roach are tolerant of relatively high temperatures (86–95°F [30–35°C]) and low oxygen levels (1–2 ppm) (Taylor et al. 1982). In the summer, roach feed mostly on filamentous algae, with smaller quantities of crustaceans and insects (Greenfield and Deckert 1973, Moyle 2002). In winter their diet consists of diatoms and other unicellular algae (Moyle et al. 1989).

1.1.4 Threats

Elevated alkalinity and conductivity are thought to depress juvenile populations, and low dissolved oxygen availability affects adult survival (Smith 1982). Roach are also susceptible to habitat alteration and destruction (Smith 1982), and are dependent on clean gravels for egg and juvenile survival.

1.1.5 Sensitivity to forest management activities

Siltation of streams, resulting from upslope erosion associated with timber harvest and road building, are threats to successful reproduction in this species. Logging practices that result in increased stream temperatures, such as removing canopy shade over streams, could actually increase reproduction (Moyle 2002). The ability of roach to occupy waters with high water temperatures and shallow pools help it thrive in watercourses adversely affected by sedimentation and canopy removal. In addition, the increased water temperatures reduce habitat suitability for cold water species such as juvenile steelhead and coho salmon, which decreases their ability to compete with roach.

1.1.6 Comments

Moyle (2002) recommend a taxonomic re-evaluation of the California roach and believe that such an evaluation may turn up new subspecies or even species, and possibly merge presently recognized forms.

1.2 Coho Salmon (Central California Coast ESU and Southern Oregon/Northern California Coasts ESU)

Scientific Name: *Oncorhynchus kisutch*
Federal Status: Endangered (Central California Coast ESU)
Threatened (Southern Oregon/Northern California Coasts ESU)
State Status: Endangered (Central California Coast ESU)
Threatened (Southern Oregon/Northern California Coasts ESU)

1.2.1 Distribution

In North America, coho salmon range from coastal streams from the Lorenzo River in central California to Point Hope Alaska (Moyle 2002). Coho populations found in the primary and secondary assessment areas belong to two Evolutionarily Significant Units (ESUs). Populations distributed from Punta Gorda south to the San Lorenzo River (Santa Cruz County, California) belong to the Central California Coast ESU. Populations in river basins from Punta Gorda north to the Oregon border belong to the Southern Oregon/Northern California Coasts ESU. In the primary assessment area, Central California Coast coho salmon are documented to occur in the Albion, Big, Cottoneva, Elk, Garcia, Hardy, Hollow Tree, Howard, Navarro, and Noyo basins (MRC 2012, CDFG 2009b). Within the secondary assessment area, Central California Coast coho salmon are documented to occur in the Albion, Bailey Ridge, Bear Harbor, Briceland, Burbeck, Cahto Peak, Cold Spring, Comptche, Dutchman's Knoll, Elk, Eureka Hill, Fort Bragg, Garberville, Greenough Ridge, Gualala, Hales Grove, Inglenook, Legget, Lincoln Ridge, Mallo Pass Creek, Mathison Peak, McGuire Ridge, Mendocino, Navarro, Noble Butte, North Spur, Noyo Hill, Ornbaum Valley, Philo, Piercy, Point Arena, Sherwood Peak, Westport, and Zeni Ridge quadrangles (CDFG 2009b). Coho salmon in the Southern Oregon/Northern California

Coasts ESU are found within the primary assessment area in the Hollow Tree Creek basin and within the secondary assessment area in the Bear Harbor, Cahto Peak, Garberville, Hales Grove, Legget, Lincoln Ridge, Noble Butte, and Piercy quadrangles (CDFG 2009b; MRC, unpublished data).

1.2.2 Life history

After attaining sexual maturity in the summer following one or two winters at sea, adult coho migrate to the vicinity of their natal stream during late summer and fall (Sandercock 1991). Over 95% of coho salmon in Washington, Oregon, and California mature and return from the ocean to fresh water in their third year of life, spending only one winter at sea (NMFS 1995). Coho salmon typically spend about 3 to 4 months within spawning gravels as eggs and alevins, and up to 15 months rearing in fresh water before they migrate out to the ocean (Sandercock 1991). Coho smolt outmigration generally occurs in the spring approximately one year after they emerge from gravels. After reaching the estuary, coho salmon may remain for a few months prior to entering the ocean environment, where they typically mature for approximately 16 months in the ocean (Sandercock 1991) until they migrate upstream to spawn.

1.2.3 Habitat associations

Eggs and alevins require high oxygen levels and gravel permeability to result in normal development. Fry tend to aggregate in backwaters, side channels, stream margins, and other low velocity locations, especially areas with low light intensity and overhead cover (Nickelson et al. 1992, Ruggles 1966). As they grow, juvenile coho move to deeper habitats, although they continue to prefer low-velocity habitat throughout the rearing period. Numerous studies have shown that deep pools with substantial cover in the form of large woody debris are the most important habitat elements used by juvenile coho in the winter (Hartman 1965; Bustard and Narver 1975a, 1975b; Tschaplinski and Hartman 1983; Murphy et al. 1984; Bisson et al. 1985, 1988; Everest et al. 1986). Following winter peak flows, juvenile coho salmon emerge from winter hiding areas and feed heavily to grow in preparation for downstream migration.

1.2.4 Threats

Watershed disturbances associated with logging, road construction, livestock grazing, urbanization, agriculture, mining, dam construction, water diversions, hatchery production, and other human activities are among the primary threats to coho salmon in fresh water. These disturbances can result in the loss of complex stream habitat (Brown et al. 1994; NMFS 1995, 2011a, 2011b), reducing habitat suitability and successful reproduction and rearing by coho salmon. Improperly constructed crossings can be partial or complete barriers to movement. Especially important is the off-channel habitat that provides high-quality rearing and feeding habitat for juvenile coho salmon. The loss of suitable habitat area and complexity in streams may also make juvenile coho more vulnerable to fish, avian, and mammalian predation by such species as pike minnows, kingfishers, mergansers, and otters. Even where predation is not a major factor affecting coho populations, it may retard recovery when populations are severely depressed (CDFG 1994). Hatchery practices also threaten coho salmon populations by increased competition and loss of genetic integrity due to the influence of hatchery fish.

1.2.5 Sensitivity to forest management activities

Increased peak flows, reduction in the amount of large woody debris, increased fine and coarse sediment input to the watershed, and removal of riparian vegetation can reduce coho salmon spawning success, degrade rearing habitat, and lead to reduced fitness and survival. Increased peak flows due to logging can reduce survival of eggs and alevins through displacement if gravels are mobilized; juveniles may also be displaced if suitable velocity refuges are lacking in rearing areas (Nicholas 1988). Removal of large woody debris or curtailment of large woody debris recruitment generally leads to loss of those habitat features most important to rearing juvenile coho and a decline in abundance (Bryant 1980, Toews and Moore 1982, Lestelle and Cederholm 1984, Dolloff 1986, Elliott 1986, Fausch and Northcote 1992). Stream channels tend to become simpler and less stable after the removal of large woody debris, and the habitat complexity that provides substrate diversity, refuges from current velocity, and cover used by spawning, feeding, and resting salmonids is also lost (McMahon and Reeves 1989). Cutting of streamside forests and large woody debris removal has been observed to decrease frequency and area of pool habitat and increase riffle area (Bryant 1980, Everest and Meehan 1981, Bisson and Sedell 1984). Timber harvesting and associated road building often cause increased levels of sediment delivery to channels, which may cause increased water turbidity, filling of pools and reduction of juvenile coho rearing habitat. Effects of increased turbidity may include physiological stress such as gill trauma and decreased osmoregulatory ability, and behavioral changes such as delayed migration, decreased feeding rates, and altered prey selection (Bash et al. 2001, Newcombe and Jensen 1996). Embeddedness of substrates with fine sediments may reduce production (Crouse et al. 1981), primarily by reducing egg-to-emergence survival and aquatic invertebrate production (Chamberlin et al. 1991, Bjornn and Reiser 1991). Aggradation of streams from erosion may result in less stable spawning gravels and mortality of eggs and embryos due to gravel mobilization during freshets (Nawa et al. 1990). Logging practices that result in increased stream temperatures, such as removing shade over streams, threaten survival and reproduction by coho salmon. Removal of riparian canopy cover exposes more of the stream channel to direct solar radiation. Higher temperatures during the incubation period can cause coho to emerge earlier and be displaced by winter freshets (Scrivener and Anderson 1984). High summer water temperatures reduce growth and may cause mortality of juveniles.

1.2.6 Comments

This species would be covered under MRC's proposed HCP/NCCP.

1.3 Steelhead (Northern California DPS and Central California Coast DPS)

Scientific Name: *Oncorhynchus mykiss*
Federal Status: Threatened (Northern California DPS)
Threatened (Central California Coast DPS)
State Status: Species of Special Concern (Northern California DPS)
(none) (Central California Coast DPS)

1.3.1 Distribution

Steelhead are distributed throughout the North Pacific Ocean and historically spawned in streams along the west coast of North America from Alaska to northern Baja California. The species is currently known to spawn only as far south as Malibu Creek in southern California (Barnhart 1991, NMFS 1996). Winter-run steelhead occur in streams and rivers throughout the primary and secondary assessment areas and belong to two contiguous Distinct Population Segments (DPSs) (NMFS 2006). Steelhead occupying waters north of the Russian River to Redwood Creek in Humboldt County belong to the Northern California DPS. Populations distributed from the Russian River south to Aptos Creek (Santa Cruz County) belong to the Central California Coast DPS. Northern California steelhead occur within the primary assessment area in the Albion, Alder, Big, Buckhorn, Cottaneva, Doyle, Elk, Garcia, Greenwood, Gualala, Hardy, Hollow Tree, Howard, Little Howard, Juan, Mallo Pass, Mills, Navarro, and Point Arena Coastal basins (CDFG 2007; MRC, unpublished data). Within the secondary assessment area Northern California steelhead have been documented in the Albion, Bailey Ridge, Bear Harbor, Boonville, Briceland, Burbeck, Cahto Peak, Cold Spring, Comptche, Dutchman's Knoll, Elk, Eureka Hill, Fort Bragg, Garberville, Greenough Ridge, Gualala, Gube Mountain, Hales Grove, Inglenook, Laughlin Ridge, Legget, Lincoln Ridge, Longvale, Mallo Pass Creek, Mathison Peak, McGuire Ridge, Mendocino, Mistake Point, Navarro, Noble Butte, North Spur, Noyo Hill, Ornbaum Valley, Orrs Spring, Philo, Piercy, Point Arena, Saunders Reef, Sherwood Peak, Ukiah, Westport, and Zeni Ridge USGS quadrangles (CDFG 2007). In the primary and secondary assessment areas, steelhead found in the Upper Russian River basin belong to the Central California Coast steelhead DPS.

1.3.2 Life history

Steelhead return to spawn in their natal stream, usually in their fourth or fifth year of life (Shapovalov and Taft 1954, Behnke 1992). Winter-run steelhead populations generally enter spawning streams from fall through spring as sexually mature adults and spawn a few months later in late winter or spring (Roelofs 1985, Meehan and Bjornn 1991, Behnke 1992). Although most steelhead die after spawning, adults are capable of returning to the ocean and migrating back upstream to spawn in subsequent years. Steelhead typically spend about 20–100 days within spawning gravels as eggs (Shapovalov and Taft 1954, Barnhart 1991) and 14–35 days as alevins (Barnhart 1991) until they emerge from the gravel. Juveniles typically remain in their natal streams for at least their first summer (Barnhart 1991) before outmigrating to the ocean as smolts, although some may remain in fresh water for three or four years before smolting (Roelofs 1985). Steelhead migrating downstream may rear for one to six months in the estuary before entering the ocean (Barnhart 1991). Recent studies (Bond 2006) have suggested juveniles that rear longer in the estuary grow more rapidly than those in the stream and therefore increase their ocean survival.

1.3.3 Habitat associations

During their upstream migration, adult steelhead require deep pools for resting and holding (Puckett 1975; Roelofs 1983, as cited in Moyle et al. 1989). Incubating eggs require high dissolved oxygen concentrations, with optimal concentrations at or near saturation. After emergence from spawning gravels in spring or early summer, steelhead fry move to shallow-water, low-velocity habitats such as stream margins and low-gradient riffles and will forage in open areas lacking instream cover (Hartman 1965, Everest et al. 1986, Fontaine 1988). As fry increase in size in late summer and fall, they increasingly use areas with cover and show a preference for higher-velocity, deeper mid-channel waters near the thalweg (Hartman 1965, Everest and Chapman 1972, Fontaine 1988). Steelhead overwinter in pools, especially low-velocity deep pools with large rocky substrate or woody debris for cover, including backwater and dammed pools (Hartman 1965, Swales et al. 1986, Raleigh et al. 1984, Fontaine 1988).

1.3.4 Threats

Declines in steelhead populations are significant and are due at least in part to degradation of fresh water habitat, non-native species predation, and influence of artificial propagation on the genetic integrity of local populations (NMFS 2006, 2011c). Uncertainty remains regarding other potential risks to these populations, primarily due to the paucity of data (NMFS 2011c). Because of their anadromous life history and changes in habitat requirements at different life stages, steelhead in their fresh water life stages are vulnerable to a wide range of watershed disturbances, including dams, timber harvest, road construction, blocked passage at road crossings, agricultural and residential development, recreational use, and other human-related disturbances.

1.3.5 Sensitivity to forest management activities

Increased peak flows, reduction in the amount of large woody debris, increased fine sediment input to the watershed, and removal of riparian vegetation can reduce steelhead spawning success, degrade rearing habitat, and lead to reduced fitness and survival. The effects of increased magnitude and altered timing of peak flows due to logging may include reduced survival of eggs and alevins through displacement if gravels are mobilized; juveniles may also be displaced if suitable velocity refuges are lacking in rearing areas (Nicholas 1988). Removal of large woody debris results in stream channels that are simpler and less stable, and the habitat complexity that provides substrate diversity, velocity refuge, and cover used by spawning, feeding, and resting salmonids is also lost (McMahon and Reeves 1989). Reduced large woody debris may also limit formation of backwater pools and the complex stream margin habitat used by emergent fry (McCain 1992). Reductions in the amount of large woody debris in stream channels may reduce the carrying capacity of these streams for juvenile anadromous salmonids, especially of the older age classes which may prefer deeper habitats. Sedimentation due to land use activities has been recognized as a primary cause of habitat degradation for steelhead populations on the west coast (NMFS 1996). Timber harvesting and associated road building often cause increased levels of sediment delivery to channels, which may cause increased water turbidity, filling of pools and reduction of juvenile coho rearing habitat. Effects of increased turbidity may include physiological stress such as gill trauma and decreased osmoregulatory ability, and behavioral changes such as delayed migration, decreased feeding rates, and altered prey selection (Bash et al. 2001). Embeddedness of substrates with fine sediments may reduce production (Crouse et al. 1981), primarily by reducing egg-to-emergence survival and aquatic invertebrate production. Increased input of fine sediment resulting from natural or anthropogenic disturbance may be the principle cause of egg and alevin mortality in some areas (Shapovalov and Taft 1954). Sedimentation also reduces the amount of interstitial habitat available for use as a refuge by juvenile salmonids during high-flow events or low temperatures (Hillman et al. 1987). Logging practices that result in increased stream temperatures, such as removing shade over streams, threaten survival and reproduction by steelhead. Removal of riparian canopy cover exposes more of the stream channel to direct solar radiation. High summer water temperatures reduce growth and may cause mortality of juveniles.

1.3.6 Comments

This species would be covered under MRC's proposed HCP/NCCP.

1.4 Chinook Salmon (California Coastal ESU)

Scientific Name: *Oncorhynchus tshawytsch*

Federal Status: Threatened
State Status: (none)

1.4.1 Distribution

Chinook salmon are distributed in the Pacific Ocean throughout the northern temperate latitudes in North America and northeast Asia. In North America, they spawn in rivers from Kotzebue Sound, Alaska south to the San Joaquin River in California's Central Valley (Healey 1991). The Chinook salmon California Coastal ESU encompasses all naturally spawning coastal Chinook salmon from Redwood Creek (Humboldt County) to the Russian River (Sonoma County). Chinook salmon were historically distributed throughout Northern coastal California; however, Hollow Tree Creek is the only watershed within MRC's ownership known to currently have a spawning population of Chinook salmon (MRC 2012). Recent observations have raised the possibility that there are reproducing populations of Chinook salmon in other watersheds, such as the Noyo River and the Albion River (G. Niellands, pers comm., 2001; MRC 2002, 2012). California coastal Chinook salmon have been documented within the primary assessment area in the Albion, Big, Garcia, Hollow Tree, Navarro, and Noyo basins (MRC 2012, PSMFC 2004).

1.4.2 Life history

Chinook salmon in the California Coastal ESU exhibit life history characteristics of the fall-run ecotype. Adult fall-run Chinook throughout their range generally enter estuaries from July to September, remaining in these areas until they become nearly sexually mature before moving upstream as flows increase in the fall. In California, most adult fall-run Chinook enter streams from August through November, with peak arrival usually occurring in October and November (Leet et al. 1992), and spawn from early October through December. Egg incubation generally lasts between 40–90 days at water temperatures of 42.8–53.6°F (6–12°C) (Vernier 1969, Bams 1970, Heming 1982, all as cited in Bjornn and Reiser 1991), and the alevins remain in the gravel for 2 to 3 weeks before emerging from the gravel. Fall Chinook salmon fry usually outmigrate from the spawning areas between January and March with smolts typically entering the ocean between April and July (Leet et al 1992).

1.4.3 Habitat associations

Most Chinook salmon spawn in the mainstem of large rivers and lower reaches of tributaries, usually in low-gradient (<3%) areas (Kostow 1995). Spawning sites (redds) are typically located near pool tailouts (i.e., heads of riffles) where intragravel dissolved oxygen concentrations are high. Juvenile Chinook salmon tend to use mainstem reaches and estuaries as rearing habitat more extensively than do juvenile coho salmon and steelhead. Following emergence, fry occupy low-velocity, shallow areas near stream margins, including backwater eddies and areas associated with bank cover such as large woody debris, where they aggregate in small schools (Lister and Genoe 1970, Everest and Chapman 1972, McCain 1992). As fry grow, they move into deeper and faster water further from banks (Hillman et al. 1987, Everest and Chapman 1972, Lister and Genoe 1970).

1.4.4 Threats

Chinook salmon are vulnerable to a wide range of watershed disturbances, including dams, timber harvest, road construction, mining, habitat blockages, recreational use, and other human-related disturbances. Threats to Chinook salmon fresh water habitat include human alterations to the hydrologic regime, and diversions affecting the quality, quantity, and water temperature of water in Chinook-bearing streams. Overutilization for recreational purposes has been identified as one of the primary reasons for the decline of the California Coastal Chinook salmon ESU (NMFS 2007). Predation is a factor, although not one of the primary driving factors for the decline of the ESU (NMFS 2007). Persistence of Chinook salmon populations is also threatened by loss of genetic integrity due to the influence of hatchery fish.

1.4.5 Sensitivity to forest management activities

Increased peak flows, reduction in the amount of large woody debris, increased fine sediment input to the watershed, and removal of riparian vegetation can reduce Chinook salmon spawning success, degrade rearing habitat, and lead to reduced fitness and survival. The effects of increased magnitude and altered timing of peak flows due to logging may include reduced survival of eggs and alevins through displacement if gravels are mobilized; juveniles may also be displaced if suitable velocity refuges are lacking in rearing areas (Nicholas 1988). Timber harvesting and associated road building can increase fine sediment delivery to stream channels, which can reduce the suitability of spawning and rearing habitats by filling interstitial spaces between sediment particles, reducing intragravel flow and the delivery of dissolved oxygen to incubating eggs and developing alevins (Chapman 1988). Chinook salmon eggs may be more sensitive to reductions in dissolved oxygen than other salmonids, given their large size and small surface-to-volume ratio (Healey 1991). The filling of pools by sediment can reduce the amount of rearing habitat available to juvenile Chinook salmon. Bjornn et al. (1977) found that reduction of pool volume by half following the addition of sand reduced juvenile Chinook salmon abundance by over two-thirds. Sedimentation may also fill interstitial spaces used as velocity refuge by juvenile salmon during high flow events (Hillman et al. 1987). Reduction of large woody debris in stream channels can decrease frequency, depth, and complexity of pool habitat used by rearing juveniles. Although pool habitat is an important geomorphic feature of channels where Chinook salmon rear, it is likely not as important to Chinook salmon as it is for coho salmon (see coho salmon species account for further discussion of the effects of reduced large woody debris in streams). However, reduced large woody debris availability may also limit formation of backwater pools and complex lateral habitat used by emergent Chinook salmon fry (McCain 1992). Logging and grazing practices that reduce riparian vegetation and stream channel shading may increase stream temperature, which may reduce survival of adult and juvenile Chinook salmon. High summer water temperatures in mainstem areas appear to reduce usable habitat for juvenile rearing (Lindsay et al. 1986). However, because fall Chinook salmon emigrate to the ocean before the hottest summer months, the effects of elevated water temperatures on juvenile Chinook are generally minimal compared to other salmonids, such as coho salmon and steelhead, that rear in streams during summertime.

1.4.6 Comments

This species would be covered under MRC's proposed HCP/NCCP.

1.5 River Lamprey

Scientific Name: *Lampetra ayresi*
Federal Status: (none)
State Status: Species of Special Concern

1.5.1 Distribution

River lampreys are thought to be present in large coastal streams from roughly Juneau, Alaska to San Francisco Bay (Moyle 2002). While thought to prefer large rivers, individuals have also been documented in smaller streams (Kostow 2002). From the little available information on this species, the region of primary abundance in California is in the lower Sacramento-San Joaquin drainage, especially the Stanislaus and Tuolumne Rivers. In addition, they are present in the Napa River, Sonoma Creek, and Alameda Creeks, all tributaries to San Francisco Bay. Along the California coast, river lampreys have been found in Salmon Creek, tributaries to the lower Russian River, and possibly the Eel River (Moyle 2002). Outside of California, their distribution is isolated and greatly scattered, with most individuals being reported from the Columbia and Frasier basins (Kostow 2002). There are no documented occurrences of river lamprey within the primary or the secondary assessment areas.

1.5.2 Life history

Little information is available on river lamprey life history (Moyle 2002). Spawning migrations occur in fall, and spawning is thought to take place in streams from February through May (Moyle 2002), with adults dying soon after spawning (Kostow 2002). One study in Cache Creek found females with fecundities of 11,400–37,300 eggs (Moyle 2002). Kan (1975) also reported spring spawning in Oregon and California and provided fecundity measurements from individuals taken from the Columbia and the Sacramento rivers from 11,400 to 174,000 eggs per female. River lampreys are hypothesized to spend 3–5 years in the ammocoete stage before metamorphosis into adults. This transformation, which leads to development of eyes, teeth, more defined fins, and an oral disc begins in the summer and takes 9–10 months to complete (Kostow 2002, Moyle 2002). After metamorphosis, eyed individuals known as macropthalmia enter the ocean at the end of spring where they spend approximately 3–4 months. During this period, individuals remain slow to show, feeding on a variety of fishes such as smelt, salmon, and herring and displaying rapid growth (Beamish 1980).

1.5.3 Habitat associations

Very little information is available on habitat requirements for river lampreys (Kostow 2002, Moyle 2002). During the brief periods that adult river lampreys are in fresh water they are not seen, probably because they are in deep water habitats in the mainstems of larger rivers (Beamish 1980). Adults build redds by formation of depressions in gravel riffles. Like other lamprey species, river lamprey ammocoetes occur in silty backwater and eddy habitats. No data is available on temperature preferences for river lampreys in the wild, but in one laboratory study in Canada spawning was initiated at 54°F (12°C) (Beamish 1980).

1.5.4 Threats

River lampreys are affected by different types of habitat alteration including dams, diversions, channelization, pollution and urbanization (Moyle et al. 1995). In addition, timber harvesting and the associated road building could increase the delivery of fine sediment to the stream channel, thus decreasing the quantity and quality of available spawning habitat. Some degree of siltation could benefit river lampreys, however, since ammocoetes require silty substrate in low velocity areas for rearing.

1.5.5 Sensitivity to forest management activities

Siltation of streams, resulting from upslope erosion associated with timber harvest and road building, could reduce the amount of clean gravel available for spawning habitat. Rearing ammocoetes tend to occupy backwater and side-channel depositional areas that benefit from fine sediment and organic detritus deposition.

1.6 Tidewater Goby

Scientific Name: *Eucyclogobius newberryi*
Federal Status: Endangered
State Status: Species of Special Concern

1.6.1 Distribution

The tidewater goby is endemic to California and inhabits brackish water habitats from San Diego County in the south to the mouth of the Smith River, Del Norte County in the north (Swift 1980, Swift et al. 1989). Swift et al. (1989) recorded its presence at 64 localities in 1984, only 11 of them north of San Francisco Bay. Existing tidewater goby populations are relatively small and isolated (Moyle et al. 1989). Within the primary and secondary assessment areas, isolated populations of tidewater gobies exist in lagoon habitat in the Tenmile River, Virgin Creek, Pudding Creek, Davis Pond, Brush Creek, and Lagoon Creek in Mendocino County (USFWS 2005). There are no documented occurrences of tidewater gobies within the primary assessment area but they are documented to occur within the secondary assessment area within the Fort Bragg and Point Arena quadrangles (CDFG 2009a).

1.6.2 Life history

Tidewater gobies are a small, short-lived, estuarine/lagoon adapted species that may infrequently disperse via marine habitat but with no dependency on marine habitat for its life cycle (Swift et al. 1989, Lafferty et al. 1999). Unlike other California gobies, the tidewater goby is able to complete its entire life cycle in fresh or brackish water (Wang 1982, Irwin and Soltz 1984, Swift et al. 1989). Tidewater gobies are thought to reproduce year-round, although spawning peaks are known to occur (Moyle 2002). Reproduction and spawning typically occurs during spring and summer in slack shallow waters of seasonally disconnected or tidally muted lagoons, estuaries, and sloughs. The female deposits eggs into the breeding burrow, which the male guards until larvae emerge in 9–10 days (Swift et al. 1989).

1.6.3 Habitat associations

The preferred juvenile/adult habitat is also slack, shallow water in seasonally disconnected or tidally muted lagoons, estuaries, and sloughs. Tidewater gobies appear to prefer shallow depths (<3 ft [1 m]) near emergent vegetation, possibly to avoid predation by wading birds and piscivorous fish (Moyle 2002). Reported shallow minimum depths of occurrence may be associated with depth thresholds for wading bird predators such as herons; in general, avian predation efficiency decreases with depths >8 in (20 cm) (Gawlik 2002). Tidewater gobies are tolerant of a wide range of salinities, water temperatures, and dissolved oxygen levels. They have been found in water with average surface salinity ranging from 1.8– 32.2 ppt (Chamberlain 2006), but are typically found in water with salinity < 12–15 ppt (Swift et al. 1989, USFWS 2005). Chamberlain (2006) documented tidewater gobies in water temperatures of 55–78ºF (13–

25.4ºC) and dissolved oxygen levels of 0.2–15.5 mg/l. Tidewater gobies prefer a sandy substrate for burrow construction, but may also be found in silt or mud (73 FR 5920). The diet consists mostly of small crustaceans (i.e., mysid shrimp, ostracods, amphipods), aquatic insects (i.e., chironomid and other dipteran larvae), and mollusks, which are gleaned from bottom substrates (Swift 1980, Wang 1982, Irwin and Soltz 1984).

1.6.4 Threats

Severe salinity changes and tidal and stream flow fluctuations have a detrimental effect on the survival of tidewater gobies, resulting in population declines (Irwin and Soltz 1984). However, since tidewater gobies are known to be able to reproduce in a variety of salinities, small changes in salinity probably do not prevent successful hatching of the eggs (Entrix 2004). Degradation of coastal lagoons and estuaries through diversion of freshwater supplies, pollution, excessive siltation, and development of surrounding lands can lead to rapid population declines, given the short life cycle and specialized habitat requirements of tidewater gobies (Moyle et al. 1989). Additionally, competition with non-native species has also reduced the available habitat for tidewater gobies (USFWS 1994).

1.6.5 Sensitivity to forest management activities

Tidewater gobies may be affected by forest management activities that increase fine sediment delivery and deposition that in turn alter the substrate characteristics necessary for burrow construction (USFWS 2005). This species may also be affected by forest management activities such as herbicide application that negatively affect downstream water quality.

2 AMPHIBIANS AND AQUATIC REPTILES

2.1 Southern Torrent (Southern Seep) Salamander

Scientific Name: *Rhyacotriton variegatus*
Federal Status: (none)
State Status: Species of Special Concern

2.1.1 Distribution

Southern torrent salamanders are distributed in California along the humid coastal drainages from the Oregon border to approximately Point Arena in Mendocino County (Stebbins 2003). This species has been recorded in many locations in the primary assessment area, including the Albion River, Alder Creek, Cottaneva Creek, Elk Creek, Greenwood Creek, Hardy Creek, Hollow Tree Creek, Howard Creek, Juan Creek, Little Howard Creek, Mallo Pass Creek, and Navarro River basins (CDFG 2009a, MRC 2012). In the secondary assessment area, southern torrent salamanders have been observed in various locations around the northern third of the assessment area and are documented Albion, Bear Harbor, Dutchman's Knoll, Elk, Fort Bragg, Hales Grove, Inglenook, Leggett, Lincoln Ridge, Mallo Pass Creek, Mendocino, Northspur, Sherwood Peak, and Westport quadrangles (CDFG 2009a).

2.1.2 Life history

Little is known about southern torrent salamander breeding. Clutch sizes for two nests observed in California were small, consisting of 8–11 eggs (Jones et al. 2005). Egg development time is very slow; eggs from salamander species in the same genus generally take around 200 days to hatch (Jones et al. 2005). Larval development takes 3–3.5 years, and an additional 1–1.5 years is needed to reach sexual maturity (Jones et al. 2005). Long development and maturation times suggest that this is a long-lived species (Jones et al. 2005).

2.1.3 Habitat associations

Southern torrent salamanders are found in rocky headwater streams in mesic late-successional forest or nearby riparian forests, though the species may be found in younger stage forests in coastal northern California (Welsh and Lind, 1996, Jones et al. 2005), presumably due to marine-influenced temperature control. Species in the genus *Rhyacotriton* are the most drought-intolerant species salamanders known, and rely heavily on moist environments. Reproduction likely occurs along the shallow margins of streams, springs, and seeps (Jones et al. 2005). Little is known about southern torrent salamander egg mass deposition habitat since there have been only 2 egg clutches described. Both observed egg masses were attached to the underside of boulders, mid-channel in shallow, cold streams (Karraker et al. 2005). Larvae generally occur in cold (44–59°F [6.5–15°C]), low-velocity flows over loose, coarse rock or rubble substrates with low sedimentation (Welsh and Lind 1996). Adults are usually found in contact with cold water though may occasionally be found in moist upland areas (Jones et al. 2005). In previously logged forests, southern torrent salamanders have been found to be more abundant in higher-gradient reaches (Corn and Bury 1989, Diller and Wallace 1996), whereas in old-growth forests the species does not show as strong an association (Corn and Bury 1989; Welsh and Ollivier, upublished data, as cited in Welsh et al. 1998; see also Welsh and Lind 1996).

2.1.4 Threats

Southern torrent salamanders are considered particularly sensitive to environmental disturbance due to their strict moisture and temperature requirements as well as their slow development period (Hayes 1996, Bury and Corn 1988) and minimal dispersal capabilities. The species' limited mobility may substantially reduce their ability to recolonize streams where they have been eliminated (Bury et al. 1991).

2.1.5 Sensitivity to forest management activities

Habitat fragmentation, decrease of in-channel and riparian large woody debris, increased stream temperatures, and increased input of fine sediment to the watershed could decrease habitat quantity and quality for the southern torrent salamander as a result of forest management activities. These impacts could be a result of timber harvest (especially clearcut practices or modification of late-successional forest environments), a lack of protection of headwater streams, road building, and culvert installation. Increased stream temperatures following removal of riparian canopy cover has been documented to decrease habitat suitability for all life stages of southern torrent salamander (Corn and Bury 1989). Welsh and Lind (1996) indicated that tree harvest may have the greatest impact on salamander populations in low-gradient streams, on south-facing slopes, and in areas with unconsolidated geologies because of changes in microclimate and sediment transport. However, the consequences of canopy loss are likely to be less pronounced in coastal areas where summer fog moderates high summer temperatures (Diller and Wallace 1996).

2.2 Coastal Tailed Frog

Scientific Name: *Ascaphus truei*
Federal Status: (none)
State Status: Species of Special Concern

2.2.1 Distribution

The current distribution of coastal tailed frogs in California extends from the Oregon border to approximately Anchor Bay, Mendocino County and about as far east as near Big Bend, Shasta County (Stebbins 2003, Jones et. al. 2005). Although their distribution is patchy, coastal tailed frogs are often locally abundant where suitable habitat exists. Within the primary assessment area, coastal tailed frogs have been noted in Albion River, Alder Creek, Cottaneva Creek, Elk Creek, Greenwood Creek, Hardy Creek, Juan Creek, Mallo Pass Creek, Navarro River, and Point Arena Creek river basins (CDFG 2009a, MRC 2012). Coastal tailed frogs have been documented in the secondary assessment area in the Albion, Annapolis, Dutchman's Knoll, Elk, Fort Bragg, Laughlin Range, Lincoln Ridge, Mathison Peak, Mendocino, Northspur, Noyo Hill, and Sherwood Peak quadrangles (CDFG 2009a, MRC 2012).

2.2.2 Life history

Males of this species have a cloacal "tail", which is used for copulation and internal fertilization. Coastal tailed frog mating occurs in the summer and early fall, while oviposition is delayed until the following June or early July (Sever et al. 2001). A gelatinous string of eggs is laid in the stream on the underside of rocks. Eggs are resistant to scour, enabling tailed frogs to reproduce in high gradient, high velocity streams. Larvae have specialized mouthparts that enable them to adhere to the substrate and feed on diatoms in high velocity streams. The metamorphosis to the juvenile phase occurs anywhere from 1 to 5 years after hatching (Lannoo 2005).

2.2.3 Habitat associations

Coastal tailed frogs inhabit cold (41–65°F [5–18.5°C]) (Brown 1975), fast-flowing, high gradient, perennial mountain streams that flow through Douglas-fir, coast redwood, Sitka spruce, western hemlock, and ponderosa pine stands from sea level to near timber line (Stebbins 2003). Tailed frogs forage along streams and in adjacent forest stands at night and rest during the day in interstitial spaces of large submerged substrate of high gradient riffles or on moist stream banks (Daugherty and Sheldon 1982, Leonard et al. 1993). Inland, higher elevation, or higher latitude populations may seek cover under large downed logs and boulders for overwintering sites during cold periods (Daugherty and Sheldon 1982). In milder, coastal climates, coastal tailed frogs may remain active year-round.

2.2.4 Threats

Some data shows sedimentation and warm water temperatures are associated with lower abundances (Lannoo 2005).

2.2.5 Sensitivity to Forest Management Activities

Forest management may increase habitat fragmentation, stream temperatures, and fine sediment input to a watershed that could, in turn, decrease habitat quantity and quality for the coastal tailed frog (Nussbaum et al. 1983, Corn and Bury 1989, Wahbe et al. 2001). It is believed that the larval stage, which is restricted to streams, is most sensitive to timber harvest (Diller and Wallace 1999). Forest management (including activities such as timber harvest, road building, and culvert installation) may decrease the amount of habitat elements for coastal tail frogs including in-channel large woody debris, riparian canopy cover, and riparian foraging areas. Corn and Bury (1989) documented significantly greater density and biomass of tailed frogs in uncut in harvested stands. Welsh (1990) also documented significant differences between frequency of detections and forest age class. Increased insolation following timber harvesting appears to cause shifts in food availability for larval tailed frogs (Kupferberg 1996b), and may inhibit the ability of tadpoles to attach to rocks (Bury and Corn 1988, Beschta et al. 1987). However, short-term beneficial effects (temporary increase in light penetration and stream productivity) from timber harvesting have been documented in stable streams where water temperatures remain within a suitable range for tailed frogs (Richardson and Neill 1998, Kim 1999). In addition, tailed frogs may be less sensitive to deforestation in coastal streams where maritime influences can maintain cool temperatures during the summer (Corn and Bury 1989).

2.2.6 Comments

Based on recent genetic and morphological studies, two species of tailed frog are now recognized: coastal tailed frog (*Ascaphus truei*) and Rocky mountain tailed frog (*Ascaphus montanus*) (Neilson et al. 2001). They are easily distinguished by geographical distribution.

This species would be covered under MRC’s proposed HCP/NCCP.

2.3 California Red-legged Frog

Scientific Name: *Rana draytonii*
Federal Status: Threatened
State Status: Species of Special Concern

2.3.1 Distribution

Although their historic range was largely cismontane California, California red-legged frogs are now largely restricted to coastal drainages on the central coast. The species’ range occurs from Mendocino County to Baja California, with isolated remnant populations occurring in the Sierra foothills, from sea level to approximately 8,000 ft (2,440 m) (Stebbins 2003, Shaffer et al. 2004). Genetic analyses conducted by Shaffer et al. (2004) on larval red-legged frogs in Mendocino County showed that a narrow range of overlap with its congener, northern red-legged frog (*Rana aurora*), occurs in Mendocino County. Genetically “pure” northern red-legged frogs were found around and north of Big River, genetically “pure” California red-legged frogs were found around and south of Mills Creek, and hybrids occurred between those two regions (Shaffer et al. 2004). California red-legged frogs (or possible hybrids, where applicable) have been detected within the primary assessment area in the following river basins: Big River, Albion River, Navarro River, Greenwood Creek, Elk Creek, and Mills Creek (CDFG 2009a, MRC 2012). California red-legged frogs have also been found within the secondary assessment area in the McGuire Ridge, and Point Arena quadrangles (CDFG 2009a). USFWS defines the range of California red-legged frog as extending through the Greenwood Creek watershed in the northern portion of the Point Arena Hydrographic Unit (USFWS 2009).

2.3.2 Life history

Breeding occurs between late November and late April (Jennings and Hayes 1994). Females lay egg masses containing approximately 2,000–6,000 eggs (USFWS 2002). Eggs hatch within 6–14 days and tadpoles require approximately 11–20 weeks to metamorphose, generally from May to September (USFWS 2002), although overwintering by California red-legged frogs has been documented at non-forested breeding sites (Fellers et al. 2001). California red-legged frogs become reproductively mature frogs at 2 to 4 years, with females taking longer to develop (Jennings and Hayes 1994).

2.3.3 Habitat associations

California red-legged frog breeding habitat is generally characterized by still or slow-moving water with deep pools (usually at least 2.3 ft [0.7 m], though frogs have been known to breed in pools less than 2.3 ft [0.7 m] deep) and emergent and overhanging vegetation (Jennings and Hayes 1994). Its breeding habitats include wetlands, wet meadows, ponds, lakes, and low-gradient, slow-moving stream reaches. Although some adults may remain resident year-round at favorable breeding sites, others may disperse overland up to a mile or more (Fellers and Kleeman 2007). Movements may be along riparian corridors, but some individuals move directly from one site to another without apparent regard for topography or riparian corridors (Bulger et al. 2003). California red-legged frogs sometimes enter a dormant state during summer or in dry weather (aestivation), finding cover in small mammal burrows, moist leaf litter, root wads, or cracks in the soil. California red-legged frogs are typically active year-round in coastal areas because temperatures are generally moderate (USFWS 2002, Bulger et al. 2003).

2.3.4 Threats

Threats to the species within its remaining range include several human-influenced impacts, including urban encroachment, introduction of exotic predators and competitors, habitat fragmentation, contaminants including pesticides and fertilizers, and the creation of large reservoirs that may not be properly managed for native species (USFWS 2002).

2.3.5 Sensitivity to forest management activities

Both the northern and California red-legged frogs are known to be affected by forest management activities (e.g., timber harvest and road building) in both breeding and non-breeding habitat through increased habitat fragmentation reduced overwintering habitat, changes in microclimate, increased input of fine sediment to water bodies, and changes in predator-prey dynamics. Welsh et al. (1998) believed that direct habitat destruction and the use of pesticides, particularly those contaminating breeding sites, constitute the largest threats to red-legged frogs on managed forestlands. Amphibians may be particularly sensitive to developmental disruption in the egg and early larval stages (Berrill et al. 1994, 1997; as cited in Welsh et al. 1998), and fatal developmental abnormalities may be triggered by some herbicides at very low concentrations. Some herbicides commonly used on forestlands contain estrogenic, endocrine-disrupting, or other compounds (e.g., 2,4-D; 2,4,5-T, atrazine) (Colborn et al. 1993) have been linked to genetic damage in tadpoles (Clements et al. 1997), feminization of male frogs (Hayes et al. 2002, Langlois et al. 2010), developmental deformities (Hayes et al. 2006), and reduced metamorphic success (Langlois et al. 2010), all in *Rana* frogs. Radiotelemetry research on northern red-legged frogs indicates that habitat fragmentation by logging affects the movements and dispersal of red-legged frogs, which can increase predation and desiccation mortality and reduce genetic exchange between subpopulations (Chan-McLeod 2003, Chan-McLeod and Moy 2007). Because of the ameliorating effects of precipitation on movements through landscapes fragmented by logging, such impacts may be greater on California red-legged frogs, which occupy more southern regions than the northern red-legged frog (Chan-McLeod 2003). Various stand characteristics and management strategies increase red-legged frog movements through managed forests, including development of the understory and provision of residual tree patches (Chan-McLeod and Moy 2007). In warmer and dryer regions, Chan-McLeod and Moy (2007) suggest that reduction in distance between residual tree patches may be more important for increasing habitat connectivity than patch size. Because red-legged frogs make extensive long-distance movements away from their breeding sites, retention of riparian buffers along streams is not believed sufficient to retain habitat connectivity (Chan-McLeod and Moy 2007).

2.3.6 Comments

Historically, *Rana draytonii* were known as subspecies *Rana aurora draytonii*. Recent literature has shown the northern red-legged frog (*Rana aurora*) and California red-legged frog (*Rana draytonii*) as distinct species (Shaffer et al. 2004).

This species would be covered under MRC's proposed HCP/NCCP.

2.4 Northern Red-legged Frog

Scientific Name: *Rana aurora*
Federal Status: (none)
State Status: Species of Special Concern

2.4.1 Distribution

Northern red-legged frogs are known to occur along the California coast from Mendocino County north to southwestern British Columbia, at elevations from sea level to 0–3,800 ft (1,160 m) (Lannoo 2005). Genetic analyses conducted by Shaffer et al. (2004) on larval red-legged frogs in Mendocino County showed that a narrow range of overlap with its congener, California red-legged frog (*Rana draytonii*), occurs in Mendocino County. Genetically "pure" northern red-legged frogs were found around and north of Big River, genetically "pure" California red-legged frogs were found around and south of Mills Creek, and hybrids occurred between those two regions (Shaffer et al. 2004). Northern red-legged frogs (or possible hybrids, where applicable) are documented within the primary assessment area in the Albion River, Big River, Elk Creek, Greenwood Creek, Navarro River, Hollow Tree Creek, and Rockport Small Coastal Streams watershed analysis units[1] (MRC 2012). In the secondary assessment area, there are documented occurrences of northern red-legged frogs in the Fort Bragg, Inglenook, and Mathison Peak quadrangles (CDFG 2009a). USFWS defines the range of its congener, California red-legged,

[1] While MRC was not able to detect northern red-legged frogs during surveys for potential red-legged frog breeding sites in the northern third of the primary assessment area, this species was observed in the Hollow Tree Creek and Rockport Small Coastal Streams watershed analysis units during tailed-frog survey efforts there (J. Ramaley, pers. comm., 2011).

frog as extending through the Greenwood Creek watershed in the northern portion of the Point Arena Hydrographic Unit (USFWS 2009).

2.4.2 Life history

Breeding for northern red-legged frogs generally occurs in late winter through early spring, typically when water temperatures exceed 43–46°F (6–7°C) (Lannoo 2005). Females deposit approximately 500–800 eggs in a large mass, attached to herbaceous vegetation in low or no-flow areas (Stebbins 2003, Lannoo 2005). Eggs hatch in the spring (March–April) and tadpoles metamorphose in June or July (Lannoo 2005). The majority of northern red-legged frog males begin breeding after 2 years of age, and females begin breeding after 3 years of age (Lannoo 2005). Adults may move large distances (> 1,000 ft [300 m]) from breeding ponds in riparian areas (Lannoo 2005).

2.4.3 Habitat associations

Northern red-legged frogs utilize a variety of habitats throughout their various life stages. Aquatic sites such as coastal lagoons, pools, marshes, ponds, or backwater areas are used for breeding, while upland habitats such as open grasslands with seeps and springs may be used for oversummering and for foraging. Deep pools are an important breeding habitat feature for northern red-legged frogs and California red-legged frogs, especially for evading predators. Other sources of cover include emergent vegetation, undercut banks, and root-wads. In northwestern California, northern red-legged frogs have been observed in dense understory vegetation such as ferns and sedges in streamside flats stands of redwoods.

2.4.4 Threats

Degradation of habitat and water quality, and susceptibility to agricultural chemicals and non-native species threaten northern red-legged frog populations (Lannoo 2005). As well as non-native fish species, the non-native American bullfrog (*Lithobates catesbeiana*) is a potential competitor and predator of northern red-legged frogs. American bullfrogs are widely established west of the Cascades and may be displacing northern red legged frogs (Lannoo 2005).

2.4.5 Sensitivity to forest management activities

Both the northern and California red-legged frogs are known to be affected by forest management activities (e.g., timber harvest and road building) in both breeding and non-breeding habitat through increased habitat fragmentation reduced overwintering habitat, changes in microclimate, increased input of fine sediment to water bodies, and changes in predator-prey dynamics. Welsh et al. (1998) believed that direct habitat destruction and the use of pesticides, particularly those contaminating breeding sites, constitute the largest threats to red-legged frogs on managed forestlands. Amphibians may be particularly sensitive to developmental disruption in the egg and early larval stages (Berrill et al. 1994, 1997; as cited in Welsh et al. 1998), and fatal developmental abnormalities may be triggered by some herbicides at very low concentrations. Some herbicides commonly used on forestlands contain estrogenic, endocrine-disrupting, or other compounds (e.g., 2,4-D; 2,4,5-T, atrazine) (Colborn et al. 1993) have been linked to genetic damage in tadpoles (Clements et al. 1997), feminization of male frogs (Hayes et al. 2002, Langlois et al. 2010), developmental deformities (Hayes et al. 2006), and reduced metamorphic success (Langlois et al. 2010), all in *Rana* frogs. Radiotelemetry research on northern red-legged frogs indicates that habitat fragmentation by logging affects the movements and dispersal of red-legged frogs, which can increase predation and desiccation mortality and reduce genetic exchange between subpopulations (Chan-McLeod 2003, Chan-McLeod and Moy 2007). Because of the ameliorating effects of precipitation on movements through landscapes fragmented by logging, these effects may be of less impact to northern red-legged frogs than California red-legged frogs (Chan-McLeod 2003). Various stand characteristics and management strategies increase red-legged frog movements through managed forests, including development of the understory and provision of residual tree patches (Chan-McLeod and Moy 2007). In cooler and wetter regions, Chan-McLeod and Moy (2007) suggest that larger residual tree patches may be more important for increasing habitat connectivity than reducing distance between patches. Because red-legged frogs make extensive long-distance movements away from their breeding sites, retention of riparian buffers along streams is not believed sufficient to retain habitat connectivity (Chan-McLeod and Moy 2007).

2.4.6 Comments

Historically, *Rana aurora* were known as subspecies *Rana aurora aurora*. Recent literature has shown the northern red-legged frog (*Rana aurora*) and California red-legged frog (*Rana draytonii*) as distinct species (Shaffer et al. 2004). Northern red-legged frogs are now believed to be most closely related to Cascade frogs (*Rana cascadae*) (Shaffer et al. 2004).

This species would be covered under MRC's proposed HCP/NCCP.

2.5 Foothill Yellow-legged Frog

Scientific Name: *Rana boylii*
Federal Status: (none)
State Status: Species of Special Concern

2.5.1 Distribution

Historically in California, foothill yellow-legged frogs were found in the Sierra Nevada foothills, up to elevations of approximately 6,000 ft (1,830 m), and in the Coast Range from the Oregon border south to the San Gabriel River in southern California (Stebbins 2003). Currently, populations are thought to have disappeared from the southern Sierra Nevada foothills, in areas south of the Transverse ranges, and along the coast south of Monterey County (Jennings and Hayes 1994). On MRC lands, foothill yellow-legged frogs have been detected in the Albion River, Alder Creek, Big River, Elk Creek, Garcia River, Greenwood Creek, Hollow Tree Creek, Mallo Pass Creek, Navarro River, Noyo River basins (MRC 2012, CDFG 2009a). In the secondary assessment area foothill yellow-legged frogs have been documented in the Cahto Peak, Elk, Fort Bragg, Gualala, Legget, Lincoln Ridge, Mallo Pass Creek, McGuire Ridge, Mendocino, Navarro, Northspur, Ornbaun Valley, Point Arena, and Zeni Ridge quadrangles (CDFG 2009a).

2.5.2 Life history

Foothill yellow-legged frog breeding (oviposition) typically begins in spring when flows diminish and average daily water temperatures reach approximately 53–55°F (12–13°C) (around April–May, depending on locale) (Kupferberg 1996a). Rainfall during the breeding season can delay oviposition (Kupferberg 1996a, b). Eggs generally hatch within 5–37 days, depending on water temperatures (Zweifel, 1955, Ashton et al. 1998). Tadpoles generally metamorphose within 3–4 months after hatching (Lannoo 2005). Adults are thought to be reproductively mature in the second year after metamorphosis, though there are reports of reproduction as early as 6 months after metamorphosis (Zweifel, 1955, Lannoo 2005).

2.5.3 Habitat associations

Foothill yellow-legged frogs are typically found in perennial streams or rivers and intermittent creeks with pools. The species often breeds in low-gradient sections near junctions with tributary streams due to proximity to adult overwintering habitat in tributaries and to the presence of boulders and cobbles in these locations. Egg deposition usually occurs in cobble bars or under large boulders in areas where water flows at a low velocity. Tadpoles show affinity to the oviposition site, remaining in edgewater habitat with interstices, vegetation, and/or detritus for cover. Adults prefer areas with exposed basking sites and cool shady areas adjacent to the waters edge. On the South Fork Eel River, oviposition commenced when water temperatures reached approximately 54°F (12°C) (Kupferberg 1996a), although eggs have been known to occur elsewhere in waters with temperatures ranging from 48 to 71°F (9 to 21.5°C) (Zweifel 1955). Tadpoles tend to develop faster in channels with warmer water and higher algal food production than in small headwater tributaries (Kupferberg 1996a). Adults feed on a variety of aquatic and terrestrial invertebrates and mollusks (Fitch 1936). Although all life stages were found in all channel types investigated in the Mattole basin, Welsh and Hodgsdon (2010) noted that: (1) foothill yellow-legged frogs were much more abundant along alluvial channels, (2) tadpoles were not detected at temperatures <13 C, and (3) that tadpole numbers increased as water temperature increased. Similarly, Welsh et al. (2005) found foothill yellow-legged frogs more abundant along open, sunny reaches of mixed grassland streams compared with second-growth and late-seral forest types.

2.5.4 Threats

Habitat fragmentation, chemical contamination, and predation by non-native fish and amphibians may contribute to population declines. Bullfrogs have been implicated in the observed reduction of foothill yellow-legged frog populations in the Sierra (Moyle 1973, as cited in Zeiner et al. 1990a) and centrarchid fishes in foothill streams readily prey on foothill yellow-legged frog eggs (Werschkul and Christensen 1977, as cited in Zeiner et al. 1990a). In addition, high flow releases from reservoirs during the breeding season can dislodge or shear egg masses from the substrate and flush tadpoles from refugia (Kupferberg 1996a).

2.5.5 Sensitivity to forest management activities

Forest management activities (e.g., timber harvest and road building) could affect foothill yellow-legged frogs through fragmenting habitat, degrading water quality, and increasing fine sediment input to the watershed. Stream siltation resulting from tree removal and road building are possible threats to successful foothill yellow-legged frog reproduction, as increased sediment loads in breeding streams may fill in interstitial spaces available for use by tadpoles, in turn reducing potential food sources for both tadpoles and adults by reducing algal and macroinvertebrate production. In addition, attachment of egg masses may be weak or absent where substrates are embedded with sediment. Foothill yellow-legged frogs are also highly susceptible to water diversions and channel alterations which can interfere with reproduction. Opening of streamside canopy may enhance habitat suitability due to provision of basking opportunities and warming of waters.

2.6 Pacific Pond Turtle

Scientific Name: *Actinemys marmorata marmorata*
Federal Status: (none)
State Status: Species of Special Concern

2.6.1 Distribution

Pacific pond turtle (formerly western pond turtle) is the only freshwater turtle native to most of the west coast of temperate North America. In California it is found from the Oregon border along the Coast Ranges to the Mexican border, and west of the crest of the Cascades and Sierras. Pacific pond turtles have been detected within the primary assessment area in the Ackerman Creek, Big River, Garcia River, Navarro River, and Noyo River basins (MRC, unpublished data). In the secondary assessment area, Pacific pond turtles have been documented approximately 2 mi (3.2 km) north of the primary assessment area, just outside of the Noyo River basin and approximately 4 mi (6.4 km) east of the primary assessment area, just outside of the Big River basin (CDFG 2009a); as well as in Hare Creek on Jackson Demonstration State Forest (B. Valentine, CDFG, pers. comm.)

2.6.2 Life history

Pacific pond turtle eggs are typically laid in June and July, though they may be laid throughout the year (Holland 1994, Reese 1996). Egg-laying sites vary from sandy shoreline to forest soil types, though are generally located in grassy meadows, away from trees and shrubs (Holland 1994), with canopy cover commonly less than about 10% (Reese 1996). Incubating eggs are extremely sensitive to increased soil moisture, which can cause high mortality (Bettelheim 2005, Shaffer 2005, Ashton et al. 1997). Young hatch in late fall, or overwinter in the nest and emerge in early spring. Low fecundity, low hatchling and juvenile survivorships, high adult survivorship, and potentially long lifespans are characteristic of this species (Jennings et al. 1992). Pacific pond turtles have temperature-dependent sex determination, where the temperature of the egg determines the sex (Spinks et al. 2003).

2.6.3 Habitat associations

Pacific pond turtles inhabit fresh or brackish water habitats characterized by areas of deep water, low flow velocities, moderate amounts of riparian vegetation, warm water and/or ample basking sites, and underwater cover elements such as large woody debris and rocks (Jennings and Hayes 1994). Along major rivers, Pacific pond turtles are often concentrated in side channel and backwater areas. Turtles may move to off-channel habitats, such as oxbows, during periods of high flows (Holland 1994). Although adults are habitat generalists, hatchlings and juveniles require very specialized habitat for survival through their first few years. In addition to requiring low-flow and backwater areas of rivers, hatchlings need to spend much of their time feeding in shallow water amongst dense submergent and short emergent vegetation, presumably to avoid predators (Jennings and Hayes 1994). Although an aquatic reptile, Pacific pond turtles spend time on land basking, overwintering, and nesting, up to 0.6 mi (1 km) away from aquatic habitats (Holland 1994). Reese and Welsh (1997) recorded frequent and prolonged year-round use of terrestrial habitat up to 0.3 mi (500 m) from the Trinity River for both nesting and overwintering activities. Female turtles have been known to exhibit nest site fidelity (Holland and Bury 1998).

2.6.4 Threats

Pacific pond turtle populations may be impacted by introduced species and construction of dams (Reese and Welsh 1998). Potential competitive exclusion by introduced turtle species and predation on hatchlings by introduced bullfrogs and largemouth bass are increasing threats to the Pacific pond turtle.

2.6.5 Sensitivity to forest management activities

Pacific pond turtles may be affected by the sedimentation of pools associated with timber harvest and road building; infilling of pools may reduce the quantity of available habitat for adult and juvenile Pacific pond turtles. Forest management that removes large woody debris could affect Pacific pond turtle by reducing amount of basking and hiding cover. Reduction in streamside canopy may increase opportunities for basking. Timber-harvest could have impacts on terrestrial nest sites—either directly through habitat removal or indirectly through thermal modifications. There is no documented evidence that Pacific pond turtles are particularly sensitive to increases in turbidity that may be associated with timber harvest.

3 BIRDS

3.1 Great Blue Heron

Scientific Name: *Ardea herodias*
Federal Status: (none)
State Status: Board of Forestry Sensitive

3.1.1 Distribution

Great blue herons are year-round residents throughout the majority of California. During the spring and summer, great blue herons breed throughout California; most rookeries in the state are found in northern California (Zeiner et al. 1990b). Though no great blue heron rookeries have been documented in the primary assessment area, secondary assessment area, or adjacent lands (CDFG 2009a), this species is common in northern California and is likely to occur near lacustrine or wet meadow habitats in the assessment area.

3.1.2 Life history

Great blue herons are sometimes solitary nesters, but often occur in mixed colonies (rookeries) with great egrets and other birds. Courtship, nesting, and egg-laying activities occur from early March through June (Butler 1992). Courtship displays are elaborate and include stretch displays, snap displays, circle flights, landing calls, twig shakes, crest-raising, fluffed and arched neck displays, and bill clappering (Butler 1992). Nest site selection is related to the availability of foraging habitat and the protection from predators (e.g., islands, high branches). Clutch size averages three to four eggs but can range from one to eight eggs (Zeiner et al. 1990b). Great blue herons stalk prey in shallow water and feed primarily on small fish as well as insects, snakes, turtles, rodents, and small birds. They feed their young a diet consisting mostly of fish.

3.1.3 Habitat associations

Great blue herons require ponds, lakes, rivers, streams, marshes, or wet meadows for foraging on aquatic invertebrates and fish (Cogswell 1977). Great blue herons make nests and raise their young in a colony (rookery) consisting of a group of trees where many mating pairs build their nests. Nests are found mostly in trees, up to 100 ft (30 m) or more above ground (Vennesland and Butler 2001). Nests are usually selected near brackish or freshwater marshes, swamps, rivers, or lakes. Large trees or snags in secluded locations are preferred nesting sites, but when not available, great blue herons use other vegetation such as shrubs, bulrushes, or even bare ground on islands without predators (Butler 1992).

3.1.4 Threats

This species is susceptible to biological concentration of pesticides in wetland habitats (Jackman and Scott 1975). Populations are also jeopardized by the continuing loss of wetlands and by human disturbance of nesting sites (Ehrlich et al. 1992).

3.1.5 Sensitivity to forest management activities

Nesting great blue herons may be sensitive to noise, vibration, and human presence near rookeries during road building and timber management operations.

3.2 Great Egret

Scientific Name: *Ardea alba*
Federal Status: (none)
State Status: Board of Forestry Sensitive

3.2.1 Distribution

The great egret winters throughout much of California, except high mountains and deserts, and breeds in portions of the north and central coast as well as the Central Valley (McCrimmon et al. 2001). Though no great egret rookeries have been documented in the primary assessment area, secondary assessment area, or adjacent lands (CDFG 2009a), this species is common in northern California and is likely to occur near lacustrine or wet meadow habitats in the assessment area.

3.2.2 Life history

Great egret is a monogamous, colonial nester, breeding from March to July (Maxwell and Kale 1977, Palmer 1962, all as cited in Zeiner et al. 1990b). Males attract females with a variety of courtship displays, most of which are ground displays, including stretch displays, wing preen displays, and bowing (McCrimmon et al. 2001). Breeding is initiated once the necessary weather indicators and prey availability have aligned. Males court females with their display territory and nest site selection. They often nest in mixed colonies with great blue herons, and require groves of large trees for nesting, often choosing eucalyptus, redwood, or Monterey pine. An egret platform nest is usually near the top of trees and consists of long sticks topped with softer vegetation (McCrimmon et al. 2001). The great egret uses brood reduction; they lay a large clutch (i.e., average of three eggs, range from one to six eggs) and let sibling competition and food abundance play a large role in how many survive to fledge (McCrimmon et al. 2001). Great egrets are carnivorous; their diet is mainly fish but also includes amphibians, reptiles, birds, small mammals, insects, crustaceans, and mollusks (Pranty and Radamaker 2006, McCrimmon et al. 2001).

3.2.3 Habitat associations

The great egret can be found in all types of wetlands, both inland and along the coast, including marshes, floodplains, stream and river margins, pond and lake shores, wet meadows, tidal flats and estuaries, canals, and flooded fields. This species nests in large trees and other woody vegetation.

3.2.4 Threats

Threats include loss of habitat due to wetland conversion and human disturbance to nesting sites (Cogswell 1977).

3.2.5 Sensitivity to forest management activities

Nesting great egrets may be sensitive to noise, vibration, and human presence near rookeries during road building and timber management operations.

3.3 Osprey

Scientific Name: *Pandion haliaetus*
Federal Status: (none)
State Status: Board of Forestry Sensitive

3.3.1 Distribution

Osprey breed and winter throughout much of California, particularly in northwestern California (Poole et al. 2002). Although nests are found in many regions of California, the species southern breeding stronghold is in Marin County (Shuford 1993); it also is a fairly common breeding species in Sonoma County (Burridge 1995). The assessment area is within the summer nesting range only—osprey are absent during the non-breeding period. Osprey have been documented in the primary assessment area in the Albion, Garcia River, Navarro West, Rockport, and South Coast inventory blocks (MRC, unpublished data; CDFG 2009a). In addition, there are several records of osprey in the secondary assessment area, 2–3 mi (3–5 km) northwest of the Albion inventory block, approximately 1 mi (1.5 km) northwest of the Navarro West inventory block, and less than 0.3 mi (0.5 km) northwest of the Rockport inventory block, (MRC, unpublished data; CDFG 2009a).

3.3.2 Life history

Male birds generally arrive on the nesting grounds a few days before females in mid-March to early April and usually select nest sites; after courtship displays consisting of a male display flight that often includes fish and courtship feeding, breeding begins in March and continues through September (Zeiner et al. 1990b, Poole et al. 2002). Colonial nesting is common; nest selection factors include safety from predators, proximity to water and feeding areas, open access, and a stable nest base in trees, cliffs, power-poles, and predator-free ground or boulder locations (e.g., islands) (Poole et al. 2002). Nest size varies, but can be as small as approximately 2.3 ft (0.7 m) across and 0.3–0.5 ft (8–15 cm) deep, up to 7 ft (2 m) across and 13 ft (4 m) deep (Poole et al. 2002). Nests consist of large sticks at the base followed by smaller debris that is often lined with flat objects (e.g., algae, bark, plastic bags) (Poole et al. 2002). The clutch size ranges from one to four eggs, but usually averages three. Female birds brood young up to four weeks of age; young are fledged at six or seven weeks; and, young become sexually mature at three years of age (Zeiner et al. 1990b, Poole et al. 2002). Osprey feed nearly entirely on fish, although they also take a few mammals, reptiles, birds, amphibians, and invertebrates (Zeiner et al. 1990b).

3.3.3 Habitat associations

Ospreys are most commonly associated with large fish-bearing waters located in and near coniferous and mixed conifer habitats. These piscivores require open, clear water for foraging, which may occur in rivers, lakes, reservoirs, bays, estuaries, and surf zones. Nests are usually located within 1,312 ft (400 m) of fish-producing waters (Lederer 1976), but nests can be as far as 2 to 3 mi (3.2 to 5.8 km) from water (Shuford 1993). Tall, open-branched “pilot” trees are required nearby for landing by adults before approaching the nest and for practice flights by the young (Zeiner et al. 1990b). In forested areas, nests are usually in large, predominant trees and snags.

3.3.4 Threats

As with the peregrine falcon and bald eagle, pesticides caused reproductive failure of ospreys in the past (Garber 1972), but reproductive success has increased significantly since the early 1970s (Airola and Shubert 1981, Poole et al. 2002). Loss of breeding habitat and declining fish numbers may threaten some populations (Ehrlich et al. 1992). Human disturbance also can reduce nesting success (Ewins 1997); some populations are also affected by shooting (Poole et al. 2002). Other factors influencing reproductive success include predation by raccoons (*Procyon lotor*) and great horned owls (*Bubo virginianus*) (Ewins 1997).

3.3.5 Sensitivity to forest management activities

Removal of snags and large trees reduces nesting and perching habitat availability. Timber harvesting and road-building activities that degrade conditions for fish, the predominant prey, can indirectly affect osprey. Osprey are sensitive to disturbance during the breeding and rearing season.

3.4 White-tailed Kite

Scientific Name: *Elanus leucurus*
Federal Status: (none)
State Status: Fully Protected

3.4.1 Distribution

White-tailed kite is a resident (breeding and wintering) species throughout central and coastal California up to the western edge of the foothills of the Sierra Nevada; California constitutes the stronghold of the North American breeding range (Zeiner et al. 1990b, Dunk 1995). They are non-migratory, but may make slight seasonal range shifts in coastal areas during winter (Zeiner et al. 1990b). White-tailed kite have been documented in the primary assessment area in the Navarro West and South Coast inventory blocks (MRC, unpublished data). There are no California Natural Diversity Database (CNDDB) records of white-tailed kite observations in the secondary assessment area.

3.4.2 Life history

White-tailed kites breed from February through October, although peak breeding occurs from May through August (Zeiner et al. 1990b). This raptor is monogamous (Dunk 1995) and pairs are documented mostly between December and August but are also found together year-round. Courtship displays include flutter flights and males offering prey to females, often in the air (Dunk 1995). Nest building occurs from January through August; nests are constructed of twigs lined with grass that are located in trees or shrubs near foraging areas (Dunk 1995). The first eggs are laid generally between February and March (clutch size ranges from three to six eggs) (Stendell 1972, Dunk 1995), and fledging occurs 35–40 days thereafter (Polite 2005). Kites attend communal night-roosts (up to 100 or more birds) in the post-fledging period and through the winter (Bammann 1975, Dunk and Cooper 1994, Dunk 1995) but are usually solitary hunters (Ehrlich et al. 1988). This species prefers to forage in open and un-grazed grasslands, agricultural fields, wetlands, and meadows. Their year-round diet consists of >95% small mammals (Dunk 1995) but can also include birds, insects, and reptiles.

3.4.3 Habitat associations

White-tailed kites breed in lowland grasslands, oak woodlands or savannah, and wetlands with open areas. Those habitats supporting larger prey populations are more suitable; un-grazed lands support higher prey populations than grazed lands (Dunk 1995). Groves of trees are required for perching and nesting. Roost sites are typically small stands of trees, though kites do not seem to associate with particular tree species (Dunk 1995).

3.4.4 Threats

Rapid urbanization of agricultural lands in southern California resulted in declines in white-tailed kite populations in the 1980s (Small 1994). Some pairs of white-tailed kites will tolerate limited human disturbance. There is evidence of an upswing in the California population of this species in the last several decades, possibly due to increased habitat for microtine rodents as a result of agricultural development (Small 1994, Ehrlich et al. 1988).

3.4.5 Sensitivity to forest management activities

Little sensitivity to disturbances caused by timber management since white-tailed kites are not closely associated with timber habitats. White-tailed kites could be sensitive to disturbance due to noise and human presence if open habitats are used for timber management operations such as landings, staging areas, or new roads.

3.5 Northern Harrier

Scientific Name: *Circus cyaneus*
Federal Status: (none)
State Status: Species of Special Concern

3.5.1 Distribution

Northern harrier is a fairly common winter visitor in California; however, the breeding population now appears to be restricted to north coastal lowlands, the central coast, the northern Central Valley, Klamath Basin, and Great Basin (MacWhirter et al. 1996, Davis and Niemela 2008).

Numbers of breeding pairs have been reduced throughout the state, although the breeding range has not changed substantially since the 1940s (Davis and Niemela 2008). Spring and fall migrants are rare to uncommon east of the Sierra, but they occasionally occur in mountain meadows up to 10,000 ft (3,000 m) (Small 1994). Along the Mendocino County coast, this species is thought to breed at MacKerricher State Beach, near Fort Bragg, and south at Manchester State Beach (Davis and Niemela 2008). Northern harriers have been documented in the primary assessment area in the South Coast inventory block (MRC, unpublished data). There are no CNDDB records of northern harrier observations in the secondary assessment area (CDFG 2009a).

3.5.2 Life history

This highly territorial species breeds from April through September, with peak breeding during June and July (Zeiner et al. 1990b). Monogamous to polygynous, males attract mates by performing sky-dancing courtship displays accompanied by chattering vocalizations ending at a potential nest site (MacWhirter et al. 1996). Harriers nest on the ground in shrubby vegetation, usually along the edge of marshes (Brown and Amadon 1968). Nests are constructed of larger plants (e.g., willows, cattails) at the base with grasses and sedges lining the interior. Females lay a single clutch averaging 5 eggs. Males provide food for females during incubation and until young are fledged at 53 days (Craighead and Craighead 1956). The pair and associated juveniles may roost communally until the following spring. Northern harriers feed primarily on voles or other small mammals; birds, frogs, reptiles, and invertebrates make up the rest of their diet (MacWhirter et al. 1996).

3.5.3 Habitat associations

Preferred habitats include flat, hummocky, open areas with tall grasses, shrubs, and aquatic edges (Zeiner et al. 1990b). Meadows, marshes, and wetlands are optimal habitat types; other suitable habitats include grasslands, ungrazed or lightly grazed pastures, and grain fields (Davis and Niemela 2008).

3.5.4 Threats

Destruction of wetlands and annual grasslands throughout California has led to a decline in northern harrier populations. In addition, grazing and agricultural practices, including plowing and burning of nesting areas during early stages of the nesting season, have contributed to the decline of this ground-nesting species (Remsen 1978). Human disturbance including recreation, off-leash dogs, and off-highway vehicle use, as well as livestock trampling, are major sources of nest failure (Davis and Niemela 2008).

3.5.5 Sensitivity to forest management activities

Northern harriers could be sensitive to disturbance of open habitats if used for timber management operations such as landings, staging areas, or new roads, and to disturbance of wetlands if operations encroach on wetland habitats or alter hydrological patterns.

3.6 Golden Eagle

Scientific Name: *Aquila chrysaetos*
Federal Status: Protected under the Bald and Golden Eagle Protection Act

State Status: Fully Protected, Board of Forestry Sensitive

3.6.1 Distribution

The golden eagle winters and breeds throughout California, although it is rare or absent along the immediate coast, in flat areas within the Central Valley, and in arid regions of the south (e.g., lower Colorado River, Salton Sea) (Small 1994, Kochert et al. 2002). Golden eagles have been documented in the primary assessment area in the Navarro West, Noyo, and South Coast inventory blocks (MRC, unpublished data). There are no CNDDB records of golden eagle observations in the secondary assessment area (CDFG 2009a).

3.6.2 Life history

Golden eagles are largely non-migratory, although some individuals migrate to California or move to lower elevations during winter and move to higher elevations for breeding (Zeiner et al. 1990b). Breeding generally begins in late January, peaks between March and July, and continues through August (Zeiner et al. 1990b). Generally a monogamous species, resident population's pairs and nests are often maintained year-round (Kochert et al. 2002). Nest construction occurs between one and three months prior to egg-laying; large, platform nests are usually built on cliffs or large trees near open habitats. Clutch size can range from one to four eggs, with an average clutch size of two eggs; during abundant prey years, the average clutch size is closer to three eggs (Kochert et al. 2002). The golden eagle usually preys on small or medium-sized mammals, such as jackrabbits, hares, and ground squirrels, although these birds will opportunistically take birds, reptiles, fish, and carrion, and occasionally large prey such as young ungulates or domestic animals (Ehrlich et al. 1992, Kochert et al. 2002).

3.6.3 Habitat associations

For nesting, the golden eagle requires steep cliffs or large, predominant trees near open areas for hunting or scavenging, such as open woodlands and oak savannahs, grasslands, chaparral, and sagebrush flats. Golden eagles are associated with foothills and mountainous areas that include open terrain suitable for hunting (e.g., grasslands, savannah, early seral stage forests) (Zeiner et al. 1990b).

3.6.4 Threats

Main threats include habitat destruction and fragmentation, although shooting and trapping, collisions with vehicles or power lines, power line electrocution, and poisons intended for coyotes also represent serious threats (Ehrlich et al. 1992). Disturbance by humans during the breeding season was found to be the major source of nest failure in other western states (Snow 1973).

3.6.5 Sensitivity to forest management activities

Golden eagles may be affected by harvest of nest trees and may be sensitive to noise and vibrations during timber management operations. Silviculture practices that do not maintain or recruit large, predominant trees may reduce the available amount of roosting and nesting habitat.

3.7 Bald Eagle

Scientific Name: *Haliaeetus leucocephalus*
Federal Status: Delisted, Protected under Bald and Golden Eagle Protection Act
State Status: Endangered, Fully Protected, Board of Forestry Sensitive

3.7.1 Distribution

Bald eagle is a year-round resident and uncommon winter migrant in California (Zeiner et al. 1990b). Historically, breeding populations were distributed throughout northern California and south to Mexico along the Pacific Coast; however, more recently, nesting in California has been documented as restricted to Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity counties (Zeiner et al. 1990b). Breeding occurrences may be rebounding in the state, as recent records document nesting in 28 counties (CDFG 2009c). Bald eagles winter throughout most of California in lower elevations, with large concentrations in the Klamath Basin (Zeiner et al. 1990b). Bald eagles have been documented in the primary assessment area in the Albion and Rockport inventory blocks (MRC, unpublished data), and along Big River (Detrich 1986, as cited in MRC's HCP/NCCP 2012). There is one record of a bald eagle observation in the secondary assessment area, approximately 8 km (5 mi) east of the South Coast inventory block (CDFG 2009a).

3.7.2 Life history

Bald eagle breeding begins generally in February, peaks between March and June, and continues through August (Zeiner et al. 1990b). The species breeds at coastal areas, rivers, lakes, and reservoirs with forested shorelines or cliffs in northern California. Wintering bald eagles are associated with aquatic areas containing some open water for foraging. Bald eagles exhibit dramatic courtship displays, including vocalizations and acrobatic flight displays (e.g., cartwheel display, chase display, and roller-coaster flight) (Buehler 2000). Bald eagles nest in tall trees in mature and old growth forests that have some habitat edge and are near permanent water (within 1.25 mi [2 km]) with suitable foraging opportunities. Bald eagles tend to select nest trees away human development and disturbance (Buehler 2000); nesting begins approximately two months prior to egg-laying. Monogamous pairs have only one brood per season and between one and three eggs within the clutch (Buehler 2000). Bald eagles use snags or other hunting perches adjacent to large bodies of water or rivers to hunt mainly for fish and waterfowl (Peterson 1986, Zeiner et al. 1990b); bald eagles will also feed on carrion, small mammals, and other small vertebrates (Ehrlich et al. 1988).

3.7.3 Habitat associations

Bald eagles forage and scavenge on large bodies of water with abundant fish, such as estuaries, coastal waters, rivers, large lakes, and reservoirs. High snags, trees, and open rocky slopes provide hunting perches (Call 1978); open, easily approached perches and feeding areas are preferred. Bald eagles are most likely to nest in mature or old-growth forest; very large trees in stands of approximately less than 40 percent canopy cover are preferred for nesting (Peterson 1986). Nest trees are usually located close to a permanent body of water and must be large enough to accommodate the bald eagle's large stick nest. Bald eagles winter in communal roosts in late-successional stands.

3.7.4 Threats

Bald eagles are easily disturbed during nesting and require areas free of human activities for successful reproduction. Many types of human activities have been implicated in reduced nesting and productivity of bald eagles, including development, logging, habitat degradation, and recreation (Zeiner et al. 1990b). Other factors relating to bald eagle mortality or reproductive failure include lead poisoning from consuming lead-shot prey, collisions with power lines, and DDT-induced eggshell thinning (Zeiner et al. 1990b). Bald eagles may also be sensitive to disturbance from human activities near or within communal winter roost sites, which can prevent eagles from feeding or taking shelter (depending on the proximity of other suitable roost or foraging areas and the condition of the affected eagles) (USFWS 2007c).

3.7.5 Sensitivity to forest management activities

Forest management activities have resulted in the loss of suitable nest sites, abandonment of nests, and reduced nesting productivity (Thelander 1973, Anthony and Isaacs 1989). Controlled selective harvest may be compatible with maintaining habitat for bald eagles if it promotes the growth of large trees preferred by bald eagles for nesting and as long as adequate attention is given to providing suitable numbers of perch trees and alternative nest trees (Lehman 1979). Helicopters have been implicated in disturbance to bald eagles (Watson 1993), and helicopter yarding of timber could be detrimental during the nesting season if appropriate buffer zones are not established. Activities that permanently modify communal winter roost sites and foraging areas may eliminate elements that are necessary for feeding and sheltering (USFWS 2007c).

3.8 Northern Goshawk

Scientific Name: *Accipter gentilis*
Federal Status: (none)
State Status: Species of Special Concern, Board of Forestry Sensitive

3.8.1 Distribution

Northern goshawk is a year-round resident in California; the breeding stronghold is distributed across much of the northern Coast Ranges, the Klamath, Siskiyou, and Warner mountains, Cascades, Modoc Plateau, and through most of the Sierra Nevada (Keane 2008). Mendocino County is at the southern edge of the north coastal portion of the northern goshawk nesting range (Shuford 1993, Burridge 1995). Northern goshawks have been documented in the primary assessment area in the Big River and Noyo inventory blocks (MRC, unpublished data; CDFG 2009a). There are several records of northern goshawk observations in the secondary assessment area, including 8 mi (13 km) east of the Garcia River inventory block, 6–7 mi (10–11 km) west of the Noyo inventory block, and two occurrence near the Rockport inventory block—one approximately 1–2 mi (2–3 km) east and one less than 0.5 mi (1 km) north of the Rockport inventory block (CDFG 2009a). Nesting northern goshawks have also been observed in the secondary assessment area at the Angelo Coast Range Reserve (Keane 2008).

3.8.2 Life history

Northern goshawk breeding in California typically begins during late spring or early summer (April to June), depending on the latitude (Zeiner et al. 1990b). Northern goshawks are monogamous and engage in courtship displays (e.g., sky-dance display) during nest construction (Squires and Reynolds 1997). The species nests in mature and/or old-growth forests, including within coniferous and mixed conifer-hardwood vegetation types; preferred stands are those with relatively large trees, high canopy cover, and an open understory (Keane 2008). Breeding birds construct up to nine alternate nests (Detrich and Woodbridge 1994); nests are located just below the forest canopy, usually on large branches against the trunk (Squires and Reynolds 1997). Northern goshawk pairs have only one brood per season and between one and five eggs within the clutch (Zeiner et al. 1990b). Often from a perching position in snags, the northern goshawk preys upon both ground and tree squirrels, chipmunks, and a variety of bird species (e.g., robins, flickers, jays, etc.) (Squires and Reynolds 1997, Keane 2008). Many birds will stay in their territories year-round, only leaving when prey is limited.

3.8.3 Habitat associations

In the northwest, northern goshawks nest in mature and old-growth stands of coniferous forest at middle and higher elevations. For nesting, this species requires dense stands composed of large trees with high canopy closure, a relatively open understory, which are often located near clearings (Shuster 1980), small logging roads, stream courses, or other flight paths (Squires and Reynolds 1997, Keane 2008). Goshawk territories are associated with larger patches of mature forest; occupancy of patches has been positively associated with patch area (Woodbridge and Detrich 1994).

3.8.4 Threats

The main threats to northern goshawk are habitat degradation, loss, and fragmentation.

3.8.5 Sensitivity to forest management activities

Habitat for northern goshawks has been altered by both timber harvest and fire suppression through changes to forest structure and composition (Squires and Reynolds 1997, Keane 2008). Forest management activities may affect northern goshawk populations through loss or fragmentation of suitable breeding, post-fledging, and foraging habitat and through direct disturbance during logging operations or road use. The species' preference for nesting in large stands of mature or old-growth forests (Shuster 1980, Hayward and Escano 1989, Crocker-Bedford 1990, all as cited in Lilieholm et al. 1993) with high canopy closure and relatively open understory, as well as pair fidelity to nesting areas (Crocker-Bedford 1990, Reynolds and Joy 1998) makes it particularly susceptible to logging-related habitat loss or degradation, especially as such stands tend to have high economic value. In addition to the relatively long-term impacts of removing larger trees and reducing canopy cover, logging activities conducted near nests during the incubation and nestling periods can cause reproductive failure due to nest abandonment (Boal and Mannan 1994, Squires and Reynolds 1997). Goshawk populations may be strongly regulated by prey availability (Doyle and Smith 1994, Crocker-Bedford 1998; all as cited in Cooper and Stevens 2000), which may also be affected by forest management, both in terms of prey abundance as well as foraging habitat structure. For example, an analysis of ten prey species commonly included in the diet of goshawks in southeast Alaska found that none of the species would be expected to benefit from clearcut logging and most would decline in abundance (Iverson et al. 1996). Management methods, such as long rotation periods between logging, can be used to reduce impact on goshawk habitat (Cooper and Stevens 2000). Lilieholm et al. (1993, 1994) describe a possible strategy for using the Stand Density Index, a measure that effectively integrates both mean size and tree density, to guide forest management for the purpose of attaining stand structure objectives to maintain northern goshawk nesting habitat.

3.9 American Peregrine Falcon

Scientific Name: *Falco peregrinus anatum*
Federal Status: Delisted
State Status: Delisted, Fully Protected, Board of Forestry Sensitive

3.9.1 Distribution

The American peregrine falcon breeds in coastal California north of Santa Barbara, southern portions of the Sierra Nevada, and other mountains in northern California (Zeiner et al. 1990b, White et al. 2002). During the winter, the species has been found throughout the Central Valley (Zeiner et al. 1990b). American peregrine falcons have been documented in the primary assessment area in the Big River, Noyo, and Ukiah inventory blocks (MRC, unpublished data; CDFG 2009a). In addition, there is an American peregrine falcon observation documented in the secondary assessment area, 5–6 mi (8–9 km) east of the Big River inventory block (MRC, unpublished data).

3.9.2 Life history

Breeding usually begins in early March and continues through August (Zeiner et al. 1990b). Generally monogamous throughout the year, peregrine falcon pairs roost and hunt cooperatively (Ehrlich et al. 1988, White et al. 2002). Pairs usually have one brood per season, although may have a second clutch if eggs are lost; average clutch size is typically 3 to 4 eggs, but can be up to 7 (Zeiner et al. 1990b). Peregrine falcons feed mainly on birds and occasionally bats or other small mammals, fish, or insects (Zeiner et al. 1990b, White et al. 2002).

3.9.3 Habitat associations

Peregrine falcons use a variety of open habitats including wetlands, woodlands, cities, agricultural lands, and coastal areas (Gertsch et al. 1994); riparian habitat and wetlands are particularly important (Zeiner et al. 1990b). Peregrine falcons typically nest in open settings with unobstructed views and open access, often near water (e.g., wetlands, rivers, coastal areas). Nests are usually made in a depression or scrape on high cliff ledges, but also in dunes, human-made structures, and occasionally within abandoned raptor nests in large, predominant snags or trees (Zeiner et al. 1990b, White et al. 2002). Birds in urban environments have been observed nesting on city buildings and bridges (White et al. 2002). On rare occasions, peregrine falcons will nest in large trees high above the forest canopy. Nests have recently been documented in the broken tops of residual old-growth redwood trees in Humboldt County, California (Hunter et al. 2005). Peregrine falcons hunt prey in a variety of open habitat types such as wetlands, estuaries, mudflats, marshes, meadows, lakes, and rivers (Porter et al. 1973); forests are not typically used as foraging habitat.

3.9.4 Threats

This species is threatened by disturbance of nesting sites, shooting, egg collecting, recreational rock climbing, climate change, and harvest for falconry. Although this species has made significant recoveries since population estimates in the 1970s (e.g., in California, up from 11 breeding pairs in 1976 to over 300 breeding pairs in 2008 due to the ban of DDT) (Langham and Taylor 2008), the flame retardant PBDE may be a threat to the long-term recovery of California peregrine falcons (Langham and Taylor 2008).

3.9.5 Sensitivity to forest management activities

Peregrine falcons can be extremely sensitive to human disturbance, which can lead to abandonment of eggs or young. Forest management that provides for retention and recruitment of large, predominant trees may offer nesting opportunities for peregrine falcons; whereas, silviculture practices that do not maintain or recruit such trees may not provide nesting opportunities.

3.10 Western Snowy Plover

Scientific Name: *Charadrius alexandrinus nivosus*
Federal Status: Threatened
State Status: Species of Special Concern (interior population)

3.10.1 Distribution

Western snowy plover is a year-round resident (i.e., breeds and winters) along the entire Pacific Coast of California, including the mainland coast, bays, estuaries, coastal wetlands in southern California, islands, and coastal rivers (Powell 1995, Shuford et al. 2008, USFWS 2010a). Snowy plovers that breed in inland California are not part of the western snowy plover population (USFWS 2010a). Recent nesting has been documented at several locations throughout the northern California coast, including Big Lagoon, Brush Creek, Centerville Beach, Clam Beach, Eel River gravel bars, Eel River Wildlife Area, Gold Bluffs Beach, South Spit, Ten Mile River, and Virgin Creek (USFWS 2010a). In Mendocino County, numerous wintering and nesting records have been documented along beaches. Rivers in the assessment area have limited potential for occurrence, though there are no records along Mendocino County rivers and the sand and gravel bars are considered by the agencies as too narrow for nesting. There is a western snowy plover observation documented in the secondary assessment area along the coast, 11–12 mi (18–19 km) west of the Noyo inventory block (CDFG 2009a).

3.10.2 Life history

Western snowy plover breeding in California typically begins in early March and continues through the end of September; courtship may begin as early as February (USFWS 2010a). Western snowy plovers are polyandrous, as females may breed with multiple males (USFWS 2010a). The species nests in shallow depressions scraped in open, sandy areas sometimes near low cover (e.g., rocks, driftwood), and lays an average clutch of three eggs (i.e., between 2 and 6); females and males both incubate eggs (Zeiner et al. 1990b, Powell 2001, Page et al. 2009, USFWS 2010a). Once the eggs have hatched, males care for the young for approximately one month; females desert the nest and, if possible, may have a second clutch with a new male in which she assists in brood care (USFWS 2010a). The species feeds on marine to freshwater and terrestrial invertebrates below the high-water line at beaches, in dry sand, or in shallow water (Zeiner et al. 1990b, Page et al. 2009).

3.10.3 Habitat associations

Along the Pacific Coast, western snowy plovers are associated with barren to sparsely vegetated dune-backed beaches, barrier beaches, salt-evaporation ponds, and occasionally bluff-backed beaches and gravel bars in rivers with wide flood plains up to seven miles (straight-line distance) from the nearest ocean beach (USFWS 2007a, Page et al. 2009). Nests are situated above the high tide line (USFWS 2010a).

3.10.4 Threats

The main threats to western snowy plovers are loss of nesting habitat through encroachment by invasive species (e.g., *Ammophil arenaria* [European beachgrass]) and urban development, as well as reproductive failure from human disturbance/recreation (e.g., walking or running through habitat, dogs, beach use, vehicles, etc.), predation (e.g., invasive red fox [*Vulpes vulpes*], common raven [*Corvus corax*], loss of food resources from beach raking, and climatic disturbances (Powell 1995, USFWS 2007a, Page et al. 2009, USFWS 2010a). In addition, western snowy plovers are sensitive to oil and contaminant spills (USFWS 2007a).

3.10.5 Sensitivity to forest management activities

Western snowy plovers could be affected by forest management due to gravel extraction from channels for use on forest roads, or from seasonal road use and maintenance across active channels.

3.10.6 Comments

There is critical habitat for western snowy plover along the coast in Mendocino County.

3.11 Marbled Murrelet

Scientific Name: *Brachyamphus marmoratus*
Federal Status: Threatened
State Status: Endangered, Board of Forestry Sensitive

3.11.1 Distribution

Marbled murrelets occur along the Pacific Coast and while some birds may winter in southern California, marbled murrelets are largely a resident species that breeds in old-growth and mature coastal forests from central California north beyond the Oregon border (Nelson 1997, USFWS 1997a). The largest populations of nesting marbled murrelets in California have been documented in Del Norte and Humboldt counties and, much further to the south, in San Mateo and Santa Cruz counties (USFWS 1997a, Zeiner et al. 1990b, McShane et al. 2004). The Alder Creek basin within the South Coast inventory block is the only portion of the primary assessment area with known marbled murrelet occupation; there are three known occupied sites within the primary assessment area of this basin (MRC 2012). There was confirmed evidence of nesting marbled murrelets in this area; eggshell fragments were identified under an old-growth Douglas-fir near Alder Creek in 1993 (MRC 2012). There have been confirmed and possible radar detections of marbled murrelets in Navarro River, Greenwood Creek, and Albion River basins (which are encompassed by Albion, Navarro West, and South Coast inventory blocks), though follow-up surveys conducted by MRC in some of those areas have not resulted in any ground detections (MRC 2012). In the secondary assessment area, murrelets have been identified on Hawthorne Timber lands, Russian Gulch State Park, Admiral Standley State Recreation Area, Angelo Preserve, the Gualala River, and 0.6 mi (1 km) east of the town of Mendocino (MRC 2012).

3.11.2 Life history

Marbled murrelet breeding is presumed to begin in early spring, although pairs have been documented year-round near breeding sites (Nelson 1997). Individuals court at sea, forming socially monogamous pairs (Nelson 1997). In California, nesting occurs from March through September in late-successional stands of conifers, typically within 6.5 mi (10 km) of the coast (USFWS 1997a), while the farthest inland distance recorded in California was 24 mi (39 km) from the ocean at Grizzly Creek Redwoods State Park (Paton and Ralph 1990). In California, marbled murrelets use nesting platforms, typically branches with a diameter greater than 4 in (10 cm), to establish nests often in mossy depressions on limbs at heights of a minimum of 100 ft (30 m) (USFWS 1997a). Besides large diameter branches, nests have also been confirmed in broken-topped trees, lateral burls, and debris accumulations. Nests are concealed by high overhead and horizontal canopy cover; also, the trunk can contribute to concealment (Hamer and Nelson 1995). Marbled murrelets exhibit site fidelity and are known to return to the same stand and even the same tree from year to year (USFWS 1997a). This species is thought to lay one single-egg clutch, usually during early morning hours (Zeiner et al. 1990b, Hebert and Golightly 2006). Birds forage entirely in coastal marine waters at surface and mid-water depths (approximately 160–330 ft [50–100 m] deep) within 0.6–1.2 mi (1–2 km) of shore, feeding on small fish and invertebrates (Zeiner et al. 1990b, USFWS 1997a, Hebert and Golightly 2008).

3.11.3 Habitat associations

Marbled murrelets spend most of their time in the ocean and nest inland in stands of old-growth conifers within flight distance of the coast, with suitable nesting platforms and abundant near-shore food sources (which, in California, is often within 6.5 mi [10 km] of the coast) (USFWS 1997a, Hebert and Golightly 2008). The most commonly occupied stands are dominated by old-growth redwoods and Douglas-fir (Miller and Ralph 1996, USFWS 1997a, Zeiner et al. 1990b) and are characterized by large trees, multiple canopy layers, and moderate to high canopy closure (USFWS 1997a, Nelson 1997). Of particular importance are nesting platforms, typically branches with a diameter greater than 4 in (10 cm).

3.11.4 Threats

Threats to marbled murrelet populations are numerous, the principle threat to these birds being the loss and fragmentation of nesting habitat due to timber harvesting (USFWS. 1997a). Other factors include increases in nest predation from corvids, oil spills, gill netting, fluctuations in food supply due to El Niño, windthrow, natural fires, and alterations from fishery management (Marshall 1988, Ralph et al. 1995, USFWS 1997a, McShane et al. 2004, Hebert and Golightly 2006, Becker and Beissinger 2006).

3.11.5 Sensitivity to forest management activities

Because this species relies on old-growth coniferous forest located close to marine waters for nesting habitat, timber management activities present a significant threat. Due to the long duration of time required to achieve over-mature forest conditions, lands managed for timber production may not recover nest habitat value (B. Valentine, pers. comm.). Fragmented forests (smaller stand size, increased edge habitat) may reduce overall breeding habitat and affect nesting success (Nelson and Hamer 1995; S. K. Nelson and I. A. Manley, unpublished data; both as cited in Cooperrider et al. 2000). Fragmented forests often allow predators easier access to both eggs and adult birds; they also lead to a general increase in reproductive habitat for avian predators such as corvids (ravens, crows, and jays) resulting in greater predator densities (USFWS 1997a).

3.11.6 Comments

This species would be covered under MRC's proposed HCP/NCCP.

USFWS has not designated any part of the primary assessment area as critical habitat for the marbled murrelet; however, USFWS has designated areas within the secondary assessment area (including adjacent to the primary assessment area) as critical habitat. These areas include Jackson Demonstration State Forest and Bureau of Land Management lands east and north of Rockport, Hendy Woods State Park, Montgomery Woods State Reserve, and Maillard State Reserve. Critical habitat has been designated in zones where relatively large populations nest, as well as in areas of current low use and where murrelet use is unknown.

3.12 Long-eared Owl

Scientific Name: *Asio otus*
Federal Status: (none)
State Status: Species of Special Concern

3.12.1 Distribution

Long-eared owls are occasional year-round residents and breed throughout much of California, except for deserts in southern California and the Central Valley (Zeiner et al. 1990b). Suitable habitat includes riparian areas and dense oak and coniferous forests adjacent to more open habitats (Zeiner et al. 1990b, Hunting 2008). In northwestern California, potential breeding pairs have been documented in Humboldt and Mendocino counties south through Willets (Hunting 2008). Although this species has the potential to occur in the assessment area, no sightings have been documented in the primary assessment area, secondary assessment area, or the adjacent land.

3.12.2 Life history

Long-eared owls are thought to form monogamous pairs at or soon after communal roosts disband in February or March (Marks et al. 1994). Males court females using zigzag display flights and advertising song. Nesting begins with pair formation; in California, suitable nest areas include riparian thickets and areas with dense tree canopies. Long-eared owls do not construct nests; rather, birds utilize abandoned nests constructed by a variety of species including squirrels, hawks, and corvids (Zeiner et al. 1990b, Marks et al. 1994). A single brood species, eggs are laid as early as late-February through May (Marks et al. 1994). While tree canopy is required for nesting, long-eared owls forage nocturnally, presumably in more open habitat with low vegetation to capture small mammals and birds (Marks et al. 1994, Hunting 2008).

3.12.3 Habitat associations

Long-eared owls breed in conifer, oak, or riparian woodlands that are either open or are adjacent to grasslands, meadows, or shrublands. Dense vegetative cover and suitable nesting platforms with abandoned nests are required for long-eared owl nesting and roosting. Long-eared owls require nearby open grassland, meadows, or wetland areas for foraging (Hunting 2008). Occasionally, however, long-eared owls hunt in oak woodland, riparian, and coniferous forest areas (Zeiner et al. 1990b, Hunting 2008).

3.12.4 Threats

The destruction and fragmentation of breeding and foraging habitat, including riparian habitat and oak woodland, is thought to be a major factor causing the decline of this species (Zeiner et al. 1990b, Hunting 2008).

3.12.5 Sensitivity to forest management activities

There is currently little data correlating effects on long-eared owls with forest management, probably since the species is so closely associated with open habitats (Holt 1997). However, loss of riparian woodlands and isolated tree groves could adversely impact this species. Clearcutting may create temporary patches of foraging and edge habitat.

3.13 Northern Spotted Owl

Scientific Name: *Strix occidentalis caurina*
Federal Status: Threatened
State Status: Species of Special Concern, Board of Forestry Sensitive

3.13.1 Distribution

Northern spotted owls are uncommon year-round residents in the northern California coastal ranges from Marin County north, as well as within the Cascade Range in northern California, southeast to the Pit River in Shasta County below 7,600 ft (2,300 m) (Harris 1993, Gutiérrez et al. 1995, USFWS 2010b). South of Burney in the southern Cascade Range and Sierra Nevada, the northern spotted owl is replaced by the California spotted owl (*Strix occidentalis occidentalis*) (Gutiérrez et al. 1995). Northern spotted owls are found throughout the primary and secondary assessment areas. Between 1988 and 2007, MRC surveyed approximately 220 individual territories on or adjacent to MRC property. As of fall 2007, 214 northern spotted owl territories were determined to still be active within the assessment area, 167 of which were either in the primary assessment area or within a 1,000-ft (305-m) buffer of the primary assessment area (MRC 2012).

3.13.2 Life history

Northern spotted owls are generally monogamous, forming long-term pair bonds that often last for life (Courtney et al. 2004). In late February or early March, pairs begin roosting in cavities, the tops of broken trees, or abandoned nests; nesting is followed by peak breeding in April and May (Zeiner et al. 1990b, Gutiérrez et al. 1995, Courtney et al. 2004). Generally a single brood species, northern spotted owls generally lay a clutch of between one and four eggs (Gutiérrez et al. 1995). A pair may use the same nesting location for several years; although breeding may not occur every year (Zeiner et al. 1990b). Primary prey items for northern spotted owls are small mammals, but birds and insects are also taken (Forsman et al. 1984, Zeiner et al. 1990b). The diet of northern spotted owls in coastal Mendocino County and other portions of their coastal range in

California primarily consists of dusky-footed woodrats (*Neotoma fuscipes*) (Pious and Ambrose 1994).

3.13.3 Habitat associations

Northern spotted owls are typically associated with complex mature or old-growth stands dominated by conifers, particularly redwoods with hardwood understories (Pious 1994, USFWS 2011a). Roosting sites are characterized by dense canopy cover dominated by large-diameter trees (i.e., greater than 30-in [76-cm] dbh), multiple canopy layers, and north-facing slopes, often in cool shady areas (Barrows 1981, Gutièrrez et al. 1995, Courtney et al. 2004). Nests tend to be found in tree or snag cavities, on platforms (e.g., abandoned raptor or raven nests, squirrel nests, mistletoe brooms, or debris accumulations), or on broken-top snags (Zeiner et al. 1990b). In coastal Mendocino County, the majority of nests occurred in redwood trees (Pious 1995).

Foraging habitats vary more than roosting and nesting habitats (Thomas et al. 1990) but are similarly characterized by high canopy closure and complex structure (USFWS 1994). Although spotted owls appear to avoid crossing clearcut areas and recently logged forests (Gutierrez et al. 1995), they have been recorded foraging along forest edges (Ward 1990, as cited in Gutierrez et al. 1995; Zabel et al. 1995). It appears that some open areas are important foraging areas in northern California, as the abundance and diversity of prey is higher in early successional habitats (Folliard et al. 2000). Spotted owls are probably not able to maneuver well in the young stands with highest prey abundance (Zabel et al. 1993, as cited in Thome et al. 1999); therefore, they are likely to forage in stands that are young enough to contain an abundance of prey, such as woodrats, but are old enough to allow the owls to fly under the canopy (Thome et al. 1999).

3.13.4 Threats

Extensive loss and degradation of habitat, primarily due to even-aged tree-management, have been considered to be a principal threat to northern spotted owls (Gutièrrez et al. 1995). More recently, it has been found that competition with, displacement by, hybridization with, and possible direct mortality by the barred owl (*Strix varia*) may be one of the most immediate threats to the species (USFWS 2011a, Courtney et al. 2004).

3.13.5 Sensitivity to forest management activities

Since northern spotted owls nest in late-successional habitats, loss of habitat from forest management activities has been one of the major threats to the species (USFWS 2011a). Timber harvesting and road building have direct effects on nesting, roosting, and foraging habitat by removing large trees and opening the upper canopy layer. Spotted owls are sensitive to habitat disturbance, due to their association with late seral stages of forest and snags or cavity trees, as well as their low tolerance for high temperatures. In addition, forest fragmentation isolates populations and provides habitat that competing barred owls (*Strix varia*) may utilize better than spotted owls. One reported case of a barred owl preying upon a spotted owl occurred on a trail (Leskiw and Gutièrrez 1998). According to Wasser et al. (1997), timber harvesting and road building activities can also affect northern spotted owls by increasing physiological stress and contributing to decreased reproductive success. Noise is a source of disturbance and a potential threat to northern spotted owls, especially during the breeding season, as it can cause the abandonment of adults from the nest as well as abandonment of young. Noise includes road traffic and use of mechanized equipment. Studies in Redwood National Park and State Parks showed that chainsaw noise 100 ft (31 m) away from a nest was still 1.5–2 times louder than natural background noise (Redwood National and State Parks 1998). Forest management can also have a positive effect on northern spotted owls by increasing the amount of forage habitat through establishment of open areas which provide an increase in prey availability.

3.13.6 Comments

This species would be covered under MRC's proposed HCP/NCCP.

USFWS has not designated any part of the primary assessment area as critical habitat for northern spotted owl; however critical habitat exists within the secondary assessment area, east of the Rockport and Navarro East inventory blocks. In 2008, the USFWS designated 1.2 million ac (0.49 million ha) of critical habitat essential to the conservation of the northern spotted owl in 15 units in California, occurring on federal land (USFWS 2008).

3.14 Vaux's Swift

Scientific Name: *Chaetura vauxi*
Federal Status: (none)
State Status: Species of Special Concern

3.14.1 Distribution

Vaux's swifts are migrant and summer residents in California, breeding predominantly throughout the narrow redwood coastal zone in northern and north coastal California south to Monterey County, although a few scattered occurrences have been documented in the western slopes of the Sierra Nevada north of Tulare County (Zeiner et al. 1990b, Sterling and Paton 1996, Bull and Collins 2007, Hunter 2008). In north coastal California, Vaux's swifts have been documented in Humboldt, Del Norte, Mendocino, Marin, and Sonoma counties (Hunter 2008). Vaux's swifts have been documented in the primary assessment area in the Big River, Garcia, Navarro West, Noyo, and Rockport inventory blocks (MRC, unpublished data). Presence of Vaux's swift in the secondary assessment area is unknown (the California Natural Diversity Database does not track sightings of Vaux's swift.)

3.14.2 Life history

Vaux's swifts have strong pair bonds, often nesting together monogamously for multiple years (Bull and Collins 2007). After in-flight courtship displays (e.g., v-wing display), pairs form in late winter or early spring followed by breeding early May to mid-August (Zeiner et al. 1990b, Bull and Collins 2007). Pairs seek nesting habitat mostly in mature or old-growth coniferous forests (Bull and Collins 2007). Vaux's swifts nest predominantly in hollow live trees or snags—cavities must be large enough to allow for flight—and lay a single brood of between three and seven eggs (Zeiner et al. 1990b, Sterling and Paton 1996, Hunter 2008). Birds seek primarily insect prey on the wing above the forest canopy or at lower elevations over more open areas such as meadows, burn areas, and water bodies, as well as potentially foraging on spiders and insects in trees (Bull and Collins 2007).

3.14.3 Habitat associations

Along the northern California coast, Vaux's swifts prefer nesting in cavities and burned-out tree hollows in coniferous forests, often in old-growth redwood and, less often, in Douglas fir forests

(Zeiner et al. 1990b, Hunter 2008). Vaux's swifts have been very occasionally documented nesting in man-made structures in urban areas, such as chimneys or cracks in highway bridges (Sterling and Paton 1996, Hunter 2008). Birds forage above the forest canopy, in forest openings such as burn areas, and above streams and rivers (Zeiner et al. 1990b, Bull and Collins 2007). During migration, large roost trees and chimneys are important for Vaux's swifts to avoid exposure and conserve body heat (Bull and Collins 2007).

3.14.4 Threats

Vaux's swifts there are threatened by habitat loss due to the destruction of complex older forests which provide an abundance of the old, hollow trees and snags used for nesting (Hunter 2008). In addition, snag and hollow tree production, key habitat elements for Vaux's swifts, has been curtailed by fire suppression (Bull and Collins 2007, Hunter 2008). Direct mortality has been documented at man-made roosting sites (Hunter 2008).

3.14.5 Sensitivity to forest management activities

The loss of stand complexity and old growth forests due to certain types of harvesting reduces or eliminates Vaux's swift habitat. Sanitation and salvage of large dead and dying trees after fire can eliminate future nest sites, and fire prevention can curtail the processes that create quality nest and roost cavities in redwood forests.

3.15 Olive-sided Flycatcher

Scientific Name: *Contopus cooperi*
Federal Status: (none)
State Status: Species of Special Concern

3.15.1 Distribution

Olive-sided flycatchers are migrant and summer residents in California, breeding throughout northern California south through Monterey County, Sierra Nevada, and southern California mountains below 9,000 ft (2,800 m) (Altman and Sallabanks 2000, Widdowson 2008). Although the range of breeding habitat remains similar to historical accounts, most of these birds currently breed in the Sierra Nevada foothills, (CalPIF 2002, Widdowson 2008). Olive-sided flycatchers nest within the assessment area (John Hunter, USFWS, pers. comm., e-mail dated 24 June 2008); they have been documented in the primary assessment area in the Albion, Big River, Navarro East, Navarro West, Noyo, Rockport, South Coast, and Ukiah inventory blocks (MRC, unpublished data). Presence of olive-sided flycatcher in the secondary assessment area is unknown (the California Natural Diversity Database does not track sightings of olive-sided flycatcher.)

3.15.2 Life history

Olive-sided flycatchers have strong pair bonds during breeding season and are considered a monogamous species (Altman and Sallabanks 2000). Males pursue females during courtship with looping display flights; once pairs form by May, nest-building quickly follows. Nests sites are selected in montane and northern coniferous forests, in coniferous tree branch-tips often near water (Altman and Sallabanks 2000, CalPIF 2002). Olive-sided flycatchers are a single brood species; average clutch size ranges from three to four eggs (Zeiner et al. 1990b). Birds use exposed perches to feed on flying insects, often preferring honeybees (Zeiner et al. 1990b, CalPIF 2002, Widdowson 2008).

3.15.3 Habitat associations

Olive-sided flycatchers have been documented in a wide variety of forested habitats in California, including mixed conifer, Douglas-fir, redwood, and montane hardwood-conifer forests (Widdowson 2008). They primarily occur in late-successional coniferous forests with open canopies, near forest edges or forest openings (e.g., meadows, rivers, harvest units), and with abundant perches (Zeiner et al. 1990b, Altman and Sallabanks 2000, CalPIF 2002, Widdowson 2008). The birds prefer nesting areas near water bodies, potentially due to increased insect abundance in these areas (Altman and Sallabanks 2000). In addition, studies have indicated that there are increased nesting olive-sided flycatchers when there is reduced forest canopy due to logging operations or fire (CalPIF 2002).

3.15.4 Threats

Habitat degradation and urban development continues to be the primary threat to this species (Widdowson 2008).

3.15.5 Sensitivity to forest management activities

Because olive-sided flycatchers are associated with decreased canopy cover (CalPIF 2002), the species may respond well to timber harvest operations if the forest is managed with small clear-cuts adjacent to mature forests. In addition, if stream buffers are maintained and residual large snags and large live potential nest trees are left, it may benefit olive-sided flycatchers (Altman and Sallabanks 2000, CalPIF 2002).

Population declines are occurring across the entire breeding range; thus, it is possible that harvested forests may have the right structure but not function appropriately (e.g., a change in food resources), or reduced populations may be a result of habitat loss or alteration on wintering grounds (Altman and Sallabanks 2000). When comparing naturally burned forest with selectively harvested forest, olive-sided flycatcher density was greater in the selectively harvested landscape, though estimated nest success was approximately half of that observed in naturally burned forest. Reduced nest success was presumed to be a result of higher abundance of nest predators found in the selectively harvested forest (Robertson and Hutto 2007).

3.16 Willow Flycatcher

Scientific Name: *Empidonax traillii*
Federal Status: (none)
State Status: Endangered

3.16.1 Distribution

Although historically the willow flycatcher occurred throughout California in deciduous shrub and willow thicket habitats, it is currently a rare summer resident in wet meadow and montane riparian habitats at elevations between 2,000 and 8,000 ft (600 and 2,440 m), primarily in the

Sierra Nevada and Cascade ranges (Craig and Williams 1998, Sedgewick 2000). Willow flycatchers are no longer present throughout most of the historical California range, but do rarely occur in riparian areas during the spring and fall migration periods. Nearer the assessment area, willow flycatchers are known to breed along the Eel River and in mesic clear-cuts in northern Humboldt County (John Hunter, USFWS, pers. comm., e-mail dated 19 October 2009). In the primary assessment area, willow flycatchers have been observed as migrants only, especially in fall (John Hunter, USFWS, pers. comm., e-mail dated 14 October 2009). There is record of a willow flycatcher observation approximately 30 mi (48 km) north of the Rockport inventory block (CDFG 2009a).

3.16.2 Life history

Willow flycatchers perform courtship displays before forming generally monogamous pairs, with nesting initiated as early as May (Sedgewick 2000). Preferred nesting habitat includes moist meadows with perennial streams and riparian deciduous woodlands. Nests are constructed at the bases of branches of small trees and shrubs in thicket edges (Sedgwick 2000). A single brood species, willow flycatchers lay an average clutch of three to four eggs in June (Zeiner et al. 1990b). Willow flycatchers use low willows and other short stature vegetation as perches to forage for flying insects (Sedgwick 2000).

3.16.3 Habitat associations

Willow flycatchers require dense riparian shrubland near permanent standing water, often thickets of willows or alder, for foraging and roosting; however, areas with dense tree cover are not suitable. In addition, low, exposed branches are used during foraging (Zeiner et al. 1990b). Water is always present in willow flycatcher territories in California (Sedgewick 2000). Deciduous shrubs and small trees at least 6.6 ft (2 m) tall are required for nesting (Craig and Williams 1998). In the Pacific Northwest, willow flycatchers are known to nest in early seral stages (e.g., recent clearcuts) of conifer forests (Altman et al. 2003).

3.16.4 Threats

Threats to willow flycatchers include habitat destruction and degradation (Sedgwick 2000). In particular, the overgrazing of livestock, especially cattle, results in modifications to site hydrology, soil compaction, nest trampling, and grazing of willows (Craig and Williams 1998, Sedgwick 2000). In addition, willow flycatcher nests are frequently parasitized by brown-headed cowbirds (*Molothrus ater*) (Craig and Williams 1998).

3.16.5 Sensitivity to forest management activities

The willow flycatcher may be sensitive to forestry operations that affect riparian willow vegetation or wetlands. Timber harvest adjacent to or upslope of willow flycatcher habitat may alter the hydrology of the area and negatively impact willow flycatcher habitat (Craig and Williams 1998). However, early stages of clearcuts in moist areas may provide transitory nesting habitat.

3.17 Purple Martin

Scientific Name: *Progne subis*

Federal Status: (none)
State Status: Species of Special Concern

3.17.1 Distribution

The purple martin is a rare migrant and summer resident in California, breeding throughout much of the central and northern California coast, as well as low to mid-elevation Sierra Nevada forests and sporadically occurring in the Transverse and Peninsular ranges of southern California (Zeiner et al. 1990b, Airola and Williams 2008). The largest concentration of breeding pairs is located in northwestern California, within redwood forest near the coast (Airola and Williams 2008). Purple martins have been documented in the primary assessment area in the Albion, Big River, Garcia River, and Noyo inventory blocks (MRC, unpublished data). In addition, there are several purple martin observations documented in the secondary assessment area: 8–11 mi (14–18 km) west of the Noyo inventory block, and 1 mi (1–2 km) northwest of the Albion inventory block (CDFG 2009a).

3.17.2 Life history

Purple martins are socially monogamous, with occasional polygyny when a second female settles within the pair's territory (Brown 1997). Pair bonds form quickly after courtship displays and birds begin nesting as early as April and peaking in June (Zeiner et al. 1990b, Brown 1997). Purple martins nest in cavities, most often in dead tree cavities and holes in live trees often made by woodpeckers, but also in man-made birdhouses, cliff or building crevices, or even traffic lights; nests are constructed within the cavity and are a combination of twigs, leaves, grass, and mud (Brown 1997). A single brood species unless nest failure occurs, purple martin females lay an average of four to five eggs (Zeiner et al. 1990b, Brown 1997). Birds mainly forage high in the air for insects near their nesting sites, but also take insects from the ground or vegetation (Brown 1997).

3.17.3 Habitat associations

Purple martins have been documented in forested and woodland areas from sea level through mid-elevations (Shuford 1993, Airola and Williams 2008). These include coniferous forest (Douglas-fir, ponderosa pine, redwood) and montane-hardwood forests, as well as historically in oak and sycamore woodlands; most nest sites include large snags in open areas located near water (Zeiner et al. 1990b, Williams 2002). Nesting areas require an abundance of nesting cavities (i.e., large snags), open air for foraging, and abundant food (i.e., aerial insects) (Airola and Williams 2008). Purple martins prefer clusters of very large snags in open areas (with less than 10–30% and often near zero canopy cover) in prominent and often remote positions on the landscape for nesting. Prior to European settlement, these sites likely were created by large natural fires (Williams 2001). More recently, clearcuts with light residual retention have also created such areas (B. Valentine, CDFG, pers. comm.) Purple martin also require very low densities or the absence of the non-native European starling (*Sturnus vulgaris*) (Airola and Williams 2008).

3.17.4 Threats

In California, declines in purple martins have been attributed to the loss of snags, large trees, old-growth forests, and riparian habitat, and to competition for nest cavities from European starlings and house sparrows (*Passer domesticus*) in areas where snags are limited (Zeiner et al. 1990b, Airola and Grantham 2003, Airola and Williams 2008).

3.17.5 Sensitivity to forest management activities

Timber harvest, including fire prevention, salvage logging after a fire, can reduce the quantity and quality of snags and large trees required for nesting. Conversely, even-aged forest management with retention of large residual trees can enhance habitat.

3.18 Yellow Warbler

Scientific Name: *Dendroica petechia*
Federal Status: (none)
State Status: Species of Special Concern

3.18.1 Distribution

Yellow warbler breeds throughout much of California except the Central Valley, southern Californian deserts, and high Sierra Nevada, but it is not a year-round resident (Zeiner et al. 1990b, Heath 2008). The largest concentrations of breeding pairs occur in northeastern California in Modoc National Forest and Shasta County, as well as the Cascade Range and Sierra Nevada (Heath 2008). In northwestern California, the yellow warbler breeds in Del Norte, Humboldt, Mendocino, Siskiyou, Sonoma, and Trinity counties; in Mendocino County the breeding pairs are not documented at low elevations along the coast (Heath 2008). No occurrences of yellow warbler have been recorded in the primary or secondary assessment areas. There is record of a yellow warbler observation between 2 and 3 mi (5 and 6 km) east of the Noyo inventory block (CDFG 2009a).

3.18.2 Life history

Yellow warblers are socially monogamous, forming pair bonds and nesting after courtship initiates in April (Zeiner et al. 1990b, Lowther et al. 1999). Breeding occurs from mid-April through early August, with peak activity in June (Zeiner et al. 1990b). Yellow warblers nest 2 to 16 ft (0.6 to 5 m) above ground, at the base of branches (branch forks) in small deciduous trees and shrubs, often in willow thickets (Zeiner et al. 1990b, Lowther et al. 1999). Nests are built of grasses and bark with fine fibers, hair, and feathers used for lining (Lowther et al. 1999). A single brood species, yellow warblers may attempt to nest several times before laying an average of four to five eggs (Zeiner et al. 1990b, Heath 2008). Birds forage for insects within the shrub and tree canopy, occasionally feeding on the wing or eating fruit (Zeiner et al. 1990b, Lowther et al. 1999).

3.18.3 Habitat associations

The preferred habitat of yellow warblers includes open-canopy, deciduous riparian vegetation in close proximity to water, often along streams or wet meadows (Heath 2008). Frequently nesting in small willows and alders, yellow warblers are also associated with cottonwoods, Oregon ash, and other riparian shrubs and trees depending upon the geographic region (Zeiner et al. 1990b, Heath 2008). The species also occasionally nests in montane chaparral in open coniferous forests (Heath 2008).

3.18.4 Threats

Destruction and the deterioration of riparian habitat is the most recognized threat to the yellow warbler (Lowther et al. 1999, Heath 2008). In addition, brood parasitism by brown-headed cowbirds (*Molothrus ater*) has been implicated in population declines; however, the data on parasitism is inconclusive (Zeiner et al. 1990b, Heath 2008). Predation by small mammals and birds contributes to nesting failure (Heath 2008).

3.18.5 Sensitivity to forest management activities

Silvicultural practices can degrade yellow warbler habitat directly by removal of riparian vegetation and indirectly by increasing bank erosion (Kondolf et al. 1996). Conversely, reduction in conifer canopy can enhance nesting habitat by encouraging riparian deciduous shrubs and trees. Logging activities may increase yellow warbler vulnerability to brood parasitism by cowbirds, which frequent disturbed habitats such as clearcuts.

3.19 Yellow-breasted Chat

Scientific Name: *Icteria virens*
Federal Status: (none)
State Status: Species of Special Concern

3.19.1 Distribution

The yellow-breasted chat is a migrant and summer resident distributed across much of California, breeding mainly in northwestern California and the low- and mid-elevation Sierra Nevada, with sporadic occurrences documented in northeastern California (e.g., Lassen, Modoc, and Mono counties), the northern portion of the Central Valley, the San Francisco Bay-Delta region, central coast, and portions of southern California and southern deserts (Eckerle and Thompson 2001, Comrack 2008). Suitable elevations range up to 6,500 ft (2,050 m), the higher elevation occurrences are on the eastern side of the Sierra Nevada. No occurrences of yellow-breasted chat have been recorded in the primary or secondary assessment areas. There is record of a yellow-breasted chat between 2 and 3 mi (5 and 6 km) east of the Noyo inventory block (CDFG 2009a).

3.19.2 Life history

Yellow-breasted chats are mostly monogamous; pair bonds last either for one season or, if the nest fails, until nest failure (Eckerle and Thompson 2001). Males attract females with a variety of flight displays before birds form pairs and begin nesting in early May (Zeiner et al. 1990b). After building a nest of grass and leaves lined with finer stems and hair in dense thickets of shrubs, yellow-breasted chats lay their first brood between May and July; some yellow-breasted chats have been documented to have a second brood in late June or early July after the young from the first brood have fledged (Eckerle and Thompson 2001). This species forages in low, dense riparian shrubland on a variety of spiders, insects, and berries gleaned from vegetation (Zeiner et al. 1990b, Ricketts and Kus 2000).

3.19.3 Habitat associations

Yellow-breasted chats can be found in dense thickets of willows or other brushy areas of riparian woodlands (Zeiner et al. 1990b, Ricketts and Kus 2000). The species prefers areas with an open-canopy and close proximity to water along streams or wet meadows; however, the preferred understory for nesting sites is thick and often includes a tangle of blackberry and wild grape (Zeiner et al. 1990b, Comrack 2008). A few taller trees are necessary to use as perches singing (Comrack 2008).

3.19.4 Threats

The numbers of yellow-breasted chat in California have been much reduced in recent decades and while habitat destruction is likely implicated; other pressures must be contributing (Comrack 2008). It is possible that nest parasitism by the brown-headed cowbird (*Molothrus ater*) may be influencing populations (Comrack 2008), in addition to factors that reduce the quality of riparian habitat such as vegetation clearing for flood conveyance and control purposes, and cattle grazing (Comrack 2008). In addition, predation by snakes, western scrub-jays (*Aphelocoma californica*), raccoons (*Procyon lotor*), and dusky-footed woodrats (*Neotoma fuscipes*) may be detrimental to populations (Ricketts and Kus 2000).

3.19.5 Sensitivity to forest management activities

Timber harvesting generally favors early-successional species such as yellow-breasted chat. Reduction in conifer canopy from timber harvest can enhance nesting habitat by encouraging riparian deciduous shrubs and trees.

3.20 Grasshopper Sparrow

Scientific Name: *Ammodramus savannarum*
Federal Status: (none)
State Status: Species of Special Concern

3.20.1 Distribution

Grasshopper sparrows are predominantly breeding and summer residents in California, with occasional wintering thought to occur in the southern coastal tip of the state (Vickery 1996, Unitt 2008). Breeding pairs have been documented throughout much of coastal California and sporadically through most of the Central Valley, as well as Siskiyou County and at the base of the Sierra Nevada in Kern County (Unitt 2008). In the northern California coast, despite the apparent lack of suitable habitat, breeding pairs are found in the patchwork of grasslands that occur in the matrix of coniferous forest (Unitt 2008). Grasshopper sparrows may occur and nest in the assessment area, although no sightings have been documented. There is record of a grasshopper sparrow observation between 14 and 15 mi (24 and 25 km) southeast of the Navarro East inventory block (CDFG 2009a).

3.20.2 Life history

Grasshopper sparrows are generally considered monogamous, with pairs forming on the breeding grounds using flight courtship displays (Vickery 1996, CalPIF 2000). Nest building and breeding begins in April and continues through July (Zeiner et al. 1990b). Nests are constructed of grasses and forbs placed on the ground in a depression that is often well-camouflaged by overhanging vegetation (Zeiner et al. 1990b). To counteract the high predation rates, grasshopper sparrows usually have at least two broods per season (Vickery 1996). Grasshopper sparrows are visual hunters that actively search for prey on the ground, feeding upon grasshoppers, other invertebrates, and seeds from grasses and sedges (Zeiner et al. 1990b, Vickery 1996).

3.20.3 Habitat associations

Grasshopper sparrows are typically found in moderately open native and non-native grasslands short to moderate in stature with scattered shrubs; in California, birds prefer grasslands with fairly dense herbaceous cover, presumably because they provide concealment (Zeiner et al. 1990b, Vickery 1996, CalPIF 2000, Unitt 2008). Grasshopper sparrows have also been documented on steep hillslopes with low vegetative cover in southern California (CalPIF 2000). Vegetation communities that include high cover of shrubs or the presence of trees are not suitable (Vickery 1996).

3.20.4 Threats

Habitat destruction, habitat conversion to vineyards, and urban development are the primary threats to this species (Unitt 2008). Other potential threats include over- or under-grazing as both have been documented as detrimental, early-season mowing that results in nest failure, and fire suppression activities that result in the conversion of grassland to shrubland (Vickery 1996, Unitt 2008).

3.20.5 Sensitivity to forest management activities

Little sensitivity to disturbances caused by timber management since grasshopper sparrows are not closely associated with timber habitats. Grasshopper sparrows could be sensitive to disturbance of open habitats if used for timber management operations such as landings, staging areas, or new roads.

3.21 Bryant's Savannah Sparrow

Scientific Name: *Passerculus sandwichensis alaudinus*
Federal Status: (none)
State Status: Species of Special Concern

3.21.1 Distribution

Bryant's savannah sparrows are year-round residents in north coastal California and the San Francisco Bay Area, from Humboldt County to northern Monterey County, with occasional occurrences along the central coast (Fitton 2008). This species resides in the narrow coastal fogbelt, its range extending approximately 9 mi (15 km) inland, possibly up to 25 mi (40 km) (Fitton 2008). Although this species has the potential to occur and nest in the assessment area (John Hunter, USFWS, pers. comm., e-mail dated 24 June 2008), no sightings have been documented in the primary assessment area, secondary assessment area, or the adjacent land.

3.21.2 Life history

Savannah sparrows are generally polygynous throughout much of their range, although populations in the southwest (presumably including California) are considered monogamous (Wheelright and Rising 2008); thus, Bryant's savannah sparrows are presumably monogamous.

Males court females with song and flutter flights; nest building, breeding, and egg laying follows a few weeks later peaking in May and June (Zeiner et al. 1990b, Wheelright and Rising 2008). Nests are constructed of a coarse grass exterior and fine grass interior and are situated on the ground in low vegetation, sometimes slightly raised on top of pickleweed or saltgrass (Fitton 2008, Wheelright and Rising 2008). Most pairs have at least two broods per season (Wheelright and Rising 2008). Bryant's savannah sparrows are visual hunters that actively search for prey on the ground, feeding on invertebrates and small seeds (CalPIF 2000).

3.21.3 Habitat associations

Bryant's savannah sparrows reside in low tidal marshlands and adjacent ruderal communities, and, within the fog belt, in mesic grasslands (Fitton 2008). Within tidally influenced habitats, the species is associated with the higher marsh dominated by pickleweed and/or saltgrass; within mesic grasslands, the species is associated with short herbaceous vegetation communities that lack woody plant cover; in all habitats bare ground is an important component of the habitat (Fitton 2008).

3.21.4 Threats

The destruction and fragmentation of coastal marshes is the primary threat to this species (Fitton 2008). Other potential threats include oil spills, removal of grazing on grasslands resulting in succession, and fire suppression (Fitton 2008).

3.21.5 Sensitivity to forest management activities

Little sensitivity to disturbances caused by timber management since Bryant's savannah sparrows are not closely associated with timber habitats. Bryant's savannah sparrows could be sensitive to disturbance of open habitats if used for timber management operations such as landings, staging areas, or new roads.

3.22 Tricolored Blackbird

Scientific Name: *Agelaius tricolor*
Federal Status: (none)
State Status: Species of Special Concern

3.22.1 Distribution

Tricolored blackbird is a year-round resident in California, where it is largely endemic (Beedy 2008). The species is common locally throughout the Central Valley and in coastal areas from Sonoma County south through Monterey County (Zeiner et al. 1990b, Beedy and Hamilton 1999, Beedy 2008). It is also found more sporadically in Mendocino and Humboldt counties, as well as northeastern California, the western Mojave Desert, and the southern California coast (Beedy 2008). Although there are no tricolored blackbird sightings documented in the primary assessment area, there is an observation documented in the secondary assessment area less than 1 mi (1–2 km) north of the Big River inventory block (CDFG 2009a).

3.22.2 Life history

Tricolored blackbirds are sometimes polygynous but form pair bonds through a large variety of courtship displays both before birds have paired and during nesting and breeding (Beedy and Hamilton 1999). Breeding begins in mid-April and continues throughout July, breeding has been reported to continue into the early fall (Zeiner et al. 1990b). Tricolored blackbirds are colonial nesters, with some colonies (mostly located in the Central Valley) reaching up to over 20,000 nests across a 10 ac (4 ha) area (Zeiner et al. 1990b). Nests are generally built within cattail and tule stands, but are also constructed in dense thickets of riparian vegetation such as willow or blackberry and are always adjacent to fresh water (Zeiner et al. 1990b, Beedy 2008). Plant materials and mud are used in nest construction to weave surrounding vegetation tightly together to protect the nest (Beedy and Hamilton 1999). Most pairs have two broods per season and three or four eggs per clutch (Zeiner et al. 1990b, Beedy and Hamilton 1999). Tricolored blackbirds are visual hunters that actively search for insects on the ground or in vegetation, occasionally capturing insects in the air (Beedy and Hamilton 1999, Hamilton 2004). Tricolored blackbirds also feed on seeds and other grains, often associated with rice fields (Zeiner et al. 1990b).

3.22.3 Habitat associations

Tricolored blackbirds reside in emergent wetland vegetation, often in cattails and tules; nesting habitat components include open accessible fresh water, a protected nesting substrate (including flooded or thorny vegetation), and a suitable nearby foraging space with adequate insect prey (Beedy and Hamilton 1999, Churchwell et al. 2005, Beedy 2008). Birds often feed in grasslands and agriculture fields (e.g., rice and alfalfa fields, cattle feedlots) as well as in riparian scrub and freshwater marsh habitats (Beedy and Hamilton 1999, Beedy 2008).

3.22.4 Threats

Habitat loss and degradation is the primary threat to this species (Beedy 2008). Other threats include plowing of agricultural fields with active colonies and nest predation by black-crowned night herons (*Nycticorax nycticorax*) and common ravens (*Corvus corax*), as well as coyotes (*Canis latrans*) and raccoons (*Procyon lotor*) when water is withdrawn from silage fields or freshwater marshes (Churchwell et al. 2005, Beedy 2008).

3.22.5 Sensitivity to forest management activities

This species exhibits little sensitivity to disturbances caused by timber management since tricolored blackbirds are not closely associated with timber habitats. Tricolored blackbirds could be sensitive to disturbance of open habitats if used for timber management operations such as landings, staging areas, or new roads; or if reforestation around breeding marshes converts foraging areas to unsuitable timbered conditions.

4 INVERTEBRATES

4.1 Behren's Silverspot Butterfly

Scientific Name: *Speyeria zerene behrensii*
Federal Status: Endangered
State Status: (none)

4.1.1 Distribution

In California, the species *Speyeria zerene* only occurs in the Sierra and Coast ranges (Garth and Tilden 1986, USFWS 2003). Within this range, the historical range of the federally endangered subspecies Behren's silverspot butterfly *(Speyeria zerene behrensii*) extends from southern Mendocino County in the vicinity of Point Arena south along the immediate coast to Stewart's Point in Sonoma County (Shapiro and Manolis 2007). The single known extant population of Behren's silverspot butterfly is on private land near Point Arena in Mendocino County (USFWS 2003, CDFG 2009a), which overlaps with the Garcia River inventory block in the secondary assessment area, approximately 2–4 mi (3–6 km) from the primary assessment area. Quadrangles associated with this population are Point Arena and Gualala. In addition, there is location data for an extirpated population of Behren's silverspot butterfly immediately adjacent to the primary assessment area in the secondary assessment area of the Albion inventory block (in the Comptche quadrangle) (CDFG 2009a). There are no records for this species in the primary assessment area. Potential colonization sites and historical sites extend along the coast, south of Point Arena.

4.1.2 Life history

Most of the knowledge of the life history of Behren's silverspot butterflies is based on what is known about the closely related Oregon silverspot butterfly (*Speyeria zerene hippolyta*). Females likely lay eggs in the dry stems and/or duff of violets (*Viola* spp.), the larval food plant (USFWS 2003, Shapiro and Manolis 2007). Immediately after hatching in late-summer/early-fall, larvae consume their eggshell lining then spin a silk pad to overwinter. In early spring, post-diapausal larvae search for food. After five stages of development (instars), which is thought to occur somewhat faster than that of the Oregon silverspot butterfly, a pupa is formed within a chamber of leaves drawn together with silk. After two weeks the adult emerges; the adult flight period for Behren's silverspot butterfly is thought to occur during mid- to late-summer (i.e., July to August, USFWS 1997b). Oregon silverspot butterflies display single brooding and female emergence after males, which likely also occurs in Behren's silverspot butterflies. Adult lifespan is approximately 3 weeks (USFWS 2003).

4.1.3 Habitat associations

This species occurs in coastal terrace prairies and, based on the habitat preference of the closely related Myrtle's silverspot butterfly, potentially in coastal sand dune systems (USFWS 2003). Within these communities, Behren's silverspot butterflies also require the presence of both larval host plants (violets [*Viola* spp.]) and nectar sources for adults (e.g., yellow bush lupine [*Lupinus arboreus*], potentially thistles [*Cirsium* spp.]) (USFWS 2003).

4.1.4 Threats

Habitat loss is the primary threat to this subspecies. Accelerated coastal terrace prairie succession due to fire suppression, habitat conversion by invasive plant species (e.g., Scotch broom [*Cytisus scoparius*], Himalayan blackberry [*Rubus discolor*], various nonnative grasses), and development have all contributed to reduced available habitat (USFWS 2003). In addition, intense cattle grazing may reduce habitat quality; however, the use of lower stocking rates at appropriate times may reduce thatch and benefit the species (USFWS 2003). Finally, over-collecting, both for illegal trade and for study, can negatively affect populations (USFWS 1997b, USFWS 2003).

4.1.5 Sensitivity to forest management activities

Silvicultural practices that reduce natural disturbance levels may result in increased forest canopy cover of certain species (e.g., Monterey pine [*Pinus radiata*], lodgepole or shore pine [*Pinus contorta* ssp. *contorta*], red alder [*Alnus rubra*]), potentially leading to habitat conversion of coastal terrace prairies (USFWS 2003).

4.1.6 Comments

The Behren's silverspot butterfly is one of seven subspecies of *Speyeria zerene* in California (USFWS 2003). Two extant subspecies, *S. z. puntareyes* and *S. z. sonomensis*, were both formerly considered to be members of the subspecies *S. z. myrtleae*, which had been listed as a federally endangered species (Shapiro and Manolis 2007). Oregon silverspot butterfly is federally listed as threatened (USFWS 1997b).

4.2 Lotis Blue Butterfly

Scientific Name: *Lycaeides argyrognomon (=Plebejus idas) lotis*
Federal Status: Endangered
State Status: (none)

4.2.1 Distribution

The federally endangered lotis blue butterfly (*Lycaeides argyrognomon lotis*) is thought to have occurred historically in California in coastal Mendocino, Sonoma, and possibly Marin counties (Tilden 1965). Since 1959, lotis blue butterflies have been observed or collected at only one site, located in a Pacific Gas & Electric Company (PG&E) right-of-way approximately 2.7 mi (4.3 km) north of the town of Mendocino in coastal Mendocino county (referred to as the PG&E site) (USFWS 2011b). This site is in the secondary assessment area, approximately 8 mi (13 km) from the primary assessment area within the Albion inventory block (CDFG 2009a), associated with the Mendocino quadrangle. Lotis blue butterfly was not detected on MRC property in the primary assessment area during surveys completed by Dr. Gordon Pratt (2003). This butterfly was last documented in 1983 (Shapiro and Manolis 2007).

4.2.2 Life history

Little is known of the specific breeding behavior or life history of the lotis blue butterfly. Based on information available for closely related subspecies, adults probably live about one week (Arnold et al. 1994). Information regarding reproductive ecology has been extrapolated from museum records and that of sister taxa. Eggs are likely laid during the adult flight season between mid-April and early July (USFWS 1985, 2007b). Diapause probably occurs during the second instar larval stage, as observed in other *L. argyrognomon* subspecies, but may occur pre-larval (i.e., obligate egg diapause) as seen in *L. a. anna* (USFWS 1985). Once feeding is resumed during spring, growth resumes and larvae likely fully develop within 4–6 weeks; the subsequent pupal stage presumably lasts another few weeks (USFWS 1985, 2007b).

4.2.3 Habitat associations

Habitat for the lotis blue butterfly has been historically characterized by early successional wet meadows and *Sphagnum* willow bogs, which are usually surrounded by pygmy, closed-cone pine, or mixed coniferous forest (USFWS 1985, 2007b). The lotis blue butterfly is believed to require a specific larval host plant or plants on which to lay its eggs, probably a species of *Lotus* (potentially seaside bird's-foot trefoil [*Lotus formosissimus*]) (USFWS 1985, 2007b) or potentially Pacific pea (*Lathyrus vestitus* var. *ochropetalus*; Arnold 1983). Preferred adult foraging habitat most likely consists of open, sunny areas where flowers are available for nectar (USFWS 1985).

4.2.4 Threats

Habitat loss, conversion to agriculture, fragmentation, and fire suppression were probably early factors in the decline of this species (Shapiro and Manolis 2007). Although the butterfly may have been naturally rare, it may have further declined due to natural factors such as a drying climate trend or vegetation community changes over long time periods (USFWS 2007b). At the PG&E site population, groundwater changes that altered the water table may have reduced bog habitat and the seaside bird's-foot trefoil population, as observed during the 1976–1977 drought when no lotis blue butterflies were observed (USFWS 1985). Alternatively, factors that reduced the host plant's populations (e.g., fire suppression, increased shade, vegetation succession) may also have affected the butterfly (USFWS 2007b). Other threats include peat mining, herbicide and/or insecticide use, logging, and specimen collection (USFWS 1985).

4.2.5 Sensitivity to forest management activities

Silvicultural practices that result in increased forest canopy cover or conversion of early successional, grassland, or bog habitats to forest may impact lotis blue butterfly habitat. Activities associated with timber harvesting, such as road construction or urbanization, may adversely affect the lotis blue by altering the hydrology of the preferred habitat of the butterfly and its suspected larval host plant. Fire suppression may also reduce the extent and quality of early successional vegetation and the number of small natural forest openings that may support butterfly populations.

4.2.6 Comments

The lotis blue butterfly is distinguished from the other 12 subspecies by its very large wingspan (approximately 1.0 in [2.5 cm]), wing color, and maculation pattern (USFWS 1985).

5 MAMMALS

5.1 Pallid Bat

Scientific Name: *Antrozous pallidus*
Federal Status: (none)
State Status: Species of Special Concern

5.1.1 Distribution

Pallid bat is widespread in most of California with the exception of the high Sierra Nevadas (up to 6,560 ft [2,000 m]) (Pierson and Rainey 2002) and the northwestern corner of the state (Zeiner et al. 1990c). Pallid bats are most abundant in xeric habitats, specifically the Great Basin, Mojave, and Sonoran desserts (Sherwin and Rambaldini 2005). Pallid bats have been documented in the primary assessment area in the Ukiah inventory block (MRC, unpublished data) and just outside of the secondary assessment area in adjacent quadrangles.

5.1.2 Life history

The pallid bat is a colonial species, with a typical maternal colony size of 50–300 (Hermanson and O'Shea 1983, Lewis 1994, Pierson et al. 1996). Breeding occurs from late October to February, with delayed fertilization and a gestation of 53–71 days. With the average litter size of two, young are born between April and July and are weaned in seven weeks. In California, pallid bats do not migrate long distances between summer and winter sites, but are believed to make local movements to hibernacula to undergo a daily shallow torpor (Hermanson and O'Shea 1983, Sherwin and Rambaldini 2005).

Pallid bats primarily forage in open spaces away from water. Pallid bats can feed on the ground, on vegetation, and in the air by using a 'wing-cupping' method which forces the prey to the ground (Sherwin and Rambaldini 2005). Their generalist diet consists primarily of large ground-dwelling or slow flying insects and arachnids (Zeiner et al. 1990c), but can also includes scorpions (pallid bats are subsequently immune to the sting), small rodents, and lizards.

5.1.3 Habitat associations

The pallid bat occurs throughout California in a variety of habitats from desert to coastal regions. At low- to mid-elevations, pallid bats are particularly associated with oak habitat (oak savannah, black oak, and oak grasslands) (Pierson and Rainey 2002). In natural settings, day and night roosts are located in rock crevices and cliffs, but can also be found in tree hollows and caves (Hermanson and O'Shea 1983; Lewis 1994, 1996; Pierson et al. 2002, 1996). However, in more urban settings (e.g., Central Valley and western Sierran foothills), day and night roosts are frequently associated with human structures such as abandoned buildings, old mine workings, and bridges (Pierson et al. 1996, 2001). Overwintering roosts require relatively cool and stable temperatures out of direct sun light.

5.1.4 Threats

The pallid bat is highly sensitive to human activity. Any disturbance to roosting sites, especially large maternal colonies, can make them vulnerable to mass displacement ultimately affecting their metabolic economy. Additional threats include: closing or reopening of mines, recreational caving, and disturbance, maintenance, and construction at or near man-made cave-like structures.

5.1.5 Sensitivity to forest management activities

Activities that lead to the removal of oak trees in open oak habitat could have impacts on roosting and foraging habitat for this species.

5.2 Western Red Bat

Scientific Name: *Lasiurus blossevillii*
Federal Status: (none)
State Status: Species of Special Concern

5.2.1 Distribution

Western red bats have been observed near the Pacific Coast, Central Valley, and the Sierra Nevada in California. Usually found at lower elevations, recent acoustic surveys in California have documented that western red bats, while relatively rare, are broadly distributed up to 8,202 ft (2,500 m) in the Sierra Nevada (Pierson et al. 2001, 2006). There are no CNDDB occurrences of this species documented within the primary assessment area, secondary assessment area, or adjacent lands.

5.2.2 Life history

Western red bats in California sexually segregate in summer, with males moving to higher elevations and breeding females and young typically roosting at lower elevations (Grinnell 1918). Reproduction occurs between August and September with the onset of delayed fertilization occurring in March. Females typically give birth to four young. This species is migratory, and winter records for both sexes are concentrated along the central and southern coast (Pierson et al. 2006). Winter behavior is not well understood, however western red bats apparently arise from hibernation on warmer days to feed (Shump and Shump 1982).

Western red bats forage at both canopy height and low over the ground (Shump and Shump 1982). Diet studies in California suggests that the species feeds primarily on small moths, but a variety of other insects, particularly orthopterans, are also eaten (Ross 1961). Along the central Sacramento River, western red bats were repeatedly observed flying within one meter of the water surface, presumably foraging on emerging insects (Stillwater Sciences et al. 2003).

5.2.3 Habitat associations

This species roosts non-colonially in dense canopies and within tree foliage, beneath overhanging leaves (Constantine 1959, Shump and Shump 1982). Roosts have been observed near streams, fields, and orchards. Studies in the Central Valley found that summering populations of western red bats are substantially more abundant in remnant stands of cottonwood/sycamore riparian greater than 164 ft (50 m) wide than in younger, less extensive stands (Pierson et al. 2006). Foraging habitats of western red bat are not currently well-understood.

5.2.4 Threats

Since this species often roosts in riparian trees, activities that limit re-establishment of or degrade riparian vegetation including cottonwoods and sycamores could impact this species.

5.2.5 Sensitivity to forest management activities

Forest management affecting riparian corridors and vegetation communities may affect roosting and foraging habitat. While foraging habitats are not currently well-understood, earlier successional stages are presumed to provide higher foraging value than later successional stages due to the higher availability of insect prey species.

5.3 Townsend's Western Big-eared Bat

Scientific Name: *Corynorhinus townsendii townsendii*
Federal Status: (none)
State Status: Species of Special Concern

5.3.1 Distribution

Townsend's big-eared bats have been documented from sea level to 10,800 ft (3,300 m) although in California, maternity roosts appear to be confined to elevations below 5,900 ft (1,800 m) (Pierson and Fellers 1998, Sherwin and Piaggio 2005). This species occurs throughout California and is associated with caves and structures in a variety of habitats from deserts to coastal scrub to montane forests. Townsend's western big-eared bats have not been documented within the primary assessment area, but have been documented within the secondary assessment area, approximately 1–2 mi (3–4 km) south of the Garcia River inventory block (CDFG 2009A), associated with the Gualala quadrangle, and just outside of the secondary assessment area in adjacent quadrangles.

5.3.2 Life history

Mating of Townsend's western big-eared bats occurs in October–February (Sherwin and Piaggio 2005). Delayed fertilization occurs in spring when insect prey are most abundant, although insemination may occur prior to winter hibernation. Maternal colonies form between March and June and consist of 25–300 adult females. Males remain solitary during this time. The length of gestation is temperature-dependent, usually ranging from 60 to 100 days. A female will give birth to one young which will wean after six weeks. Sexual maturity is reached after one year. Although seasonal movement patterns of Townsend's western big-eared bat are not well understood, hibernating colonies of Townsend's big-eared bat can include mixed sexes and can range from single individuals to several hundreds, and up to thousands (Sherwin and Piaggio 2005). This species feeds primarily on small moths, which comprise over 90% of its diet, and other insects (Kunz and Martin 1982, Sherwin and Piaggio 2005).

5.3.3 Habitat associations

This cavity-dwelling species roosts and hibernates in caves (commonly limestone or basaltic lava), mines, buildings, bridges (with a cave-like understructure), rock crevices, tunnels, basal hollows in large trees, and cave-like attics (Pierson and Fellers 1998, Pierson and Rainey 2007, Pierson et al. 2001, Pierson and Rainey 1996, Sherwin et al. 2000, Sherwin and Piaggio 2005).

Foraging has been observed in a variety of habitats (e.g., oak woodlands, desert scrub, alfalfa fields). In coastal California, radio-tracking studies documented foraging along vegetated creek drainages and in forested areas (Fellers and Pierson 2002). Townsend's big-eared bats have been observed feeding in the air along forest edges (Kunz and Martin 1982), and capturing insects in proximity to vegetation (Fellers and Pierson 2002).

5.3.4 Threats

The greatest threat to this species is disturbance or loss of roost sites. They are sensitive to human activity (i.e., recreational caving, closing or reopening of mines); once disturbed, colonies may abandon the roost (Humphrey and Kunz 1976, as cited in Sherwin and Piaggio 2005).

5.3.5 Sensitivity to forest management activities

Forest management practices involving the removal of riparian vegetation may decrease foraging and roosting habitat and spraying pesticides in forested areas may affect the prey base (moths) (Sherwin and Piaggio 2005). Removal of trees with large basal hollows would have direct and immediate impacts to potential roost sites (including maternity roosts); retention and recruitment of such structures is needed to preserve important Townsend's western big-eared bat habitat. Fire prevention can curtail the processes important in creating quality nest and roost hollows in redwood trees.

5.4 California Ringtail

Scientific Name: *Bassariscus astutus raptor*
Federal Status: (none)
State Status: Fully Protected

5.4.1 Distribution

California ringtail ranges over the entire state of California, with the exception of the extreme northeast corner and the southern portions of the San Joaquin Valley (Orloff 1988). It is found on the lower western slope of the Sierra Nevada and the Pacific drainage slope of the Coast Range from the Oregon line west of Mt. Shasta and south to Ventura County. The average altitudinal distribution of ringtails in California is 1,900 ft (580 m) on the north coast, 2,800 ft (850 m) in the northern Sierra Nevada, and 3,900 ft (1,190 m) in the southern Sierra Nevada (Grinnell et al. 1937, Schempf and White 1977). Within the primary assessment area, MRC documented two detections of California ringtail using track plate surveys within the Noyo inventory block (MRC, unpublished data). There are no other recorded occurrences of this species within the secondary assessment area or adjacent lands.

5.4.2 Life history

The ringtail is active year-long, non-migratory, and nocturnal. This species is solitary except during the mating season (Poglayen-Neuwall and Toweill 1988) which occurs February to May (Poglayen-Neuwall and Poglayen-Neuwall 1980). A litter of 2–4 young is born in May or June (Walker et al. 1968). The young are weaned at 4 months, with sexual maturity reached at approximately 10 months (Nowak 1991). Ringtails are omnivorous, preferentially eating rodents (e.g., woodrats, mice) and rabbits, but also taking birds and eggs, reptiles, fruits, nuts, and some carrion (Taylor 1954, Trapp 1978). Likely predators of ringtails are bobcats, raccoons, foxes, and large owls (Zeiner et al. 1990c).

5.4.3 Habitat associations

Little is known about the specific habitat requirements of ringtails. Ringtails are found in a variety of habitats, but are typically found in a mixture of forest and shrubland in close association with rocky areas or riparian habitats. Ringtails are usually not found more than 0.6 mi (1 km) from permanent water. Dens are located in rock crevices, tree cavities, logs, snags, abandoned burrows, woodrat nests, ruins of Native American dwellings, and sometimes in the upper parts of cabins (Zeiner et al. 1990c, Nowak 1991).

5.4.4 Threats

Although ringtails now have protection in many states, many fall victim to traps set for other furbearing animals (Nowak 1999, Poglayen-Neuwall and Toweill 1988). Although specific threats to ringtails over their range in California are not documented, some populations have been extirpated due to urbanization of coastal basins in southern California and the San Francisco Bay Area, and to general loss and degradation of riparian habitat throughout California (Williams 1986).

5.4.5 Sensitivity to forest management activities

The effects of timber harvest on ringtails are unknown. However, the availability of snags and downed logs suitable for denning habitat is generally lower in managed forests (Cline et al. 1980). Ringtails apparently avoid clearcuts and shrubby areas possibly due to the lack of adequate den sites in the form of standing trees or snags (Callas 1987).

5.5 Humboldt Marten

Scientific Name: *Martes americana humboldtensis*
Federal Status: (none)
State Status: Species of Special Concern

5.5.1 Distribution

Humboldt marten, a recognized subspecies of the American marten (*Martes americana*), is endemic to northwestern California and extreme southwest Oregon (Grinnell et al. 1937, Gibilisco 1994, Slauson et al. 2001). Humboldt marten were once common in the narrow coastally influenced forest belt extending from sea level to about 3,000 ft (915 m) between Sonoma County, California north to Curry County Oregon (Grinnell et al. 1937, Gibilisco 1994, Slauson et al. 2001, 2003). Currently there is one confirmed population of Humboldt marten located near Redwood National and State Parks that occupies approximately 5% of the historical range (Zielinski et al. 2001, Slauson et al. 2003). There are no recorded occurrences of Humboldt marten within the primary assessment area, secondary assessment area, or adjacent lands.

5.5.2 Life history

The marten breeding season extends from June to August. A litter of one to five kits is born in late March or early April. Young martens are weaned after 42 days and sexual maturity is reached at 15 to 24 months (Buskirk and Powell 1994). Martens are dietary generalists and forage on a variety of vertebrates, bird eggs, insects, and fruit. They eat carrion as well as birds and mammals that they kill themselves (Buskirk and Ruggiero 1994). Diet changes seasonally based on animal prey and fruit crop abundance (Buskirk and Ruggiero 1994, Martin 1994). In California, martens maintain home ranges of approximately 740 ac (300 ha) (Spencer et al. 1983). There is no available information on migration or movement patterns of Humboldt marten, but studies have shown that American martens are highly mobile animals and have home ranges that are 3–4 times larger than predicted for similar-sized terrestrial mammalian carnivores (Buskirk and Ruggiero 1994). While martens are capable of long distance dispersal movements, most juveniles that disperse and successfully establish home ranges move an average of 2.5 to 4.3 mi (4 to 7 km) (Johnson et al. 2009).

5.5.3 Habitat associations

Martens are considered one of the most habitat-specific mammals in North America (Buskirk and Ruggiero 1994). Studies have found that martens use mid- to late-successional stands of mesic conifers with complex physical structure near the ground and dense canopy closure (Buskirk and Powell 1994). Dense, spatially extensive shrub cover is a critical habitat element for the Humboldt marten (Slauson 2012, Slauson et al. 2007). Martens typically occupy old-growth stands with shrub layers under the coastal forest canopy that average >70% cover, are dominated by long-lived shade tolerant species, and form continuous structural layers connecting adjacent forest stands (Slauson 2012). Martens are known to forage in areas where habitat structure renders prey vulnerable and where suitable resting structures are abundant (Burskirk and Powell 1994). While Humboldt martens use stands other than old growth for foraging, a large patch of old-growth forest is a prominent component of their home ranges (Slauson 2012). Humboldt martens are associated with large patches of old-growth habitat (greater than approximately 250 ac [100 ha]); smaller patches (less than approximately 370 ac [150 ha]) support unstable marten occupancy (Slauson 2012; Slauson et al. 2007, et al. 2009). Resting and denning structures are typically located in the largest available woody structures, and to a lesser extent rock piles and slash piles (Bull and Heater 2000).

5.5.4 Threats

Timber harvest practices that reduce or eliminate conifer-dominated late seral stage forests with dense shrub cover; and loss of genetic variation within a continually small population (Slauson et al. 2003).

5.5.5 Sensitivity to forest management activities

Marten does not occur in extensively logged redwood forests (Slauson et al. 2003). Clearcut and heavily logged stands generally are not used by martens for several decades following timber harvest and recovery of a heavy understory shrub component (Buskirk and Powell 1994). Humboldt martens do not occupy areas with high road densities, presumably due in part to the roads enhancing habitat for generalist predators to the detriment of Humboldt martens (Slauson 2012).

5.6 Pacific Fisher

Scientific Name: *Martes pennanti pacifica*
Federal Status: Candidate, under review by USFWS
State Status: Species of Special Concern

5.6.1 Distribution

Pacific fisher, a subspecies of the fisher, has a fragmented and patchy distribution in the north coast and Klamath Province of California at elevations ranging from 83 to 3,300 ft (25 to 1,000 m) (Zielinski et al. 1995). There have been no recent confirmed sightings of Pacific fisher in the primary or secondary assessment areas (CDFG 2010). MRC biologists have surveyed the primary assessment area according to Zielinski and Kucera (1995) protocols, resulting in no detections of Pacific fisher (S. Billig, pers. comm., email correspondence with H. Shepley, 15 October 2009). There are two unconfirmed reports of Pacific fishers on MRC land: one in the Cottaneva Creek watershed within the Rockport inventory block in February of 2001 (A. Nadig 2001, unpublished data, as cited in MRC 2005); and one in the North Fork Big River watershed within the Big River inventory block in July of 1995 (D. Juliano 1995, unpublished data, as cited in MRC 2005). There are two reported occurrences of this species that fall just outside of the assessment area; one approximately 4–5 mi (7–8 km) east of the Noyo inventory block and one 28–29 mi (46–47 km) north of the Rockport inventory block (CDFG 2009a). Two Pacific fishers were accidentally trapped in the northeastern part of the county in 1994 and 1995, outside of MRC lands (MRC unpublished data). There have also been sighting of Pacific fishers roughly 30 mi north of the primary assessment area, on what were previously Pacific Lumber Company Lands (PALCO 2004).

5.6.2 Life history

Male and female fishers reach reproductive age at 1 year and probably breed from early January to early April (Powell and Zielinski 1994, citing many authors). Birth likely occurs in late March and early April (Hall 1942, as cited in Powell and Zielinski 1994). Litter size averages 2 to 3 young (Zeiner et al. 1990c); up to three different den trees may be used during the three months after giving birth, April to June (Weir and Almuedo 2010). The fisher’s diet changes in response to prey availability. The fisher’s diverse range of prey includes small rodents (including deer mice, red-backed voles, and voles) and squirrels, skunks, hares, rabbits, porcupines, mountain beavers, gophers, and chipmunks (Grenfell 1979, Powell and Zielinski 1994, Golightly 1997). Fishers also feed on carrion, insects, and vegetable matter (Grenfell 1979, Zielinski et al. 1999).

5.6.3 Habitat associations

Landscapes dominated by old-growth forests with complex vertical and horizontal structure (Aubry and Raley 2006) are common habitat for fishers (Schempf and White 1977). Pacific fishers in California are typically associated with mixed conifer, Douglas-fir, and ponderosa pine forests with at least 50% canopy cover (Zielinski et al. 1997). Breeding and resting activities are often associated with large tracts of dense habitat with a substantial snag and large downed wood component (Schempf and White 1977). Small fisher home ranges reported in California include study areas with mast-producing hardwoods (e.g., tanoak and madrones) as a major forest component, presumably resulting in abundant prey, since such species provide substantial food sources for potential fisher prey species (Lofroth et al. 2011). Cavities that are located in the upper portions living trees or snags are often used for dens (Powell and Zielinski 1994). Large hardwoods may provide enhanced natal and maternal cavities (Thompson et al 2007). Fishers will use cavities created by pileated woodpeckers in diseased trees for natal and maternal dens (Aubry et al. 1997). Resting substrate includes cavities in living trees or snags, downed wood, stumps, mistletoe brooms, squirrel and raptor nests, brush piles, rock falls, and holes in the ground (Powell and Zielinski 1994).

5.6.4 Threats

Timber harvest is the biggest threat to fishers because historical as well as some modern logging practices fragment habitat and degrade existing habitats (Powell and Zielinski 1994). Trapping has led to large declines in fisher populations in the United States (Powell and Zielinski 1994). While fisher trapping is no longer legal, fishers are often trapped incidentally (Lewis and Zielinski 1996). Human presence through recreation and associated infrastructure (e.g., roads and trails) negatively affects fishers (Powell and Zielinski 1994). Fisher mortality increases with proximity to heavily used roads (e.g., due to collision mortality), and the presence of roads decreases use of surrounding habitat (Dark 1997, Golightly 1997). Indiscriminant use of rodenticides has recently been identified as a risk factor fishers (Gabriel et al. 2011).

5.6.5 Sensitivity to forest management activities

Timber harvesting is likely the major factor responsible for the declines in fisher populations in the United States (Powell and Zielinski 1994). Removal of large trees, snags, and downed logs, and reduced canopy cover appear to negatively impact this species by removing denning and resting sites, as well as structural and species components associated with prey composition, abundance, and vulnerability (Thompson and Haerestad 1994, Sturtevant and Bissonette 1997, as cited in Cooperrider et al. 2000). In addition to habitat loss, disturbance caused by timber harvesting and road building may also decrease habitat quality for fishers. Fishers are also negatively influenced by clearcut edges (Clem 1977, Buck 1982, Rosenberg and Raphael 1986, all as cited in Dark 1997).

5.7 American Badger

Scientific Name: *Taxidea taxus*
Federal Status: (none)
State Status: Species of Special Concern

5.7.1 Distribution

In California, badgers are uncommon, permanent residents throughout the state except in the humid coastal forests of Del Norte County and the northwest portion of Humboldt County (Harris and Ogan 1997, CDFG 1986, Grinnell et al. 1937). There are no documented occurrences of American badgers within the primary or secondary assessment areas; however, American badger was documented outside of the assessment area, approximately 5–6 mi (8–9 km) north of the Noyo inventory block (CDFG 2009a).

5.7.2 Life history

Badgers mate in summer and early fall; gestation lasts 180–260 days including time of delayed implantation (Long 1999, Sullivan 1996, Harris and Ogan 1997). An average litter of two to three is born in March or April (Harris and Ogan 1997). Young may emerge from the den as early as five to six weeks old, are weaned by June, and disperse in late summer (Long 1999, Harris and Ogan 1997). A female may breed in the first year with males not reaching sexual maturity until their second year (Harris and Ogan 1997). Home ranges of males span 1,300–2,600 ac (520–1,040 ha) during spring and summer, and average 163 ac (65 ha) for both males and females during winter (Harris and Ogan 1997). Badgers are carnivores that feed mostly on rodents: rats (*Ratus* sp.), mice (*Peromyscus* sp.), chipmunks (*Tamias* sp.), ground squirrels (*Spermophilus* sp.), and pocket gophers (*Thomys* sp.). Badgers are also somewhat opportunistic sometimes eating reptiles, insects, and carrion (Harris and Ogan 1997).

5.7.3 Habitat associations

Suitable habitat for badgers is characterized by shrubland, open grasslands, fields, and alpine meadows with friable soils (Long 1999, Harris and Ogen 1997). Badgers dig burrows in friable soils for cover and frequently use old burrows excavated by other species (Harris and Ogen 1997).

5.7.4 Threats

Agriculture and urban development have been the primary causes of decline and extirpation of populations of badgers in California (CDFG 1986). Rodent and predator poisoning pose double threats through direct and secondary poisoning of badgers (CDFG 1986).

5.7.5 Sensitivity to forest management activities

Although the American badger is somewhat tolerant of human activities, the effects of chronic disturbance and habitat degradation caused by timber harvest and associated activities may displace badgers or cause an increase in home range size (CDFG 1986). Creation of early-successional conditions may temporarily enhance habitat locally.

5.7.6 Comments

From Mendocino County south along the coast, American badgers have been drastically reduced from historic numbers (CDFG 1986, Grinell at al. 1937).

5.8 Point Arena Mountain Beaver

Scientific Name: *Aplodontia rufa nigra*
Federal Status: Endangered
State Status: Species of Special Concern

5.8.1 Distribution

Of the seven subspecies of mountain beavers, the Point Arena mountain beaver has the most limited range, known only to occur in western Mendocino County, California (USFWS 1991, 1998). The Point Arena mountain beaver occurs within narrow and irregularly shaped coastal valleys on north-facing slopes and protected gulches (USFWS 1991). Point Arena mountain beavers are known to occur as far north as Bridgeport Landing down to just south of Point Arena (MRC 2012). To date, there are 262 known Point Arena mountain beaver sites (J. Hunter, USFWS, e-mail message to Crain Hansen, ICF Jones and Stokes, 8 January 2009, as cited in MRC 2012). In the combined primary and secondary assessment areas, Point Arena mountain beavers have been documented in the Mills Creek, Mallo Pass Creek, Irish Creek, Alder Creek, Brush Creek, and Garcia river basins (within the Garcia River and South Coast inventory blocks) (CDFG 2009a). In the South Coast inventory block of the primary assessment area, there are currently 14 known Point Arena mountain beaver sites in 13 burrow systems; 10 of those burrow systems have been mapped, and range in size from 0.06 to 0.57 ac (0.02 to 0.23 ha) (MRC 2012). These mapped burrow systems add up to a total of 1.87 ac (0.76 ha) (MRC 2012).

5.8.2 Life history

Mountain beavers reach sexual maturity during their second year. The limited breeding season takes place during a one-to-two month window in late winter (USFWS 1991). Gestation lasts 20 to 30 days and a single litter of two to three is born in late February and March every year (Pfeiffer 1958, as cited in USFWS 1991). Studies have indicated that the majority of adult mountain beavers remain within 79 ft (24 m) of their burrows and have home ranges that vary from 0.01 to 0.08 ac (40 to 320 m^2) (Martin 1971, as cited in USFWS 1991, 1998). The Point Arena mountain beaver forages on succulent herbaceous plants and deciduous tree bark and leaves (Steele 1986, 1989).

5.8.3 Habitat associations

Point Arena mountain beavers have been found in a variety of habitat types including coastal scrub, coastal strand, conifer forest, and riparian plant communities (Steele 1986, as cited in USFWS 1998). This species is known to occur within narrow and irregularly shaped coastal valleys, often on north-facing slopes and gulches (USFWS 1991). Burrows and dens are most commonly located under dense patches of perennial vegetation in friable, well-drained soils (Steele 1986), often with high soil moisture. Mountain beaver populations seem to be positively associated with a tangle of second-growth species of trees, shrubs, forbs and downed wood on the forest floor (Carraway and Verts 1993).

5.8.4 Threats

The primary threats to Point Arena mountain beaver include habitat loss and fragmentation and urbanization in western Mendocino County. Other significant threats include livestock grazing, rodent control, timber harvest, and domestic and feral cats and dogs (Steele 1986, 1989).

5.8.5 Sensitivity to forest management activities

Mountain beavers may adapt relatively well to habitat changes resulting from timber harvest because of their subterranean habits and preference for dense vegetation that may be present following timber harvest or wildfire (Sleeper 1997). Animals may remain in their burrows despite the clearing of vegetation and burning, however, and Gyug (1997, as cited in USFWS 1998) observed that ground disturbance from timber harvest was related to a decrease in mountain beavers in southern British Columbia. T. Wooster (in litt. 1997, as cited in USFWS 1998) noted that the succession of shrubby open habitat preferred by the Point Arena mountain beaver to dense, closed canopy forest, may threaten some mountain beaver populations at several locations. The removal of downed logs associated with forest management could adversely affect mountain beavers.

5.8.6 Comments

This species would be covered under MRC's proposed HCP/NCCP.

5.9 Sonoma (=California Red) Tree Vole

Scientific Name: *Arborimus pomo*
Federal Status: (none)
State Status: Species of Special Concern

5.9.1 Distribution

In California, the Sonoma tree vole is restricted to coastal forests in the humid fog belt from Sonoma County north to the Klamath mountains (Williams 1986, Jameson and Peeters 2004, Adam and Hayes 1998). Distribution of Sonoma tree voles in many parts of their range is patchy (Hall 1981), but this species can be locally common (Williams 1986). The Sonoma tree vole has been documented within the primary assessment in the Albion, Big River, Garcia River, Navarro East, Navarro West, Noyo, Rockport, and South Coast inventory blocks (MRC, unpublished data; CDFG 2009a). In addition, there are numerous records of Sonoma tree vole throughout the secondary assessment area, including between 4 and 16 mi (2 and 26 km) northwest of the Rockport inventory block; less than 1–9 mi (less than 1.6–14 km) south/southeast of the Rockport inventory block; less than 1–8 mi (1.6–12 km) north and west of the Noyo inventory block, less than 1–2 mi (less than 1–3 km) north of the Big River inventory block, from immediately adjacent to 6 mi (9 km) north and south of the Albion inventory block, approximately 2 mi (3 km) east of the Navarro West inventory block, from adjacent to the west and 1–2 mi (2–3 km) east of the South Coast inventory block, and between adjacent and 7 mi (11 km) in all directions of the Garcia River inventory block (MRC, unpublished data; CDFG 2009a).

5.9.2 Life history

The Sonoma tree vole is a nocturnal rodent that is active year-round (Zeiner et al. 1990c). This species lives, nests, and feeds within the forest canopy, though males are rarely terrestrial (Williams 1986). The home range usually consists of one or more trees (Brown 1985, as cited in Carey 1991). Both sexes construct nests of Douglas-fir needles, typically located 20–60 ft (6–18 m) above the ground in branches or against trunks of Douglas-fir trees (Williams 1986). In cases where nests were found in species other than Douglas-fir, grand fir, and redwood, nests were on branches interlocking with branches of Douglas-fir. Breeding occurs throughout the year, peaking from February through September. Females breed 24 hours after giving birth to one to four young, with one or more litters per year. The young are weaned at 30–40 days (Zeiner et al. 1990c). The diet of the red tree vole consists of needles, buds, and the tender bark of twigs of Douglas-fir, western hemlock, grand fir, and Bishop pine (Williams 1986, Wooster 1996). Needle resin ducts are removed before the remaining part is eaten. Young needles may be consumed entirely (Harris 1990). Red tree voles obtain water from food or by licking dew or rainwater from coniferous trees (Maser 1965). Where present, tree voles are a common component of spotted owl diets (Forsman et al. 2004).

5.9.3 Habitat associations

The Sonoma tree vole is found in humid coastal coniferous forests composed of Douglas-fir, grand fir, western hemlock, Bishop pine, and/or Sitka spruce (Williams 1986, Jameson and

Peeters 2004, Wooster 1996). In Mendocino County, nests have occasionally been located on open ridge tops and in previously heavily logged and/or grazed areas (Wooster 1996). The predominant tree species used by red tree voles is Douglas-fir, with larger trees able to support colonies of tree voles (Meiselman 1987, Carey 1991, Wooster 1996, Thompson and Diller 2002, Jones 2003). Tree voles have also been documented nesting in tanoak, presumably due to its common occurrence in many Douglas-fir stands (Thompson and Diller 2002). Tree voles often select old-growth trees with large, single branches and/or cavities that can support their large nests. Based on a study by Thompson and Diller (2002), tree voles are hypothesized to start colonizing in tree stands as young as around 20 years old. Density of active vole nests increases significantly as stands mature beyond 20 years old (Thompson and Diller 2002). Wooster (1996) asserted that Sonoma tree voles generally avoid uniform stands and that they prefer mixed-age stands with some openings in the canopy. Chinnici et al. (2012) reported that Sonoma tree vole nests were found within all successional stages with the exception of the young growth Douglas-fir/hardwood type, though the highest proportion of nests in the redwood region of northern California were in un-harvested and partially harvested old-growth Douglas-fir stands.

5.9.4 Threats

Loss and fragmentation of habitat resulting from timber harvesting (particularly clear-cutting), forest fires, and clearing for agriculture and housing development represent the primary threats to the Sonoma tree vole (Williams 1986, Huff et al. 1992). Because of their susceptibility to predators (Swingle et al 2010), fragmentation effects may be exacerbated where the fragmentation concentrates both predators and prey. The invasion of Barred Owls may depress tree vole populations. Dispersal of this species may be limited by their inability to cross non-forested areas (Carey 1991).

5.9.5 Sensitivity to forest management activities

In some cases, timber harvesting practices are responsible for the direct mortality of Sonoma tree voles (Williams 1986). Sonoma tree voles are presumed to be susceptible to effects of forest fragmentation, as they are primarily arboreal, have a low reproductive rate, and are poor dispersers (Corn and Bury 1986, Williams 1986, Carey 1991, BLM 1996). Wooster (1996) suggested that local populations of red tree voles might be sustained by the California Forest Practice Rules that require retention of a minimum of 50% of both the understory and overstory vegetation along Class I and II streams and maintenance of a species composition that is similar to the pre-harvest stand. Chinnici et al. (2012) concluded that Sonoma tree vole could benefit from forest management strategies aimed at retaining a mature Douglas-fir stand component. Because of the vole’s strong association with Douglas-fir, practices that shift tree species composition away from Douglas-fir may affect the species’ viability and reduce populations.

5.9.6 Comments

Prior to 1991, all red tree voles were considered one species, *Arborimus longicaudus*. Subsequent genetic analysis resulted in a split into two distinct species whose ranges are divided near the Oregon-California border (Johnson and George 1991). The American Society of Mammalogists now recognize populations within California as *A. pomo* (Sonoma tree vole) and populations within Oregon as *A. longicaudus* (red tree vole) (Wilson and Reeder 1993).

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Appendix C

Public Scoping Reports

Scoping Meeting Summary

on the

Program Timberland Environmental Impact Report

for the

Mendocino Redwood Company's

Proposed Timber Operations and Forest Management

in Mendocino and Sonoma Counties

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Mendocino Redwood Company
Program Timberland Environmental Impact Report

Introduction

Scoping is the process of determining the coverage, focus, and content of an environmental impact statement (EIS)/environmental impact report (EIR) as prescribed in the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) respectively. Scoping helps to identify the range of actions, alternatives, environmental effects, and mitigation measures to be analyzed in depth, to select methods of assessment, and to eliminate from detailed study those issues that are not important to the decision at hand. Scoping is also an effective way to bring together and resolve the concerns of a project's proponents; interested federal, state, and local agencies; and other interested parties, including opponents of the project.

This report summarizes the results of two public scoping meetings conducted for the proposed Mendocino Redwoods Company (MRC) timber operations and forest management in Mendocino and Sonoma Counties. A separate report summarizes the written public comments received to date on the proposed MRC project (will be available under separate cover).

Background

On June 17, 2002, the California Department of Fish & Game (CDFG) distributed a Notice of Preparation for an environmental impact report regarding CDFG's issuance of a take permit in association with a natural community conservation plan for MRC's forest management in Mendocino and Sonoma Counties (SCH# 2002062055). Information was gathered for an environmental impact report, but an environmental impact report was not prepared pending further development of the natural community conservation plan. Since that time, California Department of Forestry (CDF) has elected to prepare a program timberland environmental impact report (PTEIR) for MRC's timber operations and forest management activities. As a result, CDF must assume the role of CEQA lead agency. The PTEIR will address the same general scope of activities as was initially contemplated for the environmental impact report and will replace it. However, the PTEIR will also analyze the impacts of those activities for purposes of compliance with the Forest Practice Act and the Forest Practice Rules. The PTEIR will therefore meet certain requirements of the Forest Practice Act and the Forest Practice Rules, as well as CEQA requirements. This notice supplements and updates CDFG's June 17, 2002 Notice of Preparation and reflects these changes.

Project Description

CDF intends to gather information necessary for the preparation of a PTEIR that will analyze MRC's timber operations and forest management in Mendocino and Sonoma Counties. MRC's timber operations include the cutting and removal of timber and other solid wood forest resources from timberlands for commercial purposes and related activities, such as the construction and maintenance of roads, fuel breaks, firebreaks, stream crossings, landings, skid trails, beds for the falling of trees, fire hazard abatement, and site preparation that involves the disturbance of soil or burning of vegetation following timber harvesting activities. MRC's forest management involves additional activities on MRC lands, including measures to: control the establishment, composition and growth of forests; conserve and restore fish, wildlife, and natural communities (i.e., habitat); protect water quality; and remediate existing, environmentally degraded conditions (such as old, poorly designed roads that cause erosion).

MRC will submit to CDF a draft timberland management plan (TMP) that will describe MRC's proposed timber operations. MRC will also prepare and submit to the CDFG, the USFWS, and the NMFS, a draft joint habitat conservation plan and natural community conservation plan (HCP/NCCP) and will submit to CDFG a draft Master Streambed Alteration Agreement. The HCP/NCCP and Master Streambed Alteration Agreement will describe MRC's forest management activities and will provide additional detail about MRC's timber operations that is relevant for conservation planning and fish and wildlife resource protection purposes. MRC's timber operations and forest management as described in the TMP, the HCP/NCCP, and the Master Streambed Alteration Agreement comprise the project that will be analyzed in the joint PTEIR/EIS for purposes of the State and Federal regulatory actions identified above.

MRC's TMP will include the performance standards and objectives MRC proposes to use for timber operations on its land, identify specific resource protection measures MRC proposes to implement, and identify how MRC proposes to achieve "maximum sustained production of high quality timber products," as required by the Forest Practice Rules. The PTEIR/EIS will analyze the draft TMP, inform CDF and the public generally of any significant environmental effects of MRC's proposed timber operations, identify possible ways to minimize the significant effects, and evaluate reasonable alternatives to the way MRC proposes to conduct timber operations under the TMP.

In addition, the PTEIR/EIS will analyze the draft HCP/NCCP and inform CDFG of the potential effects associated with CDFG's approval of the HCP/NCCP pursuant to section 2820 of the Fish and Game Code and issuance of a take permit pursuant to section 2835 of the Fish and Game Code. The take permit would authorize adverse impacts to certain species, including threatened species and endangered species, resulting from MRC's timber operations and forest management. MRC's proposed 80-year HCP/NCCP will encompass MRC's ownership and will include a conservation strategy for endangered species, threatened species, and other sensitive species and natural communities.

The PTEIR/EIS will also analyze MRC's draft Master Streambed Alteration Agreement and inform CDFG of the potential effects associated with CDFG's issuance of a final Master Streambed Alteration Agreement pursuant to section 1602 and section 1605(g).

CDF expects MRC to apply for waste discharge requirements from the North Coast Regional Water Quality Control Board for its timber operations and forest management. The PTEIR/EIS will include an analysis of the potential water quality impacts of MRC's activities that the Board may use for that purpose.

CDF expects MRC also to apply to the USFWS and the NMFS for incidental take permits based on the HCP/NCCP pursuant to Section 10(a)1(B) of the of the Endangered Species Act (16 U.S.C.A. §1539(a)(1)(B).).

Project Location

MRC's TMP and HCP/NCCP will cover lands that include mixed conifer forest and habitat important to the conservation of threatened and endangered species in the central California coast and northern California region. The TMP and HCP/NCCP area includes timberlands west of State Highway 101. Redwood is the dominant or co-dominant tree species. A map showing the areas under consideration in greater detail is available from MRC's website at: www.mrc.com/maps_charts.html.

Scoping Process

The federal Council on Environmental Quality's (CEQ's) NEPA Regulations and the State of California's CEQA Guidelines provide guidance for the scoping process. Scoping has the following specific and fairly limited objectives.

- To identify the concerns of the affected public and agencies.
- To facilitate an efficient EIS/EIR preparation process by assembling the cooperating agencies, assigning EIS/EIR writing tasks, ascertaining all the related permits and reviews that must be scheduled concurrently, and establishing time or page limits.
- To define the issues and alternatives that will be examined in detail in the EIS/EIR while simultaneously devoting less attention and time to issues that cause no concern.
- To save time in the overall process by helping to ensure that draft statements adequately address relevant issues, reducing the possibility that new comments will cause a statement to be rewritten or supplemented.

NEPA, CEQ's NEPA Regulations, nor the CEQA Guidelines require formal scoping meetings. However, an amendment to CEQA requires that a scoping meeting be conducted for a project of statewide, regional, or areawide significance.

Public Scoping Meetings

Three public scoping meeting were held in 2002 to solicit comments to help determine the scope of the HCP/NCCP and EIS/EIR. More recently, two meetings were held were held on March 23, 2006 in Fort Bragg and March 28, 2006 in Ukiah. A Notice of Preparation for the EIR was filed with the State Clearinghouse on March 10, 2006. In addition, public information was sent to various local radio, television, and print media, and as a result information was broadcasted and printed regarding the time, date, location, and purpose of the meetings. To ensure the neutral facilitation of the meetings and neutral recording of comments received at the meetings, MRC retained the public outreach and facilitation services of Austin McInerny, who facilitated the meetings held in 2002. A summary of the earlier scoping meetings is available at: http://www.mrc.com/habitat_conservplan.html#sessions.

Meeting Structure

At each meeting, the facilitator presented the meeting agenda, described the purpose of the meeting, the proposed process for the meeting, and the role of the facilitation team (facilitator and recorder). The facilitator also explained that a report summarizing the issues raised during the meetings and that this summary would be available to the public in hard copy format and for download from the MRC website. Following this discussion, the facilitator introduced Mike Jani from MRC who provided a description of the project's background and its relationship to the Habitat Conservation Plan and Natural Community Conservation Plan (HCP/NCCP). He also provided an overview of MRC's proposed timber operations and management strategies. The facilitator then provided a very brief summary of comments and issues identified during the 2002 scoping process and introduced Allen Robertson from CDF who summarized the CEQA and NEPA process and described a “Program Timberland Environmental Impact Report”. Following these presentations, a short break was held.

After the break, a moderated question-and-answer and comment period was conducted. During that time, CDF staff, project staff and members of the facilitation team responded to audience questions and attempted to clarify aspects of the project. The facilitator and his assistant recorded all verbal comments on a series of flip charts. Interested parties were also encouraged to provide comments in writing either on the blank comment cards that were distributed at the meetings or by U.S. mail after the meetings.

Attendees at the meetings received several handouts, including a meeting agenda; meeting operating rules; a copy of the NOP; a proposed schedule of the process; a diagram showing the relationship between all the necessary permits and environmental review; and a blank comment sheet.

Participating Staff

The following representatives from MRC, CDF, and the facilitation team participated in the scoping meetings.

- Mike Jani, MRC
- Jon Woessner, MRC
- Sarah Billig, MRC
- Allen Robertson, CDF
- Austin McInerny, facilitator
- Greta Kirschenbaum, recorder

Meeting Attendance

Approximately twenty citizens attended the Fort Bragg meeting and approximately twelve citizens attended the Ukiah meeting. Attendee sign-in information will be added to the project mailing list for future notifications.

Verbal Comments from Scoping Meetings

All public comments received at the meetings are listed below as they were recorded at each respective meeting. Participants were routinely asked whether the written summary on the flipchart accurately represented their comment. Requests to revise written summaries were done at the time of the request and were made directly onto the flipchart during the meeting. All participants were informed that comments would be presented in this summary document and that participants were responsible for informing the facilitation team of any revisions during the meeting.

Based on the range of comments received at the 2002 scoping meetings, the facilitation team created the following set of issue categories, which were used to summarize the comments received at the 2006 meetings.

- Monitoring and Adaptive Management
- Ecology and Hydrology of MRC land
- Endangered Species Act Decision – Making, Enforcement, and the HCP Process
- MRC Landscape Planning Model/Timber Operations
- Independent Scientific Review Teams
- Public Access
- Collaborative Data: Collection, Assessment, and Decision-Making
- Land Use/Land Management Practices
- Cumulative and Cultural Impacts
- Water Quality
- Multiple Agency Coordination
- NEPA/CEQA Alternatives Development and Approval Process
- Public Involvement in the Plan Development Process
- Other Issues

Comments are organized under these issue categories to facilitate future use of the input in the development and review of project alternatives, and to inform decisions about key topics for future public workshops sponsored that may be held by MRC. While some comments may fall into more than one issue category, the facilitation team has only listed each item once in the most appropriate category. During the meetings, participants also raised several questions. Not all the questions that were raised could be answered during the public meetings however, these questions will be the basis of continued discussion at future public workshops. Questions raised are also included below.

Ft. Bragg – May 23, 2006

Monitoring and Adaptive Management

- What are checks and balances that exist to make sure mitigation is implemented correctly and how will follow-up happen?

- If you realize that PTHP is not appropriate, is there a feedback loop that would require a THP?
- What happens when something not associated with a THP happens (e.g., landslide, fire) – is a new plan required?

Ecology and Hydrology of MRC Land

- Concerns about spotted owl. The northern spotted owl feeds on flying squirrels while the southern owls feed differently. Have major studies on spotted owls been done in northern range or down in the southern areas? If not, speaker has concern that information is inadequate on spotted owls.
- What about owls in Albion?
- How many acres of pygmy forest are on MRC's lands?

Endangered Species Act Decision – Making, Enforcement, and the HCP Process

- Entire life cycle of spotted owl should be considered; not just reproductive life.
- What are the impacts of the HCP on wildlife?
- How is the HCP actually completed and by whom?
- How long can the species decline before you try and mitigate for loss?
- Is the HCP revocable? Does it necessarily last for 80 years?
- Concerned about issuance of incidental take permits.
- How are various lifecycles of species being accounted for in HCP?
- Would like to see threat of barn owl to spotted owl addressed in plan.
- How is use of herbicide addressed in the plan?
- Are you going to analyze the effects of herbicides in the EIR/PTHP?
- Would like to see plan include provisions in place to prevent accidental effects on plants not targeted by herbicide use.
- How will biological and botanical resources be addressed?
- Would like to hear about MRC's ideas about making this a habitat development plan versus a habitat conservation plan. Where will this be covered? Can it be illustrated such that public can see it before the end of the scoping comment period?
- Do you have your list of species to be covered together?
- How many acres of MRC lands will be covered by plan?
- Will HCP cover lands other than MRC-owned land?

- Why in this political climate should MRC or the public trust that habitat will be protected through federal involvement?
- Process should be approached with great skepticism given the degree to which laws have been watered down.
- Building something programmatic over such a diverse, complex geographical area seems problematic.

Independent Scientific Review Teams

- Will there be research projects associated with plan and if so will they be peer reviewed?
- What happened with the science review team that was discussed during the earlier scoping process?

Collaborative Data: Collection, Assessment, and Decision-Making

- What about invertebrates? Not many volunteers qualified to survey for species.
- Find checklist to be woefully inadequate in providing public information.
- How can you get a complete biological inventory through using volunteers? How valid are these surveys?

Land Use/Land Management Practices

- Historically, how many management companies have owned/operated the property in question?
- How do changes in planning process affect MRC interaction with contiguous landowners?
- Would existing easement agreements with contiguous landowners change?
- How can we rest assured that MRC will honor existing easement/agreements with contiguous land owners/managers?
- What actions regarding actions on other landowners' lands would be covered in the plan?
- Can you run your forest without the HCP?

Cumulative and Cultural Impacts

- How do you address offsite impacts on species?
- How can you do a thorough cumulative impact analysis unless you have adequate baseline data?

Water Quality

- Are you dealing with the Environmental Protection Agency (EPA) in addressing Total Maximum Daily Loads (TMDL)?
- Who is water quality memorandum of understanding (MOU) with? Is this a separate document from the EIR?

Multiple Agency Coordination

- How will you ensure that the EIR will cover concerns raised by all agencies?
- Where are other agencies during the scoping process? It appears as if there is always someplace else you have to go for answers.

NEPA/CEQA Alternatives Development and Approval Process

- Will there be an implementation plan for Albion?
- Under what circumstances is the programmatic EIR no longer valid?
- How long does PTEIR last? Does it last beyond current owner's management of property?
- Would additional permits be required during PTHP process?
- How much is MRC paying for and how much are taxpayers paying for?
- Who is the consulting group preparing the EIR?
- Did the lead agency change? What caused the change?
- What happens to lands that MRC owns currently that get sold later?
- Will CDF do scoping in Sonoma County?
- Will this plan cover things outside of THPs like herbicide use?
- Does one CEQA document include the HCP?
- Are forest practice rules still adhered to in a PTHP? Are these equivalent of mitigation under CEQA?

Public Involvement in the Environmental Review Process

- If something is not documented in a master document, how will the public know that those things exist to be looked at?
- Can the public propose that a THP is out of the scope of the PTEIR?
- Will the public be able to review proposed mitigation?
- If a member of the public believed that there was new information not taken into account in the PTEIR, is there opportunity to comment?
- Are results of monitoring going to be made public?
- What is the public notification process that would occur regarding activities on the ground?
- Are you soliciting input through newspapers?
- If you were really interested in involving the public in this process, it seems that you would give us answers as we go along.

Other Issues

- How does MRC justify expense of planning process?
- Concern that MRC is trying to complete the HCP in Mendocino County; huge business risk.

Ukiah – May 28, 2006

Ecology and Hydrology of MRC Land

- How many spotted owls do you have on the property?
- What about the spotted owl? Has MRC's operations affected spotted owl?
- What does 120 owl territories translate into terms of number of owls inhabiting properties?

Endangered Species Act Decision – Making, Enforcement, and the HCP Process

- How do you know you're not counting the same owls when you're calling them into assess their numbers?
- Are marbled murrelets included in the incidental take permit request?
- Does plan increase current restricted range of Coho salmon?
- Does the process by which you capture the owls habituate them?

- How do you capture the owls to tag them?
- Is there a commitment to expand the range of Coho?
- Lack of comfort with 80-year incidental take permit.
- What about other species besides spotted owl?
- What is proposed for the marbled murrelet?
- How long of a planning horizon is MRC covering with this process?

MRC Landscape Planning Model / Timber Operations

- Do you try to keep a balance where you cut more than inventory?
- Does spotted owl affect how you harvest timber?
- Does MRC have plans to buy any lands from Hawthorne/Campbell?
- Explain on map where you are cutting – any wilderness areas?
- How do you collect the tree seeds?
- If ages of trees are intermixed, how will you get harvested trees out without disturbing other trees/stands?
- Is cable transport process cost-prohibitive?
- Is there a bottom/basal area that you will not go into for harvesting?
- Outside of special treatment areas, how will you maintain older trees?
- Priority should be give to replanting riparian areas to protect Coho salmon.
- What age redwood are you cutting right now to pay your bills?
- What are “super trees” and does MRC grow them?
- What is the number for your current inventory?
- When you estimate percentages of inventory, is the watercourse zone included?
- Why is availability of redwood seeds so low in Mendocino County?

Public Access

- Can the public recreate on MRC lands?

Collaborative Data: Collection, Assessment, and Decision-Making

- Interested to see how this process works in conjunction with Mattole Restoration Council’s restoration process.

- What will the role of community liaison groups be in writing/implementing the plan?

Land Use/Land Management Practices

- What is your approach to sustainability?
- Before MRC ownership, property had been clearcut; how do you deal with the state of the land and public perception that land had been over harvested?
- If you were allowed to use fire, would you then be less likely to use herbicides?
- What is our policy with respect to herbicides?
- Why did you not do a sustained yield plan?
- Will MRC consider selling off portions of the property for development?
- What are you doing with the previously clearcut areas of property?

Cumulative and Cultural Impacts

- Cumulative impacts-interesting to see how historical information is incorporated. Curious to see how things came to be on property.
- Frustrating to public that mitigation doesn't cover replanting comprehensively.
- What are the legacy impacts and how do they affect current activities?

Water Quality

- How much larger would stream protection buffers be in special circumstances?
- Is the term watershed included in this process?
- What kind of stream protection measures will be included?
- Will the EIR include the MOU on water quality? With the MOU be analyzed in the EIR?
- Will the MOU come of with the draft plan? Will it function as a permit from the Regional Water Quality Control Board?

Multiple Agency Coordination

- What are state/federal agencies that are in charge of each process (i.e., HCP, NCCP, TMP, etc)?

NEPA/CEQA Alternatives Development and Approval Process

- Are you keeping together harvest plans during the HCP planning process?
- Is there anything inherent in PTEIR process that would mandate sustainability of timber harvesting/management?
- What does programmatic mean?
- Will EIR be done in house at CDF or by a consultant?
- Will Option A be included in PTEIR?
- Will you be analyzing stand distribution in each inventory block and then doubling that inventory?

Public Involvement in the Environmental Review Process

- Hope that given scope/size of document that comment period will be extended beyond 45 days.

Scoping Report

for the proposed Mendocino Redwood Company HCP/NCCP Environmental Impact Statement and Environmental Impact Report

Prepared for
US Fish and Wildlife Service
National Marine Fisheries Service
California Department of Fish and Game

Prepared by
Stillwater Sciences
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February 10, 2003

Stillwater Sciences

NOTE TO THE READER regarding this draft National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) Scoping Report:

Scoping is a public process under NEPA and CEQA intended to assist the lead agencies in the development of an Environmental Impact Statement and Environmental Impact Report (EIS/EIR). Information gathered from the public and responsible agencies helps determine the scope of an EIS/EIR and identify significant issues related to the proposed project or action. The objectives of scoping are to:

- Invite participation by interested parties, including the public, non-government organizations, and federal, state, and local government agencies;
- Identify a preliminary list of environmental and socioeconomic issues to address in the NEPA/CEQA document utilizing, in part, the feedback received from agencies and the public;
- Assist the action agencies to formulate a range of alternatives to analyze in the NEPA/CEQA document, and;
- Streamline the overall process by ensuring that significant and relevant issues are addressed.

This purpose of this Scoping Report is to organize and summarize concerns and issues that were raised during the initial scoping conducted for this project.

Table of Contents

List of Tables

1 SUMMARY

The U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NOAA Fisheries), and California Department of Fish and Game (CDFG) are the co-lead agencies responsible for preparation of an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) to evaluate the impacts of the proposed Mendocino Redwood Company (MRC) Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP). Scoping is an important part of the EIS/EIR process under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). To initiate the development of the EIS/EIR, the lead agencies and MRC held three public scoping meetings to provide information to and solicit comments from the public on the proposed HCP/NCCP and EIS/EIR. Verbal comments were recorded at the meetings, and written comments were submitted to the lead agencies.

The state and federal lead agencies will use the feedback received from other agencies and the public to identify a preliminary list of environmental and socioeconomic issues to address in the EIS/EIR, and will begin to formulate a range of alternatives to be analyzed in the EIS/EIR.

This report summarizes both the written and verbal comments received during scoping, including approximately 840 written and 175 verbal comments. The issues, concerns, alternatives, and recommendations were organized within the following broad categories:

- Abiotic
- Biotic
- Human Environment
- NEPA/CEQA
- HCP/NCCP
- Implementation
- Management Practices and Land Use
- Agency Participation
- Public Involvement
- Regulatory Issues
- Agency Comments

Comments within each category listed above were then placed into more specific topics (see Section 4.2). The comments were then reviewed and discussed to determine whether the comment may warrant a detailed analysis in the EIS/EIR, and were summarized in this report.

2 INTRODUCTION

MRC is seeking Incidental Take Permits (ITPs), which would permit incidental take of species listed under the federal or state Endangered Species Acts (ESAs). As part of the permit process, MRC is preparing an Habitat Conservation Plan and Natural Communities Conservation Plan (HCP/NCCP), which is designed to minimize and mitigate the impacts of the incidental take. The HCP/NCCP will contain provisions to protect habitat for sensitive species and communities, and will minimize and mitigate any take that would be expected to occur under the plan.

Mendocino Redwood Company (MRC) is preparing a HCP/NCCP for approximately 232,500 acres of timberland in coastal Mendocino and Sonoma Counties, California. The land, acquired by MRC, includes important habitat for a variety of sensitive species, such as the federally listed threatened and state listed endangered marbled murrelet (*Brachyramphus marmoratus*

marmoratus), the federally listed threatened northern spotted owl (*Strix occidentalis caurina*), and the federally listed threatened and state listed endangered coho salmon (*Oncorhynchus kisutch*). The HCP/NCCP is expected to provide formal protection for sensitive species and their habitats and allow MRC to harvest timber in an ecologically and economically sustainable manner. More information about HCPs and incidental take permits under the federal ESA can be found at http://endangered.fws.gov/hcp/index.html. More information about the State of California's NCCP program can be found at http://www.dfg.ca.gov/nccp/index.html.

The US Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NOAA Fisheries), and the California Department of Fish and Game (CDFG), as lead agencies, are preparing a joint Environmental Impact Statement and Environmental Impact Report (EIS/EIR) to analyze the expected environmental impacts of the actions proposed in the HCP/NCCP.

Scoping is an important part of the EIS/EIR process under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). The scoping process was initiated to seek input on the proposed actions from the public and responsible agencies. This report summarizes both the written and verbal comments received during scoping.

2.1 NEPA / CEQA Overview

MRC is developing an HCP/NCCP as part of an application for incidental take permits from both the federal and state governments. Issuance of an ITP for MRC's proposed activities as described in their HCP/NCCP is the action that invokes NEPA and requires an assessment of environmental impacts.

Authorization by CDFG for incidental take, pursuant to Section 2081(b) of the California Endangered Species Act (CESA) and/or Section 2835 of the California Fish and Game Code (NCCPA), triggers a required environmental analysis under CEQA. As the state lead agency, the CDFG is required by CEQA to analyze the environmental impacts of the proposed NCCP.

As the CEQA lead agency, CDFG will be responsible for ensuring that the EIR/EIS complies with CEQA and the CEQA Guidelines. The USFWS and NOAA Fisheries, as the co-lead agencies under NEPA, will be jointly responsible for ensuring that the EIR/EIS complies with NEPA and the Council on Environmental Quality (CEQ) regulations. The CDFG, USFWS, and NOAA Fisheries are responsible for the scope and content of the EIR/EIS, and must ensure that all pertinent environmental issues and impacts, and reasonable alternatives and their impacts, are addressed in the EIR/EIS.

2.1.1 NEPA

The NEPA requires federal agencies to consider the environmental impacts of "major federal actions significantly affecting the quality of the human environment". Approval of an HCP and issuance of an ITP is such a major federal action requiring NEPA review. NEPA requirements include the designation of a federal lead agency (or co-lead agencies) and determining whether NEPA applies to a proposed action. An EIS is required if the proposed federal action has the potential to significantly affect the quality of the human environment. The lead agency is responsible for determining if an EIS is required and, if so determined, for initiation of the scoping process to inform and seek input from the public and responsible agencies. In this case USFWS and NOAA Fisheries, serving as joint lead agencies, have determined that an EIS is warranted for the project.

Once the lead agency is determined and the need for an EIS is established, a Notice of Intent (NOI) must be published in the Federal Register. The NOI serves as official legal notice that a federal agency is preparing an EIS. The NOI for the MRC EIS/EIR was published by the USFWS and NOAA Fisheries on June 6, 2002 (Federal Register 67:38932–38934). As part of the USFWS and NOAA Fisheries tribal trust responsibilities, the USFWS and NOAA Fisheries sent a joint letter in October 2002 to 16 local tribal groups to solicit their input on how this project could affect Tribal trust resources or the exercise of Native American rights.

The next step in the EIS process under NEPA is initiation of scoping. NEPA requires the lead agency to solicit information from the public and consult with appropriate federal agencies regarding the proposed action. Scoping helps determine the scope, focus, and content of the EIS.

2.1.2 CEQA

CEQA is initiated when a California public agency engages in, funds, or grants a permit for a project that may have environmental effects within the state of California. An EIR is required if the proposed project could result in significant environmental impacts. The lead agency under CEQA must determine whether an EIR will be needed, and is responsible for the scope and content of the EIR. As the state lead agency, the CDFG has determined that MRC's proposed NCCP warrants preparation of an EIR.

Scoping, though not required by CEQA, is encouraged to help the lead agency identify the concerns and issues of the public and interested federal, state, and local agencies, and to determine the scope and content of the EIR. The scoping process under CEQA includes publication of a Notice of Preparation (NOP) in the State Clearinghouse to notify parties and responsible agencies of the proposed action. The CDFG published the NOP for the MRC EIS/EIR on June 17, 2002 (OPR State Clearinghouse, SCH No. 2002062055).

2.2 Public Involvement Process

Public involvement is an important part of the NEPA and CEQA processes. Public input is sought during the scoping process by means of scoping meetings and through written comments submitted to the federal and state lead agencies. Verbal comments voiced at the scoping meetings and written comments submitted during the public scoping period are summarized and considered during development of the EIS/EIR. Opportunity for public input is also required later in the process as part of the public review and comment period for the draft EIS/EIR.

In addition to the public scoping meetings, MRC held four public information workshops. Although not part of the scoping process under NEPA and CEQA, they are a part of the public outreach required under the Natural Community Conservation Plan Act. These workshops were conducted by MRC to provide interested parties with additional information on the HCP/NCCP process, MRC's approach to landscape management, and the existing conditions on MRC's forestlands.

3 PUBLIC SCOPING ACTIVITIES

Scoping is a public process that helps the lead agencies develop the scope of issues and alternatives to be addressed in the EIS/EIR. Information gathered from the public and responsible agencies helps determine the scope of the EIS/EIR and identify significant issues related to the proposed actions under the HCP/NCCP. The objectives of scoping are to:

- Invite participation by interested parties, including the public, non-government organizations, and federal, state, and local government agencies;
- From the feedback received from agencies and the public, identify a preliminary list of environmental and socioeconomic issues to address in the NEPA/CEQA document;
- Help formulate a range of alternatives to analyze in the NEPA/CEQA document; and
- Streamline the overall process by ensuring that significant and relevant issues are addressed.

The federal and state lead agencies initiated the scoping process by publishing the NOI and NOP and advertising the scoping meetings in local media.

3.1 Press Releases and Announcements

Press releases were submitted to several newspapers and two radio stations in the vicinity of the project area to announce the public scoping meetings for the EIS/EIR. The press releases included a brief description of the proposed plans, as well as the date, location, and time of the meetings. The following media points received the press release:

- The Ukiah Daily Journal (June 20, 2002);
- The Mendocino Beacon (June 20 and 27, 2002);
- The Fort Bragg Advocate News (June 20 and 27, 2002);
- KZYX and Z, 88.3, 90.7, and 91.5 FM (Mendocino County Public Broadcasting); and
- KMUD 91.1, 88.3, and 88.9 FM (Redwood Community Radio, Humboldt County).

3.2 Public Scoping Meetings

Three public scoping meetings were held to provide information to and receive comments from the public on the proposed HCP/NCCP and EIS/EIR. Meetings were held in three locations in the vicinity of the planning area during late June 2002 (Table 1).

Table 1. Locations, dates, and attendance of public scoping meetings.

Location	Date	Time	Attendees
Santa Rosa	June 25, 2002	7:00–9:00 pm	10
Ukiah	June 26, 2002	7:00–9:00 pm	19
Fort Bragg	June 27, 2002	7:00–9:00 pm	30
Total			**59**

At the meetings, representatives from the USFWS, NOAA Fisheries, CDFG, and MRC explained the intent of the proposed HCP/NCCP, outlined the NEPA and CEQA requirements and processes, and encouraged the public to express environmental concerns and issues that may result from such an action. Verbal comments were recorded and summarized in a separate Scoping Meeting Summary (JSA 2002), and are also included in this report. Meeting attendees were given the opportunity to submit written comments at the meetings and given information on how to later submit written comments to the lead agencies.

3.3 Method of Comment Collection and Analysis

Written comments on the proposed plan were submitted to the federal and state lead agencies and forwarded to Stillwater Sciences for review and analysis. All letters received were cataloged, copied for archiving, entered into a database, and reviewed to determine the subject or subjects of the comment. Comments were recorded and tracked using a two-part system, wherein (1) each comment letter was given a unique number, and (2) each individual comment within a letter was assigned a unique code.

Verbal comments recorded at the scoping meetings and summarized by Jones and Stokes (2002) were also cataloged with a unique identifier, entered into the same database, and reviewed in a similar fashion. It is important to note that in some cases, verbal comments in Jones and Stokes (2002) were repeated under several different "issue categories." However, for the purposes of this Scoping Report, each unique verbal comment has been catalogued only once.

The comments listed in this report are largely reproduced verbatim; however, for efficiency and ease of analysis, some of the comments presented below have been paraphrased or summarized. In all cases every effort was made to retain the original nature and intent of each comment.

3.4 Determination of Depth and Need for Analysis in the EIS/EIR

Although all comments were reviewed by the lead agencies, statements of opinion or conjecture that do not provide information or otherwise raise issues that inform impacts or impact assessment pertinent to the activities considered in this EIS/EIR, environmental impacts of the proposed project, and development of alternatives, are not included in this report. Similarly, requests for information that do not enable impact assessment or facilitate decision-making among alternatives are not likely to be satisfied in the EIS/EIR, although many of them will be satisfied in the HCP/NCCP and associated documents (e.g., the Implementation Agreement).

Comments were first categorized into themes and topics (see Section 4.2 Categories and Topics) to organize the comments and concerns expressed by interested parties. The comments were then reviewed to tentatively determine whether they warranted detailed, general, or any consideration in the EIS/EIR. The depth to which these comments will be addressed in the EIS/EIR is dependent on several factors, primarily (1) what specific activities are proposed for final coverage under the HCP/NCCP (the HCP/NCCP has not been finalized at this time), (2) the quantity, quality, and availability of obtaining data and information, 3) the depth, specificity, or ambiguity, of the issue or comment, 4) the degree of speculation that would be required to address the issue, and (5) the necessity for such an analysis to facilitate decision-making among alternatives (i.e., would the analysis produce information that would clarify differences in environmental impacts among the various selected alternatives). Certain issues may shift between levels of coverage as details of the HCP/NCCP materialize (e.g., changes in covered activities or species).

The comments are presented in Section 4.3 (Comments Received). For comments that may not receive detailed analysis in the EIS/EIR, and for other selected comments warranting additional explanation, italicized explanations are provided.

Many comments were related to concerns over the implementation and enforcement of the HCP/NCCP. The EIS/EIR will assume that the proposed plan and selected alternatives will be implemented as described, and will compare the plan and alternatives accordingly. The HCP/NCCP must meet all required issuance criteria as defined by applicable law and regulation in order for agencies to approve the plan. The lead agencies will work closely with MRC to develop an Implementation Agreement (IA) for the HCP/NCCP, which will contain legally binding commitments from MRC to appropriately implement their plan. It is the responsibility of the state and federal agencies to ensure compliance by monitoring and enforcing the provisions of the plan. If MRC fails to meet the provisions of the HCP/NCCP and associated Implementation Agreement, the agencies may revoke the incidental take permit and undertake any remedies described in the IA or otherwise provided for by law.

Many other comments were related to HCP/NCCP development and process issues, and to general Endangered Species Act, HCP, and NCCP issues. For example, many comments expressed opinions about the types of species protection measures that should be included in the HCP/NCCP. Other comments were questions about federal or state laws, regulations, policies and related matters, including the federal "No Surprises" policy for HCPs. Many expressed the opinion that incidental take should not be allowed under the federal endangered species act, or that it should not be allowed for this particular HCP.

Some or all of these issues may be addressed in the HCP/NCCP or accompanying decision documents. Background information on State and Federal Endangered Species Act laws and programs can be found at the web-site addresses above or by contacting the local offices of each agency to request paper copies of background materials. The EIS/EIR will analyze the environmental impacts of the proposed plan and alternatives. It will not address process or implementation comments, or matters that have been previously decided by law, regulation, or policy. It will only analyze the environmental consequences of these decisions.

4 PUBLIC SCOPING RESULTS

4.1 Summary of Comments

All written comments received until August 9, 2002, were included in this analysis. Verbal comments included in this report are those voiced at the three public scoping meetings and recorded by Jones and Stokes (2002).

A total of 53 unique written submissions were received. The number and proportion of written submissions are summarized by affiliation in Table 2. Most submissions contained multiple comments. The total number of comments is therefore greater than the number of submissions. The majority of the written submissions were from private individuals (58%) and non-governmental organizations (32%).

Table 2. Written submissions, by affiliation.

Affiliation	Number of Submissions	Percent of Total
Individual	31	58
Non-governmental Organization	17	32
Federal Agency	2	4
State or Local Agency	1	2
Business	1	2
Tribal Government	1	2

All comments originated from within California. Table 3 shows the county of origin of each written submission. A total of eight counties were represented, with the majority (76%) of submissions coming from Mendocino County.

Table 3. Written submissions, by county.

County	Number of Submissions	Percent of Total
Mendocino	39	76
Humboldt	3	6
San Francisco	2	4
Santa Clara	2	4
Sonoma	2	4
Alameda	1	2
Mono	1	2
Sacramento	1	2

4.2 Categories and Topics

The comments were categorized into 11 subject areas, as follows (total number of comments received precedes each subject category and topic). Comments received by government agencies were incorporated into appropriate subject categories, and are also summarized in Section 4.3.11.

(58) Abiotic
- 3 Air quality
- 12 Climate and global warming
- 4 Hydrology
- 1 Large woody debris
- 22 Soils/erosion/sedimentation
- 16 Water quality/quantity

(239) Biotic
- 15 Biodiversity
- 1 Coastal zone impacts
- 2 Ecosystem effects of HCP/NCCP
- 18 Environmental baseline
- 14 Habitat connectivity/fragmentation/loss
- 9 Historical conditions
- 3 Invasive species
- 8 Old growth
- 6 Pathogens and diseases
- 15 Plants
- 11 Riparian areas and protection
- 33 Species covered/not covered by HCP/NCCP
- 34 TES species
- 6 Wetlands
- 64 Wildlife and fisheries

(29) Human Environment
- 7 Cost to taxpayers
- 3 Cultural resources
- 2 Human health and safety
- 2 Recreation
- 12 Socioeconomics
- 3 Visual resources

(52) NEPA/CEQA
- 32 Alternatives analysis
- 12 EIS/EIR provisions
- 6 Impacts analysis
- 2 Independent consultant

(202) HCP/NCCP
- 31 Conservation measures and objectives
- 9 HCP/NCCP process
- 86 Incidental take and the ITP
- 24 No surprises policy
- 9 Other HCPs: examples, effectiveness
- 18 Regional/global context of HCP/NCCP
- 25 Scientific basis and/or adequacy of HCP/NCCP measures

(90) Implementation
- 23 Enforcement of HCP/NCCP provisions
- 18 Financial commitment
- 5 Long-term commitment
- 4 Mitigation
- 29 Monitoring and Adaptive Management
- 11 Survey and monitoring protocols

(155) Management Practices and Land Use
- 7 Adjacent landowners

- 21 Cell and repeater towers
- 13 Conservation easements/reserves
- 28 Herbicides and forest chemicals
- 14 Land use and conversion
- 17 Transfer of ownership
- 9 Restoration
- 12 Roads and road management
- 31 Timber management
- 3 Other management practices

(35) Agency Participation
- 23 Agency commitment
- 5 Agency participation
- 7 Agency roles

(101) Public Involvement
- 28 Disclosure of information
- 9 Lack of project definition
- 12 Length of comment period
- 28 Opportunity for public comment
- 24 Public scoping process

(54) Regulatory Issues
- 1 Forest Practice Rules
- 2 Option A
- 3 Public Trust doctrine
- 14 Regulatory compliance
- 6 THP
- 23 Relationship between THPs and HCPs
- 5 TMDLs

(37) **Agency Comments** (already included in total)

(1015) GRAND TOTAL

4.3 Comments Received

4.3.1 Abiotic

The EIS/EIR will address the abiotic component of the affected environment/environmental setting, as well as potential impacts and mitigations associated with the abiotic environment under each proposed alternative. Abiotic issues to be addressed include air quality; climate; soils, erosion, and sedimentation; and water quality and quantity.

4.3.1.1 Air quality (3 written comments)

Issues likely to be addressed further in the EIS/EIR:

- The EIS/EIR should evaluate potential air quality impacts. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*
- Evaluate mitigation and monitoring options to reduce air quality impacts. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*

Issues that may not receive detailed analysis in the EIS/EIR:

- Please address how air quality might be affected by the burning—by wildfires or heating of homes—of trees that have been treated by pesticides (or other chemicals). Please focus your remarks particularly on effects on children, the elderly, and individuals with chemical sensitivities. *Explanation: The potential effects of the various alternatives on general air quality will be addressed in the EIS/EIR. Additionally, the EIS/EIR will have a general discussion on effects of forest chemicals, but a detailed analysis will not be conducted because MRC is not requesting coverage for use of forest chemicals as part of the proposed action or alternatives. Analyses of impacts on human health are the responsibility of EPA when chemicals are registered for use.*

4.3.1.2 **Climate and global warming** (4 verbal comments; 8 written comments)

Issues likely to be addressed further in the EIS/EIR:

- On a local level, how will the NOAA Fisheries, USFWS, CDFG and MRC assess cumulative impacts on microclimate changes that affect fog drip, mini drought conditions, and water temperature levels that in turn affect species survival?

Issues that may not receive detailed analysis in the EIS/EIR:

- Suggestion that no action be taken until global temperature change is better understood. *Explanation: Opinion noted. Ecological uncertainties are recognized and will be addressed in the context of the proposed plan.*

The following comments have been noted. The EIS/EIR will evaluate the potential for cumulative effects on a local and regional scale to the extent there are broadly accepted models available to do so at the appropriate scale. Global warming is expected to be addressed in the HCP/NCCP as a changed circumstance.

- Address how this HCP might interact with other forest activities to exacerbate or accelerate climate change on the north coast.

- Global warming must be recognized: how is future ecological uncertainty addressed in the HCP/NCCP process?

- The carbon storage function of our forests and their value in stabilizing climate and helping prevent global warming are incalculable but need to be recognized.

- Analyze environmental impacts of the proposed plan in the context of global warming.

- Global warming: what are the results on species?

- How will the cumulative impacts of global warming and the effects of the plan on future global warming be assessed?

4.3.1.3 **Hydrology** (1 verbal comment; 3 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Address impacts to stream flows from removal of canopy cover.

- Address timber harvesting impacts on the rate of runoff to streams and rivers.

Issues that may not receive detailed analysis in the EIS/EIR:

- What about Class III streams - are they really "recovering Class II streams"? *Explanation: The EIS/EIR will analyze the impacts of the proposed plan and selected alternatives on the watercourses in the Plan Area, including potential effects on recovery from past disturbance.*

- Address effects to water table levels from loss of fog drip from harvested areas. *Explanation: The EIS/EIR will analyze impacts to surface water quantity and quality that may result from the proposed plan and alternatives. Information regarding local* *groundwater tables in the Plan Area, however, is insufficient to support a detailed analysis of this type.*

- Consider the dollar value of water regulation and flood control from trees, which increase regional rainfall and prevent flooding by absorbing rainwater and releasing it gradually into streams. *Explanation: Impacts of changes in forest cover on hydrology will be addressed in the EIS/EIR, and the services provided by intact forests will be considered generally. A more detailed economic analysis would only be conducted if it would facilitate decision-making among alternatives.*

4.3.1.4 Large Woody Debris (1 written comment)

Issues likely to be addressed further in the EIS/EIR:

- Analyze impacts of the HCP on recruitment of large woody debris (LWD).

4.3.1.5 Soils/erosion/sedimentation (22 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Cumulative impacts analysis needs to include geology and soils.
- Describe the landscape, geomorphology, and soils of the area, including their distribution, hazard or erodible soils, debris-flow and landslide potential, sediment delivery and special soils or geologic conditions.
- Comment suggests the EIR identify steepness, stability, erosion hazard rating of slopes, and location of previous slope and road failures, erosion, or mass wasting incidents. The EIS/EIR also must assess and map upslope activities potentially delivering sediment
- Comment suggests examining the cumulative impacts and mitigation of silt/sand on species' watercourse habitat downstream as it moves toward the estuaries.
- Discuss the effects the HCP will have on short-term and long-term soil productivity as a result of erosion.
- Evaluate the role of trees as soil anchors.
- Evaluate the role of timber harvesting in triggering landslides.
- Evaluate the effects of removing hardwoods on slope stability.
- Address soil compaction through the use of heavy mechanized equipment.
- Analyze impacts of HCP on stream sedimentation, taking into consideration that forests secure topsoil and prevent sedimentation.
- Since all 87 watersheds are listed with the USEPA under the Clean Water Act for sediment impairment, the EIR must address sediment discharge into the waters of the State. *Explanation: The EIS/EIR will analyze the impacts of the proposed plan and alternatives on sediment production and delivery in Plan Area watersheds. A total of 65 planning watersheds, of the 87 planning watersheds in the Plan Area, are currently listed by USEPA and the NCRWQCB as water quality impaired and subject to TMDL*

development. The wildlife agencies understand that additional watersheds could be listed.

- Is timber harvesting allowed in areas where historic landslides have occurred?

- Assess the effects of siltation on eggs and fry and other damage to fisheries as a result of logging practices that deliver sediment to streams.

Issues that may not receive detailed analysis in the EIS/EIR:

- Discuss the soil types in the project area. How are soil types determined? Please be specific. Are soil samples done throughout the project area? *Explanation: Soils and geology in the project area, as well as the assessment methods used, will be discussed in the HCP/NCCP. The EIS/EIR will include an analysis of the potential impacts to these resources that could result from the proposed plan and selected alternatives.*

- Implement an erosion control plan as part of the HCP/NCCP. *[Comment from Elk County Water District: also included in the Agency Comments section (Section 4.3.11)]. Explanation: An erosion control plan will be described as part of the HCP/NCCP, and will be evaluated as a mitigation measure in the EIS/EIR.*

- Siltation of reservoirs costs agricultural dollars in lost irrigation water. *Explanation: There are no reservoirs in the Plan Area used for irrigation.*

- Evaluate the role of trees by species and their influence on soil amendment and consequent forest health. *Explanation: The EIS/EIR will analyze the impacts to forest health that could result from implementation of the proposed plan and alternatives. An analysis of the role of individual tree species, however, is not possible due to limitations on the level of detail of available forest inventory data.*

- What is the soil loss per acre per year when timber is harvested? How much is delivered to receiving waters? Is this permissible under TMDLs? *Explanation: The EIS/EIR will analyze impacts related to sediment production and delivery that could occur under the proposed plan and alternatives, and will discuss issues of TMDL compliance. A site-specific, detailed analysis of soil loss per acre is not feasible given available information. Watershed-specific estimates for 303(d) listed basins provide some general information.*

- Assess cumulative impacts to soils from loss of soil anchors, loss of amendments, compaction, short-cycle harvesting, exposure to UV light, drying, pesticides, and fertilizers. *Explanation: It is likely that there will be no significant differences among the EIS/EIR alternatives to warrant detailed analyses of these issues.*

4.3.1.6 Water Quality/Quantity (16 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Consider water quality and quantity impacts associated with forest management. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*

- Assess cumulative impacts in Greenwood Creek watershed to protect water quality. *[Comment from Elk County Water District: also included in the Agency Comments* *section (Section 4.3.11)]. Explanation: The proposed plan and EIS/EIR will address cumulative effects on a watershed level.*

- Evaluate impacts to TES species of potential changes in water quality and quantity. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*

- Discuss effects of the HCP on water temperature, dissolved oxygen, sediment, potential contaminants (nutrients, herbicides, machine fluids, sawdust and logging slash), turbidity, in forested, deforested, and grassland areas.

- Address fisheries and stream protections including stream quality, erosion control, and drinking water quality.

- Identify streams and rivers where limiting factors for fisheries are water diversions.

- MRC should disclose details of plans for stream alterations, water diversion, and water extraction for the next 80 years. *Explanation: Opinion noted. The HCP/NCCP is expected to provide a plan for water use by MRC for forest management.*

- Comment suggests EIS/EIR should examine cumulative effect of deforestation combined with water diversion in terms of water quality. The concern is increased sedimentation.

- Mitigation for water quality impairment must be assured *[Comment from Elk County Water District: also included in the Agency Comments section (Section 4.3.11)]. Explanation: The EIS/EIR will include analysis of any proposed mitigation measures to maintain adequate water quality. Specific assurances are not included in an environmental review document.*

- Monitor water quality in Greenwood Creek as part of the HCP/NCCP *[Comment from Elk County Water District: also included in the Agency Comments section (Section 4.3.11)]. Explanation: The EIS/EIR will analyze the environmental impacts of measures and actions proposed in the HCP/NCCP, including monitoring.*

Issues that may not receive detailed analysis in the EIS/EIR:

- Address the effects of pesticides and fertilizers on stream health, drinking water quality, and on the wildlife in streams (direct contact, inhalation, absorption.) *Explanation: The EIS/EIR will have a general discussion on effects of forest chemicals, but a detailed impacts analysis will not be conducted because MRC is not requesting coverage for use of forest chemicals as part of the proposed action or alternatives.*

- How will aquifers be damaged? *Explanation: The EIS/EIR will include general analysis of impacts to hydrology, including changes to sub-surface flow and peak runoff.*

- Discuss the impacts to water quality from use of dust abatement products (other than water) on roads. *Explanation: The lead agencies will review the types of dust abatement products typically used by MRC, but MRC is not seeking coverage for their use under the HCP/NCCP, and a detailed analysis is not expected to facilitate decision making among alternatives.*

- Will the plan disclose and assess the impact of the future scarcity of potable water at the local, state and global levels? *Explanation: The EIS/EIR will analyze potential water quality and quantity impacts resulting from the proposed plan and selected alternatives. A detailed analysis of state or global impacts, however, is not expected to facilitate* *decision-making among alternatives. [See hydrology section above, the EIS/EIR will look at the effects of forestry on hydrology, including water drafting]*

- Comment suggests MRC's plan should give precedence to maintaining enough water in the rivers and tributaries for the needs of fish and plants before they draft any water. *Explanation: Comment noted. The EIS/EIR will analyze the environmental impacts of proposed activities on fish and plant as required by law and regulation, including the impacts of water drafting.*

4.3.2 Biotic

The EIS/EIR will address potential impacts and mitigations associated with the biotic environment under each proposed alternative. Biotic issues to be addressed include topics on biodiversity, coastal zone impacts, ecosystem effects of the HCP/NCCP, environmental baseline, habitat fragmentation, historical conditions, invasive species, old growth, pathogens and disease, plants, riparian areas, species covered/not covered by the HCP/NCCP, special-status species, wetlands, wildlife, and fisheries.

4.3.2.1 Biodiversity (15 written comments)

Issues likely to be addressed further in the EIS/EIR:

- How will CDFG ensure that the Project conserves and restores large habitat blocks with intact ecosystem function and biological diversity?
- How will CDFG ensure that the Project maintains suitable environmental gradients and habitat diversity sufficient to ensure shifting taxa distributions due to changed circumstances?
- The EIS/EIR needs to analyze impacts of the HCP on wildlife and vegetative structure and diversity during harvest and over the long term.
- The value of forests in terms of species diversity, habitats, and genes must be recognized for the benefit of future citizens.
- Address the loss of biodiversity.
- Discuss the relationship of habitat destruction to loss of biodiversity.
- Address the types of biodiversity that old-growth forest habitats preserve.
- Discuss the impacts to loss of seed generation and genetic diversity with loss of older trees.
- Use "umbrella species" to ensure conservation of biodiversity. *Explanation: The proposed plan and alternatives are expected to include measures designed to protect a variety of species and habitats, and ensure conservation of biodiversity and ecosystem integrity in the Plan Area. The inclusion of protection measures for “focus species” is intended to provide protection for species with similar habitat requirements. The proposed plan will specifically describe the ancillary species and ecosystem benefits that will result from these protection measures.*
- Include protections for lower profile species such as fungi and lichens. *Explanation: The proposed plan and alternatives are expected to include measures designed to protect a*

variety of species and habitats, and ensure conservation of biodiversity and ecosystem integrity in the Plan Area. The inclusion of protection measures for "focus species" is intended to provide protection for species with similar habitat requirements. The proposed plan will specifically describe the ancillary species and ecosystem benefits that will result from these protection measures.

- Commenter is concerned that use of species-specific critical habitat protections does not ensure adequate preservation of a diversity of species.

Issues that may not receive detailed analysis in the EIS/EIR:

- The commenter is especially interested in reestablishment of the original diversity of native trees, shrubs, and plants, as well as fish, amphibians, birds, and mammals. *Explanation: The proposed plan is expected to include conservation measures to promote the recovery of a diverse species assemblage in the Plan Area. The EIS/EIR will analyze the effectiveness of the proposed conservation measures.*

- The impacts to future Americans and Californians—for instance, in loss of endangered species and biodiversity in this large forested area—could be permanent and catastrophic. *Explanation: Comment noted. Statements of opinion or conjecture will not be addressed specifically in the EIS/EIR.*

- How can the loss of irreplaceable biodiversity, endangered species habitat, and timber resources be analyzed? *Explanation: The EIS/EIR will analyze the potential impacts of the proposed plan and alternatives on biodiversity, endangered species habitat, and timber resources using the best available data and methods, as required by law and regulation.*

4.3.2.2 **Coastal Zone Impacts** (1 written comment)

Issues likely to be addressed further in the EIS/EIR:

- The anticipated permit would authorize timber harvesting for 80 years, which could adversely affect water quality and habitat resources of the Coastal Zone. The timber activities could degrade water quality through increased sedimentation into coastal streams/rivers. Additionally, the timber harvesting activities could directly and indirectly damage environmentally sensitive habitat resources of the Coastal Zone. *[Comment from California Coastal Commission: also included in the Agency Comments section (Section 4.3.11)]*

4.3.2.3 **Ecosystem Effects of HCP/NCCP** (2 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Provide details on the effects of the HCP/NCCP on the forest ecosystem.

- Describe the effects of changing timber harvest methods on species composition in the forest, wetlands, and rivers.

4.3.2.4 **Environmental Baseline** (1 verbal comment; 17 written comments)

Issues likely to be addressed further in the EIS/EIR:

- What is the "baseline" for undertaking this analysis?
- The EIS/EIR should include a comprehensive assessment of current conditions. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*
- Provide accurate, detailed descriptions and maps of the area covered in the proposed plan.
- The EIS/EIR must include detailed assessment of forest inventory data.
- As part of an 80-yr commitment, MRC's plan should describe current conditions for and status of TES species on the ownership.
- The Marine Biological Field Station and UC and Pacific Union College made a very comprehensive study of wildlife of the Albion and its estuary in the 1940's and 50's. This information should be available at Albion field station or in the library in Angwin. *Explanation: Comment noted. The EIS/EIR will analyze the potential impacts of the proposed plan and alternatives using the best available data and methods. The EIS will provide information on the known and suspected occurrences of sensitive wildlife species based on the information available.*

Issues that may not receive detailed analysis in the EIS/EIR:

- EPA believes the no action alternative is not equivalent to a no impact baseline. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]. Explanation: Opinion noted.*
- Describe and use forest conditions prior to logging (i.e., 1850s) as the environmental baseline. *Explanation: The EIS/EIR, as well as the proposed plan, will use available information on historical resource conditions to analyze cumulative impacts and to describe the environmental setting. The analysis of impacts in the EIS/EIR, however, will be performed using current conditions as the environmental baseline, as defined by law and regulation.*
- Is sufficient information supplied to adequately describe baseline conditions? *Explanation: As part of EIS/EIR development, the agencies will assess the sufficiency and adequacy of information to describe and analyze baseline conditions and the impacts of different alternatives.*
- Adequate baseline data (including stream temperature, sedimentation and turbidity, percentage of shade canopy, and location, quality and quantity of LWD, spawning gravel, riffles, pools, fish spawning and rearing sites, and key forest plant and animal species) is needed to assess impacts of the HCP on water quality. *Explanation: The EIS/EIR will analyze the potential impacts of the proposed plan and alternatives using the best available data and methods. Incomplete or unavailable information will be addressed as per law and regulation (e.g. Sec. 1502.22 of the NEPA implementing regulations [51 FR 15625, Apr. 25, 1986], Section 15384 of the California Code of Regulations).*

- Conclusions in the EIS/EIR must be supported by accurate and adequate baseline data (including field surveys), available information on the results of wildlife surveys, (including maps of survey routes, and the known and suspected occurrence of wildlife species in the project area), scientific studies, population viability analyses, and other information that provides a scientifically justifiable basis for the environmental document's conclusions. *Explanation: The EIS/EIR will analyze the potential impacts of the proposed plan and alternatives using the best available data and methods, which will be described and disclosed to the public as required by law and regulation. Incomplete or unavailable information will be addressed as per law and regulation (e.g. Sec. 1502.22 of the NEPA implementing regulations [51 FR 15625, Apr. 25, 1986], Section 15384 of the California Code of Regulations).*

4.3.2.5 Habitat Connectivity, Fragmentation and Loss (1 verbal comment; 13 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Are habitat corridors being analyzed?
- Discuss fragmentation in relation to loss of biodiversity, microclimate change, edge effects, increased wind velocity, evaporation, solar insolation, influx of invasive species, increased risk of catastrophic fire, reduction of fog drip and natural moisture retention, lack of shade and resulting effects on the role of lichens, mycorrhyzal root fungi, and plant succession in the forest, reduction in genetic diversity of trees, and effects on nutrient and hydrologic cycles.
- Discuss effects on all species recovery, species' reaction to crowding when habitat is reduced in size, effects on reproductive success and dispersal, and effects of exposure to additional predation. *Explanation: Impacts to species proposed for coverage under the HCP/NCCP will be evaluated in the EIS/EIR.*
- Identify species that are most susceptible to fragmentation.
- Evaluate the loss of wildlife corridors and how that might prevent gene flow between fragmented habitats. Also discuss how this loss might disrupt or prevent wildlife access to forage areas, breeding grounds, and hibernation sites.
- Describe the effects of the proposed plan on the present and future distribution and quality of wildlife habitats, particularly old growth, including the role of forest connectivity and the effects of forest fragmentation (dispersal and movement) in and near the project.
- Discuss the effects of fragmentation, removal and modification of key habitats and the effects on reproductive success of individual species.
- How will the HCP provide a link between ecosystems? Will wildlife corridors be considered?
- How will links be maintained in this HCP between the Santa Cruz and Humboldt populations of marbled murrelets to help increase their range and genetic diversity, to help ensure the viability of these populations, and not appreciably reduce their chance of survival?

- How will CDFG ensure that the project maintains connectivity between large habitat blocks and similar habitat areas outside the Project area, such as those in the local state parks and in JDSF? *Explanation: The EIS/EIR will analyze the potential impacts of the proposed plan and alternatives on local and regional habitat connectivity*.

- Please map the remaining locations of animals and plants after the 80-year plan. Is there a net loss of habitats for these species? How does this compare to what is happening statewide to these critical habitats? Is there a net loss for critical habitats? *Explanation: The EIS/EIR will analyze the potential impacts of the proposed plan and alternatives on the quantity and quality of habitat in the Plan Area. Mapping the location of individual animals and plants throughout the proposed permit term, however, is not possible.*

4.3.2.6 **Historical Conditions** (9 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Cumulative impacts from past intensive management practices, especially as they relate to water quality, must be addressed cumulatively at watershed and regional levels.

Issues that may not receive detailed analysis in the EIS/EIR:

- Analyze cumulative impacts over time, from pre-logging period to present. *Explanation: Available information on historical pre-logging conditions will be incorporated into the cumulative effects analysis in the HCP/NCCP and EIS/EIR. Due to the limited amount of information available on historical conditions, however, it is expected that such an analysis will be general and largely qualitative.*

- Describe pre-logging conditions of TES species and habitat in the Plan Area. *Explanation: Available information on historical pre-logging conditions will be incorporated into the cumulative effects analysis in the HCP/NCCP and EIS/EIR. Due to the limited amount of information available on historical conditions of TES species, however, it is expected that such an analysis will be general and largely qualitative.*

- The EIS/EIR must assess current conditions relative to known pre-logging conditions. *Explanation: Available information on historical pre-logging conditions will be incorporated into the cumulative effects analysis in the HCP/NCCP and EIS/EIR. Because information on historical conditions is limited, however, a detailed comparison of current conditions relative to pre-logging conditions is considered too speculative for inclusion in the EIS/EIR.*

- As for trees, we know that hemlock and yew, for instance, were plentiful here before Masonite decided to practically eradicate them. *Explanation: Comment noted. The EIS/EIR will analyze the potential impacts of the proposed plan and alternatives using the best available data and methods. Issues of historical forest conditions will be addressed in the cumulative effects analysis*

4.3.2.7 **Invasive Species** (1 verbal comment; 2 written comments)

Issues that may not receive detailed analysis in the EIS/EIR:

The following comments relate to issues of HCP/NCCP development and/or content. Some or all of these issues may be addressed in the HCP/NCCP or accompanying decision documents. The EIS/EIR will analyze the potential impacts of the proposed plan and alternatives using the best available data and methods.

- The plan should incorporate long-term, environmentally safe control of invasive species, including alien weeds such as *Cortaderia jubata*, *Cytissus* and *Genista* species, *Ulex europa*, *Cirsium vulgare*, *Delairia odorata* and *Erechtites spp.*

- How will invasive species be covered in the plan?

4.3.2.8 Old Growth (8 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Address the cumulative watershed and old-growth forest impacts in north coast California.

- Address the role of the scattered residual old growth to forest health and species viability.

- Evaluate the environmental effects of this plan on the recovery of any old-growth dependent species.

Issues that may not receive detailed analysis in the EIS/EIR:

- Old-growth and late successional forest stands contribute significantly to the biological stability of the north coast forest. According to a recent study by the National Academy of Sciences, "Further cutting of the remaining late-successional and old-growth forests will accelerate threats to the biological diversity of the Pacific Northwest and threaten our ability to sustain important ecosystem processes." The study also states that management should include conservation and protection of most or all the remaining areas.
  Explanation: Comment noted. The EIS/EIR will analyze the potential impacts of the proposed plan and alternatives using the best available data and methods. Effects of the proposed plan on forest stand conditions, including late successional forest stands and old growth, will be analyzed.

The following comments relate to issues of HCP/NCCP development and/or content. Some or all of these issues may be addressed in the HCP/NCCP or accompanying decision documents. The EIS/EIR will analyze the potential impacts of the proposed plan and alternatives using the best available data and methods.

- How will each agency ensure that the remaining stands of old growth and late-successional forest in the project area are retained?

- How will each agency encourage MRC to develop additional late-successional forest stands?

- What biological metrics does each agency currently use to define old-growth and late successional forest stands?

- What rotation periods does each agency feel is compatible with the maintenance and development of old growth and late successional stands?

4.3.2.9 **Pathogens and Diseases** (3 verbal comments; 3 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Evaluate the HCP in light of the uncertainty concerning the spread of Sudden Oak Death and concerning the limited understanding of how effects that result from global warming and climate change intersect with the spread of the Sudden Oak Death.

- Sudden Oak Death and other diseases, as well as future uncertainty regarding pathogens and diseases, needs to be included in plan development and analysis.

- Since it is reasonably foreseeable that Sudden Oak Death may drive certain plants currently common in the forest, e.g., *Lithocarpus densiflorus* or some ericaceous taxa, to the brink of extinction during the term of the Project, how will CDFG ensure that such increases are changed circumstances rather than unforeseen circumstances? *Explanation: The EIS/EIR will evaluate the environmental consequences of the permit issuing agencies' decisions with respect to issues included as changed or unforeseen circumstances.*

4.3.2.10 **Plants** (3 verbal comments; 12 written comments)

Issues that may not receive detailed analysis in the EIS/EIR:

- Most of the project has been in private ownership, and current understanding is that no comprehensive floristic surveys have been performed. The JDSF draft EIR cites a lack of plant data, and CNPS and CNDDB databases often have little or no data on private timberland. *Explanation: Comment noted. The EIS/EIR will analyze the environmental impacts of the proposed plan and alternative using the best available information and methods. Incomplete or unavailable information will be addressed as per law and regulation (e.g. Sec. 1502.22 of the NEPA implementing regulations [51 FR 15625, Apr. 25, 1986], Section 15384 of the California Code of Regulations).*

- Why is so much fir dying on MRC lands? *Explanation: Current conditions in the Plan Area, including the status and trends of forest habitats, are expected to be addressed in the HCP/NCCP.*

The following comments relate to issues of HCP/NCCP development and/or content. Some or all of these issues may be addressed in the HCP/NCCP or accompanying decision documents. The EIS/EIR will analyze the environmental impacts of the proposed plan and alternatives using the best available information and methods. Incomplete or unavailable information will be addressed as per law and regulation (e.g. Sec. 1502.22 of the NEPA implementing regulations [51 FR 15625, Apr. 25, 1986], Section 15384 of the California Code of Regulations).

- Is there species distribution/biological/ecological data for each of the stands? Does this data exist in a geographic information system?

- What are the assumptions used in defining stands and their ecological change over time?

- What is the state of MRC's botanical knowledge of the Project area, and does MRC have a complete floristic survey for the Project Area?

- How was MRC's botanical information compiled, by whom, and has it been reviewed by independent botanical experts with local botanical knowledge?
- Does MRC have a plan to eliminate the botanical data gaps and minimize the botanical risk factors?
- For each covered species, how will CDFG determine the minimum habitat size large enough to support sustainable populations of plant taxa, and upon what data will this determination be made?
- Does any agency have evidence that the existing information regarding botanical taxa distribution, occurrence, and ecology on the Project area is adequate to proceed with the planning process, and if so, what is this evidence?
- Given the size of the Project area, how does each agency propose to remedy all data gaps regarding distribution, occurrence, and ecology of botanical taxa on the Project area?
- A complete floristic survey of the entire project area is essential to protect sensitive botanical taxa. Since this is private land, the public and scientific community has only limited knowledge of the botanical resources. Surveys would greatly enhance effectiveness of the HCP/NCCP, should be broad enough to include fungi, lichens, and bryophytes, and should also identify areas of biological richness and unique natural communities (pygmy forest, oak woodland, vernal pools).
- How will the public and the agencies be informed of the data gaps that exist with respect to assessments of impact on vegetation inventories due to microclimate changes in habitat that will occur and that can affect tree mortality?
- In a healthy forest, a dense tree canopy cover provides many benefits. How will the areas where conifers that are rooted next to each other with intertwined canopy—critical for endangered species survival—be protected?

4.3.2.11 Riparian Areas and Protections (3 verbal comments; 8 written comments)

Issues likely to be addressed further in the EIS/EIR:

- The EIS/EIR needs to analyze impacts of the HCP on late seral forest characteristics of stream corridors.
- Evaluate the importance of no-cut zones in riparian areas. Compare what is proposed by MRC to the Aquatic Conservation Strategy Option 9 standards of the Northwest Forest Plan, and to the NOAA Fisheries guidelines for THP review, and the NOAA Fisheries Short-term HCP guidelines.
- Address streamside habitat, regulations, and harvest practices that affect in-channel conditions.
- What is the width of riparian buffers?
- Linear riparian buffers should not be "counted toward" fully functioning late seral habitat.
- Albion/Greenwood area residents believe certain areas/stands should not be harvested, especially areas adjacent to salmonid refugia.

- Use NOAA Fisheries riparian protection measures rather than CFPRs.

Issues that may not receive detailed analysis in the EIS/EIR:

- How are stream buffers actually measured and flagged? *Explanation: This is an implementation issue that will likely be addressed in HCP/NCCP documentation. The EIS/EIR will evaluate the impact of the proposed plan, including buffer widths.*

4.3.2.12 Species Covered/Not Covered by HCP/NCCP (3 verbal comments; 30 written comments)

Issues likely to be addressed further in the EIS/EIR:

- The EIS/EIR must include detailed biological analysis of impacts of timber harvesting, resource extraction, and other activities authorized by the HCP and ITP on each wildlife and plant species to be "covered" by the HCP.
- Include a comprehensive biological assessment and evaluate the impact of the HCP and ITP on each wildlife and plant species for which "no surprises" regulatory assurances will be given.
- Provide a list of all species covered under the HCP/NCCP.
- Quantify the level of take for each species, describe activities that could result in take, and evaluate mitigation measures for each species that result in less than significant impacts.
- Analyze impacts of the HCP/NCCP on uncovered species, including migratory birds and other unlisted species. *Explanation: The proposed plan and alternatives are expected to include measures designed to protect a variety of species and habitats, and ensure conservation of biodiversity and ecosystem integrity in the Plan Area. Impacts to uncovered species will likely be analyzed in a general sense.*
- Complete biological analysis for other species in addition to those covered by "no surprises" policy. *Explanation: See explanation above.*

Issues that may not receive detailed analysis in the EIS/EIR:

The following comments have been noted, but relate to issues of HCP/NCCP development and/or content, or the provisions of laws and regulations. Some or all of these issues may be addressed in the HCP/NCCP or accompanying decision documents, and/or have already been decided by law, regulation, or other policy-level decision.

- What kind of protection or consideration will the Plan give to non-listed, federal and state "species of concern", since it will be a joint HCP/NCCP?
- Why pursue an HCP? What is the benefit to species?
- Under the proposed HCP/NCCP, how will Endangered Species Act protection be granted to currently unlisted species if they are listed in the future?
- The Federal Register explicitly names nine botanical taxa, and mentions the possibility of 51 additional, for which MRC is considering coverage. There may be significantly larger numbers of sensitive taxa, but current knowledge of their autecology is extremely limited,

and only taxa with sufficient info to develop credible management regimes can be covered.

- Commenter is concerned that “habitat-based conservation approaches not be used as a rug under which botanical ignorance is swept.” For taxa lacking adequate information regarding distribution, biology, and habitat requirements, neither species-based nor habitat-based conservation approaches may be appropriate. In such cases, agencies should ensure that the taxa not be covered under the HCP/NCCP.

- What criteria will each agency use to accept taxa for coverage (under the HCP/NCCP), and how will each agency ensure that the scientific basis for making such a decision is adequate for each taxon?

- Has MRC adequately disclosed and assessed the combined impacts of all human-caused and natural impacts on given species?

- What process will be used to identify the preliminary list of covered species and natural communities?

- What minimum set of data and management information will be required to add each taxon or natural community to the preliminary list of covered species and natural communities?

- Who will compile the list of covered species and natural communities, and what public review and comment will be provided for this list?

- Who will decide the set of covered species?

- What objective criteria will be used to determine which taxa become covered species?

- Upon what data will this decision (to cover/not cover particular species) be made?

- For each covered species, what additional data will be used to determine conditions of coverage?

- If the conditions of coverage for a given taxon are modified, what process will be followed to affect such modification?

- If the conditions of coverage for a given taxon are modified, who will make the decision to allow such modification?

- If the conditions of coverage for a given taxon are modified, will consultation within CDFG, or with other agencies, be required prior to such modification?

4.3.2.13 TES Species (5 verbal comments; 29 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Survey and monitor for TES invertebrates. *Explanation: The HCP/NCCP includes a comprehensive monitoring and adaptive management plan. Depending on the results of the EIS/EIR impact analysis, mitigation measures, potentially including additional surveying and monitoring, may be developed in the EIS/EIR for selected species.*

- If all stands are eventually harvested, what are the impacts to threatened and endangered species?

- What is the resulting impact on species from variation in harvesting on MRC's property right now?

- What are the specific threats to individual species?

- Provide detail on the impacts of take and the long-term benefits of the plan to TES species.

- Analyze THP data to determine the effects of timber operations on TES species.

- Impacts to all threatened, endangered, candidate, proposed, sensitive, rare, endemic, or otherwise at risk species should be assessed regardless of whether the species is "covered" by HCP.

- Protect the critical habitat for listed species; avoid "take" of habitat for those species unable to easily relocate.

- Assess the overall impacts of the HCP, taking into consideration species population status and habitat conditions on all lands supporting local and regional populations.

- How does MRC assess cumulative or combined impacts of operations on species habitat (e.g. causing erosion which causes sedimentation in streams)? How can MRC replace endangered species lost as a result of habitat degradation or destruction? *Explanation: The EIS/EIR will analyze the cumulative effects of the proposed plan and alternatives using the best available scientific information and methods. Although it is not possible to replace lost species, the proposed plan must contain contains measures designed to minimize and mitigate any incidental take that may occur as a result of its implementation.*

- How will MRC mitigate additional loss of conifers and adjoining supportive understory for endangered species that need acres of habitat area? How will MRC replace extinction of endangered species? *Explanation: The EIS/EIR will analyze the cumulative effects and mitigation measures of the proposed plan and alternatives using the best available scientific information and methods. The lead agencies cannot issue a permit if it does not meet all the issuance criteria as defined by endangered species law, regulation and policy (e.g., Section 10(a)(2)(B) of the ESA, Section 2081 of the CESA) (e.g., the permit could not be granted if it would result in the extinction of a listed species. Note that extinction of a listed species means the loss of a listed population, not the loss of one or more members of that population).*

- Commenter urges NOAA Fisheries, USFWS, and CDFG to work with MRC to achieve the maximum possible protection of endangered species on their lands. If this cannot be done, they should continue to have a no-take policy with regard to MRC. However, it is far more desirable that MRC begin a strong, scientifically based attempt to restore the populations of listed species on their lands.

- While long-term goals of restoration are being pursued, it is essential that critically endangered species' populations not be damaged. Strong protection is necessary to ensure that local salmonid runs and populations of other endangered species are not destroyed. MRC should not cut its few remaining old-growth trees, as they provide critical habitat...that cannot be replaced for hundreds of years. MRC should practice conservative forestry in the sensitive watersheds where salmonids persist, and should create permanent no-cut reserves where listed species are present.

- What is the status of species of concern on MRC's property? Describe in detail the status of all TES species on MRC lands.

- What is the capability of current aquatic habitat to support TES species?

- Covered activities should be timed so as not to interfere with timing of crucial life history requirements of TES species. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*

Issues that may not receive detailed analysis in the EIS/EIR:

- Please map the 87 watersheds affected for the next 80 years and where all the incidental takes will be located for: northern spotted owl, mountain beaver, freshwater shrimp, California red-legged frog, milkvetch, white sedge, bird-peak, Baker's larkspur, Kellog's buckwheat, Burke's goldfields, showy Indian clover, coastal chinook, coho salmon steelhead. Please map the current distribution and location. *Explanation: The EIS/EIR will analyze the overall effects of implementing the various alternatives. Given current scientific understanding, it is not possible to determine the exact location of all potential incidental take. Available information on the current distribution of covered species will be included in the HCP/NCCP, and is expected to include a discussion of the potential impacts and assessment of take that is likely to occur if the plan is implemented. In many cases it is not possible to predict the precise occurrence within the Plan Area of take to a specific individual member of a listed population. In such cases acres of habitat or other appropriate habitat units are used to quantify the amount of take.*

- Which of the specific/individual species will be taken? What impacts to TES species will result if ESA continues to be ignored? *Explanation: See explanation above.*

- What impacts to TES species have occurred since historical logging began? *Explanation: The environmental setting section of the EIS/EIR will describe in general what the historical conditions were in the Plan Area, and how historical logging has affected TES species.*

- Describe conditions TES species need to recover to pre-logging conditions. Explanation: The environmental setting section of the EIS/EIR will describe in general what the historical conditions were in the Plan Area, and how historical logging has affected TES species. Analysis of the recovery of TES species to pre-logging distribution and abundance is beyond the scope of the EIS/EIR.

- Analyze status and trends of TES species based on differences between L-P SYP and MRC THPs. Explanation: The EIS/EIR will analyze impacts of the proposed plan and alternatives based on the best available data and methods. In some cases historical data relevant to this analysis may include previous implementation and management plans (e.g., SYPs, THPs). A comparison of MRC’s resources and management practices with those of previous landowners, however, is unlikely to facilitate decision-making among alternatives.

- How does information on the presence/absence and status of TES species differ between the L-P SYP and MRC THPs? *Explanation: The EIS/EIR will analyze impacts of the proposed plan and alternatives based on the best available data and methods. In some cases historical data relevant to this analysis may include previous implementation and management plans (e.g., SYPs, THPs). A comparison of MRC’s resources and* *management practices with those of previous landowners, however, is unlikely to facilitate decision-making among alternatives.*

The following comments relate to issues of HCP/NCCP development and/or content. Some or all of these issues may be addressed in the HCP/NCCP or accompanying decision documents.

- Explain how agencies will address listed species.
- Will the HCP/NCCP provide information and assessment of multiple impacts to TES species?
- The specific plan for benefiting TES species needs to be disclosed to the public.
- What is the plan for the recovery of listed species?
- How will calculations of variable retention percentages and of total harvest percent be correct in calculating protection of endangered species or adequately figured into the accounting?

4.3.2.14 Wetlands (6 written comments)

Issues likely to be addressed further in the EIS/EIR:

- The EIS/EIR should identify impacts to wetlands and include management and mitigation to comply with Section 404 Clean Water Act requirements. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*
- The EIS/EIR should address feasibility of in-kind mitigation for impacts to wetlands and other aquatic habitat. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*

Issues that may not receive detailed analysis in the EIS/EIR:

The following comments relate to issues of HCP/NCCP development and/or content. Many of these issues may be addressed in the HCP/NCCP, Implementation Agreement, or accompanying decision documents.

- What wetlands and waterways planning will be conducted as part of the Project? Who will conduct it?
- How will the Project protect the hydrologic integrity of sensitive [wetland] habitat?
- How will wetlands, including those disconnected from navigable waterways and the ocean, be classified for the purposes of the NCCP?
- How will wetlands planning deal with the fact that in certain cases, the Project area does not encompass an entire watershed, but shares ownership with other parties?

4.3.2.15 Wildlife and Fisheries (3 verbal comments; 61 written comments)

Issues likely to be addressed further in the EIS/EIR:

- What are the specific impacts to salmonids and their specific watercourses?

- How will freshwater species be damaged? *Explanation: Freshwater species may or may not be damaged by the proposed project. The EIS/EIR will evaluate the impacts of the proposed project on freshwater species.*
- Analyze the status of coho salmon in MRC watersheds.
- Address the distribution of fish species in and near MRC land.
- What numbers of wild coho salmon spawners likely remain in streams on, and downstream, of the project area?
- Address the effects of increased stream temperatures from canopy loss on fish populations. Include impact studies of coho spawning streams on all MRC land.
- Consider issues related to small population size or the genetic effective size of a population; will stocks of small numbers of coho likely be extirpated.
- Consider the effects of marbled murrelet take on metapopulation viability.
- Commenter wants no-logging nest buffers and creation of new habitat near known marbled murrelet nests.
- How will the proposed plan affect marbled murrelet populations and habitat?
- Create habitat to sustain the marbled murrelet population region-wide.
- Preserve marbled murrelet habitat.
- Examine how the HCP addresses the potential of critical habitat for marbled murrelet if remaining old growth continues to be cut?
- Provide information on status of marbled murrelet on and adjacent to MRC lands.
- Discuss the effects of helicopter use on the northern spotted owl and marbled murrelet.
- The EIS/EIR should analyze effects on northern spotted owl habitat and behavior, including how foreseen and unforeseen circumstances will affect the population over the next 80 years.
- Provide information on the status of northern spotted owls on and adjacent to MRC lands.
- Include list of migratory birds from FSC in the review process for this project.
- Analyze impacts to migratory birds.
- Provide information on the status of point arena mountain beaver on and adjacent to MRC lands.
- What is the capability of current wildlife habitat to support TES species?
- Include a discussion at different landscape levels of impacts to wildlife. This discussion should assess the habitat needs of each species and its ability to move and disperse.
- Describe the role of various habitat types and forest classes in the occurrence and distribution of wildlife, and the effects of changes in the distribution and quantity of habitat types on wildlife covered by the ITP and other wildlife that these species may depend on—for example prey items.

- Please address how changes to microclimate conditions in riparian areas might affect reptiles, amphibians, and other aquatic species.

- Address immigration, emigration, and recruitment of young and the impact on wildlife populations as a result of this proposal.

- The EIS/EIR must contain comprehensive biological assessments for each covered species (and particularly listed species), and their associated habitats. Such assessments should include abundance and distribution, habitat requirements, ecological relationships, life history and population trends.

- Each combination of water source and site must be considered separately to assess the cumulative impacts of silviculture practices upon species' food, water, cover, reproduction, and migration.

Issues that may not receive detailed analysis in the EIS/EIR:

- Coastal watersheds near known marbled murrelet habitat/use areas should be surveyed to assess habitat suitability for marbled murrelet. *Explanation: The permit decision will be based on whether the application for incidental take meets the permit issuance criteria as defined by endangered species law, regulation, and policy (e.g., Section 10(a)(2)(B) of the ESA, Section 2081 of the CESA). All applicable criteria must be satisfied before a permit may be issued. The EIS/EIR will analyze the environmental impacts of the proposed plan and alternatives using the best available scientific information and methods.*

- Given that all salmonid resources in the Pacific Northwest are threatened, MRC should provide a Northern California map of all THP projects for the next 80 years that will clearly demonstrate significant cumulative impacts from projects throughout the region. The 80-year HCP/NCCP should project salmonid decline based on land disturbance over time to date and then project what the salmonid decline may be in the next 80 years given projected timbering operations. *Explanation: An analysis of cumulative effects for salmonids will be included in the proposed HCP/NCCP and the EIS/EIR. Inclusion of all potential future northern California THPs in this analysis however, is unlikely to facilitate decision-making among alternatives. [The location and specifics of future northern California THPs within the next 80-years are largely unknown. The HCP/NCCP is intended to guide MRC's future THP development and implementation so as to mitigate and avoid impacts to covered species as well as provide habitat in such a way as to conserve the covered species].*

- Commenter asked certain specific questions at the Santa Rosa scoping for which he/she would like specific answers: "Which of the 10 coho salmon found in Elk Creek in 1995 are going to be killed? Which of them will be designated 'incidental' in this 'ITP' process? Which spotted owls in these forests are considered 'incidental' and which ones will be 'taken'? In which watersheds?" *Explanation: Although the proposed plan will include measures designed to minimize and mitigate take, some level of take may occur, provided the proposed plan meets the all the issuance criteria for an Incidental Take Permit as defined by endangered species law, regulation, and policy (e.g., Section 10(a)(2)(B) of the ESA, Section 2081 of the CESA). It may not be possible to determine the occurrence or exact location of any potential incidental take, nor the fate of specific individual organisms. In such cases, effects to habitat and monitoring of populations will be used to determine the effect of the proposed plan on listed species.*

- Analyze the effects of logging on northern spotted owl habitat since MRC purchased the property. *Explanation: The EIS/EIR will describe the status of the northern spotted owl and suitable habitat on MRC lands. The analysis will focus on the effects of the various alternatives, help facilitate decision-making among alternatives.*

- Do not allow impacts to coho salmon. *Explanation: The EIS/EIR will analyze the impacts and cumulative effects of the proposed plan and alternatives on coho salmon using the best available scientific information and methods. The lead agencies cannot issue a permit if it does not meet the issuance criteria as defined by endangered species law, regulation, and policy (e.g., Section 10(a)(2)(B) of the ESA, Section 2081 of the CESA). All applicable criteria must be satisfied before a permit may be issued. (e.g., a permit could not be granted if it would result in the extinction of a listed species. Note that extinction of a listed species means the loss of a listed population, not the loss of one or more members of that population).*

- State agencies should not approve projects that would jeopardize endangered species such as the marbled murrelet. *Explanation: Pursuant to Section 2835 of the California Endangered Species Act (CESA), the state lead agency may authorize take of listed species that occurs incidental to otherwise lawful activities. Section 2800 regulations also stipulate that CDFG must ensure the species conservation and management is provided for in the NCCP.*

- What are potential impacts on marbled murrelet of habitat loss in adjacent watersheds? *Explanation: The analysis of impacts to marbled murrelets and other sensitive species will incorporate all available information that relates to populations in the project area. An analysis of habitat loss in watersheds outside the project area, however, is outside the project's sphere of influence and is not within the scope of the EIS/EIR.*

- MRC's Hamer Environmental report of probable marbled murrelet detections indicates a very low level of activity in certain watersheds that lack old growth. Since purchasing the property, MRC has since been heavily logging these rare marbled murrelet watersheds. *Explanation: Comment noted. The EIS/EIR will analyze the environmental impacts of the proposed plan and alternative using the best available information and methods.*

- Commenter especially opposes take of marbled murrelet, northern spotted owl, Point Arena mountain beaver, California freshwater shrimp, California red legged frog, California coastal chinook salmon, central and southern Oregon/northern California coast coho salmon, and central California coast and northern California steelhead. *Explanation: Comment noted. The EIS/EIR will analyze the environmental impacts of the proposed plan and alternatives, including potential impacts to fish and wildlife populations.*

- Environmentally, we are concerned about results the proposed action would have on fish and wildlife populations. *Explanation: Comment noted. The EIS/EIR will analyze the environmental impacts of the proposed plan and alternatives, including potential impacts to fish and wildlife populations.*

- Provide information needed to determine the effects of northern spotted owl no-take certificates. *Explanation: The EIS/EIR will analyze the impacts of the proposed plan and alternatives on fish and wildlife populations, including the northern spotted owl, using the best available data and methods. Determining the effects of no-take regulations is an ESA effectiveness and enforcement issue.*

The following comments relate to issues of HCP/NCCP development and/or content. Many of these issues may be addressed in the HCP/NCCP or accompanying decision documents.

- Incidental "take" must include loss of generations of salmonid redds and must be addressed cumulatively before an incidental "take" can be allowed for salmon.
- What is the scientific basis for allowing take of the marbled murrelet?
- Provide data to support MRC's assessment of habitat suitability for marbled murrelets.
- Have the agencies verified MRC's reporting on marbled murrelet presence/absence and habitat suitability?
- What is the scientific basis for marbled murrelet management practices and conservation measures, including nest protections?
- Have northern spotted owl and marbled murrelet protections been effective on MRC lands?
- MRC must have reliable, accurate baseline data for spotted owls and other designated ESA wildlife.

4.3.3 Human Environment

The EIS/EIR will address potential impacts and mitigation associated with the human environment under the proposed plan and each selected alternative. Issues to be addressed include cultural resources, human health and safety, recreation, socioeconomic issues, and visual resources.

4.3.3.1 Cost to Taxpayers (1 verbal comment; 6 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Since these 87 watersheds are impaired and there are salmonid listings under ESA, what is the economic loss to the public with continued degradation of the MRC forest over 80 years? What is the cost to the public for fisheries losses over 80 years? *Explanation: Of the 87 planning watersheds in the Plan Area, 65 are listed as water quality impaired by the USEPA and NCRWQCB. The EIS/EIR impacts analysis will consider the impacts of the proposed plan and alternatives on socioeconomic conditions. It may not be possible, however, to determine the exact cost to the public of impacts associated with the proposed plan and alternatives.*

Issues that may not receive detailed analysis in the EIS/EIR:

- The term of the HCP must be considered carefully to avoid unfairly saddling taxpayers with the expense of dealing with unforeseen circumstances related to covered taxa during the term of the HCP. *Explanation: Comment noted.*
- What are the financial impacts of preparing, implementing, and monitoring the plan and the cost to taxpayers? *Explanation: Most costs associated with preparation of the HCP/NCCP, its implementation, and monitoring are the responsibility of the permit applicant and are not borne by the public. Both state and federal statute and regulation compel the agencies to participate in the development and implementation of HCP/NCCPs. Costs associated with agency participation in the preparation, review, and*

implementation/monitoring of HCP/NCCPs are, at least in part, an expected part of the oversight process, and are not tracked on an individual project basis. In some cases the applicant also bears some of the costs of agency oversight.

- What is the cost to the public for diminished water quality? TMDL implementation? *Explanation: Although environmental impacts to surface water quality will be analyzed in general in the EIS/EIR, determining specific costs associated with diminished water quality is likely to be limited by available data and therefore is not likely to facilitate decision-making among alternatives.*

- What is the cost to the public for further impairment of rivers when and if mitigations, erosion control plans, and THP's fail? *Explanation: The EIS/EIR compares alternatives based on the assumption that the project will be implemented as described. Forecasting costs associated with failure of mitigation, erosion control, and THPs is speculative, and is unlikely to facilitate decision-making among alternatives.*

4.3.3.2 Cultural Resources (1 verbal comment; 2 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Indian cultural uses (modern) need to be included.

Issues that may not receive detailed analysis in the EIS/EIR:

- We would appreciate if you would contact the Tribal Office of the Sherwood Valley Band of Pomo Indians if any bear claws or wild turkey, hawk, eagle, or woodpecker feathers, which are used for ceremonial purposes, are found on the site. *Explanation: Comment noted. Consultation with Native American tribes that have cultural interests in the Plan Area has been initiated by the lead agencies and will continue throughout the NEPA/CEQA process.*

4.3.3.3 Human Health and Safety (2 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Analyze and report potential health and safety effects of the proposed HCP/NCCP.

4.3.3.4 Recreation (1 verbal comment; 1 written comment)

Issues that may not receive detailed analysis in the EIS/EIR:

- What level of public access will be considered in the plan? *Explanation: This is an HCP/NCCP content issue. If recreation is being considered as a covered activity then these issues will be addressed further in the EIS/EIR*

- MRC should disclose details of plans for recreation for the next 80 years. *Explanation: This is an HCP/NCCP content issue. If the proposed plan and alternatives will affect public recreation opportunities, an appropriate analysis will occur to facilitate decision-making among alternatives.*

4.3.3.5 Socioeconomics (2 verbal comments; 10 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Analyze effects of proposed HCP/NCCP on regional economic vitality and diversity.
- The EIS/EIR needs to evaluate the economic and social impacts of the proposed plan.
- The EIS/EIR needs to include a component on the potential development of any or all of these over-logged forest lands, including but not limited to economic impacts on timber, fishing, and other resource jobs. The EIS/EIR further needs to include a component on the economic impacts of further losses in the salmon fishery.

Issues that may not receive detailed analysis in the EIS/EIR:

- Will the HCP/NCCP process result in better quality wood products? *Explanation: The EIS/EIR will analyze the impacts of the proposed project, including changes in the quality of wood products, if any changes are likely to result from the proposed plan and analysis would help facilitate decision-making among alternatives.*
- For many people, enjoyment and understanding of native plants is tied to the feeling of well-being that comes from knowing that they are surrounded by healthy ecosystems. How will the Plan address these valid concerns? *Explanation: It is recognized that healthy ecosystems are important for the enjoyment of people; however, examination of such issues in the EIS/EIR is unlikely to facilitate decision-making among alternatives.*
- Do state revenue concerns, and depletion of Jackson State timber and species resources, have bearing on the MRC HCP/NCCP? Do state employee pension funds, which are invested in Hawthorne logging, and depletion of Hawthorne timber and species resources, have bearing on the MRC HCP/NCCP? *Explanation: Local and regional economic impacts of the proposed plan and alternatives will be analyzed in the EIS/EIR. A detailed analysis of the relationship between outside investments and local or regional socioeconomic impacts, however, is unlikely to facilitate decision-making among alternatives.*

4.3.3.6 Visual Resources (3 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Please address aesthetic impacts on the lives of surrounding residents.

4.3.4 NEPA / CEQA

The EIS/EIR will be prepared in accordance with NEPA and CEQA regulations, and will include clear descriptions of the project purpose and need, the proposed action and alternatives, the affected environment/environmental setting, environmental consequences, and mitigation measures. The lead agencies will use public and agency comments on topics relating to alternatives analysis, EIS/EIR provisions, and impacts analysis to develop the range of alternatives and identify priority issues for analysis in the EIS/EIR.

4.3.4.1 **Alternatives Analysis** (2 verbal comments; 30 written comments)

Issues likely to be addressed further in the EIS/EIR:

- What happens to species if "no action" is pursued at this time?
- Interpretation of the no action alternative as having no impacts may be inconsistent with NEPA regulations. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*
- The no action alternative should assume full take avoidance and be in compliance with all ESA requirements, and must accurately describe baseline conditions and assume full compliance with and enforcement of existing federal and state laws so as not to overestimate the "benefits" of the HCP mitigation program.
- The no action alternative must account for the likelihood that currently imperiled species will be listed in the future and subject to ESA restrictions. *Explanation: Impacts to candidate species may be accounted for in the EIS/EIR.*
- The EIS/EIR should provide comparison of alternatives to inform review and decision-making. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*
- The EIS/EIR should evaluate a broad mix of possible alternatives, including those that may not be within the jurisdiction of the lead agency. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*
- The EIS/EIR should describe in detail the process of selecting, eliminating, analyzing, and implementing each alternative. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*
- EPA suggests that alternative analysis be based on a watershed approach. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*
- Consider EIS/EIR alternatives that specifically reduce sedimentation of aquatic habitats. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*
- The EIS/EIR should evaluate the alternatives in terms of compliance with the Federal Antidegradation Policy and the Clean Water Act. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*
- Include alternatives that avoid or minimize water quality impacts associated with timber management activities. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*
- The EIS/EIR, to be adequate, must examine all reasonable alternatives, and cannot consider only those alternatives with the same end result. Where economic preferences are used to select the preferred alternative, the decision must be based on solid economic information.
- Evaluate a range of proposed harvest prescriptions for upland areas (roads) and riparian areas (harvest management and buffers).

- An additional 2,000 acres in the Willow Creek area will be retained in private ownership with rights to subdivide for development. Please consider the alternative of putting the entire property into a preserve. This alternative should be evaluated in light of diminished condition of most of the project area and of most of the lands adjoining MRC land and of the danger of extinction of some species proposed for take.

- A third alternative would be permanent protection at further expense to the public. MRC is in the process of selling part of its holdings in Willow Creek… why not sell the rest?

- The EIS/EIR should include an alternative for permanent protection of these forestlands at no additional cost to the public.

- Alternative: permanent protection where the Fishers themselves create a conservation land trust from their holdings and employ forest workers in restoration projects, repairing the damage that they have done.

- The EIS/EIR should include and discuss an alternative that would preserve MRC's forestland.

- Consider the alternative of restoration of the natural forest ecosystem and the protection of water quality, fish and wildlife habitats as the primary management goals.

- Compare the expected impacts from a restoration alternative, as well as a no-project alternative.

- Commenter wants no-harvest alternative for sensitive watersheds.

- Analyze a no-harvest alternative.

- Analyze an alternative that does not permit use of chemical herbicides.

- The HCP should consider other land actions (conservation) as well.

Issues that may not receive detailed analysis in the EIS/EIR:

- All alternatives selected for detailed analysis must avoid or substantially reduce the significant environmental impacts of the proposed project—thus the EIS/EIR cannot have an alternative, which authorizes more harvesting than the HCP preferred alternative, nor should it be constrained by economic preferences. *Explanation: The EIS/EIR will include feasible alternatives that represent a range of resource protections and potential environmental impacts, as required by NEPA (40 CFR 1502.14) and CEQA (CCR Section 15126) law and regulation*

- Instead of allowing an ITP, the regulatory agencies should be mandating a strict program of protection and recovery. *Opinion noted The ITP applicant must submit an HCP/NCCP that provides measures to minimize and mitigate incidental take.*

- Federal agencies should purchase and preserve property with money from the Land and Water fund. *Comment noted.*

- State should buy and protect MRC's forestlands. *Comment noted*.

4.3.4.2 **EIS/EIR Provisions** (12 written comments)

Issues likely to be addressed further in the EIS/EIR:

- The EIS/EIR should include cumulative effects analysis for each covered activity for the 80-yr permit term.
- Cumulative effects of the HCP must be carefully evaluated, keeping in mind the impacts and effectiveness of existing conservation strategies.
- Cumulative effects analysis in the EIS/EIR should use the latest scientific literature as guidance.
- The US EPA recommends that the EIS/EIR include a clear description of project need and indicate relationship between project need, purpose, and alternatives. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*
- In order to sufficiently meet the agencies' obligation under NEPA/CEQA, the EIS/EIR must independently evaluate the effectiveness of all HCP components and outcomes rather than reiterating rationale from the HCP.
- CDFG's action as state lead agency to permit take of listed species is subject to formal internal consultation. The EIS/EIR must include the results of these consultations, including CDFG's biological findings.

Issues that may not receive detailed analysis in the EIS/EIR:

- Recently enacted NCCP standards must be used to guide the scope of the EIS/EIR. *Explanation: The recently enacted NCCP standards will be used to guide preparation of the NCCP component of the HCP/NCCP. These standards, however, do not legally apply to NEPA and CEQA, and therefore will not be used to guide the scope of the EIS/EIR.*
- The EIS/EIR should include scientific evidence documenting the effectiveness of the HCP/NCCP. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)] Explanation: The analyses included in the EIS/EIR will be based on the best available information and scientific methods. Because the HCP/NCCP has not yet been implemented, however, it will not be possible to evaluate its effectiveness.*
- The EIS/EIR should include and assess the July 2002 World Wildlife Fund (WWF) Living Planet Report as it applies to the proposed plan. *Explanation: The EIS/EIR will analyze the impacts of the proposed plan and alternatives based on the best available information and scientific methods.*

4.3.4.3 **Impacts Analysis** (6 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Use THP data to analyze the abiotic impacts of logging. *Explanation: The EIS/EIR will analyze impacts of the proposed plan and alternatives based on the best available data and methods. In some cases historical data relevant to this analysis may include previous implementation and management plans (e.g., THPs).*

- Indicate resource trends and changes in biotic and abiotic conditions since the previous ownership.

- The EIS/EIR should describe potential direct, indirect, and cumulative impacts and include mitigation for impacts. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*

- The EIS/EIR should document the impacts, including cumulative impacts, of past, present, and reasonably foreseeable actions, such as timber harvesting, resource extraction, development, etc. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*

Issues that may not receive detailed analysis in the EIS/EIR:

- Analyze differences in biotic and abiotic conditions between L-P's SYP and MRC's THPs. *Explanation: The EIS/EIR will analyze the impacts of the proposed plan and alternatives based on the best available information and scientific methods. Information used in the analysis may include data describing historical conditions in the Plan Area. An analysis of plans prepared by previous owners, however, is unlikely to facilitate decision-making among alternatives.*

4.3.4.4 Independent Consultant (2 written comments)

Issues likely to be addressed further in the EIS/EIR:

- An objective third party is needed to develop the EIR/EIS. Contractors selected by agencies should not have financial or other interest in the outcome of the project. *Explanation: Stillwater Sciences, the consultant approved by the federal and state lead agencies to prepare the EIS/EIR, has entered into agreements with the agencies guaranteeing that the EIS/EIR will be prepared objectively and with no financial or other interest in the outcome of the project.*

- The HCP/NCCP Federal Register notice of June 6, 2002 is very cloudy on numerous public process issues. Who sponsored the public scoping meetings? Is Jones and Stokes an MRC, or a state and federal agency consultant? Who paid Jones and Stokes? Who is writing the HCP/NCCP for MRC? Do the agencies have a separate consultant? *Explanation: The parties responsible for preparation of the HCP/NCCP, EIS/EIR, and the initiation of the public scoping process, were clearly identified in the Federal Register notice of June 6, 2002. These parties, and their responsibilities, will also be clearly identified in the appropriate publicly available documents (i.e., the HCP/NCCP and EIS/EIR).*

4.3.5 HCP / NCCP

The EIS/EIR will include descriptions of the proposed HCP/NCCP, a detailed comparison of the HCP/NCCP with the proposed alternatives, and an analysis of the potential impacts associated with implementation of the plan and alternatives.

4.3.5.1 Conservation Measures and Objectives (31 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Protection of all 232,000–240,000 acres of the project area is essential to maintain and restore the redwood ecosystem. The health of the forests in the project area provides the basis and the critical foundation for assurance that the take of species proposed will not appreciably reduce the likelihood of the survival and recovery of the species in the wild.
- Describe watersheds with at-risk fish stocks and high quality water and discuss how this HCP will conserve those.
- How will this HCP provide for species' survival and recovery?
- Address whether the HCP includes recovery objectives for listed species, old growth or late seral dependent species, restoration of watercourses, riparian zones, and other critical habitat, and species habitat elements.
- What will the expected reduction in population be for each species proposed under the permit? What strategies in the HCP will assure that these declines don't appreciably reduce the survival/recovery of the species?
- Describe current baseline watershed conditions and develop measures to maintain and improve the condition of aquatic resources.
- A recovery-oriented HCP that meets goals and standards for HCPs/ITPs should include longer timber rotations, habitat reserves, and site protections to provide habitat for sensitive species and reasonable income for the landowner.
- Incorporate recommendations of the Marbled Murrelet Recovery Plan into the HCP/NCCP.
- The HCP/NCCP should have specific guidelines for each watershed and each TES species.
- How will the proportionality of impact and conservation measures be determined, and what metrics will be used to do so?
- Species conservation needs and recovery needs also need to be addressed.
- What watercourse protection measures will each agency require in the HCP to remedy the deficiencies in the current watercourse protection measures?
- The Plan should be designed to ensure that native vegetation is not merely preserved, but is fulfilling its role in the ecosystem. This should be included in the "landscape-level" planning, and entails conservation of habitat for pollinators and dispersers.

Issues that may not receive detailed analysis in the EIS/EIR:

The following comments relate to issues of HCP/NCCP development and/or content. Some or all of these issues may be addressed in the HCP/NCCP or accompanying decision documents. Comments regarding HCP/NCCP issues will be solicited during the HCP/NCCP review process, following release of the Draft HCP/NCCP.

- What provisions will the HCP/NCCP include to ensure ecosystem function?

- How are HCP/NCCP protection measures affected by regional and local ecology?
- The HCP/NCCP must include measures for restoration of pre-1850s conditions.
- Through what process will the preliminary conservation objectives be established?
- How will these preliminary conservation objectives address the restoration mandate for covered species?
- How will CDFG ensure that the current best available science will be used to establish the preliminary conservation objectives?
- Who will be involved in establishing the preliminary conservation objectives?
- What metrics will CDFG use to establish the "equivalency" of such conservation measures to conservation and restoration through properly configured and managed reserves?
- If equivalent conservation measures are used exclusively, how will such measures promote "conservation of unfragmented habitat areas"?
- If such equivalent conservation measures subsequently fail to provide conservation and restoration equivalent to reserves, will reserves then be created, and if so, how will CDFG ensure that suitable area, and sufficient funding, will be available at that time to create a reserve?
- How will CDFG ensure that no take of covered species occurs before establishment of the necessary preserves or equivalent conservation measures?
- How will the proposed conservation measures provide "protection of habitat, natural communities, and species diversity on the landscape or ecosystem level"?
- For each covered species, how will CDFG determine the "biological needs" of such species that conservation measures need to meet, and upon what data will this determination be based?
- How, and by whom, will the biological goals be established for each taxon?
- How will each agency decide, for each covered taxon, when habitat-based conservation approaches will be used in preference to species-based conservation approaches, and upon what basis will this decision be made?
- Under what conditions will each agency correct conservation strategies to compensate for external factors, such as catastrophic fires?

4.3.5.2 HCP/NCCP Process (6 verbal comments; 3 written comments)

Issues that may not receive detailed analysis in the EIS/EIR:

The following comments are related to HCP or NCCP processes and requirements. The EIS/EIR will analyze the environmental impacts of the proposed plan and alternatives, but will not address issues related to HCP or NCCP processes or requirements. The HCP/NCCP will discuss how various requirements are met, and will describe the relationship between the HCP and the NCCP.

- What triggers the federal register process?

- What is meant by "streamlining" the permit process?
- Who pays for the "independent" scientists and whom do they answer to?
- What is the process for paying the technical team members?
- How do the HCP and NCCP mesh?
- The recently passed state bill SB 107 contains mandates for standards and findings in the NCCP process. How will these provisions be applied in the Plan, since it is both an HCP and NCCP?
- SB 107 gave CDFG responsibility for establishing a process for public participation throughout plan development. CDFG is also responsible for establishing new, tough standards. How will the involvement of the federal HCP process affect CDFG's responsibilities?
- The relationship between the HCP, and its set of federal laws, regulations, and policy, and the NCCP, with its own set of state mandated mechanisms, was not made clear. For example, scoping comments were given different deadlines for each plan. Is there a lead agency? Or do CDFG, USFWS, and NOAA Fisheries share equally? Will the HCP and NCCP remain on separate tracks?

4.3.5.3 Incidental Take and the Incidental Take Permit (18 verbal comments; 68 written comments)

Issues likely to be addressed further in the EIS/EIR:

- As part of an 80-year commitment, MRC's plan should analyze cumulative impacts of each take.
- The HCP/NCCP is for 80 years, while MRC intends to manage for a goal of only 20,000 board feet per acre (an extremely depleted forest) over 50 years time. What is the relationship of these two time periods? And how can ancient forest species (e.g. marbled murrelet and coho salmon) survive in the meantime, or survive 50 years from now, in such depleted conditions?
- Will the HCP/NCCP 80-year plan take into account the possible continued decline of listed species under the ESA and public scrutiny and input for needed recovery of listed species?
- The agencies should carefully analyze a much shorter term HCP/NCCP (e.g. 10 years) that can be regularly updated based on new conditions and mitigation/monitoring results, considering how minimal current ecological information is. *Explanation: Many factors, including public comment, will be considered in the development of a range of alternatives for analysis in the EIS/EIR. It is possible that one or more EIS/EIR alternatives may be based on a shorter ITP term.*
- "Take" should be evaluated with respect to whether habitats "taken" correspond to population sources or sinks, provide habitat for genetically unique subpopulations or contain unique habitat/species combinations.
- Comment suggested that the ITP should not be issued until adequate information, mitigation, and scientific/public review has occurred. Credible adaptive management and

explicit agreements regarding the plan's biological goals, monitoring and enforcement must all be made clear up front. *Explanation: The EIS/EIR will analyze the environmental impacts of proposed activities, and will address the adequacy of conservation, mitigation, and monitoring to appropriately minimize and mitigate significant impacts using the best available science, in accordance with NEPA and CEQA requirements.*

- What is the advantage of an HCP for the public, MRC and species? *Explanation: The EIS/EIR will describe, evaluate, and compare the environmental impacts of the proposed plan and selected alternatives, including a no action alternative.*
- The HCP/NCCP should explain in detail the public benefits of the plan. *Explanation: The EIS/EIR will describe and evaluate the environmental impacts of the proposed plan and alternatives.*
- What exact activities are considered in MRC's application?

Issues that may not receive detailed analysis in the EIS/EIR:

- Many comments were received (4 verbal; 36 written) that expressed opposition to granting an Incidental Take Permit for MRC. Statements such as "How can agencies even consider 'incidental take' knowing the status of declining species?" and "We have a desire for no incidental take" summarize the majority of comments. *Explanation: The federal and state lead agencies recognize the public's concern regarding take of listed species. The permit decision will be based on whether the application for incidental take meets the permit issuance criteria as defined by endangered species law, regulation, and policy (e.g., Section 10(a)(2)(B) of the ESA, Section 2081 of the CESA). All applicable criteria must be satisfied before a permit may be issued. The purpose of the EIS/EIR is to analyze potential impacts of the proposed action and a reasonable array of alternatives to that proposed action.*
- Given the degraded conditions of the applicant's lands and the similar conditions of much of the forested landscape surrounding the project area in Mendocino County, it may be impossible to meet the goals and standards required by ESA of an HCP. Since HCPs should be used only in limited circumstances, and since there already exists extensive habitat degradation and elimination across much of these species' ranges, the issue of whether further habitat loss can be allowed under this ITP needs to be seriously considered. *Explanation: Opinions noted. The purpose of the EIS/EIR is to analyze potential impacts of the proposed action and a reasonable array of alternatives to that proposed action. The permit decision will be based on whether the application for incidental take meets the permit issuance criteria as defined by endangered species law, regulation, and policy (e.g., Section 10(a)(2)(B) of the ESA, Section 2081 of the CESA). All applicable criteria must be satisfied before a permit may be issued.*
- As part of an 80-year commitment, MRC's plan should identify details of take, including which species, the location of specific populations that will be subject to take, and the activities that will potentially lead to take. *Explanation: These items will be addressed in the HCP/NCCP. The EIS/EIR will analyze the impacts to listed species of the proposed plan and alternatives.*
- How will CDFG ensure that no take of any covered species occurs before management information sufficient to meet the conservation and restoration mandates is developed?

Explanation: Enforcement of law under the California Endangered Species Act (CESA) is not within the scope of the EIS/EIR.

- If what MRC is compromising is the well-being of endangered species, furthering destruction of already dwindled endangered species habitat, then MRC cannot be considered for an ITP or NCCP. MRC must then be required to file individual THPs and to be monitored to ensure the survival of endangered species and degraded habitat. *Explanation: Opinion noted.*

- It is hard for me to understand a consideration of this request when, on the other hand, the CDFG has taken drastic steps of shutting down commercial and sport fishing of bottom fish in order to save endangered numbers. Are the endangered species in the woods and watersheds no less important? *Explanation: The permit decision will be based on whether the application for incidental take meets the permit issuance criteria as defined by endangered species law, regulation, and policy (e.g., Section 10(a)(2)(B) of the ESA, Section 2081 of the CESA). All applicable criteria must be satisfied before a permit may be issued.*

- Does "take" include driving species away from their habitat? *Explanation: The term "take," as considered under the EIS/EIR, is defined by endangered species laws and implementing regulations. The federal definition is to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 U.S.C. 1532(19)). "Harm" has been further defined as "an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering." Harassment has also been defined by USFWS to mean "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as significantly disrupt normal behavioral patters which include, but are not limited to, breeding, feeding, or sheltering."*

- How can incidental take support recovery? Allowing take is inconsistent with long-term commitment to conservation. *Explanation: Opinion noted. The ESA allows incidental take of individual members of a population when that take does not jeopardize survival and recovery of the listed population. The impact of any incidental take on the survival and recovery of listed species will be analyzed in the EIS/EIR and biological opinion for this project.*

- Will species be "taken" if the HCP is approved? *Explanation: An approved HCP/NCCP must provide for conservation of designated species and must minimize and mitigate impacts to covered species as required by law and regulation for an incidental take permit. "Take" that is "incidental to otherwise lawful activities," is lawful under such a permit.*

- Taking would violate Criterion 4 for issuing an incidental take permit, "Does not reduce likelihood of survival and recovery of the species." *Explanation: Opinion noted. The EIS/EIR will analyze the impact of the proposed HCP on listed species.*

- As part of an 80-year commitment, MRC's plan should identify all incidental take that has occurred on the ownership since 1850. *Explanation: Available information on historical pre-logging conditions will be incorporated into the environmental impacts analysis in the HCP/NCCP and EIS/EIR. Information on historical conditions is limited and is unlikely to facilitate decision-making among alternatives.*

- Can the public sue the federal agencies for issuing the HCP? *Explanation: Private legal action against the federal agencies is a legal issue that is outside the scope of the EIS/EIR.*

- Federal agencies must review the entire action before approving/denying MRC's application. Review will result in denial of the proposed action. *Explanation: Opinion noted. The agencies will conduct all review and make a determination in compliance with the ESAs and NEPA/CEQA laws and regulations.*

The following issues regarding the proposed 80-year term of the HCP/NCCP and ITP will be addressed in the Biological Opinion and Statement of Findings for the ITP and 2800 permit decisions. The issue of permit length will be addressed in the EIS/EIR. Many factors, including public comment, will be considered in the development of a range of alternatives for analysis in the EIS/EIR. It is possible that one or more EIS/EIR alternatives may be based on different (shorter or longer) ITP durations.

- What is the justification for an 80-year planning period and ITP term?

- How can the public be assured that the property will be restored after the 80-year period?

- Several comments expressed opposition to an 80-year ITP term because of uncertainty regarding the future state of the environment.

- The 80-year period for the project is inappropriately long, and the period must be reduced to one for which the agencies can, in good faith, make credible management decisions regarding biological resources and unforeseen circumstances.

- Does any agency believe that it can credibly predict the state of the environment within the project area over the next 80 years so that it has reasonable confidence that it can negotiate a plan that achieves the conservation requirements of the HCP/NCCP programs, with no surprises or unforeseen circumstances, and if so, based on what evidence?

- Given the exceptionally poor state of current information regarding botanical resources located in the Project area, it will be very difficult to provide the botanical info needed to properly manage conservation of sensitive species without a long-term program of research. Such research, of necessity, will produce surprises, and appears to be at odds with an HCP for such an extended period.

4.3.5.4 No Surprises Policy (1 verbal comment; 23 written comments)

Issues likely to be addressed further in the EIS/EIR:

- The EIS/EIR must analyze the reasonably foreseeable biological impacts of including a "No Surprises" policy in the HCP and implementing agreement. The effects are likely to be significant where 1) the HCP fails to achieve its stated goals 2) HCP conditions prove inadequate to protect the species, 3) new scientific information affects the assumptions of the HCP, and 4) unanticipated circumstances significantly change the environmental baseline.

- If an 80-year “No Surprises” policy is issued, such a permit must require that all direct and indirect habitat impacts and habitat losses are fully minimized and mitigated. No net loss of quality or quantity of habitat should be allowed.

Issues that may not receive detailed analysis in the EIS/EIR:

The following comments regarding the HCP Changed and Unforeseen Circumstances provisions and the "No Surprises" policy are expected to be addressed in the HCP/NCCP. The HCP "No Surprises" policy provides the applicant with assurances that, in the event of changed or unforeseen circumstances, additional commitments of resources or funding will not be required of the applicant beyond what was negotiated as part of an approved and properly functioning HCP. The EIS/EIR will analyze the impacts of the plan, including the "no surprises" policy.

- How can the public be guaranteed of no surprises? *Explanation: An implementation agreement (IA) will be required for this HCP, should an incidental take permit be authorized. The IA is a legally enforceable document that specifies, among other things, the responsibilities of MRC and the agencies in implementing the HCP and NCCP.*

- Describe the implications of future listing of covered/uncovered species. *Explanation: If species covered by the HCP/NCCP are listed in the future, no further mitigation is required, as the HCP addresses the conservation of these species. If a species not covered by the HCP was listed in the future, the applicant would not have an incidental take permit for these species and would be responsible for avoiding take of these species.*

- Can the "No Surprises" policy be excluded from the HCP? *Explanation: On March 25, 1998, the "No Surprises" rule took effect. Under this rule, "No Surprises" assurances cannot be excluded from HCPs.*

- MRC should be required to provide detailed 80-yr forest and watershed management plans that guarantee measures will be implemented (i.e., a "No Surprises" plan). *Explanation: Opinion noted. The IA will describe the legal responsibilities of MRC in implementing the measures of the HCP.*

- Assuming standards for botanical surveys will change during the term of the project, how will CDFG ensure that such changes are considered changed circumstances rather than unforeseen circumstances?

- For each covered species, how will CDFG determine suitable environmental gradients and habitat diversity to accommodate the shifting distribution of species due to changed circumstances?

- How will CDFG address very significant data gaps and risk factors so as to avoid unforeseen circumstances over the entire term of the project?

- Since global warming is a reasonably foreseeable circumstance, does this mean that reasonably foreseeable consequences of global warming, such as significant changes in botanical populations, will be considered changed circumstances instead of unforeseen circumstances?

- For each taxon that is to be covered, how will each agency ensure that there are no unforeseen circumstances with respect to such taxon over the 80-year lifetime of the project? *Explanation: By definition unforeseen circumstances cannot be accurately predicted, therefore no assurances can be provided that they will not occur.*

- It will be "no surprise" if some of the currently unlisted sensitive taxa occurring on the project area become listed during the next 80 years. Accordingly, the agencies need to make sure that such listing does not result in an unforeseen circumstance. *Explanation: Opinion noted.*

- How will each agency deal with the reasonably foreseeable chance that additional negative effects of herbicide application will be discovered in the next 80 years so as to avoid unforeseen circumstances in the HCP?

- How does each agency propose to deal with the evolving state of riparian protection so that new, more restrictive measures are not considered "unforeseen circumstances" pursuant to the HCP? *Explanation: The adaptive management strategy of the HCP will address the incorporation of new information on habitat protection needs.*

- Given the difficulty in defining "old growth" and "late successional" stands, how does each agency plan to define these terms in the HCP to cope with reasonably and foreseeable changes in these concepts, so as to avoid unforeseen circumstances over the 80 year period of the project? *Explanation: The adaptive management strategy of the HCP will address the incorporation of new information on habitat protection needs. The HCP is the applicant's document, and therefore MRC is responsible for defining old growth, and late successional stands in the HCP. The agencies will evaluate the proposals impacts on these habitat features, including the definitions used by the applicant, in the EIS/EIR.*

- How will each agency deal with even-aged silvicultural prescriptions so as to avoid unforeseen circumstances due to the reasonably foreseeable increasing regulation, or prohibition of even-aged management during the term of the Project? *Explanation: The possession of an incidental take permit does not relieve the applicant from their responsibility to follow other federal, state, and local laws, including laws that may change the type of harvest management allowable on private forest lands. If these laws affect the ability of the HCP to achieve its stated goals, the agencies and the applicant will re-evaluate the conservation measures.*

- How will changes to standard survey protocols (a reasonably foreseeable event), e.g., those of CDF and CDFG, during the term of the HCP be incorporated as changed circumstances rather than unforeseen circumstances?

- MRC's HCP/NCCP must allow for continued TMDL impairment listings that may arise throughout the term of the HCP/NCCP. Therefore, the 'no surprise' element of HCP/NCCP would appear moot and inappropriate. *Explanation: The no surprises policy only applies to the federal Endangered Species Act. Permit applicants will need to satisfy all other legal requirements, including the Clean Water Act, however these legal requirements may change during the plan's time period.*

- Describe and analyze the flexibility of the HCP to adjust to unforeseen circumstances such as listing of a new species, a species becoming on the verge of extinction, removal of species listing, status change.

- Identify new information or changes in the ecosystem that might warrant modifications of the HCP in the future.

- No regulatory assurances should be given that might preclude further adjustments necessary to promote the recovery of any named or unnamed species. *Explanation: An adaptive management strategy to address these issues is expected to be part of the proposed HCP.*

- If there is insufficient time and/or funds to conduct adequate field surveys, the "No Surprises" policy should not apply to new species found in later surveys.

- How will the THP review be modified during the term of the HCP/NCCP to reflect regulatory changes in a way that such changes are not "unforeseen circumstances" pursuant to the HCP? *Explanation: Changes in state forest rules cannot reduce the protection measures required in the HCP. Increasing protection on MRC lands under state laws is unlikely to result in detrimental impacts to species.*

4.3.5.5 Other HCPs: Examples, Effectiveness (6 verbal comments; 3 written comments)

Issues that may not receive detailed analysis in the EIS/EIR:

The following comments apply to the HCP and NCCP programs in general. Some or all of these comments may be addressed during the public comment period for the Draft HCP/NCCP.

- How many other large scale HCPs and NCCPs are in effect?
- What examples exist of HCPs actually working to improve/conserve species?
- HCPs do not seem to work. What is MRC willing to do that goes beyond the limits of the law?
- What is the track record for approval or denial of HCPs of all sizes and types of actions? We would like this information to be distributed.
- For all approved and implemented HCPs, have the agencies actually monitored success? What is the track record?
- Scientific opinion indicates that many HCPs have been developed in the past without adequate impartial scientific guidance, and there appears to be significant criticism from the scientific community that HCPs have the potential to damage the environment rather than mitigate or avoid negative impacts (e.g., San Bruno Mountain HCP, San Diego MSCP). *Explanation: Comment noted. The EIS/EIR will analyze the potential impacts of the proposed plan and alternatives using the best available data and methods.*
- CNPS is critical of CDFG's handling of sensitive unlisted botanical taxa under the PALCO HCP, and will likely oppose any HCP that does not remedy such problems. Desired actions include public disclosure and review of proposed modifications to botanical lists and management practices, consultation with qualified specialists, public review and comment, and decisions being made upon the best science available at the time.
- How will each agency attempt to avoid the pitfalls of previous HCPs so that the MRC HCP actually achieves the stated goals?

4.3.5.6 Regional/Global Context of HCP/NCCP (1 verbal comment; 17 written comments)

Issues likely to be addressed further in the EIS/EIR:

- As part of an 80-year commitment, MRC's plan should assess the impacts of take at all scales. *Explanation: The EIS/EIR and the HCP/NCCP will analyze the local and regional environmental impacts of the proposed plan and the selected alternatives. An analysis of the impacts of take at <u>all</u> scales, however, would be limited by available information and would be unlikely to facilitate decision-making among alternatives.*

- Cumulative impacts, both temporal and spatial, should be addressed for all affected resource areas, including a discussion of the conditions on other forestlands surrounding this property. *Explanation: The EIS/EIR will analyze cumulative effects occurring through time and space, including local and regional effects of the proposed action and alternatives. Conditions on surrounding forestlands will only be analyzed in detail if they would facilitate decision-making among alternatives.*

- The MRC EIR/EIS needs to address regional economic and environmental concerns. The impacts of MRC's logging on endangered species and other resources must be disclosed and addressed.

- Potential impacts to all resources should be evaluated in relation to other forestland HCPs in the redwood region of CA. The area of impacts resulting from the HCP should be addressed at scales ranging from watershed level to the redwood-regional level. *Explanation: The EIS/EIR will analyze the environmental impacts of the proposed action and alternatives at several spatial scales, including watershed and regional scales. HCPs for other regional forestlands will be analyzed in sufficient detail necessary to facilitate decision-making among alternatives.*

Issues that may not receive detailed analysis in the EIS/EIR:

- Cumulative effects analysis must take into account the possibility that future landowners will also apply for incidental take permits, and estimate the amount of incidental take to be authorized by those permits in light of existing precedents. *Explanation: Opinion noted. Cumulative effects under NEPA is defined as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7) (a similar definition is used under CEQA).*

- Complete a cumulative impacts assessment of ITPs for the species proposed by MRC for "take", or associated species, for other landowners in the redwood region of northern California. *Explanation: The EIS/EIR for MRC's proposed HCP/NCCP will include an analysis of cumulative effects for species and habitats affected by the plan and the selected alternatives. ITPs for other landowners in the region will be analyzed in sufficient detail necessary to facilitate decision-making among alternatives.*

- Will cumulative study look at impacts across the entire country? *Explanation: The EIS/EIR for MRC's proposed HCP/NCCP will include an analysis of cumulative effects for species and habitats affected by the plan and the selected alternatives. While the analysis will consider cumulative effects at a variety of spatial and temporal scales, the plan is unlikely to have any nation-wide effects. A detailed analysis of nation-wide impacts is unlikely to facilitate decision-making among alternatives.*

The EIS/EIR for MRC's proposed HCP/NCCP will include an analysis of cumulative effects for species and habitats affected by the plan and the selected alternatives. While the analysis will consider cumulative effects at a variety of spatial and temporal scales, a detailed analysis of the global effects of the plan and alternatives is unlikely to facilitate decision-making among alternatives. Thus, the following comments are unlikely to receive detailed analysis in the EIS/EIR.

- Consider the effects of the HCP/NCCP in terms of global environmental degradation.

- The EIS/EIR should analyze the effects of the proposed plan in the context of global resource depletion.
- The EIS/EIR should analyze the contribution of MRC's forests to planetary survival.
- As part of an 80-year commitment, MRC's plan should compare current and historical conditions in local, regional, and global ecosystem contexts.
- Impact analysis must consider regional and global status of TES species.

4.3.5.7 Scientific Basis and/or Adequacy of HCP/NCCP Measures (9 verbal comments; 16 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Use THP data and other data to analyze the cumulative impacts of the HCP/NCCP. *Explanation: The EIS/EIR will analyze impacts of the proposed plan and alternatives based on the best available data and methods. In some cases historical data relevant to this analysis may include previous implementation and management plans (e.g., THPs).*

Issues that may not receive detailed analysis in the EIS/EIR:

- Given that CDF and current forest practices are not keeping up with the newest scientific studies and species/ecosystems inventories, how can there be any claims of adequate TES habitat protection and ecological integrity of supporting ecosystems? *Explanation: Opinion noted. Impacts to TES species and the aquatic and terrestrial ecosystems affected by the proposed actions will be analyzed in the EIS/EIR, including baseline conditions resulting from forest management and the implementation of state and federal laws.*
- The Landscape Planning Model needs to have more on the ground input from RPFs, with one RPF actually having first hand knowledge of one watershed. MRC has its area RPFs, but in order to speed up the preparation of THPs they bring out of area foresters. *Explanation: Opinion noted. The HCP is expected to propose a method for using the landscape planning model and keeping it current.*

The following comments relate to the scientific basis and/or adequacy of HCP/NCCP measures. HCP/NCCPs are expected to provide data and methodology used for their development. The EIS/EIR will use the best available data and methods, as required by law and regulation, to evaluate the potential impacts of the proposed plan and selected alternatives.

- Besides known botanical data gaps, of what other data gaps and risk factors is MRC aware?
- Agency is expected to employ the best available science.
- Assess the reliability of data/analysis.
- Provide sound scientific basis and justification for analyses.
- Need for complete, unbiased, independent, total, scientific check on data.
- Why are we undertaking a planning process without knowing the best available data?

- Was a review conducted of all inventory data required for the Forest Stewardship Council (FSC)?
- Evidence from stakeholder "ground truthing" must be provided and required in HCP development.
- How will ground truthing be incorporated into the process? *Explanation: HCP/NCCPs are required to have monitoring programs. The EIR/EIS will analyze the impact of the HCP/NCCP, including its monitoring program.*
- How will the HCP assess cumulative impacts within watersheds? *Explanation: The EIS/EIR will analyze the effects of the HCP/NCCP, including cumulative effects.*
- What criteria are being used by MRC in evaluating biological data in the landscape plan?
- What are the assumptions used in developing the HCP?

The following comments relate to the review and assessment of HCP/NCCP measures by an independent science panel. The NCCP Act requires independent scientific input for certain NCCP measures. This issue will be addressed as part of the HCP/NCCP process.

- Will there be an independent science panel to assess HCP/NCCP measures?
- Who are the independent scientist that will review the HCP/NCCP and EIS/EIR?
- Should be panel(s) of scientists to assist in planning and to provide review/oversight during life of the plan. The panel should include academics as well as agency personnel, and findings should be publicly available in a timely and accessible manner. The panel should identify and monitor health of individual species, ecosystem associations, and cumulative ecosystem effect, both on-site and on adjacent lands.
- How and when will the Fish and Game Code requirement for "independent scientific analysis" be established?
- How will the process for including independent scientific input be established, and how will it be maintained during the entire term of the Project?
- From whom will independent scientific input be obtained?
- How will CDFG ensure that quality, site-specific independent scientific input be obtained?
- How will CDFG ensure that amendments to the plan and implementation agreement are based on the then current best science?
- A scientific review panel should be convened as early as possible to evaluate conditions where necessary to restore TES species and habitat. The panel should be given time and money to conduct field surveys and research in order to fully understand the status of the species. All subsequent planning and management decisions should be informed by this scientific panel.

4.3.6 Implementation

Comments related to mitigation, monitoring and adaptive management will be considered when developing the scope and content of the appropriate sections of the EIS/EIR. The EIS/EIR will discuss measures to mitigate adverse environmental impacts, and identify any significant impacts that cannot be avoided for the proposed plan and selected alternatives. Comments related to issues of process, content, implementation, and enforcement of the HCP/NCCP are expected to be addressed in the HCP/NCCP, Implementation Agreement, and associated decision documents. The EIS/EIR will evaluate the proposed project and alternatives under the assumption that they will be properly implemented. The agencies work closely with MRC to develop an implementation agreement and are responsible for monitoring and enforcement of the HCP/NCCP provisions. If provisions of the HCP/NCCP or Implementation Agreement are not met, the agencies can ultimately revoke the HCP/NCCP.

4.3.6.1 Enforcement of HCP/NCCP Provisions (10 verbal comments; 13 written comments)

Issues that may not receive detailed analysis in the EIS/EIR:

Explanation: The following comments relate to procedural or enforcement issues under the federal and state Endangered Species Acts or other applicable laws. The majority of these issues will be addressed in the Implementation Agreement for the HCP/NCCP, which is submitted as part of the application package.

- Can the HCP be revoked if it does not work? *Explanation: If MRC does not implement the HCP/NCCP as described, then the permit can be revoked.*
- If HCP goals are not met, then the HCP should be revoked. *Explanation: Opinion noted*
- Is the HCP a substitute for legal enforcement? *Explanation: No, the agencies are responsible for enforcement of the HCP/NCCP and Implementation Agreement.*
- Is the independent technical team charged with enforcing the success/failure of the HCP and MRC's actions? *Explanation: No, the agencies are responsible for enforcement.*
- How can public enforcement happen if MRC has "safe harbor"? *Explanation: Actions taken outside of the HCPs conservation measures are subject to federal prosecution if the ESA is violated.*
- MRC is cutting old growth now. Who is enforcing this now?
- If the plan is approved, what penalties will be in effect if goals are not achieved? Who will be charged with ensuring plan compliance? If a violation is found, who is responsible? *Explanation: The plan and the implementation agreement will describe these measures in detail.*
- MRC should be penalized if a violation is determined. It should not be the licensed timber operator's fault.
- When do the federal/state agencies begin their oversight/monitoring of HCP success? *Explanation: As soon as an HCP is authorized.*
- Provisions should prevent MRC from shifting blame for violations to licensed timber operators (LTOs).
- HCP/NCCP should have penalties for conversion of land to residential use.
- Would like assurance that requested HCP/NCCP provisions will be implemented. *[Comment from Elk County Water District: also included in the Agency Comments section (Section 4.3.11)]*

- How can MRC guarantee they will abide by the provisions of the proposed plan?
- The EIS/EIR should address commitments, assurances, and mechanisms for funding, implementation, enforcement, and monitoring. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*
- Will failure to adopt modifications to the adaptive management strategies, or failure to fund such modifications, constitute sufficient reason for the NCCP to be suspended or revoked?
- The agency is expected to uniformly employ specific measurable and verifiable performance standards/indicators with regard to water temperature, sediment, chemical pollution, invertebrates and other food sources, high and low summer and winter water flows, road densities, and other factors affecting survival and recovery of covered species.
- What consequences will each agency expect if herbicides are applied to sensitive botanical resources in contravention of the HCP?
- We have numerous questions and concerns about the failure of the California Forest Practice Rules and CDF to regulate harvests, protection of endangered species and other resources, and the failure of CDFG Rules and CDFG's enforcement.
- Who enforces erosion control?
- Which agencies, by what means, will assure that the terms of the HCP/ITP are met?
- Who will be responsible for assuring that public trust values are not violated?
- Describe conditions or activities that will cause the ITP to be revoked. Describe charges for minor violations. Describe procedures that will be used to investigate violations of the permit.

4.3.6.2 **Financial Commitment** (18 written comments)

Issues that may not receive detailed analysis in the EIS/EIR:

Explanation: The following comments relate to funding assurances for implementation of various HCP/NCCP measures. Funding assurances are a required element of an HCP/NCCP, and will be addressed as appropriate in the HCP/NCCP and Implementation Agreement.

- The EIS/EIR needs to assess MRC's financial commitment and capabilities.
- Given the large size and long term of the project, it is essential that CDFG staff resources required by the Project are fully funded by the Project, and that the project not negatively impact CDFG's already inadequate botanical staffing.
- Will MRC fully compensate CDFG for CDFG's actual costs incurred by CDFG's participation in the preparation and implementation of the project?
- How will the compensation paid by MRC to CDFG be computed, and in what increments will it be paid?

- Since it is reasonably foreseeable that CDFG staff expenses will increase during the term of the Project, how will CDFG ensure that such increases are changed circumstances rather than unforeseen circumstances?

- How will compensation be adjusted to accommodate changed circumstances and adaptive management during the entire term of the Project?

- How will MRC guarantee that funds will be available to pay all necessary compensation to CDFG during the entire term of the project?

- What funding will be provided by MRC to ensure adequate scientific input over the entire term of the Project?

- How will each agency ensure that there are adequate funds to pursue mitigation, monitoring, and adaptive management over the 80-year project?

- The public demands thorough assessment of MRC's financial commitments for funding the mitigation and monitoring measures in the HCP, accounting for inflation, depreciation of assets, increased real estate values, and other contingencies to support the conclusions. Alternate funding must be proposed in the EIS/EIR should the analysis show inadequate funding.

- The EIS/EIR must evaluate the availability of federal and state funds to meet any future mitigation requirements, and analyze the biological effects from inability to provide adequate mitigation or implementation of the HCP due to funding constraints.

- Are there going to be independent trust funds, or bank accounts, established that will survive in case MRC encounters financial difficulties, and if so, by whom will they be managed?

- Evaluate the availability of federal and state funds to meet any future mitigation requirements for species covered under the HCP.

4.3.6.3 Long-term Commitment (2 verbal comments; 3 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Agencies should ensure that the forests and the human environment receive long-term protections.

Issues that may not receive detailed analysis in the EIS/EIR:

Explanation: The following comments relate to HCP/NCCP implementation and compliance. Many of these issues will be addressed in the Implementation Agreement for the HCP/NCCP, which is submitted as part of the application package.

- The EIS/EIR should assess MRC's commitment and reliability as a forest manager.

- Can MRC walk away from the HCP in the future? What conditions will be in place to assure compliance?

- The HCP is meaningless unless it applies to land for the entire duration (80 years or longer).

- It is essential that any HCP include true provisions for long-term management.

4.3.6.4 **Mitigation** (4 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Agencies must analyze the short-term and long-term effectiveness of each of the proposed minimization/mitigation measures and provide a scientifically justifiable reason why/how these measures will be effective. *Explanation: The EIS/EIR will analyze the environmental impacts of the proposed plan and alternatives, including any measures to minimize and/or mitigate environmental impacts, using the best available scientific data and methods.*

- In light of the limited knowledge of botanical taxa, how will each agency assure the recommended consistency of mitigation and management measures? *Explanation: The EIS/EIR will analyze the environmental impacts of the proposed plan and alternatives, including any measures to minimize and/or mitigate environmental impacts, using the best available scientific data and methods.*

- Has MRC considered mitigation banking within JDSF, or within other private holdings?

Issues that may not receive detailed analysis in the EIS/EIR:

- It should be noted that MRC is currently negotiating with Sonoma Open Space and Agriculture District to sell 3,000 acres of property in Willow and Freezeout Creeks for parks. This sale should not be counted as mitigation toward habitat loss and "take" that will occur elsewhere. *Explanation: At this point in time, MRC and the agencies do not have definitive information as to the sale of this property. MRC is unlikely to count the parcel as mitigation, but the permit decision will ultimately be based on whether the application for incidental take meets the permit issuance criteria as defined by endangered species law, regulation, and policy (e.g., Section 10(a)(2)(B) of the ESA, Section 2081 of the CESA). All applicable criteria must be satisfied before a permit may be issued. The EIS/EIR will analyze the environmental impacts of the proposed plan and alternatives, including mitigation plans.*

4.3.6.5 **Monitoring and Adaptive Management** (5 verbal comments; 24 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Evaluate MRC's long-term management plans in the context of regional precedents. *Explanation: The EIS/EIR will analyze the environmental impacts of MRC's proposed management activities for the duration of the requested permit term. The impacts analysis will be based on the best available data and methods, including regional information as appropriate.*

- The EIS must assess the HCP's adaptive management provisions. The landowner should use adaptive management as new information becomes available, and should conduct additional research and agree to reduced "No Surprises" for particular unlisted species whose conservation needs are unknown. *Explanation: The EIS/EIR will analyze the environmental impacts of the proposed plan and selected alternatives, including the adaptive management provisions contained therein. The inclusion of specific adaptive* *management approaches in the HCP/NCCP, however, is an HCP/NCCP development issue.*

Issues that may not receive detailed analysis in the EIS/EIR:

Explanation: The following comments relate to HCP/NCCP development and content rather than NEPA/CEQA's assessment of the environmental impacts of a proposed HCP/NCCP. HCP/NCCPs are expected to include detailed plans for mitigation, monitoring, and adaptive management to ensure the best available information is being used to minimize environmental impacts, and the EIS/EIR will analyze the environmental impacts of the proposed plan and alternatives, including plans for mitigation, monitoring, and adaptive management.

- EPA advocates commitment to monitoring, surveys and adaptive management, including a fallback option if species continue to decline. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)] Explanation: Monitoring is required in HCP/NCCPs. If species continue to decline, several options are available, including revocation of an HCP.*

- The HCP must have extensive, meaningful adaptive management, particularly where there are current data gaps.

- If the status of a covered taxon, or management of a covered taxon, is to be modified during the term of the Project, how will this be handled, by whom, and with how much public input?

- MRC must have an 80 year monitoring plan including: yearly monitoring benthic macroinvertebrate populations, yearly snorkel surveys to document fish populations, yearly water quality monitoring, yearly habitat surveys to show plant, tree and riparian status. All data must be transparent and easy for the public to access. MRC should provide GPS and GIS mapping to show these studies.

- Will MRC monitor erosion control plans during storms and quickly mitigate erosion control failures?

- How will the HCP incorporate adaptive management? How can the "No Surprises" policy allow for the adaptive management flexibility needed to conserve species?

- Long-term, effective monitoring by agency personnel should be set up by the scientific review panel to ensure useful revision of habitat management strategies.

- How will each agency establish the testable hypotheses, based on measurable criteria, linked to the conservation strategies and biological objectives, required by adaptive management, and how will each agency keep these hypotheses and criteria current with the best science over the life of the project?

- How will each agency establish the range of mitigation adjustments, and what mechanism will be used to establish strategy changes based upon monitoring results and deviation from desired conditions?

- Adaptive management is a sham unless the landowner is required to commit to responding adequately to monitoring results, and to implementing action determined appropriate through adaptive management, at no additional cost to the public. Unless MRC is contractually obligated to expend the resources necessary to respond to these changes, then the HCP/NCCP will not adequately protect covered taxa.

- It is essential that the review thresholds, based on measurable criteria, be clearly established for each covered taxon that will trigger action by MRC pursuant to adaptive management.
- MRC should disclose details of plans for monitoring and scientific studies for the next 80 years.
- What time interval will be used between the monitoring program's evaluations, and how will this interval be adjusted to reflect the current best available science?
- How will the periodic evaluations be scheduled throughout the term of the project to adequately survey all covered species and to reflect the current best available science?
- To whom will the monitoring program reports be distributed, and will there be opportunity for public review and comment?
- How often will adaptive management strategies be evaluated and modified, and by whom will they be evaluated?
- How will CDFG use adaptive management to eliminate or minimize the number of unforeseen circumstances?
- What management principles and conservation goals will CDFG recommend to develop the monitoring and adaptive management framework?
- How will CDFG ensure that the then currently best available science and local expertise is used in monitoring/adaptive management, and will be used to modify strategies during the entire term of the Project?
- There are clear advantages to the local communities and overall environment in MRC not having to go through time consuming THP preparation and review, providing there is continuing objective agency on-site review of progress toward their goals. Agency review should be subdivided into time periods, no longer than 5 years, and be specific for each watershed area, with defined measurable objectives other than increasing board foot yield.
- What is the monitoring process for determining the success/failure of the HCP? Who is involved in this?
- What is "Adaptive Management"?
- How flexible is the HCP? How can the plan be modified after approval?
- How does the HCP incorporate new scientific data and methods that become available in the future?
- How can an adaptive management process be crafted to allow public review/enforcement in the future?
- The HCP/NCCP should include monitoring.
- Does the Plan contain monitoring provisions?
- Provide progress reports on implementation and success of long-term goals.

4.3.6.6 Survey and Monitoring Protocols (11 written comments)

Issues that may not receive detailed analysis in the EIS/EIR:

Explanation: The following comments relate to HCP/NCCP development and content rather than NEPA/CEQA's assessment of the environmental impacts of a proposed HCP/NCCP. HCP/NCCPs are expected to include detailed monitoring and adaptive management plans, based on the best available information and methods. The EIS/EIR will analyze the environmental impacts of the proposed plan and alternatives, including plans for monitoring and adaptive management.

- Survey all lands in the Plan Area for TES species.
- Survey and monitor for fungi and lichens.
- Describe protocols used by MRC to determine marbled murrelet presence/absence and habitat suitability.
- Botanical surveys must conform to current CDF and CDFG standards.
- What standards will be used for botanical surveys and how will standards be adjusted to reflect best available science?
- Monitoring protocols must specify frequency, timing, and duration of data collection, how the data will be analyzed, and who will do the analysis. Monitoring should be based on sound science and standard survey protocols previously established.
- For any studies or surveys regarding the distribution occurrence, and ecology of botanical taxa in the Project area, how will each agency ensure that such studies and surveys are professionally and independently conducted, with appropriate public interaction, and conducted pursuant to established standards?
- Will species surveys be done using protocols approved by USFWS, NOAA Fisheries, and CDFG? Provide protocol used. Will surveys be conducted at proper times and in proper habitat? What habitats will be surveyed and how will these be classified? Will qualified personnel do the surveys? Will agencies monitor survey efforts? Will survey data be publicly available?
- Marbled murrelet surveys should be done using Pacific Seabird Group protocols.
- Include surveys done on adjacent lands that might indicate presence on MRC property.
- Habitat inventory and typing following Fish and Game protocol has not been completed.

4.3.7 Management Practices and Land Use

The EIS/EIR will address the affected environmental setting, environmental effects, and mitigation associated with each alternative. The lead agencies will use public and agency comments on topics relating to adjacent landowners, cell towers/repeaters, conservation easements/reserves, herbicides and forest chemicals, land use and conversion, transfer of ownership, restoration, roads/road management, timber management, and other management practices to help develop a range of alternatives and identify priority issues for analysis of environmental impacts in the EIS/EIR.

4.3.7.1 **Adjacent landowners** (2 verbal comments; 5 written comments)

Issues likely to be addressed further in the EIS/EIR:

- There is a desire for watershed-wide/specific workshops. What is the health of each watershed?
- How will adjoining parcels be affected for the next 100 years?
- What will be the impacts of the HCP on areas downstream of the property? For example, public lands such as parks, state forests, BLM, and other non-industrial areas.

Issues that may not receive detailed analysis in the EIS/EIR:

- How will practices on adjacent ownerships and regional ownerships be evaluated? *Explanation: The EIS/EIR will analyze watershed-level environmental impacts. Evaluating specific management practices that occur on adjacent private property would be done only to the extent necessary to facilitate decision-making among alternatives.*
- Maps of the Plan Area show that MRC owns portions of several watersheds. Planning should aim to work with adjoining landowners to ensure healthy ecosystems throughout the entire watershed. *Explanation: The EIS/EIR will analyze watershed-level environmental impacts. Measures to address ecosystem health at the watershed level are HCP/NCCP development issues.*
- MRC must work with its neighbors to achieve these goals, and it must take into account the effects of its neighbor's actions. As many of MRC's neighbors are concerned and fearful of potential management practices on MRC land, it is essential that these neighbors be seriously consulted and listened to during the HCP process. *Explanation: Consultation and dialog regarding HCP/NCCP conservation measures and implementation procedures is part of the HCP/NCCP process, and stakeholder feedback is used during scoping and comment on the draft EIS/EIR. Evaluating specific management practices that occur on adjacent private property would be done only to the extent necessary to facilitate decision-making among alternatives.*

4.3.7.2 **Cell and repeater towers** (3 verbal comments; 18 written comments)

Issues that may not receive detailed analysis in the EIS/EIR:

Explanation: The following comments address concerns over cell and repeater towers. MRC does not intend to request coverage for cell/repeater site development under the HCP/NCCP and incidental take permits. If MRC chooses to lease property for cell/repeater site development, they would not be the applicant, the lead agency would be other than the Wildlife Agencies and the activity would, at that time, be subject to NEPA/CEQA review, as well as the provisions of the state and federal Endangered Species Acts.

- Cell/repeater site development should not be covered under the HCP and ITP.
- No additional cell phone repeater towers should be allowed until effects of low-level radiation on birds/forests and human health are understood.
- What are the cumulative impacts to migratory birds/bats from expanded cell towers?

- Analyze impacts of cell/repeater towers on migratory birds, as required by the Migratory Bird Treaty Act.
- MRC should disclose details of plans for development of cell/repeater sites for the next 80 years.
- 40 million migratory birds are killed by collisions with cell towers. Impacts cannot be mitigated for, except by exclusion of cell towers.
- The application fails to include dozens of species of migratory birds, which are threatened by the building of cell phone towers.
- The cumulative impact must be considered (per ESA). This means the cumulative impact of cell towers throughout the USA.

4.3.7.3 Conservation easements/reserves (1 verbal comment; 12 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Create a conservation land trust to facilitate restoration.
- Commenter suggests there is a need for assurances that some lands will be preserved.
- Are reserves proposed? How will they be managed?
- What is the time frame for establishment of reserves, and will such reserves be established before, or after, the reserve area is logged?
- Habitat reserves, unless properly designed and managed, may fail to meet the conservation and restoration mandate of the NCCPA. How will equivalency of other measures to properly designed and managed habitat reserves be accomplished?
- What criteria would be used to determine location, size, and protection of reserves so that they achieve the conservation and restoration mandate?
- How would reserves be modified if future monitoring and adaptive management showed that the conservation goals were not being met by the reserves as then configured and managed?
- What public or independent scientific access would be provided to reserves?
- Does MRC plan to incorporate replacement habitat into the HCP/NCCP, and if so, where?

Issues that may not receive detailed analysis in the EIS/EIR:

The following comments relate to issues of HCP/NCCP development and/or content. Some or all of these issues may be addressed in the HCP/NCCP, Implementation Agreement, or accompanying decision documents. The EIS/EIR will examine the environmental impacts of proposed mitigation and minimization measures, including, but not limited to, the use of conservation reserves if they are proposed in the plan or alternatives.

- How would reserves be maintained, managed, and funded throughout the entire term of the Project, and how would such reserves be affected by a change in ownership of the reserve area or the Project area.

- What happens to previously established reserves if the NCCP is suspended or revoked?
- MRC has less than 3% of its holdings that can be considered for reserve based conservation and that may be suitable to adequately sustain wildlife species. This does not support granting of an incidental take permit. *Explanation: The EIS/EIR will examine the environmental impacts of proposed mitigation and minimization measures, including, but not limited to, the use of conservation reserves if they are proposed.*

4.3.7.4 Herbicides and forest chemicals (2 verbal comments; 26 written comments)

Issues that may not receive detailed analysis in the EIS/EIR:

Explanation: The EIS/EIR will have a general discussion on effects of forest chemicals, but a detailed impacts analysis will not be conducted because MRC is not requesting coverage for use of forest chemicals as part of the proposed action or alternatives.

- Address potential impacts of MRC's past lack of public disclosure of herbicide use.
- There is the possibility that Native Americans currently utilize the area for gathering of plant or animal materials for food, herbal, ceremonial use. Use of pesticides could jeopardize their health. The commenter requests prior notification of pesticide use at specific sites so Tribal members can be informed to avoid such areas.
- How are herbicides being used on properties and how will they be addressed in HCP plan?
- Variable retention uses chemicals. This needs to be curtailed.
- The public has insufficient access to information on health impacts of forest chemicals.
- Commenter is opposed to use of pesticides and herbicides.
- Provide information to public on effects of herbicides on wildlife.
- Are the agencies aware of latest data on effects of pesticides on salmon?
- How will information on effects of herbicides and pesticides be used in evaluating impacts to TES species?
- Analyze the cumulative effects of herbicide and pesticide use.
- MRC should disclose details of plans for use of herbicides/pesticides for the next 80 years.
- MRC should disclose details of plans for use of fertilizers for the next 80 years.
- How will each agency ensure that herbicide use will not negatively impact sensitive botanical resources?
- Will each agency encourage use of silvicultural prescriptions and rotation periods that minimize herbicide and artificial fertilizer application, and if so, what will those recommendations be?
- Agencies need to encourage MRC to do everything practicable to reduce the application of herbicides and artificial fertilizers.

- The Plan should incorporate Integrated Pest Management techniques, keeping pesticide use to a minimum.
- Evaluate the effects on soils and soil microorganisms from the use of pesticides on trees for hardwood and brush control.
- The HCP/NCCP should list all herbicides and pesticides that will be used, the times of these applications, and their effects on aquatic and terrestrial animals.
- How will cumulative impacts of herbicides on endangered species and habitat be mitigated?
- There are no accurate calculations for loss of inventory of stands due to herbicide use.

4.3.7.5 Land use and conversion (5 verbal comments; 9 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Analyze cumulative impacts in the context of other land and resource uses.

Issues that may not receive detailed analysis in the EIS/EIR:

MRC intends to use the lands covered under the HCP/NCCP for the activities specified in the HCP/NCCP. MRC is not requesting coverage for the development or conversion of property to non-forest uses such as vineyards or residential areas. Furthermore, the HCP/NCCP and/or Implementation Agreement is expected to address additions or deletions of land and modifications to the HCP/NCCP. The EIS/EIR will address the reasonably foreseeable conversion of land by surrounding landowners in the cumulative impacts analysis.

- What other development activities besides timber harvesting does MRC desire as part of the HCP?
- The HCP/NCCP should have provisions to prohibit conversion to residential use.
- The EIS/EIR needs to include information on MRC's development plans for its property.
- The activities proposed by MRC do not include conversion of timberland to other uses, such as vineyards or residential development, or sale of the project area. There is significant community concern about MRC's long-term goal for the Project area, and some feel that there is significant potential for portions of the area to be sold or developed. Please disclose MRC’s plans for land conversion, including where and when.
- Is any agency willing to allow the Project to include conversion of timberland to other uses, if MRC subsequently proposes them, and if so, how large and area, located where, and under what conditions?

The following comments relate to issues of HCP/NCCP development and/or content. Many of these issues will be addressed in the HCP/NCCP.

- MRC should disclose details of plans for gravel extraction for the next 80 years.
- MRC should disclose details of grazing and grazing leases planned for the next 80 years.
- Are there any mining operations in the project area? If so, has MRC included these as cumulative impacts?

4.3.7.6 **Transfer of ownership** (8 verbal comments; 9 written comments)

Issues likely to be addressed further in the EIS/EIR:

- The EIS/EIR should analyze the environmental, social and economic impacts of state/non-profit purchase of 3,000 acres of timberland in Willow Creek, adjacent to 2,000 acres of potential Fisher/MRC development. *Explanation: The sale of this land is not yet definitive and MRC has not decided whether it would include the parcel in the HCP/NCCP. The addition or deletion of lands will be more specifically addressed in the HCP/NCCP. The EIS/EIR will address potential changes in the amount and location of covered lands that can occur without a major amendment to the HCP/NCCP.*

- The HCP must include provisions for continued conservation after any sale of lands. For example, no-cut reserves should be placed under easement and other lands permanently protected from development and practices that will degrade habitat quality.

Issues that may not receive detailed analysis in the EIS/EIR:

- Are the agencies aware of a proposal by MRC to sell property in Willow Creek that may involve conversion of 2,000 acres of MRC's forestland in Sonoma County to development (along with the State Parks preservation of 3,000 acres adjacent to the potential development)? Are the portions of forestlands in Willow Creek subject of this deal to be covered by the HCP/NCCP? Will the 3,000 preserved acres be "traded" for further logging elsewhere? *Explanation: The agencies are aware of this potential transaction. The sale of this parcel is not yet definite, and MRC has not decided whether it would include the parcel in the HCP/NCCP. If sale occurs prior to approval/ denial of an ITP, the sold lands will not be considered as part of the HCP/NCCP (the use of these lands will affect the baseline for which impacts are analyzed, but the effect may be slight given the small number of acres involved when compared to the size of the proposed HCP). If sold after the granting of an ITP, it is unlikely that MRC will use this parcel as mitigation; however, addition or deletion of lands will be more specifically addressed in the HCP/NCCP and the ITP. The EIS/EIR will address potential changes in the amount and location of covered lands that can occur without a major amendment to the HCP/NCCP.*

The following comments have been noted. The sale or transfer of ownership of any lands covered under the HCP/NCCP will be more specifically addressed in the HCP/NCCP and the Implementation Agreement.

- History shows that no entity has owned land for anywhere near 50 years in the area. Does the HCP apply to land if MRC sells the property?

- What measures will be provided to continue with provisions of the incidental take permit should the property change hands? Which provisions will be mandated to "stay with" the property?

- How will transfer of ownership of all, or a portion of, the project area affect the NCCP?

- How will each agency respond if MRC wishes to transfer ownership of all, or a portion of, the Project area to another party?

- What environmental review process will be followed for transfers of ownership, and will the public have the opportunity to review/comment?

- Under what conditions will each agency approve transfer of ownership of all, or a portion of, the Project area to another party?
- What is the status of MRC's land for sale in Mendocino?
- What happens if MRC sells lands during a low point in species conservation?

4.3.7.7 **Restoration** (2 verbal comments; 7 written comments)

Issues likely to be addressed further in the EIS/EIR:

- The EIS/EIR should describe use of native vegetation in restoration, to comply with Executive Order 13112 *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*
- Restoration needs to be pursued as part of the project.
- Address watershed rehabilitation to improve habitat with respect to sediment contribution, riparian function, and temperatures.
- If restoration projects are part of the HCP/NCCP then these must be monitored.

Issues that may not receive detailed analysis in the EIS/EIR:

The following comments relate to issues of HCP/NCCP development and/or content. Many of these issues are expected to be addressed in the HCP/NCCP.

- MRC should disclose details of restoration and other forest management activities for the next 80 years.
- MRC should disclose details of plans for tree planting for the next 80 years.
- For each covered species, how will the restoration mandate be achieved?

4.3.7.8 **Roads and road management** (12 written comments)

Issues likely to be addressed further in the EIS/EIR:

- The EIS/EIR must examine the impact of construction and maintenance of roads, road crossing, landings and skid trails, wet weather operations, operations on steep slopes and near watercourses, and the ability of culverts to accommodate projected and unanticipated storm events.
- Discuss effects of roads, existing and proposed, and failure to maintain them, and effects of any proposed road maintenance plans, on increased erosion, impacts to water quality, and impacts to riparian habitat. Include a breakdown of road types, miles of roads, numbers of existing crossings and crossing locations by stream classification, culverts and culvert locations by stream type, road survey data on culverts that are shot-gunned, failing, not placed to grade, don't have energy dissipaters, etc. *Explanation: The EIS/EIR will analyze the impacts of the proposed plan and alternatives on sediment production and delivery, including road-related sediment, on a general level, and compare this among alternatives. Specific analyses of current conditions are expected in the HCP/NCCP. In cases where the agencies determine that the HCP's analysis does not*

fully inform NEPA/CEQA review, the EIS/EIR will perform a separate analysis only to the level of detail necessary to facilitate decision-making among alternatives.

- Discuss the importance of road abandonment near streams and other sensitive or critical habitat areas.
- Evaluate skid trails as a source of sediment discharge.
- MRC should disclose details of road management plans for the next 80 years.
- Watercourse, roads, road crossings, landings and skid trails must be described and mapped for each watershed on the project area, including appurtenant roads.
- Are roads monitored and maintained during the winter months? Are hand crews dispatched to do winter repairs in case of erosion control device failures?
- Is MRC proposing to construct dams or roads that cut off salmonid spawning habitats? If so how many and where?

4.3.7.9 Timber management (15 verbal comments; 16 written comments)

This section (and section 4.3.7.10) has several "MRC should" comments. *Explanation: The permit applicant (in this case MRC) develops the Proposed Action Alternative. Although the Wildlife Agencies make recommendations during the development of the HCP through our technical assistance program, we do not control what is included in the applicant's proposal. MRC will be provided with a copy of this scoping report for their consideration in development of their HCP application package.*

Issues likely to be addressed further in the EIS/EIR:

- Commenter requests that existing highest quality/density stands should be preserved/maintained until other stands can develop higher value habitat.
- Address cumulative effects of proposed timber harvest volume.
- Assess effects of previous and proposed harvest schedule on forest inventory.
- Many experts feel that even-aged management has cumulative negative impact on the forest ecosystem, radically modifies temperature and moisture regimes, and the cumulative impacts can have landscape-wide consequences (e.g. loss of localized fog). Please examine these possible impacts.
- What about non-timber conifers like grand fir and bishop pine, or native hardwoods that have ecosystem values? Many plants, animals, fungi, and lichens are associates with the non-favored trees. These could be negatively impacted if the tree species composition is altered. How will the plan address the possibility of induced ecosystem imbalance and associated species losses?
- The EIS/EIR needs to analyze impacts of the HCP on canopy retention.
- MRC should disclose details of plans for collection of minor forest products for the next 80 years.

Issues that may not receive detailed analysis in the EIS/EIR:

The following comments relate to issues of HCP/NCCP development and/or content. Some or all of these issues may be addressed in the HCP/NCCP or accompanying decision documents. The Proposed Action Alternative is developed by the permit applicant (in this case MRC). Although the Wildlife Agencies make recommendations during the development of the HCP through our technical assistance program, we do not control what is included in the applicant's proposal. MRC will be provided with a copy of this scoping report for their consideration in development of their HCP application package.

- What percent of timber will be proposed for late seral retention; what are the criteria for classifying late seral? What percent of timber is proposed for clearcutting, "variable retention", or other even-aged silviculture methods? How will this relate to other ownerships within watersheds and across watershed boundaries?
- MRC has stated its plan to alter species composition of tree cover on its lands, increasing the quantity of conifers. Redwood and Douglas-fir are the principal timber species, so MRC plans to increase these particular conifers. How closely will this resemble what is known about species composition in pre-timbering days?
- What is the variation in harvesting on MRC's property right now?
- There is a concern with how hardwoods are being managed, because fire potential exists.
- What portion of largest remaining trees will be logged?
- Please disclose details of future harvest scheduling.
- MRC should disclose details of plans for hauling and transportation of forest products for the next 80 years.
- MRC should disclose details of plans for silvicultural activities for the next 80 years.
- How does each agency define "even-aged" management?
- Please clarify the scope of this project, including current projected logging levels and logging locations, current and projected logging methods, timber inventory and growth and yield data and models.
- What is "variable retention"?
- Why is tanoak being removed?
- What is the timeline for creating forest stand inventories?
- MRC needs to clearly describe the inventory collection process.
- What is the size of a stand?
- Why isn't canopy retention used to develop/review the plan?
- What is the "pre-commercial development" condition that MRC is planning for?
- Does the landscape model factor in trees lost to harvesting?
- How is MRC measuring tree growth? Girth? Numbers?

- Who/what specialists participated in developing the landscape planning model?
- The landscape model growth rate is suspect. Please clarify the underlying assumptions.

4.3.7.10 Other management practices (3 written comments)

Issues that may not receive detailed analysis in the EIS/EIR:

The following comments relate to issues of HCP/NCCP development and/or content. Some or all of these issues will be addressed in the HCP/NCCP or the Implementation Agreement. The Proposed Action Alternative is developed by the permit applicant (in this case MRC). Although the Wildlife Agencies make recommendations during the development of the HCP through our technical assistance program, we do not control what is included in the applicant's proposal. MRC will be provided with a copy of this scoping report for their consideration in development of their HCP application package.

- MRC should disclose details of plans for fire suppression for the next 80 years.
- MRC should disclose details of plans for vegetation management for next 80 years.
- MRC should disclose details of plans for site preparation for the next 80 years.

4.3.8 Agency Participation

4.3.8.1 Agency commitment (5 verbal comments; 18 written comments)

Issues that may not receive detailed analysis in the EIS/EIR:

- Request that federal agencies pursue species recovery plans without waiting for presidential orders and state agencies. *Explanation: This comment does not refer to environmental impacts of the proposed project, but rather refers to concerns over implementation of recovery plans under the Endangered Species Act.*
- The EIS/EIR should evaluate the extent to which political and government property acquisition and liability concerns may inappropriately influence state and federal agency decision-making in this case. *Explanation: The EIS/EIR will address the environmental impacts of the proposed project, and as required by NEPA/CEQA law, regulation, and policy. For example, NEPA regulations state that agencies "shall insure the professional integrity, including scientific integrity, of the discussions and analysis in environmental impact statements" (Sec. 1502.24). An analysis of the influence of political motivations on government actions is outside the scope of analyses required under NEPA/CEQA.*
- Given the large size and long term of the project, it is essential that the project not negatively impact the availability of the already inadequate CDFG botanical staff. *Explanation: Comment noted.*
- How will each agency ensure that sufficient agency resources are available to guarantee that THPs comply with the HCP/NCCP over the entire term of the HCP/NCCP? *Explanation: The agencies are responsible for monitoring the implementation of the HCP/NCCP and enforcing the terms of the Implementation Agreement. However, state and federal governments ultimately determine the budget and resources each agency will receive.*

- Address agencies' ability, given the size and numbers of approved HCPs, to effectively and consistently evaluate, monitor, revise, and enforce this plan. *Explanation: The agencies are required by law and regulation to evaluate, monitor, revise, and enforce all HCP/NCCPs.*

- Commenter feels that state agencies must negotiate on behalf of the public, enforce the public's deep concerns for the environment, and must approach negotiations with vigor. *Explanation: Comment noted. The agencies recognize their responsibility to the public and the public's deep concerns for the environment.*

- Federal agencies need to be proactive in reviewing the HCP. They must not just approve the permit based on merely following a process. *Explanation: The permit decision will be based on whether the application for incidental take meets the permit issuance criteria as defined by endangered species law, regulation, and policy (e.g., Section 10(a)(2)(B) of the ESA, Section 2081 of the CESA). All applicable criteria must be satisfied before a permit may be issued.*

- State agencies have a duty to help recover endangered species. *Explanation: Comment noted. The agencies recognize their responsibility to the public and the public's deep concerns for the environment.*

- Agencies should mandate a strict program of protection and recovery. *Explanation: Comment noted. The agencies recognize their responsibility to the public and the public's deep concerns for the environment.*

- Agencies should be as restrictive as possible to protect threatened resources. *Explanation: Comment noted. The agencies recognize their responsibility to the public and the public's deep concerns for the environment.*

- Agencies should not assist corporations in circumventing species protection. *Explanation: Comment noted. The agencies recognize their responsibility to the public and the public's deep concerns for the environment. The permit decision will be based on whether the application for incidental take meets the permit issuance criteria as defined by endangered species law, regulation, and policy (e.g., Section 10(a)(2)(B) of the ESA, Section 2081 of the CESA). All applicable criteria must be satisfied before a permit may be issued.*

- Can agencies be capable watchdogs to ensure compliance? *Explanation: Comment noted. The agencies recognize their responsibility to the public and the public's deep concerns for the environment.*

- There clearly exists enormous pressure on the various state and federal agencies to approve this HCP/NCCP for the Fisher family and its logging and real estate investment in Sonoma and Mendocino Counties. The disinterest of state/federal agencies in this review is in serious question. All the more reason to ensure a transparent process and to provide the public and agencies with adequate information and time to raise their concerns. *Explanation: Comment noted. The agencies recognize their responsibility to the public and the public's deep concerns for the environment. The permit decision will be based on whether the application for incidental take meets the permit issuance criteria as defined by endangered species law, regulation, and policy (e.g., Section 10(a)(2)(B) of the ESA, Section 2081 of the CESA). All applicable criteria must be satisfied before a permit may be issued. The EIS/EIR will analyze the environmental impacts of the* *proposed plan and alternatives using the best available scientific information and methods.*

4.3.8.2 **Agency participation** (2 verbal comments; 3 written comments)

Issues likely to be addressed further in the EIS/EIR:

Explanation: The involvement of governments, resource agencies, the public, and other interested parties and organizations in EIS/EIR development is solicited via the scoping process, as described in Section 3 of this document. Local, state, and federal agencies may participate in the HCP/NCCP and EIS/EIR processes according to their jurisdiction and as described in NEPA and CEQA as they see fit. The roles and responsibilities of the NEPA/CEQA lead agencies are proscribed by law and regulation. Other agencies can provide comments at any time during the HCP/NCCP and EIS/EIR processes.

- What about other state agencies? How will they be included (e.g. Regional Water Quality Control Board, California Department of Forestry and Fire Protection [CDF], California Environmental Protection Agency)?
- Will local county government have any say in reviewing the plan? Will the California Coastal Commission review the plan?
- The North Coast Regional Water Quality Control Board should be included in HCP/NCCP permitting process.
- Ensure involvement of State Parks, Mendocino County, town councils, and other agencies.
- The proposed plan should be referred to Mendocino and Sonoma Counties for public review.

4.3.8.3 **Agency roles** (3 verbal comments; 4 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Who is the federal lead agency? *Explanation: The U.S. Fish and Wildlife Service and National Marine Fisheries Service are the two federal lead agencies, and the California Department of Fish and Game is the state lead agency. The federal and state lead agencies will be clearly identified in the EIS/EIR.*

Issues that may not receive detailed analysis in the EIS/EIR:

- Is any of the land to be covered by this plan in the Coastal Zone, and if so, how much, and what will be the role of the California Coastal Commission in the design and implementation of the plan? *Explanation: Portions of the Plan Area fall within the Coastal Zone. The lead agencies have requested the participation of the California Coastal Commission.*
- How does CDF participate in HCP development/enforcement? Will the federal agencies/CDFG continue to monitor effectiveness? *Explanation: CDF is not involved in the HCP development, as MRC is not developing a Sustained Yield Plan or Programmatic Timber EIR. CDF cannot approve a THP if it would result in either a "taking" or finding of jeopardy of wildlife species listed as rare, threatened or*

endangered by the Fish and Game Commission, the National Marine Fisheries Service, or U.S. Fish and Wildlife Service, or would cause significant, long-term damage to listed species. If the HCP/NCCP is approved, CDF can approve future THPs that would result in a "taking" if the "taking" is incidental and is authorized by a wildlife agency acting within its authority under state or federal endangered species acts. USFWS, NOAA Fisheries, and CDFG are ultimately responsible for HCP/NCCP enforcement.

- Who/what agencies approve or deny applications? *Explanation: The USFWS, NOAA Fisheries, and CDFG are responsible for approval/denial of HCP/NCCP permit applications.*

- The "scoping" sessions were singularly uninformative, and the participation and status of state and federal agency personnel in these meetings was unclear. State and federal agency personnel presented almost no information -- and were even vague on the mechanics of the HCP process, and asked no questions of MRC. *Explanation: Opinion noted. The purpose and intent of the public scoping process is described in the Section 3 of this report.*

- The JSA facilitator said that they would be issuing a scoping report. What is the relationship of the agencies to the development of this scoping report? While the agencies legally noticed the scoping meetings, they then seemed to disclaim responsibility for public comments received there. *Explanation: This scoping report was prepared by Stillwater Sciences under the direction of the lead agencies. This scoping report includes all verbal comments noted by the facilitator at each of the public scoping meetings, as well as all written comments received by the lead agencies during the comment period.*

4.3.9 Public Involvement

Many comments and questions were received regarding disclosure of information, lack of definition for the proposed project, length of the public scoping comment period, opportunity for public comment, and the public scoping process itself. Input from the public may be submitted at any time during the EIS/EIR process, but is especially encouraged during the times specifically called out in the environmental laws. Specific comments related to the content of the draft and final EIS/EIR will be solicited during the official public comment periods following publication of these documents.

4.3.9.1 Disclosure of information (9 verbal comments; 19 written comments)

Issues likely to be addressed further in the EIS/EIR:

- What information is required by federal and state laws? How is this data made available, and how is the public involved in review of data?

- The lack of technical data available to the public makes giving informed comments difficult. Please assemble all information (e.g. studies, statistics, literature and images) in the possession of the agencies and make it available to the public in one location.

- Make wildlife habitat data available to the public.

- Make all of MRC's THPs available in the public record.

- When will botanical information be made available to the public for review?

- Will the data on restoration areas be made publicly available?
- How will the public be informed of missing data, inadequate mapping of roads and wildlife habitats, treatment of roads, nonexistent, inadequate and outdated inventories? The public is currently not adequately informed.
- The agencies should require disclosure of any other trade-offs, such as the Willow Creek land conversion, and development deals that MRC may have in mind or is currently negotiating, as a prerequisite to proceeding with this HCP/NCCP.

Issues that may not receive detailed analysis in the EIS/EIR:

- Disclose all details of agency expenditures related to review and preparation of HCP/NCCP and EIS/EIR. *Explanation: Most costs associated with preparation of the HCP/NCCP, its implementation, and monitoring are the responsibility of the permit applicant and are not borne by the public. Both state and federal statute and regulation compel the agencies to participate in the development and implementation of HCP/NCCPs. Costs associated with agency participation in the preparation, review, and implementation/monitoring of HCP/NCCPs are, at least in part, an expected part of these programs, and are not tracked on an individual project basis. In some cases the applicant bears some of the costs of agency oversight.*
- The public has a desire for full disclosure of all MRC/federal agency meetings. *Explanation: Comment noted. The agencies recognize their responsibility to the public and the environmental concerns of the public. The direct involvement of the public in HCP development is at the discretion of the applicant. NCCPs are developed under public involvement rules that will be followed.*
- Please disclose MRC's current timber stand inventory, current rate of harvest (broken down by watershed) and its future harvesting plans. *Explanation: This information will be provided in the HCP/NCCP. Some of this information may be proprietary, and MRC may not be required to disclose it under federal law.*
- Commenter wishes to be kept informed, in writing, regarding ESA protection of currently unlisted species. *Explanation: The ESA does not protect unlisted species. The status and protection of species designated for coverage under the HCP/NCCP will be discussed in the EIS/EIR..*
- Does CDFG have a handbook on the NCCP process? *Explanation: The CDFG website has the most current and comprehensive information on the NCCP process. See http://www.dfg.ca.gov/nccp/. See also statutes SB 107 (http://www.dfg.ca.gov/nccp/sb107.pdf) and SB 2052 (http://www.dfg.ca.gov/nccp/sb2052.pdf).*
- There should be public disclosure of cost-accounting procedures associated with review and development of an HCP and issuance of ITP. *Explanation: Comment noted.*
- Please make draft HCP/NCCP available to the public. *Explanation: The draft HCP/NCCP will be made available for public review as soon as it is completed.*
- There is a need for more public education on HCP/NCCP. *Explanation: Comment noted. The agencies recognize the need for more public education on these processes.*

4.3.9.2 Lack of project definition (9 written comments)

Issues that may not receive detailed analysis in the EIS/EIR:

Explanation: The state and federal lead agencies recognize the public's concern regarding the availability of project-specific information provided at this stage in the scoping process. The purpose of the scoping process is described in the Section 3 of this document. Comments regarding HCP/NCCP issues will be solicited during the HCP/NCCP review process, following release of the draft HCP/NCCP. The EIS/EIR will evaluate the environmental impacts of all activities proposed in the HCP/NCCP.

- Has MRC fully disclosed all intended management and development activities and associated impacts for the next 80 years?

- There are too many uncertainties and ambiguities, and an absence of information for the public to form intelligent scoping comments.

- Neither the public nor agencies have been presented by MRC with a concrete proposal or definition of lands that would be subject to the HCP/NCCP. For example, the property area noted in the Federal Register notice was from "220,000 to 240,000" acres. What is the property's size? Why the ambiguity? *Explanation: The exact acreage comprising the Plan Area will be identified in the HCP/NCCP, including permit conditions for addition or deletion of land.*

- The Federal Register notice states that the HCP/NCCP area "includes, but is not limited to…." and then gives a list of watersheds. What other watersheds are involved? *Explanation: All watersheds in the Plan Area will be identified in the HCP/NCCP, along with specified conditions for addition or deletion of land from coverage.*

- The public cannot address many serious questions without better information and a draft plan. How can the public address the question of land conversion in the Willow Creek area or raise it as a concern, if the property is not better defined? We would like to provide specific public and expert opinion on this issue, but cannot do so if not provided with an accurate, concrete, project description.

- Without knowing what specific properties are at issue, the public cannot intelligently comment on the scope of the EIS/EIR, cannot recommend alternatives analysis, and is restricted to generic statements such as "evaluate all environmental impacts associated with the potential development of Willow Creek."

- The species proposed for "incidental take" by MRC were identified only in part in the Federal Register. Only 17 were listed, and an additional 60 unlisted species MRC may also seek coverage for were not specifically named. Pertinent comments (on biological needs and potential impacts) cannot be reasonably expected for the unnamed 60 species. Scoping is therefore being sought for an inadequately described project and is therefore incomplete.

- Neither the range of activities proposed nor the status and threats to species were on the agenda (as they were reported to be in the Federal Register). The relevance of the PowerPoint presentation to the habitat requirements of the species proposed for the 80-year no surprises ITP was not discussed, nor was it made clear if this presentation would be part of the administrative record so that the public could carefully review it.

4.3.9.3 Length of comment period (1 verbal comment; 11 written comments)

Issues that may not receive detailed analysis in the EIS/EIR:

Public involvement is an important part of the NEPA and CEQA processes. Public input is sought during the scoping process by means of scoping meetings and through written comments submitted to the federal and state lead agencies. Public input is also invited later in the process as part of the public review and comment period for the draft EIS/EIR. In addition, the HCP/NCCP process also incorporates public review and comment on the draft HCP/NCCP.

- To establish details and full implications of the "scope" of this permit requires more than the 20 days notice for the scoping meetings and a total of 30 days notice for public comment on the scope of the project -- with the public meanwhile having almost no information on the proposed HCP/NCCP and its proposed scope.
- Reopen public comment period once HCP/NCCP is made available.
- Extend comment period and make announcements more obvious.
- We know of at least 9 agencies or environmental groups that have only just heard of the Federal Register Notice, and have not had sufficient time to review it, to obtain information about MRC and to raise their concerns.
- Future public meetings or workshops were promised [at the scoping meetings] for after the deadline for scoping comments (July 8). *Explanation: In addition to the public scoping meetings, MRC held four public information workshops on September 24, 25, 27, and 30, 2002. Although not part of the official scoping process, these workshops were intended to provide interested parties with additional information on the HCP/NCCP process, MRC's approach to landscape management, and the existing conditions on MRC's forestlands.*

4.3.9.4 Opportunity for public comment (4 verbal comments; 24 written comments)

Issues likely to be addressed further in the EIS/EIR:

- Analyze all information provided by the public. *Explanation: The EIS/EIR will analyze impacts of the proposed plan and alternatives based on the best available data and methods. Relevant information provided by the public will be used in the environmental impacts analysis.*
- If the conditions of coverage for a given taxon is modified, will the public have a chance to review and comment?
- Will the public review and comment upon all amendments to the plan and implementation agreement?

Issues that may not receive detailed analysis in the EIS/EIR:

The following comments relate to issues of HCP/NCCP development and/or content. Some or all of these issues will be addressed in the HCP/NCCP and/or the Implementation Agreement. Public involvement is an important part of the NEPA and CEQA processes. Public input is sought during the scoping process by means of scoping meetings and through written comments submitted to the federal and state lead agencies. Public input is also invited later in the process as part of the public review and comment period for the draft EIS/EIR. In addition, the

HCP/NCCP process also incorporates public review and comment on the draft HCP/NCCP. Future notification of opportunities for comment will be publicized pursuant to requirements for public review under NEPA and CEQA.

- Address the public's participation in the monitoring process. Include non-profit conservation organizations in monitoring, inspection, and assessment programs.
- Neighboring landowners should have opportunity for comment.
- It is essential that public input be provided for changes to the status, management, or mitigation for covered taxa. CNPS believes that such changes should be publicly noticed, public comment taken, and inter- and intra- agency consultation undertaken before being accepted as an amendment to the HCP.
- Ensure opportunity for local environmental groups and citizens to comment on proposed plan.
- What future public opportunities will be provided during the HCP planning process?
- What role can local stakeholders play in selecting the independent scientific review panel?
- There is a desire for local veto power on who is on an independent technical review team.
- Please keep CNPS informed on formation of working groups/advisory committees, release of draft documents and NCCPA planning agreement for public review, and add CNPS to project mailing lists.
- CNPS requests a seat on the steering committee for both the HCP and NCCP and a seat on the scientific advisory committee for the both the HCP and NCCP.
- How and when will a "process for public participation throughout the plan development and review" (FG code Sec. 2815) be established?
- When will the public participation process be established, how will CDFG structure this process to ensure quality scientific participation, and how can CNPS ensure that it is included in this process? Need for adequate time to review and comment.
- What public review and comment will be used when establishing the preliminary conservation objectives?
- What opportunity will the public have to review and comment on the proposed adaptive management framework and its subsequent modifications?
- Who will conduct planning (for wetlands and waterways) and what public review and comment will be provided on such planning?
- What public review and comment will be used for independent scientific input?
- Please notify commenter of future opportunities for comment.
- The EIS/EIR should contain full and exact quotation of public comment. *Explanation: Comments received during the scoping process, as summarized in this report, will be included in the EIS/EIR. Comments received on the draft EIS/EIR, along with responses, will also be included in the final EIS/EIR.*

- There would be no opportunity for public comment on ESA protection of currently unlisted species that may become listed over the course of the HCP/NCCP. *Explanation: MRC may choose to request coverage for currently unlisted species as part of its HCP/NCCP, and would need to provide adequate conservation measures for their protection. The EIS/EIR would analyze the effects of the proposed plan on any unlisted species that MRC may choose to treat as covered species. If these covered species became listed in the future, MRC would receive incidental take coverage under the ESA. However, if new species not specified in the HCP/NCCP become listed in the future, MRC would be subject to "no take" under endangered species laws and regulations. The public can comment on this issue during the public comment period for the HCP/NCCP.*

- Include a local citizen's board in the decision-making process. *Explanation: Federal and state permit issuance decisions are the sole responsibility of the wildlife agencies pursuant to applicable laws and regulations.*

4.3.9.5 **Public scoping process** (7 verbal comments; 17 written comments)

Issues that may not receive detailed analysis in the EIS/EIR:

Explanation: The following comments were received regarding the public scoping process. The scoping process is intended to facilitate public input on the issues to be analyzed in the EIS/EIR, including alternatives. Although comments on the process of scoping itself will not be analyzed as part of the EIS/EIR, they have been reviewed by the federal and state lead agencies. Comments received during the scoping process are part of the administrative record for the EIS/EIR, and have been summarized and presented in this Scoping Report, for inclusion in the EIS/EIR.

- There has been too much information presented too quickly tonight. (verbal comment from scoping meeting)

- Suggestion to make presentations [at scoping meetings] shorter and focus on status of species instead.

- Thank you for this process that is being undertaken.
- Will there be more public meetings?

- Where and when will these other workshops happen? We need meetings in both inland/coastal locations. There is a need for adequate noticing 3–4 weeks in advance.

- 1–1 1/2 months does not seem adequate to have workshops.

- Will scoping information be publicly distributed?

- Notification of public was inadequate

- Commenter expressed frustration over lack of opportunity for public comments/questions during scoping meetings.

- Why weren't the scoping sessions recorded? We certainly noticed that our very specific and hard questions at the Santa Rosa scoping were "summarized" and diluted by the facilitator for sessions in Ukiah and Ft. Bragg. Who authorized these "summaries"? Will they be part of the administrative record, even though they were "interpreted" and not recorded for precise transcription? What is the administrative record for this HCP/NCCP? Of what does it consist? Where is it lodged?

- Scoping comments made by the public were condensed and recorded on a newsprint tablet by MRC's consultant. No transcriptions or recording of any kind occurred. Much time was wasted trying to explain to the facilitator the meaning of the comments so they could be summarized, and the meaning was often lost.

- The Federal Register notice stated that the proposed agenda for the scoping meetings "includes a summary of the range of activities that may be authorized in the incidental take," and the "status of and threats to subject species". But in fact, there was not presentation of the "status of and threats to subject species" by MRC or by the agencies. Why not? And the "summary" of the "range of activities" that will be authorized included only a few general assertions by MRC about their logging program.

- Many questions regarding the HCP/NCCP process were not answered. Many of these questions could have easily been anticipated by the agencies and written materials made available. Where and how, at this point, will the public get answers so that they can continue to participate?

- The facilitator said that a scoping report, prepared by the facilitator, would categorize scoping comments by 'issue,' and workshops would be held to discuss these issues. The questions of who would be planning and conducting these workshops, what the relationship of the agencies to them would be, and how the content of these would be developed and information controlled, remains unknown.

- In summary, the scoping has been inadequate to date. The public's attendance time was not well used and the public agencies, by abdicating their responsibility for the planning and facilitation of these meetings, have lost an opportunity to inform and educate the public.

- Notices regarding the scoping meetings did not advise the public of the existence or availability of resource materials that would guide them in forming comments, particularly the 1996 HCP handbook.

The following comments relate to the public's concern regarding the availability of project-specific information provided at this stage in the scoping process. Comments regarding HCP/NCCP issues will be solicited during the HCP/NCCP public review period, following release of the draft HCP/NCCP. The EIS/EIR will evaluate the environmental impacts of all activities proposed in the HCP/NCCP, but will not address issues related to the public availability of HCP/NCCP data.

- Agency staff told attendees that scoping would continue throughout the HCP process. This has not been officially noticed. The public can't rely on personal assurances.

- Consider that the public cannot suggest or analyze specific alternatives or fully scope issues to be addressed because there has been restricted information flow to the public in the form of 1) no public review of the HCP/ITP, 2) restricted public review of data, and 3) an adequate project description has not been provided.

- With the only guide to our scoping comments being the Federal Register notice, the public is unable to adequately comment at this point. The commenter requests that scoping continue until documents (HCP/NCCP) are available for public review. The commenter requests that the extension of scoping be officially noticed in the Federal Register.

- The public is not able to submit informed scoping comments regarding MRC without having a draft HCP/NCCP to review. At this time, there isn't even an SYP.

- The public cannot suggest the analysis of specific alternatives without knowing the nature and extent of the proposed project. Therefore, we urge you to continue the scoping phase of this process until at least several weeks after MRC's draft HCP/NCCP is made available to the public.

- The process should be changed to require a preliminary draft HCP/NCCP from MRC, studied by agencies, and released to the public, prior to conducting scoping sessions.

- The commenter suggests that the process would be more appropriate if the agencies provided information and materials to the public prior to scoping and before agencies and MRC engage in negotiating outside the public eye.

4.3.10 Regulatory Issues

The EIS/EIR will address the affected environment, potential impacts, and mitigation associated with each alternative. Comments received on regulatory issues regarding California Forest Practice Rules, MRC's Option A, the Public Trust doctrine, regulatory compliance, TMDLs, Timber Harvest Plans (THPs), and the relationship between THPs and HCPs, will be considered by state and federal lead agencies during development of the EIS/EIR. The EIS/EIR will include a discussion of the relationships between and implications of all regulations applicable to the proposed action.

4.3.10.1 Forest Practice Rules (1 written comment)

Issues likely to be addressed further in the EIS/EIR:

- Assess some of the effects to watersheds associated with implementation of the CFPRs. *Explanation: The EIS/EIR will analyze the impacts associated with implementation of the proposed plan and selected alternatives. All non-federal timber harvest in California is regulated by the CFPRs, unless superseded by additional protections, as specified in the CFPRs. The analysis of impacts in the EIS/EIR will therefore include the impacts associated with implementation of the CFPRs, as well as other protections already in place (e.g., MRC's FSC and Option A agreements), or those proposed as part of the HCP/NCCP or selected alternatives.*

4.3.10.2 Option A (2 written comments)

Issues that may not receive detailed analysis in the EIS/EIR:

- Investigate and disclose the adequacy and accuracy of MRC's Option A. *Explanation: The EIS/EIR will analyze the environmental impacts of the proposed actions, which may include management strategies similar to those found in MRC's management under its Option A. However, an investigation of the adequacy and accuracy of the Option A prior to the HCP is a Board of Forestry regulatory issue*

- Evaluate the choice of MRC to operate under an Option A rather than SYP and its effect on alternatives proposed in the HCP. *Explanation: Although the EIS/EIR will analyze the* *environmental impacts of the proposed actions, which include MRC's management under its Option A, MRC's choice to pursue an Option A is a Board of Forestry regulatory issue. The effect of MRC's Option A on the development of HCP alternatives, if any, will be evaluated in the HCP/NCCP.*

4.3.10.3 Public Trust Doctrine (1 verbal comment; 2 written comments)

Issues unlikely to receive detailed analysis in the EIS/EIR:

Explanation: Fish and wildlife are public trust resources. CDFG is the state agency with "trustee" authority over fish and wildlife wherever they occur in California. The NCCP and CEQA processes are the mechanisms through which this agency applies its trustee responsibility.

- MRC does not "own" the resources on the land. The Public Trust Doctrine therefore prohibits CDFG from approving the plan.
- Evaluate the compliance of the HCP/NCCP with the Public Trust Doctrine.
- Identify the party (agency) responsible and the mechanism that will be put in place for protection of the public trust on MRC lands, including loss of biodiversity, fisheries, groundwater, and surface water.

4.3.10.4 Regulatory Compliance (2 verbal comments; 12 written comments)

Issues likely to be addressed further in the EIS/EIR:

- The NEPA/CEQA compliance process needs to be disclosed.
- EPA recommends performing additional environmental analysis for future project-level actions. *[Comment from US EPA Region IX: also included in the Agency Comments section (Section 4.3.11)]*
- The EIS/EIR should analyze whether the HCP/NCCP is consistent with the Recovery Plans for species (especially northern spotted owl), FEMAT and 4d Rules.

Issues that may not receive detailed analysis in the EIS/EIR:

- As part of FSC certification, MRC was supposed to produce a management plan - where is it? *Explanation: MRC's management plan is available on the company website at: http://www.mrc.com.*
- Ensure the HCP follows guidelines under the California Porter-Cologne Act, the North Coast RWQCB's Basin Management Plan, and the Clean Water Act. *The applicant is responsible for meeting all applicable State and Federal laws.*

The following comments relate to regulatory compliance issues rather than NEPA/CEQA's assessment of the environmental impacts of a proposed HCP/NCCP. Many of these issues will be addressed in the HCP/NCCP and as part of the agencies' ESA Section 7 consultation, Implementation Agreement, and/or accompanying HCP/NCCP decision documents.

- The EIS/EIR must ensure that the HCP is in compliance with and consistent with the goals of CESA, and describe the authority of CDFG to issue take of state listed species. *Explanation: The state lead agency is responsible for ensuring compliance with CESA.*

- Given the size and duration of the proposed HCP, how is each agency planning to comply with the requirements of FESA Section 7 to ensure no jeopardy to covered taxa or their habitat over such a long period of time? *Explanation: This issue will be addressed by the federal agencies in the biological opinion and the EIS/EIR.*

- What "good science" supports the supposition that a FESA Section 7 compliant plan can be devised for a project of this size and duration? *Explanation: This issue will be addressed by the federal agencies in the biological opinion and the EIS/EIR.*

- Does each agency believe that the California Forest Practice Rules provide protection for sensitive taxa adequate to satisfy the requirements of FESA Section 7, and if so, upon what data is this believe based?

- Have stream alteration permits been applied for, for stream crossings and water drafting? Are valid permits obtained before activities begin?

4.3.10.5 THPs (1 verbal comment; 5 written comments)

Issues likely to be addressed further in the EIS/EIR:

- How does the current and past (10 yr) THP history combine with the proposed alternatives to cause adverse cumulative impacts to the health of the ecosystem, and how does this relate to the proposed HCP in terms of cumulative effects?

- MRC holdings are spread out and fragmented throughout Mendocino and Sonoma counties and need to be scrutinized by individual THPs in order to carefully analyze impacts of silviculture methods, especially with changes in varied cover-forage ratios. *Explanation: The EIS/EIR will analyze impacts of the proposed plan and alternatives based on the best available data and methods. In some cases historical data relevant to this analysis may include previous implementation and management plans (e.g., THPs).*

- We request that you study, while making your determination on this permit, the THPs in the attached list. They have all been approved just in the last 4 years in the Albion River watershed (attachment provided with comment letter). *Explanation: The EIS/EIR will analyze impacts of the proposed plan and alternatives based on the best available data and methods. In some cases historical data relevant to this analysis may include previous implementation and management plans (e.g., THPs).*

Issues that may not receive detailed analysis in the EIS/EIR:

- THPs do not include all information. *Comment noted.*

4.3.10.6 Relationship Between THPs and HCPs (2 verbal comments; 21 written comments)

Issues likely to be addressed further in the EIS/EIR:

- What are impacts of previous THPs? *Explanation: The EIS/EIR will analyze impacts of the proposed plan and alternatives based on the best available data and methods. In some cases historical data relevant to this analysis may include previous implementation and management plans (e.g., THPs).*

- Will MRC's 220+ THPs be assessed for cumulative impacts upon endangered species and loss of habitat? *Explanation: The EIS/EIR will include an analysis of cumulative effects* *of the proposed actions and alternatives. This analysis will be based on the best available data and methods, and may include data from existing THPs.*

- The HCP/NCCP and EIS/EIR should include detailed disclosure and analysis of cumulative effects assessments for existing THPs. *Explanation: The EIS/EIR will include an analysis of cumulative effects of the proposed actions and alternatives. This analysis will be based on the best available data and methods, and may include data from existing THPs.*

Issues that may not receive detailed analysis in the EIS/EIR:

Explanation: The following comments refer to THP and/or HCP/NCCP development and/or content issues. The relationship of the HCP/NCCP to other laws and regulations is expected to be described in the proposed plan and will also be included in the EIS/EIR. Other comments refer to regulatory issues under the jurisdiction of CDF and the California Board of Forestry.

- The HCP relationship to Timber Harvest Plans (THP) needs to be disclosed.
- MRC should disclose details of THPs for the next 80 years.
- What is the baseline for developing the HCP? Does it include current THPs?
- How are previous THPs factored in to HCP/NCCP?
- Investigate and disclose the adequacy of cumulative impacts assessments in all MRC THPs.
- Investigate and disclose the adequacy and accuracy of cumulative impacts assessments in THPs purchased from L-P in 1998.
- Investigate and disclose adequacy of TES species protections in THPs filed before L-P ownership of the property.
- Investigate and disclose the failures of CDF's THP review process to determine if the THP review process has adequately protected listed species on MRC lands in the past.
- How will each agency ensure that politics do not compromise the biological safeguards of the HCP/NCCP when implemented through the THP process throughout the entire period of the Project?
- If the agencies are planning to leave implementation of the HCP/NCCP to the THP process, then the agencies must ensure that the THP process does in fact implement the HCP/NCCP during the entire term of the HCP/NCCP. Otherwise it is not in compliance with FESA Section 7.
- Since timber management will be conducted pursuant to a set of THPs conducted through time, how will CDFG ensure that such THPs will be coordinated so as to collectively conform with all terms of the implementation agreement during the entire term of the Project?
- What interim process will be used to deal with discretionary projects, e.g., THPs, that potentially conflict with the preliminary conservation objectives?
- Will the interim process used to deal with discretionary projects such as THPs apply to THPs in the Albion watershed?

- Application of herbicide use after a THP closes is not properly regulated -- CDF claims (e.g., in the PALCO case) that it does not have authority over post-THP herbicide application. This is CEQA piecemealing, and CDF must address herbicide impacts, including cumulative impacts, as part of the THP process.
- According the CDFG, THPs submitted to CDF for the project area will continue to undergo independent CEQA review, even with the HCP/NCCP in place. However, the THP process has been severely criticized as providing inadequate protection for the forest environment. NOAA Fisheries itself expressed doubts about the CFPRs in relation to anadromous salmonid protection. It seems likely, then, that increasingly stringent FPRs will be implemented during the term of the HCP/NCCP.
- THP review is a very politicized process. CDFG biologists are put under pressure to suppress "non-concurrence" by more senior departmental management, despite scientific evidence demonstrating negative effects.
- How will THPs subject to the HCP/NCCP remedy the acknowledged deficiencies in the THP process, and how will the HCP deal with these changes so as not to produce unforeseen circumstances?
- Will THPs subject to the HCP/NCCP receive the same level of review by all agencies and the public as other THPs not subject to the HCP/NCCP?
- Will survey, mitigation, and monitoring requirements for unlisted sensitive botanical taxa for THPs subject to the HCP/NCCP be identical to other THPs not subject to the HCP/NCCP?
- In what other ways will THPs subject to the HCP/NCCP be handled differently from other THPs not subject to the HCP/NCCP?

4.3.10.7 **TMDLs** (1 verbal comment; 4 written comments)

Issues likely to be addressed further in the EIS/EIR:

- The HCP/NCCP cannot be an independent planning document for long term harvesting of timber since the HCP/NCCP will be finished before TMDL guidelines, monitoring and federal mandates are established. MRC cannot be doing an EIR that does not take into account TMDL and EPA recommendations for these watersheds. *Explanation: The EIS/EIR will analyze environmental impacts of the proposed HCP/NCCP and alternatives in the context of contaminants often covered during TMDL development and compliance. Thus, the HCP/NCCP might provide adequate measures for complying with those other laws, but MRC must meet the legal requirements of any current and future TMDLs on watersheds where they have property, whether or not the HCP/NCCP meets TMDL standards.*
- Include discussion of TMDLs, the possibility of miscalculations, and the uncertainty of a timeline—for TMDLs already promulgated—for the SWRCB to establish implementation plans, and for the regional board to adopt such plans into its Basin Plan. *Explanation: The EIS/EIR will analyze environmental impacts of the proposed HCP/NCCP and alternatives in the context of TMDL development and compliance. An evaluation of whether the HCP/NCCP meets legal mandates related to TMDLs, however, is unlikely to be included in the EIS/EIR*

Issues that may not receive detailed analysis in the EIS/EIR:

- The MRC HCP/NCCP must address the limiting factors identified by the EPA in the TMDL guidelines, executive summaries, and all other final documents that pertain to impairment listings. *Explanation: This is an HCP/NCCP content issue. The EIS/EIR will analyze environmental impacts of the proposed HCP/NCCP and alternatives in the context of TMDL development and compliance.*

- How will the HCP address Total Maximum Daily Load issues, particularly sediment? *Explanation: This is an HCP/NCCP content issue. The EIS/EIR will analyze environmental impacts of the proposed HCP/NCCP and alternatives in the context of TMDL development and compliance.*

4.3.11 Agency Comments

Comments received by all local, state, and federal agencies are summarized below and have also been incorporated in relevant categories/topics above. This included 6 comments by the California Coastal Commission, 26 comments by US EPA Region IX, and 5 comments by the Elk County Water District.

Comments from the California Coastal Commission:

- The anticipated permit would authorize timber harvesting for 80 years, which could adversely affect water quality and habitat resources of the Coastal Zone. The timber activities could degrade water quality through increased sedimentation into coastal streams/rivers. Additionally, the timber harvesting activities could directly and indirectly damage environmentally sensitive habitat resources of the Coastal Zone.

- If it is determined that activities covered under the proposed plan are reasonably likely to affect coastal uses or resources, the activities will be subject to the consistency review requirements of Section 307(c)(3)(A) of the federal Coastal Zone Management Act, and of regulations that implement this provision.
- Compliance with the Coastal Zone Management Act requires that the applicant prepare a consistency certification, which is an evaluation of the proposed activities' effects on coastal resources or uses and their consistency with the enforceable policies of the California Coastal Management Program, together with the necessary information to support the certification.

- The California Coastal Commission staff recently received an invitation from CDFG to participate in the development of the proposed plan. The Commission staff appreciates the invitation and is looking forward to participating in the process.

- In response to the notice of intent, the Commission staff believes that it is important to identify possible jurisdictional issues.

Comments from the US EPA, Region IX:

- The EIS/EIR should evaluate potential air quality impacts.

- Evaluate mitigation and monitoring options to reduce air quality impacts.

- Consider water quality and quantity impacts associated with forest management
- Evaluate impacts to TES species of potential changes in water quality and quantity

- The EIS/EIR should include a comprehensive assessment of current conditions.
- EPA believes the no action alternative is not equivalent to a no impact baseline.
- Covered activities should be timed so as not to interfere with timing of crucial life history requirements of TES species.
- The EIS/EIR should identify impacts to wetlands and include management and mitigation to comply with Section 404 Clean Water Act requirements.
- The EIS/EIR should address feasibility of in-kind mitigation for impacts to wetlands and other aquatic habitat.
- Interpretation of the no action alternative as having no impacts may be inconsistent with NEPA regulations.
- The EIS/EIR should provide comparison of alternatives to inform review and decision-making.
- The EIS/EIR should evaluate a broad mix of possible alternatives, including those that may not be within the jurisdiction of the lead agency.
- The EIS/EIR should describe in detail the process of selecting, eliminating, analyzing, and implementing each alternative.
- EPA suggests that alternative analysis be based on a watershed approach.
- Consider EIS/EIR alternatives that specifically reduce sedimentation of aquatic habitats.
- The EIS/EIR should evaluate the alternatives in terms of compliance with the Federal Antidegradation Policy and the Clean Water Act.
- Include alternatives that avoid or minimize water quality impacts associated with timber management activities.
- EIS/EIR should describe use of native vegetation in restoration, to comply with Executive Order 13112.
- The US EPA recommends that the EIS/EIR include a clear description of project need and indicate relationship between project need, purpose, and alternatives.
- The EIS/EIR should describe potential direct, indirect, and cumulative impacts and include mitigation for impacts.
- The EIS/EIR should document the impacts, including cumulative impacts, of past, present, and reasonably foreseeable actions, such as timber harvesting, resource extraction, development, etc.
- EPA recommends performing additional environmental analysis for future project-level actions.
- The EIS/EIR should address commitments, assurances, and mechanisms for funding, implementation, enforcement, and monitoring.
- EPA advocates commitment to monitoring, surveys and adaptive management, including a fallback option if species continue to decline.

- The EIS/EIR should include scientific evidence documenting the effectiveness of the HCP/NCCP.

Comments from the Elk County Water District:

- Assess cumulative impacts in Greenwood Creek watershed to protect water quality.
- Monitor water quality in Greenwood Creek as part of the HCP/NCCP.
- Implement an erosion control plan as part of the HCP/NCCP.
- Mitigation for water quality impairment must be assured.
- Would like assurance that requested HCP/NCCP provisions will be implemented.

5 SUMMARY OF FUTURE STEPS

The lead agencies will accept public input on the proposed plan at any time during the production of the EIS/EIR. All written public input will become part of the administrative record and issues raised will be addressed by the agencies as described above. The next formal comment period will open when the Draft EIS/EIR is published in winter or spring 2003. The lead agencies will circulate a notice of the Draft EIS/EIR and Draft HCP/NCCP to interested parties of which they are aware. The draft documents will be available to the public on the Lead Agencies' websites CDFG: ftp://maphost.dfg.ca.gov/outgoing/Ccr/documents, NOAA Fisheries: http://swr.ucsd.edu/, USFWS: http://www.ccfwo.r1.fws.gov/, and by request from the lead agencies. The availability of the Draft EIS/EIR will be announced by publication of a notice in the Federal Register and State Clearinghouse, as well as other media such as local newspapers. Following the release of the draft document there will be a 90-day public comment period and additional public hearings [to be determined] at locations in the project vicinity.

At the conclusion of the public comment period, the Draft EIS/EIR will be revised and the proposed Final EIS/EIR will be prepared. The availability of the proposed Final EIS/EIR will be announced by the publication of a notice in the Federal Register, at which time a 30-day public review period will commence. The final opportunity for public comment on the EIS/EIR will be this 30-day public review period. At the end of the public review period, the lead agencies will file the Final EIS/EIR and announce its availability in the Federal Register and provide it with a notice of determination with the Office of Planning and Research.

Appendix D

Alternatives Comparison Table

Table D-1. Comparison of alternatives selected for detailed analysis in the EIS/PTEIR.

No Action (No HCP/No NCCP/No permits)	**Proposed Action (HCP/NCCP)**	**Alternative A (Enhanced HCP/NCCP)**	**Alternative B (Terrestrial reserves)**	**Alternative C (HCP only, fewer covered species, shorter incidental take permit term)**
FEDERAL ESA COMPLIANCE FOR COVERED SPECIES				
Federal incidental take permit not issued. Take prohibitions for listed species apply.	Federal incidental take permit issued for 80-year term.	Same as Proposed Action.	80-year federal incidental take permit issued for marbled murrelet, and northern spotted owl only. Take prohibitions for other listed species apply.	Federal incidental take permit issued for 40-year term.
CALIFORNIA ESA COMPLIANCE FOR COVERED SPECIES				
State of California NCCP not prepared. Take prohibitions for listed species apply.	Authorization of take for 80 years under Fish & Game Code Section 2835 *et seq*.	Same as Proposed Action.	NCCP not prepared. Authorization of take for 80 years under California Fish and Game Code Section 2080.1 or 2081 (for state-listed HCP-covered species only [i.e., marbled murrelet]). Take prohibitions for other state-listed listed species apply.	State 2080.1 or 2081 permit (for state-listed covered species only). Take prohibitions for other listed species apply.
COVERED SPECIES				
None.	Coho salmon (two Evolutionarily Significant Units), Chinook salmon, steelhead (two Distinct Population Segments), red-legged frogs, coastal tailed frog, marbled murrelet, northern spotted owl, Point Arena mountain beaver, and 31 species of plants.	Same as Proposed Action.	Marbled murrelet and northern spotted owl.	Coho salmon (two Evolutionarily Significant Units), Chinook salmon, steelhead (two Distinct Population Segments), California red-legged frog, marbled murrelet, northern spotted owl, and state-listed plants.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
TIMBER HARVESTING AND FOREST MANAGEMENT ACTIVITIES				
Forest management per MRC's 2000 Management Plan (MRC 2000a, MRC's Option A (MRC 2000b), 2012 CFPRs, and other applicable federal and state regulations.	Forest management per MRC's proposed HCP/NCCP (MRC 2012), Timber Management Plan (TMP), and applicable federal and state regulations.	Same as Proposed Action, with additional measures to enhance conservation of aquatic and riparian habitats.	No harvesting and limited management in reserves. Harvesting and management outside reserves per applicable federal and state regulations.	Same as Proposed Action through year 40.
Harvesting, yarding, and transporting timber				
Silviculture				
MRC's 2000 Management Plan (MRC 2000a) specifies transition to 90% uneven-aged silviculture within 40 years; mostly individual tree and group selection with 10 year re-entry cycle.	Focus on rehabilitation, uneven-aged silviculture, and canopy retention. Target is 90% uneven-aged silviculture within 40 years, with 20 year re-entry cycle and average 75 ft^2 post-harvest basal area.	Same as Proposed Action except even-aged management on stands adjacent to riparian stands allowed only for the purpose of rehabilitation (hardwood to conifer).	Harvesting prohibited in reserves, with limited exceptions to meet ecological objectives. Outside the reserves, even-aged management (e.g., clearcut and commercial thinning) would be the primary silvicultural objective, as allowable under the CFPRs.	Same as Proposed Action through year 40.
Special concern areas				
Measures in MRC's 2000 Management Plan (MRC 2000a) apply, including silvicultural treatments, harvest scheduling, and management constraints for ecosystem protection and scenic buffers.	Similar to No Action alternative, with additional measures for aquatic AMZs, aquatic and riparian habitat, terrestrial habitat, and other concerns.	Similar to Proposed Action, with additional measures described elsewhere in this table.	Approved management in reserves to meet ecological objectives. Management outside reserves per 2012 CFPRs.	Same as Proposed Action through year 40.
Yarding				
Measures in 2012 CFPRs and MRC's 2000 Management Plan (MRC 2000a) apply. Estimated annual percentages of each yarding type, by area: 49% cable yarding, 49% tractor yarding, and 2% helicopter yarding.	Estimated percentage by yarding type same as No Action. Restricted heavy equipment use in AMZs, ELZs, EEZs, and specific terrain stability units.	Similar to Proposed Action, with additional measures. Helicopter yarding required where >1 mi of new road construction would otherwise be needed. With agency approval, some road alignments may be removed in exchange for new roads.	No yarding or loading in reserves, with limited exceptions. 2012 CFPR measures apply outside reserves. Hauling allowed on existing mainline roads in reserves if no suitable alternative exists.	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	**Proposed Action (HCP/NCCP)**	**Alternative A (Enhanced HCP/NCCP)**	**Alternative B (Terrestrial reserves)**	**Alternative C (HCP only, fewer covered species, shorter incidental take permit term)**
Management of hazardous substances				
Used in compliance with regulations of State Dept. of Agriculture and U.S. Environmental Protection Agency. Best Management Practices and other measures are specified in MRC's, Hazardous Material Business Plan and Herbicide Spill Contingency Plan. Application protocols include ground-based application, stream buffers, water testing, and neighbor notification.	Same as No Action alternative.	Same as No Action alternative.	Same as No Action alternative.	Same as No Action alternative.
Management of fire hazards				
CAL FIRE responsible for emergency services. MRC would respond per its most current Fire Suppression Plan.	Same as No Action alternative.	Same as No Action alternative.	Same as No Action alternative.	Same as No Action alternative.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Mass wasting and sediment management				
Measures in 2012 CFPRs and MRC's 2000 Management Plan (MRC 2000a) apply. Professional Geologist review required for harvest or road construction on unstable slopes and inner gorge of Class I streams. Heavy equipment restricted in Width of watercourse and lake protection zones (WLPZ) and on unstable slopes. Tractor operations generally prohibited on steep and erosion-prone slopes (e.g., >65% slopes, >50% slopes where erosion hazard rating is high, and >50% slopes leading directly to watercourse); exceptions allowed if explained and justified. On slopes 50–65% with moderate erosion hazard rating, heavy equipment limited to existing tractor roads or approved new roads. In watersheds with listed anadromous salmonids, operations on inner gorge slopes > 65% must be reviewed by Professional Geologist and erosion control required on bare ground adjacent to Class I or II streams.	2012 CFPR measures apply, with additional measures in proposed HCP/NCCP (MRC 2012) and TMP. Harvest prohibited in inner gorges of terrain stability units 1 and 2 without field review by Professional Geologist and aquatic resource expert. Silviculture in these areas limited to high-retention selection. Harvest on steep streamside slopes (terrain stability units 1 and 2) and steep dissected topography (terrain stability unit 3) subject to AMZ retention standards. Heavy equipment excluded from inner gorges and other steep streamside slopes (in terrain stability units 1, 2, and 3).	Similar to Proposed Action, with additional measures. Harvest prohibited in inner gorge and restricted to high retention selection on steep streamside slopes.	No harvest in reserves with limited exceptions as approved by agencies. 2012 CFPR measures apply outside reserves (see No Action).	Same as Proposed Action through year 40.
Road inventory				
Measures in 2012 CFPRs and MRC's 2000 Management Plan (MRC 2000a) apply. Condition of roads, landings, drainage infrastructure, and erosion control monitored annually, during winter, and during major storm events.	System-wide Road Management Plan. All current roads upgraded to standards within 30 years. Permanent roads inspected annually. Seasonal and temporary roads inspected 5 times during each 5-year period. Additional inspections following large storm events. Roads on new property surveyed and upgraded within 5 years of acquisition.	Similar to Proposed Action, with additional measures. Road plan developed within 10 years emphasizing removal of unnecessary roads. Temporary and seasonal roads inspected each winter. Other roads inspected at least once every 10 years.	Roads within reserves inventoried at same schedule as under Proposed Action. Roads in reserves given high priority for survey, relocation outside reserves, and decommissioning. 2012 CFPR measures for road inventory apply outside reserves.	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Road and landing construction, reconstruction, and maintenance				
Measures in 2012 CFPRs and MRC's 2000 Management Plan (MRC 2000a) apply. Rocked fords, rolling dips, and outsloping used where possible. New roads and landings located to avoid unstable areas, wetlands and watercourses, narrow valley bottoms, and WLPZs. Construction of drainage structures completed by 15 October. Watercourse crossings minimized, and where necessary, sized to pass 100-year flood. No construction of roads or landings in watercourse or WLPZ, unless approved. Watercourse crossings, drainage ditches, and drainage structures maintained for unrestricted flow and to prevent diversion. Road surfaces in logging areas treated to minimize erosion. Heavy equipment prohibited in WLPZ during wet weather. Temporary roads and landings decommissioned after use. WLPZ roads treated to minimize erosion. Mainline roads maintained to ensure fire access. The 2012 CFPRs include additional measures in watersheds with listed anadromous salmonids.	Similar to No Action, with additional measures in proposed HCP/NCCP (MRC 2012) and TMP. Road maintenance and controllable erosion treated based on priority. Inventory data used in conjunction with TMDL timelines and identified coho salmon core watersheds to set treatment priorities. Top 1/3 of high immediacy sites treated in each 10-year period. All sites with high and moderate treatment immediacy treated within first 30 years or within 20 years in coho core watersheds. No new roads or landings on inner gorge slopes, steep streamside slopes, steep convergent swales, or historically active mass wasting features without review by Professional Geologist and aquatic resource expert. No new watercourse crossings in inner gorge unless approved by Professional Geologist and aquatic resource expert. No roads in narrow canyon bottoms; within the AMZ parallel to a Class I, II, or III watercourse; or in areas with high mass wasting hazard. No landings in AMZ. Unused roads and landings removed, if feasible. Protective structures (i.e., trash racks) installed on all culverts at watercourse crossings in which water is flowing at the time of culvert installation. Drainage structures installed by 15 October.	Similar to Proposed Action, with additional measures. No road construction during winter period. New road construction limited to one continuous mile in any planning watershed over life of permit. No new roads, road crossings, or landings in inner gorges. No roads across the toe of historically active deep seated landslides. Focus on abandoning and limiting roads within sensitive watersheds. Unnecessary roads decommissioned coincident with timber operations. Bridges required on permanent road crossings of Class I and large Class II watercourses.	No new road construction in reserves. Existing roads in reserves abandoned or relocated, when possible. No timber loading in reserves. Hauling allowed on existing mainline roads in reserves if no suitable alternative route exists. Outside reserves, road construction, reconstruction, and maintenance per the 2012 CFPRs (see No Action).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	**Proposed Action (HCP/NCCP)**	**Alternative A (Enhanced HCP/NCCP)**	**Alternative B (Terrestrial reserves)**	**Alternative C (HCP only, fewer covered species, shorter incidental take permit term)**
Winter hauling				
Measures in 2012 CFPRs and MRC's 2000 Management Plan (MRC 2000a) apply. Winter period: 15 November to 15 April. No mechanical site prep or harvesting (with exceptions) without winter period operating plan or specific THP measures. In lieu of winter operating plan, THP measures must specify: (1) tractor yarding prohibited when soils are saturated; (2) erosion control structures installed at end of day if next day forecast is for ≥30% chance rain; (3) site specific measures required for operations in WLPZ and unstable areas. Winter loading and hauling limited to roads with stable operating surfaces. No winter loading or hauling during rain if road surface is saturated or if water is flowing in roadside ditches. Winter period extended to 15 October to 1 May in watersheds with listed anadromous salmonids.	MRC Road Management Plan applies. During early winter period (15 October until cumulative precipitation totals 4 in), heavy equipment use prohibited for 24 hours after ≥ 0.5 in of rainfall in previous 24 hours. During mid-winter period (end of early winter period until 31 March), heavy equipment use, road construction, and use of landings in AMZ prohibited when soils are saturated or when sediment can be transported to watercourse. Road use during mid-winter period limited to permanent surfaces unless road is > 200 ft from a watercourse and has no drainage to watercourse. During late-winter period (1 April to 1 May), loading, hauling, or skidding prohibited when soils are saturated or when sediment can be transported to a watercourse. No tractor or other heavy equipment use for 48 hours after ≥ 0.5 in of rainfall in previous 24 hours.	Similar to Proposed Action, with additional measures. No winter hauling after 15 October once rainfall total is 4 in. No hauling in April or May for 72 hours after 0.5 in of rain.	Additional seasonal restrictions on road use in reserves. Road use and management outside reserves per 2012 CFPRs. 2012 CFPR measures define the winter period as 15 November–1 April.	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Dust abatement				
Measures in 2012 CFPRs and MRC's 2000 Management Plan (MRC 2000a) apply. Minimize disturbance of streambed, bank, and vegetation at drafting sites (compliant with Fish and Game Code Section 1600). Approaches to drafting locations will be rocked. Pump intakes will be screened. Water usage may be restricted to ensure minimum flows. 2012 CFPR measures apply in watersheds with listed anadromous salmonids, including avoiding drafting within flood prone zone of Class I streams, installation of sediment barriers above normal high water, and prevention of soil and water contamination from vehicle fluid leaks. Operators will submit detailed logs of drafting activity to CAL FIRE.	Similar to No Action, with additional measures included in CDFG long-term streambed alteration agreement (the Management Agreement for Timber Operations) and summarized in Appendix E of the HCP/NCCP.	Similar to Proposed Action, with additional measures. Mainline haul roads would be treated by 2020 using feasible methods for dust abatement to minimize need for water drafting.	Similar to No Action, with additional measures. Development of water drafting sites prohibited in reserves. Existing sites would be moved out of reserves, where possible. 2012 CFPRs apply outside of reserves.	Same as Proposed Action through year 40.
Site preparation				
2012 CFPR measures apply. Use of heavy equipment prohibited when soils are saturated. Retain large organic debris. No broadcast burning in Class I or II WLPZ. Downed woody debris removed within 100 ft of public roads, 50 ft of private roads, and 100–200 ft of inhabited structures. Disposal of debris and slash piles by 1 April of following year. In watersheds with coho salmon or other listed salmonids, no ignition within WLPZ, EEZ, or ELZ, and burning should not consume LWD in a channels, WLPZ, EEZ, or ELZ.	2012 CFPR measures apply, with additional measures in proposed HCP/NCCP (MRC 2012) and TMP. Additional measures prohibit site preparation and burning on steep, dissected topography, inner gorge, and steep streamside slopes. Prescribed or broadcast burning prohibited in the AMZ of Class I, large or small Class II, or Class III AMZs.	Same as Proposed Action.	Management in reserves may include burning, control of exotic vegetation, and limited silvicultural treatments to meet ecological objectives. 2012 CFPR measures apply outside reserves.	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
AQUATIC AND RIPARIAN HABITAT MANAGEMENT				
Riparian zone widths, zone stratifications, buffer areas				
WLPZ per MRC's 2000 Management Plan (MRC 2000a) and the 2012 CFPRs (see below). Width of equipment exclusion zones (EEZ) or equipment limitation zones (ELZ) per the 2012 CFPRs.	Proposed HCP/NCCP (MRC 2012) defines Class I, II, and III watercourse protection areas as Aquatic Management Zones (AMZs). Width of AMZs as specified in Proposed HCP/NCCP (see below).	AMZ width is generally greater than or equal to Proposed Action (see below).	WLPZ, AMZ, EEZ, and ELZ not designated within reserves. Buffer widths outside reserves per 2012 CFPRs (see below).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Class I stream buffer widths				
Per MRC's Management Plan (2000a), Class I WLPZ buffer is 100–150 ft, depending on bank slope (modeled as 100 ft). In watersheds with listed anadromous salmonids, the 2012 CFPRs specify additional applicable riparian protection zones for Class I streams. All watersheds in the primary and secondary assessment areas are within the coastal anadromy zone. For confined channels: minimum combined width of core, inner, and outer zones is 150 ft. Additional 50 ft special operating zone required for even-aged upland silviculture. For unconfined channels: minimum combined width of core, inner A and inner B zones is variable (defined by extent of flood prone zone), but generally greater than for confined channels. Additional 50-ft outer zone required for even-aged upland silviculture.	Class I AMZ width is 130–190 ft, depending on bank slope, yarding method, and flood prone zone and channel migration zone boundaries (modeled as150 ft). Class I buffer widths are 30–40 ft wider than the No Action Alternative. Class I AMZs are further divided into inner, middle, and outer bands, with an additional 10-ft no-harvest band adjacent to the stream: • No harvest within 10 ft of the stream, except for limited selection of redwood clumps (50% of redwood stems can be removed); • Inner band width is 50 ft for all bank slope classes; • Middle band width is 50 ft for slopes 0-30%, 80 ft for slopes 30-50%, or 100 ft for slopes > 50%. Width of middle band in Class I streams can vary due to width of flood prone zone or channel migration zone (band starts at edge of flood prone zone or channel migration zone). For slopes > 50%, width of middle band may be reduced by 20–25 ft for cable or helicopter yarding; • Outer band width is 30 ft for slopes 0-30%, 20 ft for slopes 30-50%, or 40 ft for slopes > 50%. For slopes > 50%, width of outer band may be reduced by 20–25 ft for cable or helicopter yarding.	Class I AMZ width equal to one site potential tree (modeled as 150 ft).	No harvest within reserves. Outside reserves, Class I WLPZ width per 2012 CFPRs (modeled as 150 ft): • Default Class I WLPZ width in watersheds without listed salmonids is 75–150 ft, depending on bank slope and yarding method (2012 CFPRs); • In watersheds with listed salmonids, width of WLPZ and special protection zones per 2012 CFPRs (see No Action).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	**Proposed Action (HCP/NCCP)**	**Alternative A (Enhanced HCP/NCCP)**	**Alternative B (Terrestrial reserves)**	**Alternative C (HCP only, fewer covered species, shorter incidental take permit term)**
Class II stream buffer widths				
Per MRC's Management Plan (MRC 2000a), Class II WLPZ buffer is 75–110 ft, depending on bank slope. For watersheds with listed anadromous salmonids, the 2012 CFPRs define a core zone (nearest the water) and inner zone for all Class II watercourses: • For large Class II watercourses (Class II-L): minimum combined zone is 100 ft, regardless of side slope class (modeled as 150 ft); • For standard Class II watercourses (Class II-S): combined zone widths range from 50 to 100 ft depending on slope class (modeled as 75 ft). In watersheds without listed anadromous salmonids, the 2012 CFPRs do not distinguish between Class II-L and II-S streams.	Class II watercourse buffers (AMZs) separated into large and small watercourses. <u>Large Class II (watershed area >100 ac, or perennial flow at or below normal annual rainfall):</u> • No harvest within 10 ft of the stream, except for limited selection of redwood clumps; • AMZ width of 100–150 ft (modeled as 150 ft), depending on bank slope class and yarding method (25–40 ft wider than under the No Action and Alt. B, and up to 50 ft wider in watersheds with listed anadromous salmonids). <u>Small Class II (watershed area <100 ac):</u> • No harvest within 10 ft of the stream, except for limited selection of redwood clumps; • AMZ width is 50–100 ft (modeled as 75 ft), depending on slope class. • For slopes > 50%, AMZ width may be reduced by 25 ft for cable and helicopter yarding.	Class II watercourse buffers (AMZs) separated into large and small watercourses. <u>Large Class II (watershed area >100 ac):</u> • AMZ width is 1 site potential tree (modeled as 150 ft). <u>Small Class II (watershed area <100 ac):</u> • AMZ width is 50–150 ft, depending on bank slope (modeled as 75 ft).	No harvest within reserves. Outside reserves, Class II WLPZ width per 2012 CFPRs (see No Action). WLPZ width for Class II streams in watersheds without listed anadromous salmonids is 50–100 ft, depending on bank slope and yarding method (2012 CFPRs). In watersheds with listed salmonids, the 2012 CFPRs specify separate WLPZ and special protection zone widths for Class II-L and Class II-S streams (see No Action).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Class III stream buffer widths				
Class III buffer is an equipment limitation zone (ELZ), per MRC's 2000 Management Plan (MRC 2000a) and the 2012 CFPRs. Minimum ELZ widths range from 25 to 50 ft depending on bank slope class. ELZ width ≥25 ft where bank slope is <30%. No restrictions (i.e., no ELZ) if bank slope is <30% or erosion hazard rating is low, or for equipment use on existing roads or skid trails with no identified slope instability.	Class III AMZ widths per MRC's proposed HCP/NCCP (MRC 2012): • No harvest within 10 ft of the stream, except for limited selection of redwood clumps; • AMZ width is 25 ft with 50% canopy retention if bank slope < 30%; • AMZ width is 50 ft with 50% canopy retention if bank slope >30%; • AMZ widths apply regardless of erosion hazard rating or presence of existing roads or skid trails with no identified slope instability.	Same as Proposed Action.	No harvest within reserves. Outside reserves, Class III buffer (ELZ) width per MRC's Management Plan (MRC 2000a) and the 2012 CFPRs (same as No Action).	Same as Proposed Action through year 40.
Class I streams				
Equipment in Class I stream buffers				
Per MRC's 2000 Management Plan (MRC 2000a), equipment is excluded from Class I WLPZ, except for use on existing roads or skid trails with no signs of slope instability, or for construction of stream crossings. Additional 2012 CFPR measures include: • In inner zone A and B of floodprone (unconfined) channels: skid trails, falling, and yarding should not alter drainage or flow patterns; protect secondary channels and critical habitat from disturbance; use full suspension cable yarding when possible.	Equipment is excluded from Class I AMZ, with limited exceptions such as erosion control/road abandonment, use of existing roads, construction of watercourse crossings, or in cases where alternative yarding methods would cause greater risk of sediment delivery.	Same as Proposed Action.	Generally no harvest within reserves (see limited exceptions described below for stream habitat improvement). Outside reserves, 2012 CFPR measures apply. Equipment is excluded from Class I WLPZ, with the following exceptions: • At existing road crossings; • At new crossings approved under a CDFG 1600 permit; • Additional CFPR (2012) restrictions apply in watersheds with listed salmonids (see No Action).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Tree canopy retention in Class I stream buffers (measured using vertical sight tube)				
Per MRC's 2000 Management Plan (MRC 2000a), ≥70% of canopy cover would be retained or recruited. In watersheds with listed anadromous salmonids, additional 2012 CFPR measures apply: • Channel and core zones—retain all trees; • Inner zone (and inner zone A for unconfined channels)—80% overstory canopy retention, at least 25% of which is conifer; • Outer zone (and inner zone B for unconfined channels)—50% overstory canopy retention, at least 25% of which is conifer; • Special operating zone (if designated)—retain midstory and understory trees.	Class I canopy retention standards per MRC's proposed HCP/NCCP (MRC 2012): • Inner band: 85%; • Middle band: 70%; • Outer band: 50%.	N/A (no harvest within buffer equal to one site potential tree height, modeled as 150-ft no harvest buffer). In channel migration zone and flood prone zone outside AMZs, only high-retention selection would be used.	No harvest within reserves. Outside reserves, retain 50% overstory and 50% understory canopy cover, per 2012 CFPRs. In watersheds with listed anadromous salmonids, additional 2012 CFPR measures apply (see No Action).	Same as Proposed Action through year 40.
Basal area retention in Class I stream buffers				
Per MRC's 2000 Management Plan (MRC 2000a): • Retain > 200 ft^2 of basal area; • Retain > 75% of basal area of pre-harvest stand.	Per MRC's proposed HCP/NCCP (MRC 2012): • Inner and middle AMZ bands (and flood prone zone/channel migration zone)—200–300 ft^2/acre (conifer) (or 75% of pre-harvest conifer basal area, whichever is larger), based on the site class of the AMZ; • Outer band—canopy retention only, as described above.	N/A (no harvest for 1 site potential tree height, modeled as 150 ft). Flood prone zone and channel migration zone same as inner/middle bands in Proposed Action when they extend beyond one site potential tree height (150 ft).	No harvest within reserves. Outside reserves, retain 50–125 ft^2 of basal area, depending on site class, per 2012 CFPRs.	Same as Proposed Action through year 40.

<table>
<tr><th>No Action
(No HCP/No NCCP/No permits)</th><th>Proposed Action
(HCP/NCCP)</th><th>Alternative A
(Enhanced HCP/NCCP)</th><th>Alternative B
(Terrestrial reserves)</th><th>Alternative C
(HCP only, fewer covered species, shorter incidental take permit term)</th></tr>
<tr><td colspan="5">Large tree retention in Class I stream buffers</td></tr>
<tr><td>Per MRC's 2000 Management Plan (MRC 2000a):
• Retain 6 trees ≥32 in diameter at breast height per acre;
• If instream LWD demand is high or moderate, recruit & permanently retain 20 trees/330 lineal ft (10 on each side) with greatest potential for LWD input.

Per the 2012 CFPRs (within the coastal anadromy zone), retain the 13 largest conifer trees (live or dead) per acre within the core and inner zones.</td><td>Retain the following percentages of trees ≥12 in diameter at breast height, based on the sensitivity of the stream channel to LWD (calculated over a 100 m reach):
• Inner band: 10–30%;
• Middle band: 5–15%;
• Outer band: none.

Based on 4-in diameter classes, the largest tree would be retained, working down in size to the next largest tree until the above criteria are met.</td><td>Same as Proposed Action when harvest allowed (when flood prone zone extends outside of AMZ, flood prone zone is harvested as inner/middle band of Proposed Action).</td><td>No harvest within reserves.

Management outside reserves per 2012 CFPRs (no specific measures in watersheds without listed anadromous salmonids, but see No Action for CFPR measures that apply in watersheds with listed anadromous salmonids).</td><td>Same as Proposed Action through year 40.</td></tr>
<tr><td colspan="5">Silviculture in Class I stream buffers</td></tr>
<tr><td>Per MRC's 2000 Management Plan (MRC 2000a) and 2012 CFPRs:
• High retention selection only
• No sanitation or salvage logging.

2012 CFPRs in coastal anadromy zone include:
• No timber operations in Channel zone or core zone;
• In inner and outer zones, modified commercial thinning or single-tree selection only;
• Where inner gorge extends beyond Class I WLPZ and bank slope is > 55%, no even-aged management permitted.</td><td>Per MRC's Proposed HCP/NCCP (MRC 2012):
• High retention selection only;
• No sanitation or salvage logging;
• One entry in outer band allowed for shelterwood and seed tree removal (if entered, no harvest allowed in inner band).

Re-entry period same as for adjacent stands if AMZ stand meets trigger conditions (>260 ft^2 of basal area).</td><td>No harvest for one site potential tree height (150 ft), except for hardwood conversion.</td><td>No harvest within reserves.

Outside reserves, CFPR (2012) measures apply. No CFPR restrictions, except in watersheds with listed anadromous salmonids (see No Action).</td><td>Same as Proposed Action through year 40.</td></tr>
</table>

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Large woody debris retention in Class I stream buffers				
Per MRC's 2000 Management Plan (MRC 2000a), all LWD in channel and WLPZ would be retained, except for road obstruction or instream enhancement. In watersheds with listed salmonids, 2012 CFPRs require that retained large tree retention standards should be those most conducive to LWD recruitment to the channel.	All LWD retained in AMZs, except for road obstruction or instream enhancement.	Same as Proposed Action.	Same as Proposed Action inside reserves. Outside reserves, CFPR (2012) measures apply. No CFPR restrictions, except in watersheds with listed anadromous salmonids (see No Action).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Exposed soil treatment in Class I stream buffers				
Per MRC's 2000 Management Plan (MRC 2000a): • Areas of exposed soil ≥100 ft^2 within WLPZs would be treated to reduce erosion potential; • Slash pack trails and landings in WLPZ or ELZ following use; • WLPZ roads with significant sediment delivery potential would be mulched, covered with slash, and/or seeded. Per 2012 CFPRs, ≥75% ground surface cover within the WLPZ would be retained. 2012 CFPR measures required in watersheds with listed anadromous salmonids are the same as those specified in MRC's 2000 Management Plan (MRC 2000a), above.	Same as No Action.	Same as Proposed Action.	No harvest within reserves. Outside reserves, CFPR (2012) measures apply: • Areas of exposed soil ≥800 ft^2 would be treated to reduce erosion potential; • Treatment shall be done prior to 15 October, or within 10 days if disturbance occurs after 15 October; • Stabilize exposed soil on approaches to stream crossings; • Banks would be stabilized by measures (e.g., seeding, mulching, replanting) that retain and improve ground cover. In watersheds with listed anadromous salmonids, 2012 CFPR measures are the same as MRC's 2000 Management Plan (MRC 2000a) (see No Action).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Bank stability in Class I stream buffers				
Per MRC's 2000 Management Plan (MRC 2000a), bank stability measures include: • Harvest restrictions on unstable, steep and inner gorge slopes; • Heavy equipment limits in WLPZ; • Canopy retention requirements; • Restrictions on road construction; • Treatment of exposed/disturbed soil; • Rocked water drafting approaches; • Livestock mitigation measures to protect stream banks and riparian areas. 2012 CFPR measures include: • Retain ≥75% ground surface cover within the WLPZ to prevent soil erosion; • Broadcast burning should not consume large organic debris; • Banks would be stabilized by measures (e.g., seeding, mulching, replanting) that retain and improve ground cover. In watersheds with listed salmonids, the 2012 CFPRs include: • Retain all trees in channel zone and channel migration zone; • All operations on inner gorge slopes > 65% must be reviewed by a Professional Geologist; • Soils must be stabilized on any road location that may deliver deleterious amounts of fine sediment to streams.	Measures in MRC's proposed HCP/NCCP (MRC 2012) and TMP apply. Same as 2000 Management Plan (MRC 2000a) and the 2012 CFPRs (see No Action), plus: retain all trees within 10 ft of bankfull channel, except for limited selection of redwood clumps.	No harvest within one site potential tree height (150 ft) of Class I streams.	No harvest within reserves. Management outside reserves per CFPRs (see No Action).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Class II streams				
Distinction between large and small Class II streams				
Per MRC's 2000 Management Plan (MRC 2000a) and the 2012 CFPRs there is no distinction between large and small Class II streams, except in watersheds with listed anadromous salmonids. In watersheds with listed salmonids, the 2012 CFPRs describe Class II-L streams as: • 2nd and 3rd order blue line streams not identified as Class I with a drainage area sufficient to produce mid-summer flow (flows into Class I stream until 15 July); • Summer flow duration, or diagnostic channel characteristics that indicate flow, until 15 July; • Class II streams not meeting the above criteria are considered standard Class II (Class II-S).	Large Class II streams are those with a watershed area ≥100 ac, or perennial flow. Small Class II streams are those with a watershed area <100 ac.	Same as Proposed Action.	No harvest within reserves. Management outside reserves per the 2012 CFPRs (see No Action).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Equipment exclusion zones in Class II stream buffers				
Per MRC's 2000 Management Plan (MRC 2000a), equipment exclusion same as for Class I (i.e., no use of heavy equipment in the WLPZ). In watersheds with listed salmonids, additional 2012 CFPR measures apply. In core zone and inner zone, equipment limited to actions that: • Improve salmonid habitat; • Protect water quality & beneficial uses; Construct, reconstruct, remove, or abandon stream crossings; • Protect public safety; or • Facilitate full suspension cable yarding.	Equipment is generally excluded from AMZs.	Large Class II streams: same as Class I (no harvest buffer equal to one site potential tree height [150 ft]). Small Class II streams: equipment excluded from AMZ.	No harvest within reserves. Management outside reserves per the 2012 CFPRs. Equipment is excluded from channel zone. In watersheds with listed salmonids, additional CFPR (2012) measures apply (see No Action).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Canopy retention in Class II stream buffers				
Per MRC's 2000 Management Plan (MRC 2000a), canopy retention same as Class I. Additional CFPR (2012) measures include: • In Class II-L streams within the coastal anadromy zone, retain ≥80% overstory canopy (at least 25% of which is conifer); • In Class II-L streams outside the coastal anadromy zone, retain ≥70% overstory canopy (at least 25% of which is conifer); • In Class II-S streams, MRC's 2000 Management Plan measures (same as Class I measures) apply.	Large Class II: Same as Class I. Small Class II: 50% overstory canopy retained in AMZ.	Large Class II: no harvest buffer equal to 1 site potential tree height (150 ft). Small Class II: High-retention selection harvest with 85% canopy retention.	No harvest within reserves. Management outside reserves per the 2012 CFPRs (see No Action).	Same as Proposed Action through year 40.
Silviculture and basal area retention in Class II stream buffers				
Per MRC's 2000 Management Plan (MRC 2000a) and 2012 CFPR in watersheds with anadromous salmonids, Class II silviculture and basal area retention same as for Class I streams (see above). Per the 2012 CFPRs, retain at least two living conifers per acre at least 16 in diameter at breast height and 50 ft tall within 50 ft of all Class II watercourses.	Per MRC's proposed HCP/NCCP (MRC 2012) and TMP: • Large Class II—silviculture and basal area retention same as for Class I streams; • Small Class II—similar to Class I standards, but no basal area retention standards and high retention selection not required.	Large Class II: no harvest buffer equal to 1 site potential tree height (150 ft). Small Class II: retain 200–300 ft^2 basal area per acre or 75% of pre-harvest conifer basal area, whichever is larger, based on site class of AMZ.	No harvest within reserves. Outside reserves, CFPR (2012) measures apply (see No Action).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Large woody debris, bare soil and bank stability in Class II stream buffers				
Per MRC's 2000 Management Plan (MRC 2000a) and 2012 CFPR within anadromous watersheds, LWD, bare soil, and bank stability standards same as for Class I streams (see above).	LWD, bare soil, and bank stability standards same as for Class I streams.	Large Class II: no ground disturbance within 1 site potential tree height (150 ft) (so all LWD retained and no bank stability issue). Small Class II: treat all areas of exposed soils 100 ft^2 or greater. Retain all LWD except for road obstruction or instream enhancement. 25-ft no cut for bank stability.	No harvest within reserves. Outside reserves, CFPR (2012) measures apply.	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Class III streams				
Equipment limitation in Class III stream buffers				
Per MRC's 2000 Management Plan (MRC 2000a), equipment is excluded from the ELZ of Class III streams, with exception of existing trails with no sign of instability. CFPR (2012) measures include: In watersheds without listed anadromous salmonids: • No ELZ required where erosion hazard rating is low and bank slope is <30%; • 25–50 ft ELZ depending on bank slope; • No use of heavy equipment for falling, yarding, or site preparation; • No road or landing construction in Class III watercourses, with some exceptions (e.g., existing approved crossings, dry conditions, 1600 permits). In watersheds with listed anadromous salmonids: • 30–50 ft ELZ depending on bank slope; • No new construction of tractor roads in ELZ; • No ground-based equipment on slopes > 50%; • Ground-based operations in ELZ limited to methods that do not cause sediment delivery to stream.	AMZ is an ELZ, as defined above.	EEZ width is 25'-50', depending on bank slope.	Generally no harvest within reserves (see limited exceptions described above). Outside reserves, CFPR (2012) measures apply (see No Action).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	**Proposed Action (HCP/NCCP)**	**Alternative A (Enhanced HCP/NCCP)**	**Alternative B (Terrestrial reserves)**	**Alternative C (HCP only, fewer covered species, shorter incidental take permit term)**
Tree canopy retention in Class III stream buffers				
Canopy retention in Class III stream buffers is not specified in MRC's 2000 Management Plan (MRC 2000a). CFPR (2012) measures apply: • No overstory retention required; • 50% retention of understory is required.	In addition to CFPR (2012) measures, MRC would retain 50% of the overstory canopy in AMZs.	Same as Proposed Action.	No harvest within reserves. Outside reserves, CFPR (2012) measures apply (see No Action).	Same as Proposed Action through year 40.
Silviculture in Class III stream buffers				
Management in Class III stream buffers per MRC's 2000 Management Plan (MRC 2000a) and the 2012 CFPRs. Per MRC's 2000 Management Plan (MRC 2000a), no sanitation or salvage logging permitted in ELZs. 2012 CFPRs in watersheds with listed anadromous salmonids specify that all hardwoods and snags in the channel zone and ELZ would be retained. Must retain adequate countable trees needed to achieve resource conservation standards in 2012 CFPRs.	Regeneration harvest may be used in hardwood-dominated stands for the first 25 years of the proposed HCP/NCCP; partial harvest in stands that are not hardwood dominated. Can use restoration harvest in 5% of watersheds per year.	No reduction in proportion of conifer basal area.	No harvest within reserves. Outside reserves, CFPR (2012) measures apply (see No Action).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Large woody debris, bank stability and bare soil in Class III stream buffers				
LWD, bank stability, and bare soil measures are not specified in MRC's 2000 Management Plan (MRC 2000a). CFPR (2012) measures that apply include: In watersheds without listed salmonids: • Retain ≥75% ground surface cover within the ELZ to prevent soil erosion; • Remove soil deposited in Class III watercourses before concluding operations or before 15 October; • Stabilize exposed soil on approaches to crossings in Class III ELZ. In watersheds with listed anadromous salmonids, additional measures include: • Retain all trees in ELZ and channel zone that stabilize stream bed or banks; • Retain all pre-existing LWD within the channel zone; • Retain all pre-existing LWD on the ground within the ELZ that is stabilizing sediment; • Stabilize bare soil >100 ft^2; • No ignition of burning in ELZ.	LWD, bare soil, and bank stability standards same as for Class I streams.	Same as Proposed Action.	No harvest within reserves. Outside reserves, CFPR (2012) measures apply (see No Action).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Wetlands and other aquatic habitats				
Wetlands and wet meadows				
Management of wetlands, wet meadows, and other wet areas is not specified in MRC's 2000 Management Plan (MRC 2000a). CFPR (2012) Class II measures apply if Class II aquatic habitat is present (see above): • Retain and protect non-commercial vegetation in meadows and wet areas; • Protect soil in meadows and wet areas to the maximum extent possible.	25–50 ft EEZ buffer around wetlands, wet meadows, and wet areas depending on whether surface area is less than or greater than 50 ft^2. Buffer becomes ELZ following consultation with MRC biologist. Buffer remains EEZ if covered species are using the area. Within buffer: • only partial harvest allowed; • no sanitation or salvage; • retain downed LWD; • basal area retention of 50 ft^2 or 50% of the pre-harvest basal area, whichever is greater.	50-ft EEZ buffer around wetlands/wet meadows and wet areas. Within buffer: • Only partial harvest allowed; • no sanitation or salvage; • retain downed LWD.	No management in reserves. Outside reserves, CFPR (2012) measures apply (see No Action).	Same as Proposed Action through year 40.
Seeps and springs				
Management of seeps and springs is not specified in MRC's 2000 Management Plan (MRC 2000a). CFPR (2012) measures apply; same as for wetlands and wet meadows, above.	Protected if within Class I & II AMZs according to measures above. For those not within Class I or II AMZ: • minimum 50-ft EEZ buffer; • only partial harvest allowed within buffer; • no sanitation or salvage; • retain downed LWD; • 50% canopy retention.	Same as Proposed Action.	No management in reserves. Outside reserves, CFPR (2012) measures apply (same as wetlands and wet meadows, above).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Stream Habitat Improvement				
Per MRC's 2000 Management Plan (MRC 2000a), stream habitat improvement would occur opportunistically, on a THP-basis. Foresters, with guidance from biologists, would look for ways to add more LWD to stream channels. No targeted restoration or stream habitat improvement projects would be conducted.	Ongoing and planned stream habitat improvement projects would continue, as described in MRC's proposed HCP/NCCP (MRC 2012). HCP/NCCP measures include LWD placement in Class I watercourses, with an initial focus on coho "core" watersheds. In addition, limited riparian restoration treatments in Class I and II AMZs to accelerate development of late-successional conifer-dominated riparian areas.	Same as Proposed Action.	Stream habitat improvement, restoration, and monitoring permitted in reserves if approved by agencies. However, the reserves would emphasize habitat for terrestrial species, thus stream habitat improvement would not be a priority. Outside reserves, no stream habitat improvement would occur.	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
TERRESTRIAL HABITAT				
Wildlife trees				
Snag and wildlife tree retention and recruitment				
Per MRC's 2000 Management Plan (MRC 2000a): • Retain all snags and active raptor nest trees in every THP, unless there is a safety risk or excessive fuel loading hazard; potentially retain trees with characteristics attractive to raptor nesting; • In WLPZ and other wildlife emphasis areas, recruit at least 2–3 snags/acre averaged over 40 ac; in general forested areas, recruit at least 1–2 snags/acre (snag defined as ≥16 in diameter at breast height and 10 ft long); • If snag density is deficient (per above), recruit live cull trees or green trees to meet targets. Per the 2012 CFPRs: • Retain all snags except for approved exceptions. Snags may also be cut when merchantable and included in a THP; • Establish buffer zones around trees with an active nest of a listed/sensitive bird species (size specified in CFPRs); • Observe seasonal restrictions in buffers, as specified for individual bird species. Also see applicable measures described for old growth and hardwoods, below.	Per MRC's proposed HCP/NCCP: • Retain all snags and wildlife trees (HCP/NCCP); • Objectives are 4 snags, wildlife trees, or recruitment trees/ac in AMZ and 3 snags, wildlife trees, or recruitment trees trees/ac on remainder of landscape; • Manage wildlife trees so that they a) are distributed across the forest (riparian and upslope areas; grouped and individuals); and b) exist in sufficient quantity and quality across the forest. Per the 2012 CFPRs: • Establish buffer zones around trees with an active nest of a listed/sensitive bird species (size specified in CFPRs); • Observe seasonal restrictions in buffers, as specified for individual bird species.	Similar to Proposed Action, with additional measures: • Avoid cutting wildlife trees. If wildlife trees must be cut, recruit replacements of ≥ diameter at breast height if possible; • Retain and recruit trees as wildlife trees from largest 5% of stand diameter distribution; • Increase objectives for number of wildlife trees/ac by one (e.g., from 2/ac to 3/ac), in each tree class; • Wildlife trees count only when ranked as 'hard snags,' and are greater than 24 in for white woods, 32 in for redwoods, 18 in for hardwoods, and greater than half of the site-potential tree height on the site.	No harvest within reserves. Outside reserves, CFPR (2012) measures apply (See No Action).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Downed large woody debris				
Retention strategies				
Per MRC's 2000 Management Plan (MRC 2000a): • Retain all LWD in WLPZ (except for road obstruction or riparian & stream restoration); • In THP areas, retain unmerchantable logs remaining after timber operations. Per the 2012 CFPRs: • In watersheds with listed salmonids, retain and protect downed LWD in the WLPZ that currently or may in the future provide LWD recruitment.	Retain all downed LWD in AMZs, wetlands, & seeps/springs, except for road obstruction or instream enhancement. In THP areas, retain unmerchantable logs remaining after timber operations; retain all hollow logs and hollow standing trees for future recruitment. Redistribute culls from landings to forest floor.	Same as Proposed Action.	No harvest within reserves. Outside reserves, CFPR (2012) measures apply.	Same as Proposed Action through year 40.
Target densities				
Per MRC's 2000 Management Plan (MRC 2000a): • In WLPZ, recruit at least 7 downed logs/acre (≥16 in diameter at breast height and 10 ft long), averaged over 40 ac; • In general forested areas, recruit and retain at least 5 downed logs/acre (per WLPZ specifications).	In AMZs and other special emphasis areas: retain 6 *hard* logs per acre (≥ 16 in diameter at breast height x 6 ft long), averaged over each silvicultural unit. In other areas: retain 5 *hard* logs per acre (≥ 16 in diameter at breast height x 6 ft long), averaged over each silvicultural unit.	Same as Proposed Action, plus: Logs only count when greater than 2/3 the diameter and length of site-potential trees.	No harvest within reserves. Outside reserves, no CFPR measures apply (2012 CFPRs do not contain density targets).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Old growth				
Type I old-growth stands				
Per MRC's 2000 Management Plan (MRC 2000a): • Old growth definition does not distinguish between old-growth types; • Old-growth trees defined as those > 250 years old and ≥48 in diameter at breast height; • Do not harvest: un-entered old-growth stands > 20 ac; stands ≥5 ac with an average of ≥6 old-growth trees/acre; and individual residual old-growth trees with significant wildlife value (e.g., large limbs, cavities, nesting platforms).	Type I old growth: • Defined as an un-harvested stand with at least three contiguous acres of old growth (FSC-US 2010); • No harvest in Type I old growth; • Protect a 150 ft buffer that retains ≥75% of the conifer basal area within Type I old growth; • Pursue conservation easements to permanently protect old-growth stands.	300-ft no-cut buffer around Type I stands. 1,000-ft seasonal activity restriction around Type I stands.	No harvest within reserves. Outside reserves, CFPR (2012) measures apply. Old-growth stands are subject to harvest using clearcut or other silvicultural methods.	Same as Proposed Action through year 40.
Type II old-growth stands				
MRC's 2000 Management Plan (MRC 2000a) does not distinguish between old-growth types. General restrictions on old-growth harvest apply (see Type I measures, above).	Type II old growth: • Defined as a previously harvested stand of at least three contiguous acres with ≥ 6 old-growth trees/ac; • Retain current acreage of Type II stands; • Harvest in Type II stands using single-tree selection only to maintain and increase mean stand diameter at breast height; • Maintain screen trees for old-growth trees; • Preserve all individual old-growth trees.	No harvest within Type II stands. 300-ft silviculture-limited zone around stands. 1,000-ft seasonal activity restriction.	No harvest in reserves. Outside reserves, CFPR (2012) measures apply. Old-growth stands are subject to harvest using clearcut or other silvicultural methods.	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Residual old-growth trees				
MRC's 2000 Management Plan (MRC 2000a) does not distinguish between old-growth types. General restrictions on old-growth harvest apply (see Type I measures, above).	An individual old-growth tree is defined as: • ≥ 48 in diameter at breast height if coastal redwood, or ≥ 36 in diameter at breast height if Douglas-fir, and > 200 years old; or • Any tree > 200 years old and with a preponderance of old-growth characteristics regardless of diameter at breast height; or • Any tree > 200 years old that cannot be replaced in size or ecological function within 80–130 years, regardless of diameter at breast height or presence of old-growth characteristics. Protect the remaining old-growth trees and forest on MRC land, except as necessary for road construction or safety. Retain all screen trees around individual old-growth trees.	Same as Proposed Action, with additional measures, below. Retain largest tree/ac and sheltering trees to recruit into 'old-growth' character over the life of the plan (where the largest tree/acre is not residual and would otherwise be removed).	No harvest within reserves. Outside reserves, CFPR (2012) measures apply. Residual old-growth trees are subject to harvest using clearcut or other silvicultural methods.	Same as Proposed Action through year 40.
Hardwoods				
True oaks (Quercus spp.) and madrone retention				
Per MRC's 2000 Management Plan (MRC 2000a): • Retain all true oaks > 18 in diameter at breast height, with exception of those requiring removal for safety, roads, or yarding corridors; • Overall goal is to restore natural hardwood-conifer balance across the landscape.	Per MRC's proposed HCP/NCCP (MRC 2012) and TMP: • Maintain all true oak stands; • Retain all true oak and madrone trees >18 in diameter at breast height, except as necessary for safety, road right-of-way, or yarding corridors.	Retain all true oak and madrone trees >16 in diameter at breast height, except as necessary for safety, road right-of-way, or yarding corridors.	No harvest within reserves. Outside reserves, no CFPR (2012) requirements. True oaks and madrones may be cleared to improve growing conditions for conifers.	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Hardwood retention in uplands				
MRC's 2000 Management Plan (MRC 2000a) measures apply across the landscape: • Retain 15% of the total post-harvest basal area in hardwoods (if hardwoods comprised at least 15% basal area prior to harvest); • Review all THPs to identify & retain hardwood trees that enhance wildlife habitat; • Overall goal is to restore natural hardwood-conifer balance across the landscape.	Three types of hardwood stands and management strategies under MRC's proposed HCP/NCCP and TMP: • Class I stands are dominated by native hardwoods (tanoak, madrone, true oak, etc.) and have never been managed for conifer timber production. No harvest; • Class II stands are dominated by native hardwoods and may have had some conifer harvest, although their suitability for conifer restoration is unknown. Okay to harvest if stand is re-classified as Class III following on-the-ground assessment; • Class III stands are dominated by native hardwoods only because of past management and are clearly suitable for conifer restoration. Okay to harvest and restore to conifer dominance. Per MRC's proposed HCP/NCCP and TMP: • Retain ≥15 ft2 of hardwood trees >6 in diameter at breast height, provided they made up at least that amount pre-harvest; • Retain all hardwoods >6 in diameter at breast height when <15 ft2 basal area of hardwoods per acre is present before harvest; • Retain all hardwoods ≥24 in diameter at breast height if they comprise less than 20% of the hardwoods pre-harvest; • Retain clusters of mast-producing hardwoods; • Maintain hardwood clumps in rehabilitation stands; • Retain hardwoods, when possible, in clumps that include a variety of size classes and that surround large individual trees or those with significant wildlife value; • Retain aggregate hardwood areas within variable retention units; • Maintain 1,487 acres as representative sample areas for early-successional hardwood stands.	Same as Proposed Action. Where hardwood or hardwood-conifer stands make up <15% of a planning watershed, retain these stands as hardwood dominated stands.	No harvest within reserves. Outside reserves, no CFPR (2012) requirements. Hardwoods may be cleared to improve growing conditions for conifers.	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Hardwood retention in riparian areas				
MRC's 2000 Management Plan (MRC 2000a) does not include specific riparian retention measures for hardwoods. General measures apply across the landscape (see *Hardwood retention in uplands*, above). In watersheds with listed anadromous salmonids, CFPR (2012) measures apply: • Retain hardwoods sufficient to provide a deciduous vegetation component to the riparian zone for aquatic nutrient inputs; • Retain hardwoods in the WLPZ inner zones A & B of floodprone (unconfined) streams if they provide or may contribute to salmonid habitat; • Retain hardwoods in the ELZ of Class III streams, where feasible. In watersheds with coho salmon and where harvest adjacent to Class III streams is even-aged: • Retain ≥15 ft2 basal area per acre of hardwoods in ELZ where it exists prior to harvest, including the largest hardwood trees; • Retain all hardwoods when <15 ft2 basal area per acre is present before harvest.	Per MRC's proposed HCP/NCCP (MRC 2012) and TMP: • Retain hardwoods in riparian stands (AMZs) except for riparian or in-stream habitat enhancement, to establish cable corridors, or to create safer working conditions; • Retain the boles of felled hardwoods to provide in-stream and terrestrial woody debris.	Same as Proposed Action.	No harvest within reserves. Outside reserves, CFPR (2012) measures apply (see No Action). In watersheds without listed anadromous salmonids, hardwoods may be cleared to improve growing conditions for conifers.	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Unique habitats				
Closed-cone pine forest				
Management of closed-cone pine forest is not specified in MRC's 2000 Management Plan (MRC 2000a). There are no specific CFPR (2012) requirements. CEQA compliance required for rare plants and communities in any THP.	Per MRC's proposed HCP/NCCP (MRC 2012) and TMP: • No harvest in pygmy forest or Bishop pine forest; • Timber operations limited to existing infrastructure (i.e., roads); • Where new roads are necessary, no more than 5% of the total MRC pygmy ownership can be disturbed over the 80-year term of the plan; • Decommission, close, and revegetate historical roads in closed-cone pine forest whenever possible; • Reintroduce and manage ecological processes or surrogates after obtaining approval of the wildlife agencies.	Same as Proposed Action, plus: • No new road construction; • Decommission and revegetate unused roads (except mainline roads).	No harvest within reserves. Outside reserves, no CFPR (2012) requirements.	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Oak woodlands				
MRC's 2000 Management Plan (MRC 2000) measures apply across the landscape (see *True oaks and madrone retention*, above).	Per MRC's proposed HCP/NCCP (MRC 2012) and TMP: • No Harvest in oak woodlands except to remove invading conifers; • Timber operations limited to existing infrastructure (i.e., roads); • New road construction requires rare plant survey; • Decommission, close, and revegetate historical roads in oak woodlands whenever possible; • Reintroduce and manage ecological processes or surrogates after obtaining approval of the wildlife agencies.	Same as Proposed Action, plus implement ecological burn programs under adaptive management oversight, especially where Douglas-fir appears to be encroaching on annual grasslands, oak woodlands, or oak savannahs.	No harvest within reserves. Outside reserves, no CFPR (2012) requirements. May consider option to convert to agriculture and/or housing or cut for fuelwood.	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Rocky outcrops and other unique habitats				
Management of rocky outcrops and other unique habitats is not specified in MRC's 2000 Management Plan (MRC 2000). CFPR (2012) measures include restrictions for sensitive species that may use rocky outcrops and other unique habitats. Peregrine falcon measures include buffers around active nests and restrictions on timing of timber harvest. Similar protection measures for golden eagles and other bird species that may nest in rocky outcrops.	Rocky outcrops defined as: • At least 1 ac in size with ground cover entirely of rock; or • Near-vertical rock faces 50 ft or more high and 100 or more ft long that not have been affected by man. Conservation measures: • Preserve and maintain 3 rocky outcrops comprising 63 ac across 3 planning watersheds; • Survey for peregrine falcons when timber operations are proposed within 0.5 mi of rocky outcrop or within 1 mi for helicopter yarding; • Consult with the wildlife agencies prior to operations within 0.25 mi of a peregrine falcon nest.	Same as Proposed Action, plus: • 20-ac buffer; • Seasonal closure if needed from 1 January to 15 August.	No harvest within reserves. Outside reserves, the 2012 CFPRs include nest protection measures for peregrine falcons and other bird species that use rocky outcrops (see No Action).	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
HABITAT CONNECTIVITY				
Measures for habitat connectivity are not specified in MRC's 2000 Management Plan (MRC 2000a). No specific CFPR (2012) measures. However, the 2012 CFPRs include general objectives relating to habitat connectivity, including retention/recruitment of late and diverse successional stage habitat components for wildlife concentrated in WLPZs and as appropriate to provide for functional connectivity between habitats.	MRC would continue using its landscape planning approach and measures from its proposed HCP/NCCP (MRC 2012) and TMP during the harvest planning process to address habitat connectivity needs within and across watersheds, with further refinement as species-specific measures are developed.	Same as Proposed Action.	Inside reserves, no harvest is allowed. Habitat connectivity would be maintained and improved through forest succession. Reserves designed to incorporate important wildlife movement routes between drainages and connect with late-successional-like silviculture that promotes larger trees and decadence such as riparian silviculture. Selected WLPZs are extended through Class III streams to those in adjacent drainages. Outside reserves, all even-aged management areas would have specific connectivity measures (e.g., LWD, canopy, and basal area retention) focusing on probable wildlife movement routes.	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	**Proposed Action (HCP/NCCP)**	**Alternative A (Enhanced HCP/NCCP)**	**Alternative B (Terrestrial reserves)**	**Alternative C (HCP only, fewer covered species, shorter incidental take permit term)**
SPECIES-SPECIFIC HABITAT MANAGEMENT				
Anadromous salmonids (coho salmon, Chinook salmon, and steelhead)				
Habitat-based measures, as described above for mass wasting and sediment management; road and landing construction, reconstruction, and maintenance; riparian buffers; and other measures implemented according to the 2012 CFPRs and MRC's 2000 Management Plan would provide limited benefits to anadromous salmonids. Stream habitat improvement would occur opportunistically, on a THP-basis. No targeted restoration or stream habitat improvement projects would be conducted.	In addition to measures described for the No Action alternative, MRC would implement additional HCP/NCCP and TMP measures to minimize sediment delivery to streams and retain and enhance riparian function. A system-wide road plan would be implemented. Stream habitat improvement projects would include LWD placement in Class I watercourses with an initial focus on coho "core" watersheds, and limited riparian restoration treatments in Class I and II AMZs to accelerate development of late-successional conifer-dominated riparian areas.	Similar to Proposed Action, with additional restrictions on harvest in steep streamside areas, accelerated road plan implementation, additional mass wasting and sediment management measures, and no-cut riparian buffers (equal in width to the height of one site-potential tree) along Class I and Large Class II streams.	Outside reserves, same as No Action, except no stream habitat improvement activities. Inside reserves, stream habitat improvement, restoration, and monitoring permitted in reserves if approved by agencies.	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Northern spotted owl				
Manage to comply with no-take standards in the CFPRs and MRC's Spotted Owl Resource Plan (SORP) (which includes measures that exceed the requirements of the CFPRs), with assistance from CAL FIRE for take avoidance determinations. In the case where a nest site or activity center has been located within 1.3 mi of a THP boundary, CFPR (2012) measures include: • No timber operations w/in 500 ft of an active nest site or activity center; • Maintain sufficient functional characteristics to support roosting w/in 500–1,000 ft of active nest site or activity center; • ≥500 ac of Nesting/ Roosting/ Foraging habitat (N/R/F); • 1,336 total acres of owl habitat provided w/in 1.3 mi of each nest site or pair activity center. Restrict noise disturbance within ¼ mi of any activity center during the breeding season (1 February–31 July). No control measures for barred owls.	No USFWS or CALFIRE technical assistance required. High protection sites: • ≥ 80-ac no-harvest core area with preference for including N/R, w/ min distance of 1,000 ft from initial activity center; • Retain suitable N/R/F habitat within the extended protection area (i.e., 267 ft beyond the periphery of the core area); • ≥500 ac of N/R/F within 0.7 mi of activity center. Moderate protection sites: • ≥18-ac no-harvest core area with preference for including N/R, w/ min distance of 500 ft from initial activity center; • Retain suitable N/R/F habitat within the extended protection area (i.e., 500 ft beyond the periphery of the core area); • ≥500 ac of N/R/F within 0.7 mi of activity center. Limited protection sites: • Retain 4 screen trees around nest tree. Overall landscape-scale objective is to maintain 50% of all covered lands with an average >11 in diameter at breast height and 40% canopy closure. Over the term of the plan N/R habitat would increase from 21% of potential habitat at the beginning of the term to 25% by the end. Control measures for barred owls would include non-lethal (if possible) or lethal methods.	No USFWS or CALFIRE technical assistance required. High protection sites: • ≥100-ac no-harvest N/R core area; • ≥500 ac of N/R/F within 0.7 mi. Moderate protection sites: • ≥25-ac no-harvest N/R core area; • maintain N/R within 1,000 ft; • ≥500 ac of N/R/F within 0.7 mi. Limited protection sites: • ≥5-ac N/R core area. Overall landscape-scale objective is to maintain 60% of all covered lands with an average >11 in diameter at breast height and >50% canopy closure. Control measures for barred owls would be same as Proposed Action.	Fifteen northern spotted owl reserves, totaling approximately 40,341 ac, are included in the reserve system. No harvest is permitted within the reserves. Outside reserves, measures for northern spotted owls would be the same as for Limited protection sites under the Proposed Action. No control measures for barred owls.	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Marbled murrelet				
Lower Alder Creek Management Area (LACMA)				
No LACMA or other marbled murrelet reserves established. Manage land in Lower Alder Creek to comply with no-take standards, with CDFG technical assistance. CFPR (2012) measures include: • "If CDFG determines jeopardy or a take will occur as a result of operations proposed in the THP, the Director shall disapprove the THP unless the THP is accompanied by authorization by a wildlife agency acting within its authority under state or federal endangered species acts." No-take standards applied by agencies: • no harvest core and 300-ft buffer around occupied habitat; • breeding season disturbance buffer, width from core based on noise levels. No control measures for corvids.	Estimated size of the LACMA is 1,237 ac. Core Areas: • No forest management operations or public entry. Habitat Areas: • Timber management with agency technical assistance only to enhance marbled murrelet habitat; • Breeding season: timber operations only if murrelets are not occupying any area within 0.25 mi of proposed project and operations are: (1) at least 0.25 mi beyond a core area periphery; (2) at least 100 ft away from potential habitat trees; and (3) occur w/ in 2 hours after sunrise to 2 hours before sunset. Restrictions to helicopter ops, blasting, and vehicular traffic; • Non-breeding season: timber operations only if murrelets are not occupying any area within 300 ft of a proposed project and operations are: (1) at least 300 ft beyond a core area periphery; (2) at least 100 ft away from potential habitat trees; and (3) occur within 2 hours after sunrise to 2 hours before sunset, with exceptions. Restrictions to helicopter ops, blasting, and vehicular traffic. Buffer Areas: • Timber harvest with agency technical assistance only to provide buffering and protection for core and habitat areas; • Breeding season: same as for habitat areas; • Non-breeding season: same as for habitat areas. Control measures for corvids would include non-lethal (if possible) or lethal methods.	Estimated size of the LACMA is 1,237 ac. Core Areas: • Same as Proposed Action. Habitat Areas: • Timber management with agency technical assistance only to protect and improve marbled murrelet habitat; • 75-ft no-harvest buffer around potential nest trees. Buffer Areas: • Timber harvest allowed only with agency technical assistance to protect or enhance marbled murrelet habitat. Control measures for corvids would be same as Proposed Action.	Marbled murrelet reserves totaling 6,039 ac are included in reserve system. No harvest is permitted within the reserves, which includes what is defined as the LACMA under the Proposed Action. No control measures for corvids.	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Other conservation measures in designated stands outside LACMA				
None.	Provide opportunities for the wildlife agencies to analyze and purchase MRC-designated potential murrelet recruitment habitat in 22 stands in six areas. Across the primary assessment area: • Retain all primary murrelet trees and screen trees; • Permit harvest of secondary murrelet trees if a ground survey determines that it is unlikely murrelets are occupying the surrounding area.	Same as Proposed Action.	Other than the marbled murrelet reserves totaling 6,039 ac that are included in the reserve system, no additional stands designated for murrelet conservation. No harvest is permitted within the reserves. Outside reserves: • Same as Proposed, except no analyzing or purchase of potential murrelet recruitment habitat.	Same as Proposed Action through year 40.
Other conservation measures outside LACMA				
Same as LACMA measures (above).	No agency technical assistance required. Explicit restrictions on activities during breeding and non-breeding seasons within occupied sites as well as sites identified as high, moderate, and limited protection areas. Includes limits to approaches, and restrictions on prescribed burning, fire control lines, helicopters, blasting, maintenance, and hauling. Constrain operations at prescribed distances from habitat trees if habitat trees are not surveyed for occupancy.	No agency technical assistance required. Increased no-cut buffers and limited harvest buffers compared with Proposed Action.	Other than the marbled murrelet reserves totaling 6,039 ac that are included in the reserve system, no additional stands designated for murrelet conservation. No harvest is permitted within the reserves. Outside reserves: • Same as Proposed.	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Point Arena mountain beaver				
Manage to comply with no-take standards, with USFWS technical assistance. • Minimum 100-ft no-harvest around burrow areas; • Up to 400-ft no-cut around burrows if contiguous habitat extends that far from burrow.	No agency technical assistance required. • 200-ft no-harvest around active burrows or suitable Point Arena mountain beaver habitat; • No salvage operations within 100 ft of known burrow systems; • Restrictions to road construction, foot traffic, tree felling, rodent control, and blasting; • Specific restrictions to ground disturbance during breeding and non-breeding seasons; • Create habitat (as part of adaptive management efforts).	No agency technical assistance required. • 150-ft no harvest buffer around burrow areas.	Point Arena mountain beaver habitat is included in the reserve system. No harvest is permitted within the reserves. The 2012 CFPRs do not include measures specific to Point Arena mountain beaver. Point Arena mountain beaver are not known to occur outside reserves in the primary assessment area. If encountered outside the reserves, management would be same as No Action.	Same as Proposed Action through year 40.
California red-legged frogs				
Measures for California red-legged frog are not specified in MRC's 2000 Management Plan (MRC 2000a) or in the 2012 CFPRs.	Conservation measures include: • Vegetation maintenance standards for documented breeding sites; • A 25- to 50-ft ELZ or EEZ around wetlands, wet areas, wet meadows, seeps, and springs, excluding existing roads; • A 50-ft EEZ or ELZ around all potential and documented breeding sites, excluding existing roads. Limit water drafting at documented breeding sites.	Same as Proposed Action.	No harvest is permitted within the reserves. Outside of the reserves, same as No Action alternative	Same as Proposed Action through year 40.

No Action (No HCP/No NCCP/No permits)	Proposed Action (HCP/NCCP)	Alternative A (Enhanced HCP/NCCP)	Alternative B (Terrestrial reserves)	Alternative C (HCP only, fewer covered species, shorter incidental take permit term)
Plants				
Rare plant policies in the 2012 CFPRs and MRC's 2000 Management Plan (MRC 2000a) apply.	Conservation elements include: Community- and category-based conservation measures, rare plant surveys, species-specific protection measures; monitoring and adaptive management.	Same as Proposed Action.	Outside reserves, CFPR (2012) measures apply.	Same as Proposed Action through year 40, but for state-listed species only.
Monitoring and adaptive management				
No formalized adaptive management plan. Monitoring may include California red-legged frog capture and handling and northern spotted owl banding (would require a separate recovery permit issued under Section 10(a)(1)(A) of the federal ESA). Monitoring may also include marbled murrelet surveys (no capture).	MRC would implement an adaptive management plan. Monitoring would include the capture, handling and limited relocation of covered salmonid and amphibian species; and the capture, handling, and banding of northern spotted owls. Monitoring would also include marbled murrelet surveys (no capture).	Same as Proposed Action.	No formalized adaptive management plan. Monitoring may include northern spotted owl banding and marbled murrelet surveys. The agencies and MRC would develop research and monitoring guidelines for northern spotted owl and marbled murrelet inside and outside of the reserves.	Same as Proposed Action through year 40.

ACRONYMS:

AMZ = Aquatic Management Zone
CEQA = California Environmental Quality Act
CFPR(s) = California Forest Practice Rule(s)
EEZ = equipment exclusion zone
EIS = Environmental Impact Statement
ELZ = equipment limitation zone
HCP = Habitat Conservation Plan
LACMA = Lower Alder Creek Management Area
LWD = large woody debris
MRC = Mendocino Redwood Forest
NCCP = Natural Community Conservation Plan
N/R/F = Nesting/ Roosting/ Foraging
PTEIR = Program Timberland Environmental Impact Report
THP = Timber Harvesting Plan
TMP = Timber Management Plan
WLPZ = watercourse and lake protection zone

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Appendix E

Timber Model Description

1 Model Description

The simulation model used to estimate growth and yield in the primary assessment area is the Cooperative Redwood Yield Project Timber Output Simulator[1] (CRYPTOS). CRYPTOS is an interactive computer program, designed to simulate growth and yield of redwood and Douglas-fir forest stands found in the north coastal region of California.

For each tree in a list of tree species, CRYPTOS "grows" and estimates forest mortality, crown canopy, and competition, as well as the site conditions in each stand. Growth estimates of the forest include assumptions on regeneration of new trees after harvest. Harvest is simulated in the model. This allows the application of myriad silvicultural applications to be tested against a unique set of vegetation, site class, and sensitivity levels in each stand. The use of a simulation model has enabled MRC to compare multiple scenarios with different management strategies and identify the best scenario to meet their objectives. The simulation model provides a prediction of periodic inventory, harvest, growth, and habitat levels over time.

CRYPTOS projects the tree lists derived from inventory sampling through time (forest growth) and management activities (harvest) over a long period of time (100 years in this case). For the EIS/PTEIR, CRYPTOS equations for height and diameter growth, crown recession, and mortality were used. CRYPTOS estimates growth for 5-year timeframes. The model is set to 'harvest' stands (if they are scheduled for harvest) before they are grown. This is a more conservative approach to estimating harvest volumes than growing the stands before they are harvested, since the harvest estimate doesn't consider the real growth that occurs in the forest for years 2 through 5 in any 5-year planning period. Projected inventory, harvest estimates, and growth estimates are reported every 5 years.

For the EIS/PTEIR, five management alternatives were modeled:

1. No Action alternative (No HCP/NCCP and No Permits)
2. Proposed Action (HCP/NCCP)
3. Alternative A (Enhanced HCP/NCCP)
4. Alternative B (Reserves)
5. Alternative C (HCP Only and Shorter Permit Term [40 yrs])

Tables E-1 through E-8 display the modeling logic used to determine silviculture regimes under each alternative (silviculture methods are described below in Sections 1.1–1.21 of this appendix). A stand must be scheduled for harvest for the silviculture logic to be considered. Possible silviculture regimes for any particular stand are based on the stand's specific sensitivity constraints, if any. Constrained stands have usually only one possible regime available. Non-constrained stands are assigned a silviculture regime based on a decision hierarchy. The stand continues through the set of regimes if the stand does not trigger the first regime in the decision

[1] Originally released in 1982, CRYPTOS was developed by the Redwood Yield Cooperative, a cooperative of redwood landowners at the University of California, Berkeley. Authors of the program's user guide are Lee C. Wensel, Professor; Bruce Krumland, associate specialist; and Walter J. Meerschaert, postgraduate researcher (Department of Forestry and Resource Management, University of California, Berkeley). Most large landowners in the redwood region use or have used CRYPTOS to help manage their timberlands. Many companies, including MRC's sister company Humboldt Redwood Company, now use FORSEE (4C, or Forest Ecosystems in a Changing Environment), which is the latest version of CRYPTOS.

hierarchy. If the stand's conditions do not meet any of the trigger conditions it receives a 'No Harvest' and is reviewed at the next entry cycle.

Under each alternative, stands were coded with a concern code (a 6 digit number) which guides the silviculture regime for each stand. Linked within the 50+ databases which house the stands and tree lists, there are lookup tables for concern codes and retention levels for each alternative. As CRYPTOS assesses each stand, it computes the current basal area and harvests according to each stand's concern code and silviculture retention levels. If a stand has less basal area than the harvest trigger, then it receives a "No Harvest" and the model moves on to the next stand. Harvest retention levels were varied to suit each alternative. For example, retention levels for selection silviculture under the "No Action" alternative are set at 90 ft^2 of basal area, and retention levels for selection silviculture under the "Proposed" alternative are set at 75 ft^2 of basal area. Watercourse buffer widths also varied from one alternative to the other. To compensate for static polygons, the retention levels were altered to simulate reduced or expanded buffer widths. The silviculture triggers and volume calculations take place within the growth model, whereas the differences allocated to each stand, as per the particular alternative, are adjusted in the numerous databases which are used by the growth model.

The retention displayed in the tables below shows the desired distribution of basal area by diameter classes. Few stands will initially be at the desired distribution of diameter classes. In such cases, the model will retain the sum of the specified retention and distribute the retention to those size classes that meet or exceed the specified retention level. The model will not harvest below the desired condition by size class. The following tables display the silviculture triggers and retention used in CRYPTOS for non-constrained (no specific sensitivity) and constrained stands.

Table E-1. Silviculture regimes and CRYPTOS model logic for non-constrained stands under the No Action alternative.

Silviculture descriptions and model decision logic								
Silviculture	**Triggers and retention**	**Conifer basal area by diameter class**				**Total conifer trigger/BA retained**	**Hardwood BA trigger/retention**	**Descriptions**
		0–16 in	**16–24 in**	**24–32 in**	**>32 in**			
Selection	Triggers	≥120				≥120	0	These silviculture regimes are employed for non-constrained stands (i.e., those with no special constraints)
	Average Retention	50	30	5	5	90	15	
Selection (Stepped Approach)	Triggers	≥220				≥220	0	
	Average Retention (Step 1)	45	65	20	10	140	15	
	Average Retention (Step 2)	50	30	5	5	90	15	
Selection (Grp)	Triggers	≥100 and <120				≥100 and <120	0	
	Average Retention	50	30	5	5	90	15	
Transition	Triggers	≥60 <100				≥60 <100	0	
	Average Retention	25	15	5	5	50	15	
Variable Retention (Restoration)	Triggers	>20 sq. ft Conifer >16 in dbh and total Conifer BA <120 and >60 sq. ft. Hardwoods >0 in dbh				<120	>60	
	Average Retention	10	0	5	5	20	15	
Rehabilitation	Triggers	>5				>5	0	
	Average Retention	0	0	2	3	5	15	
Seed Tree Removal	Triggers	>5	>10			>15	0	
	Average Retention	5	0	5	5	15	15	

Silviculture descriptions and model decision logic								
Silviculture	Triggers and retention	Conifer basal area by diameter class				Total conifer trigger/BA retained	Hardwood BA trigger/retention	Descriptions
		0–16 in	16–24 in	24–32 in	>32 in			
No Harvest								This silviculture regime is employed for non-constrained stands that do not meet the basal area harvest triggers

BA = basal area
Grp = group

Table E-2. Silviculture regimes and CRYPTOS model logic for constrained stands under the No Action alternative.

Silviculture descriptions and model decision logic								
Silviculture	Triggers and retention	Conifer basal area by diameter class				Total Conifer trigger/BA retained	Hardwood BA	Descriptions
		0–16 in	16–24 in	24–32 in	>32 in			
Selection (High Retention2)	Triggers	>230				>230		Class I watercourse stands (buffer 150 ft)
	Average Retention	70	70	20	20	180	55	
Selection (High Retention3)	Triggers	>180				>180		Large Class II watercourse stands (buffer 150 ft)
	Average Retention	50	40	15	15	120	55	
Selection (High Retention)	Triggers	>260				>260		Small Class II watercourse stands (buffer 75 ft)
	Average Retention	50	50	50	50	200	55	
Selection_Carb (High Retention)	Triggers	>240				>240		Stands selected for carbon sequestration
	Average Retention	50	50	50	50	200	15	

Silviculture descriptions and model decision logic								
Silviculture	**Triggers and retention**	**Conifer basal area by diameter class**				**Total Conifer trigger/BA retained**	**Hardwood BA**	**Descriptions**
		0–16 in	**16–24 in**	**24–32 in**	**>32 in**			
Selection (Medium Retention-OG)	Triggers	>160				>160		Type II old-growth stands
	Average Retention	50	50	25	25	150	15	
Selection (Northern Spotted Owl & Marbled Murrelet Buffers)	Triggers	≥105				≥105		Stands selected as northern spotted owl and marbled murrelet buffers
	Average Retention	50	30	5	5	75	15	
Selection (Floodplain)	Triggers	>300				>300		Areas identified as floodplain from watershed analyses
	Average Retention	75	75	75	75	300	55	
Selection (Visual)	Triggers	≥105				≥105		Stands selected to retain aesthetic values
	Average Retention	50	30	5	5	75	15	
Selection (Coastal Zone STA)	Triggers	≥120				≥120		Coastal Zone Special Treatment Areas
	Average Retention	20	35	35	10	100	15	
No Harvest								Northern spotted owl core stands, marbled murrelet core stands, type I old growth stands, pygmy forest, rock outcrops, brush; also for constrained stands that don't meet the trigger conditions for harvest

BA = basal area
OG = old growth
STA = Special Treatment Areas

Table E-3. Silviculture regimes and CRYPTOS model logic for non-constrained stands under the Proposed Action.

Silviculture descriptions and model decision logic								
Silviculture	**Triggers and retention**	**Conifer basal area by diameter class**				**Total conifer trigger/BA retained**	**Hardwood BA Trigger/retention**	**Descriptions**
		0–16 in	**16–24 in**	**24–32 in**	**>32 in**			
Selection	Triggers	≥105				≥105	0	These silviculture regimes are employed for non-constrained stands (i.e., those with no special constraints)
	Average Retention	20	25	20	10	75	15	
Transition	Triggers		≥50 <105			≥50 <105	0	
	Average Retention	35	10	2	3	50	15	
Rehabilitation	Triggers	>15				>5	0	
	Average Retention	10	0	2	3	15	15	
Variable Retention (Restoration)	Triggers	>20 sq. ft Conifer >16 in dbh and total Conifer BA <105 and >60 sq. ft. Hardwoods >0 in dbh				<105	>60	
	Average Retention	10	0	5	5	20	15	
Seed Tree Removal	Triggers	>5	>10			>15	0	
	Average Retention	5	0	5	5	15	15	
No Harvest								

BA = basal area
dbh = diameter at breast height

Table E-4. Silviculture regimes and CRYPTOS model logic for constrained stands under the Proposed Action.

Silviculture descriptions and model decision logic								
Silviculture	**Triggers and retention**	**Conifer basal area by diameter class**				**Total conifer trigger/BA retained**	**Hardwood BA**	**Descriptions**
		0–16 in	**16–24 in**	**24–32 in**	**>32 in**			
Selection (High Retention)	Triggers	>260				>260		Class I and Large Class II watercourse buffers (inner and middle bands - set at 150 ft)
	Average Retention	25	75	100sq.ft. + 20% of largest trees		200	55	
Selection_Carb (High Retention)	Triggers	>240				>240		Stands selected for carbon sequestration
	Average Retention	50	50	50	50	200	15	
Selection MR (Marbled Murrelet Buffers)	Triggers	≥130				≥130		Marbled murrelet buffer stands; these stands will be managed to retain and promote larger trees
	Average Retention	30	30	30	30	120	15	
Selection (Northern Spotted Owl Buffers)	Triggers	≥105				≥105		Northern spotted owl buffer stands adjacent to "No Harvest" core areas
	Average Retention	20	25	20	10	75	15	
Selection (OG Type II)	Triggers	≥160				≥160		Selection employed for Type II old-growth stands
	Average Retention	50	50	25	25	150	15	
Selection TSU (Terrain Stability Units)	Triggers	≥105				≥105		TSU 1 and TSU 2 can only be under Selection silviculture; TSU 3 can trigger Transition silviculture if >25 and < 50% of stand is covered by TSU 3; these stands (identified on the ground) may be harvested with other silviculture methods depending on site specific conditions; Selection and Transition silviculture was employed for modeling purposes
	Average Retention	20	25	20	10	75	15	

Silviculture descriptions and model decision logic

Silviculture	Triggers and retention	Conifer basal area by diameter class				Total conifer trigger/BA retained	Hardwood BA	Descriptions
		0–16 in	16–24 in	24–32 in	>32 in			
Selection (Floodplain)	Triggers	>300				>300		Areas identified as floodplain in watershed analyses
	Average Retention	75	75	75	75	300	55	
Selection (Visual)	Triggers	≥105				≥105		Stands selected to retain aesthetic values
	Average Retention	20	25	20	10	75	15	
Selection (Small Class II)	Triggers	≥105				>105		Small Class II watercourse stands - 75 ft buffer
	Average Retention	20	25	20	10	75	15	
Selection (Coastal Zone STA)	Triggers	>130				>130		Coastal Zone Special Treatment Areas
	Average Retention	20	50	40	10	120	15	
No Harvest								Northern Spotted Owl Core Stands, Marbled Murrelet Core Stands, Type I old-growth stands, pygmy forest, rock outcrops, brush; also for constrained stands that don't meet the trigger conditions for harvest

BA = basal area
OG = old growth
TSU = Terrain Stability Unit
STA = Special Treatment Area

Table E-5. Silviculture regimes and CRYPTOS model logic for stands with non-constrained stands under Alternative A.

Silviculture descriptions and model decision logic								
Silviculture	**Triggers and retention**	**Conifer basal area by diameter class**				**Total conifer trigger/BA retained**	**Hardwood BA trigger/retention**	**Descriptions**
		0–16 in	**16–24 in**	**24–32 in**	**>32 in**			
Selection	Triggers	≥105				≥105	0	These silviculture regimes are employed for stands with no special constraints
	Average Retention	20	25	20	10	75	15	
Transition	Triggers		≥50 <105			≥50 <105	0	
	Average Retention	35	10	2	3	50	15	
Rehabilitation	Triggers	>5				>5	0	
	Average Retention	10	0	2	3	15	15	
Variable Retention (Restoration)	Triggers	>20 sq. ft Conifer >16 in dbh and total Conifer BA <105 and >60 sq. ft. Hardwoods >0 in dbh				<105	>60	
	Average Retention	10	0	5	5	20	15	
Seed Tree Removal	Triggers	>5	>10			>15	0	
	Average Retention	5	0	5	5	15	15	
No Harvest								

BA = basal area
dbh = diameter at breast height

Table E-6. Silviculture regimes and CRYPTOS model logic for constrained stands under Alternative A.

Silviculture descriptions and model decision logic								
Silviculture	**Triggers and retention**	**Conifer basal area by diameter class**				**Total conifer trigger /BA retained**	**Hardwood BA**	**Descriptions**
		0–16 in	**16–24 in**	**24–32 in**	**>32 in**			
Selection (High Retention)	Triggers	>260				>260		Small Class II watercourse stands
	Average Retention	50	50	50	50	200	55	
Selection_Carb (High Retention)	Triggers	>240				>240		Stands selected for carbon sequestration
	Average Retention	50	50	50	50	200	55	
Selection MR (Northern Spotted Owl & Marbled Murrelet Buffers)	Triggers	≥130				≥130		Selected stands that are adjacent to northern spotted owl core areas; marbled murrelet buffer stands will be managed to retain and promote larger trees
	Average Retention	30	30	30	30	120	15	
Selection (OG Type II)	Triggers	≥160				≥160		Selection employed for Old Growth Type II stands
	Average Retention	50	50	25	25	150	15	
Selection TSU (Terrain Stability Units)	Triggers	≥105				≥105		Terrain Stability Units;TSU 1 and TSU 2 can only be harvested under Selection silviculture; TSU 3 can trigger Transition silviculture if >30 and < 50% of stand is covered by TSU 3; these stands (identified on the ground) may be harvested with other silvicultures depending on site specific conditions; selection and Transition silvicultures were employed for modeling purposes
	Average Retention	20	25	20	10	75	15	

Silviculture descriptions and model decision logic

Silviculture	Triggers and retention	Conifer basal area by diameter class				Total conifer trigger /BA retained	Hardwood BA	Descriptions
		0–16 in	16–24 in	24–32 in	>32 in			
Selection (Floodplain)	Triggers	>300				>300		Areas identified as floodplain by watershed analysis
	Average Retention	75	75	75	75	300	55	
Selection	Triggers	≥105				≥105		Stands selected to retain aesthetic values
	Average Retention	20	25	20	10	75	15	
Selection (Coastal Zone STA)	Triggers	>130				>130		Coastal Zone Special Treatment Areas
	Average Retention	20	50	40	10	120	15	
No Harvest								Class I and Large Class II watercourses, Northern Spotted Owl Core Stands, Marbled Murrelet Core Stands, Type I and Type II Old Growth Stands, Pygmy Forest, Rock Outcrops, Brush; also for special concern stands that don't meet the trigger conditions for harvest

BA = basal area
OG = old growth
TSU = Terrain Stability Unit
STA = Special Treatment Area

Table E-7. Silviculture regimes and CRYPTOS model logic for stands with non-constrained stands under Alternative B.

Silviculture descriptions and model decision logic								
Silviculture	**Triggers and retention**	**Conifer basal area by diameter class**				**Total Conifer trigger/BA retained**	**Hardwood BA trigger/retention**	**Descriptions**
		0–16 in	**16–24 in**	**24–32 in**	**>32 in**			
Clearcut	Triggers	≥80				≥120	0	These silviculture regimes are employed for stands with no special constraints
	Average Retention	0	0	0	0	0	15	
Commercial Thin	Triggers	≥100				≥100	0	
	Average Retention	25	25	25	25	100	15	
Rehabilitation	Triggers	>5				>5	0	
	Average Retention	10	0	2	3	15	15	
Seed Tree Removal	Triggers	>5	>10			>15	0	
	Average Retention	5	0	5	5	15	15	
No Harvest								

BA = basal area

Table E-8. Silviculture regimes and CRYPTOS model logic for constrained stands under Alternative B.

Silviculture descriptions and model decision logic								
Silviculture	**Triggers and retention**	**Conifer basal area by diameter class**				**Total conifer trigger/BA retained**	**Hardwood BA trigger/retention**	**Descriptions**
		0–16 in	**16–24 in**	**24–32 in**	**>32 in**			
Selection (High Retention)	Triggers	>160				>160		Class I and Large Class II Watercourse Buffers outside of reserves. (Inner and Middle Bands)
	Average Retention	75	75	5	5	160	55	
Selection_Carb (High Retention)	Triggers	>240				>240		Stands selected for carbon sequestration, outside of reserves
	Average Retention	50	50	50	50	200	15	
Selection (OG Type I)	Triggers	≥260				≥260		Old Growth Type I outside of reserves
	Average Retention	50	50	50	50	200	15	
Selection (Floodplain)	Triggers	>300				>300		Areas identified as floodplain by watershed analysis outside of reserves
	Average Retention	75	75	75	75	300	55	
Selection	Triggers	≥105				≥105		Stands selected to retain aesthetic values
	Average Retention	20	25	20	10	75	15	
Selection (Small Class II)	Triggers	≥95				>95		Small Class II Watercourse Stands outside of reserves
	Average Retention	40	30	10	5	85	15	
Selection (Coastal Zone STA)	Triggers	>130				>130		Coastal Zone Special Treatment Areas outside of reserves
	Average Retention	20	50	40	10	120	15	

Silviculture descriptions and model decision logic								
Silviculture	Triggers and retention	Conifer basal area by diameter class				Total conifer trigger/BA retained	Hardwood BA trigger/retention	Descriptions
		0–16 in	16–24 in	24–32 in	>32 in			
No Harvest								Northern Spotted Owl Reserves, Marbled Murrelet Reserves, Marbled Murrelet/Point Arena Mtn. Beaver Reserves, Pygmy Forest, Rock Outcrops, Brush; also for special concern stands that don't meet the trigger conditions for harvest

BA = basal area
OG = old growth
STA = Special Treatment Areas

1.1 Variable Retention (Restoration)

1.1.1 Description

This regime is utilized primarily to rotate stands with low conifer basal area and relatively high hardwood basal area back to a conifer dominated stand. The regime is considered an even-aged regime and is employed only in upslope stands with no special constraints. Pockets of the pre-harvest stand are retained to provide habitat structure and forest complexity. The stand will be managed using uneven-age silviculture in successive entries.

1.1.2 Timing options

The regime is available for harvest for the first six decades. The re-entry period is 20–30 years.

1.1.3 Trigger conditions

Stands must have between 50 ft^2 and 120 ft^2 of conifer basal area per acre. The stand must also have at least 60 ft^2 of hardwood basal area per acre. The regime is considered for mixed conifer and hardwood stands and mixed hardwood stands. The stand must have 50% or more of its overall basal area in trees greater than 16 in to be considered for harvest.

1.1.4 Residual stand conditions

The modeled retention is 20% of both the conifer and hardwood pre-harvest basal area, representing both species and size distribution found in the pre-harvest stand.

1.1.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 300 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood trees and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.1.6 Vegetation control

Hardwoods are modeled for management within each of the silviculture regimes. The targeted hardwood basal area retention level is 15 ft^2 per acre in each stand following harvest. This is to ensure that hardwoods remain part of the complex structural timber stand conditions MRC is seeking.

1.2 Rehabilitation

1.2.1 Description

The rehabilitation regime is reserved for those stands experiencing excessive hardwood competition. This regime is considered as an even-aged regime. Rehabilitation removes the hardwood competition and allows conifer regeneration to take place. Successive harvests will incorporate uneven-aged silviculture.

1.2.2 Timing options

The regime is available throughout the planning horizon. Subsequent harvest will be treated with uneven-age silviculture. The minimum re-entry period is 30 years.

1.2.3 Trigger conditions

Stands must have less than 50 ft^2 of conifer basal area per acre and more than 50 ft^2 of hardwood basal area per acre. The regime is considered for mixed conifer and hardwood stands and mixed hardwood stands. The stand must have 50% or more of its overall basal area in trees larger than 8 in dbh.

1.2.4 Residual stand conditions

Minimum conifer basal area retention is 5 ft^2 for the No Action alternative and for all other alternatives it is 15 ft^2 of conifer basal area per acre. Minimum hardwood retention is 15 ft^2 of hardwood basal area per acre.

1.2.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 300 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood trees and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees 'grow' in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.2.6 Vegetation control

Hardwoods are modeled for management within each of the silviculture regimes. The targeted hardwood basal area retention level is 15 ft^2 per ac in each stand following harvest. This is to ensure that hardwoods remain part of the complex structural timber stand conditions MRC is seeking.

1.3 Transition

1.3.1 Description

The goal of the transition regime is to develop uneven-aged stands from even-aged stands and/or to improve stocking levels in understocked stands.

1.3.2 Timing options

The regime is available throughout the planning horizon. Subsequent harvest will be treated with selection silviculture. The minimum re-entry period is 20 years.

1.3.3 Trigger conditions

Stands must have between 60–105 ft^2 of conifer basal area per acre to be selected for transition. Stands must also have less than 60 ft^2 of hardwood basal area per acre. The regime is considered for conifer-dominated stands, mixed conifer/hardwood stands, and mixed hardwood stands. Stands must have 50% or more of its overall basal area in trees larger than 16 inches dbh. Hardwood harvest is triggered if hardwood basal area exceeds 15 ft^2 of basal area per acre. Stands that have a portion (25–50%) of their area within a TSU 3 unit may also be harvested with this regime if there is high basal area (60 ft^2) in hardwoods.

1.3.4 Residual stand conditions

Minimum conifer basal area retention is 50 ft^2 of conifer basal area per acre. Minimum hardwood retention is 15 ft^2 of hardwood basal area per acre.

1.3.5 Regeneration

The stand is assumed to have 200 seedlings per acre, representing the pre-harvest conifer species mix. The small trees 'grow' in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.3.6 Vegetation control

Hardwoods are modeled for management within each of the silviculture regimes. The targeted hardwood basal area retention level is 15 ft^2 per acre in each stand following harvest. This is to ensure that hardwoods remain part of the complex structural conditions we are seeking in our stands.

1.4 Selection (High Retention)

1.4.1 Description

The goal of this regime is to create and maintain dense, multistoried, uneven-aged stands with a variety of diameter classes. The regime is considered for stands with 50% or more of the stands overall basal area in trees greater than 16 in dbh. The regime is applied to sensitive areas, such as watercourse buffers.

1.4.2 Timing options

The regime is available throughout the planning horizon. If the stand is a watercourse buffer, it cannot be harvested unless the adjacent upslope stand is harvested. The minimum re-entry period is dependent on the specific alternative.

1.4.3 Trigger conditions

Trigger conditions vary among alternatives (Tables E-1 through E-8). Please refer to the Silviculture Descriptions and Model Decision Logic tables for each alternative. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. No harvest can occur within a size class unless the minimum conifer basal area is present in the stand.

1.4.4 Residual stand conditions

Minimum conifer basal area retention is dependent on the specific alternative. Under the Proposed Action and Alternative A, there is the additional retention of 20% of the largest trees in the stand. The basal area retention simulates a canopy closure of at least 70% and a presence of large trees. In general, all hardwoods will be retained.

1.4.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 40 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.4.6 Vegetation control

No vegetation control is modeled with this regime.

1.5 Selection

1.5.1 Description

The goal of this regime is to create and maintain continuous cover of multistoried, uneven-aged stands with a variety of diameter classes. The regime is applied to stands that are not experiencing a high level of hardwood competition. The regime is designed to develop and maintain a variety of age classes.

1.5.2 Timing options

The regime is available for harvest throughout the planning horizon. The minimum re-entry period is 20 years.

1.5.3 Trigger conditions

Stands must have a minimum of 105 ft^2 of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. There would be no harvest within a particular size class if the pre-harvest conifer basal area is less than the desired conifer retention for that size class.

1.5.4 Residual stand conditions

Minimum conifer basal area retention is 75 ft^2 of conifer basal area per acre. If hardwoods are harvested, retention is 15 ft^2 of basal area per acre.

1.5.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 100 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.5.6 Vegetation control

Vegetation management will occur if hardwoods comprise greater than 15 ft^2 per acre.

1.6 Seed Tree Removal

1.6.1 Description

The seed tree removal regime is the final step in rotating the stand that preceded it. Seed trees are removed when the younger stand established in part by the seed trees fully occupies the stand. While considered an even-aged regime, the developing stand will be treated in subsequent treatments with uneven-age silviculture.

1.6.2 Timing options

The regime is available for harvest for the first four decades.

1.6.3 Trigger conditions

Stands must have between 15 and 60 ft^2 of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. The stand must have 50% or more of its overall basal area in trees larger than 16 in dbh, with a vigorous and well stocked understory stand of smaller trees. Hardwood harvest is triggered if the hardwood basal area exceeds 15 ft^2 per acre. There would be no harvest within a particular size class if the pre-harvest conifer basal area is less than the desired conifer retention for that size class.

1.6.4 Residual stand conditions

Minimum conifer basal area retention is 15 ft^2 of conifer basal area per acre. If hardwoods are harvested, retention is 15 ft^2 of basal area per acre.

1.6.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 250 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.6.6 Vegetation control

Vegetation management will occur if hardwoods comprise greater than 15 ft^2 per acre.

1.7 Selection (Stepped Approach)

1.7.1 Description

This regime is a stepped approach, consisting of two entries, the goal of which is to create and maintain continuous cover of multistoried, uneven-aged stands with a variety of diameter classes. The regime is applied to upslope stands that have a high basal area and are not experiencing a high level of hardwood competition. The regime is designed to develop and maintain a variety of age classes.

1.7.2 Timing options

The regime is available for harvest throughout the planning horizon. The minimum re-entry period is 20 years.

1.7.3 Trigger conditions

Stands must have a minimum of 220 ft^2 of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. There would be no harvest within a particular size class if the pre-harvest conifer basal area is less than the desired conifer retention for that size class.

1.7.4 Residual stand conditions

Minimum retention for the first entry (i.e., Step 1) is 140 ft^2 of conifer basal area per acre if pre-harvest conifer basal area is greater than 220 ft^2. Minimum retention for the second entry (i.e., Step 2) is 90 ft^2 of conifer basal area per acre. If hardwoods are harvested, retention is 15 ft^2 of basal area per acre.

1.7.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 100 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees 'grow' in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.7.6 Vegetation control

Vegetation management will occur if hardwoods comprise greater than 15 ft^2 per acre.

1.8 Selection (Grp)

1.8.1 Description

The goal of this regime is to create and maintain continuous cover of multistoried, uneven-aged stands with a variety of diameter classes. The regime is applied to stands that are not experiencing a high level of hardwood competition. The regime is designed to develop and maintain a variety of age classes.

1.8.2 Timing options

The regime is available for harvest throughout the planning horizon. The minimum re-entry period is 10 years.

1.8.3 Trigger conditions

Stands must have a minimum of 100 ft^2 and less 120 ft^2 of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. There would be no harvest within a particular size class if the pre-harvest conifer basal area is less than the desired conifer retention for that size class.

1.8.4 Residual stand conditions

Minimum conifer basal area retention is 90 ft^2 of conifer basal area per acre. If hardwoods are harvested, retention is 15 ft^2 of basal area per acre.

1.8.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 100 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.8.6 Vegetation control

Vegetation management will occur if hardwoods comprise greater than 15 ft^2 per acre.

1.9 Selection (High Retention2)

1.9.1 Description

The goal of this regime is to create and maintain dense, multistoried, uneven-aged stands with a variety of diameter classes. The regime is considered for stands with 50% or more of the stands overall basal area in trees greater than 16 in dbh. The regime is applied to sensitive areas, such as watercourse buffers.

1.9.2 Timing options

The regime is available throughout the planning horizon. If the stand is a watercourse buffer, it cannot be harvested unless the adjacent upslope stand is harvested. The minimum re-entry period is 20 years.

1.9.3 Trigger conditions

Stands must have a minimum of 230 ft^2 of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. There would be no harvest within a particular size class if the pre-harvest conifer basal area is less than the desired conifer retention for that size class.

1.9.4 Residual stand conditions

Minimum conifer basal area retention is 180 ft^2 of conifer basal area per acre. This simulates a canopy closure of at least 70% and a presence of large trees. In general, all hardwoods will be retained.

1.9.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 40 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees 'grow' in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.9.6 Vegetation control

No vegetation control is modeled with this regime.

1.10 Selection (High Retention3)

1.10.1 Description

The goal of this regime is to create and maintain dense, multistoried, uneven-aged stands with a variety of diameter classes. The regime is considered for stands with 50% or more of the stands overall basal area in trees greater than 16 in dbh. The regime is applied to sensitive areas, such as watercourse buffers.

1.10.2 Timing options

The regime is available throughout the planning horizon. If the stand is a watercourse buffer, it cannot be harvested unless the adjacent upslope stand is harvested. The minimum re-entry period is 20 years.

1.10.3 Trigger conditions

Stands must have a minimum of 260 ft^2 of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. There would be no harvest within a particular size class if the pre-harvest conifer basal area is less than the desired conifer retention for that size class.

1.10.4 Residual stand conditions

Minimum conifer basal area retention is 200 ft^2 of conifer basal area per acre. Under the Proposed Action, there is the additional retention of 20% of the largest trees in the stand. This simulates a canopy closure of at least 70% and a presence of large trees. In general, all hardwoods will be retained.

1.10.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 40 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees 'grow' in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.10.6 Vegetation control

No vegetation control is modeled with this regime.

1.11 Selection_Carb (High Retention)

1.11.1 Description

The goal of this regime is to create and maintain dense, multistoried, uneven-aged stands with a variety of diameter classes. A select project area was defined for testing carbon sequestration.

1.11.2 Timing options

The regime is available throughout the planning horizon. If the stand is a watercourse buffer, it cannot be harvested unless the adjacent upslope stand is harvested. The minimum re-entry period is 20 years.

1.11.3 Trigger conditions

Stands must have a minimum of 240 ft^2 of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. There would be no harvest within a particular size class if the pre-harvest conifer basal area is less than the desired conifer retention for that size class.

1.11.4 Residual stand conditions

Minimum conifer basal area retention is 200 ft^2 of conifer basal area per acre. This simulates a canopy closure of at least 70% and a presence of large trees.

1.11.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 40 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees 'grow' in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.11.6 Vegetation control

No vegetation control is modeled with this regime.

1.12 Selection (Medium Retention—Old Growth [OG])

1.12.1 Description

The goal of this regime is to create and maintain dense, multistoried, uneven-aged stands with a variety of diameter classes. The regime is considered for stands with 50% or more of the stands overall basal area in trees greater than 16 in dbh. This regime is applied to Type II Old Growth stands.

1.12.2 Timing options

The regime is available throughout the planning horizon. If the stand is a watercourse buffer, it cannot be harvested unless the adjacent upslope stand is harvested. The minimum re-entry period is 20 years.

1.12.3 Trigger conditions

Stands must have a minimum of 160 ft^2 of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. There would be no harvest within a particular size class if the pre-harvest conifer basal area is less than the desired conifer retention for that size class.

1.12.4 Residual stand conditions

Minimum conifer basal area retention is 150 ft^2 of conifer basal area per acre. This simulates a canopy closure of at least 60% and a presence of large trees. All residual old growth trees are retained. If pre-harvest basal area in hardwoods exceeds 15 ft^2, then 15 ft^2 of basal area will be retained.

1.12.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 40 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.12.6 Vegetation control

Hardwoods will be reduced to 15 ft^2 of basal area.

1.13 Selection (Old Growth [OG] Type I)

1.13.1 Description

The goal of this regime is to create and maintain dense, multistoried, uneven-aged stands with a variety of diameter classes. The regime is considered for stands with 50% or more of the stands overall basal area in trees greater than 16 in dbh. This regime is applied to Type I Old Growth stands.

1.13.2 Timing options

The regime is available throughout the planning horizon. If the stand is a watercourse buffer, it cannot be harvested unless the adjacent upslope stand is harvested. The minimum re-entry period is 20 years.

1.13.3 Trigger conditions

Stands must have a minimum of 260 ft^2 of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. There would be no harvest within a particular size class if the pre-harvest conifer basal area is less than the desired conifer retention for that size class.

1.13.4 Residual stand conditions

Minimum conifer basal area retention is 200 ft^2 of conifer basal area per acre. This simulates a canopy closure of at least 60% and a presence of large trees. All residual old growth trees are retained. If pre-harvest basal area in hardwoods exceeds 15 ft^2, then 15 ft^2 of basal area will be retained.

1.13.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 40 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.13.6 Vegetation control

Hardwoods will be reduced to 15 ft^2 of basal area.

1.14 Selection (Northern Spotted Owl and Marbled Murrelet Buffers)

1.14.1 Description

The goal of this regime is to create and maintain continuous cover of multistoried, uneven-aged stands with a variety of diameter classes. The regime is applied to stands that are not experiencing a high level of hardwood competition. The regime is designed to develop and maintain a variety of age classes.

1.14.2 Timing options

The regime is available for harvest throughout the planning horizon. The minimum re-entry period is 20 years.

1.14.3 Trigger conditions

Stands must have a minimum of 105 ft^2 of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. There would be no harvest within a particular size class if the pre-harvest conifer basal area is less than the desired conifer retention for that size class.

1.14.4 Residual stand conditions

Minimum conifer basal area retention is 75 ft^2 of conifer basal area per acre. If hardwoods are harvested, retention is 15 ft^2 of basal area per acre.

1.14.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 100 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.14.6 Vegetation control

Vegetation management will occur if hardwoods comprise greater than 15 ft^2 per acre.

1.15 Selection (Floodplain)

1.15.1 Description

The goal of this regime is to create and maintain dense, multistoried, uneven-aged stands with a variety of diameter classes. The regime is considered for stands with 50% or more of the stands overall basal area in trees greater than 16 in dbh. The regime is applied to sensitive areas, such as watercourse buffers. This regime is applied to a unique group of stands that were identified as being within a floodplain.

1.15.2 Timing options

The regime is available throughout the planning horizon. If the stand is a watercourse buffer, it cannot be harvested unless the adjacent upslope stand is harvested. The minimum re-entry period is 20 years.

1.15.3 Trigger conditions

Stands must have a minimum of 300 ft^2 of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. There would be no harvest within a particular size class if the pre-harvest conifer basal area is less than the desired conifer retention for that size class.

1.15.4 Residual stand conditions

Minimum conifer basal area retention is 300 ft^2 of conifer basal area per acre. Under the Proposed Action, there is the additional retention of 20% of the largest trees in the stand. This simulates a canopy closure of at least 70% and a presence of large trees. In general, all hardwoods will be retained.

1.15.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 40 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.15.6 Vegetation control

No vegetation control is modeled with this regime.

1.16 Selection (Visual)

1.16.1 Description

The goal of this regime is to create and maintain continuous cover of multistoried, uneven-aged stands with a variety of diameter classes. The regime is applied to stands that are not experiencing a high level of hardwood competition. The regime is designed to develop and maintain a variety of age classes. A select group of stands were identified adjacent to public roads, etc. and will be managed for aesthetic purposes.

1.16.2 Timing options

The regime is available for harvest throughout the planning horizon. The minimum re-entry period is 20 years.

1.16.3 Trigger conditions

Stands must have a minimum of 105 ft^2 of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. There would be no harvest within a particular size class if the pre-harvest conifer basal area is less than the desired conifer retention for that size class.

1.16.4 Residual stand conditions

Minimum conifer basal area retention is 75 ft^2 of conifer basal area per acre. If hardwoods are harvested, retention is 15 ft^2 of basal area per acre.

1.16.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 100 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.16.6 Vegetation control

Vegetation management will occur if hardwoods comprise greater than 15 ft^2 per acre.

1.17 Selection (Coastal Zone Special Treatment Areas [STA])

1.17.1 Description

The goal of this regime is to create and maintain continuous cover of multistoried, uneven-aged stands with a variety of diameter classes. The regime is applied to stands that are not experiencing a high level of hardwood competition. The regime is designed to develop and maintain a variety of age classes. A select group of stands were identified within the Coastal Zone Special Treatment Area and will be managed with selection silviculture only.

1.17.2 Timing options

The regime is available for harvest throughout the planning horizon. The minimum re-entry period is 20 years.

1.17.3 Trigger conditions

Stands must have a minimum of 120 ft^2 of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. There would be no harvest within a particular size class if the pre-harvest conifer basal area is less than the desired conifer retention for that size class.

1.17.4 Residual stand conditions

Minimum conifer basal area retention is 100 ft^2 of conifer basal area per acre. If hardwoods are harvested, retention is 15 ft^2 of basal area per acre.

1.17.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 100 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.17.6 Vegetation control

Vegetation management will occur if hardwoods comprise greater than 15 ft^2 per acre.

1.18 Selection TSU (Terrain Stability Units)

1.18.1 Description

The goal of this regime is to create and maintain continuous cover of multistoried, uneven-aged stands with a variety of diameter classes. The regime is applied to stands that are not experiencing a high level of hardwood competition. The regime is designed to develop and maintain a variety of age classes. This regime applies to stands within identified TSU units that have 50% or more of the area within a TSU 3 unit.

1.18.2 Timing options

The regime is available for harvest throughout the planning horizon. The minimum re-entry period is 20 years.

1.18.3 Trigger conditions

Stands must have a minimum of 105 ft^2 of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. There would be no harvest within a particular size class if the pre-harvest conifer basal area is less than the desired conifer retention for that size class.

1.18.4 Residual stand conditions

Minimum conifer basal area retention levels for stands with TSU designations are set at 75 ft^2 of conifer basal area per acre. If hardwoods are harvested, retention is 15 ft^2 of basal area per acre. There is no additional modeled retention for these stands. In practice, however, more retention may be allocated for specific areas where slope stability is an issue.

1.18.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 100 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees 'grow' in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.18.6 Vegetation control

Vegetation management will occur if hardwoods comprise greater than 15 ft^2 per acre.

1.19 Selection (Small Class II)

1.19.1 Description

The goal of this regime is to create and maintain continuous cover of multistoried, uneven-aged stands with a variety of diameter classes. The regime is applied to stands that are not experiencing a high level of hardwood competition. The regime is designed to develop and maintain a variety of age classes. This regime applies to stands identified as Small Class II watercourses.

1.19.2 Timing options

The regime is available for harvest throughout the planning horizon. The minimum re-entry period is 20 years.

1.19.3 Trigger conditions

Stands must have a minimum of 105 ft^2 of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. There would be no harvest within a particular size class if the pre-harvest conifer basal area is less than the desired conifer retention for that size class.

1.19.4 Residual stand conditions

Minimum conifer basal area retention is 75 ft^2 of conifer basal area per acre. If hardwoods are harvested, retention is 15 ft^2 of basal area per acre.

1.19.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 100 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.19.6 Vegetation control

Vegetation management will occur if hardwoods comprise greater than 15 ft^2 per acre.

1.20 Clearcut

1.20.1 Description

This regime is utilized under Alternative B to rotate stands under an even-aged regime.

1.20.2 Timing options

The regime is available for harvest throughout the planning horizon. The rotation cycle is 60 years.

1.20.3 Trigger conditions

Stands must have greater than120 ft^2 of conifer basal area per acre. The regime is considered for mixed conifer and hardwood stands and mixed hardwood stands. The stand must have 80 ft^2 of basal area or more of its overall basal area in trees greater than 16 in to be considered for harvest.

1.20.4 Residual stand conditions

All conifers greater than 6 in dbh are harvested. 15 ft^2 of hardwoods are retained if present in the pre-harvest stand.

1.20.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 300 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood trees and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.20.6 Vegetation control

Hardwoods are modeled for management within each of the silviculture regimes. The targeted hardwood basal area retention level is 15 ft^2 per acre in each stand following harvest.

1.21 Commercial Thin

1.21.1 Description

The goal of this regime is to thin clearcut stands to achieve optimal spacing, growth, and maintain or enhance the average diameter. This regime is considered even-aged as it is an intermediate step in the clearcut cycle

1.21.2 Timing options

The regime is applied midway (30 years) between 60 year clearcut events.

1.21.3 Trigger conditions

Stands must have greater than of 100 ft^2 of conifer basal area per acre to be selected for harvest. The regime is considered for conifer-dominated stands and mixed conifer/hardwood stands. There would be no harvest within a particular size class if the pre-harvest conifer basal area is less than the desired conifer retention for that size class.

1.21.4 Residual stand conditions

Minimum conifer basal area retention is 100 ft^2 of conifer basal area per acre. If hardwoods are harvested, retention is 15 ft^2 of basal area per acre.

1.21.5 Regeneration

Natural regeneration and planted seedlings are assumed for this regime. The growth model assumes that post-harvest stands are regenerated with 10 seedlings per acre. The assumed regeneration mimics the species composition of the pre-harvest stand by determining the proportion of redwood and Douglas-fir trees present in the pre-harvest stand and assigning the same proportion to the seedlings. The small trees ‘grow’ in the model with a small tree modeling routine which adds 1 ft height growth per year until the tree achieves 10 ft in height, upon which the trees are assumed to have a dbh of 4 in. At this point the small trees are subject to competition and mortality.

1.21.6 Vegetation control

Vegetation management will occur if hardwoods comprise greater than 15 ft^2 per acre.

2 Landscape Planning

Landscape Planning refers to the suite of inventory databases, forest growth models, habitat models, and Geographic Information Systems (GIS) programs that enable the analysis and presentation of current and projected forest conditions. Many efforts are made to ensure an approach that reflects actual ‘on-the-ground’ conditions and constraints. The Landscape Planning approach is designed to allow planners to assess the effects of a broad range of management activities at the stand level, watershed units, and the ownership. Examples of the types of review provided through this approach include:

- Conifer and hardwood stocking levels on a periodic basis.
- Area harvested on a periodic basis.
- Forest structure types (habitat) on a periodic basis.

2.1 Stands—The Basis of Landscape Planning

Stands are the smallest geographic units (polygons) in Landscape Planning. The size and extent of stands is based on vegetation, topography, and sensitivity attributes, as well as regulatory considerations. Inventory information can be interpreted at the stand level. That information can be grown and harvested in growth and yield simulations. Reports of all management activities can be prepared at the stand level. Critical information stored in the relational databases for each stand includes:

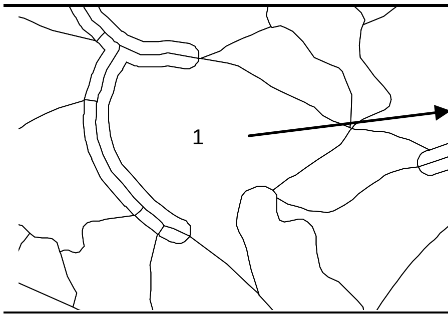
- Stand Identifier
- Acres
- Vegetation Codes
- Sensitivity (watercourse buffers, old growth stands, spotted owls, etc.).
- Site Class
- Harvest Timing

Each of these attributes is described independently below. The management activities identified in Landscape Planning databases and models can be mapped using GIS and monitored on the ground to validate model outputs.

2.2 Stand Delineation

Stands are identified using aerial photos, drawn on a base map, assigned a unique identifier, and digitized into the GIS. Stands are manageable units that are accessible by a road or cable system and limited by ridges and/or watercourse buffers. Each stand is assigned a unique identifier so it can be 'joined' to relational databases (Table E-9). Generally, the minimum mapping unit for stands is 20 acres, unless the stand has a particular sensitivity (such as a watercourse) or a sharp contrast in vegetation. Sensitivity constraints reduce the minimum mapping unit to an appropriate size to represent the sensitivity. Watercourse stands can be less than an acre since watercourse buffers are linked to the adjacent, upslope stand. A sharp contrast in vegetation could result in a minimum mapping unit of 10 acres.

Table E-9. Example of relationship between stands in the GIS and stands in a relational database. The image on the left displays a stand with a unique identifier (1). Information about the stand is stored in a relational database.



Stand	Acres	Vegetation	Sensitivity	Site class	Harvest timing
1	25	CH2D	00010	III	10
2	14	RD3L	10001	III	5

2.3 Acres

Acres are calculated in the GIS and exported to the relational database. Acres are stored as gross acres (the total acres within the polygon) and net acres (an adjustment assigned to each stand to account for roads and landings that are not part of the forested stand). The road deduction assigned to all stands is 3% since roads and landings have been computed to represent approximately 3% of the ownership's area. It is the net acres that are used to expand per acre estimates of volume, habitat, and other features to larger scale units (planning watersheds, Sustainability Units, ownership).

2.4 Vegetation

Each stand is assigned a vegetation label that forms the basis of a stratified sample. Sampling generates tree lists that are used to estimate inventories of many forest variables, such as volume, density, basal area, and habitat conditions. Vegetation labels are determined for each stand from aerial photos or field visits. The vegetation label consists of a species class code, a size class code, and a density class code. Figure E-1 below displays how vegetation labels are assigned to each stand.

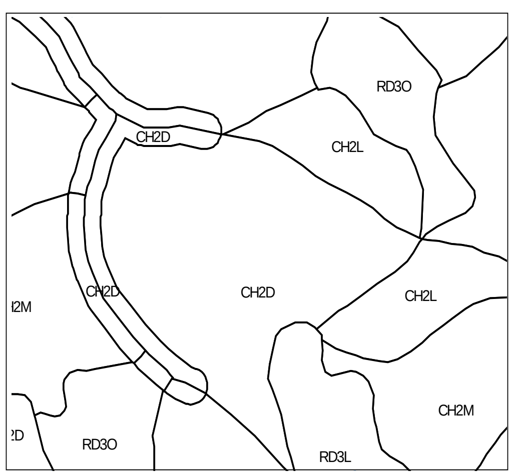


Figure E-1. Example of vegetation labels assigned to stands.

Tree lists for the stands that have been sampled are generated from the plots within the stand. Tree lists are developed for stands that have not been cruised by assigning all plots for a given stratum to the un-sampled stands of the same stratum. In the primary assessment area, as of December 31, 2008, there were 1,525 cruised (sampled) stands comprising 35,452 acres and 14,409 uncruised (unsampled) stands comprising 167,410 acres.

2.4.1 Vegetation classification rules and symbology—introduction

Vegetation is classified according to a stand's species composition, the dominant size of the trees in the stand, and the canopy closure, or density, of the stand. The system has been developed to address mixed age stands and even age stands. Rules for classification have been created to reduce ambiguity in labeling stands. Standards have been established to ensure that vegetation classification is consistent.

2.4.2 Vegetation classification rules and symbology—determining size classes

Size classification is the first component of vegetation classification to be determined. A diameter size class label is assigned to each of the forested stands. Vegetation polygons are classified into one of five "Diameter at Breast Height (dbh)" classes (Table E-10).

Table E-10. Class assignments for Diameter at Breast Height (dbh) ranges.

Class	dbh
1	0–8 in
2	8–16 in
3	16–24 in
4	24–32 in
5	>32 in

Rules have been developed to assign a size class to each vegetation polygon which accounts for trees of many age classes and many diameter classes (Table E-11).

Table E-11. Decision matrix for determining dominant diameter class.

Is total tree cover greater than 5%? Of the stand's area?	No →	Are there at least 300 trees per acre?	No →	Non-forest
Yes ↓		Yes ↓		
		Size Class = 1		
Do the trees greater than 32 in (Size Class 5) dbh comprise more than 50% of the total basal area in the stand?	Yes →	Size Class = 5		
No ↓				
Do the trees greater than 24 in (Size Class 4 and 5) dbh comprise more than 50% of the total basal area in the stand?	Yes →	Size Class = 4		
No ↓				
Do the trees greater than 16 in (Size Class 3, 4 and 5) dbh comprise more than 50% of the total basal area in the stand?	Yes →	Size Class = 3		
No ↓				
Do the trees greater than 8 in (Size Class 2, 3, 4 and 5) dbh comprise more than 50% of the total basal area in the stand?	Yes →	Size Class = 2		
No ↓ Size Class = 1				

2.5 Vegetation Classification Rules and Symbology—Species Classification

Vegetation polygons that have 5% or more of their area covered by tree crowns are classified as forest and will be labeled with a three-part labeling system that includes species, size, and density. The vegetation labels are developed for inventory purposes. They are not intended to define natural communities. Definitions and symbols for each are as follows.

2.5.1 Species classification—non-forest symbols

Vegetation polygons that have less than 5% of their area covered by tree crowns should be classified as non-forest and will be labeled with one of the following symbols, depending on the predominant cover. Table E-12 displays the vegetation symbols applied to stands that do not have forest cover, or the forest cover is a non-timber species.

Table E-12. Vegetation symbols assigned to non-forest stands.

BR	Brush—Chaparral
GR	Grass and Meadows
BG	Bare ground, including rocks and watercourse beds
WA	Water
PG	Pygmy Forest
GX	Oak Woodland
RK	Rock Outcrop
BP	Bishop Pine Forest

A forested polygon is labeled with an appropriate conifer or hardwood species symbol when 70% or more of the basal area in the stand can be attributed to that species. If no one species represents 70% or more of the basal area, a mixed-species symbol will be used.

2.5.2 Species classification—dominant-conifer species symbols

Table E-13. Vegetation labels assigned to stands that have at least 70% of the stand's basal area in the conifer species identified.

RW	Coast redwood
DF	Douglas-fir

2.5.3 Species classification—dominant-hardwood species symbols

Table E-14. Vegetation labels assigned to stands that have at least 70% of the basal area is in the species identified.

AL	Alder
TO	Tanoak
LO	Live oak
BO	Black oak
MO	Madrone

2.5.4 Species classification—two-species symbols (conifers)

Table E-15. Vegetation labels assigned to stands where no one conifer species has 70% of the stand's basal area, but two species combined do have at least 70% of the basal area and each of the dominant species constitute at least 30% of the overall basal area.

RD	Redwood/Douglas-fir
RM	Redwood/Monterey Pine

2.5.5 Species classification—two-species symbols (conifers and hardwoods)

Table E-16. Vegetation labels assigned to stands where conifer species do not comprise 70% or more of the stand's basal area. The stand is comprised of a mixture of species that make up 70% of the basal area and each of the dominant species (species groups) constitutes at least 30% of the overall basal area.

CH	Conifer/Hardwood mix
MH	Mixed Hardwood—Upland Broadleaf Forest
RE	Redwood/Eucalyptus

2.5.6 Vegetation classification rules and symbology—density classification

Table E-17. Density classes are based on the canopy closure of all trees greater than 8' dbh for Size Class 2 and above. All trees are considered for the canopy closure estimates in Size Class 1 stands.

Canopy cover	Description	Code
0–20%	Open Canopy Coverage	O
20–40%	Low Canopy Coverage	L
40–60%	Medium Canopy Coverage	M
60–80%	Dense Canopy Coverage	D
80–100%	Extremely Dense Canopy Coverage	E

2.6 Sampling Methodology

The ownership is broken into smaller units called Sustainability Units. Sustainability Units are the basis for sampling and deriving confidence targets. They also serve as the basis for assessing timber sustainability. Sustainability Units were developed by aggregating planning watershed boundaries that contain similar environmental characteristics. The largest Sustainability Unit is approximately 20,000 acres in size. The sampling goal is to be within 10% of the net board ft volume within the Sustainability Unit at the 90% confidence interval

2.6.1 Stratified sampling

The vegetation labels, or strata, that are assigned to a stand using photo interpretation or field visits are the basis for a stratified sampling system. Strata types with higher expected volume levels are sampled at a higher intensity (more stands sampled) than strata types with lower volume levels, since the principal goal of sampling is to derive confidence in volume estimates.

2.6.2 Selecting stands for sampling

Stands are randomly selected for sampling across a Sustainability Unit and/or planning watersheds. No effort is made to separate sensitivity classes within a vegetation stratum for sampling. The application of management policies (treatments) to stands of the same vegetation stratum in different sensitivity classes results in different outcomes for the vegetation. Vegetation labels are updated when stands are harvested or, at least every 20 years if a stand is not harvested.

Sampling priorities are identified at the beginning of each calendar year based on an assessment of the number and age of plots that represent each stratum within each planning watershed. MRC has established a goal of having at least 30 plots in 3 different stands for each planning watershed in a Sustainability Unit for strata that are estimated to have at least 100 ft^2 of conifer basal area. The goal for strata that are estimated to have less than 100 ft^2 of conifer basal area, but at least 30 ft^2 of conifer basal area, is 20 plots in 2 different stands. Strata that are estimated to have less than 30 ft^2 are assigned 10 plots in 2 different stands.

2.6.3 Sampling procedure

The allocation of plots is based on an effort to achieve an estimate that has adequate confidence to represent the stand being cruised and to distribute the plots in enough stands of a given stratum to represent potential variation between polygons, thus achieving a higher level of confidence at the stratum level. We have determined that 10 plots are adequate for the stand level confidence and 20–50 plots are adequate for the stratum level confidence. The variation in the number of plots is based on the anticipated volume in the stratum and the proportion the stratum represents in the overall inventory. A stratum with a high anticipated volume that represents a high proportion of the acres will be allocated more plots than a stratum that represents a small proportion of the acres and has low volume.

Points (plot centers) are located on the stand map at the appropriate chain intervals that evenly distributes the desired number of plots throughout the stand along cardinal bearings. Once in the field, an entry point to the first plot is determined. Common entry points are landmarks such as landings, watercourse crossings or other identifiable stand boundaries. This point will be the anchor point from which all cruise lines will be established. A GPS coordinate is taken (if possible) and directions to the first plot are written on flagging displayed at the entry point. Plot locations will be referenced by flagging that identify the plot number and specify directions to the next plot.

2.6.4 Data collection at plots

The plots are sampled using a set of nested plots. All trees equal to or greater than six inches (Diameter at Breast Height) are sample with a variable radius plot. A fixed 10^{th} acre plot is used to measure down logs and brush cover. A 100^{th} acre fixed plot is used to tally trees smaller than 6 inches.

1. Trees greater than six inches are measured if they fall in the variable radius plot. The basal area factor (BAF) selected for the stand is based on getting, on the average, five to six trees ‘in’ per plot. Trees will be tallied and measured in a clockwise direction beginning at a North line.
2. Species: Species are coded on the plot sheets with the codes shown in Table E-18.

Table E-18. Codes and common names for common species found in Mendocino Redwood Company's forests.

Species code	Common name
AL	Red Alder
BM	Big Leaf Maple
BO	Black Oak
BP	Bishop pine
CB	California Bay
DF	Douglas-fir
EU	Eucalyptus
GC	Golden chinquapin
GF	Grand fir
LO	Live Oak
MO	Madrone
MP	Monterey pine
NM	California Nutmeg
PY	Pacific yew
RW	Redwood
SP	Sugar pine
SS	Sitka spruce
TO	Tanoak
UK	Unknown
WH	Western Hemlock
WM	Wax Myrtle
WO	White Oak

3. Diameter at Breast Height (dbh) Diameters are measured at a point 4.5 ft above the ground level or root collar on the uphill side of the tree. Measurement accuracy is to the nearest inch. In the case of irregularities in dbh, such as swelling, bumps, depressions, branches, etc., diameters are measured immediately above the irregularity at the place where it ceases to affect the normal stem form.
4. Height. Total height is measured on all trees on every third plot starting with the first plot. If the angle from level to the point of measurement exceeds 45 degrees (i.e., 100% or 66 topo), the distance from the measured tree must be increased to reduce the angle. At least 30% of the total trees should have height measurements while emphasizing a good distribution throughout the diameter classes; this applies to stand level targets that are necessary in order to prepare species-specific height regressions. A regression equation is derived from the measured trees to estimate the unmeasured tree heights. Tree height regressions are species-specific, so for example, redwood-regressed heights are based on measured redwood heights only. Species that are uncommon in a particular stand should be measured for height if they are in any plot, since the sample size for developing a regression estimator might be inadequate.
5. Height to Crown Base (HTCB*)*. This measurement provides an estimate of the total crown area. The measurement is taken on every tree that is measured for height. The measurement is taken from the base of the tree to the visually balanced base of the crown, since tree crowns are often irregular.

6. Status. A status code is entered for each tree. Status codes describe the physical condition of the tree (Table E-19).

Table E-19. Status codes for trees sampled.

Status codes		
Code	**Features**	**Description**
L	Live	Default code for trees with normal form.
S	Snag	Standing trees that are dead.
H	Live Snag	Standing trees that retain little live component – mostly dead.
W	Old growth	Old growth trees.
R	Snag Recruitment	Trees that will be retained for future snags.
P	Broken Top	Trees that are not snags or old growth and are not of normal form.
P	Dead Top	
P	Forked	
P	Suppressed	

7. Down Logs. Down logs are measured on every plot. The sample area for downed logs is a fixed 1/10th acre plot (37.2 ft radius). Down logs must meet the following criteria to be sampled:
   - The log must have an average diameter of at least six inches (as determining by summing the large end diameter and the small end diameter and dividing by two),
   - The log must have a length of at least ten ft, for average diameters less than 16 inches, or
   - a length of at least six ft, for average diameters greater than 15.9 in.

Down logs are determined to be either hard (no material gives way when kicked, sound when kicked is a thud) or soft (material falls of when kicked, sound is muffled). Hard logs generally have the top intact, the bark on, and the wood is sound. Soft logs usually have a broken top, the bark is sloughing off, and the wood is decaying. A status code 'H' is applied to hard down logs and a status code 'S' is applied to soft down logs.

8. Regeneration. Trees less than 6 in dbh are tallied on every plot. The sample area measured for regeneration is a fixed 1/100th acre plot (11.8 ft radius). Record all conifers and hardwoods by species and tally seedlings and saplings in two size classes: 0-2.9 inch dbh and 3-5.9 inch dbh.
9. Shrub Cover. Shrubs are defined as any plant species less than 10 ft tall with crown diameters equal to at least 75% of the height. The measurement is derived from an ocular estimate of the shrub cover within a 1/10th acre plot (37.2 ft radius). The dominant shrub species is recorded along with the following density codes shown in Table E-20.

Table E-20. Density codes for understory vegetation sampled on each plot.

Density code	Description of understory coverage	Percent coverage of understory
O	Open	0–19.9%
L	Low	20–49.9 %
M	Medium	40–59.9 %
D	Dense	60–79.9 %
E	Extremely Dense	80–100%

10. Additional Notes. Any further information concerning the stand being cruised can be extremely important. Items that should be noted are the location of skid trails, springs, watercourses and historical artifacts. Wildlife observations should also be noted, such as woodrat nests, bird nests, owls, raptors, mountain lions, and bears.

2.6.5 Site index sampling

Site trees are sampled to derive an estimate of the height of the co-dominant trees (by species) at age 50. Stands that share similar environmental variables, particularly soil are grouped together into various site classes. The site indices derived from sampling are used to assign an average site index for each species to the stands that share the same site class. The current data applies site index estimates to an ownership stratification of site classes.

Approximately 3 to 5 trees per stand are selected for site trees and measured for species, dbh, height, HTCB, and age. Selected site trees are conifer trees that display no deformities and are in a co-dominant position in the stand. The trees measured for site index are averaged for each species. The allocation of site index to the landscape is based on expanding the results of the estimated site index from the sampled trees to other stands within the Planning Watershed based on soil stratification.

2.7 Structure Classes

Stratification of the forest cover into units that share common features is accomplished using a variety of tools, including aerial photos and other forms of remote sensing. The units, or strata, derived from stratification are the basis for field sampling activities designed to obtain tree lists that represent the forested condition for each stratum. Distinct tree lists are produced from sampling for each planning watershed (sub-watersheds defined by the State of California) from sampling. Therefore, the tree list for a given stratum in one planning watershed is distinct, albeit similar, from that of a stratum with the same label in another planning watershed.

Forest structural conditions have strong associations with habitat value. Mendocino Redwood Company's landscape planning tools include a component in the Growth and Yield model that classifies forest vegetation into groupings or classes of forest structure classes. Forest structure classes are based on:

- Species dominance
- Size dominance
- Density of the forest

The structure classes are fewer in number than the total number of vegetation strata. The purpose with identifying structure classes is to combine forested areas into similar vegetation units for habitat purposes, not for determining levels of timber stocking. Although highly correlated to vegetation strata, forest structure classes are computed from empirical data acquired from field samples. While both vegetation strata and forest structure classes are based on the same set of rules, strata are assigned a priori (before sampling) and structure classes are computed a posteriori (post sampling).

Mendocino Redwood Company developed this system for determining structure classes in order to understand both the current condition of the forest and changes to forest structure resulting from forest growth and harvesting activities. The system was developed as an alternative to the California Wildlife Habitat Relationship (CWHR) model because the CWHR system was developed for even-aged management, where trees in a forest stand are very close to the same size and age. MRC manages its forest with uneven age harvesting. This means that there are trees from more than one age and size group in forested stands at all times. CWHR determines the size of the forest stand utilizing an average. Averaging works well for forested stands where the distribution of tree sizes within a stand is minimal. It does not describe the condition of a forest with a wide distribution of sizes, as in uneven age management. A crosswalk was developed to address northern spotted owl habitat, CWHR, and Successional stages. For a given structure class, a specific habitat is assigned. For example, structure class 10 would be labeled as Foraging northern spotted owl habitat, have a CWHR of MHC4M, and would be classified as Mid-Successional. Table E-21 below shows the crosswalk between structure class and other habitat designations.

Table E-21. Structure class and habitat relationships.

Structure class	Northern spotted owl habitat	Dominant CWHR	Successional stage
0	Non_Suitable	N/A	Non Timber
1	Non_Suitable	MHW2P	Early Successional
2	Non_Suitable	MHW4P	Mid Successional
10	Foraging	MHC4M	Mid Successional
11	Non_Suitable	MHC2D	Early Successional
12	Foraging	MHC4D	Mid Successional
13	Non_Suitable	RDW2P	Early Successional
14	Non_Suitable	RDW4S	Mid Successional
15	Non_Suitable	RDW5P	Mid Successional
16	Non_Suitable	RDW5P	Mid Successional
17	Foraging	RDW3M	Mid Successional
18	Foraging	RDW4M	Mid Successional
19	Foraging	RDW5M	Mid Successional
20	Foraging	RDW5M	Advanced Successional
21	Foraging	RDW3D	Mid Successional
22	Roosting/Nesting	RDW4D	Mid Successional
23	Roosting/Nesting	RDW5D	Advanced Successional
24	Roosting/Nesting	RDW6D	Advanced Successional

Appendix G

Supplementary Descriptions of Geologic Units and Soils

1 Franciscan Complex Geologic Units in the Assessment Area

The sections below provide detailed descriptions of the dominant geologic units within the assessment area.

1.1 Coastal Belt Terrane

The Coastal Belt terrane underlies the westernmost portions of the assessment area and is separated from the Central Belt terrane by the eastward-dipping Two Rocks thrust fault. Rocks of the Coastal Belt terrane are typically highly sheared and folded and consist of structurally deformed, massive, hard graywacke sandstone and shale interbedded with small amounts of limestone, pebble conglomerate, and Mesozoic volcanic rocks (Wahrhaftig and Birman 1965, Kleist 1974, Kramer 1976, Blake et al. 1985). The bedrock is locally homoclinally folded, generally has a northwest strike, and dips moderately to steeply (30 to 85 degrees) to the northeast. Bedrock may be vertically oriented and highly disrupted near fault contacts. The graywacke sandstones are competent, generally resistant to weathering, and commonly fine- to medium-grained in texture, but may be coarser-grained in some areas and may have a chloritic matrix. The conglomerates are composed of clasts of quartzite, graywacke, greenstone, and red, black, and green chert. Mesozoic era volcanic rocks, consisting mostly of greenstone and metamorphosed tuffaceous sandstone, occur in narrow northwest-trending lenses up to 3 mi (5 km) long. Ridge tops are usually underlain by sandstone, conglomerate, and volcanic rocks, while streams generally occupy areas of sheared shale.

High erosion rates are characteristic of portions of the Coastal Belt terrane, where hillslope erosion is dominated by shallow debris slides, active deep-seated landslides (most of which are translational-rotational in this terrane), and gullying in Holocene valley fills.

1.2 Central Belt Terrane

The Central Belt terrane is an assemblage of fragmented and sheared Franciscan Complex rocks and Mesozoic Era volcanic and metavolcanic rocks (Blake et al. 1985, Wahrhaftig and Birman 1965). Rocks of the Central Belt are predominantly melange (Blake et al. 1985), which is composed of a matrix of previously sheared shale containing discontinuous blocks ranging in size from meters to kilometers of sandstone, chert, high-grade blueschist, serpentine and serpentinized ultramafic intrusive rocks (mainly dunite, peridotite, and gabbro), eclogite, greenstone, basaltic pillow basalt, diabase, and minor pyroclastic rocks.

The Central Belt terrane is located between the Coastal Belt terrane on the west and the Eastern Belt terrane on the east. Earthflows are especially prominent in the Central Belt terrane and mass soil movement rates are typically higher than in the Coastal Belt. Highly sheared shale units in the Central Belt are prone to mass soil movement.

1.3 Eastern Belt Terrane

The Eastern Belt terrane is comprised of moderately to highly sheared and folded metagreywacke, medium-grade blueschist, metaquartzite (essentially the metamorphic equivalents of the pre-Cretaceous sandstone interbedded with shale and chert, respectively), and eclogite. This unit exhibits high-grade (high pressure, moderate temperature metamorphism progressively increases to the east) metamorphism. Structurally, the Eastern Belt terrane is highly folded, exhibits numerous low-angle faults, and is characterized by thrust belts of serpentinized ultramafic rocks.

1.4 Upper Cretaceous Sandstone

The Upper Cretaceous sandstone unit is part of the Great Valley Sequence and consists of consolidated, thick bedded, gently homoclinally folded sandstone with interbedded shale or mudstone, siltstone and conglomerate. The sandstone varies from greywacke to arkosic sandstone. Lenticular conglomerate beds up to 492 ft (150 m) or 500 ft (152 m) thick, some extending for miles along the strike, are mapped within this unit. Pebbles and cobbles in the conglomerates are well rounded and include rhyolites; black, red and green chert; quartzite, and granitic clasts. Generally, bedrock strikes to the northwest and dips 30 to 90 degrees to the northeast. Great Valley Sequence rocks are located mostly in the Willow Creek basin in MRC's Sonoma County holdings.

1.5 Tertiary Marine Deposits

Tertiary marine deposits consist of moderately to well consolidated, moderately folded sandstone and mudstone with interbedded shale, siltstone, breccia and pebble (and cobble) conglomerate. In several areas, thin flows of basalts, andesites and rhyolites are present in the sedimentary strata. The sandstone varies from normal to arkosic, and the siltstone and mudstone vary from phosphatic to glauconitic. Conglomerates are composed of well rounded clasts of rhyolite; red, black and green chert; quartzite; and granitic material. They occur in lenticular units up to 500 ft (152 m) in thickness, and some extend along strike for miles. These marine sediments are located to the west of the San Andreas Fault, and were deposited in coastal embayments that extended 4 to 14 mi (8 to 24 km) eastward from the present shoreline. In most of the basins in the assessment area, these Plio-Pleistocene sediments rest unconformably on the Franciscan Complex.

1.6 Quaternary Surficial Deposits

Marine terraces and dune deposits, stream terraces, and colluvial and alluvial deposits of Holocene and Quaternary age occur throughout the assessment area. Pleistocene marine terraces are composed of quartz sand and gravel deposits. Dune deposits composed of partially consolidated, fine- to medium-grained sand commonly overlay marine terraces. Colluvial deposits composed of poorly consolidated sediment occur in unchanneled valleys (hollows) and along toeslopes. Landslide deposits composed of a heterogeneous mixture of rock, soil, and organic debris are common throughout the assessment area.

2 Soil Types in the Assessment Area

The sections below provide detailed descriptions of the soil types found within the assessment area. The descriptions are based on those found in NRCS (1987). Soil types in the assessment area are summarized in Table G-1.

2.1 Albion River

Throughout the Albion River basin, soils are mainly characterized by fine to coarse, loamy alfisols (NRCS 1987). The predominant soil series in the Albion River basin is the Irmulco-Tramway series, characterized by moderately deep to very deep, well-drained soils, formed from weathered sandstone, and covers approximately 40% of the basin area. The Dehaven-Hotel and Dehaven-Hotel-Irmulco series straddle the North Fork and South Fork Albion Rivers and are distributed around their tributaries, covering 20% of the basin area. These soils are moderately deep to deep, well-drained, and formed from weathered sandstone on relatively steeper hillslopes (30 to 100% slopes). Eighteen percent of the basin consists of the Ornbaun-Zeni series, moderately deep to deep, well-drained soils formed from weathered sandstone and mudstone, which are found mainly in the upper watershed. About 7% of the area consists of the Ferncreek-Quinliven series, clayey ultisols forming in very deep, somewhat poorly to moderately well drained soils, developed from marine sediments of marine terraces.

2.2 Big River

The soils of the Big River basin are characterized mainly by fine to coarse, loamy alfisols (NRCS 1987). The predominant soil series covering approximately 70% of the Big River basin is the Ornbaun-Zeni series, moderately deep to deep, well-drained soils formed from weathered sandstone and mudstone, two-thirds of which occur on 30 to 75% hillslope gradients. One-fourth of the basin area is composed of the Irmulco-Tramway series, Threechop-Ornbaun, and Yellowhound-Kibesillah-Ornbaun series. The Irmulco-Tramway series is characterized by moderately deep to very deep, well-drained soils, formed from weathered sandstone. The Threechop-Ornbaun series, found mostly along ridge tops, consists of deep, well-drained clayey soils formed from sandstone and mudstone. The Yellowhound-Kibesillah-Ornbaun series, also formed from deep, well-drained soils that have developed from weathered sandstone, mudstone or conglomerate, and lie mostly in stream channel and stream bank hillslope areas.

2.3 Cottaneva Creek

The soils of the Cottaneva Creek basin are characterized mainly by fine to coarse, loamy alfisols (NRCS 1987). The Dehaven-Hotel series found in channel vicinities in the western basin, formed in moderately deep to deep, well-drained soils, from weathered sandstone, and the Ornbaun-Zeni series, moderately deep to deep, well-drained soils formed from weathered sandstone and mudstone, each represent approximately one-fourth of the Rockport Coastal basin soil distribution. The Irmulco-Tramway, Yellowhound-Kibesillah and Yellowhound-Kibesillah-Ornbaun series that form moderately deep to deep, well-drained soils, and develop from weathered sandstone, mudstone or conglomerate, are distributed over 40% of the basin across the eastern half. The Ornbaun-Zeni series is found along the ridges and upper hillslopes from the western to central regions of the basin.

2.4 Garcia River

The soils of the Garcia River basin are characterized mainly by fine to coarse, loamy alfisols (NRCS 1987). One-fourth of the basin area, primarily the upper portions of hillslopes on the eastern side of the basin, is mantled by the Yellowhound-Kibesillah and Yellowhound-Kibesillah-Ornbaun series, formed from deep well-drained soils developed from weathered sandstone, mudstone or conglomerate. The lower eastern hillslopes and stream valleys (which comprise 20% of the basin area), are covered by the Dehaven-Hotel series formed in moderately deep to deep, well-drained soils, from weathered sandstone on relatively steeper hillslopes (30 to 100% slopes). Another 20% of the basin is underlain by the Irmulco-Tramway series, characterized by moderately deep to very deep, well-drained soils, formed from weathered sandstone, which dominate the lower gradient slopes west of the Garcia River.

2.5 Greenwood Creek

The soils of the Greenwood Creek assessment area are characterized mainly by fine to coarse, loamy alfisols (NRCS 1987). Twenty-five percent of the South Coastal basin is characterized by the Ornbaun-Zeni series, moderately deep to deep and well-drained soils, formed from weathered sandstone and mudstone. This soil is found in the northern upper hillslopes interspersed between the Yellowhound complexes and also found more continuously in the southern assessment area. Approximately another quarter is represented by the Woodin-Yellowhound, Yellowhound-Kibesillah and Yellowhound-Kibesillah-Ornbaun series that form moderately deep to deep, well-drained soils, and develop from weathered sandstone, mudstone or conglomerate. The remaining soil cover is characterized by a variety of other soil types including the Dehaven-Hotel series formed in moderately deep to deep, well-drained soils, from weathered sandstone, and the Irmulco-Tramway series, characterized by moderately deep to very deep, well-drained soils, formed from weathered sandstone.

2.6 Gualala River

The soils of Gualala River basin are characterized mainly by sandy and gravelly loams of inceptisols and ultisols (NRCS 1987, Laacke 1979, USDA 1999). The northern and eastern thirds of the basin (which together make up approximately half of the total basin area) are underlain by Hugo Very Gravelly Loam. This soil unit occurs on steep slopes with gradients between 30 and 75%. Hugo Very Gravelly Loam is derived from weathered fine-grained sandstone and shale. The Hugo-Josephine and Goldridge Fine Sandy Loam series cover about a third of the basin. Goldridge Fine Sandy Loam series is derived from Franciscan shale or fine-grained sandstone (Laacke 1979, USDA 1999), and most commonly occur along ridges and in upper hillslope areas. The Hugo-Josephine series, which weathers from shale or greenstone (Laacke 1979, USDA 1999), occur mostly in middle hillslope areas of the central and southern parts of the Gaulala basin, between stream channels and the Goldridge Fine Sandy Loam series.

2.7 Hollow Tree Creek

The soils of the Hollow Tree Creek basin are characterized mainly by fine to coarse, loamy alfisols (NRCS 1987). Seventy percent of the basin is characterized by the Yellowhound-Woodin, Yellowhound-Kibesillah and Yellowhound-Woodin-Ornbaun series that form moderately deep to deep, well-drained soils, and develop from weathered sandstone, mudstone or conglomerate. These soils are found throughout the South Fork Eel assessment area, with the Ornbaun-Zeni series found along the ridges and upper hillslopes of the western perimeter. The Ornbaun-Zeni series underlies 15% of the basin area, consisting of moderately deep to deep and well-drained soils, formed from weathered sandstone and mudstone.

2.8 Navarro River

The soils of the Navarro River basin are characterized mainly by fine to coarse, loamy alfisols (NRCS 1987). The predominant soil series in the Navarro River basin is the Ornbaun-Zeni series, which covers about 60% of the basin. This series is typified by moderately deep to deep, well-drained soils formed from weathered sandstone and mudstone. The bulk of this series occurs on hillslopes with gradients ranging from 30 to 75%. One-fourth of the basin is underlain by the Irmulco-Tramway, Yellowhound-Kibesillah and Yellowhound-Kibesillah-Ornbaun series, also formed from moderately deep to deep, well-drained soils, and developed from weathered sandstone, mudstone or conglomerate. The Irmulco-Tramway series is found dominantly in the western half of the basin. The Yellowhound-Kibesillah and Yellowhound-Kibesillah-Ornbaun soils are distributed along and in the vicinity of stream and tributaries channels of the eastern basin half.

2.9 Noyo River

The soils of the Noyo River basin are characterized mainly by fine to coarse, loamy alfisols (NRCS 1987). Sixty-four percent of the Noyo River basin is underlain by the Ornbaun-Zeni series, a moderately deep to deep, well-drained soils formed from weathered sandstone and mudstone. One-fourth of the basin surface is characterized by the Yellowhound-Kibesillah and Yellowhound-Kibesillah-Ornbaun series, also formed from moderately deep to deep, well-drained soils, and developed from weathered sandstone, mudstone or conglomerate. These soils occur in patches that extend between channels and ridges across the western half of the basin.

2.10 Northern Russian River and Willow/Freezeout Creek

The soils of the Russian River basin are characterized mainly by fine to coarse, loamy alfisols and inceptisols (NRCS 1987). The Casabonne-Wohly loams and Casabonne-Wohly-Pardaloe series characterize approximately 20% of the Russian River basin. This soil is formed in moderately deep to deep, well-drained soils formed from weathered sandstone, siltstone or shale, occurring in the Russian River basin mainly on hillslopes with gradients ranging from 30 to 75% throughout the central portion of the basin. Another 20% is characterized by the Hugo very gravelly loam. One-third of the basin is also represented by Yorktree-Hopland-Woodin, Helty-Silt Loam and the Ornbaun-Zeni series, which is distributed in the western third and the eastern perimeter of the basin assessment area. The Yorktree-Hopland-Woodin series is moderately deep to deep, well-drained soils, formed from sandstone or shale. The Ornbaun-Zeni series is moderately deep to deep and well-drained, formed from weathered sandstone and mudstone.

Table G-1. Soil descriptions by basin.

Basin name	Dominant soil type[1]	Dominant soil series	% basin area	General description		
				Location	Parent material	Degree drained
Albion	Fine to coarse, loamy alfisols	Irmulco-Tramway	40	Throughout basin, moderately to very deep depths	Sandstone	Well-drained
		Dehaven-Hotel, Dehaven-Hotel-Irmulco	20	Straddles the North Fork and South Fork Albion Rivers, distributed around tributaries to these rivers, on 30–100% gradient hillslopes, moderately deep to deep depths	Sandstone	Well-drained
		Ornbaun-Zeni	18	Mainly in upper watershed, moderately deep to deep depths	Sandstone and mudstone	Well-drained
	Clayey ultisols	Ferncreek-Quinliven	7	Deep depths	Marine sediments	Somewhat poorly to moderately well-drained
Big	Fine to coarse, loamy alfisols	Ornbaun-Zeni	70	30–70% gradient hillslopes, moderately deep to deep depths	Sandstone and mudstone	Well-drained
		Irmulco-Tramway	25	Moderately deep to very deep depths	Sandstone	Well-drained
	Clayey	Threechop-Ornbaun		Mostly on ridgetops, deep depths	Sandstone and mudstone	Well-drained
	Fine to coarse, loamy alfisols	Yellowhound-Kibesillah-Ornbaun		Stream channel and stream bank hillslopes, at deep depths	Sandstone, mudstone or conglomerate	Well-drained

Basin name	Dominant soil type[1]	Dominant soil series	% basin area	General description		
				Location	Parent material	Degree drained
Garcia	Fine to coarse, loamy alfisols	Yellowhound-Kibesillah, Yellowhound-Kibesillah-Ornbuan	25	Upper portions of hillslopes on eastern side of basin, deep depths	Sandstone, mudstone or conglomerate	Well-drained
		Dehaven-Hotel	20	Lower eastern hillslopes and stream valleys, on 30–100% gradient hillslopes, moderately deep to deep depths	Sandstone	Well-drained
		Irmulco-Tramway	20	Dominate the lower gradient slopes west of the Garcia River, at moderately deep to deep depths	Sandstone	Well-drained
Gualala	Sandy and gravelly loams, inceptisols and ultisols[2]	Hugo Very Gravelly Loam	50	30–75% gradient hillslopes, on northern and eastern thirds of basin	Fine-grained sandstone and shale	Well-drained
	Gravelly sandy clay loam, gravelly loam, and sandy loam; inceptisols and ultisols	Hugo-Josephine	30	Mostly in middle hillslope areas in the central and southern parts of the Gaulala basin, between stream channels and the Goldridge Fine Sandy Loam	Shale or greenstone	Well-drained
		Goldridge Fine Sandy Loam		Most commonly occur along ridges in upper hillslopes	Franciscan shale or fine-grained sandstone	Well-drained

Basin name	Dominant soil type[1]	Dominant soil series	% basin area	General description		
				Location	Parent material	Degree drained
Navarro	Fine to coarse, loamy alfisols	Ornbaun-Zeni	60	Throughout basin on 30–75% gradient hillslopes, moderately deep to deep depths	Sandstone and mudstone	Well-drained
		Irmulco-Tramway	25	Dominantly found on western half of Navarro basin, moderately deep to deep depths	Sandstone, mudstone or conglomerate	Well-drained
		Yellowhound-Kibesillah, Yellowhound-Kibesillah-Ornbuan		Distributed along and in the vicinity of stream and tributary channels of the eastern basin half, moderately deep to deep depths	Sandstone, mudstone or conglomerate	Well-drained
Noyo	Fine to coarse, loamy alfisols	Ornbaun-Zeni	64	Throughout basin, moderately deep to deep depths	Sandstone and mudstone	Well-drained
		Yellowhound-Kibesillah, Yellowhound-Kibesillah-Ornbuan	25	Occur in patches that extend between channels and ridges across the western half of the basin, moderately deep to deep depths	Sandstone, mudstone or conglomerate	Well-drained
Rockport Coastal	Fine to coarse, loamy alfisols	Dehaven-Hotel	25	Channel vicinities in western parts of basin, moderately deep to deep depths	Sandstone	Well-drained
		Ornbaun-Zeni	25	Found along ridges and upper hillslopes from the western to central regions of the basin, moderately deep to deep depths	Sandstone and mudstone	Well-drained
		Irmulco-Tramway	40	Moderately deep to deep depths	Sandstone, mudstone or conglomerate	Well-drained
		Yellowhound-Kibesillah, Yellowhound-Kibesillah-Ornbuan				

Basin name	Dominant soil type[1]	Dominant soil series	% basin area	General description		
				Location	Parent material	Degree drained
Russian	Fine to coarse, loamy alfisols and inceptisols	Casabonne-Wohly loams, Casabonne-Wohly-Pardaloe	20	Central basin, on 30-75% gradient hillslopes, moderately deep to deep depths	Sandstone, siltstone or shale	Well-drained
		Hugo Very Gravelly Loam	20	Steep slopes 9 to 75 percent	Fine-grained sandstone and shale	Well-drained
		Yorktree-Hopland-Woodin	30	Moderately deep to deep depths	Sandstone or shale	Well-drained
		Ornbaun-Zeni		Distributed in the western third and the eastern perimeter of the basin assessment area, moderately deep to deep depths		
		Ornbaun-Zeni	25	Northern upper hillslopes between Yellowhound complexes, and in southern basin parts, moderately deep to deep depths	Sandstone or mudstone	Well-drained
South Coastal	Fine to coarse, loamy alfisols	Woodin-Yellowhound, Yellowhound-Kibesillah, Yellowhound-Woodin-Ornbaun	25	Moderately deep to deep depths	Sandstone and mudstone	Well-drained
		Yellowhound-Woodin, Yellowhound-Kibesillah, Yellowhound-Woodin-Ornbaun	70	Throughout basin, moderately deep to deep depths	Sandstone, mudstone or conglomerate	Well-drained
South Fork Eel	Fine to coarse, loamy alfisols	Ornbaun-Zeni	15	Along ridges and upper hillslopes of the western perimeter, moderately deep to deep depths	Sandstone, mudstone or conglomerate	Well-drained

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Appendix H

Hydrology Effects from Timber Harvest: Supplemental Information

1. Stormflow Processes

Understanding storm runoff processes is an important step in understanding the potential effects of timber harvest and associated road building on runoff and sediment delivery. Three processes are important in generating stormflow:

- **Subsurface Flow and Displacement.** Where hillslopes are moderately steep and the near-surface soils are highly permeable, storm runoff is generated by groundwater displacement (Beven 1981). In this process, water stored in the soil (in both saturated and unsaturated zones) is rapidly displaced by new water entering the soil during precipitation events. Isotopic tracer work has confirmed that much of the storm runoff in steep forested watersheds is actually "old" water that has been stored in near-surface soils for up to a year (Kendall et al. 1995, Pearce et al. 1986).
- **Saturation Overland Flow.** In areas of more gentle, convergent topography, saturation overland flow is the dominant storm runoff generation process (Dunne 1978, Wilson and Dietrich 1987, Montgomery and Dietrich 1995). As a storm progresses, surface flow is initiated in progressively smaller channels, and the saturated zone adjacent to channels and at the heads of first-order tributaries expands. These transiently saturated zones (or variable-source areas) then begin contributing directly to stream discharge (Hewlett and Hibbert 1967, Harr 1977, Dunne 1978).
- **Subsurface flow.** Soil macropores (Aubertin 1971) and soil pipes (Ziemer 1992) also play an important role in generating flow from storms. Soil macropores and pipes are relatively large pores, such as animal burrows, shrinkage cracks, worm holes, or root holes in an otherwise fine-grained soil, in which capillary forces are negligible and water moves downward under free gravity drainage (Dunne and Leopold 1978). Ziemer (1992) and Albright (1991) found that soil pipes convey both water and sediment to stream channels during storms. Soil pipes are thought to enhance internal drainage, rapidly reducing pore water pressure in drainage swales that would otherwise be prone to slope failure (Keppeler and Brown 1998).

Timber harvest and associated road building can affect each of these processes in a variety of ways, including compacting soils, creating areas of imperviousness, triggering road surface runoff, intercepting of subsurface flows, increasing late fall groundwater levels, and extending the channel network (EPA 2005, Lewis et al. 2001).

2. Peak Flows

While multiple watershed-scale studies have reported increases in peak flows due to forest harvest (e.g., Ziemer 1981, Wright et al. 1990, Rice et al. 1979, Rothacher 1973, Harr 1981, Jones and Grant 1996, Beschta et al. 2000, Thomas and Megahan 1998, Guillemette et al. 2005), a more recent USDA Forest Service synthesis of available data in the Pacific Northwest suggests that peak flow increases may not be clearly discernable in many watersheds and may be detected only in flows with a return period of 6 years or less (Grant et al. 2008).

Grant et al. (2008) report found that watersheds in rain-dominated regions, such as those located in the hydrology and water quality assessment area, are less sensitive to peak flow changes than watersheds that experience transient snow (i.e., seasonal snow near melting point as opposed to a persistent snowpack), and changes in peak flows are only detectable when >29% of the watershed has been harvested in rain-dominated regions. The effects of timber harvest are particularly pronounced in smaller basins (< 2,500 acres [<10 kilometers^2]), because stormflow response in small basins depends primarily on hillslope processes, while response in large basins depends primarily on total storm volume and the geomorphology of the stream channel network. Accordingly, Grant et al. (2008) inferred that small watershed (< 2,500 acres [<10 kilometers^2]) studies are likely to reflect the maximum effect of forest harvest on peak flows.

Long-term research at Caspar Creek (Lewis et al. 2001) has shown that the magnitude of change in peak flows is related to the amount of canopy removed from forest harvest, the antecedent wetness of the watershed, and the size of the event. Caspar Creek, a 5,356-acre (2,167-ha) basin in the assessment area that drains directly to the Pacific Ocean, has been the site of intensive hydrologic research and varying forest management practices since 1962. Measurements of streamflow and sediment yield throughout the study period offer insight into the hydrologic response of coastal watersheds to road building and timber harvesting. Changes in peak flow were documented during an 11-year study, including an event with a 7-year return interval, in the North Fork Caspar Creek basin (Ziemer 1998, Lewis et al. 2001). Nearly all stormflow volumes and peak discharges increased after logging, with the greatest increases being about 400% in volume and 300% in peak discharge following extended periods with little or no precipitation, but most increases were less than 100% (Ziemer 1998). Increases in both volume and peak discharge were related to the proportion of the watershed cut and were largest when the soil was dry (i.e., during the first peak flows in the fall) (Ziemer 1998). There was a mean peak flow increase of 35% in entirely clearcut subwatersheds and an increase of 16% in partially (30–50%) clearcut tributary watersheds for discharge events that occur less frequently than twice a year (Ziemer 1998). The effect of area cut on both volume and peak discharge declined with storm size; that is, cutting had less effect in large storms than in small ones. Earlier results from the South Fork Caspar Creek basin also indicated a similar pattern (Ziemer 1998).

Logging-related disturbances also appear to result in shifts in the timing of peak discharge forward in time (i.e., lag-time decreases) (Wright et al. 1990). Sendek (1985) also indicated that logging in South Fork Caspar Creek decreased the lag time for large storms but found that logging increased lag time for small storms, an effect related to logging-induced volume increases for small runoff events, especially in the fall.

Compaction of roads, skid-trails, and landings can reduce infiltration and create surface runoff (Harr et al. 1975). Conversion of shallow subsurface flow to overland flow (via interception by roadcuts), and the connection of the road drainage network to the stream network, can alter the timing of runoff and affect stormflow patterns in streams (Montgomery 1994, Jones and Grant 1996, Wemple et al. 1996). Observations of increases in peak flows at the watershed scale due to logging roads or other compacted surfaces (skid trails, landings, cable-yarding corridors, or fire-lines), however, have been inconclusive. Logging with road construction has been associated with a significant increase in peak flows in some hydrologic studies (Harr et al. 1979, Jones and Grant 1996), while not in others (Ziemer 1981, Duncan 1986, Keppeler and Ziemer 1990, Ziemer et al. 1996). For instance, Wright et al. (1990) found no significant increases in channel-forming flows following selective logging activities in South Fork Caspar Creek that resulted in compaction of approximately 15% of the watershed by skid trails, landings, and roads. However, the additional runoff from long undrained stretches of roads or other compacted surfaces can result in a faster delivery of water to channels or hillslopes. The results of studies by Jones and Grant (1996) support the hypothesis that roads can amplify the effect of clearcutting by modifying water flow paths and speeding the delivery of water to channels during storm events. The increased water delivery then results in increased stream channel scour and bank erosion. Gullies forming below culverts that drain long stretches of road are significantly more likely on steep (>40%) slopes

(Wemple et al. 1996). In some geology types (e.g., Franciscan mélange), however, gullies can form even on gentle slopes from increased road runoff.

Based upon their recent synthesis of Pacific Northwest data, including several of the studies summarized in the preceding paragraphs (Rothacher 1973; Harr et al. 1979; Ziemer 1981, 1998; Duncan 1986; Wright et al. 1990; Jones and Grant 1996; Lewis et al. 2001), Grant et al. (2008) suggest a matrix for determining the likelihood of peak flow increase given site conditions and potential management treatments, including road density, road connectivity, drainage efficiency (the routing and timing of water delivery to the channel that is dependent on intrinsic basin characteristics such as stream density, topographic relief, soil depth, and bedrock permeability and porosity), patch size of harvested areas, and presence of riparian buffers (Figure H-1).

	Likelihood of peak flow increase High ← → Low			Potential considerations
High	High	Moderate	Low	**Road density**
↕	All or most	Some	Few or none	**Road connectivity**
	Fast	Moderate	Slow	**Drainage efficiency**
	Large	Small	Thinned	**Patch size**
Low	Absent	Narrow	Wide	**Riparian buffers**

Figure H-1. Site conditions and management considerations that potentially influence peak flows. Considerations are listed in decreasing likelihood of effect. Grayscale represents theoretical range in impact of each factor (black = high, white = low). Source: Grant et al. 2008.

3. Annual Water Yield and Low Flows

Multiple studies have documented increases in annual water yield and low flows in the period following forest harvest (Rothacher 1970, Harr et al. 1979, Keppeler and Ziemer 1990, Lewis et al. 2001, Moore and Wondzell 2005, Reid and Lewis 2011, Reid 2012). Tree removal reduces evapotranspiration and interception in the forest, which can increase average soil moisture and raise dry season water tables; the net effect can be increased total water yield and summer low flows during the period following harvest (Ziemer 1987, EPA 2005). In the Pacific Northwest, annual water yields have been found to decrease slightly following forest harvest in areas where fog drip was a significant hydrologic input (Moore and Wondzell 2005). Low flows also became more extreme (i.e., lower) after harvest in the two cases where fog drip was important; however, the authors suggest that conifer-dominated riparian buffers might reduce the likelihood that forest harvest and post-harvest compositional changes would influence low flow discharge (Moore and Wondzell 2005).

Water yield and low flows can return to pre-harvest levels with forest re-growth. In the Caspar Creek Experimental Watersheds, annual water yield from the North Fork and South Fork of Casper Creek was found to return to pre-logging levels within 15 years (Ziemer et al. 1996), and reductions in forest cover of less than 20% did not result in detectable increases in annual water yield (Ziemer 1987). Reid and Lewis (2011) have recently reported that (also in the Caspar Creek Experimental Watersheds) increased dry-season flow occurred for eight years after selective logging, followed by at least 27 years of decreased dry-season flows. Other studies in the Pacific Northwest and elsewhere suggest that summer low-flows may eventually decline to below pre-logging levels as the forest regrows (Hicks et al. 1991, Perry 2007, Reid 2012).

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Appendix I

Timber Model Output and Supporting Data for the Hydrology, Beneficial Uses of Water, and Water Quality Environmental Effects Analysis

Table I-1. Area of watershed analysis units included in the primary assessment area.

Watershed Analysis Unit	Area (acres)
Albion River	14,748
Alder Creek/Schooner Gulch	12,906
Big River	33,499
Cottaneva Creek	7,798
Elk Creek	14,079
Garcia River	12,699
Greenwood Creek	9,561
Hollow Tree Creek	20,411
Navarro River	54,421
Noyo River	19,240
Rockport Small Coastal Streams	10,079
Upper Russian River	3,591
Total[1]	213,032

[1] For the primary assessment area only.

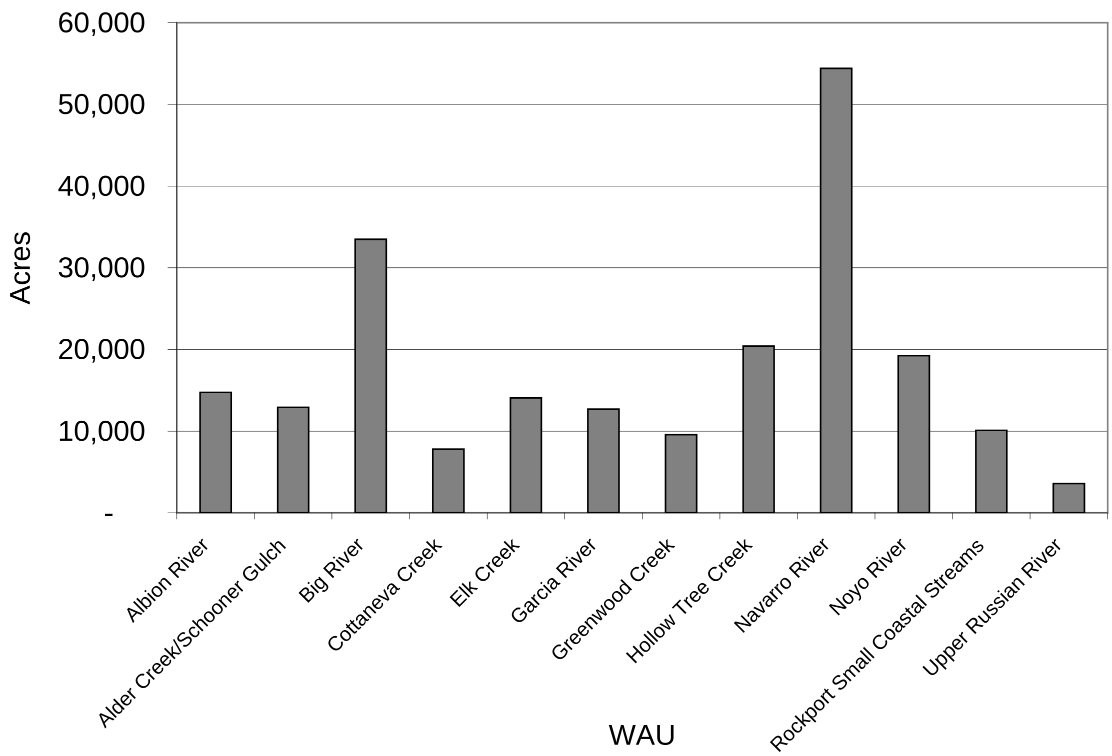

Figure I-1. Area of watershed analysis units (WAUs) included in the primary assessment area.

Table I-2. Percent harvested in the primary assessment area by planning watershed for each decade of the analysis period. Grey shaded percent harvest values exceed the presumptive threshold for significant flow effects (i.e., 50-60% for partial harvest and 30-40% for clearcut harvest).

Planning Watershed	Decade	Percent harvested by decade: Timber model output for primary assessment area (non-cumulative)					Including est. contributions from upstream harvest (cumulative)[1]
		No Action	Proposed Action	Alt A	Alt B	Alt C [2]	No Action
Albion River watershed analysis unit							
Lower Albion River	1	11%	19%	19%	13%	19%	9%
	2	18%	10%	9%	16%	10%	21%
	3	26%	22%	20%	14%	22%	24%
	4	24%	17%	15%	13%	17%	31%
	5	34%	25%	21%	13%	-	37%
	6	33%	17%	15%	15%	-	37%
	7	37%	26%	23%	12%	-	39%
	8	34%	17%	15%	14%	-	39%
Middle Albion River	1	13%	16%	15%	24%	16%	5%
	2	31%	33%	27%	13%	33%	16%
	3	33%	23%	21%	22%	23%	17%
	4	51%	39%	32%	23%	39%	26%
	5	53%	26%	22%	8%	-	27%
	6	54%	41%	34%	21%	-	27%
	7	54%	28%	25%	26%	-	28%
	8	63%	41%	35%	12%	-	31%
South Fork Albion River	1	14%	18%	17%	11%	18%	14%
	2	34%	32%	31%	7%	32%	34%
	3	37%	26%	25%	8%	26%	37%
	4	51%	39%	38%	13%	39%	51%
	5	61%	27%	26%	7%	-	61%
	6	64%	43%	40%	8%	-	64%
	7	66%	30%	27%	14%	-	66%
	8	66%	44%	41%	7%	-	66%
Upper Albion River	1	1%	7%	7%	5%	7%	1%
	2	8%	3%	3%	5%	3%	8%
	3	8%	10%	9%	5%	10%	8%
	4	11%	3%	3%	2%	3%	11%
	5	13%	11%	10%	3%	-	13%
	6	12%	3%	3%	4%	-	12%
	7	13%	11%	10%	3%	-	13%
	8	13%	3%	3%	3%	-	13%

Planning Watershed	Decade	Percent harvested by decade: Timber model output for primary assessment area (non-cumulative)					Including est. contributions from upstream harvest (cumulative)[1]
		No Action	Proposed Action	Alt A	Alt B	Alt C [2]	No Action
Alder Creek/Schooner Gulch watershed analysis unit							
Lower Brush Creek	1	5%	8%	7%	5%	8%	5%
	2	6%	9%	9%	8%	9%	6%
	3	11%	8%	8%	3%	8%	11%
	4	12%	7%	7%	4%	7%	12%
	5	9%	8%	8%	8%	-	9%
	6	12%	10%	9%	3%	-	12%
	7	13%	9%	8%	4%	-	13%
	8	15%	10%	9%	8%	-	15%
Mallo Pass Creek	1	5%	10%	10%	0%	10%	5%
	2	9%	10%	10%	0%	10%	9%
	3	10%	12%	12%	0%	12%	10%
	4	18%	10%	10%	0%	10%	18%
	5	23%	13%	12%	0%	-	23%
	6	21%	12%	10%	0%	-	21%
	7	22%	14%	12%	0%	-	22%
	8	23%	12%	10%	0%	-	23%
North Fork Alder Creek	1	18%	38%	27%	9%	38%	18%
	2	41%	26%	19%	8%	26%	41%
	3	41%	41%	33%	9%	41%	41%
	4	48%	33%	26%	6%	33%	48%
	5	62%	45%	34%	8%	-	62%
	6	55%	36%	26%	8%	-	55%
	7	59%	48%	37%	6%	-	59%
	8	68%	36%	25%	8%	-	68%
Point Arena Creek	1	1%	5%	5%	7%	5%	1%
	2	3%	6%	6%	4%	6%	3%
	3	8%	6%	5%	5%	6%	8%
	4	9%	6%	6%	5%	6%	9%
	5	10%	6%	5%	3%	-	10%
	6	12%	7%	6%	4%	-	12%
	7	11%	6%	5%	5%	-	11%
	8	12%	7%	6%	3%	-	12%
Big River watershed analysis unit							
East Branch North Fork Big River	1	1%	0%	0%	21%	0%	1%
	2	12%	41%	40%	19%	41%	12%
	3	31%	0%	0%	14%	0%	31%
	4	27%	44%	40%	14%	44%	27%
	5	36%	0%	0%	19%	-	36%
	6	36%	47%	41%	13%	-	36%
	7	45%	0%	0%	14%	-	45%
	8	44%	47%	42%	19%	-	44%

Planning Watershed	Decade	Percent harvested by decade					
		Timber model output for primary assessment area (non-cumulative)					Including est. contributions from upstream harvest (cumulative)[1]
		No Action	Proposed Action	Alt A	Alt B	Alt C [2]	No Action
Lower North Fork Big River	1	3%	8%	7%	13%	8%	2%
	2	18%	22%	22%	15%	22%	15%
	3	18%	10%	10%	14%	10%	25%
	4	30%	24%	22%	10%	24%	28%
	5	32%	12%	10%	13%	-	34%
	6	33%	25%	22%	16%	-	35%
	7	34%	15%	13%	10%	-	39%
	8	36%	25%	22%	13%	-	40%
Mettick Creek	1	21%	29%	29%	18%	29%	11%
	2	38%	32%	30%	20%	32%	23%
	3	22%	36%	33%	19%	36%	17%
	4	48%	38%	34%	15%	38%	31%
	5	62%	37%	34%	17%	-	40%
	6	74%	40%	34%	19%	-	48%
	7	76%	40%	35%	15%	-	49%
	8	77%	42%	37%	17%	-	50%
Rice Creek	1	0%	1%	1%	1%	1%	0%
	2	1%	3%	3%	1%	3%	1%
	3	2%	4%	4%	1%	4%	2%
	4	2%	3%	3%	1%	3%	2%
	5	7%	6%	5%	1%	-	7%
	6	7%	3%	3%	1%	-	7%
	7	8%	7%	5%	1%	-	8%
	8	8%	3%	3%	1%	-	8%
Russell Brook	1	7%	21%	17%	13%	21%	3%
	2	34%	29%	26%	10%	29%	12%
	3	33%	27%	20%	11%	27%	12%
	4	41%	34%	29%	9%	34%	15%
	5	58%	32%	22%	9%	-	22%
	6	60%	38%	31%	10%	-	23%
	7	68%	34%	24%	10%	-	26%
	8	68%	39%	33%	9%	-	26%
South Daugherty Creek	1	8%	18%	19%	15%	18%	8%
	2	21%	23%	22%	18%	23%	21%
	3	22%	25%	26%	14%	25%	22%
	4	34%	25%	24%	14%	25%	34%
	5	44%	28%	26%	19%	-	44%
	6	51%	27%	24%	16%	-	51%
	7	53%	32%	29%	15%	-	53%
	8	55%	28%	25%	19%	-	55%

Planning Watershed	Decade	Percent harvested by decade: Timber model output for primary assessment area (non-cumulative)					Including est. contributions from upstream harvest (cumulative)[1]
		No Action	Proposed Action	Alt A	Alt B	Alt C [2]	No Action
Two Log Creek	1	10%	22%	22%	6%	22%	7%
	2	14%	2%	2%	8%	2%	17%
	3	16%	25%	23%	6%	25%	16%
	4	21%	5%	4%	5%	5%	24%
	5	26%	27%	23%	8%	-	32%
	6	28%	5%	4%	6%	-	36%
	7	30%	29%	26%	5%	-	38%
	8	30%	5%	5%	8%	-	39%
Cottaneva Creek watershed analysis unit							
Cottaneva Creek	1	12%	23%	21%	19%	23%	12%
	2	21%	28%	25%	14%	28%	21%
	3	26%	27%	24%	19%	27%	26%
	4	37%	33%	31%	13%	33%	37%
	5	50%	32%	27%	13%	-	50%
	6	60%	36%	32%	18%	-	60%
	7	61%	32%	29%	14%	-	61%
	8	62%	36%	33%	15%	-	62%
Elk Creek watershed analysis unit							
Lower Elk Creek	1	10%	15%	14%	3%	15%	19%
	2	23%	17%	16%	2%	17%	36%
	3	26%	26%	24%	3%	26%	37%
	4	32%	21%	20%	3%	21%	47%
	5	47%	30%	27%	2%	-	59%
	6	44%	22%	20%	3%	-	57%
	7	44%	30%	27%	3%	-	60%
	8	47%	22%	20%	2%	-	61%
Upper Elk Creek	1	27%	28%	27%	27%	28%	27%
	2	46%	34%	32%	24%	34%	46%
	3	47%	33%	31%	26%	33%	47%
	4	59%	37%	34%	22%	37%	59%
	5	69%	40%	37%	21%	-	69%
	6	68%	39%	35%	25%	-	68%
	7	73%	41%	37%	22%	-	73%
	8	74%	39%	35%	21%	-	74%

Planning Watershed	Decade	Percent harvested by decade					
		Timber model output for primary assessment area (non-cumulative)					Including est. contributions from upstream harvest (cumulative)[1]
		No Action	Proposed Action	Alt A	Alt B	Alt C [2]	No Action
Garcia River watershed analysis unit							
Rolling Brook	1	8%	27%	25%	16%	27%	8%
	2	16%	14%	16%	17%	14%	23%
	3	18%	24%	25%	13%	24%	29%
	4	23%	15%	17%	14%	15%	35%
	5	30%	31%	29%	17%	-	45%
	6	33%	20%	19%	15%	-	51%
	7	35%	32%	30%	15%	-	53%
	8	42%	20%	19%	18%	-	62%
South Fork Garcia River	1	9%	35%	34%	21%	35%	9%
	2	34%	55%	51%	26%	55%	34%
	3	43%	37%	36%	25%	37%	43%
	4	53%	57%	51%	16%	57%	53%
	5	66%	39%	37%	25%	-	66%
	6	77%	60%	55%	25%	-	77%
	7	80%	42%	38%	18%	-	80%
	8	89%	61%	55%	25%	-	89%
Greenwood Creek watershed analysis unit							
Lower Greenwood Creek	1	14%	24%	23%	22%	24%	11%
	2	31%	17%	14%	17%	17%	22%
	3	37%	36%	32%	21%	36%	26%
	4	46%	22%	18%	19%	22%	33%
	5	49%	37%	33%	14%	-	42%
	6	53%	23%	18%	20%	-	42%
	7	52%	38%	33%	20%	-	43%
	8	54%	23%	19%	14%	-	45%
Upper Greenwood Creek	1	8%	10%	10%	11%	10%	8%
	2	12%	14%	12%	7%	14%	12%
	3	12%	17%	17%	15%	17%	12%
	4	19%	21%	18%	14%	21%	19%
	5	33%	19%	19%	6%	-	33%
	6	29%	22%	19%	15%	-	29%
	7	31%	20%	19%	14%	-	31%
	8	35%	22%	19%	6%	-	35%

Planning Watershed	Decade	Percent harvested by decade					
		Timber model output for primary assessment area (non-cumulative)					Including est. contributions from upstream harvest (cumulative)[1]
		No Action	Proposed Action	Alt A	Alt B	Alt C [2]	No Action
Hollow Tree Creek watershed analysis unit							
Lower Hollow Tree Creek	1	12%	15%	15%	11%	15%	14%
	2	15%	11%	10%	12%	11%	32%
	3	17%	16%	15%	10%	16%	34%
	4	22%	11%	10%	8%	11%	39%
	5	23%	17%	16%	10%	-	47%
	6	26%	12%	11%	9%	-	53%
	7	24%	18%	16%	8%	-	60%
	8	26%	12%	11%	10%	-	62%
Middle Hollow Tree Creek	1	19%	35%	34%	23%	35%	14%
	2	41%	40%	39%	23%	40%	39%
	3	52%	37%	37%	21%	37%	40%
	4	65%	45%	43%	18%	45%	46%
	5	71%	44%	40%	21%	-	56%
	6	76%	49%	44%	20%	-	63%
	7	81%	45%	40%	18%	-	74%
	8	80%	49%	44%	22%	-	75%
Mill Creek	1	10%	11%	11%	5%	11%	10%
	2	6%	0%	0%	5%	0%	6%
	3	7%	11%	11%	5%	11%	7%
	4	6%	0%	0%	3%	0%	6%
	5	8%	13%	12%	5%	-	8%
	6	9%	0%	0%	5%	-	9%
	7	8%	13%	12%	3%	-	8%
	8	11%	0%	0%	5%	-	11%
Upper Hollow Tree Creek	1	9%	35%	34%	30%	35%	9%
	2	36%	30%	29%	29%	30%	36%
	3	26%	34%	35%	25%	34%	26%
	4	22%	29%	29%	22%	29%	22%
	5	39%	43%	40%	28%	-	39%
	6	48%	33%	30%	25%	-	48%
	7	65%	45%	41%	22%	-	65%
	8	69%	34%	30%	28%	-	69%
Navarro River watershed analysis unit							
Dutch Henry Creek	1	8%	5%	5%	13%	5%	16%
	2	16%	39%	38%	8%	39%	20%
	3	33%	5%	5%	13%	5%	39%
	4	46%	50%	46%	11%	50%	48%
	5	46%	5%	5%	7%	-	52%
	6	51%	53%	47%	15%	-	58%
	7	52%	6%	5%	11%	-	61%
	8	55%	54%	47%	7%	-	64%

Planning Watershed	Decade	Percent harvested by decade					
		Timber model output for primary assessment area (non-cumulative)					Including est. contributions from upstream harvest (cumulative)[1]
		No Action	Proposed Action	Alt A	Alt B	Alt C [2]	No Action
Flynn Creek	1	28%	30%	25%	15%	30%	28%
	2	27%	11%	8%	22%	11%	27%
	3	36%	33%	25%	14%	33%	36%
	4	36%	11%	8%	9%	11%	36%
	5	36%	36%	28%	19%	-	36%
	6	40%	12%	8%	12%	-	40%
	7	38%	37%	30%	10%	-	38%
	8	39%	14%	10%	22%	-	39%
Hendy Woods	1	1%	1%	1%	2%	1%	Insufficient data to estimate contributions from upstream planning watershed harvest
	2	6%	5%	5%	3%	5%	
	3	7%	1%	1%	4%	1%	
	4	8%	9%	8%	4%	9%	
	5	8%	1%	1%	3%	-	
	6	11%	11%	10%	4%	-	
	7	10%	1%	1%	4%	-	
	8	11%	11%	10%	3%	-	
John Smith Creek	1	17%	43%	41%	22%	43%	17%
	2	24%	6%	6%	18%	6%	24%
	3	30%	44%	40%	16%	44%	30%
	4	45%	6%	6%	14%	6%	45%
	5	46%	48%	43%	17%	-	46%
	6	50%	7%	6%	14%	-	50%
	7	50%	48%	42%	16%	-	50%
	8	52%	7%	6%	18%	-	52%
Little N. Fork Navarro River	1	24%	46%	46%	24%	46%	24%
	2	23%	23%	22%	27%	23%	23%
	3	50%	50%	46%	25%	50%	50%
	4	51%	24%	21%	15%	24%	51%
	5	61%	52%	48%	24%	-	61%
	6	68%	28%	24%	27%	-	68%
	7	75%	56%	51%	17%	-	75%
	8	78%	29%	25%	24%	-	78%
Lower S. Branch Navarro River	1	13%	38%	38%	28%	38%	11%
	2	18%	21%	20%	23%	21%	25%
	3	28%	47%	45%	28%	47%	25%
	4	54%	20%	20%	25%	20%	39%
	5	46%	54%	51%	22%	-	47%
	6	63%	24%	21%	29%	-	56%
	7	70%	58%	52%	26%	-	64%
	8	75%	25%	22%	22%	-	64%

Planning Watershed	Decade	Percent harvested by decade: Timber model output for primary assessment area (non-cumulative)					Including est. contributions from upstream harvest (cumulative)[1]
		No Action	Proposed Action	Alt A	Alt B	Alt C [2]	No Action
Middle Navarro River	1	10%	23%	20%	6%	23%	Insufficient data to estimate contributions from upstream planning watershed harvest
	2	25%	11%	7%	6%	11%	
	3	23%	27%	21%	9%	27%	
	4	41%	30%	21%	11%	30%	
	5	49%	31%	25%	6%	-	
	6	56%	32%	24%	8%	-	
	7	63%	32%	26%	11%	-	
	8	62%	32%	26%	6%	-	
Middle S. Branch Navarro River	1	19%	30%	29%	28%	30%	11%
	2	20%	26%	24%	25%	26%	27%
	3	26%	42%	40%	29%	42%	24%
	4	43%	34%	32%	27%	34%	34%
	5	55%	49%	45%	23%	-	47%
	6	64%	36%	33%	29%	-	53%
	7	72%	52%	46%	27%	-	62%
	8	72%	39%	33%	24%	-	61%
Mouth of Navarro River	1	13%	21%	19%	18%	21%	Insufficient data to estimate contributions from upstream planning watershed harvest
	2	25%	17%	12%	15%	17%	
	3	32%	25%	22%	14%	25%	
	4	39%	18%	13%	14%	18%	
	5	42%	28%	25%	14%	-	
	6	45%	19%	15%	13%	-	
	7	44%	28%	24%	14%	-	
	8	45%	19%	15%	14%	-	
North Fork Indian Creek	1	2%	0%	0%	4%	-	2%
	2	3%	12%	12%	4%	12%	3%
	3	7%	0%	0%	9%	0%	7%
	4	7%	19%	18%	5%	19%	7%
	5	20%	0%	0%	5%	0%	20%
	6	15%	20%	19%	9%	-	15%
	7	15%	0%	0%	5%	-	15%
	8	19%	21%	19%	5%	-	19%
North Fork Navarro River	1	20%	33%	28%	16%	33%	16%
	2	28%	14%	8%	12%	14%	24%
	3	34%	39%	32%	10%	39%	33%
	4	42%	15%	8%	13%	15%	42%
	5	46%	40%	36%	11%	-	48%
	6	48%	15%	9%	10%	-	54%
	7	49%	41%	35%	11%	-	58%
	8	49%	15%	12%	12%	-	60%

Planning Watershed	Decade	Percent harvested by decade					
		Timber model output for primary assessment area (non-cumulative)					Including est. contributions from upstream harvest (cumulative)[1]
		No Action	Proposed Action	Alt A	Alt B	Alt C [2]	No Action
Ray Gulch	1	15%	1%	1%	12%	1%	Insufficient data to estimate contributions from upstream planning watershed harvest
	2	23%	46%	38%	3%	46%	
	3	34%	6%	6%	7%	6%	
	4	35%	47%	38%	9%	47%	
	5	44%	13%	11%	3%	-	
	6	51%	52%	41%	7%	-	
	7	60%	14%	13%	10%	-	
	8	58%	54%	43%	3%	-	
Upper Navarro River	1	19%	22%	22%	12%	22%	7%
	2	32%	16%	16%	22%	16%	14%
	3	28%	26%	23%	29%	26%	14%
	4	58%	48%	41%	18%	48%	24%
	5	69%	29%	24%	23%	-	28%
	6	74%	49%	44%	30%	-	31%
	7	82%	37%	34%	19%	-	33%
	8	85%	52%	45%	23%	-	35%
Upper S. Branch Navarro River	1	4%	14%	14%	18%	14%	4%
	2	33%	28%	27%	19%	28%	33%
	3	22%	15%	15%	18%	15%	22%
	4	27%	31%	30%	13%	31%	27%
	5	41%	17%	16%	20%	-	41%
	6	45%	36%	32%	18%	-	45%
	7	53%	20%	18%	13%	-	53%
	8	52%	37%	33%	20%	-	52%
Noyo River watershed analysis unit							
Hayworth Creek	1	13%	21%	17%	20%	21%	13%
	2	29%	24%	19%	19%	24%	29%
	3	36%	30%	22%	14%	30%	36%
	4	42%	27%	20%	16%	27%	42%
	5	50%	32%	26%	18%	-	50%
	6	58%	28%	23%	15%	-	58%
	7	57%	34%	27%	16%	-	57%
	8	60%	28%	21%	18%	-	60%
McMullen Creek	1	5%	0%	0%	8%	0%	5%
	2	4%	12%	5%	8%	12%	4%
	3	6%	0%	0%	8%	0%	6%
	4	8%	25%	12%	9%	25%	8%
	5	22%	0%	0%	9%	-	22%
	6	23%	26%	16%	8%	-	23%
	7	23%	0%	0%	9%	-	23%
	8	24%	27%	15%	9%	-	24%

Planning Watershed	Decade	Percent harvested by decade: Timber model output for primary assessment area (non-cumulative)					Including est. contributions from upstream harvest (cumulative)[1]
		No Action	Proposed Action	Alt A	Alt B	Alt C [2]	No Action
Middle Fork N. Fork Noyo River	1	25%	39%	39%	16%	39%	25%
	2	23%	14%	12%	23%	14%	23%
	3	26%	50%	47%	20%	50%	26%
	4	43%	14%	12%	16%	14%	43%
	5	59%	55%	53%	21%	-	59%
	6	67%	15%	14%	20%	-	67%
	7	63%	65%	60%	17%	-	63%
	8	68%	18%	16%	21%	-	68%
North Fork Noyo River	1	16%	32%	28%	20%	32%	10%
	2	30%	30%	26%	16%	30%	16%
	3	43%	34%	28%	17%	34%	22%
	4	48%	31%	28%	15%	31%	29%
	5	58%	35%	31%	14%	-	37%
	6	65%	34%	30%	17%	-	42%
	7	64%	36%	30%	15%	-	41%
	8	65%	34%	29%	14%	-	43%
Olds Creek	1	5%	5%	4%	8%	5%	4%
	2	8%	11%	10%	7%	11%	6%
	3	12%	6%	5%	10%	6%	9%
	4	21%	20%	18%	9%	20%	14%
	5	23%	6%	5%	7%	-	21%
	6	25%	21%	19%	10%	-	22%
	7	26%	6%	5%	9%	-	22%
	8	27%	23%	21%	7%	-	24%
Redwood Creek	1	2%	9%	8%	5%	9%	2%
	2	4%	4%	4%	7%	4%	4%
	3	10%	10%	8%	7%	10%	10%
	4	13%	7%	6%	4%	7%	13%
	5	15%	11%	9%	6%	-	15%
	6	16%	7%	6%	7%	-	16%
	7	16%	11%	9%	4%	-	16%
	8	18%	9%	8%	6%	-	18%
Rockport Small Coastal Streams watershed analysis unit							
Hardy Creek	1	13%	24%	24%	17%	24%	13%
	2	28%	25%	25%	12%	25%	28%
	3	35%	28%	27%	15%	28%	35%
	4	40%	23%	25%	19%	23%	40%
	5	50%	29%	28%	10%	-	50%
	6	53%	28%	25%	16%	-	53%
	7	55%	39%	37%	18%	-	55%
	8	57%	36%	30%	12%	-	57%

Planning Watershed	Decade	Percent harvested by decade: Timber model output for primary assessment area (non-cumulative)					Including est. contributions from upstream harvest (cumulative)[1]
		No Action	Proposed Action	Alt A	Alt B	Alt C [2]	No Action
Howard Creek	1	10%	37%	35%	16%	37%	10%
	2	24%	14%	14%	18%	14%	24%
	3	27%	36%	35%	14%	36%	27%
	4	30%	14%	14%	12%	14%	30%
	5	40%	42%	40%	19%	-	40%
	6	43%	16%	14%	14%	-	43%
	7	50%	47%	42%	12%	-	50%
	8	50%	17%	15%	19%	-	50%
Juan Creek	1	11%	24%	23%	21%	24%	11%
	2	21%	49%	46%	27%	49%	21%
	3	53%	25%	24%	18%	25%	53%
	4	50%	49%	45%	17%	49%	50%
	5	56%	27%	25%	28%	-	56%
	6	74%	54%	48%	20%	-	74%
	7	76%	33%	31%	16%	-	76%
	8	86%	58%	49%	28%	-	86%
Upper Russian River watershed analysis unit							
Upper Ackerman Creek	1	5%	9%	9%	9%	9%	5%
	2	6%	10%	10%	8%	10%	6%
	3	6%	9%	9%	4%	9%	6%
	4	12%	12%	10%	10%	12%	12%
	5	16%	10%	10%	7%	-	16%
	6	18%	12%	11%	5%	-	18%
	7	19%	10%	10%	10%	-	19%
	8	20%	13%	12%	9%	-	20%

[1] Because the hydrologic response to timber harvest is spatially cumulative (i.e., hydrology in a given planning watershed would be affected by harvest occurring within the planning watershed itself and harvest occurring in any upstream planning watershed), the MRC timber model output is considered in a spatially cumulative manner for particular cases. Since peak flow increases combine to yield a lower percentage increase with distance downstream, spatially cumulative calculations only make sense for those planning watersheds that exceed the presumptive threshold for peak flow effects. Exceedances to the presumptive thresholds for peak flow effects (50–60% for partial harvest methods, 30–40% for clear cut) primarily occur for the No Action alternative, so estimation of cumulative peak flow effects is carried out for all planning watersheds under this alternative. For other alternatives, harvest estimates by planning watershed are generally sufficiently low that spatially cumulative calculations are not needed.

[2] "-" indicates that no harvest is estimated because Alternative C stops after decade 4.

Table I-3. Planning Watersheds exceeding percent harvest thresholds (50-60% for partial harvest, 30-40% for clearcut harvest) for peak flow effects under the No Action alternative.

Watershed Analysis Unit	Planning Watershed
Albion River	South Fork Albion River
Alder/Creek Schooner Gulch	North Fork Alder Creek
Big River	South Daugherty Creek
Cottoneva Creek	Cottoneva Creek
Elk Creek	Lower Elk Creek
	Upper Elk Creek
Garcia River	Rolling Brook
	South Fork Garcia River
Hollow Tree Creek	Lower Hollow Tree Creek
	Middle Hollow Tree Creek
	Upper Hollow Tree Creek
Navarro River	Dutch Henry
	John Smith Creek
	Little N. Fork Navarro River
	Lower S. Branch Navarro River
	Middle S. Branch Navarro River
	North Fork Navarro River
	Upper S. Branch Navarro River
Noyo River	Hayworth Creek
	Middle Fork N. Fork Noyo River
Rockport Small Coastal Streams	Hardy Creek
	Howard Creek
	Juan Creek

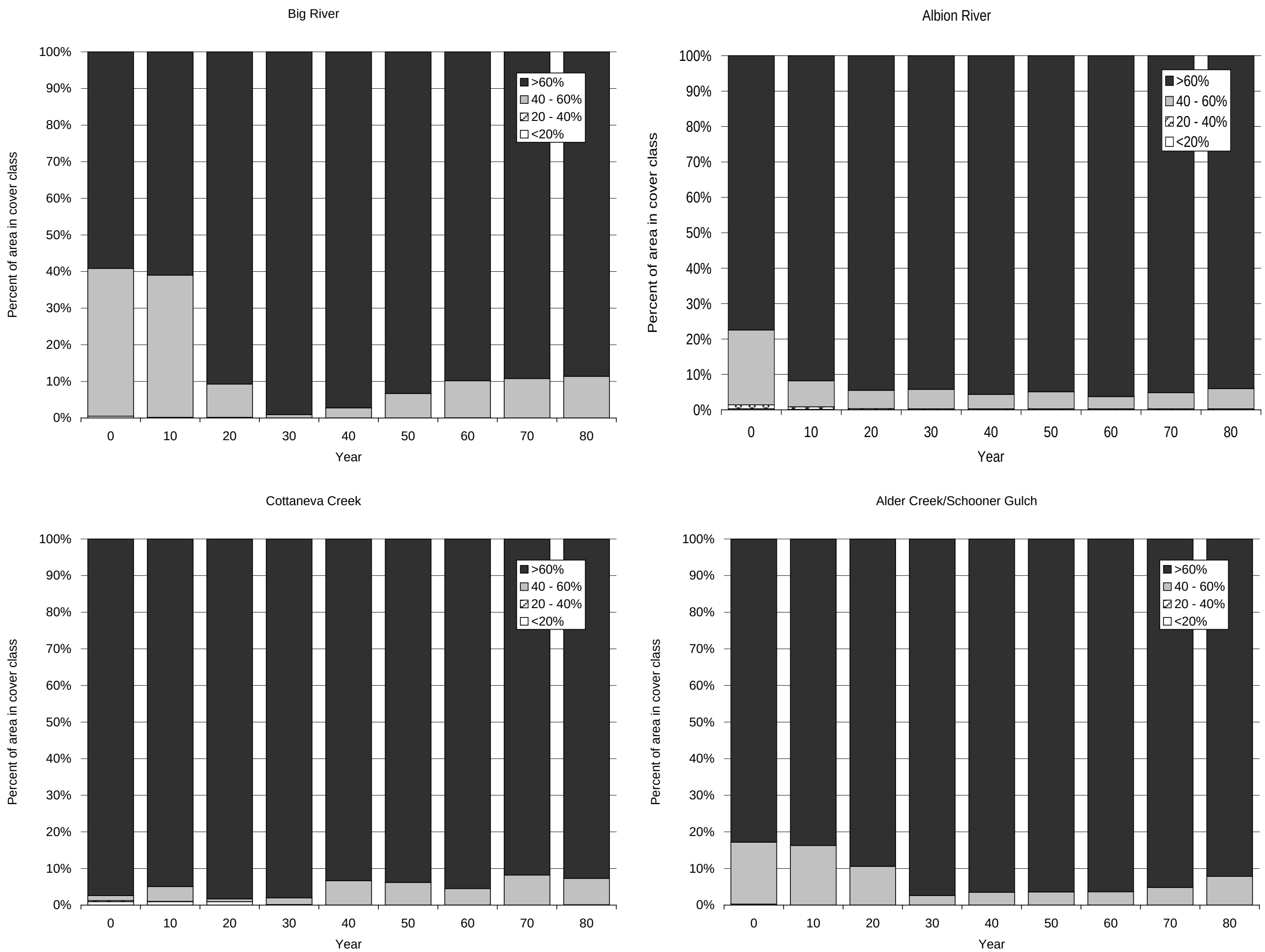

Figure I-2a. Riparian canopy closure by watershed analysis unit for each decade of the analysis period under the No Action alternative. Data are from MRC's 2010 timber modeling output.

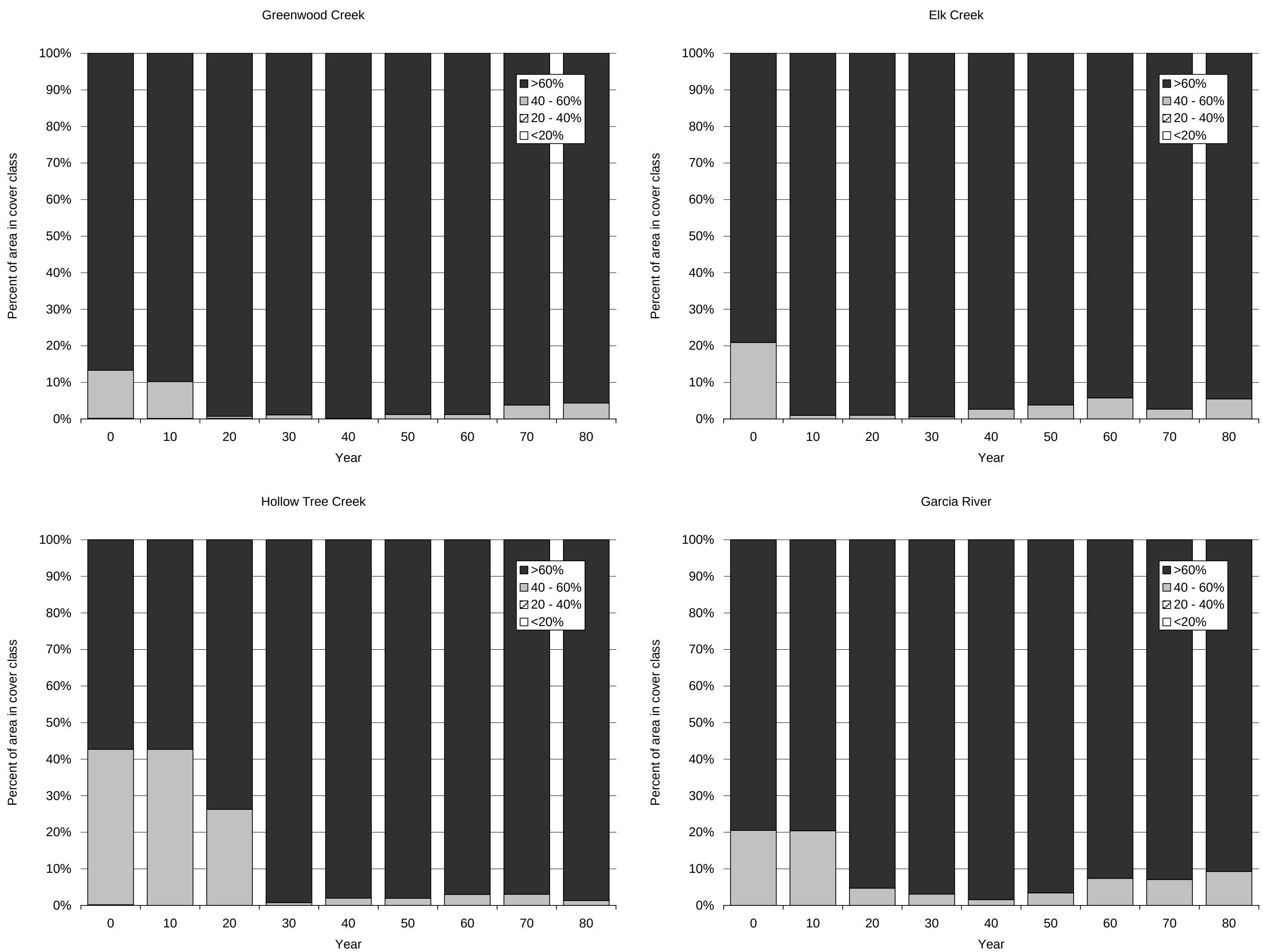

Figure I-2b. Riparian canopy closure by watershed analysis unit for each decade of the analysis period under the No Action alternative. Data are from MRC's 2010 timber modeling output.

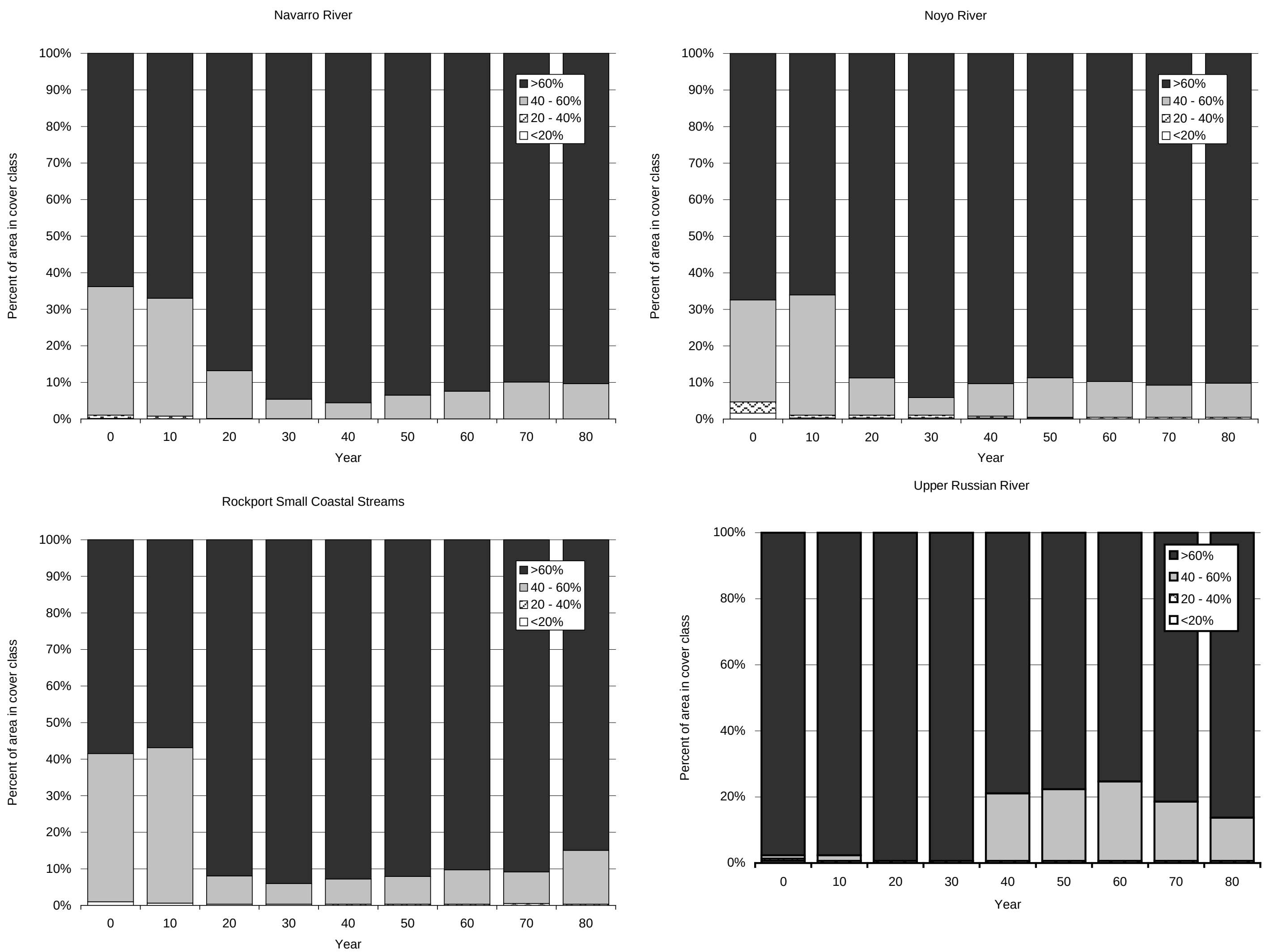

Figure I-2c. Riparian canopy closure by watershed analysis unit for each decade of the analysis period under the No Action alternative. Data are from MRC's 2010 timber modeling output.

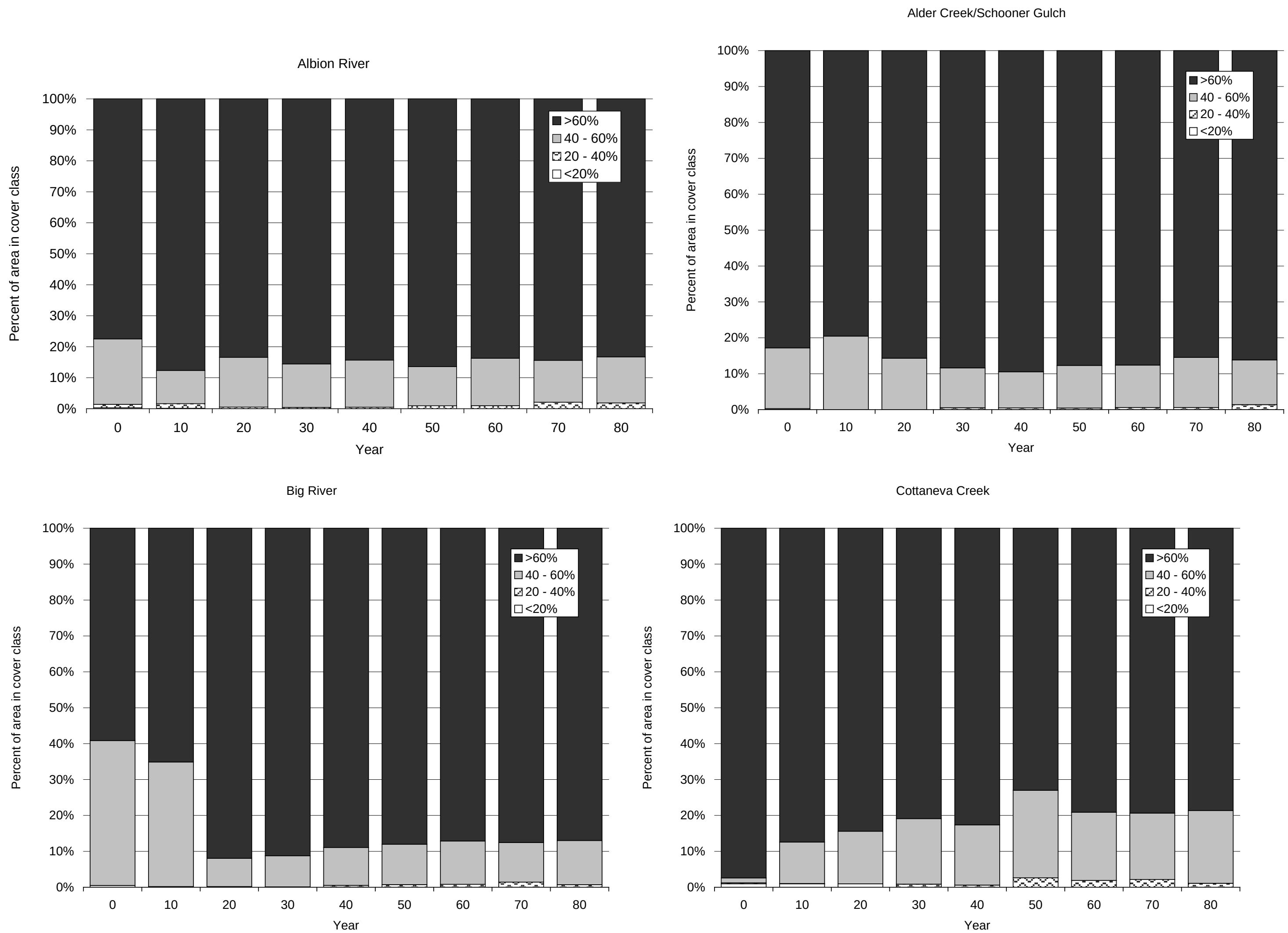

Figure I-3a. Riparian canopy closure by watershed analysis unit for each decade of the analysis period under the Proposed Action. Data are from MRC's 2010 timber modeling output.

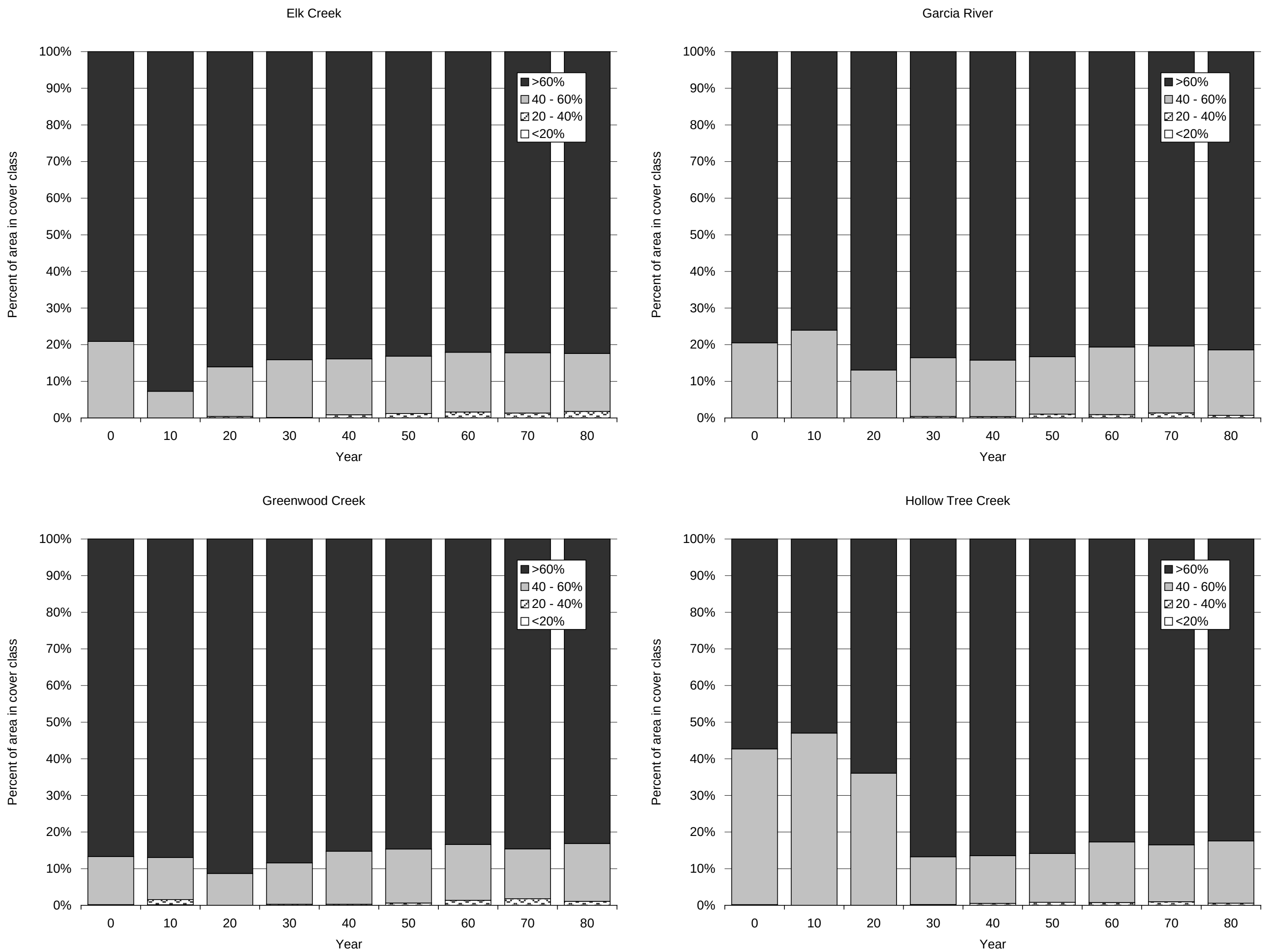

Figure I-3b. Riparian canopy closure by watershed analysis unit for each decade of the analysis period under the Proposed Action. Data are from MRC's 2010 timber modeling output.

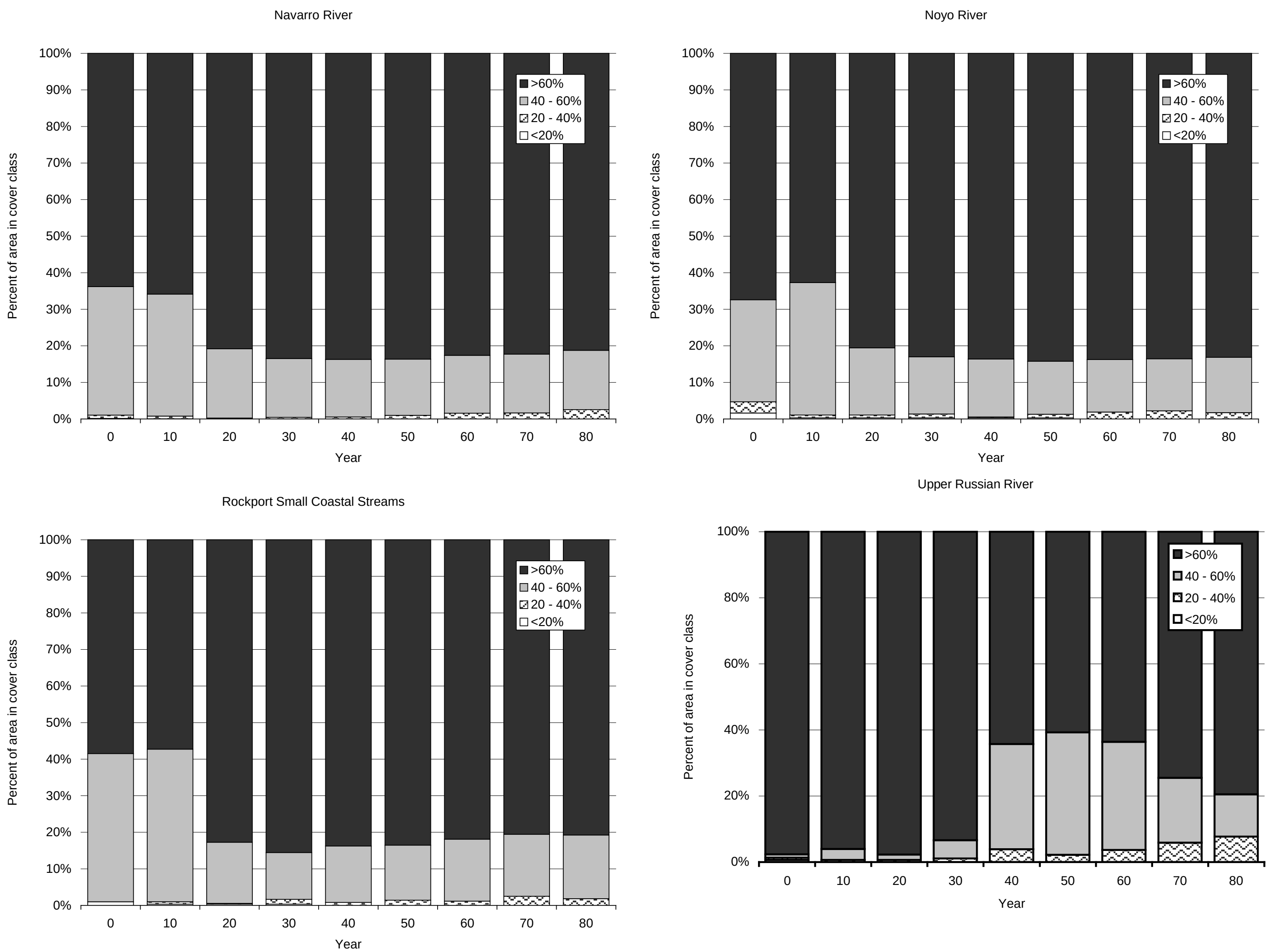

Figure I-3c. Riparian canopy closure by watershed analysis unit for each decade of the analysis period under the Proposed Action. Data are from MRC's 2010 timber modeling output.

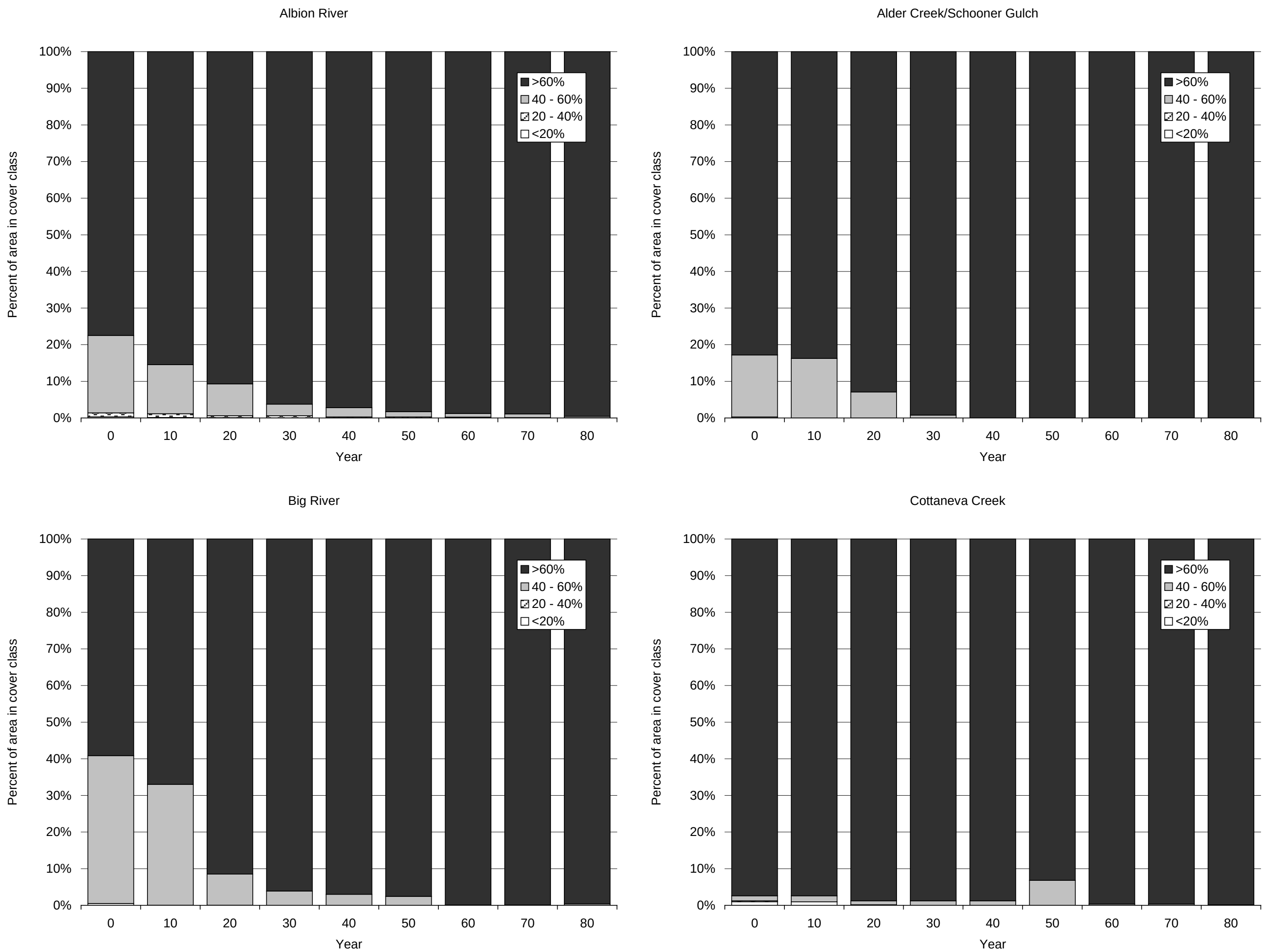

Figure I-4a. Riparian canopy closure by watershed analysis unit for each decade of the analysis period under Alternative A. Data are from MRC's 2010 timber modeling output.

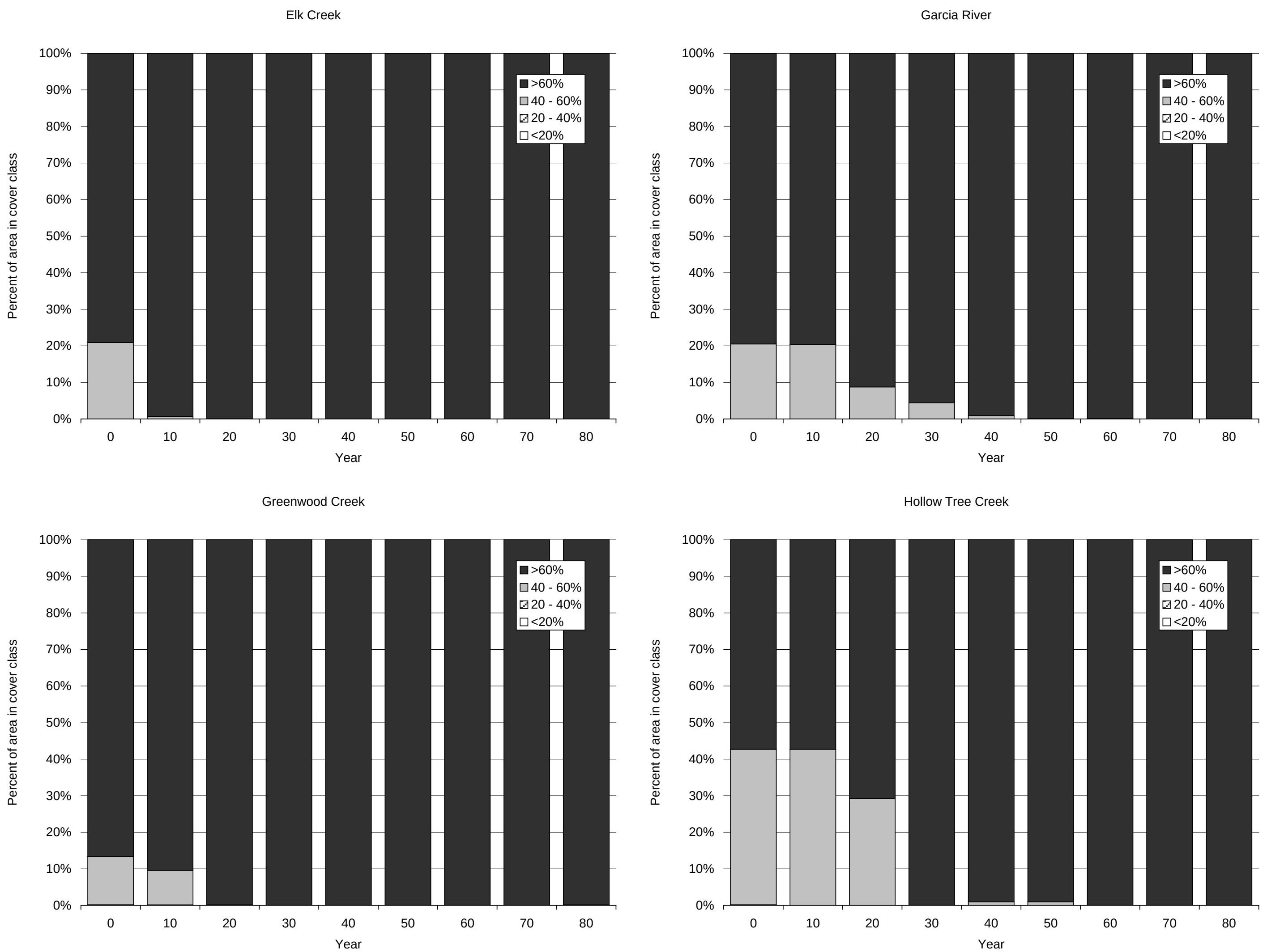

Figure I-4b. Riparian canopy closure by watershed analysis unit for each decade of the analysis period under Alternative A. Data are from MRC's 2010 timber modeling output.

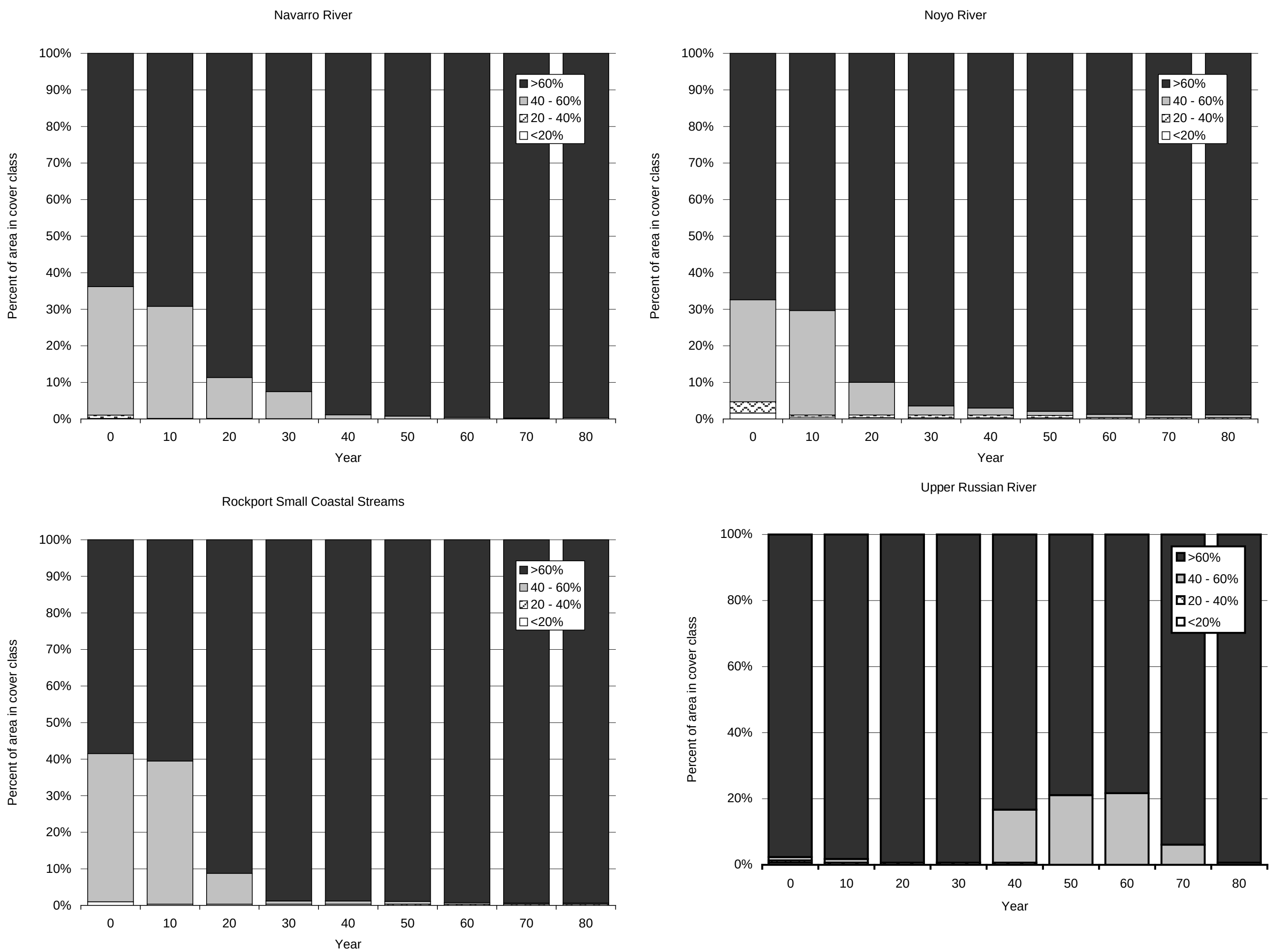

Figure I-4c. Riparian canopy closure by watershed analysis unit for each decade of the analysis period under Alternative A. Data are from MRC's 2010 timber modeling output.

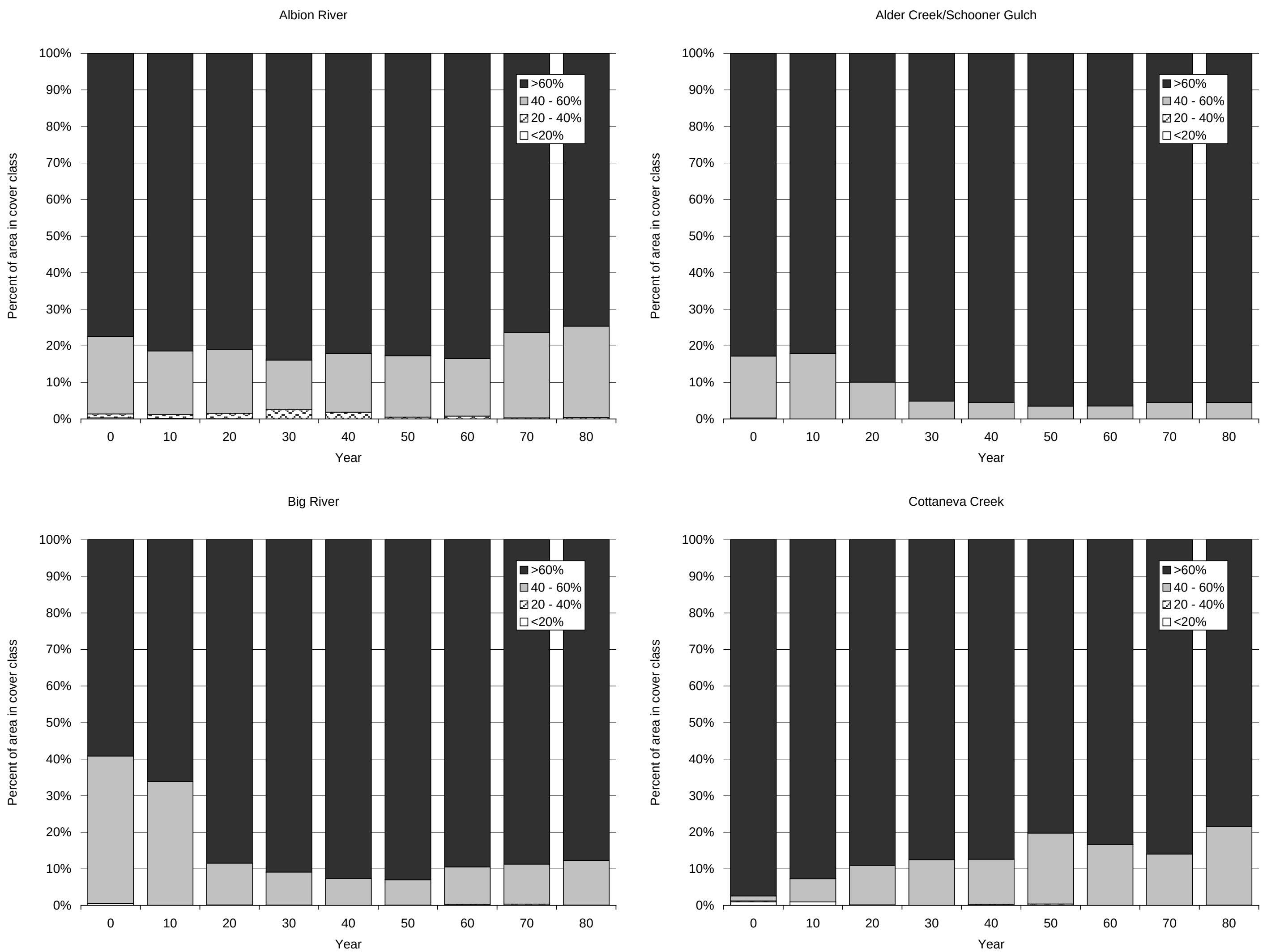

Figure I-5a. Riparian canopy closure by watershed analysis unit for each decade of the analysis period under Alternative B. Data are from MRC's 2010 timber modeling output.

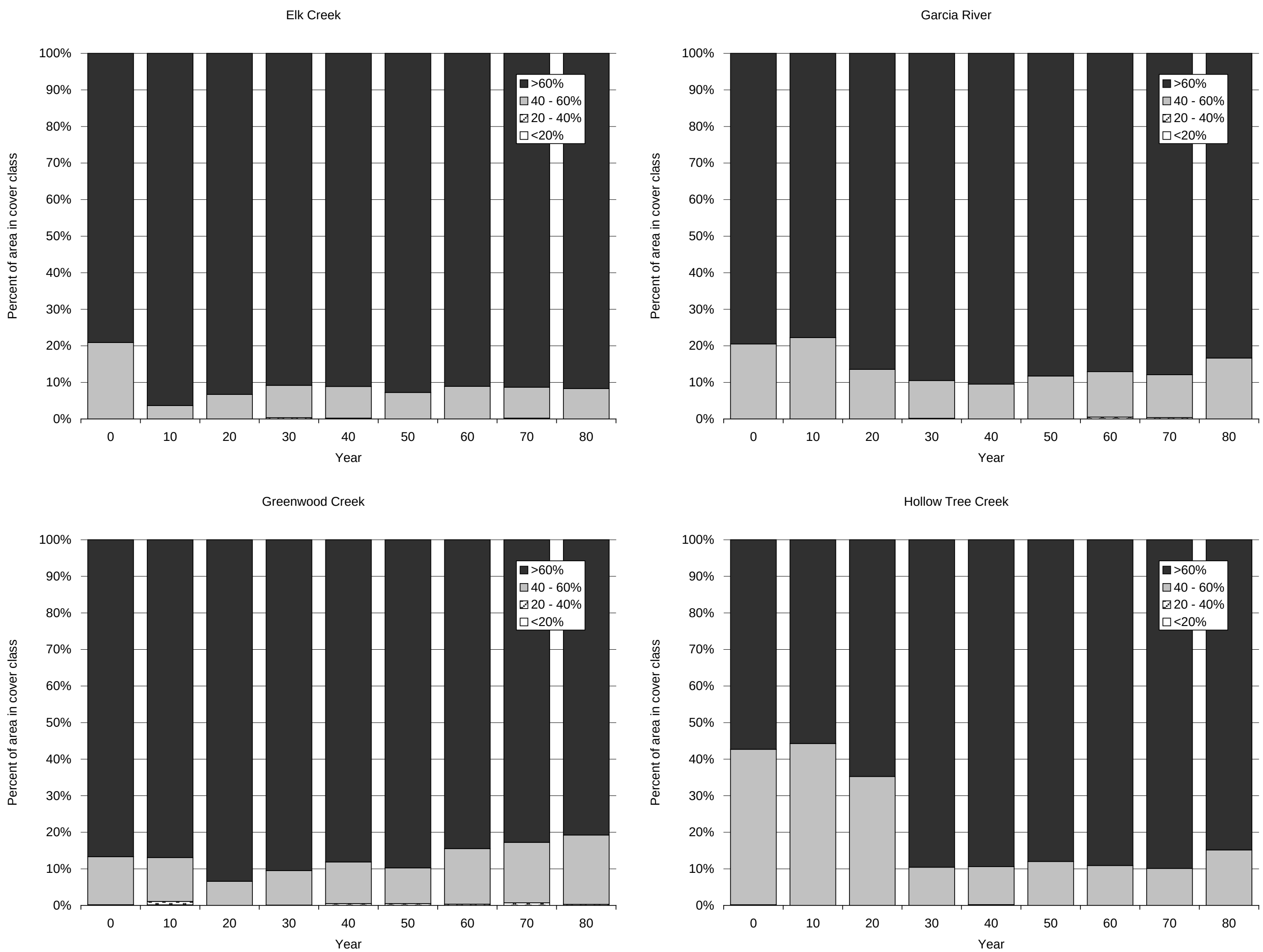

Figure I-5b. Riparian canopy closure by watershed analysis unit for each decade of the analysis period under Alternative B. Data are from MRC's 2010 timber modeling output.

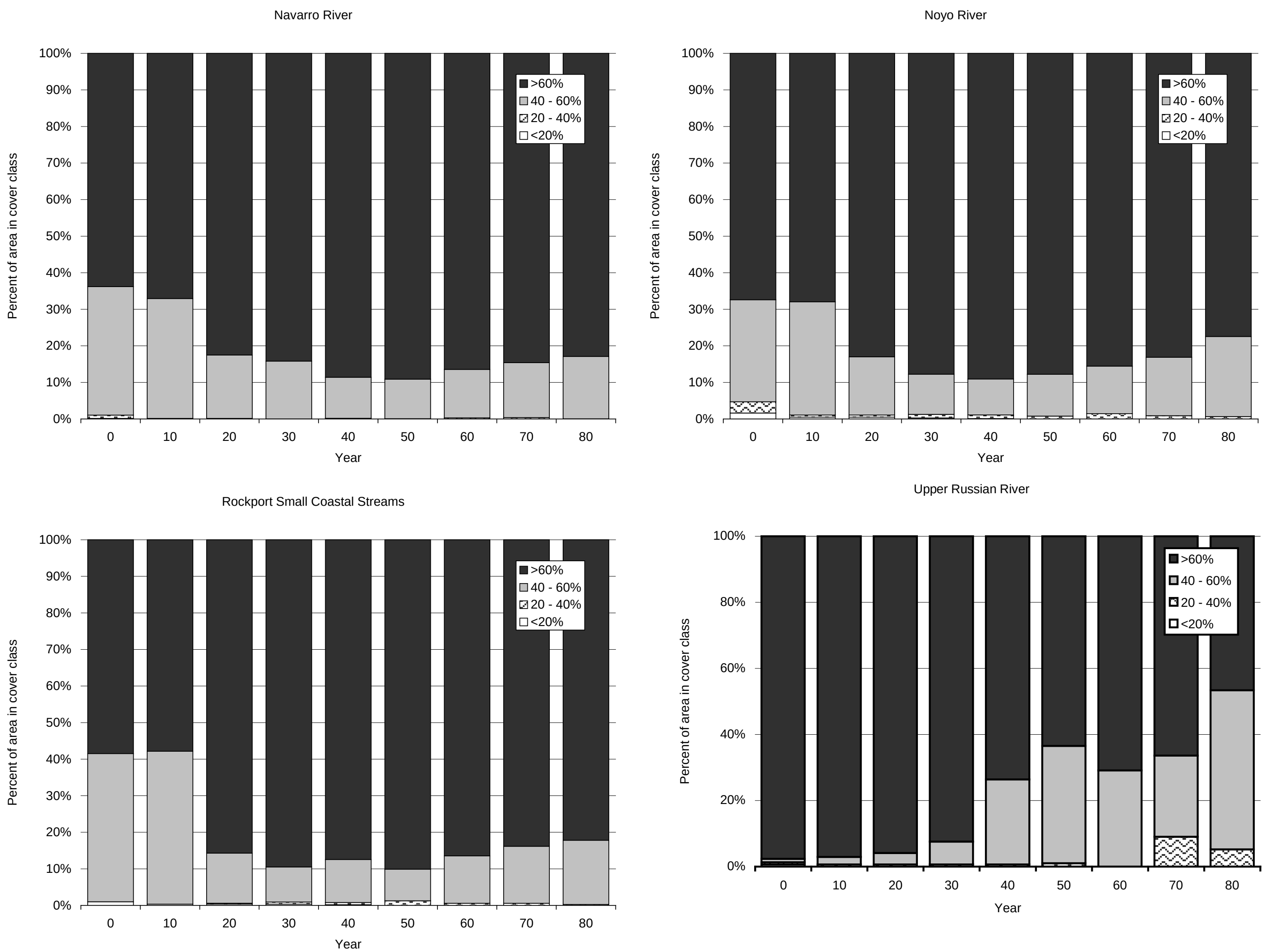

Figure I-5c. Riparian canopy closure by watershed analysis unit for each decade of the analysis period under Alternative B. Data are from MRC's 2010 timber modeling output.

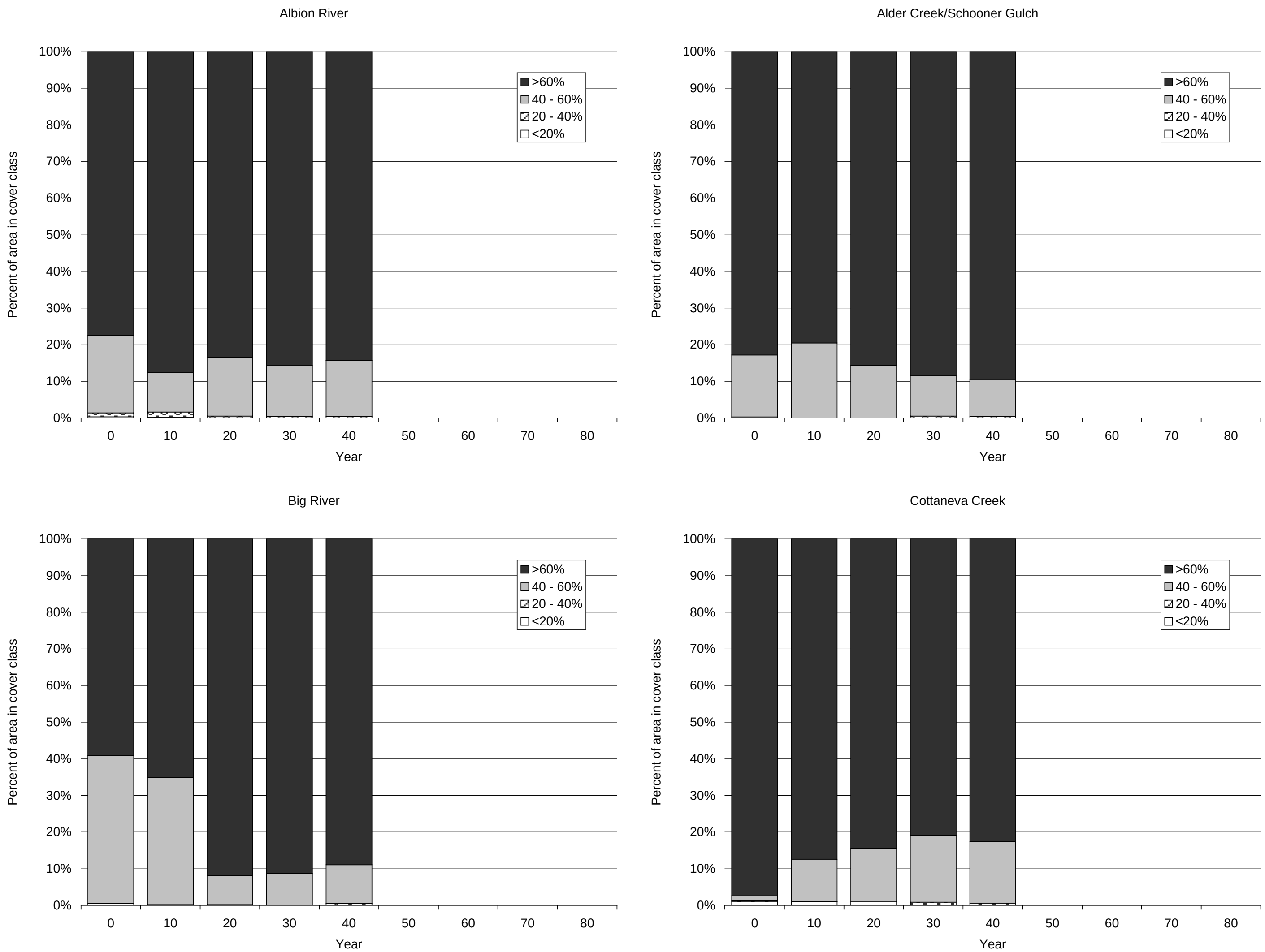

Figure I-6a. Riparian canopy closure by watershed analysis unit for each decade of the analysis period under Alternative C. Data are from MRC's 2010 timber modeling output.

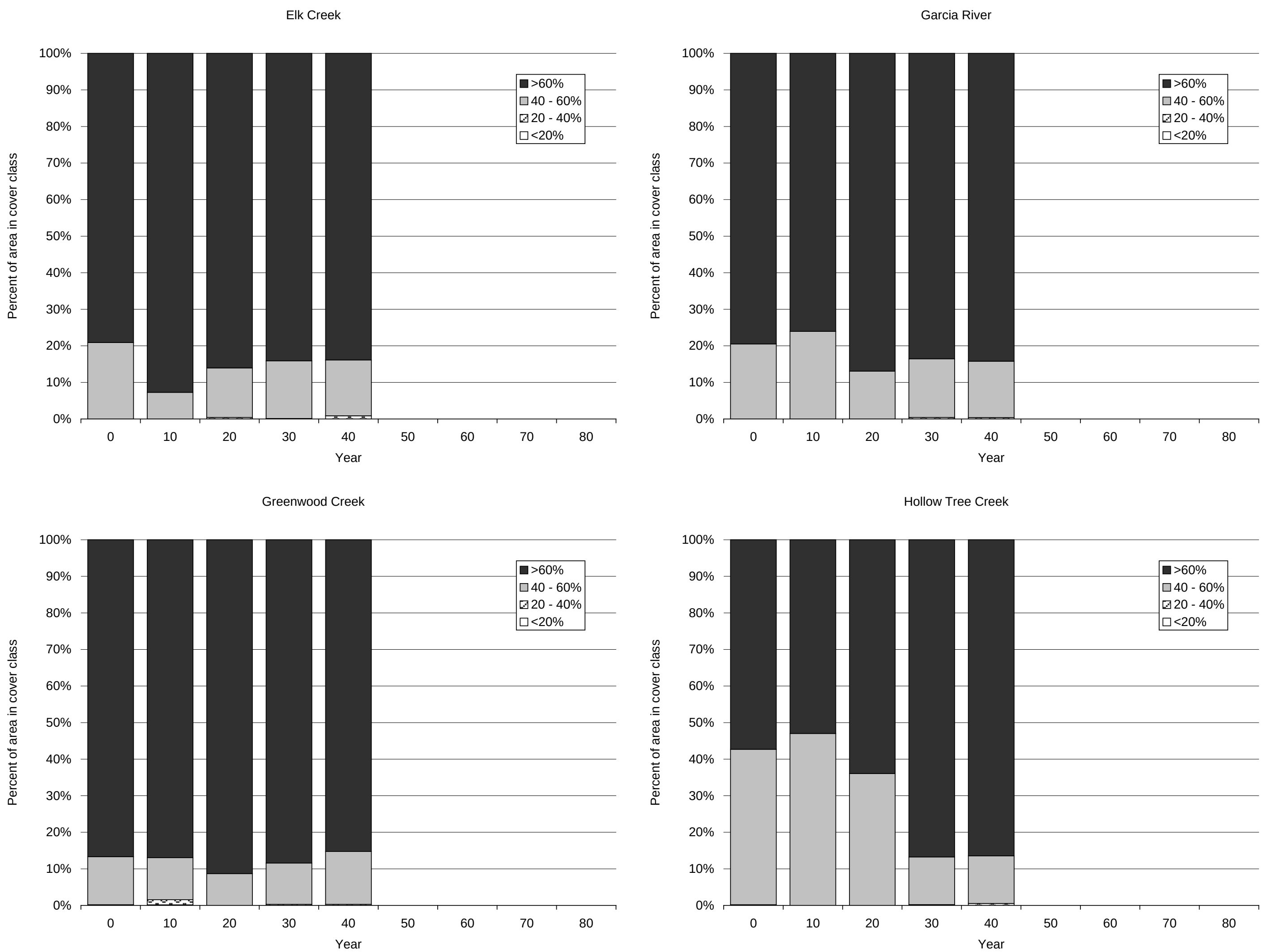

Figure I-6b. Riparian canopy closure by watershed analysis unit for each decade of the analysis period under Alternative C. Data are from MRC's 2010 timber modeling output.

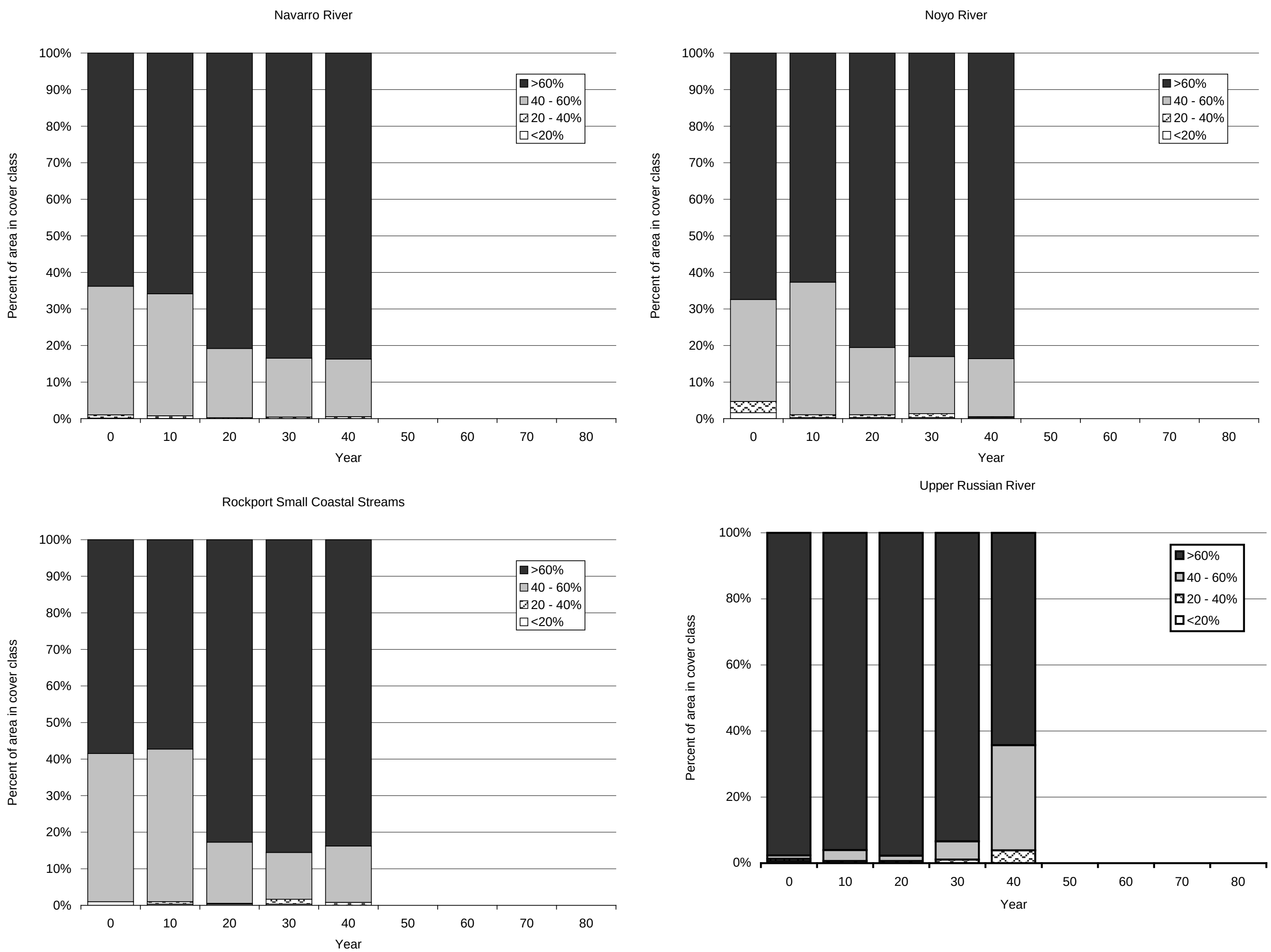

Figure I-6c. Riparian canopy closure by watershed analysis unit for each decade of the analysis period under Alternative C. Data are from MRC's 2010 timber modeling output.

Appendix J

Special-status Aquatic and Terrestrial Wildlife Species Scoping List

Methodology for Special-Status Species Scoping Lists:

The California Natural Diversity Database was queried using 7.5-minute U.S. Geological Survey quadrangles, including the 30 quadrangles overlaying the primary assessment area, the 12 quadrangles overlaying the secondary assessment area, and the 25 quadrangles surrounding (but not overlapping) the comprehensive assessment area—for a total of 67 quadrangles (Table J-1). This California Natural Diversity Database query area was used for consideration in analyzing potential effects on aquatic and riparian species of concern, plant species of concern, and terrestrial wildlife species of concern; the results of each are described in Sections 3.4.2, 3.5.2, and 3.6.2 respectively.

Table J-1. USGS 7.5-minute quadrangles used to generate species of concern lists for consideration in evaluation of project effects.

Primary assessment area		Secondary assessment area	Surrounding quadrangles	
Albion Bailey Ridge Boonville Burbeck Cold Springs Comptche Elk Eureka Hill Greenough Ridge Gualala Hales Grove Laughlin Range Leggett Lincoln Ridge Mallo Pass Creek	Mathison Peak McGuire Ridge Mendocino Navarro Northspur Noyo Hill Orrs Springs Philo Piercy Point Arena Saunders Reef Sherwood Peak Ukiah Westport Zeni Ridge	Bear Harbor Briceland Cahto Peak Dutchmans Knoll Fort Bragg Garberville Gube Mountain Inglenook Longvale Mistake Point Noble Butte Ornbaun Valley	Annapolis Bell Springs Big Foot Mtn Cow Mountain Dos Rios Elledge Peak Ettersburg Fort Seward Foster Mountain Guerneville Honeydew Iron Peak Jewett Rock	Laytonville Miranda Potter Valley Purdys Gardens Redwood Valley Sheltercove Stewarts Point Tan Oak Park Tombs Creek Willis Ridge Willits Yorkville

Common name ***Scientific name***	**Query sources**	**Status[a] Federal/ State**	**HCP/ NCCP covered species?**	**Distribution in California**	**Habitat association**	**Likely to occur in assessment area?**
Black abalone *Haliotis cracherodii*	USFWS	FE/–	No	Point Arena in northern California to Bahia Tortugas and Isla Guadalupe, Mexico	Intertidal and shallow subtidal rocks	No; species is restricted to marine habitats
White abalone *Haliotis sorenseni*	USFWS	FE/–	No	Historical range from Point Conception to Punta Abreojos, Mexico	Open marine rock or boulder habitat, interspersed with sand channels	No; species is restricted to marine habitats
California freshwater shrimp *Syncaris pacifica*	USFWS	FE/SE	No	Sonoma, Napa, and Marin counties	Low-elevation, low-gradient perennial or intermittent freshwater streams with perennial pools and structurally diverse banks	No; outside of species' range
Behren's silverspot butterfly *Speyeria zerene behrensii*	CNDDB; USFWS	FE/–	No	From Stewart's Point in Sonoma County, north along the coast to southern Mendocino County in the vicinity of Point Arena	Coastal dunes, meadows, and coastal terrace prairies where the host plant (*Viola* spp.) is present	Yes; though low potential in primary assessment area since species is associated with coastal habitats in secondary assessment area
Lotis blue butterfly *Lycaeides argyrognomon lotis*	CNDDB; USFWS	FE/–	No	Historically in California in coastal Mendocino, Sonoma, and possibly Marin counties	Early successional wet meadows and *Sphagnum* bogs in closed-cone pine forest, dominated primarily by bishop pine	Yes; though probability of occurring in primary assessment area low; only one historical sighting in secondary assessment area
River lamprey *Lampetra ayresi*	CDFG[b]	–/SSC	No	San Francisco Bay tributaries, Salmon Creek, Russian River, Eel River	Generally large rives; spawns in gravel riffles and rears in silty backwaters and stream edges	Yes

Common name ***Scientific name***	**Query sources**	**Status[a] Federal/ State**	**HCP/ NCCP covered species?**	**Distribution in California**	**Habitat association**	**Likely to occur in assessment area?**
Longfin smelt *Spirnichus thaleichthys*	CDFG[b]	–/SSC	No	Large estuaries from Monterey Bay north to the Oregon border	Large estuaries with salinities of 15–30 ppt	No; nearest occurrences in the lower reaches of the Eel and Russian rivers are outside of the Assessment Area
Navarro roach *Lavinia symmetricus navarroensis*	CNDDB	–/SSC	No	Navarro River watershed in Mendocino County	Small, warm, intermittent streams with isolated pools	Yes
Gualala roach *Lavinia symmetricus parvipinnis*	CNDDB	–/SSC	No	Gualala River watershed in Sonoma and Mendocino counties	Small, warm, intermittent streams with isolated pools	Yes
Coho salmon, Central California Coast ESU *Oncorhynchus kisutch*	CNDDB; USFWS	FE/SE	Yes	Punta Gorda south to the San Lorenzo River	Streams; spawns in gravel riffles	Yes
Coho salmon, Southern Oregon/Northern California Coasts ESU *Oncorhynchus kisutch*	USFWS	FT/ST	Yes	Punta Gorda north to the Oregon border	Streams; spawns in gravel riffles	Yes
Chinook salmon, California Coastal ESU *Onchorhynchus tshawytscha*	USFWS	FT/–	Yes	Russian River north to Redwood Creek (Humboldt County)	Streams; spawns in gravel riffles	Yes

Common name ***Scientific name***	**Query sources**	**Status[a] Federal/ State**	**HCP/ NCCP covered species?**	**Distribution in California**	**Habitat association**	**Likely to occur in assessment area?**
Pink salmon *Oncorhynchus gorbuscha*	CNDDB	–/SSC	No	NA	Streams; spawns in gravel riffles	No; considered extinct in California[c]
Steelhead, Central California Coast DPS *Oncorhynchus mykiss*	CNDDB; USFWS	FT/–	Yes	Russian River south to Aptos Creek	Streams; spawns in gravel riffles	Yes
Steelhead, Northern California DPS *Oncorhynchus mykiss*	CNDDB; USFWS	FT/SSC	Yes	Russian River north to Redwood Creek (Humboldt County)	Streams; spawns in gravel riffles	Yes
Tidewater goby *Eucyclogobius newberryi*	CNDDB: USFWS	FE/SSC	No	San Diego county north to the mouth of the Smith River in Del Norte County	Shallow lagoons and streams with fresh or brackish water	Yes
Southern torrent (=southern seep) salamander *Rhyacotriton variegatus*	CNDDB	–/SSC	No	Coastal drainages from near Point Arena in Mendocino County to the Oregon border, near sea level to 3,900 ft	In and adjacent to cold, permanent, well-shaded mountain springs, waterfalls, and seeps with rock substrate	Yes
Del Norte salamander *Plethodon elongates*	CNDDB	–/SSC	No	Along the coast in far northwest California from near Orick, Humboldt County, and east to Siskiyou and Trinity Counties, north to Oregon border, near sea level to 3,600 ft	Moist talus or rocky substrates in humid shaded and closed-canopy coastal forests of mixed hardwoods and conifers	No; outside of species' range
Coastal tailed frog *Ascaphus truei*	CNDDB	–/SSC	Yes	Coastal Mendocino County north to the Oregon border, with an isolated population in Shasta region, from near sea level to 8,400 ft	In and adjacent to cold, clear, moderate- to fast-flowing, perennial mountain streams in conifer forest	Yes

Common name ***Scientific name***	**Query sources**	**Status[a] Federal/ State**	**HCP/ NCCP covered species?**	**Distribution in California**	**Habitat association**	**Likely to occur in assessment area?**
California red-legged frog *Rana draytonii*	CNDDB; USFWS	FT/SSC	Yes	Largely restricted to coastal drainages on the central coast from Mendocino County to Baja California; in the Sierra foothills south to Tulare and possibly Kern counties; sea level to 8,000 ft	Breeds in still or slow-moving water with emergent and overhanging vegetation, including wetlands, wet meadows, ponds, lakes, and low-gradient, slow moving stream reaches with permanent pools; uses adjacent uplands for dispersal and summer retreat	Yes
Northern red-legged frog *Rana aurora*	CNDDB	–/SSC	Yes	Ranges from Mills Creek in Mendocino County to Oregon border, from sea level to 4,680 ft	Breeds in still or slow-moving water with emergent and overhanging vegetation, including wetlands, wet meadows, ponds, lakes, and low-gradient, slow moving stream reaches with permanent pools; uses adjacent uplands for dispersal and summer retreat	Yes
Foothill yellow-legged frog *Rana boylii*	CNDDB	–/SSC	No	From the Oregon border along the coast to the Transverse Ranges, and south along the western side of the Sierra Nevada Mountains to Kern County; a possible isolated population in Baja California, from sea level to 6,700 ft	Shallow tributaries and mainstems of perennial streams and rivers, typically associated with cobble or boulder substrate	Yes
Pacific pond turtle *Actinemys marmorata*	CNDDB	–/SSC	No	From the Oregon border along the coast ranges to the Mexican border, and west of the crest of the Cascades and Sierras	Permanent, slow-moving fresh or brackish water with available basking sites and adjacent open habitats or forest for nesting	Yes
Pacific (=olive) ridley sea turtle *Lepidochelys olivacea*	USFWS	FT/–	No	Warm waters of the Pacific coast, primarily from southern California south; does not nest in California	Well out to sea in pelagic zone as well as coastal areas, including bays and estuaries; nests on sandy ocean beaches	No; species is restricted to warm marine and shoreline habitats

Common name ***Scientific name***	**Query sources**	**Status[a] Federal/ State**	**HCP/ NCCP covered species?**	**Distribution in California**	**Habitat association**	**Likely to occur in assessment area?**
Green turtle *Chelonia mydas*	USFWS	FT/–	No	Warm waters of the Pacific coast, primarily from San Diego south; does not nest in California	Uses convergence zones in the open ocean and benthic feeding grounds in coastal areas; nests on sandy ocean beaches	No; species is restricted to warm marine and shoreline habitats
Loggerhead turtle *Caretta caretta*	USFWS	FT/–	No	Warm waters of the Pacific coast, primarily from the Channel Islands south; does not nest in California	Uses the near-shore zone and open ocean; nests on high energy, relatively narrow, steep, coarse-grained beaches	No; species is restricted to warm marine and shoreline habitats
Leatherback turtle *Dermochelys coriacea*	USFWS	FE/–	No	Temperate and cool waters of the Pacific coast; most sightings in California are from boats out at sea; have been observed in open ocean near San Diego, Santa Barbara, Ventura, San Mateo, and Santa Cruz counties; does not nest in California	Pelagic, though also forages near coastal waters	No; species is restricted to marine habitats
Short-tailed albatross *Phoebastris albatrus*	USFWS	FE/SSC	No	Pacific Ocean (nests in Japan)	Feeds in north Pacific	No; species is restricted to marine habitats
Ashy storm-petrel *Oceanodroma homochroa*	CNDDB	–/SSC	No	From Mendocino County south to Mexico	Nests on islands and offshore rocks, usually in crevices of talus slopes, rock walls, sea caves, cliffs, and driftwood; non-breeding birds remain within waters offshore of nesting habitat	No; species is restricted to marine and shoreline habitats
Brown pelican *Pelecanus occidentalis*	USFWS	FD/SD, SFP	No	Nests in the Gulf of California and along the coast to West Anacapa and Santa Barbara Islands; non-nesting range along entire California coast	Nests on low rocky or brushy slopes of undisturbed islands; rarely seen inland or far out at sea; roost habitat includes islands, offshore rocks, beaches, mudflats, wharfs, piers, breakwaters, and jetties	No; species is restricted to marine and shoreline habitats

Common name ***Scientific name***	**Query sources**	**Status[a] Federal/ State**	**HCP/ NCCP covered species?**	**Distribution in California**	**Habitat association**	**Likely to occur in assessment area?**
Great blue heron (rookery) *Ardea herodias*	CWHR	–/BOFS	No	Fairly common all year throughout most of California	Forages in ponds, lakes, rivers, streams, marshes, or wet meadows; nests near these areas in trees (occasionally in bushes or on the ground)	Yes
Great egret (rookery) *Ardea alba*	CWHR	–/BOFS	No	Common yearlong resident throughout California, except for high mountains and deserts	Forages in ponds, lakes, rivers, streams, marshes, wet meadows, tide flats, canals, and flooded fields; nests in colonies with other species in shrubs and trees over water, and on islands	Yes
Osprey *Pandion haliaetus*	CWHR	–/BOFS	No	Summer resident in most of northern California, uncommon winter visitor along coast of southern California; nests in northern California from Cascade Ranges south to Lake Tahoe, and along the coast south to Marin County	Large, clear, open, fish-bearing waters located in coniferous and mixed conifer habitats; nests near water in elevated structures (e.g., trees, cliffs)	Yes; summer nesting range only
White-tailed kite *Elanus leucurus*	CWHR	–/SFP	No	Found in nearly all lowlands of California west of the Sierra Nevada mountains and the southeast deserts	Lowland grasslands, oak woodlands, and wetlands with open areas; nests in trees near open foraging area	Yes
Northern harrier *Circus cyaneus*	CWHR	–/SSC	No	Scattered throughout California; in the northwest, nests largely within coastal lowlands from Del Norte County south to Bodega Head in Sonoma County, inland to Napa County	Nests, forages, and roosts in wetlands or along rivers or lakes, but also in grasslands, meadows, or grain fields	Yes; though extensive wetland/meadow habitats are minimally associated with forest management
Golden eagle *Aquila chrysaetos*	CNDDB	BGPA/SFP , BOFS	No	Uncommon permanent resident and migrant throughout California, except center of Central Valley	Open woodlands and oak savannahs, grasslands, chaparral, sagebrush flats; nests on steep cliffs or large trees	Yes

Common name ***Scientific name***	**Query sources**	**Status[a] Federal/ State**	**HCP/ NCCP covered species?**	**Distribution in California**	**Habitat association**	**Likely to occur in assessment area?**
Bald eagle *Haliaeetus leucocephalus*	CNDDB	FD, BGPA/SE, SFP, BOFS	No	Permanent resident and uncommon winter migrant, found nesting primarily in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity counties	Large bodies of water or rivers with abundant fish, uses adjacent snags or other perches; nests and winter communal roosts in advanced-successional conifer forest near open water	Yes
Northern goshawk *Accipter gentilis*	CNDDB	–/SSC, BOFS	No	Nests in North Coast Ranges through Sierra Nevada, Klamath, Cascade, and Warner Mountains, in Mount Pinos and San Jacinto, San Bernardino, and White Mountains; winters along north coast, throughout foothills, and in northern deserts	Mature and old-growth stands of coniferous forest, middle and higher elevations; nests in dense part of stands near an opening	Yes
American peregrine falcon *Falco peregrinus anatum*	CNDDB	FD/SD, SFP, BOFS	No	Most of California during migrations and in winter; nests primarily in the Coast Ranges, northern Sierra Nevada Mountains, and other mountainous areas of northern California	Wetlands, woodlands, cities, agricultural lands, and coastal area with cliffs (and rarely broken-top, predominant trees for nesting; often feeds near water	Yes

Common name *Scientific name*	**Query sources**	**Status[a] Federal/ State**	**HCP/ NCCP covered species?**	**Distribution in California**	**Habitat association**	**Likely to occur in assessment area?**
Western snowy plover *Charadrius alexandrinus nivosus*	CNDDB; USFWS	FT/SSC (interior population)	No	Nests in locations along the California coast, including the Eel River in Humboldt County; nests in the interior of the state in the Central Valley, the Klamath Basin, Modoc Plateau, and Great Basin, Mojave, and Colorado deserts; winters primarily along coast	Barren to sparsely vegetated dune-backed beaches, barrier beaches, and salt-evaporation ponds, infrequently on bluff-backed beaches; also nests on gravel bars in rivers with wide flood plains	Yes; numerous records (wintering and nesting) along Mendocino County beaches; rivers in the assessment area have the potential for occurrence, but are generally considered to have floodplains that are too narrow for nesting; no records along Mendocino County rivers
Marbled murrelet *Brachyramphus marmoratus*	USFWS	FT/SE, BOFS	Yes	Nesting murrelets in California mostly concentrated on coastal waters near Del Norte and Humboldt Counties, and in lesser numbers near San Mateo and Santa Cruz counties; winter throughout nesting range, and in small numbers in southern California	Most time spent on the ocean; nests inland in old-growth conifers with suitable platforms, especially redwood or Douglas-firs forests near coastal areas	Yes
Tufted puffin *Fratercula cirrhata*	CNDDB	–/SSC	No	Along the California coast from Prince Island in Del Norte County to Point Conception; nests along the Pacific coast	Feeds in the ocean; nests on offshore rocks and islands; rarely on steep mainland cliffs that are practically free of predators and anthropogenic disturbance	No; species is restricted to marine habitats

Common name ***Scientific name***	**Query sources**	**Status[a] Federal/ State**	**HCP/ NCCP covered species?**	**Distribution in California**	**Habitat association**	**Likely to occur in assessment area?**
Western yellow-billed cuckoo *Coccyzus americanus*	USFWS	FC/SE	No	Currently limited to portions of the Sacramento River and the South Fork Kern River; small populations may nest in Butte, Yuba, Sutter, San Bernardino, Riverside, Inyo, Los Angeles, and Imperial counties; winters outside of California	Summer resident of valley foothill and desert riparian habitats; nests in open woodland with clearings and low, dense, scrubby vegetation	No; outside of species' range; nearest nesting populations are in the northern Central Valley
Long-eared owl *Asio otus*	CWHR	–/SSC	No	Uncommon resident throughout the state, does not occupy the Central Valley and Southern California deserts	Riparian habitat; nests in dense vegetation close to open grassland, meadows, riparian, or wetland areas for foraging	Yes; though associated habitats are minimally associated with forest management
Northern spotted owl *Strix occidentalis caurina*	USFWS	FT/SSC, BOFS	Yes	Northwestern California south to Marin County, and southeast to the Pit River area of Shasta County	Typically in older forested habitats; nests in complex stands dominated by conifers, especially coastal redwood, with hardwood understories; some open areas are important for foraging	Yes
Vaux's swift *Chaetura vauxi*	USFWS	–/SSC	No	Summer resident of northern California; nests in the Coast Ranges from Sonoma County north and very locally south to Santa Cruz County; also found in the Sierra Nevada and possibly in the Cascade Range	Redwood and Douglas-fir habitats with large snags, especially forest with larger basal hollows and chimney trees	Yes
Olive-sided flycatcher *Contopus cooperi*	USFWS[d]	–/SSC	No	Uncommon to common summer resident found below 9,000 ft throughout California except in deserts, the Central Valley, and other lowland areas	Primarily advanced-successional conifer forests with open canopies	Yes; occurs and nests in assessment area[d]

Common name ***Scientific name***	**Query sources**	**Status[a] Federal/ State**	**HCP/ NCCP covered species?**	**Distribution in California**	**Habitat association**	**Likely to occur in assessment area?**
Willow flycatcher *Empidonax traillii*	CNDDB; USFWS[e]	–/SE	No	In the Sierra Nevada and Cascade ranges at elevations between 2,000 and 8,000 ft; nests as far south as San Diego County; confirmed breeding along the Eel River, and in mesic clear-cuts in northern Humboldt County	Dense brushy thickets within riparian woodland often dominated by willows and/or alder, near permanent standing water; uses brushy, early-succession forests (e.g., clearcuts) in the Pacific Northwest	Yes; though no documented breeding in Mendocino County; occurs in primary assessment area as migrants only, especially in fall[e]
Purple martin *Progne subis*	CNDDB	–/SSC	No	Summer resident and migrant; most densely populated in central and northern coastal conifer forests and smaller and more localized areas in the Sierra Nevada, interior foothills, and southern California	Conifer, valley-foothill, montane-hardwood forests with large snags in open areas; most nest sites located in upper slopes of hilly terrain	Yes
Yellow warbler *Dendroica petechia*	CNDDB	–/SSC	No	Summer resident; nests in most of California with the exception most of the Central Valley, high Sierras, and Mojave and Colorado deserts	Open-canopy, deciduous riparian woodland in close proximity to water along streams or wet meadows	Yes; though associated deciduous riparian habitats are minimally associated with forest management
Yellow-breasted chat *Icteria virens*	CNDDB	–/SSC	No	Uncommon summer resident and migrant in coastal California and in foothills of the Sierra Nevada	Early successional riparian habitats with a dense shrub layer and an open canopy	Yes; though associated deciduous riparian habitats are minimally associated with forest management

Common name ***Scientific name***	**Query sources**	**Status[a] Federal/ State**	**HCP/ NCCP covered species?**	**Distribution in California**	**Habitat association**	**Likely to occur in assessment area?**
Grasshopper sparrow *Ammodramus savannarum*	CNDDB; USFWS[d]	–/SSC	No	Summer resident; nests in Mendocino, Trinity, and Tehama counties south, west of the Cascade–Sierra Nevada axis and southeastern deserts, to San Diego County	Typically found in moderately open grasslands with scattered shrubs	Yes; may occur and nest in assessment area[d], though associated with open grassland habitats which are only in the secondary assessment area
Bryant's savannah sparrow *Passerculus sandwichensis alaudinus*	USFWS[d]	–/SSC	No	Coastal fog belt from Humboldt County to northern Monterey County	Low tidal marshlands, adjacent ruderal areas, moist grasslands within or near the fog belt, and infrequently in drier grasslands	Yes; may occur and nest in assessment area[d]; though associated with habitats in the secondary assessment area
Tricolored blackbird *Agelaius tricolor*	CNDDB	–/SSC	No	Common locally throughout Central Valley and in coastal areas from Sonoma County south	Feeds in grasslands and agriculture fields; nesting habitat components include a protected nesting substrate (including flooded emergent or thorny vegetation), and a suitable nearby foraging space with adequate insect prey	Yes; though associated with habitats that are minimally associated with forest management
Pallid bat *Antrozous pallidus*	CNDDB	–/SSC	No	Throughout California except for the high Sierra Nevada and from Del Norte and western Siskiyou Counties to northern Mendocino County	Roosts in trees, caves, crevices, and buildings; feeds in a variety of open habitats	Yes

Common name ***Scientific name***	**Query sources**	**Status[a] Federal/ State**	**HCP/ NCCP covered species?**	**Distribution in California**	**Habitat association**	**Likely to occur in assessment area?**
Western red bat *Lasiurus blossevillii*	CWHR	–/SSC	No	Near the Pacific Coast, Central Valley, and the Sierra Nevada	Riparian forests, woodlands near streams, fields and orchards	Yes; though associated with deciduous riparian habitats which are minimally associated with forest management
Townsend's western big-eared bat *Corynorhinus townsendii*	CNDDB	–/SSC	No	Throughout California, found in all but subalpine and alpine habitats, details of distribution not well-known	Most abundant in mesic habitats, also found in oak woodlands, desert, vegetated drainages, caves or cave-like structures (including basal hollows in large trees, mines, tunnels, and buildings)	Yes
California ringtail *Bassariscus astutus raptor*	CWHR	–/SFP	No	Widely distributed, though greatest abundance in northern California and Sierra Nevada foothills	Mixture of forest and shrub habitats in association with rocky areas or riparian habitats, low to middle elevations	Yes
Humboldt marten *Martes americana humboldtensis*	CWHR	–/SSC	No	Coastal redwood zone from the Oregon border south to Fort Ross, Sonoma County	Mid- to advanced-successional stands of conifers with complex structure near the ground and dense canopy closure	Yes
Pacific fisher *Martes pennanti* (*pacifica*) West Coast DPS	CNDDB; USFWS	FC/SSC	No	Two widely separated regions: the northern Coast Range and Klamath Province, and the southern Sierra Nevada	Advanced successional conifer forests, with complex forest structure being more important than tree species	Yes
American badger *Taxidea taxus*	CNDDB	–/SSC	No	Throughout the state except in the humid coastal forests of Del Norte County and the northwest portion of Humboldt County	Shrubland, open grasslands, fields, and alpine meadows with friable soils	Yes; though associated with habitats in the secondary assessment area

Common name ***Scientific name***	**Query sources**	**Status[a] Federal/ State**	**HCP/ NCCP covered species?**	**Distribution in California**	**Habitat association**	**Likely to occur in assessment area?**
Guadalupe fur seal *Arctocephalus townsendi*	USFWS	FT/ST, SFP	No	Southern California/Mexico region	During breeding season, found in coastal rocky habitats and caves	No; species is restricted to marine and shoreline habitats
Stellar sea-lion *Eumetopias jubatus*	USFWS	FT/–	No	Coastal waters of California	Colder waters, haul outs and rookeries usually consist of beaches, ledges, or rocky reefs	No; species is restricted to marine and shoreline habitats
Killer whale *Orcinus orca* Southern Resident DPS	NMFS[f]	FE/–	No	Pacific Ocean	Coastal habitats of temperate waters	No; species is restricted to marine habitats (important to note, however, that Chinook salmon is a primary prey species for killer whale)
Sperm whale *Physeter macrocephalus*	USFWS	FE/–	No	Pacific Ocean	Deep ocean waters	No; species is restricted to marine habitats
Sei whale *Balaenoptera borealis*	USFWS	FE/–	No	Pacific Ocean	Deep ocean waters	No; species is restricted to marine habitats
Blue whale *Balaenoptera musculus*	USFWS	FE/–	No	Pacific Ocean	Deep ocean waters	No; species is restricted to marine habitats
Fin whale *Balaenoptera physalus*	USFWS	FE/–	No	Pacific Ocean	Deep ocean waters	No; species is restricted to marine habitats
Humpback whale *Megaptera novaengliae*	USFWS	FE/–	No	Pacific Ocean	Deep ocean waters	No; species is restricted to marine habitats

Common name ***Scientific name***	**Query sources**	**Status[a] Federal/ State**	**HCP/ NCCP covered species?**	**Distribution in California**	**Habitat association**	**Likely to occur in assessment area?**
Right whale *Eubalaena* (=*Balaena*) *glacialis*	USFWS	FE/SFP	No	Pacific Ocean	Deep ocean waters	No; species is restricted to marine habitats
Point Arena mountain beaver *Aplodontia rufa nigra*	CNBBD; USFWS	FE/SSC	Yes	A disjunct, 24-square mile area in western Mendocino County; considered by USFWS as "five miles inland from the Pacific Ocean extending from a point two miles north of Bridgeport Landing south to a point five miles south of Point Arena"	Cool, moist, steep forest or scrub habitat with friable, well-drained soil, and abundance of lush herbaceous and small diameter woody plants	Yes
Sonoma (=California red) tree vole *Arborimus pomo* (= *longicaudus*)	CNDDB	–/SSC	No	Along the North Coast from Sonoma County north to the Oregon border, generally along the fog belt	Humid coastal coniferous forests with Douglas-fir, grand fir, western hemlock, bishop pine, and/or Sitka spruce	Yes

[a] Status codes:

Federal
FE = Listed as endangered under the federal Endangered Species Act
FT = Listed as threatened under the federal Endangered Species Act
FC = Federal candidate species
FD = Federally delisted
PD = Federally proposed for delisting
BGEPA = Federally protected under the Bald and Golden Eagle Protection Act

State
SE = Listed as endangered under the California Endangered Species Act
ST = Listed as threatened under the California Endangered Species Act
SD = State delisted
SSC = Considered a Species of Special Concern by the State of California
SFP = Fully Protected by the State of California
BOFS= Considered a sensitive species by the California Board of Forestry under the California Forest Practice Rules (14 CCR §895.1)

[b] Brad Valentine (CDFG), pers. comm., e-mail dated 15 October 2009
[c] Moyle 2002
[d] John Hunter (USFWS), pers. comm., e-mail dated 24 June 2008
[e] John Hunter (USFWS), pers. comm., e-mail dated 14 October 2009
[f] Eric Shott (NMFS), pers. comm, e-mail dated 20 October 2009

Appendix K

Large Woody Debris (LWD)
Recruitment Index Modeling

1 Large Woody Debris Recruitment Modeling Methods

Large woody debris (LWD) recruitment potential under each alternative was assessed using a semi-quantitative approach based on modeled riparian stand condition in 10-year time steps for Aquatic Management Zone (AMZ) stands in the primary assessment area. The approach for estimating recruitment potential for LWD under each alternative was based on the approach presented in Chapter 8 of MRC's HCP/NCCP. The method was used to formulate an estimate of LWD recruitment potential for each alternative based upon modeled estimates of AMZ stand density for the 80-year assessment period.

Estimates of potential LWD loading under each alternative were developed using the modeled AMZ stand density multiplied by the LWD loading values taken from curves presented in Chapter 8 of the HCP/NCCP. The first step in the approach is to use a relationship of LWD load to old growth redwood stand density (Keller et al. 1995) to make a preliminary estimate of reference LWD loading based on modeled stand density. We use the term "reference" because the relationship is based on old growth redwood stand density, which represents a "reference" condition that may be achievable under certain conditions but is not representative of current conditions in managed forests. It is unlikely for many riparian stands in the primary assessment area to achieve the reference LWD loading value over the proposed 80-year term of the HCP/NCCP because LWD recruitment and loading on MRC's timberlands is not subject to the same growth, input, and decay processes that occur over many centuries in an old growth forest. Furthermore, LWD inputs to streams in the primary assessment area will have different size and density characteristics than LWD inputs in an old growth forest.

A curve fit to the data from Keller et al. (1995) was developed by MRC (Figure K-1).

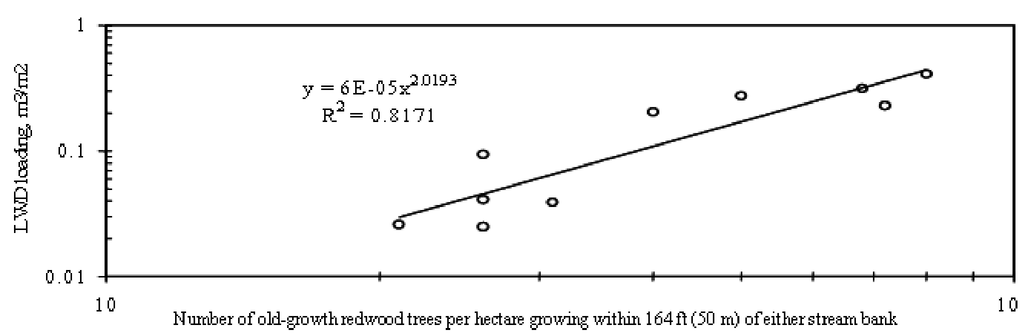

Figure K-1. Large woody debris loading as a function of riparian stand density (from Chapter 8 of the HCP/NCCP, based on Keller et al. 1995).

The equation of the line fit to the curve is

$$Y = 0.00006X^{2.0193} \tag{1}$$

where Y is LWD loading (m^3/m^2), and X is stand density (trees/ha).

Substituting modeled stand density at each decade into equation (1) provided a preliminary estimate of stream LWD loading for each decade. However, the rate of LWD recruitment to the stream is related to the width of the riparian buffer. For example, more LWD is recruited from wider buffers than narrow buffers up to width equal to about the height of a site-potential tree (Reid and Hilton 1998). Hence, the preliminary estimate of stream LWD loading derived from the substitution of modeled stand density into equation (1) was scaled by a source distance curve to account for different buffer width under each alternative. The riparian buffer widths for each alternative are shown in Table K-1.

Table K-1. Summary of buffer widths by stream class for each alternative. Buffer width varies by valley side slope.

Stream class	Buffer width (ft) by current management or project alternative					
	Current management[a]	No Action[b]	Proposed Action[c]	Alternative A[d]	Alternative B[d]	Alternative C[d]
Class I	100–190	100–150 (modeled as 100)	130–190 (modeled as 150)	Variable—equal to one site-potential tree (modeled as 150)	N/A inside reserves; 100–150 outside reserves (modeled as 150)	130–190
Large Class II	75–190	75–110 (modeled as 75)	100–150 (modeled as 150)	150 (modeled as 150)	N/A inside reserves; 75–110 outside reserves (modeled as 150)	100–150
Small Class II	10	75–110 (modeled as 75)	50–100 (modeled as 75)	50–150 (modeled as 75)	N/A inside reserves; 75–110 outside reserves (modeled as 75)	50–100
Class III	10–50	25–50	25–50	25–50	N/A inside reserves; 25–50 outside reserves	25–50

[a] MRCs current management practices are used to represent current conditions for buffer width. Buffers are defined as WLPZs and are divided into the inner zone and outer zone (MRC and CDFG 2009). Range of inner zone to outer zone is given, where applicable.
[b] Buffers are defined as WLPZs (MRC 2000).
[c] Buffers are defined as AMZs and are divided into the inner band, middle band, and outer band (MRC 2012).

For MRC's model, a site potential tree was considered by MRC to be 213 ft (60 m) (MRC 2012). Based on data presented in Reid and Hilton (1998), Peters (J. Peters, unpubl. data, Fish and Wildlife Biologist, USFWS, Arcata, California provided to B. Amerson, Biologist, Stillwater Sciences, Berkeley, California, 25 September 2009) developed source-distance curves showing that beyond about 213 ft (60 m), the rate of LWD recruitment does not increase appreciably (Figure K-2). Reid and Hilton (1998) found that virtually all LWD recruitment in a second-growth redwood forest was derived from within 213 ft (60 m), and that trees falling within this distance were often triggered by tree fall from beyond this distance. In a second-growth redwood forest with experimental riparian buffers, a "bounded" or "fringe" buffer outside the 213 ft (60 m) core buffer provided tree fall via trigger trees. Based on this information and the table of values used to develop the source-distance curves of Peters (J. Peters, unpubl. data, 25 September 2009), minimum and maximum rates of LWD loading for the range of buffer widths were developed for each alternative (Table K-2).

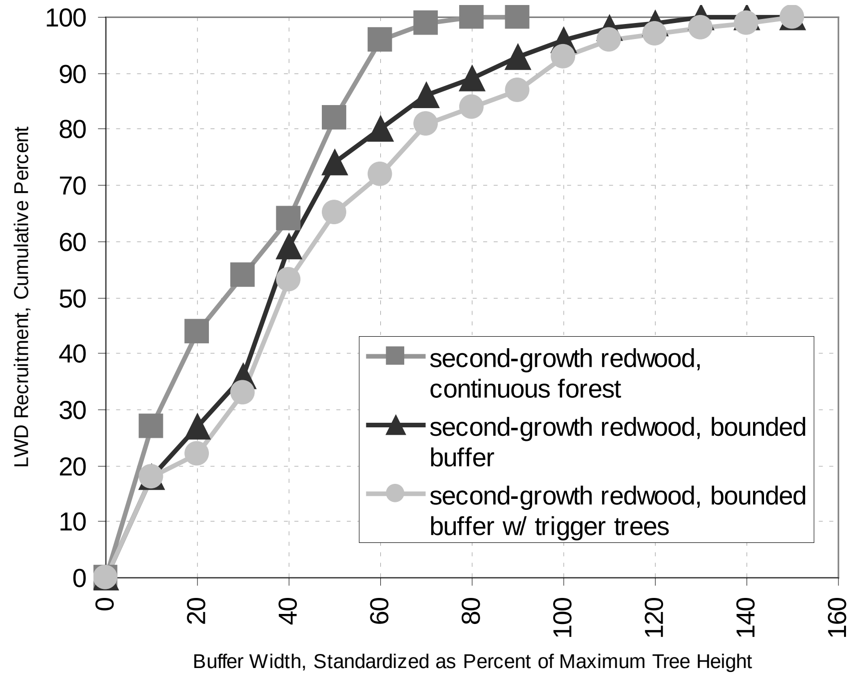

Figure K-2. Cumulative percent of LWD loading as a function of riparian buffer width. Buffer width is normalized as a percent of maximum leave-tree height of 213 ft (60 m); i.e., 100% = 213 ft. Based on Peters (unpubl. data, 25 September 2009).

Table K-2. Source-distance relationship for the range of buffer widths among all alternatives showing the percent recruitment LWD for a given buffer width. From Peters (J. Peters, unpubl. data, 25 September 2009); based on source-distance data presented in Reid and Hilton (1998).

Buffer width (ft)	Buffer width as % site-potential tree	Max recruitment (%)	Min recruitment (%)
190	89	100[a]	93
150	70	99	81
130	61	97	73
100	47	77	62
50	24	47	26
25	12	30	19

[a] Maximum recruitment rates (100%) are reached at buffer widths less than the site-potential tree height.

Where buffer widths matched values in Peters' table the exact rate was used, and where buffer widths fell between the values, linear interpolation was used to derive a rate for that buffer width. For each alternative, preliminary estimates of potential stream LWD loading derived from equation (1) were scaled by the minimum and maximum rate of LWD recruitment from the source-distance relationship in Table K-2 to develop a range of estimates of potential LWD loading. When an alternative had a range of buffer widths both the low and high values were scaled by the minimum and maximum, and the range. The mean LWD loading value by stream class for Class I and Class II streams in the primary assessment area under each alternative are presented in Tables K-3 through K-7.

Evaluation of the raw LWD loading estimates (Tables K-3, K-5, K-7, K-9, and K-11) indicates that, during the first five decades, the range of estimated values fall within the rage of values reported from streams with similar forest composition in northern coastal California. For example, O'Connor and Ziemer (1989) reported a value of 339 m^3/ha in the North Fork Caspar Creek basin, O'Connor Environmental (2000) reported 279 m^3/ha for the Garcia River watershed, and Wooster and Hilton (2004) reported an average of 251 m^3/ha for second growth stream reaches. However, after about five decades, the raw estimated values for stream LWD loading under all alternatives begin to exceed reported values for managed (i.e., second growth) streams. In some cases the raw estimates also approach or exceed the maximum LWD density (4,360 m^3/ha) reported for streams in unmanaged (i.e., old growth) coastal redwood forests (Keller et al. 1995). This is likely due in large part to the fact that the relationship of stream LWD loading to old growth redwood forest density used to develop the estimates is derived from streams in Prairie Creek National Park, a relatively undisturbed region where essentially no timber management has taken place. For this reason, the estimates of LWD loading should be considered as relative LWD loading index values, best suited for illustrating and comparing differences among alternatives, and should not be considered as true estimates of potential LWD loading under managed conditions in the primary assessment area.

To scale or "normalize" the estimates relative to the likely maximum LWD loading potential, the raw modeled values were divided by 4,360 m^3/ha—the maximum LWD density reported for old growth redwood streams in Prairie Creek National Park by Keller et al. (1995). The normalized LWD index values for each alternative are shown in Tables K-4, K-6, K-8, K-10, and K-12.

2 Raw and Normalized LWD Loading Estimates

2.1 No Action alternative

Table K-3. Predicted mean RAW LWD loading index values under the No Action alternative for Class I and II streams in the primary assessment area.

Stream class		Mean minimum and maximum raw LWD loading (m^3/ha) index values by decade								
		0	1	2	3	4	5	6	7	8
Class I	Minimum	79	85	175	298	420	591	782	928	996
	Maximum	98	105	218	372	524	737	975	1158	1243
Class II	Minimum	55	59	122	209	294	414	548	650	697
	Maximum	76	81	168	286	404	567	751	892	957

Table K-4. Predicted mean NORMALIZED LWD loading index values under the No Action alternative for Class I and II streams in the primary assessment area.

Stream class		Mean minimum and maximum normalized LWD loading (m^3/ha) index values by decade								
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Class I	Minimum	0.02	0.02	0.04	0.07	0.10	0.14	0.18	0.21	0.23
	Maximum	0.02	0.02	0.05	0.09	0.12	0.17	0.22	0.27	0.28
Class II	Minimum	0.01	0.01	0.03	0.05	0.07	0.09	0.13	0.15	0.16
	Maximum	0.02	0.02	0.04	0.07	0.09	0.13	0.17	0.20	0.22

2.2 Proposed Action alternative

Table K-5. Predicted mean RAW LWD loading index values under the Proposed Action alternative for Class I and II streams in the primary assessment area.

Stream class		Mean minimum and maximum raw LWD loading (m^3/ha) index values by decade								
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Class I	Minimum	94	103	230	453	762	1374	2144	2991	3796
	Maximum	128	141	315	622	1045	1885	2941	4103	5207
Class II	Minimum	79	87	193	382	642	1158	1806	2519	3197
	Maximum	127	140	312	615	1034	1866	2912	4062	5155

Table K-6. Predicted mean NORMALIZED LWD loading index values under the Proposed Action alternative for Class I and II streams in the primary assessment area.

Stream class		Mean minimum and maximum normalized LWD loading (m^3/ha) index values by decade								
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Class I	Minimum	0.02	0.02	0.05	0.10	0.17	0.32	0.49	0.69	0.87
	Maximum	0.03	0.03	0.07	0.14	0.24	0.43	0.67	0.94	>1
Class II	Minimum	0.02	0.02	0.04	0.09	0.15	0.27	0.41	0.58	0.73
	Maximum	0.03	0.03	0.07	0.14	0.24	0.43	0.67	0.93	>1

2.3 Alternative A

Table K-7. Predicted mean RAW LWD loading index values under Alternative A for Class I and II streams in the primary assessment area.

Stream class		Mean minimum and maximum raw LWD loading (m^3/ha) index values by decade								
		0	1	2	3	4	5	6	7	8
Class I	Minimum	104	114	255	504	846	1527	2383	3324	4217
	Maximum	127	140	312	615	1034	1866	2912	4062	5155
Class II	Minimum	32	36	80	157	264	477	744	1038	1317
	Maximum	127	140	312	615	1034	1866	2912	4062	5155

Table K-8. Predicted mean NORMALIZED LWD loading index values under Alternative A for Class I and II streams in the primary assessment area.

Stream class		Mean minimum and maximum normalized LWD loading (m^3/ha) index values by decade								
		0	1	2	3	4	5	6	7	8
Class I	Minimum	0.02	0.03	0.06	0.12	0.19	0.35	0.55	0.76	0.97
	Maximum	0.03	0.03	0.07	0.14	0.24	0.43	0.67	0.93	>1
Class II	Minimum	0.01	0.01	0.02	0.04	0.06	0.11	0.17	0.24	0.30
	Maximum	0.03	0.03	0.07	0.14	0.24	0.43	0.67	0.93	>1

2.4 Alternative B

Table K-9. Predicted mean RAW LWD loading index values under Alternative B for Class I and II streams in the primary assessment area.

Stream class		Mean minimum and maximum raw LWD loading (m^3/ha) index values by decade								
		0	1	2	3	4	5	6	7	8
Class I	Minimum	82	76	134	215	313	482	656	883	1050
	Maximum	112	104	184	294	429	661	900	1212	1440
Class II	Minimum	69	64	113	181	263	406	552	744	884
	Maximum	111	103	182	291	425	654	891	1200	1426

Table K-10. Predicted mean NORMALIZED LWD loading index values under Alternative B for Class I and II streams in the primary assessment area.

Stream class		Mean minimum and maximum normalized LWD loading (m^3/ha) index values by decade								
		0	1	2	3	4	5	6	7	8
Class I	Minimum	0.02	0.02	0.03	0.05	0.07	0.11	0.15	0.20	0.24
	Maximum	0.03	0.02	0.04	0.07	0.10	0.15	0.21	0.28	0.33
Class II	Minimum	0.02	0.01	0.03	0.04	0.06	0.09	0.13	0.17	0.20
	Maximum	0.03	0.02	0.04	0.07	0.10	0.15	0.20	0.28	0.33

2.5 Alternative C

Table K-11. Predicted mean RAW LWD loading index values under Alternative C for Class I and II streams in the primary assessment area.

Stream class		Mean minimum and maximum raw LWD loading (m3/ha) index values by decade				
		0	1	2	3	4
Class I	Minimum	94	103	230	453	762
	Maximum	128	141	315	622	1045
Class II	Minimum	79	87	193	382	642
	Maximum	127	140	312	615	1034

Table K-12. Predicted mean NORMALIZED LWD loading index values under Alternative C for Class I and II streams in the primary assessment area.

Stream class		Mean minimum and maximum normalized LWD loading (m3/ha) index values by decade				
		0	1	2	3	4
Class I	Minimum	0.02	0.02	0.05	0.10	0.17
	Maximum	0.03	0.03	0.07	0.14	0.24
Class II	Minimum	0.02	0.02	0.04	0.09	0.15
	Maximum	0.03	0.03	0.07	0.14	0.24

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Appendix L

MRC and California Wildlife Habitat Relationships Classification Schemes

MRC AND CALIFORNIA WILDLIFE HABITAT RELATIONSHIPS CLASSIFICATION SCHEMES

The MRC vegetation classification system is based on aerial photo interpretation in combination with ground-truthing of a subset of stands. Stands (i.e., discrete units or polygons of similar vegetation) are the basic unit; stands exhibit homogeneous vegetative characteristics and are grown and harvested as a unit (MRC 2012). Dominant tree size, species composition, and canopy closure are used to assign a "vegetation strata" to each stand. Dominant tree size is the first component of the classification system; stands are assigned to one of five size classes (Table L-1). Species composition is the second component. MRC considers a species dominant when 70% or more of the basal area of the dominant size class in a stand can be attributed to that species (e.g., coast redwood). Where no single species in the dominant size class equals 70% or more of the basal area of a stand, MRC assigns a mixed-species vegetation type to the stand (e.g., Redwood/Douglas-fir). Stands with at least 5% tree canopy cover are considered a forested vegetation type; stands with less than 5% tree canopy cover are considered to be "non-timber" vegetation types. Non-timber vegetation types include forested areas that are non-timber (e.g., oak woodlands), areas dominated by shrubs or by herbaceous species, and rare/unique plant communities (e.g., pygmy forest, a closed-cone pine-cypress forest type; see Section 3.5.1.3). The final component of the classification scheme is density, which is based on canopy closure of all trees greater than 8 in (20 cm) diameter at breast height (dbh), which corresponds to size class 2. In stands with smaller trees of size class 1, MRC estimates canopy closure based on all the trees in the stand. Table L-2 provides information on the various density codes.

Table L-1. MRC tree size classes.

MRC size class	DBH[a] (in)
1	0–8
2	8–16
3	16–24
4	24–32
5	> 32

[a] diameter at breast height

Table L-2. MRC tree canopy density codes.

Code	Canopy coverage	Description
O	0–20%	Open
L	20–40%	Low
M	40–60%	Medium
D	60–80%	Dense
E	80–100%	Extremely dense

Information on tree species and site quality are entered into the MRC inventory program which then classifies the stand as one of 24 structure classes; structure classes are based on species' composition, dominant dbh, and canopy closure. Further detail on MRC's delineation of size class, canopy closure, volume, basal area, and density of conifers and hardwoods is provided in

Appendix U of the HCP/NCCP. Non-forest vegetation types have a structure class of 0; further information on assessment of these areas is provided in Section 3.5.1.3.

The California Wildlife Habitat Relationships (CWHR) habitat classification system is based on species composition, size class, and canopy closure. .As with the MRC classification system, stands or polygons are the basic unit. However, classification rules for dominance are slightly different. General CWHR habitat groups include Tree-Dominated where there is at least 10% canopy closure, Shrub-Dominated where there is less than 10% tree canopy cover and at least 10% shrub cover, and Herbaceous-Dominated where at there is less than 10% cover by trees or shrubs and at least 2% cover by herbaceous species (CDFG and CIWTG 2005). These groups are further subdivided into habitat types based on dominant species (i.e., those species having greater than 50% relative overstory cover) and geographic distribution. Within habitat types, habitat stages are designated based on size (i.e., dbh) and cover class (i.e., canopy closure) for Tree-Dominated types, based on age and cover class for Shrub-Dominated types, and based on height and cover class for Herbaceous-Dominated types. Table L-3 provides detail on how CWHR size classes are defined for Tree-Dominated types. Table L-4 provides detail on how CWHR closure class is defined for Tree-Dominated types.

Table L-3. CWHR[a] tree size classes.

CWHR size class	Description	DBH[b]	Conifer crown diameter	Hardwood crown diameter
1	Seedling tree	<1 in	n/a	n/a
2	Sapling tree	1–6 in	n/a	<15 in
3	Pole tree	6–11 in	<12 ft	15–30 ft
4	Small tree	11–24 in	12–24 ft	30–45 ft
5	Medium/Large tree	>24 in	>24 ft	>45 ft
6	Multi-layered tree	Size class 5 over a distinct layer of size class 4 or 3 trees, total tree canopy exceeds 60% closure		

[a] California Wildlife Habitat Relationships
[b] diameter at breast height

Table L-4. CWHR[a] tree canopy closure codes.

Code	CWHR closure class	Ground cover (canopy closure)
S	Sparse Cover	10–24%
P	Open Cover	25–39%
M	Moderate Cover	40–59%
D	Dense Cover	60–100%

[a] California Wildlife Habitat Relationships

Each MRC structure class and vegetation strata can be loosely associated with one of the four major timber-associated CWHR habitat types (Redwood, Douglas-fir, Montane Hardwood-Conifer, and Montane Hardwood). The relationships between these two classification systems are presented in Table L-5.

Table L-5. Relationship between MRC structure classes definitions and CWHR[a] habitat types.

MRC structure class	MRC general description	MRC successional stage	CWHR type	CWHR size class (dbh[b])	CWHR closure code
0	Non-forest or Pioneer	Pioneer	Non-timber	N/A	N/A
1	Hardwoods, Saplings, Open to Medium Density	Early Successional	Montane Hardwood	2	P (Open Cover)
2	Hardwoods, Small Sawtimber, Open to Low Density	Mid-Successional		4 (11–24 in)	P (Open Cover)
3	Hardwoods, Poles, Low to Medium Density	Mid-Successional		3 (6–11 in)	M (Moderate Cover)
4	Hardwoods, Small Sawtimber, Medium Density	Mid-Successional		4 (11–24 in)	M (Moderate Cover)
5	Hardwoods, Poles, High Density	Mid-Successional		3 (6–11 in)	D (Dense Cover)
6	Hardwoods, Small Sawtimber, High Density	Mid-Successional		4 (11–24 in)	D (Dense Cover)
7	Mixed Conifers and Hardwoods, Saplings, Open to Low Density	Early Successional	Montane Hardwoods—Conifer	2 (1–6 in)	P (Open Cover)
8	Mixed Conifers and Hardwoods, Small Sawtimber, Open to Low Density	Mid-Successional		4 (11–24 in)	P (Open Cover)
9	Mixed Conifers and Hardwoods, Saplings, Medium Density	Mid-Successional		3 (6–11 in)	M (Moderate Cover)
10	Mixed Conifers and Hardwoods, Saplings and Small Sawtimber, High Density	Mid-Successional		4 (11–24 in)	M (Moderate Cover)
11	Mixed Conifers and Hardwoods, Saplings, High Density	Early Successional		2 (1–6 in)	D (Dense Cover)
12	Mixed Conifers and Hardwoods, Small Sawtimber, High Density	Mid-Successional		4 (11–24 in)	D (Dense Cover)

MRC structure class	MRC general description	MRC successional stage	CWHR type	CWHR size class (dbh[b])	CWHR closure code
13	Conifers, Saplings, All Densities	Early Successional	Conifer (Redwood and Douglas-fir)	2 (1–6 in)	P (Open Cover)
14	Conifers, Small Sawtimber, Open Density	Mid-Successional		4 (11–24 in)	S (Sparse Cover)
15	Conifers, Small to Large Sawtimber, Low Density	Mid-Successional		5 (>24 in)	P (Open Cover)
16	Conifers, Large Sawtimber, Open Density	Mid-Successional		5 (>24 in)	P (Open Cover)
17	Conifers, Poles, Medium Density	Mid-Successional		3 (6–11 in)	M (Moderate Cover)
18	Conifers, Small Sawtimber, Medium Density	Mid-Successional		4 (11–24 in)	M (Moderate Cover)
19	Conifers, Medium Sawtimber, Medium Density	Mid-Successional		5 (>24 in)	M (Moderate Cover)
20u	Conifers, Large Sawtimber, Medium Density	Advanced Successional		5 (>24 in)	M (Moderate Cover)
20e	Conifers, Large Sawtimber, Medium Density	Mid-Successional		5 (>24 in)	M (Moderate Cover)
21	Conifers, Poles, High Density	Mid-Successional		3 (6–11 in)	D (Dense Cover)
22	Conifers, Small Sawtimber, High Density	Mid-Successional		4 (11–24 in)	D (Dense Cover)
23u	Conifers, Medium Sawtimber, High Density	Advanced Successional		6 (>24 in, multi-layered)[c]	N/A
23e	Conifers, Medium Sawtimber, High Density	Mid-Successional		5 (>24 in)	D (Dense Cover)
24u	Conifers, Large Sawtimber, High Density	Advanced Successional		6 (>24 in, multi-layered)[c]	N/A
24e	Conifers, Large Sawtimber, High Density	Mid-Successional		5 (>24 in)	D (Dense Cover)

[a] California Wildlife Habitat Relationships

[b] diameter at breast height

[c] CWHR size class 6 is specifically defined as “Size class 5 over a distinct layer of size class 4 or 3 trees, total tree canopy exceeds 60% closure.”

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Appendix M

California Wildlife Habitat Relationships Types Not Covered

1 TREE-DOMINATED HABITATS: BROAD-LEAVED

1.1 Eucalyptus

The Eucalyptus California Wildlife Habitat Relationships (CWHR) habitat type is a non-native habitat type that occurs throughout California, from San Diego and Imperial counties in the south to Shasta in the north, with highest concentrations of planted groves in southern and central California. It is generally located below 1,500 ft (500 m) on relatively flat or rolling terrain, occasionally in the foothills (Mayer and Laudenslayer 1988).

The Eucalyptus habitat type is dominated by generally one species of eucalyptus, typically blue gum (*Eucalyptus globulus*) or red gum (*Eucalyptus camaldulensis*), with little else in the overstory. Due to the allelopathic nature of eucalyptus leaves, the understory in these stands is sparse, with little shrub cover and a variable, often weedy herbaceous layer. The particular species present varies greatly, depending on the size and nature of the eucalyptus stand; in plantation areas the understory may be entirely composed of weeds, whereas in smaller stands established in native plant communities, native shrub species maybe present, including chamise (*Adenostoma fasciculatum*), manzanita, toyon (*Heteromeles arbutifolia*), and scrub oak (*Quercus berberifolia*; Mayer and Laudenslayer 1988). The Eucalyptus CWHR habitat type is most equivalent to the Manual of California Vegetation (MCV) *Eucalyptus* (*globulus, camaldulensis*) Semi-Natural Woodland Stands (Eucalyptus groves) (Sawyer et al. 2009).

Stand structure in Eucalyptus habitat type may vary but is generally a dense stand with a closed canopy of a few species of eucalyptus. Tree size varies by spacing and species and may range in height from 87 to 133 ft (26 to 40 m). Eucalyptus trees are grow rapidly and therefore stands may reach maturity within 15 years after planting (Walters 1980). The habitat type is well-adapted to fire; the trees regrowth via epicormic shoots and lignotuber sprouting; grasslands may dominate for a short period of time while the regenerating forest grows (Mayer and Laudenslayer 1988).

There is no Eucalyptus habitat type within the primary assessment area is limited to one stand of eucalyptus trees planted in a redwood stand. Within the secondary assessment area, approximately 68 ac (27 ha) of this habitat type are present. This habitat type would not be included in timber harvest operations and therefore MRC is not seeking HCP/NCCP coverage for activities in this type. There are, however, numerous small areas where eucalyptus trees were planted for test plots that are small enough that the stand is treated as an inclusion within a different CWHR forest type. These eucalyptus trees may be included for treatment within the timber harvest areas.

2 SHRUB-DOMINATED HABITATS

2.1 Chamise-redshank Chaparral

The Chamise-redshank Chaparral CWHR habitat type is located throughout California, below 4,000 ft (1,200 m) on mountain ranges outside deserts. The habitat type can be broken into the “redshank” and “chamise” types. The distribution of the former is restricted to the interior valleys of the peninsular mountain ranges of Riverside and San Diego counties, stands in the Santa Monica Mountains, and stands in northern Santa Barbara and San Luis Obispo counties. The distribution of the latter is more widespread, occurring across the state, including in the assessment area. In northern coastal California, the chamise habitat type often occupies south- and west-facing steep slopes with thin soils (Mayer and Laudenslayer 1988).

The Chamise-redshank Chaparral habitat type consists of pure stands dominated by chamise or red shank (*Adenostoma sparsifolium*), or a combination of the two. The distribution of redshank is outside of the project assessment area, however; therefore the habitat type for this project consists entirely of pure stands of chamise. It is distinguished from the Mixed Chaparral habitat type based on at least one of the three criteria: (1) greater than 60% relative shrub cover of chamise; (2) for young stands recovering from fire, greater than 20% cover chamise and greater than 75% cover the combined total of chamise and short-lived sub-shrubs such as yerba santa; (3) greater than 50% cover chamise and greater than 75% cover the combined total of chamise and shrubs of intermediate lifespan such as ceanothus species (*Ceanothus* spp.). Common associates include toyon, poison oak, redberry, and California buckthorn, with ceanothus, manzanita and scrub oak occurring at higher elevations, on more mesic exposures (Mayer and Laudenslayer 1988). The Chamise-redshank Chaparral CWHR habitat type is most equivalent to the MCV *Adenostema fasciculatum* Shrubland Alliance (Chamise chaparral) (Sawyer et al. 2009).

Fire is an integral part of Chamise-redshank Chaparral ecology. Cover of herbaceous and sub-shrub species are more prevalent in the first few years after fire. After a few years, shrub cover begins to dominate and the canopy closes, excluding most herbaceous and sub-shrub species (Mayer and Laudenslayer 1988).

The Chamise-redshank Chaparral habitat type does not occur in the primary assessment area and only occupies approximately 280 ac (113 ha) of the secondary assessment area. Although some of these areas are adjacent to forested lands within the primary assessment area, timber management activities would not be conducted in the Chamise-redshank Chaparral habitat type and therefore MRC is not seeking HCP/NCCP coverage for activities in this type.

2.2 Coastal Scrub

The Coastal Scrub CWHR habitat type occurs discontinuously in a narrow band along the Pacific Coast on steep, south-facing slopes and on sandy, mudstone, or shale soils. It usually occurs within 20 mi (32 km) of the ocean at elevations ranging from sea level to 3,000 ft (900 m) (Mayer and Laudenslayer 1988).

In exposed areas very close to the ocean, Coastal Scrub includes yellow bush lupine (*Lupinus arboreus*), which is naturalized to the area [Jepson Online Interchange 2010]*)* and many-colored lupine (*Lupinus variicolor*). More inland, and in more protected areas, the habitat type in the north is dominated by coyote bush, blue blossom ceanothus, coffeeberry, bush monkey flower (*Mimulus aurantiacus*), blackberry (*Rubus* spp.), poison oak, and salal. Bracken fern, swordfern (*Polystichum californicum*), cow parsnip (*Heracleum lanatum*), several species of Indian paint brush (*Castilleja* spp.), yerba buena *(Satureja douglasii*), and California oatgrass *(Danthonia californica)* are common ground cover species (Mayer and Laudenslayer 1988). The Coastal Scrub CWHR habitat type is most equivalent to the following MCV alliances: *Baccharis pilularis* Shrubland Alliance (Coyote brush scrub); *Ceanothus thyrsiflorus* Shrubland Alliance (Blue blossom chaparral); *Diplacus aurantiacus* Shrubland Alliance (Bush monkeyflower scrub); and *Lupinus arboreus* Shrubland Alliance and Semi-Natural Shrubland Stands (yellow bush lupine scrub). Additionally, there are likely inclusions of *Ambrosia latifolia–Ambrosia chamissonis* Herbaceous Alliance (dune mat), *Carpobrotus* spp. Semi-Natural Herbaceous Stands (ice plant mats), *Cytisus* spp. Semi-Natural Shrubland Stands (Broom patches), *Toxicodendron* *diversilobum* Shrubland Alliance (Poison oak scrub), and *Rubus* (*parviflorus, spectabilis, ursinus*) Shrubland Alliance (Coastal brambles) within the more broadly-defined Coastal Scrub CWHR habitat type (Sawyer et al. 2009).

Coastal Scrub communities recover quickly from fire disturbance, and generally attain pre-fire composition and stature within 10 years following disturbance. The lupine phase of northern Coastal Scrub is fairly stable, though grazing pressure is reported to alter the stand type to grasslands. The coyotebrush phase of northern Coastal Scrub appears to be fairly stable as well, though there is some debate as to if it is a seral stage and eventually replaced by a tree-dominated habitat type (Mayer and Laudenslayer 1988).

Within the primary assessment area, the Coastal Scrub habitat type is combined with the Mixed Chaparral habitat type for a total of 156 ac (386 ha). The majority of the acreage is within the Big River and Navarro East inventory blocks. Within the secondary assessment area, there are approximately 9,628 ac (3,898 ha) of the Coastal Scrub habitat type. Although some of these areas are adjacent to forested lands within the primary assessment area, timber management activities would not be directed towards the Coastal Scrub habitat type and therefore MRC is not seeking HCP/NCCP coverage for activities in this type.

2.3 Mixed Chaparral

The Mixed Chaparral CWHR habitat type is an evergreen sclerophyllous shrubland type that occurs on the cismontane side of coastal mountain ranges as well as in the foothills of the Sierra Nevada, in elevations below 5,000 ft (1,520 m) (Barbour et al. 2007). It can occur on all aspects but tends to occur on north-facing slopes at lower elevations. In these areas, shrubs adapted to dry conditions and soils with low nutrients are able to out-compete trees (Mayer and Laudenslayer 1988).

The Mixed Chaparral habitat type varies moving north to south and depending upon precipitation regime, aspect and soil type. Common shrub species include chamise, birchleaf mountain-mahogany (*Cercocarpus betuloides*), toyon, yerba-santa (*Eriodictyon californicum*), and silk-tassel (*Garrya* spp.) (Mayer and Laudenslayer 1988). The Mixed Chaparral CWHR habitat type is most equivalent to the following MCV alliances: *Ceanothus cuneatus* Shrubland Alliance (Wedge leaf ceanothus chaparral, Buck brush chaparral); *Ceanothus oliganthus* Shrubland Alliance (Hairy leaf ceanothus chaparral); *Chrysolepis chrysophylla* Shrubland Alliance (Golden chinquapin thickets); *Holodiscus discolor* Shrubland Alliance (Ocean spray brush); and *Lupinus albifrons* Shrubland Alliance (Silver bush lupine scrub). Additionally, there are likely inclusions of *Arctostaphylos (nummularia*, *sensitiva*) Shrubland Alliance (Glossy leaf manzanita chaparral) and *Toxicodendron diversilobum* Shrubland Alliance (Poison oak scrub) within the more broadly-defined Mixed Chaparral CWHR habitat type (Sawyer et al. 2009).

The Mixed Chaparral habitat type is fire-adapted, with post fire recovery schedules varying with species composition, slope, aspect, elevation and soil type. Immediately after a fire event, the habitat type is dominated by short-lived herbs and sub-shrubs; over time shrubs become the dominant cover type and herbaceous species disappear. Stands more than 25 to 35 years old become senescent (Mayer and Laudenslayer 1988).

Within the primary assessment area, the Mixed Chaparral habitat type is combined with the Coastal Scrub habitat type for a total of 156 ac (386 ha). The majority of the acreage is within the Big River and Navarro East inventory blocks. Within the secondary assessment area, there are approximately 4,729 ac (1,915 ha) of the Mixed Chaparral habitat type. Although some of these areas are adjacent to forested lands within the primary assessment area, timber management activities would not be directed towards the Mixed Chaparral habitat type and therefore MRC is not seeking HCP/NCCP coverage for activities in this type. However, there are numerous areas where a shrub community is clearly a successional stage of a commercial timber type; these areas are small and treated as inclusions within a different CWHR habitat type. Therefore, MRC may manage these areas for timber.

3 HERBACEOUS-DOMINATED HABITATS

3.1 Saline Emergent Wetland

The Saline Emergent Wetland CWHR habitat type occurs along the coast, margins of bays, lagoons, and estuaries between intertidal sand and mud flats and upland communities not subject to tidal action (Macdonald 1977). The specific elevation zone where Saline Emergent Wetlands occur is bounded by the level of mean lower high water to extreme high water, otherwise known as the upper tidal zone. Soil salinity is highly variable due to differences in ocean water versus freshwater inputs and evaporation (Macdonald 1977).

Plant species characteristic of the Saline Emergent Wetland habitat type vary, depending on salinity. The following plants can be expected in Saline Emergent Wetlands, presented in order of high to low salinity tolerance: cordgrass (*Spartina foliosa*), pickleweed (*Salicornia virginica*), dense-flowered cordgrass (*Spartina densiflora*), glasswort (*Salicornia subterminalis*), saltwort (*Batis maritima*), jaumea (*Jaumea carnosa*) California seablite (*Suaeda californica* var *pubescens*), seaside arrowgrass (*Triglochin maritime*), alkali sea heath (*Frankenia grandifolia*), seashore saltgrass (*Distichlis spicata*), spear leaved saltbush (*Atriplex patula* ssp. *hastata*), salt cedar grass (*Monanthochloe littoralis*), Point Reyes bird's beak (*Cordylanthus maritimus* ssp. *palustris*), common glasswort (*Salicornia europaea*), sea-lavender (*Limonium californicum*), brass-buttons (*Cotula coronopifolia*), saltmarsh dodder (*Cuscuta salina*), Oregon gumweed (*Grindelia stricta*), salt rush (*Juncus leseurii*), tufted hairgrass (*Deschmpsia caespitosa*), Pacific alkali bulrush (*Scirpus robustus*), Olney bulrush (*Scirpus olneyi*), common tule (*Schoenoplectus acutus* previously known as *Scirpus acutus*), California bulrush, cattails, cinquefoil (*Potentilla* spp.), and coast carex (*Carex obnupta*) (Mayer and Laudenslayer 1988). The Saline Emergent Wetland CWHR habitat type is most equivalent to the following MCV alliances: *Argentina egedii* Herbaceous Alliance (Pacific silverweed marshes), *Distichilis spicata* Herbaceous Alliance (Salt grass flats), *Lepidium latifolium* Semi-Natural Herbaceous Stands (Perennial pepper weed patches), *Sarcocornia pacificia* (*Salicornia depressa*) Herbaceous Alliance (Pickleweed mats), *Spartina* (*alternifolora*, *densiflora*) Semi-Natural Herbaceous Stands (Smooth or Chilean cordgrass marshes), and *Typha* (*angustifolia*, *domingensis*, *latifolia*) Herbaceous Alliance (Cattail marshes) (Sawyer et al. 2009).

Saline Emergent Wetlands establishes as low marsh on intertidal flats; with time and accumulation of plant detritus and sediments, the marsh changes to high marsh. Plant height is greatest in the outer, lower zone, ranging from 3.3 to 4.9 ft (1 to 1.5 m). Various factors affect the stability and duration of the marsh habitat: increased sedimentation rates, diking, ditching, dredging, filling, diversion or impoundment of water upstream, trampling, and pollution (Mayer and Laudenslayer 1988).

Saline Emergent Wetlands do not occur within the primary assessment area and are mapped on only 23 ac (9 ha) of the secondary assessment area. These coastal areas are not adjacent to areas currently supporting merchantable timber, but are downstream of them. MRC is not seeking HCP/NCCP coverage for activities in Saline Emergent Wetlands.

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Appendix N

Special-status Plant Species Scoping List

Scientific name Common name	Status[a] Federal/ State/ California Rare Plant Rank	HCP/ NCCP covered species?	Blooming period	Elevation range (ft)	Suitable habitat type	Related CWHR[b] and CNDDB [c] -listed plant community types	Likely to occur in assessment area?	Query source	Documented occurrences: Primary assessment area (by inventory block)	Documented occurrences: Secondary assessment area (by quad)	Documented occurrences: Outside of the assessment area (by quad)
Vascular plants											
Abronia umbellata ssp. *breviflora* Pink sand-verbena	–/–/1B.1	No	June–October	0–32	Coastal dunes	CWHR: coastal scrub CNDDB: none	Yes; coastal dunes present within the secondary assessment area	CNPS[d], CNDDB		Fort Bragg, Inglenook, Mendocino, Point Arena, Westport	Fort Bragg, Inglenook, Mendocino, Westport
Agrostis blasdalei Blasdale's bent grass	–/–/1B.2	No	May–July	16–492	Coastal bluff scrub, coastal dunes, coastal prairie	CWHR: coastal scrub CNDDB: Northern coastal bluff scrub and coastal terrace prairie	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Albion, Elk, Fort Bragg, Mendocino, Point Arena, Westport	Elk, Fort Bragg, Mendocino, Stewarts Point, Westport
Alisma gramineum Narrow-leaved water plantain	–/–/2.2	No	June–August	1,279–5,905	Shallow freshwater marshes and swamps	CWHR: lacustrine CNDDB: coastal and valley freshwater marsh	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Longvale	Cahto Peak, Longvale, Willits
Arabis mcdonaldiana McDonald's rock cress	FE/SE/1B.1	No	May–July	440–5,900	Lower montane coniferous forest, serpentinite soils in upper montane coniferous forest	CWHR: Douglas-fir and redwood CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB, USFWS			Noble Butte
Arctostaphylos bakeri ssp. *sublaevis* The Cedars manzanita	–/SR/1B.2	No	February–May	610–2,500	Closed-cone coniferous forest, serpentinite seeps in chaparral	CWHR: closed-cone pine cypress, chamise-redshank chaparral, and mixed chaparral CNDDB: none.	Yes; suitable habitat within the assessment area	CNPS, CNDDB	CNPS and CNDDB documented species; no detailed location data provided		

Scientific name Common name	Status[a] Federal/ State/ California Rare Plant Rank	HCP/ NCCP covered species?	Blooming period	Elevation range (ft)	Suitable habitat type	Related CWHR[b] and CNDDB [c] -listed plant community types	Likely to occur in assessment area?	Query source	Documented occurrences		
									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Arctostaphylos canescens ssp. *sonomensis* Sonoma canescent manzanita	–/–/1B.2	No	January–April, sometimes June	1590–5,495	, Sometimes in serpentinite soils in chaparral or lower montane coniferous forest	CWHR: Douglas-fir, redwood, mixed chaparral, and chamise-redshank chaparral CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Leggett, Noble Butte, Purdys Gardens
Arctostaphylos nummularia ssp. *mendocinoensis* [*Arctostaphylos mendocinoensis* in Hickman 1993] Pygmy manzanita	–/–/1B.2	No	January	295–656	Closed-cone coniferous forest in acidic sandy clay	CWHR: closed-cone pine-cypress CNDDB: Mendocino pygmy cypress forest	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Mendocino	
Arctostaphylos stanfordiana ssp. *raichei* Raiche's manzanita	–/–/1B.1	No	February–April	1,476–3,280	Often in rocky, serpentinite soils in chaparral or lower montane coniferous forest openings	CWHR: Douglas-fir, redwood, mixed chaparral, and chamise-redshank chaparral CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Leggett, Noble Butte, Purdys Gardens
Astragalus agnicidus Humboldt milk-vetch	–/SE/1B.1	Yes	April–September	590–2,624	Disturbance areas and openings in North Coast coniferous forest, broadleaved upland forest	CWHR: montane hardwood-conifer, montane hardwood, Douglas-fir, and redwood. CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB	Garcia River, Rockport, Big River, Noyo, Navarro East	Dutchmans Knoll, Gualala, Hales Grove, Lincoln Ridge, Northspur, Noyo Hill, Sherwood Peak	Miranda

Scientific name Common name	Status[a] Federal/ State/ California Rare Plant Rank	HCP/ NCCP covered species?	Blooming period	Elevation range (ft)	Suitable habitat type	Related CWHR[b] and CNDDB [c] -listed plant community types	Likely to occur in assessment area?	Query source	Documented occurrences		
									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Blennosperma nanum var. *robustum* Point Reyes blennosperma	–/SR/1B.2	No	February–April	32–475	Coastal prairie, coastal scrub	CWHR: coastal scrub CNDDB: Northern coastal bluff scrub and coastal terrace prairie	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Fort Bragg	Fort Bragg
Kopsiopsis hookeri [*Boschniakia hookeri* in Hickman 1993] Small groundcone	–/–/2.3	Yes	April–August	295–2,903	Closed-cone coniferous forest, North Coast coniferous forest. Parasitic on *Gaultheria shallon* and *Vaccinium* spp.	CWHR: closed-cone pine-cypress, Douglas-fir, and redwood CNDDB: Mendocino pygmy cypress forest	Yes; suitable habitat within the assessment area	CNPS, CNDDB	Albion		Miranda, Purdys Gardens
Calamagrostis crassiglumis Thurber's reed grass	–/–/2.1	No	May–July	32–147	Mesic coastal scrub, freshwater marshes and swamps	CWHR: coastal scrub. CNDDB: Northern coastal bluff scrub and coastal and valley freshwater marsh	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Inglenook	
Calamagrostis foliosa Leafy reed grass	–/SR/4.2	No	May–September	0–4,002	Coastal bluff scrub, rocky sections of North Coast coniferous forest	CWHR: coastal scrub, Douglas-fir, and redwood CNDDB: Northern coastal bluff scrub	Yes; suitable habitat within the assessment area	CNDDB	Rockport	Bear Harbor, Westport	Bear Harbor, Shelter Cove, Shubrick Peak, Westport
Hesperocyparis pygmaea [misapplied synonym is *Callitropsis pygmaea*; *Cupressus goveniana* ssp. *pygmaea* in Hickman 1993] Pygmy cypress	–/–/1B.2	Yes	n/a	98–1,968	Closed-cone coniferous forest, often found in podzol-like soil	CWHR: closed-cone pine-cypress CNDDB: Mendocino pygmy forest	Yes; suitable habitat within the assessment area	CNPS, CNDDB	Garcia River, Albion	Elk, Eureka Hill, Fort Bragg, Gualala, Mathison Peak, Mendocino, Point Arena, Saunders Reef	Gualala

Scientific name Common name	Status[a] Federal/ State/ California Rare Plant Rank	HCP/ NCCP covered species?	Blooming period	Elevation range (ft)	Suitable habitat type	Related CWHR[b] and CNDDB [c] -listed plant community types	Likely to occur in assessment area?	Query source	Documented occurrences		
									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Calochortus raichei The Cedars fairy-lantern	–/–/1B.2	No	May–August	656–1,607	Closed-cone coniferous forest, serpentinite soils in chaparral	CWHR: closed-cone pine cypress, chamise-redshank chaparral, and mixed chaparral CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB	CNPS and CNDDB documented species; no detailed location data provided		
Calystegia collina ssp. *tridactylosa* Three-fingered morning-glory	–/–/1B.2	No	April–June	0–1,968	Chaparral, rocky, gravelly openings on serpentinite soil in cismontane woodland	CWHR: chamise-redshank chaparral, mixed chaparral, blue oak woodland, and coastal oak woodland CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Dos Rios
Calystegia purpurata ssp. *saxicola* Coastal bluff morning-glory	–/–/1B.2	No	May–September	32–344	Coastal dunes, coastal scrub, North Coast coniferous forest	CWHR: coastal scrub, Douglas-fir, and redwood CNDDB: Northern coastal bluff scrub	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Albion, Gualala, Mendocino, Point Arena, Saunders Reef	Albion, Gualala, Mendocino, Point Arena, Stewarts Point
Campanula californica Swamp harebell	–/–/1B.2	Yes	June–October	3–1,328	Coastal prairie, closed-cone coniferous forest, North Coast coniferous forest, riparian forest and woodland, meadows and seeps, freshwater marshes and swamps, bogs and fens	CWHR: closed-cone pine-cypress, Douglas-fir, redwood, montane hardwood, montane hardwood-conifer, montane riparian, and wet meadow CNDDB: coastal terrace prairie, Mendocino pygmy cypress forest, coastal and valley freshwater marsh, fen, and sphagnum bog	Yes; suitable habitat within the assessment area	CNPS, CNDDB	South Coast, Garcia River	Albion, Dutchmans Knoll, Elk, Eureka Hill, Fort Bragg, Gualala, Inglenook, Mallo Pass Creek, Mathison Peak, Mendocino, Noyo Hill, Point Areana Saunders Reef	Annapolis, Fort Bragg, Gualala, McGuire Ridge, Mendocino, Point Arena, Stewarts Point

Scientific name Common name	Status[a] Federal/ State/ California Rare Plant Rank	HCP/ NCCP covered species?	Blooming period	Elevation range (ft)	Suitable habitat type	Related CWHR[b] and CNDDB [c] -listed plant community types	Likely to occur in assessment area?	Query source	Documented occurrences		
									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Cardamine pachystigma var. *dissectifolia* Dissected-leaved toothwort	–/–/3	No	February–May	836–6,889	Usually rocky, serpentine soils in chaparral and lower montane coniferous forest	CWHR: chamise-redshank chaparral, mixed chaparral, Douglas-fir, and redwood CNDDB: none	Yes; suitable habitat within the assessment area	CNPS	CNPS documented species; no detailed location data provided		
Carex californica California sedge	–/–/2.3	Yes	May–August	295–1,099	Coastal prairie, closed-cone coniferous forest, North Coast coniferous forest, meadows and seeps, bogs and fens	CWHR: closed-cone pine-cypress, Douglas-fir, redwood, and wet meadow CNDDB: coastal terrace prairie, Mendocino pygmy cypress forest, fen, and sphagnum bog	Yes; suitable habitat within the assessment area	CNPS, CNDDB	Albion	Albion, Elk, Eureka Hill, Fort Bragg, Mathison Peak, Mendocino, Point Arena	
Carex comosa Bristly sedge	–/–/2.1	Yes	May–September	0–2,050	Coastal prairie, valley and foothill grassland, broadleaved upland forest, marshes and swamps	CWHR: annual grassland and montane hardwood CNDDB: coastal terrace prairie, and coastal and valley freshwater marsh	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Cow Mountain
Carex lenticularis var. *limnophila* Lagoon sedge	–/–/2.2	No	June–August	0–19	Bogs and fens, marshes and swamps, along gravelly shores and beaches in North Coast coniferous forest	CWHR: Douglas-fir and redwood CNDDB: coastal and valley freshwater marsh, fen, and sphagnum bog	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Noyo Hill	
Carex livida Livid sedge	–/–/1A	No	June	0	Bogs and fens	CWHR: none CNDDB: fen and sphagnum bog	Yes; suitable habitat within the secondary assessment area.	CNPS, CNDDB		Mendocino	Mendocino

Scientific name Common name	Status[a] Federal/ State/ California Rare Plant Rank	HCP/ NCCP covered species?	Blooming period	Elevation range (ft)	Suitable habitat type	Related CWHR[b] and CNDDB [c] -listed plant community types	Likely to occur in assessment area?	Query source	Documented occurrences		
									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Carex lyngbyei Lyngbye's sedge	–/–/2.2	No	May–August	0–32	Brackish and freshwater marshes and swamps	CWHR: saline emergent wetland CNDDB: coastal and valley freshwater marsh and coastal brackish marsh	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Inglenook, Mendocino, Noyo Hill, Point Arena	Point Arena
Carex saliniformis Deceiving sedge	–/–/1B.2	Yes	June, sometimes July	9–754	Coastal bluff scrub and scrub, coastal prairie, meadows and seeps, fresh and saltwater marshes and swamps	CWHR: coastal scrub, wet meadow, and saline emergent wetland CNDDB: Northern coastal bluff scrub, coastal terrace prairie, coastal and valley freshwater marsh, coastal brackish marsh, and northern coastal salt marsh	Yes; suitable habitat within the assessment area	CNPS, CNDDB	South Coast	Elk, Fort Bragg, Inglenook, Mendocino, Noyo Hill, Point Arena	Elk, Fort Bragg, Mendocino, Stewarts Point
Carex viridula var. *viridula* Green yellow sedge	–/–/2.3	Yes	July–September, sometimes June and November	0–5,246	North Coast coniferous forest, marshes and swamps, bogs and fens	CWHR: Douglas-fir and redwood CNDDB: coastal and valley freshwater marsh, fen, and sphagnum bog	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Inglenook	
Castilleja affinis ssp. *litoralis* Oregon coast paintbrush	–/–/2.2	No	June	49–328	Coastal bluff scrub, coastal dunes, sandy soils in coastal scrub	CWHR: coastal scrub. CNDDB: Northern coastal bluff scrub	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Bear Harbor, Fort Bragg, Inglenook, Mistake Point, Westport	Bear Harbor, Fort Bragg, Inglenook, Mistake Point, Shelter Cove, Westport

Scientific name Common name	Status[a] Federal/ State/ California Rare Plant Rank	HCP/ NCCP covered species?	Blooming period	Elevation range (ft)	Suitable habitat type	Related CWHR[b] and CNDDB[c] -listed plant community types	Likely to occur in assessment area?	Query source	Documented occurrences		
									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Castilleja ambigua ssp. *humboldtiensis* Humboldt Bay owl's-clover	–/–/1B.2	No	April–August	0–9	Coastal salt marshes and swamps	CWHR: saline emergent wetland CNDDB: coastal brackish marsh and northern coastal salt marsh	Yes; suitable habitat within the secondary assessment area	CNPS, CNDDB		Mendocino, Point Arena	
Castilleja mendocinensis Mendocino Coast Indian paintbrush	–/–/1B.2	No	April–August	0–524	Coastal bluff scrub, closed-cone coniferous forest, coastal dunes, coastal prairie, coastal scrub	CWHR: coastal scrub and closed-cone pine-cypress CNDDB: Northern coastal bluff scrub, Mendocino pygmy cypress forest, and coastal terrace prairie	Yes; suitable habitat within the assessment area	CNPS, CNDDB	Rockport	Albion, Bear Harbor, Elk, Fort Bragg, Gualala, Hales Grove, Inglenook, Mendocino, Saunders Reef, Westport	Albion, Bear Harbor, Elk, Fort Bragg, Gualala, Hales Grove, Inglenook, Mendocino, Saunders Reef, Westport
Ceanothus confusus Rincon Ridge ceanothus	–/–/1B.1	No	February–June	246–3,494	Closed-cone coniferous forest, chaparral, volcanic or serpentinite soils in cismontane woodland	CWHR: closed-cone pine-cypress, chamise-redshank chaparral, mixed chaparral, coastal oak woodland, and blue oak woodland CNDDB: Mendocino pygmy cypress forest	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Purdys Gardens
Chorizanthe howellii Howell's spineflower	FE/ST/1B.2	No	May–July	0–114	Coastal dunes, coastal prairie, and sandy, often disturbed areas of coastal scrub	CWHR: coastal scrub CNDDB: coastal terrace prairie and Northern coastal bluff scrub	Yes; suitable habitat within the assessment area	CNPS, CNDDB, USFWS		Fort Bragg, Inglenook	Fort Bragg, Inglenook

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									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Clarkia amoena ssp. *whitneyi* Whitney's farewell-to-spring	–/–/1B.1	No	June–August	32–328	Coastal bluff scrub, coastal scrub	CWHR: coastal scrub CNDDB: Northern coastal bluff scrub	Yes; suitable habitat within the assessment area	CNPS, CNDDB	Rockport	Fort Bragg, Inglenook, Westport	Fort Bragg, Inglenook, Shelter Cove, Westport
Collinsia corymbosa Round-headed Chinese-houses	–/–/1B.2	No	April–June	0–65	Coastal dunes	CWHR:coastal scrub CNDDB: none	Yes; coastal dunes present within the secondary assessment area	CNPS, CNDDB		Fort Bragg, Inglenook	Fort Bragg, Inglenook
Coptis laciniata Oregon goldthread	–/–/2.2	Yes	March–April	0–3,280	Meadows and seeps, North Coast coniferous forest,streambanks	CWHR: Douglas-fir, redwood, montane riparian, and wet meadow CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB	Big River, Albion, Noyo, South Coast, Rockport	Comptche, Dutchmans Knoll, Elk, Mathison Peak, Northspur, Noyo Hill, Sherwood Peak	
Cryptantha excavata Deep-scarred cryptantha	–/–/1B.3	No	April–May	328–1,640	Cismontane woodland in sandy or gravelly soil	CWHR: coastal oak woodland and blue oak woodland CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Foster Mountain
Erigeron biolettii Streamside daisy	–/–/3	Yes	June–October	98–3,608	Cismontane woodland, North Coast coniferous forest, broadleaved upland forest, riparian forest and woodland	CWHR: coastal oak woodland, blue oak woodland, montane hardwood, montane hardwood-conifer, Douglas-fir, redwood, and montane riparian CNDDB: none	Yes; suitable habitat within the assessment area	CNPS	CNPS documented species; no detailed location data provided		

Scientific name Common name	Status[a] Federal/ State/ California Rare Plant Rank	HCP/ NCCP covered species?	Blooming period	Elevation range (ft)	Suitable habitat type	Related CWHR[b] and CNDDB [c] -listed plant community types	Likely to occur in assessment area?	Query source	Documented occurrences		
									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Erigeron supplex Supple daisy	–/–/1B.2	No	May–July	32–164	Coastal bluff scrub, coastal prairie	CWHR: coastal scrub CNDDB: Northern coastal bluff scrub and coastal terrace prairie	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Gualala, Mendocino, Point Arena, Saunders Reef	Gualala, Mendocino, Point Arena, Saunders Reef, Stewarts Point
Eriogonum kelloggii Kellogg's (= Red Mountain) buckwheat	FC/SE/1B.2	No	June–August, sometimes May	1,899–4,101	Lower montane coniferous forest in rocky, serpentinite soil	CWHR: Douglas-fir and redwood CNDDB: none	Yes; suitable habitat present within the secondary assessment area	CNPS, CNDDB, USFWS			Leggett, Noble Butte
Erysimum menziesii ssp. *menziesii* Menzies' wallflower	FE/SE/1B.1	No	March–June	0–114	Coastal dunes	CWHR: coastal scrub CNDDB: none	Yes; coastal dunes present within the secondary assessment area	CNPS, CNDDB, USFWS		Fort Bragg, Inglenook	Fort Bragg, Inglenook
Erythronium oregonum Giant fawn lily	–/–/2.2	No	March–May	328–1,640	Cismontane woodland, openings meadows and seeps with serpentinite, rocky soils	CWHR: coastal oak woodland, blue oak woodland, and wet meadow CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Bell Springs
Erythronium revolutum Coast fawn lily	–/–/2.2	Yes	March–July, sometimes Aug	0–4,429	North Coast coniferous forest, broadleaved upland forest, riparian forest and woodland, bogs and fens	CWHR: montane hardwood-conifer, Douglas-fir, redwood, montane hardwood, and montane riparian CNDDB: fen and sphagnum bog	Yes; suitable habitat within the assessment area	CNPS, CNDDB	Navarro East, Navarro West, Albion	Comptche, Leggett, Navarro, Philo	Garberville, Leggett, Miranda, Philo, Piercy, Sherwood Peak

Scientific name Common name	Status[a] Federal/ State/ California Rare Plant Rank	HCP/ NCCP covered species?	Blooming period	Elevation range (ft)	Suitable habitat type	Related CWHR[b] and CNDDB [c] -listed plant community types	Likely to occur in assessment area?	Query source	Documented occurrences		
									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Fritillaria roderickii Roderick's fritillary	–/SE/1B.1	Yes	March–May	49–1,312	Coastal bluff scrub, coastal prairie, valley and foothill grassland	CWHR: coastal scrub and annual grassland CNDDB: Northern coastal bluff scrub and coastal terrace prairie	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Gualala, Laughlin Range, Philo, Point Arena, Saunders Reef	Gualala, Philo, Saunders Reef
Gentiana setigera Mendocino gentian	–/–/1B.2	No	August–September	1,607–3,494	Lower montane coniferous forest, mesic meadows and seeps	CWHR: Douglas-fir, redwood, and wet meadow CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Noble Butte
Gilia capitata ssp. *pacifica* Pacific gilia	–/–/1B.2	Yes	April–August	16–2,851	Coastal bluff scrub and scrub, coastal prairie, valley and foothill grassland	CWHR: coastal scrub and annual grassland CNDDB: Northern coastal bluff scrub and coastal terrace prairie	Yes; suitable habitat within the assessment area	CNPS, CNDDB	Navarro West	Albion, Elk, Fort Bragg, Mendocino, Point Arena, Saunders Reef	Briceland, Fort Bragg, Mendocino, Point Arena, Willits
Gilia capitata ssp. *tomentosa* Woolly-headed gilia	–/–/1B.1	No	May–July	49–508	Coastal bluff scrub, openings in chaparral, coastal prairie, valley and foothill grassland	CWHR: coastal scrub, chamise-redshank chaparral, mixed chaparral, and annual grassland CNDDB: Northern coastal bluff scrub and coastal terrace prairie	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Stewarts Point
Gilia millefoliata Dark-eyed gilia	–/–/1B.2	No	April–July	6–98	Rocky outcrops in coastal bluff scrub	CWHR: coastal scrub CNDDB: Northern coastal bluff scrub	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Fort Bragg, Inglenook, Mendocino	Fort Bragg, Mendocino

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									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Glyceria grandis American manna grass	–/–/2.3	No	June–August	149–6,496	Bogs and fens, meadows and seeps, marshes and swamps adjacent to streambanks and lake margins	CWHR: wet meadow, and montane riparian CNDDB: fen, sphagnum bog, and coastal and valley freshwater marsh	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Point Arena	Point Arena
Harmonia guggolziorum Guggolz' harmonia	–/–/1B.1	No	April–May	524–639	Chaparral in open areas with serpentinite soil	n/a	Yes; suitable habitat present within the secondary assessment area	CNPS, CNDDB			Yorkville
Hemizonia congesta ssp. *congesta* Pale yellow hayfield tarplant	–/–/1B.2	No	April–November	65–1,837	Valley and foothill grassland, occasionally along roadsides	CWHR: annual grassland CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Noyo Hill	
Hesperevax sparsiflora var. *brevifolia* Short-leaved evax	–/–/1B.2	No	March–June	0–705	Sandy sections of coastal bluff scrub, coastal dunes	CWHR: coastal scrub CNDDB: Northern coastal bluff scrub	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Albion, Fort Bragg, Inglenook, Mendocino, Point Arena, Saunders Reef	Albion, Fort Bragg, Mendocino, Point Arena, Saunders Reef, Stewarts Point

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									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Hesperolinon adenophyllum Glandular western flax	–/–/1B.2	Yes	May–August	492–4,314	Serpentinite substrates in valley and foothill grassland, cismontane woodland, chaparral	CWHR: chamise-redshank chaparral, mixed chaparral, annual grassland, blue oak woodland, and coastal oak woodland CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Burbeck, Cow Mountain, Foster Mountain, Greenough Ridge, Potter Valley, Willits
Horkelia bolanderi Bolander's horkelia	–/–/1B.2	No	June–August	1,476–3,608	Chaparral, lower montane coniferous forest, meadows and seeps, mesic areas is edges of valley and foothill grassland	CWHR: chamise-redshank chaparral, mixed chaparral, Douglas-fir, redwood, annual grassland, and wet meadow CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Purdys Gardens
Horkelia marinensis Point Reyes horkelia	–/–/1B.2	No	May–September	16–1,148	Coastal dunes, coastal prairie, sandy areas in coastal scrub	CWHR: coastal scrub CNDDB: coastal terrace prairie and Northern coastal bluff scrub	Yes; suitable habitat within the assessment area	CNPS, CNDDB	Rockport	Fort Bragg, Gualala, Inglenook, Noyo Hill, Westport	Fort Bragg, Inglenook, Westport
Horkelia tenuiloba Thin-lobed horkelia	–/–/1B.2	Yes	May–July	164–1,640	Coastal bluff scrub and scrub, coastal prairie, valley and foothill grassland, chaparral, closed-cone coniferous forest, broadleaved upland forest	CWHR: closed-cone pine-cypress, montane hardwood, coastal scrub, chamise-redshank chaparral, mixed chaparral, and annual grassland CNDDB: Northern coastal bluff scrub, coastal terrace prairie, and Mendocino pygmy cypress forest	Yes; suitable habitat within the assessment area	CNPS, CNDDB	Garcia River	Gualala	Annapolis, Willis Ridge

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Juncus supiniformis Hair-leaved rush	–/–/2.2	Yes	April–May, sometimes June	65–328	Marshes and swamps, bogs and fens	CWHR: none CNDDB: coastal and valley freshwater marsh, sphagnum bog, and fen	Yes; suitable habitat within the secondary assessment area	CNPS, CNDDB		Fort Bragg, Mendocino	Mendocino
Lasthenia burkei Burke's goldfields	FE/SE/1B.1	No	April–June	49–1,969	Mesic meadows and seeps, vernal pools	CWHR: wet meadow CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB, USFWS			Ukiah
Lasthenia californica ssp. *bakeri* Baker's goldfields	–/–/1B.2	No	April–October	196–1,706	Openings within closed-cone coniferous forest, coastal scrub, meadows and seeps, marshes and swamps	CWHR: closed-cone pine-cypress, coastal scrub, and wet meadow CNDDB: Mendocino pygmy cypress forest, Northern coastal bluff scrub, and coastal and valley freshwater marsh	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Albion, Fort Bragg, Gualala, Mendocino, Point Arena, Saunders Reef	Albion, Fort Bragg, Gualala, Mendocino, Suanders Reef
Lasthenia californica ssp. *macrantha* Perennial goldfields	–/–/1B.2	No	January–November	16–1,706	Coastal bluff scrub, coastal dunes, coastal scrub	CWHR: coastal scrub CNDDB: Northern coastal bluff scrub	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Albion, Fort Bragg, Gualala, Mallo Pass Creek, Mendocino, Point Arena, Saunders Reef	Albion, Fort Bragg, Gualala, Mallo Pass Creek, Mendocino, Point Arena, Saunders Reef
Lasthenia conjugens Contra Costa goldfields	FE/–/1B.1	No	March–June	0–1,541	Cismontane woodland, alkaline playas, valley and foothill grassland, vernal pools in mesic areas	CWHR: blue oak woodland, coastal oak woodland, annual grassland, and wet meadow CNDDB: none	Yes; suitable habitat within the assessment area.	CNPS, CNDDB, USFWS		Point Arena	

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									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Lathyrus palustris Marsh pea	–/–/2.2	No	March–August	3–328	Bogs and fens, coastal prairie, coastal scrub, lower montane coniferous forest, marshes and swamps, North Coast coniferous forest	CWHR: coastal scrub, Douglas-fir, and redwood CNDDB: sphagnum bog, fen, coastal terrace prairie, Northern coastal bluff scrub	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Gualala	Shelter Cove
Layia septentrionalis Colusa layia	–/–/1B.2	No	April–May	328–3,592	Chaparral, cismontane woodland, sandy, serpentinite soils in valley and foothill grassland	CWHR: chamise-redshank chaparral, mixed chaparral, annual grassland, blue oak woodland, and coastal oak woodland CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Purdys Gardens
Lilium maritimum Coast lily	–/–/1B.1	Yes	May–August	16–1,558	Coastal bluff scrub and scrub, coastal prairie, closed-cone coniferous forest, North Coast coniferous forest, broadleaved upland forest, marshes and swamps	CWHR: coastal scrub, closed-cone pine-cypress, Douglas-fir, redwood, montane hardwood, and montane hardwood-conifer CNDDB: Northern coastal bluff scrub, coastal terrace prairie, Mendocino pygmy cypress forest, and coastal and valley freshwater marsh	Yes; suitable habitat within the assessment area	CNPS, CNDDB	Navarro West, Garcia River, South Coast	Albion, Cold Spring, Elk, Eureka Hill, Fort Bragg, Gualala, Inglenook, Mathison Peak, Mendocino, Point Arena, Saunders Reef	Albion, Fort Bragg, Gualala, Point Arena, Suanders Reef, Stewarts Point
Limnanthes bakeri Baker's meadowfoam	–/SR/1B.1	Yes	April–May	574–2,985	Vernally mesic valley and foothill grassland, meadows and seeps, marshes and swamps, vernal pools	CWHR: annual grassland and wet meadow CNDDB: coastal and valley freshwater marsh	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Laytonville, Ukiah, Willits

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									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Lupinus milo bakeri Milo Baker's lupine	–/ST/1B.1	No	June–September	1,295–1,410	Often along roadsides within cismontane woodland, valley and foothill grassland	CWHR: annual grassland, blue oak woodland, and coastal oak woodland CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Longvale
Lupinus sericatus Cobb Mountain lupine	–/–/1B.2	No	March–June	902–5,003	Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest	CWHR: blue oak woodland, coastal oak woodland, montane hardwood, montane hardwood-conifer, chamise-redshank chaparral, mixed chaparral, Douglas-fir, and redwood CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Big Foot Mountain
Malacothamnus hallii Hall's bush mallow	–/–/1B.2	No	May–September, sometimes October	32–2,493	Chaparral, coastal scrub	CWHR: chamise-redshank chaparral, mixed chaparral, and coastal scrub CNDDB: Northern coastal bluff scrub	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Elledge Peak
Malacothamnus mendocinensis Mendocino bush mallow	–/–/1A	Yes	May–June	1,394–1,886	Cismontane woodland	CWHR: blue oak woodland and coastal oak woodland CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Elledge Oeak
Microseris borealis Northern microseris	–/–/2.1	No	June–September	3,280–6,561	Bogs and fens, lower montane coniferous forest, mesic meadows and seeps	CWHR: Douglas-fir, redwood, and wet meadow CNDDB: sphagnum bog and fen	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Mendocino	Mendocino

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									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Microseris paludosa Marsh microseris	–/–/4.2	No	April–June, sometimes July	16–984	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland	CWHR: closed-cone pine-cypress, blue oak woodland, coastal oak woodland, coastal scrub, and annual grassland CNDDB: Northern coastal bluff scrub, and Mendocino pygmy cypress forest	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Point Arena	Point Arena
Mitella caulescens Leafy-stemmed mitrewort	–/–/4.2	No	April–October	16–5,577	North Coast coniferous forest, broadleaved upland forest, lower montane coniferous forest, riparian forest and woodland, meadows and seeps	CWHR: Douglas-fir, redwood, montane hardwood, montane hardwood-conifer, montane riparian, and wet meadow CNDDB: none	Yes; suitable habitat within the assessment area	CNDDB	Navarro West	Bear Harbor, Dutchmans Knoll, Elk, Hales Grove, Mendocino	Bear Harbor, Mendocino
Monardella villosa ssp. *globosa* Robust monardella	–/–/1B.2	No	June–July, sometimes August	328–3,001	Coastal bluff scrub and scrub, cismontane woodland, openings in chaparral, openings in broadleaved upland forest	CWHR: montane hardwood, blue oak woodland, coastal oak woodland, coastal scrub, chamise-redshank chaparral, and mixed chaparral CNDDB: Northern coastal bluff scrub	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Miranda, Noble Butte, Tan Oak Park
Montia howellii Howell's montia	–/–/2.2	No	March–May	0–2,395	Meadows and seeps, North Coast coniferous forest, vernal pools	CWHR: wet meadow, Douglas-fir, and redwood CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Briceland	Briceland, Fort Seward, Miranda
Navarretia leucocephala ssp. *bakeri* Baker's navarretia	–/–/1B.1	No	April–July	16–5,708	Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, mesic vernal pools	CWHR: Douglas-fir, redwood, blue oak woodland, coastal oak woodland, annual grassland, and wet meadow CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Longvale	Laughlin Range, Longvale, Redwood Valley, Willits

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Oenothera wolfii Wolf's evening-primrose	–/–/1B.1	No	May–October	9–2,624	Coastal bluff scrub, coastal dunes, coastal prairie, sandy mesic areas in lower montane coniferous forest	CWHR: coastal scrub, Douglas-fir, and redwood. CNDDB: Northern coastal bluff scrub and coastal terrace prairie	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Inglenook	
Packera bolanderi var. *bolanderi* Seacoast ragwort [previously known as *Senecio bolanderi* var. *Bolanderi*]	–/–/2.2	Yes	May–July, sometimes February–April	98–2,132	Coastal scrub, sometimes along roadsides in North Coast coniferous forest	CWHR: coastal scrub, Douglas-fir, and redwood CNDDB: Northern coastal bluff scrub	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Fort Bragg, Mathison Peak, Mendocino	Fort Bragg, Mendocino
Phacelia insularis var. *continentis* North Coast phacelia	–/–/1B.2	No	March–May	32–557	Coastal bluff scrub, coastal dunes, in sandy, sometimes rocky soils	CWHR: coastal scrub CNDDB: Northern coastal bluff scrub	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Fort Bragg, Inglenook	Fort Bragg, Inglenook
Pinus contorta ssp. *bolanderi* Bolander's beach pine	–/–/1B.2	Yes	n/a	246–820	Closed-cone coniferous forest	CWHR: closed-cone pine-cypress CNDDB: Mendocino pygmy cypress forest	Yes; suitable habitat within the assessment area	CNPS, CNDDB	Albion	Albion, Elk, Fort Bragg, Mathison Peak, Mendocino	
Piperia candida White-flowered rein orchid	–/–/1B.2	Yes	May–September	98–4,297	Broadleafed upland forest, lower montane coniferous forest, sometimes in north coast coniferous forest, sometimes on serpentinite	CWHR: montane hardwood-conifer, montane hardwood, Douglas-fir and redwood CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB	Big River	Comptche, Lincoln Ridge, Noble Butte, Philo, Piercy, Sherwood Oeak	Annapolis, Honeydew, Laytonville, Noble Butte, Philo, Sherwood Peak

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									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Plagiobothrys lithocaryus Mayacamas popcorn-flower	–/–/1A	No	April–May	984–1,476	Chaparral, cismontane woodland, mesic areas in valley and foothill grassland	CWHR: chamise-redshank chaparral, mixed chaparral, blue oak woodland, coastal oak woodland, and annual grassland CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Potter Valley
Pleuropogon hooverianus North Coast semaphore grass	–/ST/1B.1	Yes	April–August	33–2,201	Openings and mesic areas in North Coast coniferous forest, broadleaved upland forest, meadows and seeps	CWHR: montane hardwood, montane hardwood-conifer, Douglas-fir, redwood, and wet meadow CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB	Ukiah, Albion	Comptche, Orrs Springs	Cahto Peak, Elledge Peak, Longvale, Redwood Valley, Willits
Potamogeton epihydrus Nuttall's ribbon-leaved pondweed	–/–/2.2	No	July–August	1,210–7,125	Marshes and swamps	CWHR: lacustrine CNDDB: coastal and valley freshwater marsh	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Cahto Peak, Willits
Puccinellia pumila Dwarf alkali grass	–/–/2.2	No	July	3–32	Coastal salt marshes and swamps	CWHR: saline emergent wetland CNDDB: Northern coastal salt marsh	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Fort Bragg	Fort Bragg
Rhynchospora alba White beaked-rush	–/–/2.2	No	July–August	196–6,692	Meadows and seeps, marshes and swamps, bogs and fens	CWHR: wet meadow CNDDB: coastal and valley freshwater marsh, fen, and sphagnum bog	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Fort Bragg, Inglenook, Mathison Peak	

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									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Sanguisorba officinalis Great burnet	–/–/2.2	Yes	July–October	196–4,493	North Coast coniferous forest, broadleaved upland forest, serpentine substrates in riparian forest and woodland or scrub, meadows and seeps, marshes and swamps	CWHR: Douglas-fir, redwood, montane hardwood, montane hardwood-conifer, montane riparian, blue oak woodland, coastal oak woodland, chamise-redshank chaparral, mixed chaparral, and wet meadow CNDDB: coastal and valley freshwater marsh	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Albion, Fort Bragg, Mendocino	Albion, Mendocino
Sedum laxum ssp. *eastwoodiae* Red Mountain stonecrop	FC/–/1B.2	No	May–July	1,969–3,937	Lower montane coniferous forest in serpentinite soils	CWHR: Douglas-fir and redwood CNDDB: none	Yes; suitable habitat present within the secondary assessment area	CNPS, CNDDB, USFWS			Noble Butte
Sidalcea calycosa ssp. *rhizomata* Point Reyes checkerbloom	–/–/1B.2	No	April–September	9–246	Marshes and swamps	CWHR: none CNDDB: coastal and valley freshwater marshes	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Albion, Elk, Saunders Reef	Albion, Saunders Reef, Stewarts Point

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									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Sidalcea malachroides Maple-leaved checkerbloom	–/–/4.2	Yes		6–2,395	Coastal bluff scrub and scrub, coastal prairie, North Coast coniferous forest, broadleaved upland forest	CWHR: Douglas-fir, redwood, montane hardwood, montane hardwood-conifer and coastal scrub CNDDB: Northern coastal bluff scrub, and coastal terrace prairie	Yes; suitable habitat within the assessment area	CNDDB	South Coast, Garcia River, Rockport, Albion	Albion, Bear Harbor, Comptche, Dutchmans Knoll, Gualala, Inglenook, Mallo Pass Creek, Mendocino, Noyo Hill, Point Arena, Westport	Albion, Gualala, Point Arena, Stewarts Point
Sidalcea malviflora ssp. *patula* Siskiyou checkerbloom	–/–/1B.2	Yes	May–August	49–2,880	Coastal bluff scrub, coastal prairie, often roadcuts in North Coast coniferous forest	CWHR: Douglas-fir, redwood, and coastal scrub CNDDB: Northern coastal bluff scrub and coastal terrace prairie	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Albion	
Sidalcea malviflora ssp. *purpurea* Purple-stemmed checkerbloom	–/–/1B.2	No	May–June	15–85 m (49–278 ft)	Coastal prairie, broadleaved upland forest	CWHR: montane hardwood CNDDB: coastal terrace prairie	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Fort Bragg, Gualala, Mallo Pass Creek, Point Arena, Saunders Reef	Fort Bragg, Gualala, Saunders Reef, Stewarts Point
Silene campanulata ssp. *campanulata* Red Mountain catchfly	–/SE/4.2	No	April–July	1,394–6,840	Chaparral, and usually serpentininte, rocky soils in lower montane coniferous forest	CWHR: chamise-redshank chaparral, mixed chaparral, Douglas-fir, and redwood CNDDB: none	Yes; suitable habitat within the assessment area	CNDDB			Leggett, Noble Butte

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									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Streptanthus glandulosus var. *hoffmanii* Hoffman's bristly jewel-flower	–/–/1B.3	No	March–July	393–1,558	Chaparral, cismontane woodland, often rocky, serpentinite soils in valley and foothill grassland,	CWHR: chamise-redshank chaparral, mixed chaparral, blue oak woodland, coastal oak woodland, and annual grassland CNDDB: none	Yes; suitable habitat within the assessment area	CNPS	CNPS documented species; no detailed location data provided		
Streptanthus morrisonii ssp. *morrisonii* Morrison's jewel-flower	–/–/1B.2	No	May–September	393–1,919	Closed-cone coniferous forest, serpentinite soils in chaparral	CWHR: closed-cone pine-cypress, chamise-redshank chaparral, and mixed chaparral CNDDB: Mendocino pygmy cypress forest	Yes; suitable habitat within the assessment area	CNDDB			Tombs Creek
Thermopsis robusta Robust false lupine	–/–/1B.2	No	May–July	492–4,921	Broadleafed upland forest, North Coast coniferous forest	CWHR: montane hardwood, montane hardwood-conifer, Douglas-fir, and redwood CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Lincoln Ridge	
Tracyina rostrata Beaked tracyina	–/–/1B.2	Yes	May–June	295–2,591	Valley and foothill grassland, cismontane woodland	CWHR: blue oak woodland, coastal oak woodland, and annual grassland CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Fort Seward, Jewett Rock, Purdys Gardens
Trifolium amoenum Showy Indian (two-forked) clover	FE/–/1B.1	No	April–June	16–1,362	Coastal bluff scrub, and serpentinite soils in valley and foothill grassland	CWHR: coastal scrub and annual grassland CNDDB: Northern coastal bluff scrub	Yes; suitable habitat within the assessment area	USFWS	USFWS documented species; no detailed location data provided		

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									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Trifolium buckwestiorum Santa Cruz clover	–/–/1B.1	Yes	April–October	344–2,001	Broadleafed upland forest, cismontane woodland, gravelly margins in coastal prairie	CWHR: blue oak woodland, coastal oak woodland, and montane hardwood CNDDB: coastal terrace prairie	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Eureka Hill, Philo, Zeni Ridge	
Viburnum ellipticum Oval-leaved viburnum	–/–/2.3	Yes	May–June	705–4,593	Cismontane woodland, chaparral, lower montane coniferous forest	CWHR: Douglas-fir, and redwood, blue oak woodland, coastal oak woodland, chamise-redshank chaparral, and mixed chaparral CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Bells Springs, Harris, Laytonville, Leggett, Tan Oak Park
Viola palustris Marsh violet	–/–/2.2	No	March–August	0–492	Coastal bogs and fens, mesic coastal scrub	CWHR: coastal scrub. CNDDB: Northern coastal bluff scrub, sphagnum bog and fen.	Yes; suitable habitat within the assessment area.	CNPS, CNDDB		Fort Bragg	Fort Bragg

Scientific name Common name	Status[a] Federal/ State/ California Rare Plant Rank	HCP/ NCCP covered species?	Blooming period	Elevation range (ft)	Suitable habitat type	Related CWHR[b] and CNDDB [c] -listed plant community types	Likely to occur in assessment area?	Query source	Documented occurrences		
									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Non-vascular plants											
Didymodon norrisii Norris' beard-moss	–/–/1B.3	No	n/a	1,968–6,473	Cismontane woodland, intermittently mesic and rocky areas in lower montane coniferous forest	CWHR: Douglas-fir, redwood coastal oak woodland, and blue oak woodland CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB			Upper Lake
Entosthodon kochii Koch's cord-moss	–/–/1B.2	No	n/a	590–3,280	Cismontane woodland	CWHR: coastal oak woodland and blue oak woodland CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB	CNPS and CNDDB documented species; no detailed location data provided		
Fissidens pauperculus Minute pocket-moss	–/–/4.1	No	n/a	32–3,359	North Coast coniferous forest in damp coastal soil	CWHR: Douglas-fir and redwood CNDDB: none	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Bailey Ridge	
Lycopodium clavatum Running-pine	–/–/1B.2	Yes	June–August	147–4,019	North Coast coniferous forest, lower montane coniferous forest, riparian forest and woodland, marshes and swamps	CWHR: Douglas-fir, redwood, montane hardwood, montane hardwood- conifer, and montane riparian CNDDB: coastal and valley freshwater marsh	Yes; suitable habitat within the assessment area	CNDDB		Noyo Hill	McGuire Ridge
Triquetrella californica Coastal triquetrella	–/–/–	No	n/a	32–328	Coastal bluff scrub, coastal scrub	CWHR: coastal scrub CNDDB: Northern coastal bluff scrub	Yes; suitable habitat within the assessment area	CNPS, CNDDB		Fort Bragg	Fort Bragg

Scientific name Common name	Status[a] Federal/ State/ California Rare Plant Rank	HCP/ NCCP covered species?	Blooming period	Elevation range (ft)	Suitable habitat type	Related CWHR[b] and CNDDB [c] -listed plant community types	Likely to occur in assessment area?	Query source	Documented occurrences		
									Primary assessment area (by inventory block)	Secondary assessment area (by quad)	Outside of the assessment area (by quad)
Usnea longissima Long-beard lichen	–/–/–	Yes	n/a	0–2,000	Closed-cone coniferous forest, North Coast coniferous forest, broadleaved upland forest	CWHR: closed-cone pine-cypress, Douglas-fir, redwood, montane hardwood, and montane hardwood-conifer CNDDB: Mendocino pygmy cypress forest	Yes; suitable habitat within the assessment area	CNDDB	South Coast, Albion	Bear Harbor, Dutchmans Knoll, Elk, Hales Grove, Inglenook, Leggett, Lincoln Ridge, Mathison Peak, Noyo Hill, Orrs Springs, Piercy	Annapolis, Harris, Honeydew, Noble Butte, Shelter Cove, Stewarts Point

[a] Status codes:

FE = Listed as endangered under the federal Endangered Species Act
FC = Federal candidate species

SE = Listed as endangered under the California Endangered Species Act
ST = Listed as threatened under the California Endangered Species Act
SR = Listed as rare by the state of California

California Rare Plant Rank
1A = plants presumed extinct in California
1B = plants rare, threatened, or endangered in California, and elsewhere
2 = plants rare, threatened, or endangered in California, but more common elsewhere
3 = plants about which we need more information, a review list
4 = plants of limited distribution, a watch list

California Rare Plant Threat Rank
0.1= Seriously threatened in California (high degree/immediacy of threat)
0.2 = Fairly threatened in California (moderate degree/immediacy of threat)
0.3 = Not very threatened in California (low degree/immediacy of threats or no current threats known)

[b] California Wildlife Habitat Relationships
[c] California Natural Diversity Database
[d] California Native Plant Society

Appendix O

Timber Model Output Tables for the Vegetation and Plant Species of Concern Environmental Effects Analysis

Alternative	Inventory Block	veg type	Year 0	10	20	30	40	50	60	70	80	90	100
No Action (No HCP/No Permit)	Albion Inventory Block	MHC	685.60	663.10	532.96	164.65	206.67	235.97	229.57	184.27	40.90	25.75	5.23
No Action (No HCP/No Permit)	Albion Inventory Block	MHW	60.61	75.70	117.05	84.07	78.09	59.29	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Albion Inventory Block	RDW	13333.51	13340.92	13429.71	13831.00	13794.96	13784.46	13850.16	13895.46	14038.82	14053.97	14074.49
No Action (No HCP/No Permit)	Big River Inventory Block	MHC	13799.61	13313.06	4416.55	5726.40	2174.92	710.29	524.51	286.95	54.28	171.17	325.96
No Action (No HCP/No Permit)	Big River Inventory Block	MHW	233.23	2033.35	6543.60	2299.55	290.91	340.17	86.41	8.67	8.67	8.67	8.67
No Action (No HCP/No Permit)	Big River Inventory Block	RDW	18040.80	16727.22	21113.49	24047.68	29607.80	31023.17	31462.71	31778.02	32010.68	31893.80	31739.01
No Action (No HCP/No Permit)	Garcia River Inventory Block	MHC	7301.82	7108.89	3871.30	3244.96	1855.32	1495.08	1236.83	496.74	151.11	193.94	390.12
No Action (No HCP/No Permit)	Garcia River Inventory Block	MHW	403.05	912.00	2021.25	1542.11	1419.66	1430.56	747.86	292.93	197.32	104.52	21.94
No Action (No HCP/No Permit)	Garcia River Inventory Block	RDW	6295.77	5979.75	8108.09	9213.57	10725.65	11075.00	12015.95	13210.96	13652.20	13702.17	13588.57
No Action (No HCP/No Permit)	Navarro East Inventory Block	MHC	17634.64	15010.60	5453.18	3785.93	2375.45	1418.31	724.18	531.96	300.68	217.52	267.99
No Action (No HCP/No Permit)	Navarro East Inventory Block	MHW	438.60	2110.78	4233.50	2630.49	1955.54	1048.77	694.38	356.92	85.27	62.79	38.88
No Action (No HCP/No Permit)	Navarro East Inventory Block	RDW	11519.47	12471.34	19906.03	23176.29	25261.72	27125.63	28174.15	28703.84	29206.77	29312.40	29285.85
No Action (No HCP/No Permit)	Navarro West Inventory Block	MHC	6752.33	5971.61	3529.73	2535.18	890.42	553.43	339.11	264.86	161.02	131.54	217.37
No Action (No HCP/No Permit)	Navarro West Inventory Block	MHW	116.05	876.02	2031.28	740.87	287.34	184.13	50.22	0.00	0.00	13.27	13.27
No Action (No HCP/No Permit)	Navarro West Inventory Block	RDW	15557.86	15578.60	16865.24	19150.19	21248.47	21688.67	22036.91	22161.38	22265.22	22281.44	22195.60
No Action (No HCP/No Permit)	Noyo Inventory Block	MHC	6622.09	4877.51	1372.35	2417.42	737.20	399.50	422.20	383.99	98.92	197.75	238.81
No Action (No HCP/No Permit)	Noyo Inventory Block	MHW	45.18	2014.79	2250.50	170.36	192.61	611.70	420.19	0.00	10.88	0.00	0.00
No Action (No HCP/No Permit)	Noyo Inventory Block	RDW	12071.34	11846.32	15115.76	16150.83	17808.80	17727.41	17896.22	18354.62	18628.80	18540.87	18499.80
No Action (No HCP/No Permit)	Rockport Inventory Block	MHC	19850.52	16970.11	8754.10	6816.04	5118.44	1294.75	1483.26	1089.81	533.36	669.70	847.25
No Action (No HCP/No Permit)	Rockport Inventory Block	MHW	1678.15	5020.33	7523.80	4081.64	978.29	1403.01	848.20	123.90	32.39	32.39	8.99
No Action (No HCP/No Permit)	Rockport Inventory Block	RDW	15595.86	15134.09	20846.62	26226.85	31027.79	34426.77	34793.07	35910.82	36558.77	36422.44	36268.28
No Action (No HCP/No Permit)	South Coast Inventory Block	MHC	9467.30	7895.67	2336.65	1756.90	971.97	801.27	1142.95	386.33	42.48	26.61	99.49
No Action (No HCP/No Permit)	South Coast Inventory Block	MHW	584.88	1714.27	1790.15	760.59	899.29	1696.03	814.68	98.41	56.51	26.74	12.02
No Action (No HCP/No Permit)	South Coast Inventory Block	RDW	22390.25	22832.49	28315.63	29924.93	30571.17	29945.12	30484.80	31957.69	32343.43	32389.08	32330.92
No Action (No HCP/No Permit)	Ukiah Inventory Block	MHC	1444.97	585.24	392.26	524.21	556.86	300.29	312.10	68.52	35.29	6.96	2.40
No Action (No HCP/No Permit)	Ukiah Inventory Block	MHW	688.83	696.95	635.60	292.75	141.14	224.84	51.59	29.70	29.70	29.70	29.70
No Action (No HCP/No Permit)	Ukiah Inventory Block	RDW	257.79	1109.40	1363.73	1574.63	1693.60	1866.46	2027.90	2293.38	2326.60	2354.93	2359.49
Proposed Action (HCP/NCCP)	Albion Inventory Block	MHC	685.60	592.84	745.42	185.86	78.38	126.71	102.24	51.91	6.65	17.08	10.42
Proposed Action (HCP/NCCP)	Albion Inventory Block	MHW	60.61	60.61	60.61	60.61	60.61	11.85	11.85	5.19	5.19	0.00	0.00
Proposed Action (HCP/NCCP)	Albion Inventory Block	RDW	13333.51	13426.27	13273.69	13833.25	13940.73	13941.17	13965.64	14022.62	14067.88	14062.64	14069.30
Proposed Action (HCP/NCCP)	Big River Inventory Block	MHC	13799.61	13768.64	6976.38	2342.94	1035.24	1010.09	431.08	157.28	261.77	608.14	510.26
Proposed Action (HCP/NCCP)	Big River Inventory Block	MHW	233.23	48.21	117.17	117.17	36.14	8.67	8.67	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Big River Inventory Block	RDW	18040.80	18256.78	24980.08	29613.52	31002.25	31054.88	31633.88	31916.36	31811.87	31465.49	31563.38
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	MHC	7301.82	6459.67	3177.45	1420.97	1007.11	671.09	343.07	228.76	328.96	365.11	366.38
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	MHW	403.05	355.56	506.61	400.91	232.03	194.08	178.96	70.85	10.20	0.52	0.52
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	RDW	6295.77	7185.40	10316.57	12178.75	12761.49	13135.46	13478.61	13701.03	13661.47	13635.00	13633.73
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	MHC	17634.64	15054.83	6579.75	2331.48	1227.06	1146.50	632.11	651.64	494.04	455.22	390.66
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	MHW	438.60	458.49	660.05	624.29	291.85	219.08	132.01	19.33	19.33	19.33	19.33
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	RDW	11519.47	14079.39	22352.92	26636.95	28073.81	28227.13	28828.60	28921.74	29079.34	29118.16	29182.72
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	MHC	6752.33	5321.15	4021.48	1525.63	470.33	245.37	163.31	189.81	276.99	284.67	210.73
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	MHW	116.05	91.77	32.04	32.04	32.04	32.04	32.04	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	RDW	15557.86	17013.33	18372.73	20868.57	21923.87	22148.84	22230.90	22236.43	22149.25	22141.57	22215.51
Proposed Action (HCP/NCCP)	Noyo Inventory Block	MHC	6622.09	6051.25	1899.68	483.53	252.49	343.09	173.20	289.29	86.37	98.40	91.68
Proposed Action (HCP/NCCP)	Noyo Inventory Block	MHW	45.18	104.84	30.04	30.04	30.04	30.04	0.00	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Noyo Inventory Block	RDW	12071.34	12582.53	16808.90	18225.05	18456.08	18365.48	18565.42	18449.32	18652.25	18640.21	18646.94
Proposed Action (HCP/NCCP)	Rockport Inventory Block	MHC	19850.52	19061.00	10005.58	2946.31	1310.63	1127.61	703.52	567.11	670.94	898.06	899.57
Proposed Action (HCP/NCCP)	Rockport Inventory Block	MHW	1678.15	977.84	571.23	375.21	120.37	19.75	0.00	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Rockport Inventory Block	RDW	15595.86	17085.68	26547.71	33803.01	35693.52	35977.17	36421.00	36557.41	36453.59	36226.46	36224.95
Proposed Action (HCP/NCCP)	South Coast Inventory Block	MHC	9467.30	7794.54	2561.09	1340.69	481.05	92.69	5.49	46.82	47.83	73.31	63.80
Proposed Action (HCP/NCCP)	South Coast Inventory Block	MHW	584.88	572.45	217.00	51.40	53.35	53.35	47.87	16.04	3.57	2.42	2.42
Proposed Action (HCP/NCCP)	South Coast Inventory Block	RDW	22390.25	24075.43	29664.34	31050.34	31908.02	32296.39	32389.08	32379.56	32391.03	32366.70	32376.21
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	MHC	1444.97	978.39	779.17	354.86	225.47	173.64	76.10	13.96	0.00	17.87	17.87
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	MHW	688.83	497.65	176.41	170.14	57.34	47.57	47.57	47.57	47.57	29.70	29.70

Dominant CWHR Habitat Type (forestwide) by Inventory Block

Alternative	Inventory Block	veg type	Year 0	10	20	30	40	50	60	70	80	90	100
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	RDW	257.79	915.55	1436.02	1866.59	2108.78	2170.38	2267.92	2330.06	2344.02	2344.02	2344.02
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	MHC	685.60	441.82	525.61	216.36	119.74	109.41	97.01	24.47	11.85	11.85	5.19
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	MHW	60.61	60.61	60.61	60.61	60.61	36.32	36.32	11.85	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	RDW	13333.51	13577.29	13493.50	13802.75	13899.37	13933.99	13946.40	14043.40	14067.88	14067.88	14074.53
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	MHC	13799.61	11675.73	5735.41	1086.34	42.82	78.97	63.71	8.94	8.59	8.59	0.00
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	MHW	233.23	48.21	17.60	17.60	8.67	8.67	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	RDW	18040.80	20349.69	26320.62	30969.69	32022.15	31986.00	32009.92	32064.69	32065.04	32065.04	32073.63
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	MHC	7301.82	6325.96	2990.53	1076.50	550.56	431.01	200.84	112.53	114.75	88.39	58.03
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	MHW	403.05	289.81	232.03	232.03	232.03	163.26	163.26	90.63	10.83	0.52	0.52
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	RDW	6295.77	7384.87	10778.07	12692.11	13218.04	13406.36	13636.54	13797.47	13875.06	13911.73	13942.08
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	MHC	17634.64	13027.40	5950.59	1698.87	770.92	735.24	486.14	369.91	241.97	87.23	49.15
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	MHW	438.60	468.57	392.72	391.83	225.23	79.63	79.63	19.33	19.33	19.33	18.86
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	RDW	11519.47	16096.74	23249.39	27502.01	28596.56	28777.84	29026.94	29203.47	29331.41	29486.15	29524.70
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	MHC	6752.33	4484.32	2868.25	1199.51	432.49	450.64	304.43	196.07	170.17	106.30	94.87
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	MHW	116.05	91.77	32.04	32.04	32.04	32.04	32.04	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	RDW	15557.86	17850.15	19525.96	21194.69	21961.71	21943.57	22089.77	22230.17	22256.07	22319.94	22331.37
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	MHC	6622.09	5190.34	1484.37	369.56	226.18	217.24	57.65	150.86	14.22	12.53	5.80
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	MHW	45.18	14.33	5.80	5.80	5.80	5.80	5.80	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	RDW	12071.34	13533.94	17248.44	18363.26	18506.63	18515.57	18675.16	18587.76	18724.39	18726.08	18732.81
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	MHC	19850.52	17971.61	8401.72	1221.65	476.49	250.46	193.70	106.46	84.16	59.41	40.22
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	MHW	1678.15	1000.33	328.17	304.37	94.17	26.18	8.99	6.52	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	RDW	15595.86	18152.59	28394.64	35598.51	36553.87	36847.89	36921.83	37011.54	37040.36	37065.11	37084.30
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	MHC	9467.30	7026.07	2671.05	738.69	171.37	48.30	1.95	13.07	31.21	47.09	42.72
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	MHW	584.88	548.91	74.70	51.40	51.40	51.40	51.40	40.28	22.14	6.26	8.68
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	RDW	22390.25	24867.45	29696.68	31652.34	32219.66	32342.73	32389.08	32389.08	32389.08	32389.08	32391.03
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	MHC	1444.97	920.93	601.26	366.02	217.47	188.26	128.84	34.73	7.16	17.87	17.87
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	MHW	688.83	497.65	176.41	176.41	78.12	52.31	47.57	47.57	47.57	29.70	29.70
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	RDW	257.79	973.02	1613.92	1849.16	2096.00	2151.02	2215.18	2309.29	2336.87	2344.02	2344.02
Alternative B (Reserves)	Albion Inventory Block	MHC	685.60	929.25	1010.77	683.98	1258.54	879.66	631.36	222.27	377.22	575.62	912.52
Alternative B (Reserves)	Albion Inventory Block	MHW	60.61	250.48	602.68	1248.78	920.81	747.89	381.00	648.08	564.23	1240.42	1014.52
Alternative B (Reserves)	Albion Inventory Block	RDW	13333.51	12899.99	12466.28	12146.96	11900.37	12452.17	13067.37	13209.38	13138.27	12263.68	12152.69
Alternative B (Reserves)	Big River Inventory Block	MHC	13799.61	17536.95	10360.36	4874.39	2863.88	1532.96	1888.16	1644.46	2263.84	2341.15	2032.92
Alternative B (Reserves)	Big River Inventory Block	MHW	233.23	77.35	214.95	2744.59	1609.34	2819.84	1797.67	3087.23	2846.67	3709.46	1500.81
Alternative B (Reserves)	Big River Inventory Block	RDW	18040.80	14459.34	21498.32	24454.65	27600.41	27720.83	28387.80	27341.94	26963.13	26023.02	28539.90
Alternative B (Reserves)	Garcia River Inventory Block	MHC	7301.82	7917.87	4911.89	2541.91	2268.52	1318.06	1543.72	783.84	1031.35	1250.90	1288.19
Alternative B (Reserves)	Garcia River Inventory Block	MHW	403.05	421.09	581.69	2100.70	1213.15	2074.32	678.73	1455.11	1239.36	1976.90	980.37
Alternative B (Reserves)	Garcia River Inventory Block	RDW	6295.77	5661.68	8507.05	9358.02	10518.96	10608.26	11778.18	11761.68	11729.93	10772.83	11732.07
Alternative B (Reserves)	Navarro East Inventory Block	MHC	17634.64	19166.41	10490.98	4285.80	3647.82	2154.01	2098.58	1592.62	2434.09	2614.35	2808.54
Alternative B (Reserves)	Navarro East Inventory Block	MHW	438.60	438.03	799.78	3901.86	2622.82	2923.07	2366.69	3626.41	3564.13	4612.87	2166.38
Alternative B (Reserves)	Navarro East Inventory Block	RDW	11519.47	9988.28	18301.96	21405.05	23322.07	24515.63	25127.44	24373.68	23594.48	22365.49	24617.79
Alternative B (Reserves)	Navarro West Inventory Block	MHC	6752.33	7998.06	6046.52	2545.14	1613.27	1473.57	1455.31	1055.47	932.82	1198.02	1222.12
Alternative B (Reserves)	Navarro West Inventory Block	MHW	116.05	291.03	558.71	2237.11	2086.07	2216.07	856.90	1208.88	1230.43	2296.86	1803.05
Alternative B (Reserves)	Navarro West Inventory Block	RDW	15557.86	14137.14	15821.00	17643.99	18726.90	18736.60	20114.03	20161.89	20262.99	18931.36	19401.07
Alternative B (Reserves)	Noyo Inventory Block	MHC	6622.09	8101.78	4316.53	1871.30	1854.83	1559.93	1320.45	680.89	1105.92	1486.44	1514.53
Alternative B (Reserves)	Noyo Inventory Block	MHW	45.18	209.94	285.99	2750.93	1713.11	2382.68	865.02	1697.29	1357.06	2665.34	1539.59
Alternative B (Reserves)	Noyo Inventory Block	RDW	12071.34	10426.90	14136.10	14116.38	15170.67	14796.00	16553.14	16360.43	16275.63	14586.83	15684.49
Alternative B (Reserves)	Rockport Inventory Block	MHC	19850.52	20362.48	13029.61	4996.48	3623.47	2595.60	3303.02	2583.64	2401.67	2609.50	3318.98
Alternative B (Reserves)	Rockport Inventory Block	MHW	1678.15	1354.72	1201.63	4451.94	2661.91	4894.15	1583.50	2733.73	2422.48	5062.29	2387.59
Alternative B (Reserves)	Rockport Inventory Block	RDW	15595.86	15407.33	22893.28	27676.10	30839.15	29634.77	32238.01	31807.15	32300.37	29452.73	31417.95
Alternative B (Reserves)	South Coast Inventory Block	MHC	9467.30	10449.94	4597.14	2386.01	3215.34	1937.08	1276.38	962.06	903.94	1985.32	2419.58
Alternative B (Reserves)	South Coast Inventory Block	MHW	584.88	572.62	1088.73	3796.74	3197.90	2602.45	813.85	1326.12	1509.72	3909.87	2906.85
Alternative B (Reserves)	South Coast Inventory Block	RDW	22390.25	21419.87	26756.56	26259.69	26029.19	27902.89	30352.20	30154.25	30028.77	26547.24	27116.00
Alternative B (Reserves)	Ukiah Inventory Block	MHC	1444.97	1426.14	1139.14	767.03	375.86	374.68	186.24	147.10	289.10	113.53	127.34

Alternative	Inventory Block	veg type	Year 0	10	20	30	40	50	60	70	80	90	100
Alternative B (Reserves)	Ukiah Inventory Block	MHW	688.83	605.93	207.24	312.63	117.24	168.72	51.42	638.65	362.45	322.07	88.59
Alternative B (Reserves)	Ukiah Inventory Block	RDW	257.79	359.53	1045.21	1311.94	1898.49	1848.20	2153.93	1605.85	1740.04	1955.99	2175.67
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	MHC	685.60	592.84	745.42	185.86	78.38	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	MHW	60.61	60.61	60.61	60.61	60.61	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	RDW	13333.51	13426.27	13273.69	13833.25	13940.73	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	MHC	13799.61	13768.64	6976.38	2342.94	1035.24	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	MHW	233.23	48.21	117.17	117.17	36.14	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	RDW	18040.80	18256.78	24980.08	29613.52	31002.25	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	MHC	7301.82	6459.67	3177.45	1420.97	1007.11	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	MHW	403.05	355.56	506.61	400.91	232.03	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	RDW	6295.77	7185.40	10316.57	12178.75	12761.49	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	MHC	17634.64	15054.83	6579.75	2331.48	1227.06	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	MHW	438.60	458.49	660.05	624.29	291.85	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	RDW	11519.47	14079.39	22352.92	26636.95	28073.81	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	MHC	6752.33	5321.15	4021.48	1525.63	470.33	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	MHW	116.05	91.77	32.04	32.04	32.04	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	RDW	15557.86	17013.33	18372.73	20868.57	21923.87	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	MHC	6622.09	6051.25	1899.68	483.53	252.49	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	MHW	45.18	104.84	30.04	30.04	30.04	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	RDW	12071.34	12582.53	16808.90	18225.05	18456.08	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	MHC	19850.52	19061.00	10005.58	2946.31	1310.63	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	MHW	1678.15	977.84	571.23	375.21	120.37	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	RDW	15595.86	17085.68	26547.71	33803.01	35693.52	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	MHC	9467.30	7794.54	2561.09	1340.69	481.05	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	MHW	584.88	572.45	217.00	51.40	53.35	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	RDW	22390.25	24075.43	29664.34	31050.34	31908.02	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	MHC	1444.97	978.39	779.17	354.86	225.47	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	MHW	688.83	497.65	176.41	170.14	57.34	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	RDW	257.79	915.55	1436.02	1866.59	2108.78	0.00	0.00	0.00	0.00	0.00	0.00

Alternative	Inventory Block	veg size	Year 0	10	20	30	40	50	60	70	80	90	100
No Action (No HCP/No Permit)	Albion Inventory Block	2	1563.42	804.31	807.76	247.82	71.62	78.31	52.64	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Albion Inventory Block	3	1927.99	3194.57	2374.54	2160.36	2165.17	1464.38	1914.03	2343.73	3174.89	3238.03	3577.79
No Action (No HCP/No Permit)	Albion Inventory Block	4	7613.47	7963.21	7762.54	8478.25	8363.30	9058.85	8054.43	7334.68	6772.37	6937.08	6668.20
No Action (No HCP/No Permit)	Albion Inventory Block	5	2964.52	2117.63	3134.89	3174.49	3291.81	3178.90	3357.72	3607.94	3049.37	2607.60	2405.66
No Action (No HCP/No Permit)	Albion Inventory Block	6	10.32	0.00	0.00	18.80	187.82	299.28	700.91	793.38	1083.10	1297.00	1428.08
No Action (No HCP/No Permit)	Big River Inventory Block	2	2720.62	6072.94	7811.27	5211.17	871.70	446.56	293.49	78.84	27.17	22.19	0.00
No Action (No HCP/No Permit)	Big River Inventory Block	3	8994.00	10792.26	6688.93	5935.28	12406.19	12861.64	7588.69	5019.52	6367.66	9777.55	11941.81
No Action (No HCP/No Permit)	Big River Inventory Block	4	20063.09	14981.55	17127.92	20178.49	17517.99	14665.73	17973.20	20990.85	19673.81	16327.31	14634.81
No Action (No HCP/No Permit)	Big River Inventory Block	5	295.92	226.89	445.50	730.65	1225.73	4074.36	6034.07	5789.34	5511.69	4944.85	4050.49
No Action (No HCP/No Permit)	Big River Inventory Block	6	0.00	0.00	0.00	18.04	52.02	25.34	184.17	195.08	493.30	1001.74	1446.52
No Action (No HCP/No Permit)	Garcia River Inventory Block	2	498.73	1216.11	1650.99	1938.48	1568.80	1703.51	1187.85	419.10	123.55	152.64	0.00
No Action (No HCP/No Permit)	Garcia River Inventory Block	3	3891.46	3548.59	4104.41	3004.39	3160.40	3691.24	4690.16	4596.14	4974.88	4951.05	4845.93
No Action (No HCP/No Permit)	Garcia River Inventory Block	4	9430.05	9138.24	8144.89	8889.23	9019.64	7890.35	6202.25	6851.63	6861.22	7101.04	7415.34
No Action (No HCP/No Permit)	Garcia River Inventory Block	5	180.40	97.70	100.35	168.53	251.80	686.97	1891.81	2098.71	1915.57	1595.20	1379.81
No Action (No HCP/No Permit)	Garcia River Inventory Block	6	0.00	0.00	0.00	0.00	0.00	28.56	28.56	35.06	125.40	200.71	359.55
No Action (No HCP/No Permit)	Navarro East Inventory Block	2	2400.04	6413.67	5514.05	4472.90	2231.71	1603.36	946.67	550.42	224.25	48.95	31.09
No Action (No HCP/No Permit)	Navarro East Inventory Block	3	7418.32	8780.06	6115.52	5737.64	8787.90	8990.14	6813.76	6701.96	7401.29	9091.06	10328.63
No Action (No HCP/No Permit)	Navarro East Inventory Block	4	19577.79	14189.19	17694.32	18777.33	17860.78	17420.28	17700.07	17254.77	16964.66	15919.34	15072.17
No Action (No HCP/No Permit)	Navarro East Inventory Block	5	196.57	209.79	268.82	594.76	712.33	1571.22	4114.12	5047.95	4887.61	4168.04	3484.71
No Action (No HCP/No Permit)	Navarro East Inventory Block	6	0.00	0.00	0.00	10.09	0.00	7.72	18.09	37.61	114.92	365.32	676.12
No Action (No HCP/No Permit)	Navarro West Inventory Block	2	2520.19	2907.60	2941.41	1629.25	449.61	426.22	152.75	36.23	68.82	36.23	50.51
No Action (No HCP/No Permit)	Navarro West Inventory Block	3	4452.47	5690.60	4614.76	3929.85	4504.05	5054.50	5325.91	5040.81	6616.67	6721.13	8134.73
No Action (No HCP/No Permit)	Navarro West Inventory Block	4	14246.13	12842.98	13960.07	15070.84	15375.99	14063.15	12906.98	12465.01	10863.77	10664.14	9412.44
No Action (No HCP/No Permit)	Navarro West Inventory Block	5	923.42	672.93	630.32	1495.73	1694.76	2374.34	3570.51	4305.91	4095.46	3872.82	3055.82
No Action (No HCP/No Permit)	Navarro West Inventory Block	6	284.03	312.12	279.69	300.58	401.83	508.03	470.09	578.28	781.53	1131.92	1772.74
No Action (No HCP/No Permit)	Noyo Inventory Block	2	1193.52	2306.47	2611.77	1126.24	245.18	754.77	560.57	146.25	10.88	10.88	0.00
No Action (No HCP/No Permit)	Noyo Inventory Block	3	6276.20	6383.48	3536.55	2584.21	4498.52	4461.01	4609.39	4676.99	5807.67	6813.15	7052.32
No Action (No HCP/No Permit)	Noyo Inventory Block	4	11199.88	9964.08	12414.86	14721.91	12904.64	12105.36	10706.09	10154.01	9308.95	8756.28	9241.24
No Action (No HCP/No Permit)	Noyo Inventory Block	5	69.02	84.58	175.43	254.86	1046.16	1373.36	2807.97	3704.94	3447.96	2708.39	1828.29
No Action (No HCP/No Permit)	Noyo Inventory Block	6	0.00	0.00	0.00	51.39	44.10	44.10	54.59	56.43	163.16	449.91	616.77
No Action (No HCP/No Permit)	Rockport Inventory Block	2	3338.24	5873.89	8587.57	7094.98	2980.41	1491.90	1579.10	626.49	23.39	84.03	0.00
No Action (No HCP/No Permit)	Rockport Inventory Block	3	5514.65	8028.23	7695.54	6671.91	9765.43	11353.98	10695.77	9690.90	8900.39	10864.06	12956.22
No Action (No HCP/No Permit)	Rockport Inventory Block	4	27797.10	22981.56	20272.20	22067.04	22503.51	21210.53	19443.92	20970.14	21760.84	19978.71	18413.43
No Action (No HCP/No Permit)	Rockport Inventory Block	5	474.53	240.84	569.21	1290.59	1875.18	3027.62	5313.75	5647.87	5904.63	5304.81	4776.49
No Action (No HCP/No Permit)	Rockport Inventory Block	6	0.00	0.00	0.00	0.00	0.00	40.49	91.98	189.12	535.27	892.92	978.39
No Action (No HCP/No Permit)	South Coast Inventory Block	2	1528.11	2203.32	2410.32	1345.79	1078.68	1975.29	1382.11	249.24	51.77	0.00	1.95
No Action (No HCP/No Permit)	South Coast Inventory Block	3	6860.11	9379.46	6394.82	4777.51	5697.09	6629.06	7060.55	8924.74	9753.02	10838.83	10077.14
No Action (No HCP/No Permit)	South Coast Inventory Block	4	23683.35	20465.25	23449.43	24228.56	22945.86	19830.04	19165.31	16843.59	16491.68	15766.70	16660.43
No Action (No HCP/No Permit)	South Coast Inventory Block	5	251.22	326.56	110.12	2012.85	2648.04	3935.28	4766.61	6081.13	5274.05	4396.56	3693.09
No Action (No HCP/No Permit)	South Coast Inventory Block	6	119.65	67.84	77.73	77.73	72.77	72.77	67.84	343.73	871.91	1440.35	2009.82
No Action (No HCP/No Permit)	Ukiah Inventory Block	2	53.37	147.75	347.65	153.81	244.87	226.67	115.41	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Ukiah Inventory Block	3	540.37	1104.12	602.10	640.34	714.61	688.55	540.36	471.25	421.80	360.19	568.78
No Action (No HCP/No Permit)	Ukiah Inventory Block	4	1781.36	1123.24	1425.35	1580.96	1329.13	1219.33	1081.65	1026.57	1414.05	1570.70	1357.12
No Action (No HCP/No Permit)	Ukiah Inventory Block	5	16.49	16.49	16.49	16.49	86.50	240.55	637.69	848.41	459.25	279.78	201.29
No Action (No HCP/No Permit)	Ukiah Inventory Block	6	0.00	0.00	0.00	0.00	16.49	16.49	16.49	45.36	96.49	180.93	264.41
Proposed Action (HCP/NCCP)	Albion Inventory Block	2	1563.42	1151.50	1131.08	620.25	20.51	0.00	24.47	0.00	20.52	0.00	0.00
Proposed Action (HCP/NCCP)	Albion Inventory Block	3	1927.99	2710.40	1635.59	1382.03	2021.88	2109.38	797.78	703.01	573.10	104.55	323.64
Proposed Action (HCP/NCCP)	Albion Inventory Block	4	7613.47	8157.67	8361.81	9138.65	9343.02	9032.94	9702.47	10029.59	9696.28	10204.17	10254.79
Proposed Action (HCP/NCCP)	Albion Inventory Block	5	2964.52	2060.15	2951.23	2920.00	2498.04	2533.57	2507.44	2157.92	2213.23	1833.27	1249.74
Proposed Action (HCP/NCCP)	Albion Inventory Block	6	10.32	0.00	0.00	18.80	196.27	403.82	1047.57	1189.21	1576.60	1937.73	2251.55
Proposed Action (HCP/NCCP)	Big River Inventory Block	2	2720.62	2051.99	2599.21	1199.55	221.01	403.77	459.92	46.24	35.95	55.63	41.57
Proposed Action (HCP/NCCP)	Big River Inventory Block	3	8994.00	14214.79	12857.51	7077.85	9291.07	8533.13	1830.15	1357.57	989.92	391.49	348.13
Proposed Action (HCP/NCCP)	Big River Inventory Block	4	20063.09	15614.19	16214.24	23031.43	21147.95	19872.21	24933.80	25759.29	25441.19	26067.73	26337.78

CWHR Size Class (forestwide) by inventory block

Alternative	Inventory Block	veg size	Year 0	10	20	30	40	50	60	70	80	90	100
Proposed Action (HCP/NCCP)	Big River Inventory Block	5	295.92	146.17	356.18	753.07	1391.56	3204.87	4679.11	4602.69	4437.42	3323.11	2155.01
Proposed Action (HCP/NCCP)	Big River Inventory Block	6	0.00	46.49	46.49	11.73	22.04	59.64	170.65	307.84	1169.16	2235.66	3191.14
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	2	498.73	555.75	397.26	328.56	83.94	72.01	70.18	0.00	70.07	28.80	0.00
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	3	3891.46	5839.37	5201.67	3947.61	4067.54	2690.74	1050.87	583.40	288.08	404.26	331.57
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	4	9430.05	7486.23	8226.30	9478.36	9437.27	10367.62	11280.86	11558.08	11866.79	11785.82	11665.85
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	5	180.40	119.29	175.40	246.10	411.89	836.53	1529.43	1771.34	1525.43	1326.04	1219.23
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	6	0.00	0.00	0.00	0.00	0.00	33.74	69.30	87.81	250.27	455.72	783.99
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	2	2400.04	2037.42	1769.01	874.21	86.68	65.01	169.03	18.85	156.25	46.45	0.00
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	3	7418.32	13045.22	11926.56	7624.67	9118.99	6525.20	1386.17	1062.80	642.61	623.79	557.85
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	4	19577.79	14300.29	15750.17	20499.66	19437.34	21536.50	25332.12	25219.89	24915.22	25073.48	25363.40
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	5	196.57	209.79	146.97	575.95	939.61	1372.71	2511.06	2983.20	3215.37	2710.30	1564.69
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	6	0.00	0.00	0.00	18.22	10.09	93.29	194.33	307.96	663.27	1138.69	2106.77
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	2	2520.19	1671.21	939.34	329.66	9.61	0.00	28.75	0.00	27.22	0.00	0.00
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	3	4452.47	5910.89	4473.30	1962.94	2408.00	2544.09	799.38	621.65	318.50	483.63	273.55
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	4	14246.13	13759.09	16143.10	18344.90	17961.55	17048.58	18152.02	17662.35	17538.12	17350.99	17417.27
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	5	923.42	548.45	454.72	1364.01	1597.54	2279.11	2775.64	3321.92	3470.57	2903.28	2355.04
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	6	284.03	536.60	415.78	424.73	449.53	554.46	670.46	820.32	1071.82	1688.34	2380.38
Proposed Action (HCP/NCCP)	Noyo Inventory Block	2	1193.52	821.42	963.42	460.49	154.79	115.08	74.17	8.45	11.83	0.00	0.00
Proposed Action (HCP/NCCP)	Noyo Inventory Block	3	6276.20	6655.30	3721.49	2129.81	3520.85	3924.59	984.78	1009.12	518.19	261.47	241.25
Proposed Action (HCP/NCCP)	Noyo Inventory Block	4	11199.88	11169.93	13893.90	15953.72	14505.77	13463.33	15482.06	15144.15	15304.31	15639.17	15952.12
Proposed Action (HCP/NCCP)	Noyo Inventory Block	5	69.02	91.96	159.80	150.28	531.36	1190.24	2112.32	2322.10	2350.42	1902.58	1197.41
Proposed Action (HCP/NCCP)	Noyo Inventory Block	6	0.00	0.00	0.00	44.32	25.85	45.37	85.29	254.79	553.87	935.41	1347.84
Proposed Action (HCP/NCCP)	Rockport Inventory Block	2	3338.24	2452.10	3431.93	1767.45	140.62	107.02	0.00	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Rockport Inventory Block	3	5514.65	12809.26	11376.23	10342.93	11635.00	6855.70	1201.43	701.38	696.28	369.76	185.31
Proposed Action (HCP/NCCP)	Rockport Inventory Block	4	27797.10	21757.07	21957.88	23806.32	23579.39	27474.92	31666.86	31615.04	31605.59	31569.61	32214.01
Proposed Action (HCP/NCCP)	Rockport Inventory Block	5	474.53	106.09	358.48	1207.82	1769.52	2646.16	4085.70	3922.00	2889.73	2730.93	1437.05
Proposed Action (HCP/NCCP)	Rockport Inventory Block	6	0.00	0.00	0.00	0.00	0.00	40.73	170.54	886.11	1932.93	2454.22	3288.16
Proposed Action (HCP/NCCP)	South Coast Inventory Block	2	1528.11	1629.59	1659.54	679.10	224.19	88.24	15.01	0.00	0.00	0.00	26.53
Proposed Action (HCP/NCCP)	South Coast Inventory Block	3	6860.11	6477.37	4073.31	4010.33	5244.55	5238.76	2086.22	1132.90	1213.98	575.40	597.40
Proposed Action (HCP/NCCP)	South Coast Inventory Block	4	23683.35	24099.93	26419.74	25462.23	24250.19	22490.33	24599.17	24815.04	24863.34	25180.09	24981.47
Proposed Action (HCP/NCCP)	South Coast Inventory Block	5	251.22	134.16	212.12	2213.05	2645.77	4547.36	5529.89	5786.77	4620.79	3813.64	3163.71
Proposed Action (HCP/NCCP)	South Coast Inventory Block	6	119.65	101.38	77.73	77.73	77.73	77.73	212.14	707.72	1744.31	2873.31	3673.33
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	2	53.37	29.70	246.52	58.71	29.70	0.00	174.77	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	3	540.37	1328.64	670.76	845.89	762.10	995.98	220.63	103.77	172.84	87.80	25.15
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	4	1781.36	1016.77	1457.83	1470.51	1528.26	1185.21	1704.49	1689.45	1854.00	1950.29	1957.01
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	5	16.49	16.49	16.49	16.49	55.05	193.92	275.22	553.02	253.28	163.75	151.39
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	6	0.00	0.00	0.00	0.00	16.49	16.49	16.49	45.36	111.47	189.75	258.04
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	2	1563.42	870.98	1005.00	356.39	0.00	0.00	24.29	0.00	24.47	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	3	1927.99	2483.73	1848.79	1690.71	2252.43	2445.86	875.85	907.49	444.74	486.08	283.91
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	4	7613.47	8017.89	7843.83	8576.78	8583.59	8029.67	9069.09	9421.27	9504.40	9504.32	9979.87
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	5	2964.52	2707.13	3382.10	3257.27	3045.52	3098.21	2785.01	2231.51	2034.84	1747.52	1257.71
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	6	10.32	0.00	0.00	198.57	198.19	505.99	1325.48	1519.46	2071.26	2341.80	2558.23
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	2	2720.62	1043.55	1534.22	1373.46	259.80	0.00	145.20	21.05	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	3	8994.00	14677.64	14546.34	7371.14	10006.27	8603.50	1713.02	749.94	621.54	180.08	289.16
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	4	20063.09	16028.30	15537.86	22013.20	19750.43	19269.15	23557.21	24902.93	24310.26	24962.72	25289.67
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	5	295.92	277.66	408.73	1274.46	2033.63	4174.92	6498.18	5963.69	5905.59	4249.66	2572.29
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	6	0.00	46.49	46.49	41.37	23.51	26.07	160.03	436.02	1236.24	2681.17	3922.51
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	2	498.73	516.85	800.87	844.62	225.14	0.00	0.00	14.38	39.24	15.12	28.80
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	3	3891.46	5791.89	5329.62	3972.93	4580.09	3839.62	1415.26	787.76	298.08	384.52	218.47
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	4	9430.05	7574.87	7647.56	8924.20	8773.33	9322.15	10954.58	11236.21	11500.52	11407.77	11413.75
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	5	180.40	117.01	222.59	258.88	422.08	795.41	1582.62	1845.71	1862.59	1744.08	1578.75
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	6	0.00	0.00	0.00	0.00	0.00	43.46	48.18	116.57	300.20	449.14	760.87
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	2	2400.04	1385.72	1561.43	1540.24	95.96	105.71	174.41	28.80	46.19	2.52	0.00

Alternative	Inventory Block	veg size	Year 0	10	20	30	40	50	60	70	80	90	100
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	3	7418.32	13512.82	12968.16	8022.63	10277.90	7632.84	1450.45	988.52	565.76	605.80	544.85
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	4	19577.79	14547.69	14920.69	19240.71	18287.09	20204.08	24458.67	24423.18	24057.76	24235.60	24543.10
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	5	196.57	146.48	142.44	779.04	921.67	1559.87	3284.13	3880.53	4202.66	3157.21	2190.03
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	6	0.00	0.00	0.00	10.09	10.09	90.22	225.05	271.67	720.34	1591.58	2314.73
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	2	2520.19	1339.11	1342.68	198.60	14.32	0.00	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	3	4452.47	7080.22	5223.79	1832.58	2797.03	2549.47	347.14	612.28	397.82	318.05	255.23
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	4	14246.13	12857.00	14813.69	18025.49	16899.06	15886.12	16750.53	15481.44	15833.63	16363.89	16335.04
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	5	923.42	815.34	591.78	1913.46	2231.99	3307.34	4526.55	5158.11	4657.60	3372.11	2350.42
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	6	284.03	334.57	454.29	456.12	483.84	683.31	802.02	1174.41	1537.19	2372.18	3485.55
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	2	1193.52	717.18	601.26	287.43	0.00	17.66	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	3	6276.20	7030.72	3867.19	2161.72	3655.26	2973.95	476.96	828.86	331.45	83.74	69.44
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	4	11199.88	10931.95	14066.53	15971.45	14120.14	13836.40	14379.68	13464.11	14575.32	14957.91	15034.11
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	5	69.02	58.76	203.64	266.62	933.17	1877.69	3790.57	4320.33	3347.80	2271.24	1652.86
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	6	0.00	0.00	0.00	51.39	30.04	32.92	91.41	125.31	484.04	1425.72	1982.21
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	2	3338.24	2577.03	3522.70	2356.08	210.40	0.00	16.81	10.76	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	3	5514.65	12933.72	11474.04	9593.19	12025.02	8136.64	1203.72	601.01	761.12	349.51	292.93
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	4	27797.10	21399.65	21679.89	23602.69	22779.34	25759.78	30285.74	30554.92	30273.17	30825.52	31232.78
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	5	474.53	214.13	447.90	1556.98	2067.36	3150.83	5366.59	5109.08	4299.65	3155.61	2013.68
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	6	0.00	0.00	0.00	15.57	42.40	77.28	251.65	848.76	1790.58	2793.89	3585.13
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	2	1528.11	1500.42	1596.03	731.70	145.81	17.99	1.95	1.95	0.00	1.95	0.00
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	3	6860.11	6477.85	4293.59	3848.35	5127.49	5679.11	2202.11	873.02	581.29	462.05	364.63
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	4	23683.35	24179.94	26344.01	25663.35	24058.19	21993.01	24395.79	24950.23	24902.16	25058.54	24883.39
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	5	251.22	182.84	131.08	2121.30	3033.21	4674.60	5664.37	5966.02	4872.48	3690.26	3190.24
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	6	119.65	101.38	77.73	77.73	77.73	77.73	178.20	651.19	2086.50	3229.63	4004.17
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	2	53.37	29.70	141.33	102.86	204.47	55.02	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	3	540.37	1277.44	576.96	777.02	608.11	977.41	403.02	336.32	70.93	78.67	48.86
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	4	1781.36	1067.96	1656.82	1495.23	1523.25	1096.85	1692.06	1574.90	1859.65	1797.31	1787.57
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	5	16.49	16.49	16.49	16.49	39.28	245.83	280.02	435.02	356.67	294.13	286.19
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	6	0.00	0.00	0.00	0.00	16.49	16.49	16.49	45.36	104.35	221.48	268.97
Alternative B (Reserves)	Albion Inventory Block	2	1563.42	1765.93	1900.46	1896.44	1892.69	1423.25	949.80	1538.01	1584.39	1647.81	2016.45
Alternative B (Reserves)	Albion Inventory Block	3	1927.99	2629.71	1894.08	3064.99	4268.68	3676.40	3326.49	3047.81	2560.28	2928.70	3225.18
Alternative B (Reserves)	Albion Inventory Block	4	7613.47	7564.08	6030.01	4857.26	3877.33	4535.46	4273.76	3860.76	4075.39	3395.51	2547.86
Alternative B (Reserves)	Albion Inventory Block	5	2964.52	2109.69	4255.17	4255.85	3946.52	4158.84	4726.73	4566.78	3453.43	2712.05	1959.32
Alternative B (Reserves)	Albion Inventory Block	6	10.32	10.32	0.00	5.18	94.51	285.77	802.94	1066.36	2406.24	3395.65	4330.91
Alternative B (Reserves)	Big River Inventory Block	2	2720.62	2953.96	1236.97	2862.01	3511.40	3638.61	2870.50	3762.59	4206.83	4788.52	3521.01
Alternative B (Reserves)	Big River Inventory Block	3	8994.00	14025.29	11957.14	10935.28	10822.13	9344.00	6541.56	7322.19	8438.00	9215.89	9991.36
Alternative B (Reserves)	Big River Inventory Block	4	20063.09	14842.03	18267.49	16995.58	15640.92	15678.14	13026.89	9484.16	6750.93	5011.68	5373.19
Alternative B (Reserves)	Big River Inventory Block	5	295.92	252.35	612.03	1265.30	2082.30	3381.66	9524.28	11144.19	11289.14	8431.91	4872.64
Alternative B (Reserves)	Big River Inventory Block	6	0.00	0.00	0.00	15.46	16.88	31.22	110.40	360.50	1388.74	4625.63	8315.43
Alternative B (Reserves)	Garcia River Inventory Block	2	498.73	671.16	531.14	1965.53	2056.33	2464.53	1439.82	1505.97	1669.36	2475.01	2042.38
Alternative B (Reserves)	Garcia River Inventory Block	3	3891.46	4623.78	4925.53	4388.19	4619.09	5076.85	5151.36	4941.85	4710.68	4749.65	4667.80
Alternative B (Reserves)	Garcia River Inventory Block	4	9430.05	8539.17	8252.49	7254.18	6574.04	5707.20	5479.39	4627.13	4159.84	2873.82	3105.08
Alternative B (Reserves)	Garcia River Inventory Block	5	180.40	166.53	291.48	392.74	751.18	718.18	1883.58	2728.30	2978.76	3185.22	2829.88
Alternative B (Reserves)	Garcia River Inventory Block	6	0.00	0.00	0.00	0.00	0.00	33.86	46.48	197.39	482.00	716.93	1355.49
Alternative B (Reserves)	Navarro East Inventory Block	2	2400.04	3242.90	1825.18	3870.23	4326.12	4239.04	3668.74	4332.25	4616.83	6036.27	4185.24
Alternative B (Reserves)	Navarro East Inventory Block	3	7418.32	12339.99	11055.29	10094.72	11527.77	10905.43	8937.23	9233.68	9307.08	10634.60	11454.28
Alternative B (Reserves)	Navarro East Inventory Block	4	19577.79	13800.72	16408.46	15072.06	13017.04	13202.63	13272.40	9553.67	8061.66	5194.10	6111.71
Alternative B (Reserves)	Navarro East Inventory Block	5	196.57	209.11	303.78	545.62	721.78	1155.40	3587.87	6325.63	7222.59	6510.14	4899.93
Alternative B (Reserves)	Navarro East Inventory Block	6	0.00	0.00	0.00	10.09	0.00	90.22	126.47	147.49	384.55	1217.60	2941.55
Alternative B (Reserves)	Navarro West Inventory Block	2	2520.19	2625.12	2008.55	2898.05	3438.31	3038.03	1968.81	1880.02	2209.45	2833.62	2909.89
Alternative B (Reserves)	Navarro West Inventory Block	3	4452.47	5231.63	4547.84	4285.79	4928.79	5860.77	6265.00	6030.87	5133.83	5489.15	5262.53
Alternative B (Reserves)	Navarro West Inventory Block	4	14246.13	13442.53	14236.29	12161.40	10480.51	9728.36	7082.64	5647.59	5337.67	4051.02	4026.14
Alternative B (Reserves)	Navarro West Inventory Block	5	923.42	774.93	1306.74	2695.98	3065.19	3063.60	6254.16	7861.96	8024.83	6823.37	4489.95

Alternative	Inventory Block	veg size	Year 0	10	20	30	40	50	60	70	80	90	100
Alternative B (Reserves)	Navarro West Inventory Block	6	284.03	352.04	326.82	385.01	513.43	735.48	855.63	1005.80	1720.46	3229.09	5737.74
Alternative B (Reserves)	Noyo Inventory Block	2	1193.52	535.58	1062.94	3060.23	3377.37	3166.30	2182.71	2307.80	2389.26	3283.23	3111.57
Alternative B (Reserves)	Noyo Inventory Block	3	6276.20	7161.92	4337.74	4742.06	6002.24	7197.30	6622.08	6412.80	5464.84	5971.25	5937.99
Alternative B (Reserves)	Noyo Inventory Block	4	11199.88	10968.54	12881.59	10156.98	7492.72	6518.22	5743.94	4832.83	5300.26	3544.63	3654.28
Alternative B (Reserves)	Noyo Inventory Block	5	69.02	72.57	445.52	732.14	1841.10	1810.16	4135.13	5026.46	5233.70	4872.20	3286.47
Alternative B (Reserves)	Noyo Inventory Block	6	0.00	0.00	10.83	47.20	25.19	46.63	54.75	158.73	350.56	1067.30	2748.31
Alternative B (Reserves)	Rockport Inventory Block	2	3338.24	2799.01	2861.27	5506.04	5283.15	6203.87	3947.76	3868.94	4627.12	6228.01	4597.03
Alternative B (Reserves)	Rockport Inventory Block	3	5514.65	11900.59	9900.52	10061.64	12097.96	12815.34	11988.84	11966.12	11055.52	11015.63	12059.66
Alternative B (Reserves)	Rockport Inventory Block	4	27797.10	22137.18	23584.34	19406.69	16875.31	14262.09	13885.64	10669.10	9651.13	7694.70	8049.93
Alternative B (Reserves)	Rockport Inventory Block	5	474.53	287.75	778.40	2150.15	2868.11	3757.48	7175.80	9952.86	9944.79	8167.02	5585.14
Alternative B (Reserves)	Rockport Inventory Block	6	0.00	0.00	0.00	0.00	0.00	85.75	126.49	667.51	1845.97	4019.17	6832.76
Alternative B (Reserves)	South Coast Inventory Block	2	1528.11	1459.03	2057.12	4615.73	5103.00	3933.51	1965.73	2094.84	2426.04	4490.30	4850.75
Alternative B (Reserves)	South Coast Inventory Block	3	6860.11	7123.11	5341.54	5627.54	8017.50	9092.86	9165.10	7807.19	5903.53	6029.39	7084.78
Alternative B (Reserves)	South Coast Inventory Block	4	23683.35	23675.55	24542.69	18096.27	14236.39	11618.15	9690.48	8681.30	8311.03	5837.24	4075.29
Alternative B (Reserves)	South Coast Inventory Block	5	251.22	132.59	462.24	4068.97	5056.57	7749.31	11535.93	12980.54	11025.54	7882.97	5977.48
Alternative B (Reserves)	South Coast Inventory Block	6	119.65	52.15	38.85	33.93	28.97	48.61	85.19	878.56	4776.28	8202.53	10454.13
Alternative B (Reserves)	Ukiah Inventory Block	2	53.37	160.53	143.10	169.74	295.21	237.26	103.28	523.23	760.35	581.10	302.37
Alternative B (Reserves)	Ukiah Inventory Block	3	540.37	1266.23	1139.85	1291.31	1367.64	1005.89	807.67	558.18	659.10	1022.73	1349.70
Alternative B (Reserves)	Ukiah Inventory Block	4	1781.36	948.34	1092.15	892.83	631.21	1005.15	1240.00	911.97	526.04	287.87	278.03
Alternative B (Reserves)	Ukiah Inventory Block	5	16.49	16.49	16.49	37.72	97.54	143.28	240.65	381.72	429.61	437.25	271.71
Alternative B (Reserves)	Ukiah Inventory Block	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.49	16.49	62.65	189.79
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	2	1563.42	1151.50	1131.08	620.25	20.51	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	3	1927.99	2710.40	1635.59	1382.03	2021.88	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	4	7613.47	8157.67	8361.81	9138.65	9343.02	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	5	2964.52	2060.15	2951.23	2920.00	2498.04	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	6	10.32	0.00	0.00	18.80	196.27	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	2	2720.62	2051.99	2599.21	1199.55	221.01	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	3	8994.00	14214.79	12857.51	7077.85	9291.07	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	4	20063.09	15614.19	16214.24	23031.43	21147.95	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	5	295.92	146.17	356.18	753.07	1391.56	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	6	0.00	46.49	46.49	11.73	22.04	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	2	498.73	555.75	397.26	328.56	83.94	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	3	3891.46	5839.37	5201.67	3947.61	4067.54	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	4	9430.05	7486.23	8226.30	9478.36	9437.27	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	5	180.40	119.29	175.40	246.10	411.89	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	2	2400.04	2037.42	1769.01	874.21	86.68	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	3	7418.32	13045.22	11926.56	7624.67	9118.99	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	4	19577.79	14300.29	15750.17	20499.66	19437.34	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	5	196.57	209.79	146.97	575.95	939.61	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	6	0.00	0.00	0.00	18.22	10.09	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	2	2520.19	1671.21	939.34	329.66	9.61	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	3	4452.47	5910.89	4473.30	1962.94	2408.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	4	14246.13	13759.09	16143.10	18344.90	17961.55	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	5	923.42	548.45	454.72	1364.01	1597.54	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	6	284.03	536.60	415.78	424.73	449.53	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	2	1193.52	821.42	963.42	460.49	154.79	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	3	6276.20	6655.30	3721.49	2129.81	3520.85	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	4	11199.88	11169.93	13893.90	15953.72	14505.77	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	5	69.02	91.96	159.80	150.28	531.36	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	6	0.00	0.00	0.00	44.32	25.85	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	2	3338.24	2452.10	3431.93	1767.45	140.62	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	3	5514.65	12809.26	11376.23	10342.93	11635.00	0.00	0.00	0.00	0.00	0.00	0.00

Alternative	Inventory Block	veg size	Year 0	10	20	30	40	50	60	70	80	90	100
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	4	27797.10	21757.07	21957.88	23806.32	23579.39	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	5	474.53	106.09	358.48	1207.82	1769.52	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	2	1528.11	1629.59	1659.54	679.10	224.19	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	3	6860.11	6477.37	4073.31	4010.33	5244.55	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	4	23683.35	24099.93	26419.74	25462.23	24250.19	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	5	251.22	134.16	212.12	2213.05	2645.77	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	6	119.65	101.38	77.73	77.73	77.73	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	2	53.37	29.70	246.52	58.71	29.70	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	3	540.37	1328.64	670.76	845.89	762.10	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	4	1781.36	1016.77	1457.83	1470.51	1528.26	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	5	16.49	16.49	16.49	16.49	55.05	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	6	0.00	0.00	0.00	0.00	16.49	0.00	0.00	0.00	0.00	0.00	0.00

Structure Class (upland)
Plan Area

Alternative	Inventory Block	Year	1	2	3	4	5	6	7	8	9	10	11	12	13
Alternative A (Enhanced HCP/NCCP)	Plan Area	0	58.26	24.24	247.06	146.46	3158.33	240.42	3228.35	1122.55	927.42	63625.31	0.00	8169.48	11983.55
Alternative A (Enhanced HCP/NCCP)	Plan Area	10	58.26	0.00	227.77	208.58	1976.24	197.45	1280.89	644.67	17977.68	34676.54	0.00	5196.10	8403.79
Alternative A (Enhanced HCP/NCCP)	Plan Area	20	45.87	0.00	227.77	23.30	741.38	0.00	471.98	960.27	19029.10	4676.49	0.00	2773.15	11574.29
Alternative A (Enhanced HCP/NCCP)	Plan Area	30	45.87	0.00	227.77	0.00	721.53	0.00	121.50	221.17	3773.61	1455.21	29.65	1328.10	7588.18
Alternative A (Enhanced HCP/NCCP)	Plan Area	40	45.87	0.00	48.20	134.69	369.46	0.00	31.46	227.64	336.33	1013.58	0.00	858.91	1073.91
Alternative A (Enhanced HCP/NCCP)	Plan Area	50	18.86	0.00	0.00	27.01	134.46	179.23	0.00	240.71	179.40	565.72	0.00	935.88	175.57
Alternative A (Enhanced HCP/NCCP)	Plan Area	60	18.86	0.00	0.00	27.01	40.88	253.38	0.00	115.86	161.85	489.25	24.29	445.86	317.56
Alternative A (Enhanced HCP/NCCP)	Plan Area	70	0.00	18.86	0.00	27.01	17.87	81.16	0.00	203.88	106.12	136.59	14.38	408.75	60.61
Alternative A (Enhanced HCP/NCCP)	Plan Area	80	0.00	18.86	0.00	27.01	17.87	10.30	0.00	197.88	18.45	113.61	0.00	200.94	109.91
Alternative A (Enhanced HCP/NCCP)	Plan Area	90	0.00	18.86	0.00	27.01	0.00	0.00	0.00	51.66	46.67	62.81	0.00	145.19	17.64
Alternative A (Enhanced HCP/NCCP)	Plan Area	100	0.00	18.86	0.00	27.01	0.00	0.00	0.00	38.59	17.87	0.00	0.00	150.98	28.80
Alternative B (Reserves)	Plan Area	0	58.26	24.24	247.06	146.46	3158.33	240.42	3228.35	1122.55	927.42	63625.31	0.00	8169.48	11983.55
Alternative B (Reserves)	Plan Area	10	1141.63	0.00	278.38	62.47	2170.65	248.14	6951.60	836.32	28851.16	42381.36	440.03	7461.75	7220.94
Alternative B (Reserves)	Plan Area	20	3319.74	20.90	966.54	0.00	950.50	0.00	2871.27	1560.80	28625.63	13037.88	231.93	6474.36	7165.80
Alternative B (Reserves)	Plan Area	30	21642.07	169.94	832.19	53.86	607.71	0.00	408.51	640.54	16241.07	3614.70	790.46	2343.50	3987.66
Alternative B (Reserves)	Plan Area	40	14847.84	322.66	314.25	68.40	452.14	0.00	1751.30	508.08	10792.45	2970.47	3192.51	959.35	9483.22
Alternative B (Reserves)	Plan Area	50	19874.73	168.60	304.93	41.93	228.93	119.86	873.00	186.43	6352.40	2843.54	2269.79	805.02	5320.38
Alternative B (Reserves)	Plan Area	60	8358.13	291.23	349.69	14.49	166.66	137.94	558.44	74.18	8202.28	1390.50	2699.64	562.24	7478.64
Alternative B (Reserves)	Plan Area	70	14870.72	588.84	716.32	41.49	48.54	112.29	491.05	30.88	7327.09	644.16	661.06	381.29	5786.19
Alternative B (Reserves)	Plan Area	80	12883.41	1195.14	880.04	41.49	33.44	38.67	1037.89	16.57	8794.26	558.87	871.17	340.57	9695.53
Alternative B (Reserves)	Plan Area	90	22888.90	2068.03	570.64	41.49	212.18	0.00	581.14	42.62	11259.84	725.18	1205.72	258.24	7684.23
Alternative B (Reserves)	Plan Area	100	12905.95	1140.92	218.70	41.49	39.73	24.29	725.50	23.66	11410.97	1074.28	2090.67	237.50	11814.57
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	0	58.26	24.24	247.06	146.46	3158.33	240.42	3228.35	1122.55	927.42	63625.31	0.00	8169.48	11983.55
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	10	391.73	0.00	90.50	39.17	2032.56	293.54	3176.34	536.53	20570.82	37060.57	492.78	6386.43	8253.07
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	20	410.44	0.00	867.63	0.00	809.36	0.00	779.69	933.01	20765.92	7876.95	79.02	3269.14	11836.51
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	30	45.87	0.00	279.43	0.00	1274.40	0.00	731.79	125.88	5243.93	3932.14	219.12	1879.17	5305.66
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	40	45.87	0.00	21.72	195.56	481.72	0.00	196.16	219.53	579.71	3357.17	76.41	1166.24	648.75
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Plan Area	0	58.26	24.24	247.06	146.46	3158.33	240.42	3228.35	1122.55	927.42	63625.31	0.00	8169.48	11983.55
No Action (No HCP/No Permit)	Plan Area	10	11118.36	292.30	1048.60	43.18	2372.35	259.46	11251.69	361.82	1413.09	45044.63	440.03	6868.59	4639.72
No Action (No HCP/No Permit)	Plan Area	20	23305.20	453.93	1581.33	0.00	1501.02	23.48	3561.53	112.48	2040.16	13946.45	1996.99	5854.61	3789.22
No Action (No HCP/No Permit)	Plan Area	30	10942.87	205.07	497.83	0.00	679.73	0.00	5505.27	174.39	3041.61	9838.31	5103.84	2486.78	1658.51
No Action (No HCP/No Permit)	Plan Area	40	5011.11	311.79	95.82	67.03	607.67	0.00	2325.53	218.86	1721.15	7082.68	2180.95	818.02	220.33
No Action (No HCP/No Permit)	Plan Area	50	6327.52	164.42	108.18	67.03	35.76	210.71	1133.69	248.52	1246.06	2624.98	1085.40	310.06	158.04
No Action (No HCP/No Permit)	Plan Area	60	3152.37	55.82	107.38	94.04	31.09	185.99	966.82	57.78	1222.91	1312.72	2116.37	441.97	35.02
No Action (No HCP/No Permit)	Plan Area	70	477.63	121.93	12.36	27.01	29.65	171.61	816.49	137.96	278.76	982.77	787.15	512.31	23.35
No Action (No HCP/No Permit)	Plan Area	80	186.63	33.94	9.24	39.37	29.65	62.90	176.24	52.14	59.63	490.35	107.85	402.13	57.17
No Action (No HCP/No Permit)	Plan Area	90	113.67	55.52	0.00	27.01	0.00	31.33	45.95	26.09	0.00	926.87	87.93	438.82	107.37
No Action (No HCP/No Permit)	Plan Area	100	0.00	39.78	0.00	39.37	0.00	18.97	41.63	93.07	28.80	1635.65	31.09	470.26	8.88
Proposed Action (HCP/NCCP)	Plan Area	0	58.26	24.24	247.06	146.46	3158.33	240.42	3228.35	1122.55	927.42	63625.31	0.00	8169.48	11983.55
Proposed Action (HCP/NCCP)	Plan Area	10	391.73	0.00	90.50	39.17	2032.56	293.54	3176.34	536.53	20570.82	37060.57	492.78	6386.43	8253.07
Proposed Action (HCP/NCCP)	Plan Area	20	410.44	0.00	867.63	0.00	809.36	0.00	779.69	933.01	20765.92	7876.95	79.02	3269.14	11836.51
Proposed Action (HCP/NCCP)	Plan Area	30	45.87	0.00	279.43	0.00	1274.40	0.00	731.79	125.88	5243.93	3932.14	219.12	1879.17	5305.66
Proposed Action (HCP/NCCP)	Plan Area	40	45.87	0.00	21.72	195.56	481.72	0.00	196.16	219.53	579.71	3357.17	76.41	1166.24	648.75
Proposed Action (HCP/NCCP)	Plan Area	50	18.86	27.01	0.00	0.00	134.22	349.50	391.86	155.53	260.31	2484.00	0.00	1169.23	437.68
Proposed Action (HCP/NCCP)	Plan Area	60	18.86	27.01	0.00	0.00	40.88	299.85	204.85	83.24	50.17	1060.88	23.57	936.32	758.04
Proposed Action (HCP/NCCP)	Plan Area	70	0.00	45.87	0.00	0.00	17.87	65.84	32.81	263.61	165.04	581.14	0.00	992.55	39.69
Proposed Action (HCP/NCCP)	Plan Area	80	0.00	18.86	0.00	27.01	0.00	23.53	55.32	80.56	118.47	1002.55	39.24	716.42	219.42
Proposed Action (HCP/NCCP)	Plan Area	90	0.00	18.86	0.00	27.01	0.00	0.00	52.83	3.95	39.41	1831.76	0.00	742.87	75.25
Proposed Action (HCP/NCCP)	Plan Area	100	0.00	18.86	0.00	27.01	0.00	0.00	31.74	0.00	17.87	1805.19	0.00	610.99	26.53

Structure Class (upland)
Plan Area

Alternative	Inventory Block	Year	14	15	16	17	18	19	20	21	22	23	24
Alternative A (Enhanced HCP/NCCP)	Plan Area	0	218.48	2126.69	26.17	5452.01	9150.91	1295.59	99.38	31837.00	31727.69	2297.09	125.41
Alternative A (Enhanced HCP/NCCP)	Plan Area	10	415.32	2917.68	65.54	22346.80	28289.35	1382.07	99.38	24239.91	25244.67	1275.45	163.99
Alternative A (Enhanced HCP/NCCP)	Plan Area	20	1000.29	4998.31	17.31	20026.84	53616.51	848.42	0.00	19229.34	34816.15	2050.90	160.16
Alternative A (Enhanced HCP/NCCP)	Plan Area	30	587.38	7525.24	15.92	7461.36	71009.86	1071.98	11.94	26606.08	43361.65	3856.87	266.97
Alternative A (Enhanced HCP/NCCP)	Plan Area	40	403.21	7825.21	0.00	2289.18	51855.93	851.64	0.00	48030.05	57211.38	4422.81	258.35
Alternative A (Enhanced HCP/NCCP)	Plan Area	50	197.17	7331.66	0.00	3807.25	76251.11	2715.95	24.37	38613.82	39119.55	6301.29	468.82
Alternative A (Enhanced HCP/NCCP)	Plan Area	60	141.66	9593.17	0.00	3510.27	98134.23	4731.85	24.37	6358.76	41900.35	10166.84	831.53
Alternative A (Enhanced HCP/NCCP)	Plan Area	70	41.76	12446.79	42.90	937.17	106548.65	4672.90	63.05	5624.05	34710.84	9974.05	1150.46
Alternative A (Enhanced HCP/NCCP)	Plan Area	80	52.97	13472.22	0.00	389.96	104475.38	6267.53	58.77	3644.50	37734.84	7906.85	2569.96
Alternative A (Enhanced HCP/NCCP)	Plan Area	90	0.00	13622.14	0.00	441.29	109697.53	5216.30	49.79	2460.55	35118.32	6190.22	4121.84
Alternative A (Enhanced HCP/NCCP)	Plan Area	100	111.96	13442.64	0.00	392.24	113484.78	3829.38	17.85	1957.38	32986.77	4431.84	6350.90
Alternative B (Reserves)	Plan Area	0	218.48	2126.69	26.17	5452.01	9150.91	1295.59	99.38	31837.00	31727.69	2297.09	125.41
Alternative B (Reserves)	Plan Area	10	98.63	2065.31	0.00	12865.53	13175.95	1502.39	128.10	18182.41	29993.01	1131.46	100.63
Alternative B (Reserves)	Plan Area	20	379.69	2994.77	53.40	11164.93	25951.95	2936.54	147.58	12187.72	52983.88	3200.92	61.13
Alternative B (Reserves)	Plan Area	30	966.76	4038.80	45.78	8247.88	11381.28	4319.49	95.96	28067.84	61158.43	7527.57	105.80
Alternative B (Reserves)	Plan Area	40	183.65	1462.20	40.17	15157.77	4614.23	3258.38	23.01	36619.24	58589.23	11462.35	214.93
Alternative B (Reserves)	Plan Area	50	115.46	792.99	56.09	13322.15	1862.74	1189.31	79.81	44462.12	59168.81	16258.19	590.62
Alternative B (Reserves)	Plan Area	60	106.61	883.15	56.09	8781.15	4465.15	1163.51	185.95	41173.16	54662.45	34373.71	1152.84
Alternative B (Reserves)	Plan Area	70	20.06	663.55	24.79	6191.17	1441.59	1355.66	146.72	42975.82	46370.34	43853.66	2544.55
Alternative B (Reserves)	Plan Area	80	14.70	737.03	95.65	7453.98	493.20	1674.10	162.71	36043.57	42966.72	42213.47	9045.66
Alternative B (Reserves)	Plan Area	90	73.22	571.90	185.91	5431.30	641.15	1478.77	218.29	39557.99	28946.81	32769.41	19874.88
Alternative B (Reserves)	Plan Area	100	32.50	186.59	256.73	8657.55	474.95	1117.26	237.55	40639.45	30011.36	19511.50	34414.17
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	0	218.48	2126.69	26.17	5452.01	9150.91	1295.59	99.38	31837.00	31727.69	2297.09	125.41
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	10	77.34	3618.57	48.23	23685.77	24403.34	839.49	0.00	18681.51	24988.18	1356.69	366.46
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	20	462.32	5892.72	48.23	16792.58	52471.44	356.89	0.00	15703.09	35848.92	2039.51	135.45
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	30	274.81	6392.36	15.92	7873.60	67947.69	859.53	0.00	24203.69	47495.95	2976.88	120.27
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	40	20.06	7627.69	0.00	4518.16	59376.89	792.32	0.00	42211.76	52620.94	2915.54	215.62
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Plan Area	0	218.48	2126.69	26.17	5452.01	9150.91	1295.59	99.38	31837.00	31727.69	2297.09	125.41
No Action (No HCP/No Permit)	Plan Area	10	0.00	2322.79	48.23	27343.95	13435.74	1498.02	143.42	20671.08	25636.70	964.79	69.29
No Action (No HCP/No Permit)	Plan Area	20	260.22	3189.96	114.52	25372.58	35745.64	971.96	66.16	10330.52	41270.24	1730.38	69.29
No Action (No HCP/No Permit)	Plan Area	30	402.77	3138.23	63.66	17311.49	57474.16	1115.30	116.38	13359.25	40717.05	3351.37	103.97
No Action (No HCP/No Permit)	Plan Area	40	67.31	2362.66	59.85	21185.39	70029.84	1713.90	84.10	27850.97	28802.02	4213.19	257.66
No Action (No HCP/No Permit)	Plan Area	50	168.01	1854.32	298.54	29651.68	78718.04	4441.92	91.16	24070.30	19237.40	4612.74	423.34
No Action (No HCP/No Permit)	Plan Area	60	216.92	2120.94	384.77	35421.94	85530.42	8516.84	72.60	12450.98	15052.84	6944.07	795.21
No Action (No HCP/No Permit)	Plan Area	70	152.92	1552.24	485.70	37433.65	90606.80	11115.34	85.82	9711.63	14288.38	6363.18	1113.19
No Action (No HCP/No Permit)	Plan Area	80	86.24	1099.03	501.63	45421.07	91873.17	9005.83	221.05	7895.83	12102.55	5223.22	2150.97
No Action (No HCP/No Permit)	Plan Area	90	47.85	1049.61	556.11	58203.77	81984.18	6502.43	583.72	4440.63	14263.43	4301.48	3494.06
No Action (No HCP/No Permit)	Plan Area	100	0.00	944.70	497.59	67210.58	77439.89	4231.14	518.19	2243.96	13810.50	2975.95	5007.80
Proposed Action (HCP/NCCP)	Plan Area	0	218.48	2126.69	26.17	5452.01	9150.91	1295.59	99.38	31837.00	31727.69	2297.09	125.41
Proposed Action (HCP/NCCP)	Plan Area	10	77.34	3618.57	48.23	23685.77	24403.34	839.49	0.00	18681.51	24988.18	1356.69	366.46
Proposed Action (HCP/NCCP)	Plan Area	20	462.32	5892.72	48.23	16792.58	52471.44	356.89	0.00	15703.09	35848.92	2039.51	135.45
Proposed Action (HCP/NCCP)	Plan Area	30	274.81	6392.36	15.92	7873.60	67947.69	859.53	0.00	24203.69	47495.95	2976.88	120.27
Proposed Action (HCP/NCCP)	Plan Area	40	20.06	7627.69	0.00	4518.16	59376.89	792.32	0.00	42211.76	52620.94	2915.54	215.62
Proposed Action (HCP/NCCP)	Plan Area	50	64.39	14280.84	12.12	5688.74	74473.63	2330.23	24.37	33142.52	37107.08	4340.88	394.85
Proposed Action (HCP/NCCP)	Plan Area	60	0.00	13462.12	0.00	3833.17	90078.33	3760.43	24.37	6346.15	49634.04	5969.90	675.66
Proposed Action (HCP/NCCP)	Plan Area	70	0.00	16651.27	62.32	1488.14	99704.45	3934.63	37.24	5495.20	39932.18	6850.18	927.83
Proposed Action (HCP/NCCP)	Plan Area	80	0.00	18595.89	0.00	1260.59	104287.32	4981.26	27.89	3964.51	33561.16	6458.62	1849.23
Proposed Action (HCP/NCCP)	Plan Area	90	0.00	18176.27	0.00	937.84	107542.27	5735.60	7.47	2285.66	31689.41	5234.83	2886.54
Proposed Action (HCP/NCCP)	Plan Area	100	0.00	18682.19	0.00	513.55	110280.72	4342.59	0.00	2302.60	30114.43	4313.99	4199.58

Dominant CWHR Habitat Type (riparian) by Inventory Block

Alternative	Inventory Block	veg type	Year 0	10	20	30	40	50	60	70	80	90	100
No Action (No HCP/No Permit)	Albion Inventory Block	MHC	23.92	28.50	19.60	13.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Albion Inventory Block	MHW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Albion Inventory Block	RDW	1916.83	1912.26	1921.15	1927.44	1940.75	1940.75	1940.75	1940.75	1940.75	1940.75	1940.75
No Action (No HCP/No Permit)	Big River Inventory Block	MHC	924.93	1113.66	430.07	28.26	0.35	2.78	0.35	0.35	0.00	0.00	0.00
No Action (No HCP/No Permit)	Big River Inventory Block	MHW	2.78	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Big River Inventory Block	RDW	3070.18	2883.89	3567.48	3969.28	3997.55	3995.12	3997.55	3997.55	3997.90	3997.90	3997.90
No Action (No HCP/No Permit)	Garcia River Inventory Block	MHC	607.35	583.19	407.53	315.19	274.70	249.95	78.56	1.56	1.32	9.68	9.68
No Action (No HCP/No Permit)	Garcia River Inventory Block	MHW	21.32	21.32	21.32	21.32	21.32	21.32	21.32	21.32	19.99	11.64	11.64
No Action (No HCP/No Permit)	Garcia River Inventory Block	RDW	1116.84	1141.00	1316.67	1409.00	1449.49	1474.24	1645.63	1722.63	1724.19	1724.19	1724.19
No Action (No HCP/No Permit)	Navarro East Inventory Block	MHC	1187.49	1299.64	533.80	82.35	16.18	13.34	7.72	0.00	0.00	2.48	2.08
No Action (No HCP/No Permit)	Navarro East Inventory Block	MHW	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.00
No Action (No HCP/No Permit)	Navarro East Inventory Block	RDW	2448.52	2336.37	3102.21	3553.66	3619.83	3622.67	3628.29	3636.01	3636.01	3633.53	3634.40
No Action (No HCP/No Permit)	Navarro West Inventory Block	MHC	552.55	564.92	441.86	160.73	17.45	5.28	11.39	3.07	1.48	0.00	0.00
No Action (No HCP/No Permit)	Navarro West Inventory Block	MHW	4.66	4.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Navarro West Inventory Block	RDW	2473.98	2461.60	2589.32	2870.45	3013.74	3025.91	3019.80	3028.12	3029.71	3031.19	3031.19
No Action (No HCP/No Permit)	Noyo Inventory Block	MHC	754.73	820.04	160.51	43.18	1.70	27.54	1.70	1.70	1.70	0.00	0.00
No Action (No HCP/No Permit)	Noyo Inventory Block	MHW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Noyo Inventory Block	RDW	1323.41	1258.10	1917.63	2034.95	2076.44	2050.59	2076.44	2076.44	2076.44	2078.13	2078.13
No Action (No HCP/No Permit)	Rockport Inventory Block	MHC	1566.79	1595.31	962.81	128.38	109.01	132.22	102.61	96.31	73.45	71.94	41.02
No Action (No HCP/No Permit)	Rockport Inventory Block	MHW	145.58	145.19	111.70	106.86	65.17	8.99	8.99	8.99	8.99	8.99	8.99
No Action (No HCP/No Permit)	Rockport Inventory Block	RDW	2644.86	2616.73	3282.72	4121.98	4183.05	4216.01	4245.63	4251.92	4274.78	4276.29	4307.21
No Action (No HCP/No Permit)	South Coast Inventory Block	MHC	814.03	735.23	157.43	16.80	1.95	1.95	0.00	16.50	26.49	26.61	41.34
No Action (No HCP/No Permit)	South Coast Inventory Block	MHW	51.40	51.40	51.40	51.40	51.40	51.40	53.35	36.86	26.86	26.74	12.02
No Action (No HCP/No Permit)	South Coast Inventory Block	RDW	3534.46	3613.26	4191.07	4331.70	4346.54	4346.54	4346.54	4346.54	4346.54	4346.54	4346.54
No Action (No HCP/No Permit)	Ukiah Inventory Block	MHC	246.39	275.45	33.28	33.28	118.72	127.12	93.84	58.51	25.28	4.56	0.00
No Action (No HCP/No Permit)	Ukiah Inventory Block	MHW	129.82	96.53	96.53	96.53	11.10	2.69	2.69	2.69	2.69	2.69	2.69
No Action (No HCP/No Permit)	Ukiah Inventory Block	RDW	18.99	23.21	265.38	265.38	265.38	265.38	298.66	333.99	367.22	387.94	392.50
Proposed Action (HCP/NCCP)	Albion Inventory Block	MHC	23.92	28.50	19.60	13.31	5.67	0.00	0.00	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Albion Inventory Block	MHW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Albion Inventory Block	RDW	1916.83	1912.26	1921.15	1927.44	1935.08	1940.75	1940.75	1940.75	1940.75	1940.75	1940.75
Proposed Action (HCP/NCCP)	Big River Inventory Block	MHC	924.93	1104.80	433.94	20.51	5.31	14.11	10.24	2.21	11.10	4.80	11.10
Proposed Action (HCP/NCCP)	Big River Inventory Block	MHW	2.78	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Big River Inventory Block	RDW	3070.18	2892.75	3563.61	3977.04	3992.59	3983.79	3987.66	3995.69	3986.79	3993.09	3986.79
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	MHC	607.35	555.46	379.54	302.20	244.15	159.43	38.25	12.67	11.12	20.80	20.80
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	MHW	21.32	21.32	21.32	21.32	21.32	21.32	21.32	10.20	10.20	0.52	0.52
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	RDW	1116.84	1168.73	1344.65	1421.99	1480.04	1564.76	1685.94	1722.64	1724.19	1724.19	1724.19
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	MHC	1187.49	1297.26	507.63	90.99	18.72	18.80	2.51	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	MHW	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	RDW	2448.52	2338.75	3128.38	3545.02	3617.29	3617.21	3633.50	3636.01	3636.01	3636.01	3636.01
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	MHC	552.55	547.49	445.61	143.46	17.45	5.28	18.15	3.22	6.78	1.52	1.52
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	MHW	4.66	4.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	RDW	2473.98	2479.04	2585.57	2887.73	3013.74	3025.91	3013.03	3027.96	3024.40	3029.66	3029.66
Proposed Action (HCP/NCCP)	Noyo Inventory Block	MHC	754.73	801.46	185.12	42.33	1.70	23.57	10.01	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Noyo Inventory Block	MHW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Noyo Inventory Block	RDW	1323.41	1276.67	1893.01	2035.80	2076.44	2054.56	2068.13	2078.13	2078.13	2078.13	2078.13
Proposed Action (HCP/NCCP)	Rockport Inventory Block	MHC	1566.79	1554.68	892.94	133.55	91.94	146.91	110.32	92.06	83.67	70.94	13.17
Proposed Action (HCP/NCCP)	Rockport Inventory Block	MHW	145.58	145.19	111.70	98.30	81.28	8.99	0.00	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Rockport Inventory Block	RDW	2644.86	2657.36	3352.58	4125.38	4184.00	4201.32	4246.91	4265.17	4273.55	4286.29	4344.06
Proposed Action (HCP/NCCP)	South Coast Inventory Block	MHC	814.03	700.14	144.59	14.34	3.06	0.00	5.49	37.31	47.83	48.98	48.98
Proposed Action (HCP/NCCP)	South Coast Inventory Block	MHW	51.40	51.40	53.35	51.40	53.35	53.35	47.87	16.04	3.57	2.42	2.42
Proposed Action (HCP/NCCP)	South Coast Inventory Block	RDW	3534.46	3648.35	4201.95	4334.16	4343.49	4346.54	4346.54	4346.54	4348.49	4348.49	4348.49
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	MHC	246.39	269.06	33.28	39.55	104.57	107.76	76.10	13.96	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	MHW	129.82	96.53	96.53	90.26	12.47	2.69	2.69	2.69	2.69	2.69	2.69

Dominant CWHR Habitat Type (riparian) by Inventory Block

Alternative	Inventory Block	veg type	Year 0	10	20	30	40	50	60	70	80	90	100
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	RDW	18.99	29.60	265.38	265.38	278.16	284.74	316.40	378.53	392.50	392.50	392.50
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	MHC	23.92	32.82	13.31	13.31	13.31	0.00	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	MHW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	RDW	1916.83	1907.93	1927.44	1927.44	1927.44	1940.75	1940.75	1940.75	1940.75	1940.75	1940.75
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	MHC	924.93	892.25	452.94	2.43	0.35	2.78	0.35	0.35	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	MHW	2.78	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	RDW	3070.18	3105.30	3544.61	3995.12	3997.55	3995.12	3997.55	3997.55	3997.90	3997.90	3997.90
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	MHC	607.35	583.19	413.71	339.39	287.77	250.28	69.77	1.95	22.35	22.35	20.80
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	MHW	21.32	21.32	21.32	21.32	21.32	21.32	21.32	21.32	0.52	0.52	0.52
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	RDW	1116.84	1141.00	1310.48	1384.80	1436.43	1473.91	1654.42	1722.24	1722.63	1722.63	1724.19
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	MHC	1187.49	1249.37	549.22	136.26	10.22	18.84	3.53	0.00	3.21	2.48	0.47
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	MHW	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.00
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	RDW	2448.52	2386.64	3086.79	3499.75	3625.79	3617.16	3632.48	3636.01	3632.79	3633.53	3636.01
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	MHC	552.55	514.31	430.25	301.01	32.40	17.53	16.32	3.39	3.39	1.59	2.21
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	MHW	4.66	4.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	RDW	2473.98	2512.21	2600.94	2730.17	2998.78	3013.66	3014.87	3027.80	3027.80	3029.60	3028.98
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	MHC	754.73	732.54	140.19	42.33	6.78	32.63	8.80	3.60	1.70	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	MHW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	RDW	1323.41	1345.59	1937.94	2035.80	2071.35	2045.50	2069.34	2074.53	2076.44	2078.13	2078.13
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	MHC	1566.79	1565.84	978.71	163.85	90.77	141.41	102.61	90.22	84.16	59.41	40.22
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	MHW	145.58	145.19	111.70	106.86	83.41	15.42	8.99	6.52	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	RDW	2644.86	2646.20	3266.82	4086.52	4183.05	4200.39	4245.63	4260.49	4273.06	4297.81	4317.00
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	MHC	814.03	733.27	306.18	12.38	1.95	1.95	1.95	13.07	31.21	47.09	42.72
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	MHW	51.40	51.40	51.40	51.40	51.40	51.40	51.40	40.28	22.14	6.26	8.68
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	RDW	3534.46	3615.22	4042.31	4336.11	4346.54	4346.54	4346.54	4346.54	4346.54	4346.54	4348.49
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	MHC	246.39	275.45	33.28	33.28	96.57	122.38	93.84	34.73	7.16	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	MHW	129.82	96.53	96.53	96.53	33.25	7.44	2.69	2.69	2.69	2.69	2.69
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	RDW	18.99	23.21	265.38	265.38	265.38	265.38	298.66	357.77	385.34	392.50	392.50
Alternative B (Reserves)	Albion Inventory Block	MHC	23.92	25.98	19.60	13.31	10.67	0.00	0.00	0.00	0.00	0.00	0.00
Alternative B (Reserves)	Albion Inventory Block	MHW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative B (Reserves)	Albion Inventory Block	RDW	1916.83	1914.78	1921.15	1927.44	1930.08	1940.75	1940.75	1940.75	1940.75	1940.75	1940.75
Alternative B (Reserves)	Big River Inventory Block	MHC	924.93	1111.30	435.36	19.44	2.78	7.33	2.63	2.26	1.64	0.00	0.00
Alternative B (Reserves)	Big River Inventory Block	MHW	2.78	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative B (Reserves)	Big River Inventory Block	RDW	3070.18	2886.25	3562.18	3978.11	3995.12	3990.57	3995.27	3995.64	3996.26	3997.90	3997.90
Alternative B (Reserves)	Garcia River Inventory Block	MHC	607.35	567.56	382.58	304.15	257.69	192.01	46.62	3.42	5.27	12.96	12.96
Alternative B (Reserves)	Garcia River Inventory Block	MHW	21.32	21.32	21.32	21.32	21.32	21.32	21.32	17.90	16.05	8.35	8.35
Alternative B (Reserves)	Garcia River Inventory Block	RDW	1116.84	1156.63	1341.61	1420.05	1466.50	1532.18	1677.57	1724.19	1724.19	1724.19	1724.19
Alternative B (Reserves)	Navarro East Inventory Block	MHC	1187.49	1304.54	525.66	129.46	15.70	11.17	6.13	0.47	0.47	0.47	0.47
Alternative B (Reserves)	Navarro East Inventory Block	MHW	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.00	0.00	0.00	0.00
Alternative B (Reserves)	Navarro East Inventory Block	RDW	2448.52	2331.46	3110.35	3506.55	3620.30	3624.84	3629.88	3636.01	3636.01	3636.01	3636.01
Alternative B (Reserves)	Navarro West Inventory Block	MHC	552.55	554.53	445.39	194.33	13.37	1.81	5.42	3.70	3.70	3.01	4.60
Alternative B (Reserves)	Navarro West Inventory Block	MHW	4.66	4.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative B (Reserves)	Navarro West Inventory Block	RDW	2473.98	2472.00	2585.80	2836.86	3017.82	3029.37	3025.77	3027.48	3027.48	3028.18	3026.59
Alternative B (Reserves)	Noyo Inventory Block	MHC	754.73	814.02	167.14	42.33	3.63	27.54	10.10	0.00	0.00	0.00	1.93
Alternative B (Reserves)	Noyo Inventory Block	MHW	0.00	0.00	0.00	1.93	0.00	0.00	0.00	0.00	0.00	1.93	0.00
Alternative B (Reserves)	Noyo Inventory Block	RDW	1323.41	1264.11	1910.99	2033.87	2074.50	2050.59	2068.03	2078.13	2078.13	2076.20	2076.20
Alternative B (Reserves)	Rockport Inventory Block	MHC	1566.79	1586.67	923.47	127.89	122.19	141.94	99.47	79.07	61.86	34.24	14.52
Alternative B (Reserves)	Rockport Inventory Block	MHW	145.58	145.19	111.70	102.21	50.40	8.99	8.99	4.34	1.87	1.87	1.87
Alternative B (Reserves)	Rockport Inventory Block	RDW	2644.86	2625.37	3322.05	4127.12	4184.64	4206.29	4248.76	4273.82	4293.49	4321.11	4340.84
Alternative B (Reserves)	South Coast Inventory Block	MHC	814.03	726.61	168.58	12.38	5.01	0.00	10.18	34.98	47.67	51.40	47.67
Alternative B (Reserves)	South Coast Inventory Block	MHW	51.40	51.40	53.35	53.35	51.40	53.35	43.17	18.37	3.73	0.00	3.73
Alternative B (Reserves)	South Coast Inventory Block	RDW	3534.46	3621.88	4177.96	4334.16	4343.49	4346.54	4346.54	4346.54	4348.49	4348.49	4348.49
Alternative B (Reserves)	Ukiah Inventory Block	MHC	246.39	275.45	33.28	69.95	116.34	113.56	35.37	12.93	0.00	0.00	0.00

Alternative	Inventory Block	veg type	Year 0	10	20	30	40	50	60	70	80	90	100
Alternative B (Reserves)	Ukiah Inventory Block	MHW	129.82	96.53	96.53	59.86	13.47	6.09	2.69	2.69	2.69	2.69	2.69
Alternative B (Reserves)	Ukiah Inventory Block	RDW	18.99	23.21	265.38	265.38	265.38	275.54	357.13	379.57	392.50	392.50	392.50
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	MHC	23.92	28.50	19.60	13.31	5.67	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	MHW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	RDW	1916.83	1912.26	1921.15	1927.44	1935.08	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	MHC	924.93	1104.80	433.94	20.51	5.31	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	MHW	2.78	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	RDW	3070.18	2892.75	3563.61	3977.04	3992.59	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	MHC	607.35	555.46	379.54	302.20	244.15	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	MHW	21.32	21.32	21.32	21.32	21.32	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	RDW	1116.84	1168.73	1344.65	1421.99	1480.04	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	MHC	1187.49	1297.26	507.63	90.99	18.72	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	MHW	0.47	0.47	0.47	0.47	0.47	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	RDW	2448.52	2338.75	3128.38	3545.02	3617.29	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	MHC	552.55	547.49	445.61	143.46	17.45	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	MHW	4.66	4.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	RDW	2473.98	2479.04	2585.57	2887.73	3013.74	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	MHC	754.73	801.46	185.12	42.33	1.70	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	MHW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	RDW	1323.41	1276.67	1893.01	2035.80	2076.44	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	MHC	1566.79	1554.68	892.94	133.55	91.94	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	MHW	145.58	145.19	111.70	98.30	81.28	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	RDW	2644.86	2657.36	3352.58	4125.38	4184.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	MHC	814.03	700.14	144.59	14.34	3.06	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	MHW	51.40	51.40	53.35	51.40	53.35	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	RDW	3534.46	3648.35	4201.95	4334.16	4343.49	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	MHC	246.39	269.06	33.28	39.55	104.57	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	MHW	129.82	96.53	96.53	90.26	12.47	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	RDW	18.99	29.60	265.38	265.38	278.16	0.00	0.00	0.00	0.00	0.00	0.00

CWHR Size Class (riparian) by inventory block

Alternative	Inventory Block	veg size	Year 0	10	20	30	40	50	60	70	80	90	100
No Action (No HCP/No Permit)	Albion Inventory Block	2	4.35	8.03	6.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Albion Inventory Block	3	57.96	53.02	16.72	11.44	3.96	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Albion Inventory Block	4	1328.14	1411.56	546.86	488.25	470.09	394.70	223.56	196.22	164.85	198.77	225.30
No Action (No HCP/No Permit)	Albion Inventory Block	5	550.31	468.14	1370.49	1422.26	1391.55	1480.07	1489.14	1514.59	1394.15	1313.95	1256.12
No Action (No HCP/No Permit)	Albion Inventory Block	6	0.00	0.00	0.00	18.80	75.15	65.99	228.05	229.94	381.76	428.03	459.33
No Action (No HCP/No Permit)	Big River Inventory Block	2	24.97	200.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Big River Inventory Block	3	919.83	952.43	287.57	28.87	10.76	0.00	0.00	0.00	0.00	8.70	0.00
No Action (No HCP/No Permit)	Big River Inventory Block	4	3010.39	2820.85	3550.57	3661.30	3384.82	2531.44	1369.38	679.80	454.27	510.79	657.91
No Action (No HCP/No Permit)	Big River Inventory Block	5	42.71	24.34	159.76	306.25	578.80	1446.24	2576.41	3259.17	3378.87	3001.31	2633.15
No Action (No HCP/No Permit)	Big River Inventory Block	6	0.00	0.00	0.00	1.47	23.51	20.22	52.11	58.93	164.75	477.10	706.84
No Action (No HCP/No Permit)	Garcia River Inventory Block	2	0.00	1.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Garcia River Inventory Block	3	337.92	237.94	131.23	84.27	29.59	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Garcia River Inventory Block	4	1303.99	1438.97	1545.27	1551.34	1557.91	1286.73	911.23	495.10	449.30	465.94	480.48
No Action (No HCP/No Permit)	Garcia River Inventory Block	5	103.59	67.05	69.01	109.90	158.01	454.61	830.11	1239.75	1264.60	1194.60	1078.04
No Action (No HCP/No Permit)	Garcia River Inventory Block	6	0.00	0.00	0.00	0.00	0.00	4.17	4.17	10.66	31.61	84.97	186.99
No Action (No HCP/No Permit)	Navarro East Inventory Block	2	45.88	216.77	2.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Navarro East Inventory Block	3	1036.06	899.05	216.73	72.00	20.55	3.55	2.38	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Navarro East Inventory Block	4	2357.96	2324.09	3217.19	3115.82	3137.77	2645.00	1362.75	733.69	452.39	546.53	593.22
No Action (No HCP/No Permit)	Navarro East Inventory Block	5	196.57	196.57	200.10	438.58	478.16	980.21	2253.27	2875.17	3079.16	2822.69	2524.72
No Action (No HCP/No Permit)	Navarro East Inventory Block	6	0.00	0.00	0.00	10.09	0.00	7.72	18.09	27.62	104.93	267.26	518.54
No Action (No HCP/No Permit)	Navarro West Inventory Block	2	10.20	17.57	4.24	1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Navarro West Inventory Block	3	213.81	180.54	76.91	17.62	1.49	0.00	0.00	0.00	2.85	0.00	0.00
No Action (No HCP/No Permit)	Navarro West Inventory Block	4	2073.91	2124.76	2233.93	1744.73	1613.45	1238.74	909.92	464.03	486.56	502.28	566.96
No Action (No HCP/No Permit)	Navarro West Inventory Block	5	463.43	406.50	446.72	976.75	1061.09	1348.31	1715.06	2099.56	2017.78	1877.10	1572.90
No Action (No HCP/No Permit)	Navarro West Inventory Block	6	269.84	301.82	269.38	290.27	355.15	444.14	406.20	467.60	524.00	651.81	891.33
No Action (No HCP/No Permit)	Noyo Inventory Block	2	33.09	6.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Noyo Inventory Block	3	704.02	627.40	36.32	24.75	24.75	8.49	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Noyo Inventory Block	4	1307.75	1411.15	1949.83	1921.04	1716.37	1323.81	473.64	385.71	354.30	335.59	376.38
No Action (No HCP/No Permit)	Noyo Inventory Block	5	33.28	33.28	91.98	99.06	303.74	712.56	1566.09	1652.18	1624.73	1475.99	1438.98
No Action (No HCP/No Permit)	Noyo Inventory Block	6	0.00	0.00	0.00	33.28	33.28	33.28	38.40	40.24	99.11	266.55	262.77
No Action (No HCP/No Permit)	Rockport Inventory Block	2	33.15	40.14	11.82	3.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Rockport Inventory Block	3	326.85	339.05	160.64	130.82	73.14	16.61	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Rockport Inventory Block	4	3858.46	3928.38	3972.93	3367.42	2838.05	2161.28	1193.57	923.70	463.66	559.28	569.87
No Action (No HCP/No Permit)	Rockport Inventory Block	5	138.76	49.65	211.84	855.49	1446.04	2165.67	3098.51	3310.38	3552.88	3267.60	3292.41
No Action (No HCP/No Permit)	Rockport Inventory Block	6	0.00	0.00	0.00	0.00	0.00	13.66	65.15	123.15	340.68	530.36	494.95
No Action (No HCP/No Permit)	South Coast Inventory Block	2	6.48	2.93	1.95	1.95	1.95	1.95	0.00	1.95	1.95	0.00	1.95
No Action (No HCP/No Permit)	South Coast Inventory Block	3	556.11	662.32	279.12	87.95	65.72	53.86	1.95	0.00	0.00	1.95	0.00
No Action (No HCP/No Permit)	South Coast Inventory Block	4	3743.71	3648.85	4098.35	3423.76	2976.95	2140.29	1616.29	1357.09	955.04	981.57	881.00
No Action (No HCP/No Permit)	South Coast Inventory Block	5	74.86	76.93	1.73	867.48	1341.49	2190.01	2772.80	2883.50	3072.14	2836.64	2757.49
No Action (No HCP/No Permit)	South Coast Inventory Block	6	18.74	8.86	18.74	18.74	13.78	13.78	8.86	157.35	370.77	579.73	759.45
No Action (No HCP/No Permit)	Ukiah Inventory Block	2	5.20	2.69	2.69	2.69	2.69	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Ukiah Inventory Block	3	93.84	100.56	96.34	93.84	8.40	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Ukiah Inventory Block	4	279.67	275.45	279.67	282.17	365.20	138.15	104.13	101.98	89.15	69.83	31.85
No Action (No HCP/No Permit)	Ukiah Inventory Block	5	16.49	16.49	16.49	16.49	2.41	240.55	274.57	247.85	209.56	144.43	98.93
No Action (No HCP/No Permit)	Ukiah Inventory Block	6	0.00	0.00	0.00	0.00	16.49	16.49	16.49	45.36	96.49	180.93	264.41
Proposed Action (HCP/NCCP)	Albion Inventory Block	2	4.35	8.83	6.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Albion Inventory Block	3	57.96	49.73	14.54	14.54	3.96	21.57	0.23	2.21	2.80	0.00	10.35
Proposed Action (HCP/NCCP)	Albion Inventory Block	4	1328.14	1410.94	611.35	509.62	488.35	385.04	363.51	353.20	329.94	348.60	326.44
Proposed Action (HCP/NCCP)	Albion Inventory Block	5	550.31	471.25	1308.18	1397.79	1354.82	1328.80	948.83	909.78	687.84	514.49	286.82
Proposed Action (HCP/NCCP)	Albion Inventory Block	6	0.00	0.00	0.00	18.80	93.63	205.35	628.18	675.57	920.17	1077.67	1317.14
Proposed Action (HCP/NCCP)	Big River Inventory Block	2	24.97	14.21	9.99	5.58	1.18	2.74	10.24	1.04	7.84	2.81	9.83
Proposed Action (HCP/NCCP)	Big River Inventory Block	3	919.83	928.67	262.12	23.22	16.11	28.55	29.37	15.53	12.78	15.85	4.24
Proposed Action (HCP/NCCP)	Big River Inventory Block	4	3010.39	3030.68	3553.58	3535.96	2953.51	2381.92	1085.15	649.36	555.40	563.35	536.07

Alternative	Inventory Block	veg size	Year 0	10	20	30	40	50	60	70	80	90	100
Proposed Action (HCP/NCCP)	Big River Inventory Block	5	42.71	11.15	159.01	421.41	1005.06	1536.49	2768.47	3131.77	2527.31	1652.02	1112.85
Proposed Action (HCP/NCCP)	Big River Inventory Block	6	0.00	13.20	13.20	11.73	22.04	48.20	104.67	200.20	894.57	1763.87	2334.91
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	2	0.00	1.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	3	337.92	209.05	111.05	56.95	21.32	4.72	2.56	1.50	1.19	0.89	2.40
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	4	1303.99	1447.74	1512.56	1494.15	1393.65	1111.84	662.19	385.97	356.79	357.34	369.37
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	5	103.59	87.16	121.90	194.41	330.54	619.62	1035.85	1294.63	1215.98	1010.29	668.48
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	6	0.00	0.00	0.00	0.00	0.00	9.34	44.90	63.41	171.54	376.99	705.26
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	2	45.88	4.96	0.47	0.00	0.00	0.00	0.74	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	3	1036.06	883.19	168.90	59.49	15.77	18.69	4.46	11.15	9.86	10.32	2.22
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	4	2357.96	2551.76	3320.14	3163.42	2838.14	2371.79	1385.24	967.98	742.60	714.74	714.30
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	5	196.57	196.57	146.97	395.35	772.48	1152.71	2051.72	2359.37	2230.73	1855.61	912.73
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	6	0.00	0.00	0.00	18.22	10.09	93.29	194.33	297.98	653.29	1055.82	2007.23
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	2	10.20	6.08	0.00	1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	3	213.81	186.90	57.98	4.81	16.12	6.93	19.36	20.85	5.53	8.72	4.89
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	4	2073.91	2110.63	2271.33	1657.24	1360.27	1033.85	802.71	562.02	551.29	573.96	556.67
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	5	463.43	441.51	329.26	985.76	1248.43	1499.83	1602.54	1681.47	1580.48	1035.77	725.23
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	6	269.84	286.07	372.61	381.56	406.36	490.58	606.57	766.85	893.89	1412.74	1744.39
Proposed Action (HCP/NCCP)	Noyo Inventory Block	2	33.09	6.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Noyo Inventory Block	3	704.02	604.79	34.71	27.22	24.75	30.45	18.42	17.83	12.64	2.09	7.19
Proposed Action (HCP/NCCP)	Noyo Inventory Block	4	1307.75	1433.76	1938.14	1913.41	1710.24	1196.87	460.15	384.77	389.03	383.26	369.12
Proposed Action (HCP/NCCP)	Noyo Inventory Block	5	33.28	33.28	105.29	111.30	328.12	816.27	1530.46	1440.32	1195.90	864.17	569.02
Proposed Action (HCP/NCCP)	Noyo Inventory Block	6	0.00	0.00	0.00	26.21	15.02	34.54	69.10	235.21	480.56	828.62	1132.80
Proposed Action (HCP/NCCP)	Rockport Inventory Block	2	33.15	39.19	11.82	3.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Rockport Inventory Block	3	326.85	324.25	152.89	117.33	89.26	20.88	4.97	20.49	15.80	0.00	14.56
Proposed Action (HCP/NCCP)	Rockport Inventory Block	4	3858.46	3942.09	4001.83	3251.49	2728.30	2161.99	1206.55	972.22	901.79	915.13	865.70
Proposed Action (HCP/NCCP)	Rockport Inventory Block	5	138.76	51.70	190.69	984.92	1539.67	2160.46	3002.00	2544.39	1652.25	1224.01	588.23
Proposed Action (HCP/NCCP)	Rockport Inventory Block	6	0.00	0.00	0.00	0.00	0.00	13.90	143.71	820.13	1787.38	2218.09	2888.74
Proposed Action (HCP/NCCP)	South Coast Inventory Block	2	6.48	2.93	0.00	1.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	South Coast Inventory Block	3	556.11	638.64	99.32	57.88	59.83	60.00	7.66	19.81	8.87	0.00	6.78
Proposed Action (HCP/NCCP)	South Coast Inventory Block	4	3743.71	3675.90	4264.73	3324.04	2790.12	1532.36	1152.68	853.58	795.31	790.12	759.10
Proposed Action (HCP/NCCP)	South Coast Inventory Block	5	74.86	63.69	17.10	997.27	1531.20	2788.79	3086.40	2951.93	2284.12	1511.04	940.92
Proposed Action (HCP/NCCP)	South Coast Inventory Block	6	18.74	18.74	18.74	18.74	18.74	18.74	153.16	574.58	1311.60	2098.73	2693.10
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	2	5.20	2.69	2.69	2.69	2.69	0.00	0.00	0.00	0.00	0.00	0.00
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	3	93.84	100.56	96.34	87.57	9.78	0.00	0.00	0.00	0.00	1.37	1.52
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	4	279.67	275.45	279.67	288.44	344.08	184.78	153.86	126.89	149.85	142.46	103.24
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	5	16.49	16.49	16.49	16.49	22.15	193.92	224.84	222.94	133.87	61.60	32.40
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	6	0.00	0.00	0.00	0.00	16.49	16.49	16.49	45.36	111.47	189.75	258.04
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	2	4.35	1.74	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	3	57.96	41.92	16.72	16.72	3.96	0.00	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	4	1328.14	1116.80	447.58	310.42	201.21	91.54	17.44	4.35	4.35	3.96	3.96
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	5	550.31	780.29	1476.06	1493.29	1615.64	1553.30	1088.65	983.73	613.45	481.76	360.66
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	6	0.00	0.00	0.00	120.32	119.94	295.91	834.66	952.67	1322.95	1455.04	1576.13
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	2	24.97	7.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	3	919.83	968.52	135.37	30.75	10.76	0.00	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	4	3010.39	2997.51	3676.66	3298.12	2804.21	1973.17	744.39	171.52	19.70	11.11	10.76
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	5	42.71	11.15	172.67	655.83	1159.41	1998.65	3163.58	3505.89	3126.13	2061.23	1385.53
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	6	0.00	13.20	13.20	13.20	23.51	26.07	89.93	320.48	852.07	1925.56	2601.61
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	3	337.92	221.37	133.27	59.18	21.32	0.00	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	4	1303.99	1426.57	1464.20	1451.84	1408.49	1112.63	652.28	174.17	73.27	28.96	22.87
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	5	103.59	97.56	148.03	234.49	315.71	613.82	1069.45	1479.17	1450.77	1383.16	1108.17
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	6	0.00	0.00	0.00	0.00	0.00	19.06	23.78	92.18	221.47	333.39	614.47
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	2	45.88	43.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Alternative	Inventory Block	veg size	Year 0	10	20	30	40	50	60	70	80	90	100
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	3	1036.06	902.69	183.59	68.01	15.77	15.77	15.77	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	4	2357.96	2556.78	3310.46	3161.13	2829.36	2271.60	923.92	363.18	59.88	44.42	16.24
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	5	196.57	133.26	142.44	397.26	781.26	1258.90	2471.74	3011.62	2866.24	2105.41	1513.34
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	6	0.00	0.00	0.00	10.09	10.09	90.22	225.05	261.69	710.36	1486.65	2106.90
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	2	10.20	4.75	3.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	3	213.81	213.00	19.95	3.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	4	2073.91	2077.20	2280.27	1405.29	1194.19	828.55	361.23	30.67	6.88	3.82	4.12
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	5	463.43	449.73	341.01	1234.36	1421.04	1641.46	1991.26	2035.87	1848.61	1222.58	741.68
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	6	269.84	286.51	386.41	388.23	415.95	561.18	678.69	964.65	1175.70	1804.79	2285.39
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	2	33.09	8.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	3	704.02	659.79	27.16	24.75	24.75	8.49	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	4	1307.75	1376.73	1948.39	1878.18	1534.62	1024.64	225.42	82.95	51.29	42.00	31.05
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	5	33.28	33.28	102.58	141.93	499.55	1022.91	1784.77	1896.74	1692.24	970.89	696.98
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	6	0.00	0.00	0.00	33.28	19.21	22.09	67.94	98.44	334.61	1065.24	1350.10
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	2	33.15	21.90	4.78	3.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	3	326.85	339.05	161.66	123.54	91.39	23.04	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	4	3858.46	3933.94	3961.71	3064.04	2535.63	1767.25	526.20	193.06	131.20	90.59	71.58
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	5	138.76	62.33	229.08	1166.15	1730.21	2532.06	3606.21	3342.24	2625.84	1782.29	1248.48
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	6	0.00	0.00	0.00	0.00	0.00	34.88	224.82	821.93	1600.18	2484.34	3037.17
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	2	6.48	1.95	1.95	0.00	1.95	1.95	1.95	1.95	0.00	1.95	0.00
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	3	556.11	680.33	99.99	59.83	57.88	51.40	0.00	0.00	1.95	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	4	3743.71	3668.97	4277.47	3173.30	2397.07	1302.78	893.03	268.49	75.76	57.88	57.88
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	5	74.86	29.90	1.73	1148.02	1924.25	3025.02	3399.29	3648.55	2883.13	2131.80	1651.27
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	6	18.74	18.74	18.74	18.74	18.74	18.74	105.62	480.91	1439.06	2208.26	2690.74
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	2	5.20	2.69	2.69	2.69	2.69	0.00	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	3	93.84	100.56	96.34	93.84	30.55	4.74	0.00	0.00	0.00	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	4	279.67	275.45	279.67	282.17	339.08	176.99	98.68	96.53	90.52	87.33	19.23
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	5	16.49	16.49	16.49	16.49	6.38	196.97	280.02	253.30	200.33	86.38	106.99
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	6	0.00	0.00	0.00	0.00	16.49	16.49	16.49	45.36	104.35	221.48	268.97
Alternative B (Reserves)	Albion Inventory Block	2	4.35	8.83	6.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative B (Reserves)	Albion Inventory Block	3	57.96	52.22	16.72	15.99	7.09	32.80	13.09	0.96	1.72	0.00	0.23
Alternative B (Reserves)	Albion Inventory Block	4	1328.14	1495.31	879.97	844.75	787.72	641.86	476.50	436.77	332.17	293.16	267.66
Alternative B (Reserves)	Albion Inventory Block	5	550.31	384.39	1037.37	1074.83	1098.53	1188.38	1272.51	1238.25	923.90	908.20	810.80
Alternative B (Reserves)	Albion Inventory Block	6	0.00	0.00	0.00	5.18	47.41	77.71	178.66	264.77	682.96	739.39	862.06
Alternative B (Reserves)	Big River Inventory Block	2	24.97	200.27	7.76	0.44	0.00	4.55	2.28	1.91	1.64	0.00	0.00
Alternative B (Reserves)	Big River Inventory Block	3	919.83	968.11	345.70	28.19	19.74	23.27	19.34	12.85	0.00	3.81	7.70
Alternative B (Reserves)	Big River Inventory Block	4	3010.39	2805.17	3548.34	3718.74	3403.11	2756.96	1487.70	910.79	794.04	428.85	431.73
Alternative B (Reserves)	Big River Inventory Block	5	42.71	24.34	96.10	246.52	570.11	1210.55	2421.47	2967.27	2889.88	2514.80	2154.59
Alternative B (Reserves)	Big River Inventory Block	6	0.00	0.00	0.00	4.01	4.94	2.56	67.10	105.08	312.33	1050.44	1403.88
Alternative B (Reserves)	Garcia River Inventory Block	2	0.00	1.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative B (Reserves)	Garcia River Inventory Block	3	337.92	233.47	128.21	67.97	30.56	15.32	3.06	3.78	0.00	4.63	4.41
Alternative B (Reserves)	Garcia River Inventory Block	4	1303.99	1418.53	1523.31	1568.60	1584.88	1428.83	1120.13	701.75	582.84	549.48	366.57
Alternative B (Reserves)	Garcia River Inventory Block	5	103.59	91.95	93.99	108.94	130.07	279.21	595.44	984.24	1056.12	1039.60	1050.73
Alternative B (Reserves)	Garcia River Inventory Block	6	0.00	0.00	0.00	0.00	0.00	22.15	26.87	55.73	106.55	151.80	323.79
Alternative B (Reserves)	Navarro East Inventory Block	2	45.88	177.58	2.94	3.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative B (Reserves)	Navarro East Inventory Block	3	1036.06	930.89	192.18	62.47	29.35	45.01	17.96	6.19	5.04	7.92	25.00
Alternative B (Reserves)	Navarro East Inventory Block	4	2357.96	2332.13	3258.60	3231.71	3244.46	2960.77	2017.31	1252.51	866.59	740.88	639.72
Alternative B (Reserves)	Navarro East Inventory Block	5	196.57	195.89	182.76	328.57	362.68	540.49	1489.21	2244.75	2480.68	2495.01	2340.44
Alternative B (Reserves)	Navarro East Inventory Block	6	0.00	0.00	0.00	10.09	0.00	90.22	112.01	133.03	284.17	392.68	631.32
Alternative B (Reserves)	Navarro West Inventory Block	2	10.20	16.37	6.08	1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative B (Reserves)	Navarro West Inventory Block	3	213.81	189.49	73.07	5.77	9.53	18.54	9.21	0.44	2.54	0.00	8.19
Alternative B (Reserves)	Navarro West Inventory Block	4	2073.91	2117.85	2207.01	1849.96	1612.99	1430.55	942.11	666.81	610.09	443.41	410.10
Alternative B (Reserves)	Navarro West Inventory Block	5	463.43	407.37	448.40	844.76	1023.75	1054.39	1478.68	1643.38	1469.70	1250.69	1047.97

Alternative	Inventory Block	veg size	Year 0	10	20	30	40	50	60	70	80	90	100
Alternative B (Reserves)	Navarro West Inventory Block	6	269.84	300.10	296.63	328.87	384.92	527.70	601.18	720.56	948.86	1337.09	1564.93
Alternative B (Reserves)	Noyo Inventory Block	2	33.09	6.31	0.00	1.93	1.93	0.00	0.00	0.00	0.00	1.93	0.00
Alternative B (Reserves)	Noyo Inventory Block	3	704.02	581.40	50.74	44.43	32.23	33.38	7.63	12.01	7.32	2.98	11.40
Alternative B (Reserves)	Noyo Inventory Block	4	1307.75	1457.15	1971.09	1951.00	1892.57	1585.11	920.77	739.88	566.02	394.34	352.64
Alternative B (Reserves)	Noyo Inventory Block	5	33.28	33.28	56.31	51.69	133.50	430.56	1119.77	1278.29	1382.86	1350.94	1253.66
Alternative B (Reserves)	Noyo Inventory Block	6	0.00	0.00	0.00	29.09	17.90	29.09	29.96	47.96	121.92	327.93	460.43
Alternative B (Reserves)	Rockport Inventory Block	2	33.15	42.47	11.82	4.78	0.00	0.00	0.00	2.73	0.00	0.00	0.00
Alternative B (Reserves)	Rockport Inventory Block	3	326.85	333.64	140.55	115.12	59.24	42.39	24.22	15.15	9.29	5.03	4.56
Alternative B (Reserves)	Rockport Inventory Block	4	3858.46	3928.34	4020.82	3510.53	3147.47	2693.87	1893.91	1528.54	957.39	783.26	703.55
Alternative B (Reserves)	Rockport Inventory Block	5	138.76	52.78	184.04	726.81	1150.51	1617.26	2413.19	2442.92	2648.13	2451.50	2315.10
Alternative B (Reserves)	Rockport Inventory Block	6	0.00	0.00	0.00	0.00	0.00	3.71	25.91	367.89	742.41	1117.44	1334.02
Alternative B (Reserves)	South Coast Inventory Block	2	6.48	2.93	0.00	0.00	4.08	1.95	0.00	0.00	0.00	1.95	0.00
Alternative B (Reserves)	South Coast Inventory Block	3	556.11	564.34	160.71	97.71	117.44	90.21	37.89	4.62	1.66	0.67	5.36
Alternative B (Reserves)	South Coast Inventory Block	4	3743.71	3765.28	4202.49	3531.30	3120.79	2403.55	2094.22	1613.08	949.10	803.77	713.81
Alternative B (Reserves)	South Coast Inventory Block	5	74.86	53.56	17.96	757.06	1148.72	1890.40	2253.96	2539.42	2339.22	2111.24	1912.62
Alternative B (Reserves)	South Coast Inventory Block	6	18.74	13.78	18.74	13.82	8.86	13.78	13.82	242.77	1109.92	1482.26	1768.10
Alternative B (Reserves)	Ukiah Inventory Block	2	5.20	2.69	2.69	2.69	2.69	0.00	0.00	0.00	0.00	0.00	0.00
Alternative B (Reserves)	Ukiah Inventory Block	3	93.84	100.56	96.34	57.17	10.78	3.40	0.00	5.74	0.00	0.00	0.00
Alternative B (Reserves)	Ukiah Inventory Block	4	279.67	275.45	279.67	318.84	353.21	248.51	154.54	123.90	112.75	84.79	88.18
Alternative B (Reserves)	Ukiah Inventory Block	5	16.49	16.49	16.49	16.49	28.51	143.28	240.65	249.07	265.96	247.75	163.59
Alternative B (Reserves)	Ukiah Inventory Block	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.49	16.49	62.65	143.43
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	2	4.35	8.83	6.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	3	57.96	49.73	14.54	14.54	3.96	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	4	1328.14	1410.94	611.35	509.62	488.35	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	5	550.31	471.25	1308.18	1397.79	1354.82	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	6	0.00	0.00	0.00	18.80	93.63	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	2	24.97	14.21	9.99	5.58	1.18	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	3	919.83	928.67	262.12	23.22	16.11	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	4	3010.39	3030.68	3553.58	3535.96	2953.51	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	5	42.71	11.15	159.01	421.41	1005.06	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	6	0.00	13.20	13.20	11.73	22.04	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	2	0.00	1.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	3	337.92	209.05	111.05	56.95	21.32	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	4	1303.99	1447.74	1512.56	1494.15	1393.65	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	5	103.59	87.16	121.90	194.41	330.54	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	2	45.88	4.96	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	3	1036.06	883.19	168.90	59.49	15.77	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	4	2357.96	2551.76	3320.14	3163.42	2838.14	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	5	196.57	196.57	146.97	395.35	772.48	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	6	0.00	0.00	0.00	18.22	10.09	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	2	10.20	6.08	0.00	1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	3	213.81	186.90	57.98	4.81	16.12	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	4	2073.91	2110.63	2271.33	1657.24	1360.27	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	5	463.43	441.51	329.26	985.76	1248.43	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	6	269.84	286.07	372.61	381.56	406.36	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	2	33.09	6.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	3	704.02	604.79	34.71	27.22	24.75	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	4	1307.75	1433.76	1938.14	1913.41	1710.24	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	5	33.28	33.28	105.29	111.30	328.12	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	6	0.00	0.00	0.00	26.21	15.02	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	2	33.15	39.19	11.82	3.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	3	326.85	324.25	152.89	117.33	89.26	0.00	0.00	0.00	0.00	0.00	0.00

Alternative	Inventory Block	veg size	Year 0	10	20	30	40	50	60	70	80	90	100
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	4	3858.46	3942.09	4001.83	3251.49	2728.30	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	5	138.76	51.70	190.69	984.92	1539.67	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	2	6.48	2.93	0.00	1.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	3	556.11	638.64	99.32	57.88	59.83	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	4	3743.71	3675.90	4264.73	3324.04	2790.12	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	5	74.86	63.69	17.10	997.27	1531.20	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	6	18.74	18.74	18.74	18.74	18.74	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	2	5.20	2.69	2.69	2.69	2.69	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	3	93.84	100.56	96.34	87.57	9.78	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	4	279.67	275.45	279.67	288.44	344.08	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	5	16.49	16.49	16.49	16.49	22.15	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	6	0.00	0.00	0.00	0.00	16.49	0.00	0.00	0.00	0.00	0.00	0.00

Structure Class (riparian) Plan Area

Alternative	Inventory Block	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14
No Action (No HCP/No Permit)	Plan Area	0	2.69	0.00	0.47	0.00	319.57	33.28	62.56	4.40	2.43	5408.55	0.00	1200.23	98.08	3.15
No Action (No HCP/No Permit)	Plan Area	10	3.17	0.00	4.66	0.00	312.09	0.00	460.76	1.96	3.85	5098.15	0.00	1451.22	32.34	0.00
No Action (No HCP/No Permit)	Plan Area	20	2.69	0.00	0.47	0.00	278.61	0.00	13.00	1.96	0.00	1792.78	0.00	1339.14	14.16	6.31
No Action (No HCP/No Permit)	Plan Area	30	2.69	0.00	0.47	0.00	273.76	0.00	1.81	0.00	0.00	312.21	1.95	505.51	3.50	6.31
No Action (No HCP/No Permit)	Plan Area	40	2.69	0.00	0.00	0.47	146.29	0.00	0.00	0.00	0.00	132.85	1.95	405.25	0.00	6.31
No Action (No HCP/No Permit)	Plan Area	50	0.00	2.69	0.00	0.47	60.39	21.32	0.00	0.00	0.00	129.36	1.95	428.88	0.00	6.31
No Action (No HCP/No Permit)	Plan Area	60	0.00	0.00	1.95	3.17	0.00	81.71	0.00	0.00	0.00	85.66	0.00	210.49	0.00	0.00
No Action (No HCP/No Permit)	Plan Area	70	0.00	0.00	0.00	2.69	0.00	67.64	0.00	0.00	0.00	45.68	1.95	130.34	0.00	0.00
No Action (No HCP/No Permit)	Plan Area	80	0.00	0.00	0.00	2.69	0.00	56.32	0.00	0.00	0.00	19.49	1.95	108.27	0.00	0.00
No Action (No HCP/No Permit)	Plan Area	90	0.00	0.00	1.95	2.69	0.00	45.89	0.00	0.00	0.00	4.56	0.00	110.71	0.00	0.00
No Action (No HCP/No Permit)	Plan Area	100	0.00	0.00	0.00	2.69	0.00	32.65	0.00	0.00	0.00	1.61	1.95	90.56	0.00	0.00
Proposed Action (HCP/NCCP)	Plan Area	0	2.69	0.00	0.47	0.00	319.57	33.28	62.56	4.40	2.43	5408.55	0.00	1200.23	98.08	3.15
Proposed Action (HCP/NCCP)	Plan Area	10	3.17	0.00	0.00	0.00	316.75	0.00	50.45	2.55	47.41	5332.45	0.00	1425.98	33.14	0.00
Proposed Action (HCP/NCCP)	Plan Area	20	3.17	0.00	1.95	0.00	278.61	0.00	10.16	1.96	1.81	1775.17	0.00	1253.16	18.33	6.31
Proposed Action (HCP/NCCP)	Plan Area	30	2.69	0.00	0.47	0.00	258.93	0.00	7.39	0.00	0.00	321.15	1.95	469.75	3.50	6.31
Proposed Action (HCP/NCCP)	Plan Area	40	2.69	0.00	1.95	0.47	163.77	0.00	0.00	0.00	0.00	143.89	0.00	348.67	1.18	6.31
Proposed Action (HCP/NCCP)	Plan Area	50	0.00	2.69	1.95	0.47	60.39	21.32	2.74	0.00	0.00	182.89	0.00	290.22	0.00	6.31
Proposed Action (HCP/NCCP)	Plan Area	60	0.00	2.69	1.95	0.47	0.00	67.23	10.24	1.06	0.00	85.06	0.00	174.71	0.74	0.00
Proposed Action (HCP/NCCP)	Plan Area	70	0.00	2.69	1.95	0.47	0.00	24.29	1.04	0.00	0.00	16.00	0.00	144.39	0.00	0.00
Proposed Action (HCP/NCCP)	Plan Area	80	0.00	2.69	0.00	0.00	0.00	13.77	7.84	0.00	0.47	10.05	0.00	142.62	0.00	0.00
Proposed Action (HCP/NCCP)	Plan Area	90	0.00	0.00	0.00	2.69	0.00	3.41	2.81	0.00	0.00	3.52	0.00	140.72	0.00	0.00
Proposed Action (HCP/NCCP)	Plan Area	100	0.00	0.00	0.00	2.69	0.00	3.41	9.83	1.52	0.00	1.28	0.00	82.95	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Plan Area	0	2.69	0.00	0.47	0.00	319.57	33.28	62.56	4.40	2.43	5408.55	0.00	1200.23	98.08	3.15
Alternative A (Enhanced HCP/NCCP)	Plan Area	10	2.69	0.00	0.47	0.00	316.75	0.00	58.45	1.96	0.00	5006.06	0.00	1360.27	31.51	3.15
Alternative A (Enhanced HCP/NCCP)	Plan Area	20	2.69	0.00	0.47	0.00	278.61	0.00	0.00	1.96	0.00	1984.41	1.95	1329.47	8.73	9.40
Alternative A (Enhanced HCP/NCCP)	Plan Area	30	2.69	0.00	0.47	0.00	273.76	0.00	0.00	0.00	0.00	523.16	0.00	521.09	3.50	6.70
Alternative A (Enhanced HCP/NCCP)	Plan Area	40	2.69	0.00	0.00	0.47	186.68	0.00	0.00	0.00	0.00	151.35	1.95	386.81	0.00	10.20
Alternative A (Enhanced HCP/NCCP)	Plan Area	50	0.00	0.00	0.00	3.17	71.56	21.32	0.00	0.00	0.00	183.23	1.95	402.62	0.00	6.31
Alternative A (Enhanced HCP/NCCP)	Plan Area	60	0.00	0.00	0.00	3.17	0.00	81.71	0.00	0.00	0.00	89.39	1.95	205.82	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Plan Area	70	0.00	0.00	0.00	2.69	0.00	68.60	0.00	0.00	0.00	23.51	1.95	121.84	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Plan Area	80	0.00	0.00	1.95	2.69	0.00	21.19	0.00	0.00	0.00	0.00	0.00	153.18	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Plan Area	90	0.00	0.00	0.00	2.69	0.00	7.26	0.00	0.00	0.00	0.00	1.95	130.97	0.00	0.00
Alternative A (Enhanced HCP/NCCP)	Plan Area	100	0.00	0.00	0.00	2.69	0.00	9.20	0.00	0.00	0.00	0.00	0.00	106.42	0.00	0.00
Alternative B (Reserves)	Plan Area	0	2.69	0.00	0.47	0.00	319.57	33.28	62.56	4.40	2.43	5408.55	0.00	1200.23	98.08	3.15
Alternative B (Reserves)	Plan Area	10	3.17	0.00	4.66	0.00	312.09	0.00	419.42	2.55	47.41	5051.56	0.00	1445.73	36.42	0.00
Alternative B (Reserves)	Plan Area	20	3.17	0.00	1.95	0.00	278.61	0.00	12.83	1.96	1.81	1786.47	0.00	1298.01	21.99	5.46
Alternative B (Reserves)	Plan Area	30	5.10	0.00	1.95	0.00	232.45	0.00	5.42	0.00	0.00	427.61	0.00	480.21	4.78	5.46
Alternative B (Reserves)	Plan Area	40	2.69	0.00	0.00	0.47	133.90	0.00	0.00	0.00	0.00	165.27	3.88	378.22	2.13	0.00
Alternative B (Reserves)	Plan Area	50	1.95	2.69	0.00	0.47	63.79	21.32	4.55	0.00	0.00	148.23	0.00	342.58	0.00	0.00
Alternative B (Reserves)	Plan Area	60	0.00	2.69	1.95	0.00	0.00	72.01	2.28	0.00	0.00	33.47	0.00	180.16	0.00	0.00
Alternative B (Reserves)	Plan Area	70	0.00	0.00	1.95	2.69	0.00	38.66	1.91	0.00	0.00	4.91	0.00	130.01	2.73	0.00
Alternative B (Reserves)	Plan Area	80	0.00	0.00	0.00	2.69	0.00	21.65	1.64	0.00	0.00	0.00	0.00	118.98	0.00	0.00
Alternative B (Reserves)	Plan Area	90	1.93	0.00	0.00	2.69	0.00	10.23	0.00	0.00	0.00	0.00	0.00	102.09	1.95	0.00
Alternative B (Reserves)	Plan Area	100	0.00	0.00	0.00	2.69	0.00	13.96	0.00	0.00	1.93	1.20	0.00	79.03	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	0	2.69	0.00	0.47	0.00	319.57	33.28	62.56	4.40	2.43	5408.55	0.00	1200.23	98.08	3.15
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	10	3.17	0.00	0.00	0.00	316.75	0.00	50.45	2.55	47.41	5332.45	0.00	1425.98	33.14	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	20	3.17	0.00	1.95	0.00	278.61	0.00	10.16	1.96	1.81	1775.17	0.00	1253.16	18.33	6.31
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	30	2.69	0.00	0.47	0.00	258.93	0.00	7.39	0.00	0.00	321.15	1.95	469.75	3.50	6.31
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	40	2.69	0.00	1.95	0.47	163.77	0.00	0.00	0.00	0.00	143.89	0.00	348.67	1.18	6.31
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Structure Class (riparian) Plan Area

Alternative	Inventory Block	Year	15	16	17	18	19	20	21	22	23	24
No Action (No HCP/No Permit)	Plan Area	0	34.23	0.00	259.14	714.28	142.66	111.22	3664.78	11865.84	1366.11	288.59
No Action (No HCP/No Permit)	Plan Area	10	20.48	0.00	381.51	742.69	242.07	134.30	3350.18	12069.57	962.58	310.68
No Action (No HCP/No Permit)	Plan Area	20	22.22	4.15	231.07	625.99	198.21	116.28	791.43	17606.20	2249.47	288.13
No Action (No HCP/No Permit)	Plan Area	30	13.49	4.15	59.73	589.56	115.28	87.55	217.58	18128.77	4885.29	372.65
No Action (No HCP/No Permit)	Plan Area	40	9.08	4.15	55.41	951.15	189.49	0.00	36.66	16555.51	6567.65	517.36
No Action (No HCP/No Permit)	Plan Area	50	9.08	4.15	16.11	1165.65	522.55	0.00	6.01	12096.37	10491.53	619.44
No Action (No HCP/No Permit)	Plan Area	60	15.38	4.15	0.00	1180.96	1068.74	5.04	2.38	6587.09	15498.04	837.51
No Action (No HCP/No Permit)	Plan Area	70	14.33	4.15	0.00	839.07	1617.02	28.28	0.00	4237.56	17432.69	1160.86
No Action (No HCP/No Permit)	Plan Area	80	10.20	6.24	0.00	852.53	2077.98	150.08	2.85	2820.01	17359.57	2114.10
No Action (No HCP/No Permit)	Plan Area	90	9.80	6.63	2.50	957.79	1904.87	162.58	6.20	3039.13	15860.23	3466.73
No Action (No HCP/No Permit)	Plan Area	100	9.80	4.54	0.00	1214.53	1521.83	334.31	0.00	3031.13	14792.07	4544.61
Proposed Action (HCP/NCCP)	Plan Area	0	34.23	0.00	259.14	714.28	142.66	111.22	3664.78	11865.84	1366.11	288.59
Proposed Action (HCP/NCCP)	Plan Area	10	68.34	0.00	315.03	1340.81	48.60	8.13	3250.88	11787.37	1131.40	318.01
Proposed Action (HCP/NCCP)	Plan Area	20	45.01	4.15	76.84	2235.35	47.30	0.00	638.64	16353.50	2335.32	404.55
Proposed Action (HCP/NCCP)	Plan Area	30	108.64	4.15	32.44	3093.74	128.06	0.00	157.16	15138.19	5462.24	475.26
Proposed Action (HCP/NCCP)	Plan Area	40	139.19	4.15	12.08	3443.60	93.39	0.00	79.08	12524.53	8034.95	582.37
Proposed Action (HCP/NCCP)	Plan Area	50	246.43	4.15	34.28	3283.90	249.90	0.00	95.15	8326.21	11842.84	930.42
Proposed Action (HCP/NCCP)	Plan Area	60	318.57	4.15	44.25	3627.67	192.51	0.00	40.83	2994.58	16054.46	1961.10
Proposed Action (HCP/NCCP)	Plan Area	70	416.68	4.15	52.06	3465.25	291.51	1.26	55.35	1186.19	16239.70	3679.29
Proposed Action (HCP/NCCP)	Plan Area	80	419.74	0.00	51.67	3522.46	348.88	9.35	17.79	660.21	13150.26	7224.47
Proposed Action (HCP/NCCP)	Plan Area	90	403.13	9.04	23.84	3605.21	310.22	11.38	15.39	630.28	9398.35	11022.28
Proposed Action (HCP/NCCP)	Plan Area	100	410.57	0.39	36.86	3598.48	380.46	13.69	12.97	503.41	5442.15	15081.61
Alternative A (Enhanced HCP/NCCP)	Plan Area	0	34.23	0.00	259.14	714.28	142.66	111.22	3664.78	11865.84	1366.11	288.59
Alternative A (Enhanced HCP/NCCP)	Plan Area	10	32.89	0.00	145.32	1165.47	203.88	108.01	3550.08	12053.97	1227.80	313.53
Alternative A (Enhanced HCP/NCCP)	Plan Area	20	25.66	4.15	17.50	321.67	167.80	0.00	577.47	17973.83	2458.15	418.35
Alternative A (Enhanced HCP/NCCP)	Plan Area	30	28.43	4.15	1.28	152.56	183.36	0.00	204.41	16792.54	6300.30	583.86
Alternative A (Enhanced HCP/NCCP)	Plan Area	40	18.93	4.15	0.00	102.28	151.13	0.00	69.69	14573.81	9298.19	623.94
Alternative A (Enhanced HCP/NCCP)	Plan Area	50	20.73	4.15	0.00	51.09	138.01	0.00	31.88	9860.68	13700.93	1084.64
Alternative A (Enhanced HCP/NCCP)	Plan Area	60	14.05	4.15	0.00	10.47	46.14	12.08	15.77	4037.97	18792.63	2266.98
Alternative A (Enhanced HCP/NCCP)	Plan Area	70	14.05	1.45	0.00	0.00	53.35	4.61	0.00	1154.23	20097.68	4038.30
Alternative A (Enhanced HCP/NCCP)	Plan Area	80	14.05	0.75	0.00	0.00	44.74	22.69	0.00	321.73	17238.55	7760.75
Alternative A (Enhanced HCP/NCCP)	Plan Area	90	9.80	2.43	0.00	0.00	38.52	33.25	0.00	219.34	12151.30	12984.75
Alternative A (Enhanced HCP/NCCP)	Plan Area	100	9.80	0.39	0.00	0.00	31.52	39.20	0.00	109.57	8742.00	16531.47
Alternative B (Reserves)	Plan Area	0	34.23	0.00	259.14	714.28	142.66	111.22	3664.78	11865.84	1366.11	288.59
Alternative B (Reserves)	Plan Area	10	58.23	0.00	399.45	1414.55	221.38	123.96	3190.50	11622.60	914.71	313.88
Alternative B (Reserves)	Plan Area	20	94.27	0.00	229.51	2139.92	168.54	101.39	692.33	16565.20	1863.48	315.37
Alternative B (Reserves)	Plan Area	30	212.70	4.15	61.14	2132.95	116.35	51.37	199.27	17266.51	3983.81	391.06
Alternative B (Reserves)	Plan Area	40	89.23	4.15	59.34	2088.06	69.83	4.92	122.72	16425.93	5567.48	464.03
Alternative B (Reserves)	Plan Area	50	145.29	4.15	63.84	2032.82	182.46	0.00	176.68	13456.60	8167.91	766.92
Alternative B (Reserves)	Plan Area	60	258.11	4.15	59.15	2219.65	807.84	1.26	71.29	8341.10	12471.64	1055.52
Alternative B (Reserves)	Plan Area	70	292.71	3.95	45.18	2288.94	1081.45	27.12	14.61	5216.10	14475.08	1954.27
Alternative B (Reserves)	Plan Area	80	292.09	1.26	24.68	2116.31	2458.65	33.01	2.88	3219.27	12963.54	4325.62
Alternative B (Reserves)	Plan Area	90	272.32	0.00	23.32	2250.55	3411.05	91.25	1.72	1884.06	10867.44	6661.68
Alternative B (Reserves)	Plan Area	100	187.33	0.00	51.66	2133.76	3584.66	148.83	13.27	1556.00	9316.00	8491.95
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	0	34.23	0.00	259.14	714.28	142.66	111.22	3664.78	11865.84	1366.11	288.59
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	10	68.34	0.00	310.73	1262.25	130.17	111.22	3250.88	11787.37	1131.40	318.01
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	20	45.01	4.15	76.84	2318.22	55.43	0.00	638.64	16353.50	2335.32	404.55
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	30	108.64	4.15	32.44	3093.74	38.32	0.00	157.16	15138.19	5462.24	475.26
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	40	139.19	4.15	12.08	3443.60	93.39	0.00	79.08	12524.53	8034.95	582.37
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix P

Habitat Index Summary for Wildlife Communities Effects Analysis

California Wildlife Habitat Relationships ID code	California Wildlife Habitat Relationships Common name	Calculated habitat value for year 0	Predicted change in habitat value, by year[a]																			
			No Action				Proposed Action				Alternative A				Alternative B				Alternative C			
			20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80
A002	Northwestern salamander	98,144																				
A004	California giant salamander	171,556																				
A005	Southern torrent salamander	156,674																				
A006	Rough-skined newt	149,313																				
A007	California newt	27,574	-	--	--	--	-	--	--	--	-	--	--	--	-	--	--	--	-	--		
A008	Red-bellied newt	197,417																				
A012	Common ensatina	166,472																				
A014	California slender salamander	115,063		+	++	++	+	++	++	++	+	++	++	++		+	+	+	+	++		
A020	Speckled black salamander	163,848																				
A022	Arboreal salamander	8,679	++	++	++	++	++	++	++	++	++	++	++	++	++	++			++	++		
A026	Western tailed frog	110,004																				
A032	Western toad	92,942																				
A039	Pacific chorus frog	113,361			+	+				+				+								
A040	Northern red-legged frog	104,918																				
A043	Foothill yellow-legged frog	66,947																				
A046	Bullfrog	133,894																				
A048	Pacific giant salamander	171,556																				
A068	Wandering salamander	122,659																				
A071	California red-legged frog	104,918																				
R004	Western pond turtle	36,379		-	-	-		--	--	--		--	--	--			-	-		--		
R022	Western fence lizard	94,210										-				-	-	-				
R023	Sagebrush lizard	2,918	++	++		--	-	--	--	--	--	--	--	--	++	++	++	++	-	--		
R036	Western skink	64,234						-	-			-	-	-		-	-	-		-		
R039	Western whiptail	25,788	-	--	--	--	-	--	--	--	-	--	--	--		-	--	--	-	--		
R040	Southern alligator lizard	77,570			+	+			+	+			+	+								
R042	Northern alligator lizard	148,922															-	-				
R046	Rubber boa	157,417																				

California Wildlife Habitat Relationships ID code	California Wildlife Habitat Relationships Common name	Calculated habitat value for year 0	Predicted change in habitat value, by year[a]																			
			No Action				Proposed Action				Alternative A				Alternative B				Alternative C			
			20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80
R048	Ringneck snake	24,635	-	--	--	--	-	--	--	--	-	--	--	--		-	--	-	-	--		
R049	Sharptail snake	94,867							-	-			-	-			-	-				
R051	Racer	37,491				+				+		-				-	-	-				
R053	Striped racer	27,574	-	--	--	--	-	--	--	--	-	--	--	--	-	--	--	--	-	--		
R057	Gopher snake	31,029		--	--	--	-	--	--	--	-	--	--	--			-	-	-	--		
R058	Common kingsnake	39,599										-				-	-	-				
R059	California mountain kingsnake	128,675																				
R061	Common garter snake	77,591			+	+			+	+			+	+								
R062	Western terrestrial garter snake	107,289																				
R076	Western rattlesnake	64,234						-	-			-	-	-		-	-	-		-		
R078	Aquatic garter snake	111,579																				
B051	Great blue heron	32,332							+	+			+	+				+				
B052	Great egret	30,913							+	+			+	+								
B058	Green heron	41,152																				
B059	Black-crowned night heron	18,598	-	--	--	--	-	--	--	--	-	--	--	--	-	--	--	--	-	--		
B076	Wood duck	37,731							++	++			++	++								
B108	Turkey vulture	163,330																				
B110	Osprey	133,569												+								
B111	White-tailed kite	9,702	--	--	--	--		--	--	--		--	--	--	-		-			--		
B113	Bald eagle	41,708																				
B114	Northern harrier	360	++	++		--	-	--	--	--	--	--	--	--	++	++	++	++	-	--		
B115	Sharp-shinned hawk	194,619																				
B116	Cooper's hawk	120,570		-	-	-		-	-	-		-	-	-		-	-	-		-		
B117	Northern goshawk	93,272	-	-	--	--	-	--	--	--	-	--	--	--	-	--	--	--	-	--		
B119	Red-shouldered hawk	40,395	-	--	--	--	-	--	--	--	-	--	--	--	-	-	--	--	-	--		
B121	Swainson's hawk	973	++	++		--	-	--	--	--	--	--	--	--	++	++	++	++	-	--		
B123	Red-tailed hawk	153,726																				

California Wildlife Habitat Relationships ID code	California Wildlife Habitat Relationships Common name	Calculated habitat value for year 0	Predicted change in habitat value, by year[a]																			
			No Action				Proposed Action				Alternative A				Alternative B				Alternative C			
			20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80
B126	Golden eagle	88,524	-	--	--	--	-	--	--	--	-	--	--	--		-	--	-	-	--		
B127	American kestrel	93,266																				
B128	Merlin	27,056										-				-	-	-				
B129	Peregrine falcon	103,170		-	-	-		-	-	-	-	-	-	-			-	-		-		
B131	Prairie falcon	93,997		-	-	-		-	-	-	-	-	-	-			-	-		-		
B134	Sooty grouse	54,352	-	--	--	--	-	--	--	--	--	--	--	--	-	--	--	--	-	--		
B136	Ruffed grouse	125,534																				
B138	Wild turkey	86,316	-	--	--	--	-	--	--	--	-	--	--	--		-	--	--	-	--		
B140	California quail	123,331																				
B141	Mountain quail	122,824																				
B240	Marbled murrelet	27,705	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++		
B251	Band-tailed pigeon	110,596	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		
B255	Mourning dove	116,117		-	-	-		-	-	-		-	-	-			-	-		-		
B262	Barn owl	59,139		--	--	--	-	--	--	--	-	--	--	--		-	--	-	-	--		
B263	Flammulated owl	81,447	-	--	--	--	-	--	--	--	--	--	--	--	-	--	--	--	-	--		
B264	Western screech owl	165,489																				
B265	Great horned owl	137,448																				
B267	Northern pygmy owl	126,864														-	-	-				
B270	Northern spotted owl	115,188							+			+	+	+								
B272	Long-eared owl	46,630	-	--	--	--	-	--	--	--	-	--	--	--		--	--	--	-	--		
B273	Short-eared owl	4,244	-	--	--	--		-				-	-				-	-		-		
B274	Northern saw-whet owl	171,028																				
B276	Common nighthawk	30,253	-	--	--	--	-	--	--	--	-	--	--	--		--	--	--	-	--		
B277	Common poorwill	36,714		--	--	--	-	--	--	--	-	--	--	--		-	--	-	-	--		
B281	Vaux's swift	98,548		+	+	++	+	++	++	++	+	++	++	++	+	+	+	+	+	++		
B282	White-throated swift	100,464		-	--	--	-	--	--	--	-	--	--	--		-	-	-	-	--		
B287	Anna's hummingbird	32,605		-	-	-		--	--	--	-	--	--	--		-	-	-		--		

California Wildlife Habitat Relationships ID code	California Wildlife Habitat Relationships Common name	Calculated habitat value for year 0	Predicted change in habitat value, by year[a]																			
			No Action				Proposed Action				Alternative A				Alternative B				Alternative C			
			20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80
B289	Calliope hummingbird	27,214		-	--	--	-	--	--	--	-	--	--	--			-	-	-	--		
B291	Rufous hummingbird	70,736																				
B292	Allen's hummingbird	57,411																				
B294	Lewis' s woodpecker	53,010	-	--	--	--	-	--	--	--	--	--	--	--	-	-	--	--	-	--		
B296	Acorn woodpecker	98,913																				
B299	Red-breasted sapsucker	131,394																				
B302	Nuttall's woodpecker	64,537	-	--	--	--	-	--	--	--	--	--	--	--	-	--	--	--	-	--		
B303	Downy woodpecker	90,820																				
B304	Hairy woodpecker	98,719																				
B305	White-headed woodpecker	44,031	-	--	--	--	-	--	--	--	--	--	--	--	-	--	--	--	-	--		
B307	Northern flicker	115,105						-				-				-	-	-		-		
B308	Pileated woodpecker	72,418														-	-	-				
B309	Olive-sided flycatcher	133,975																				
B311	Western wood-pewee	125,388		-	-	-		-	-	-		-	-	-		-	-	-		-		
B317	Hammond's flycatcher	53,617	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
B318	Dusky flycatcher	70,363	-	-	-	-		--	-	-	-	--	-	-		-	--	--		--		
B320	Pacific-slope flycatcher	192,387																				
B321	Black phoebe	28,976	-	--	--	--	-	--	--	--	-	--	--	--		-	--	--	-	--		
B326	Ash-throated flycatcher	56,233	-	--	--	--	-	--	--	--	-	--	--	--		-	--	--	-	--		
B333	Western kingbird	25,899	-	--	--	--	-	--	--	--	-	--	--	--		-	--	--	-	--		
B338	Purple martin	6,568	++	++	++	++	++	++	++	++	++	++	++	++	++	+		++	++	++		
B339	Tree swallow	55,486	-	--	--	--	-	--	--	--	--	--	--	--	-	--	--	--	-	--		
B340	Violet-green swallow	124,685														-	-	-				
B341	Northern rough-winged swallow	76,910		--	--	--	-	--	--	--	-	--	--	--		-	--	--	-	--		
B344	Barn swallow	98,385																				
B345	Gray jay	72,288	+	++	++	++	+	++	++	++	+	++	++	++	+	+	++	++	+	++		
B346	Steller's jay	191,287																				

California Wildlife Habitat Relationships ID code	California Wildlife Habitat Relationships Common name	Calculated habitat value for year 0	Predicted change in habitat value, by year[a]																			
			No Action				Proposed Action				Alternative A				Alternative B				Alternative C			
			20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80
B348	Western scrub-jay	55,592	-	--	--	--	-	--	--	--	--	--	--	--	-	--	--	--	-	--		
B353	American crow	17,481	+					+	+			+	+		+	++	++	++		+		
B354	Common raven	172,133																				
B356	Mountain chickadee	54,168	-	--	--	--	-	--	--	--	--	--	--	--	-	--	--	--	-	--		
B357	Chestnut-backed chickadee	130,743			+	+		+	+	+		+	+	+						+		
B358	Oak titmouse	57,763	-	--	--	--	-	--	--	--	-	--	--	--		-	--	--	-	--		
B360	Bushtit	55,486	-	--	--	--	-	--	--	--	--	--	--	--	-	--	--	--	-	--		
B361	Red-breasted nuthatch	58,829																				
B362	White-breasted nuthatch	84,283	-	--	--	--	-	--	--	--	--	--	--	--	-	--	--	--	-	--		
B363	Pygmy nuthatch	44,192	--	--	--	--	-	--	--	--	-	--	--	--	-	--	--	--	-	--		
B364	Brown creeper	123,009																				
B366	Rock wren	68,197	-	--	--	--	-	--	--	--	-	--	--	--		-	--	--	-	--		
B368	Bewick's wren	33,771			-	--				-			-	-		+						
B369	House wren	57,593	-	--	--	--	-	--	--	--	-	--	--	--		-	--	--	-	--		
B370	Winter wren	159,135																				
B375	Golden-crowned kinglet	174,583																				
B376	Ruby-crowned kinglet	116,117																				
B377	Blue-gray gnatcatcher	1,503	++	++		--		--	--	--	--	--	--	--	+	++	++	++		--		
B380	Western bluebird	50,635										-			-	--	--	--				
B382	Townsend's solitaire	1,905		--	--	--	-	--	--	--	--	--	--	--	-	-	--		-	--		
B385	Swainson's thrush	92,827																				
B386	Hermit thrush	169,654																				
B389	American robin	83,202																				
B390	Varied thrush	145,427			+	+		+	+	+		+	+	+						+		
B391	Wrentit	117,608																				
B398	California thrasher	1,903	++	+		--	-	--	--	--	--	--	--	--	+	++	+	++	-	--		
B407	Cedar waxwing	55,254		+	+	++	+		+	+	+		+	+					+			

California Wildlife Habitat Relationships ID code	California Wildlife Habitat Relationships Common name	Calculated habitat value for year 0	Predicted change in habitat value, by year[a]																			
			No Action				Proposed Action				Alternative A				Alternative B				Alternative C			
			20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80
B410	Loggerhead shrike	1,459	++	++		--	-	--	--	--	--	--	--	--	++	++	++	++	-	--		
B411	European starling	88,553																				
B415	Cassin's vireo	127,225										-										
B417	Hutton's vireo	91,990										-				-	-	-				
B418	Warbling vireo	97,321	-	-	-	-	-	-	-	-	-	--	-	-		-	-	-	-	-		
B425	Orange-crowned warbler	129,791																				
B426	Nashville warbler	76,972		-	-	--	-	--	--	--	-	--	--	--		-	-	-	-	--		
B430	Yellow warbler	31,280	-	--	--	--	-	--	--	--	-	--	--	--		-	--	-	-	--		
B435	Yellow-rumped warbler	109,037		-	-	-		-	-	-	-	-	-	-		-	-	-		-		
B436	Black-throated gray warbler	82,234			-	-		-	-	-		-	-	-						-		
B437	Townsend's warbler	108,970																				
B438	Hermit warbler	145,503							+	+			+	+								
B460	Macgillivray's warbler	127,427							-	-			-	-				-				
B463	Wilson's warbler	132,568																				
B471	Western tanager	117,108	-	-	-	-		-	-	-	-	-	-	-		-	-	-		-		
B475	Black-headed grosbeak	117,114		-	-	-		-	-	-		-	-	-		-	-	-		-		
B477	Lazuli bunting	6,743	++		-	--		--	--	--		--	--	--		++		++		--		
B482	Green-tailed towhee	2,529	++	++		--	-	--	--	--	--	--	--	--	++	++	++	++	-	--		
B483	Spotted towhee	53,658												-								
B484	California towhee	2,861	++	+		--	-	--	--	--	--	--	--	--	+	++	++	++	-	--		
B489	Chipping sparrow	82,510										-										
B495	Lark sparrow	1,402	++	+		--	-	--	--	--	--	--	--	--		++	++	++	-	--		
B504	Fox sparrow	50,720										-					-	-				
B505	Song sparrow	49,302	+	++	++	++	++	++	++	++	++	++	++	++	+	+	+	+	++	++		
B506	Lincoln's sparrow	49		--		-	++	--	--	--	++	++	-	--	++		-	--	++	--		
B509	Golden-crowned sparrow	8,038		--	--	--		--	-	-		--	--	-						--		
B510	White-crowned sparrow	19,720			-	-										+	+	+				

California Wildlife Habitat Relationships ID code	California Wildlife Habitat Relationships Common name	Calculated habitat value for year 0	Predicted change in habitat value, by year[a]																			
			No Action				Proposed Action				Alternative A				Alternative B				Alternative C			
			20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80
B512	Dark-eyed junco	119,173																				
B521	Western meadowlark	11,080		-	--	--		-				-	-							-		
B524	Brewer's blackbird	109,219																				
B528	Brown-headed cowbird	47,570																				
B532	Bullock's oriole	33,400	-	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
B536	Purple finch	113,462														-	-	-				
B538	House finch	7,813		-	--	--		-	-			-	-	-						-		
B539	Red crossbill	17,677	--	--	--	--	-	--	--	--	-	--	--	--	-	--	--	--	-	--		
B542	Pine siskin	76,024		+	+	+		+	++	++		+	++	++						+		
B543	Lesser goldfinch	27,612	++	++	++	++	+	++	++	++	+	++	++	++	+	+	+	+	+	++		
B544	Lawrence's goldfinch	3,303	++		-	--	-	--	--	--	--	--	--	--		++		++	-	--		
B545	American goldfinch	39,406	+	++	++	++	+	+	+	+	+	+	+	+		+	+	+	+	+		
B546	Evening grosbeak	66,941																				
B554	Plumbeous vireo	80,440	-	--	--	--	-	--	--	--	-	--	--	--		-	--	--	-	--		
B699	Barred owl	115,188							+			+	+	+								
B702	Chimney swift	44,631																				
B773	American redstart	44,631																				
B798	White-throated sparrow	44,631																				
B799	Harris's sparrow	5,179	+	-	--	--		-	-			-	-	-						-		
B809	Indigo bunting	5,270	++	-	--	--		--	--	--	-	--	--	--		+		+		--		
M001	Virginia opossum	73,341																				
M003	Vagrant shrew	39,506										-				-	-	--				
M005	Fog shrew	172,538																				
M006	Ornate shrew	27,946	-	--	--	--	-	--	--	--	-	--	--	--		--	--	--	-	--		
M010	Water shrew	25,837	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
M011	Marsh shrew	39,362																				
M012	Trowbridge's shrew	172,538																				

California Wildlife Habitat Relationships ID code	California Wildlife Habitat Relationships Common name	Calculated habitat value for year 0	Predicted change in habitat value, by year[a]																			
			No Action				Proposed Action				Alternative A				Alternative B				Alternative C			
			20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80
M015	Shrew-mole	57,945		++	++	++	+	++	++	++	+	++	++	++	+	+	++	++	+	++		
M017	Coast mole	19,103							--	--			--	--		+						
M018	Broad-footed mole	7,453	++	-	-	--		-	-			-	-	-		+				-		
M021	Little brown bat	51,103																				
M023	Yuma myotis	31,975																				
M025	Long-eared myotis	122,543		-	-	-		-	-	-	-	-	-	-		-	-	-		-		
M026	Fringed myotis	31,975																				
M027	Long-legged myotis	113,769			-	-		-	-	-		-	-	-						-		
M028	California myotis	94,476																				
M029	Western small-footed myotis	37,135	-	--	--	--	-	--	--	--	-	--	--	--		-	--	--	-	--		
M030	Silver-haired bat	113,345																				
M031	Western pipistrelle	9,659	-	--	--	--	-	--	--	--	-	--	--	--		-	--	--	-	--		
M032	Big brown bat	125,778		-	-	-		-	-	-		-	-	-			-			-		
M033	Western red bat	90,141																				
M034	Hoary bat	90,669																				
M037	Townsend's big-eared bat	22,442																				
M038	Pallid bat	22,316																				
M039	Brazilian free-tailed bat	22,316																				
M045	Brush rabbit	15,176	+	-	-	--		--	-	-		--	--	--		+				--		
M051	Black-tailed jackrabbit	49,960		-	-	--	-	--	--	--	-	--	--	--			-	-	-	--		
M052	Mountain beaver	105,635																				
M055	Yellow-pine chipmunk	54,003	-	--	--	--	-	--	--	--	-	--	--	--		-	--	--	-	--		
M056	Yellow-cheeked chipmunk	107,203																				
M057	Allen's chipmunk	123,167																				
M059	Sonoma chipmunk	100,794			-	-			-	-		-	-	-			-	-				
M072	California ground squirrel	41,943	+					-				-					-			-		
M075	Golden-mantled ground squirrel	55,094	-	--	--	--	-	--	--	--	-	--	--	--		-	--	--	-	--		

California Wildlife Habitat Relationships ID code	California Wildlife Habitat Relationships Common name	Calculated habitat value for year 0	Predicted change in habitat value, by year[a]																			
			No Action				Proposed Action				Alternative A				Alternative B				Alternative C			
			20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80
M077	Western gray squirrel	96,029																				
M079	Douglas' squirrel	79,202	-	-	-			-	-	-		-	-	-		-	-	--		-		
M080	Northern flying squirrel	92,217																				
M081	Botta's pocket gopher	7,473	++		-	--		-	-			-	-	-		++		++		-		
M084	Western pocket gopher	2,538	++	++		--	-	--	--	--	--	--	--	--	++	++	++	++	-	--		
M105	California kangaroo rat	40	++	++	++	++	++		--	--			--	--	++	++	++	++	++			
M112	American beaver	8,838	--	--	--	--	-	--	--	--	-	--	--	--	-	--	--	--	-	--		
M113	Western harvest mouse	37,145	-	--	--	--	-	--	--	--	-	--	--	--		-	-	-	-	--		
M117	Deer mouse	160,116																				
M119	Brush mouse	68,677		-				-	-	-		-	-	-		-	-	-		-		
M120	Pinyon mouse	54,536						-				-					-	-		-		
M127	Dusky-footed woodrat	128,893																				
M128	Bushy-tailed woodrat	72,542																				
M129	Western red-backed vole	62,182																				
M132	Sonoma tree vole	80,507			+	+		+	+	+		+	+	+						+		
M134	California vole	87,953			-	-			-	-			-	-								
M136	Long-tailed vole	36,914	-	--	--	--	-	--	--	--	-	--	--	--	-	-	--	--	-	--		
M137	Creeping vole	16,697	++	++	++	++	++	+	++	++	++		++	++	++				++	+		
M141	Norway rat	37,971		+	++	++	+	++	++	++	+	++	++	++		+	+	+	+	++		
M142	House mouse	35,855	-	--	--	--	-	--	--	--	-	--	--	--	-	-	--	--	-	--		
M144	Pacific jumping mouse	52,137		+	++	++	+		+	++	+		+	+			-	-	+			
M145	Common porcupine	69,254						-	-	-		-	-	-		-	-	-		-		
M146	Coyote	95,898																				
M147	Red fox	930				--	++	--	--	--	++	--	--	--	++	++	++	++	++	--		
M149	Gray fox	79,082																				
M151	Black bear	114,111																				
M152	Ringtail	69,586																				

California Wildlife Habitat Relationships ID code	California Wildlife Habitat Relationships Common name	Calculated habitat value for year 0	Predicted change in habitat value, by year[a]																			
			No Action				Proposed Action				Alternative A				Alternative B				Alternative C			
			20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80
M153	Raccoon	122,556																				
M154	American marten	79,696	--	--	--	--	--	--	--	--	--	--	--	--	-	--	--	--	--	--		
M155	Fisher	113,988																				
M156	Ermine	57,717	-	--	--	--	-	--	--	--	--	--	--	--	-	--	--	--	-	--		
M157	Long-tailed weasel	108,270																				
M160	American badger	1,451	++	++		--	-	--	--	--	--	--	--	--	++	++	++	++	-	--		
M161	Western spotted skunk	78,446																				
M162	Striped skunk	96,738			-	-			-	-		-	-	-			-	-				
M165	Mountain lion	117,166			-	-		-	-	-		-	-	-			-	-		-		
M166	Bobcat	105,630																				
M176	Wild pig	61,367						-	-			-	-			-	--	-		-		
M177	Elk	86,130						-				-					-	-		-		
M181	Mule deer	136,311																				

[a] Methodology for calculating habitat values is in Section 3.6.2.1

+ = increase in habitat value of greater than 33% and less than 66%

++ = increase in habitat value of greater than 66%

- = decrease in habitat value of less than -33% and greater than -66%

-- = decrease in habitat value of less than -66%

Appendix Q

Timber Model Output Tables for the Terrestrial Habitat and Wildlife Species of Concern Environmental Effects Analysis

Alternative	Inventory Block	Decade	Advanced Successional	Mid Successional	Early Successional
No Action (No HCP/No Permit)	Albion Inventory Block	0	2099.883873	10416.41919	1563.420296
No Action (No HCP/No Permit)	Albion Inventory Block	1	981.1154861	12294.29517	804.312912
No Action (No HCP/No Permit)	Albion Inventory Block	2	2331.064362	10940.90112	807.7577591
No Action (No HCP/No Permit)	Albion Inventory Block	3	2597.590767	11234.30762	247.8249664
No Action (No HCP/No Permit)	Albion Inventory Block	4	3068.109283	10939.99255	71.62204552
No Action (No HCP/No Permit)	Albion Inventory Block	5	2907.143494	11094.27148	78.30856991
No Action (No HCP/No Permit)	Albion Inventory Block	6	3005.037231	11022.05005	52.63608837
No Action (No HCP/No Permit)	Albion Inventory Block	7	3137.191132	10942.53223	0
No Action (No HCP/No Permit)	Albion Inventory Block	8	2956.329987	11123.39319	0
No Action (No HCP/No Permit)	Albion Inventory Block	9	3173.991425	10905.73218	0
No Action (No HCP/No Permit)	Albion Inventory Block	10	3256.246246	10823.47742	0
No Action (No HCP/No Permit)	Big River Inventory Block	0	76.30272412	29276.70715	2720.622253
No Action (No HCP/No Permit)	Big River Inventory Block	1	60.91870594	25939.77747	6072.936371
No Action (No HCP/No Permit)	Big River Inventory Block	2	352.6326504	23909.72644	7811.273175
No Action (No HCP/No Permit)	Big River Inventory Block	3	644.4777374	26217.98273	5211.172396
No Action (No HCP/No Permit)	Big River Inventory Block	4	1106.125286	30095.8111	871.6952667
No Action (No HCP/No Permit)	Big River Inventory Block	5	2082.30899	29544.76282	446.5611725
No Action (No HCP/No Permit)	Big River Inventory Block	6	3609.376816	28170.76196	293.4941254
No Action (No HCP/No Permit)	Big River Inventory Block	7	3866.204819	28128.58624	78.84203243
No Action (No HCP/No Permit)	Big River Inventory Block	8	4129.018341	27917.44562	27.16880417
No Action (No HCP/No Permit)	Big River Inventory Block	9	4135.865982	27915.57672	22.18984985
No Action (No HCP/No Permit)	Big River Inventory Block	10	4157.96283	27915.66925	0
No Action (No HCP/No Permit)	Garcia River Inventory Block	0	180.4037247	13321.50623	498.7262573
No Action (No HCP/No Permit)	Garcia River Inventory Block	1	75.53324032	12708.99585	1216.106461
No Action (No HCP/No Permit)	Garcia River Inventory Block	2	100.3450813	12249.30322	1650.987671
No Action (No HCP/No Permit)	Garcia River Inventory Block	3	168.5333138	11893.61792	1938.484421
No Action (No HCP/No Permit)	Garcia River Inventory Block	4	247.0815086	12184.75098	1568.802704
No Action (No HCP/No Permit)	Garcia River Inventory Block	5	596.2276039	11700.89917	1703.50909
No Action (No HCP/No Permit)	Garcia River Inventory Block	6	1308.985672	11503.80286	1187.847383
No Action (No HCP/No Permit)	Garcia River Inventory Block	7	1417.033051	12164.50073	419.1019592
No Action (No HCP/No Permit)	Garcia River Inventory Block	8	1454.015541	12423.06885	123.5512238
No Action (No HCP/No Permit)	Garcia River Inventory Block	9	1468.341217	12379.65173	152.6425018
No Action (No HCP/No Permit)	Garcia River Inventory Block	10	1429.869263	12570.76599	0
No Action (No HCP/No Permit)	Navarro East Inventory Block	0	115.0005312	27077.67563	2400.036976
No Action (No HCP/No Permit)	Navarro East Inventory Block	1	115.0005312	23064.03766	6413.674179
No Action (No HCP/No Permit)	Navarro East Inventory Block	2	189.8155775	23888.84525	5514.051468
No Action (No HCP/No Permit)	Navarro East Inventory Block	3	487.7596469	24632.05432	4472.898441
No Action (No HCP/No Permit)	Navarro East Inventory Block	4	549.8683207	26811.13681	2231.707483
No Action (No HCP/No Permit)	Navarro East Inventory Block	5	1064.351713	26924.99631	1603.364729
No Action (No HCP/No Permit)	Navarro East Inventory Block	6	2924.215933	25721.82617	946.6701593
No Action (No HCP/No Permit)	Navarro East Inventory Block	7	2980.701927	26061.58792	550.4235458
No Action (No HCP/No Permit)	Navarro East Inventory Block	8	3139.985703	26228.47772	224.2486172
No Action (No HCP/No Permit)	Navarro East Inventory Block	9	3143.895153	26399.86691	48.95037079
No Action (No HCP/No Permit)	Navarro East Inventory Block	10	3158.724792	26402.89816	31.08942795
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	0	1051.675054	18854.37451	2520.190796
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	1	825.5186491	18693.11688	2907.604584
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	2	823.1143827	18661.71924	2941.406052
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	3	1733.735482	19063.25842	1629.245392
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	4	1995.354912	19981.27289	449.6119571
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	5	2504.330215	19495.69257	426.2170057
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	6	3315.052292	18958.4328	152.7544985
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	7	3834.297623	18555.71478	36.22691059
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	8	3914.653091	18442.76404	68.82277107
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	9	3994.27787	18395.73535	36.22691059
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	10	4041.786224	18333.94324	50.51078129
No Action (No HCP/No Permit)	Noyo Inventory Block	0	69.01722336	17476.07544	1193.519588
No Action (No HCP/No Permit)	Noyo Inventory Block	1	61.64260292	16370.50085	2306.468489
No Action (No HCP/No Permit)	Noyo Inventory Block	2	102.2355995	16024.60474	2611.771599
No Action (No HCP/No Permit)	Noyo Inventory Block	3	197.1080112	17415.2605	1126.24416
No Action (No HCP/No Permit)	Noyo Inventory Block	4	391.8570085	18101.57745	245.177269
No Action (No HCP/No Permit)	Noyo Inventory Block	5	930.2546558	17053.58258	754.7743454
No Action (No HCP/No Permit)	Noyo Inventory Block	6	1800.829193	16377.21191	560.5709419
No Action (No HCP/No Permit)	Noyo Inventory Block	7	2125.849342	16466.51788	146.2451248
No Action (No HCP/No Permit)	Noyo Inventory Block	8	2179.850388	16547.87738	10.88344002
No Action (No HCP/No Permit)	Noyo Inventory Block	9	2383.473969	16344.25525	10.88344002
No Action (No HCP/No Permit)	Noyo Inventory Block	10	2192.08876	16546.52368	0
No Action (No HCP/No Permit)	Rockport Inventory Block	0	359.4163909	33426.86938	3338.237202
No Action (No HCP/No Permit)	Rockport Inventory Block	1	145.5979786	31105.03125	5873.89502
No Action (No HCP/No Permit)	Rockport Inventory Block	2	486.4813309	28050.47107	8587.571014
No Action (No HCP/No Permit)	Rockport Inventory Block	3	1136.801752	28892.73938	7094.98259
No Action (No HCP/No Permit)	Rockport Inventory Block	4	1814.380833	32329.73779	2980.405689
No Action (No HCP/No Permit)	Rockport Inventory Block	5	2503.718689	33128.90076	1491.90366
No Action (No HCP/No Permit)	Rockport Inventory Block	6	3946.553131	31598.86792	1579.10234
No Action (No HCP/No Permit)	Rockport Inventory Block	7	4020.919769	32477.11597	626.4889126
No Action (No HCP/No Permit)	Rockport Inventory Block	8	4335.572372	32765.5564	23.39437294
No Action (No HCP/No Permit)	Rockport Inventory Block	9	4272.219925	32768.27649	84.02673531
No Action (No HCP/No Permit)	Rockport Inventory Block	10	4469.603821	32654.9198	0

Alternative	Inventory Block	Decade	Advanced Successional	Mid Successional	Early Successional
No Action (No HCP/No Permit)	South Coast Inventory Block	0	319.6100464	30594.71362	1528.105736
No Action (No HCP/No Permit)	South Coast Inventory Block	1	303.2387085	29935.86841	2203.321533
No Action (No HCP/No Permit)	South Coast Inventory Block	2	117.5367756	29914.57349	2410.319168
No Action (No HCP/No Permit)	South Coast Inventory Block	3	1934.711784	29161.93115	1345.786064
No Action (No HCP/No Permit)	South Coast Inventory Block	4	2415.389935	28948.35767	1078.681702
No Action (No HCP/No Permit)	South Coast Inventory Block	5	3392.833954	27074.30713	1975.287979
No Action (No HCP/No Permit)	South Coast Inventory Block	6	3960.05455	27100.26855	1382.106461
No Action (No HCP/No Permit)	South Coast Inventory Block	7	4483.374054	27709.81812	249.2371356
No Action (No HCP/No Permit)	South Coast Inventory Block	8	4822.396088	27568.26367	51.7698586
No Action (No HCP/No Permit)	South Coast Inventory Block	9	4998.461273	27443.96729	0
No Action (No HCP/No Permit)	South Coast Inventory Block	10	5116.423096	27324.05371	1.95189786
No Action (No HCP/No Permit)	Ukiah Inventory Block	0	16.48711967	2321.737549	53.36841583
No Action (No HCP/No Permit)	Ukiah Inventory Block	1	16.48711967	2227.35791	147.7478943
No Action (No HCP/No Permit)	Ukiah Inventory Block	2	16.48711967	2027.452881	347.6529541
No Action (No HCP/No Permit)	Ukiah Inventory Block	3	16.48711967	2221.299805	153.8062286
No Action (No HCP/No Permit)	Ukiah Inventory Block	4	51.79337311	2094.933105	244.8665619
No Action (No HCP/No Permit)	Ukiah Inventory Block	5	257.039978	1907.88208	226.6709442
No Action (No HCP/No Permit)	Ukiah Inventory Block	6	282.3748474	1993.808105	115.4100571
No Action (No HCP/No Permit)	Ukiah Inventory Block	7	318.4442444	2073.148682	0
No Action (No HCP/No Permit)	Ukiah Inventory Block	8	287.166626	2104.426514	0
No Action (No HCP/No Permit)	Ukiah Inventory Block	9	298.2706909	2093.322266	0
No Action (No HCP/No Permit)	Ukiah Inventory Block	10	350.230011	2041.362915	0
Proposed Action (HCP/NCCP)	Albion Inventory Block	0	2099.883873	10416.41919	1563.420296
Proposed Action (HCP/NCCP)	Albion Inventory Block	1	1340.573013	11587.64966	1151.500809
Proposed Action (HCP/NCCP)	Albion Inventory Block	2	2728.774864	10219.86646	1131.08264
Proposed Action (HCP/NCCP)	Albion Inventory Block	3	2627.452141	10832.02344	620.2478485
Proposed Action (HCP/NCCP)	Albion Inventory Block	4	2588.824539	11470.39014	20.5090847
Proposed Action (HCP/NCCP)	Albion Inventory Block	5	2768.426636	11311.297	0
Proposed Action (HCP/NCCP)	Albion Inventory Block	6	3081.370819	10973.87817	24.47444534
Proposed Action (HCP/NCCP)	Albion Inventory Block	7	3022.978577	11056.74487	0
Proposed Action (HCP/NCCP)	Albion Inventory Block	8	3194.397858	10864.8042	20.52114105
Proposed Action (HCP/NCCP)	Albion Inventory Block	9	3161.855194	10917.86841	0
Proposed Action (HCP/NCCP)	Albion Inventory Block	10	3083.763031	10995.96057	0
Proposed Action (HCP/NCCP)	Big River Inventory Block	0	76.30272412	29276.70715	2720.622253
Proposed Action (HCP/NCCP)	Big River Inventory Block	1	144.4268286	29877.21094	2051.993916
Proposed Action (HCP/NCCP)	Big River Inventory Block	2	354.4377193	29119.98053	2599.215027
Proposed Action (HCP/NCCP)	Big River Inventory Block	3	750.9261875	30123.15485	1199.550854
Proposed Action (HCP/NCCP)	Big River Inventory Block	4	1364.618393	30487.99988	221.0146027
Proposed Action (HCP/NCCP)	Big River Inventory Block	5	2284.217461	29385.64221	403.7725258
Proposed Action (HCP/NCCP)	Big River Inventory Block	6	4092.14212	27521.57129	459.9192657
Proposed Action (HCP/NCCP)	Big River Inventory Block	7	4479.717133	27547.67566	46.24042153
Proposed Action (HCP/NCCP)	Big River Inventory Block	8	4730.643402	27307.04199	35.9466629
Proposed Action (HCP/NCCP)	Big River Inventory Block	9	4436.805542	27581.19293	55.63489532
Proposed Action (HCP/NCCP)	Big River Inventory Block	10	4679.566223	27352.50043	41.56612778
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	0	180.4037247	13321.50623	498.7262573
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	1	97.12010956	13347.76611	555.7480507
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	2	153.2349625	13450.13855	397.2624836
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	3	246.1035614	13425.97327	328.5585785
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	4	406.4284763	13510.26282	83.94402885
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	5	720.4791603	13208.14563	72.01106644
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	6	1338.098213	12592.35693	70.18067932
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	7	1705.791962	12294.84412	0
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	8	1573.852898	12356.71692	70.06552887
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	9	1608.373344	12363.46008	28.80210686
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	10	1690.732475	12309.90295	0
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	0	115.0005312	27077.67563	2400.036976
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	1	196.5707655	27358.72644	2037.415821
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	2	146.9698856	27676.73035	1769.012535
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	3	445.7357683	28272.76532	874.2110586
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	4	809.056025	28696.9722	86.68335915
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	5	1279.290203	28248.40826	65.01381207
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	6	2303.678484	27120.00473	169.029335
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	7	2825.517349	26748.34546	18.8488102
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	8	3181.422882	26255.0448	156.2450027
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	9	3156.281548	26389.97861	46.45275593
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	10	3121.78199	26470.93036	0
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	0	1051.675054	18854.37451	2520.190796
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	1	1047.237531	19707.7887	1671.213959
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	2	805.962534	20680.93707	939.3402424
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	3	1699.209587	20397.37115	329.6591263
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	4	1996.476898	20420.15277	9.610693932
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	5	2584.877861	19841.362	0
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	6	3172.937126	19224.5528	28.749506
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	7	3751.768272	18674.47168	0
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	8	3792.671227	18606.35229	27.21608925
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	9	3909.173027	18517.06665	0
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	10	4027.63662	18398.60327	0

Alternative	Inventory Block	Decade	Advanced Successional	Mid Successional	Early Successional
Proposed Action (HCP/NCCP)	Noyo Inventory Block	0	69.01722336	17476.07544	1193.519588
Proposed Action (HCP/NCCP)	Noyo Inventory Block	1	51.69254303	17865.49615	821.423069
Proposed Action (HCP/NCCP)	Noyo Inventory Block	2	128.7577667	17646.43262	963.4222069
Proposed Action (HCP/NCCP)	Noyo Inventory Block	3	194.5988092	18083.52393	460.4891434
Proposed Action (HCP/NCCP)	Noyo Inventory Block	4	472.8757284	18110.94684	154.789959
Proposed Action (HCP/NCCP)	Noyo Inventory Block	5	1110.826336	17512.70343	115.082695
Proposed Action (HCP/NCCP)	Noyo Inventory Block	6	2013.943542	16650.50085	74.16706276
Proposed Action (HCP/NCCP)	Noyo Inventory Block	7	2275.669083	16454.49329	8.449950218
Proposed Action (HCP/NCCP)	Noyo Inventory Block	8	2344.635162	16382.14435	11.83306313
Proposed Action (HCP/NCCP)	Noyo Inventory Block	9	2338.677193	16399.93506	0
Proposed Action (HCP/NCCP)	Noyo Inventory Block	10	2335.250427	16403.36176	0
Proposed Action (HCP/NCCP)	Rockport Inventory Block	0	359.4163909	33426.86938	3338.237202
Proposed Action (HCP/NCCP)	Rockport Inventory Block	1	91.02239418	34581.40601	2452.096214
Proposed Action (HCP/NCCP)	Rockport Inventory Block	2	334.8527851	33357.73853	3431.930855
Proposed Action (HCP/NCCP)	Rockport Inventory Block	3	1140.152163	34216.91968	1767.450905
Proposed Action (HCP/NCCP)	Rockport Inventory Block	4	1752.509449	35231.39844	140.6158209
Proposed Action (HCP/NCCP)	Rockport Inventory Block	5	2517.958511	34499.54736	107.0165577
Proposed Action (HCP/NCCP)	Rockport Inventory Block	6	3564.24971	33560.27344	0
Proposed Action (HCP/NCCP)	Rockport Inventory Block	7	3999.634521	33124.88904	0
Proposed Action (HCP/NCCP)	Rockport Inventory Block	8	3998.737152	33125.78687	0
Proposed Action (HCP/NCCP)	Rockport Inventory Block	9	4071.295227	33053.22852	0
Proposed Action (HCP/NCCP)	Rockport Inventory Block	10	4124.261154	33000.26282	0
Proposed Action (HCP/NCCP)	South Coast Inventory Block	0	319.6100464	30594.71362	1528.105736
Proposed Action (HCP/NCCP)	South Coast Inventory Block	1	195.5665894	30617.27734	1629.586082
Proposed Action (HCP/NCCP)	South Coast Inventory Block	2	245.3491573	30537.54028	1659.539215
Proposed Action (HCP/NCCP)	South Coast Inventory Block	3	1913.971397	29849.35962	679.0982933
Proposed Action (HCP/NCCP)	South Coast Inventory Block	4	2335.748592	29882.48853	224.1922092
Proposed Action (HCP/NCCP)	South Coast Inventory Block	5	4089.092278	28265.09229	88.24384403
Proposed Action (HCP/NCCP)	South Coast Inventory Block	6	4865.543839	27561.87378	15.01184845
Proposed Action (HCP/NCCP)	South Coast Inventory Block	7	5372.779144	27069.65112	0
Proposed Action (HCP/NCCP)	South Coast Inventory Block	8	5637.444641	26804.98413	0
Proposed Action (HCP/NCCP)	South Coast Inventory Block	9	5629.599152	26812.83032	0
Proposed Action (HCP/NCCP)	South Coast Inventory Block	10	5701.563629	26714.33643	26.52890968
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	0	16.48711967	2321.737549	53.36841583
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	1	16.48711967	2345.403564	29.70218277
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	2	16.48711967	2128.590088	246.5157776
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	3	16.48711967	2316.400391	58.70551682
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	4	21.93626785	2339.95459	29.70218277
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	5	178.1882172	2213.405029	0
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	6	253.5195618	1963.305908	174.7677002
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	7	301.6347046	2089.958496	0
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	8	266.0059204	2125.587158	0
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	9	248.7917786	2142.80127	0
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	10	286.4602356	2105.132813	0
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	0	2099.883873	10416.41919	1563.420296
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	1	1524.395714	11684.35168	870.9762039
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	2	2530.818062	10543.90381	1005.002029
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	3	3046.473854	10676.85583	356.3940725
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	4	2949.806458	11129.91675	0
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	5	3162.994781	10916.729	0
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	6	3486.864136	10568.56946	24.29043007
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	7	3307.410034	10772.31299	0
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	8	3435.475098	10619.77405	24.47444534
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	9	3357.100647	10722.6228	0
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	10	3500.773743	10578.9502	0
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	0	76.30272412	29276.70715	2720.622253
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	1	169.6575015	30860.42712	1043.548016
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	2	438.9359646	30100.47717	1534.220165
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	3	990.5178547	29709.65192	1373.462835
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	4	1852.111931	29961.72644	259.7955151
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	5	3246.13488	28827.49805	0
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	6	5900.421951	26028.01245	145.1984406
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	7	5862.495636	26190.08459	21.05268669
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	8	5865.44873	26208.18457	0
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	9	5800.366302	26273.2663	0
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	10	5846.986725	26226.64575	0
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	0	180.4037247	13321.50623	498.7262573
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	1	117.0117149	13366.76929	516.8544464
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	2	200.423233	12999.3468	800.8656235
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	3	258.8833399	12897.12769	844.6243286
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	4	422.0784492	13353.41626	225.1409969
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	5	754.0539932	13246.58154	0
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	6	1341.379707	12659.25549	0
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	7	1786.643974	12199.60901	14.38227081
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	8	1905.599899	12055.79175	39.24431229
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	9	1995.799149	11989.71179	15.12473011
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	10	2004.681625	11967.15186	28.80210686

Alternative	Inventory Block	Decade	Advanced Successional	Mid Successional	Early Successional
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	0	115.0005312	27077.67563	2400.036976
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	1	125.1318779	28081.85901	1385.721859
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	2	134.3092871	27896.97452	1561.42952
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	3	618.7222862	27433.75098	1540.238853
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	4	844.2599297	28652.49319	95.95988274
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	5	1449.522627	28037.47794	105.7119789
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	6	3007.414669	26410.89099	174.4072342
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	7	3843.15856	25720.75348	28.800632
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	8	4264.893234	25281.6264	46.19273758
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	9	4206.873245	25383.323	2.516053438
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	10	4212.527752	25380.18469	0
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	0	1051.675054	18854.37451	2520.190796
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	1	1026.234433	20060.89093	1339.113907
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	2	996.9372344	20086.61792	1342.684024
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	3	2273.677163	19953.96692	198.5960994
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	4	2697.331741	19714.59259	14.31564617
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	5	3582.059654	18844.18054	0
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	6	4771.53746	17654.70251	0
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	7	5377.010788	17049.22888	0
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	8	5113.292328	17312.94751	0
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	9	5136.425064	17289.81482	0
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	10	5298.302612	17127.93707	0
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	0	69.01722336	17476.07544	1193.519588
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	1	58.76237869	17962.67297	717.1769562
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	2	203.6362448	17933.71503	601.2611475
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	3	304.8843298	18146.30078	287.4267073
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	4	765.3360872	17973.276	0
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	5	1746.459618	16974.49219	17.66064644
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	6	3191.120781	15547.49121	0
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	7	3744.173065	14994.43884	0
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	8	3252.372185	15486.23975	0
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	9	3285.636749	15452.97479	0
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	10	3202.845642	15535.76678	0
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	0	359.4163909	33426.86938	3338.237202
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	1	199.0592575	34348.43677	2577.026897
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	2	414.0742021	33187.75269	3522.696793
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	3	1514.976143	33253.46484	2356.082952
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	4	2049.377232	34864.74707	210.4000282
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	5	2996.372314	34128.15088	0
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	6	4885.7547	32221.95715	16.81126213
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	7	4964.192017	32149.5752	10.7577877
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	8	5011.457642	32113.06702	0
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	9	5022.049591	32102.47437	0
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	10	5093.054443	32031.46973	0
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	0	319.6100464	30594.71362	1528.105736
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	1	134.907383	30807.10571	1500.416573
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	2	151.9446204	30694.45923	1596.025047
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	3	1995.317959	29715.40894	731.7013359
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	4	3000.11393	29296.50781	145.8068974
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	5	4428.986816	27995.4502	17.99190068
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	6	5213.41861	27227.05884	1.95189786
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	7	6073.876251	26366.60083	1.95189786
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	8	6299.321686	26143.10791	0
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	9	6348.509705	26091.96704	1.95189786
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	10	6472.576538	25969.85254	0
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	0	16.48711967	2321.737549	53.36841583
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	1	16.48711967	2345.403809	29.70218277
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	2	16.48711967	2233.778564	141.327301
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	3	16.48711967	2272.243652	102.8623199
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	4	22.87142181	2164.251709	204.4698792
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	5	213.4594574	2123.111816	55.021595
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	6	296.5101013	2095.083008	0
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	7	369.192749	2022.400269	0
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	8	409.7047729	1981.888184	0
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	9	378.39328	2013.199707	0
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	10	481.4997559	1910.093384	0
Alternative B (Reserves)	Albion Inventory Block	0	2099.883873	10416.41919	1563.420296
Alternative B (Reserves)	Albion Inventory Block	1	1047.891281	11265.90295	1765.928986
Alternative B (Reserves)	Albion Inventory Block	2	2956.843155	9222.424805	1900.455338
Alternative B (Reserves)	Albion Inventory Block	3	3182.015694	9001.264893	1896.443024
Alternative B (Reserves)	Albion Inventory Block	4	3390.352493	8796.683472	1892.687653
Alternative B (Reserves)	Albion Inventory Block	5	4079.60968	8576.864746	1423.249008
Alternative B (Reserves)	Albion Inventory Block	6	5093.275024	8036.647339	949.8012543
Alternative B (Reserves)	Albion Inventory Block	7	5249.503601	7292.209351	1538.010689
Alternative B (Reserves)	Albion Inventory Block	8	5275.954407	7219.379272	1584.389893
Alternative B (Reserves)	Albion Inventory Block	9	5453.757507	6978.157654	1647.808777
Alternative B (Reserves)	Albion Inventory Block	10	5824.410645	6238.867676	2016.445099

Alternative	Inventory Block	Decade	Advanced Successional	Mid Successional	Early Successional
Alternative B (Reserves)	Big River Inventory Block	0	76.30272412	29276.70715	2720.622253
Alternative B (Reserves)	Big River Inventory Block	1	70.11885929	29049.55444	2953.958633
Alternative B (Reserves)	Big River Inventory Block	2	276.4768381	30560.18829	1236.96655
Alternative B (Reserves)	Big River Inventory Block	3	690.9240942	28520.69696	2862.011223
Alternative B (Reserves)	Big River Inventory Block	4	1723.801476	26838.4278	3511.40387
Alternative B (Reserves)	Big River Inventory Block	5	3074.304409	25360.71857	3638.610279
Alternative B (Reserves)	Big River Inventory Block	6	9224.627533	19978.50571	2870.499264
Alternative B (Reserves)	Big River Inventory Block	7	11228.20166	17082.83795	3762.593189
Alternative B (Reserves)	Big River Inventory Block	8	12121.90854	15744.89871	4206.825461
Alternative B (Reserves)	Big River Inventory Block	9	12405.88696	14879.22418	4788.52179
Alternative B (Reserves)	Big River Inventory Block	10	12562.89325	15989.72931	3521.009369
Alternative B (Reserves)	Garcia River Inventory Block	0	180.4037247	13321.50623	498.7262573
Alternative B (Reserves)	Garcia River Inventory Block	1	144.3644562	13185.10876	671.1618118
Alternative B (Reserves)	Garcia River Inventory Block	2	258.9685211	13210.52405	531.1435089
Alternative B (Reserves)	Garcia River Inventory Block	3	352.1732922	11682.93213	1965.530487
Alternative B (Reserves)	Garcia River Inventory Block	4	552.9659748	11391.33887	2056.330139
Alternative B (Reserves)	Garcia River Inventory Block	5	741.5905457	10794.51111	2464.533478
Alternative B (Reserves)	Garcia River Inventory Block	6	1915.61676	10645.20251	1439.816147
Alternative B (Reserves)	Garcia River Inventory Block	7	2886.000961	9608.662354	1505.97216
Alternative B (Reserves)	Garcia River Inventory Block	8	3341.050217	8990.226318	1669.359039
Alternative B (Reserves)	Garcia River Inventory Block	9	3739.520416	7786.102417	2475.012817
Alternative B (Reserves)	Garcia River Inventory Block	10	4018.489838	7939.76355	2042.382019
Alternative B (Reserves)	Navarro East Inventory Block	0	115.0005312	27077.67563	2400.036976
Alternative B (Reserves)	Navarro East Inventory Block	1	115.0005312	26234.81802	3242.895435
Alternative B (Reserves)	Navarro East Inventory Block	2	215.2108793	27552.31796	1825.18306
Alternative B (Reserves)	Navarro East Inventory Block	3	431.9759026	25290.50903	3870.227737
Alternative B (Reserves)	Navarro East Inventory Block	4	630.808239	24635.78513	4326.119644
Alternative B (Reserves)	Navarro East Inventory Block	5	1152.23472	24201.43735	4239.040237
Alternative B (Reserves)	Navarro East Inventory Block	6	3529.288571	22394.68771	3668.736229
Alternative B (Reserves)	Navarro East Inventory Block	7	6073.414844	19187.04565	4332.251991
Alternative B (Reserves)	Navarro East Inventory Block	8	6977.20809	17998.66949	4616.834885
Alternative B (Reserves)	Navarro East Inventory Block	9	6793.423351	16763.01514	6036.273788
Alternative B (Reserves)	Navarro East Inventory Block	10	6827.566132	18579.90405	4185.242722
Alternative B (Reserves)	Navarro West Inventory Bloc	0	1051.675054	18854.37451	2520.190796
Alternative B (Reserves)	Navarro West Inventory Bloc	1	1010.654141	18790.46832	2625.117455
Alternative B (Reserves)	Navarro West Inventory Bloc	2	1089.835103	19327.85767	2008.547318
Alternative B (Reserves)	Navarro West Inventory Bloc	3	1974.028542	17554.1582	2898.053234
Alternative B (Reserves)	Navarro West Inventory Bloc	4	3000.844521	15987.0824	3438.312866
Alternative B (Reserves)	Navarro West Inventory Bloc	5	3696.786682	15691.42169	3038.031113
Alternative B (Reserves)	Navarro West Inventory Bloc	6	6925.748291	13531.6853	1968.806618
Alternative B (Reserves)	Navarro West Inventory Bloc	7	8698.954819	11847.2641	1880.021332
Alternative B (Reserves)	Navarro West Inventory Bloc	8	9299.228073	10917.56232	2209.449821
Alternative B (Reserves)	Navarro West Inventory Bloc	9	9464.986885	10127.63306	2833.620064
Alternative B (Reserves)	Navarro West Inventory Bloc	10	9727.095886	9789.256592	2909.887482
Alternative B (Reserves)	Noyo Inventory Block	0	69.01722336	17476.07544	1193.519588
Alternative B (Reserves)	Noyo Inventory Block	1	61.64260292	18141.39307	535.576211
Alternative B (Reserves)	Noyo Inventory Block	2	95.86109161	17579.81555	1062.935592
Alternative B (Reserves)	Noyo Inventory Block	3	523.379035	15154.99921	3060.233795
Alternative B (Reserves)	Noyo Inventory Block	4	1424.257561	13936.98407	3377.370148
Alternative B (Reserves)	Noyo Inventory Block	5	1698.288229	13874.02637	3166.297546
Alternative B (Reserves)	Noyo Inventory Block	6	3931.013771	12624.89124	2182.707199
Alternative B (Reserves)	Noyo Inventory Block	7	4843.548447	11587.2627	2307.801079
Alternative B (Reserves)	Noyo Inventory Block	8	5120.243683	11229.10852	2389.25988
Alternative B (Reserves)	Noyo Inventory Block	9	5321.498322	10133.88159	3283.232162
Alternative B (Reserves)	Noyo Inventory Block	10	5371.659332	10255.37878	3111.573792
Alternative B (Reserves)	Rockport Inventory Block	0	359.4163909	33426.86938	3338.237202
Alternative B (Reserves)	Rockport Inventory Block	1	132.3084564	34193.20728	2799.008862
Alternative B (Reserves)	Rockport Inventory Block	2	530.8011713	33732.45593	2861.266903
Alternative B (Reserves)	Rockport Inventory Block	3	1782.489338	29835.99438	5506.039978
Alternative B (Reserves)	Rockport Inventory Block	4	2676.265457	29165.11182	5283.146606
Alternative B (Reserves)	Rockport Inventory Block	5	3732.77861	27187.87134	6203.874115
Alternative B (Reserves)	Rockport Inventory Block	6	7072.747498	26104.01355	3947.762848
Alternative B (Reserves)	Rockport Inventory Block	7	10106.04086	23149.54602	3868.936935
Alternative B (Reserves)	Rockport Inventory Block	8	10858.09787	21639.30457	4627.121338
Alternative B (Reserves)	Rockport Inventory Block	9	11224.33032	19672.18536	6228.007385
Alternative B (Reserves)	Rockport Inventory Block	10	11479.14539	21048.35229	4597.025848
Alternative B (Reserves)	South Coast Inventory Block	0	319.6100464	30594.71362	1528.105736
Alternative B (Reserves)	South Coast Inventory Block	1	114.2756901	30869.12744	1459.026146
Alternative B (Reserves)	South Coast Inventory Block	2	249.3866844	30135.92725	2057.116074
Alternative B (Reserves)	South Coast Inventory Block	3	3192.063156	24634.63843	4615.727753
Alternative B (Reserves)	South Coast Inventory Block	4	4285.385574	23054.04102	5103.002441
Alternative B (Reserves)	South Coast Inventory Block	5	7546.964478	20961.95679	3933.507751
Alternative B (Reserves)	South Coast Inventory Block	6	11341.39276	19135.30994	1965.726219
Alternative B (Reserves)	South Coast Inventory Block	7	13570.17731	16777.41211	2094.839798
Alternative B (Reserves)	South Coast Inventory Block	8	15416.01123	14600.37561	2426.042343
Alternative B (Reserves)	South Coast Inventory Block	9	15609.15924	12342.96808	4490.302155
Alternative B (Reserves)	South Coast Inventory Block	10	15868.76794	11722.90884	4850.753357

Alternative	Inventory Block	Decade	Advanced Successional	Mid Successional	Early Successional
Alternative B (Reserves)	Ukiah Inventory Block	0	16.48711967	2321.737549	53.36841583
Alternative B (Reserves)	Ukiah Inventory Block	1	16.48711967	2214.571533	160.534668
Alternative B (Reserves)	Ukiah Inventory Block	2	16.48711967	2232.001953	143.1041107
Alternative B (Reserves)	Ukiah Inventory Block	3	26.51729584	2195.335449	169.7403564
Alternative B (Reserves)	Ukiah Inventory Block	4	52.04920197	2044.334351	295.2094116
Alternative B (Reserves)	Ukiah Inventory Block	5	140.8933105	2013.438477	237.261322
Alternative B (Reserves)	Ukiah Inventory Block	6	207.1988373	2081.118164	103.2759705
Alternative B (Reserves)	Ukiah Inventory Block	7	345.5595093	1522.804199	523.2293091
Alternative B (Reserves)	Ukiah Inventory Block	8	334.3022461	1296.936401	760.3543701
Alternative B (Reserves)	Ukiah Inventory Block	9	470.3803711	1340.112061	581.100647
Alternative B (Reserves)	Ukiah Inventory Block	10	439.9661255	1649.26123	302.3656311
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	0	2099.883873	10416.41919	1563.420296
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	1	1340.573013	11587.64966	1151.500809
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	2	2728.774864	10219.86646	1131.08264
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	3	2627.452141	10832.02344	620.2478485
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	4	2588.824539	11470.39014	20.5090847
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	10	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	0	76.30272412	29276.70715	2720.622253
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	1	144.4268286	29877.21094	2051.993916
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	2	354.4377193	29119.98053	2599.215027
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	3	750.9261875	30123.15485	1199.550854
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	4	1364.618393	30487.99988	221.0146027
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	10	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	0	180.4037247	13321.50623	498.7262573
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	1	97.12010956	13347.76611	555.7480507
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	2	153.2349625	13450.13855	397.2624836
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	3	246.1035614	13425.97327	328.5585785
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	4	406.4284763	13510.26282	83.94402885
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	10	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	0	115.0005312	27077.67563	2400.036976
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	1	196.5707655	27358.72644	2037.415821
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	2	146.9698856	27676.73035	1769.012535
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	3	445.7357683	28272.76532	874.2110586
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	4	809.056025	28696.9722	86.68335915
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	10	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	0	1051.675054	18854.37451	2520.190796
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	1	1047.237531	19707.7887	1671.213959
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	2	805.962534	20680.93707	939.3402424
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	3	1699.209587	20397.37115	329.6591263
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	4	1996.476898	20420.15277	9.610693932
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	10	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	0	69.01722336	17476.07544	1193.519588
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	1	51.69254303	17865.49615	821.423069
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	2	128.7577667	17646.43262	963.4222069
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	3	194.5988092	18083.52393	460.4891434
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	4	472.8757284	18110.94684	154.789959
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	10	0	0	0

Alternative	Inventory Block	Decade	Advanced Successional	Mid Successional	Early Successional
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	0	359.4163909	33426.86938	3338.237202
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	1	91.02239418	34581.40601	2452.096214
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	2	334.8527851	33357.73853	3431.930855
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	3	1140.152163	34216.91968	1767.450905
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	4	1752.509449	35231.39844	140.6158209
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	10	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	0	319.6100464	30594.71362	1528.105736
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	1	195.5665894	30617.27734	1629.586082
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	2	245.3491573	30537.54028	1659.539215
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	3	1913.971397	29849.35962	679.0982933
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	4	2335.748592	29882.48853	224.1922092
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	10	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	0	16.48711967	2321.737549	53.36841583
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	1	16.48711967	2345.403564	29.70218277
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	2	16.48711967	2128.590088	246.5157776
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	3	16.48711967	2316.400391	58.70551682
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	4	21.93626785	2339.95459	29.70218277
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	10	0	0	0

Successional Stage (riparian) by Inventory Block

Alternative	Inventory Block	Decade	Advanced Successional	Mid Successional	Early Successional
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	0	520.6319656	1415.767586	4.353695571
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	1	618.935997	1320.0756	1.741629303
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	2	1330.467243	609.8913956	0.394587219
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	3	1575.709915	365.0433121	0
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	4	1712.40657	228.3466921	0
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	5	1827.962402	112.7908527	0
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	6	1910.473267	30.28001595	0
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	7	1918.55188	22.20137835	0
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	8	1931.923889	8.829304934	0
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	9	1929.964813	10.78853154	0
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	10	1931.695465	9.057822227	0
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	0	29.50982136	3943.416229	24.96969986
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	1	24.3447575	3966.032654	7.518433094
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	2	185.8639717	3812.031754	0
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	3	532.4151783	3465.480667	0
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	4	1070.078308	2927.817513	0
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	5	1929.206055	2068.689787	0
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	6	3250.307426	747.5884819	0
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	7	3823.305496	174.59027	0
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	8	3961.932465	35.96339464	0
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	9	3985.505844	12.38997126	0
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	10	3981.903122	15.99273682	0
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	0	103.594326	1641.914566	0
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	1	97.56277466	1647.94606	0
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	2	148.0346527	1597.474152	0
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	3	234.4866953	1511.022156	0
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	4	315.7059669	1429.802864	0
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	5	632.8787766	1112.630096	0
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	6	1093.232147	652.2766683	0
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	7	1571.342621	174.1661685	0
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	8	1671.452896	74.05596757	0
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	9	1716.549789	28.95910645	0
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	10	1722.634781	22.87411118	0
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	0	115.0005312	3475.598251	45.8839823
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	1	125.1318779	3467.599716	43.75109756
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	2	134.3092871	3502.173447	0
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	3	394.3501186	3242.132553	0
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	4	788.1361904	2848.346558	0
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	5	1345.896742	2290.585976	0
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	6	2694.839504	941.6432257	0
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	7	3264.464254	372.0185134	0
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	8	3567.76503	68.71762276	0
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	9	3580.541489	55.94126141	0
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	10	3610.878643	25.60405564	0
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	0	715.04844	2305.937408	10.20029008
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	1	718.023242	2308.411713	4.751173258
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	2	709.1945491	2318.437042	3.554450393
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	3	1622.591851	1408.594292	0
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	4	1830.738159	1200.447899	0
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	5	2192.33886	838.84725	0
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	6	2658.10701	373.0791292	0
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	7	2994.066666	37.11944866	0
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	8	3015.583771	15.60239303	0
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	9	3017.788834	13.39726877	0
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Bloc	10	3021.45636	9.729781985	0
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	0	33.27655029	2011.763275	33.09272742
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	1	33.27655029	2036.512474	8.343378305
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	2	102.5832653	1975.549156	0
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	3	175.2062035	1902.926247	0
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	4	508.9797554	1569.152756	0
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	5	1033.133453	1044.999008	0
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	6	1834.911255	243.2212305	0
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	7	1981.164268	96.96823144	0
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	8	2024.754951	53.3775084	0
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	9	2031.745972	46.38650942	0
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	10	2044.728317	33.40417647	0
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	0	138.7646518	4185.307648	33.15410832
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	1	62.32961941	4272.994507	21.90232277
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	2	229.084846	4123.365448	4.776046395
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	3	1166.151002	3187.577499	3.497908592
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	4	1730.213857	2627.012688	0
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	5	2566.936569	1790.289864	0
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	6	3828.393188	528.8333802	0
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	7	4159.583115	197.6433475	0
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	8	4221.713806	135.5126787	0
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	9	4259.274521	97.95181206	0
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	10	4281.391693	75.83464196	0

Alternative	Inventory Block	Decade	Advanced Successional	Mid Successional	Early Successional
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	0	93.60006809	4299.81366	6.480538368
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	1	48.64047909	4349.30191	1.95189786
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	2	20.47590566	4377.466339	1.95189786
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	3	1166.762081	3233.13208	0
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	4	1942.995277	2454.947052	1.95189786
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	5	3043.759201	1354.183126	1.95189786
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	6	3504.913055	893.0292969	1.95189786
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	7	4129.456329	268.4859514	1.95189786
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	8	4322.186951	77.70736647	0
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	9	4340.062195	57.88026905	1.95189786
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	10	4342.013947	57.88027287	0
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	0	16.48711967	373.5062256	5.19844532
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	1	16.48711967	376.010437	2.694207191
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	2	16.48711967	376.010498	2.694207191
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	3	16.48711967	376.010498	2.694207191
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	4	22.87142181	369.6261597	2.694207191
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	5	213.4594574	181.7323303	0
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	6	296.5101013	98.68170166	0
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	7	298.6603088	96.53150177	0
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	8	304.6744995	90.51728821	0
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	9	307.8608398	87.33095551	0
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	10	375.9630127	19.22877884	0
Alternative B (Reserves)	Albion Inventory Block	0	520.6319656	1415.767586	4.353695571
Alternative B (Reserves)	Albion Inventory Block	1	262.9520226	1668.970322	8.830896139
Alternative B (Reserves)	Albion Inventory Block	2	958.905189	975.1644592	6.683594882
Alternative B (Reserves)	Albion Inventory Block	3	1043.960502	896.7927551	0
Alternative B (Reserves)	Albion Inventory Block	4	1127.273857	813.4793777	0
Alternative B (Reserves)	Albion Inventory Block	5	1228.638573	712.1146698	0
Alternative B (Reserves)	Albion Inventory Block	6	1360.813286	579.9399719	0
Alternative B (Reserves)	Albion Inventory Block	7	1363.978119	576.7751427	0
Alternative B (Reserves)	Albion Inventory Block	8	1370.604828	570.1483994	0
Alternative B (Reserves)	Albion Inventory Block	9	1367.152176	573.6010513	0
Alternative B (Reserves)	Albion Inventory Block	10	1359.106918	581.6463451	0
Alternative B (Reserves)	Big River Inventory Block	0	29.50982136	3943.416229	24.96969986
Alternative B (Reserves)	Big River Inventory Block	1	23.50924206	3774.112366	200.2743325
Alternative B (Reserves)	Big River Inventory Block	2	96.10267258	3894.031296	7.761876106
Alternative B (Reserves)	Big River Inventory Block	3	198.6459475	3798.806534	0.443344444
Alternative B (Reserves)	Big River Inventory Block	4	572.7603598	3425.135384	0
Alternative B (Reserves)	Big River Inventory Block	5	1190.725262	2802.621727	4.548871279
Alternative B (Reserves)	Big River Inventory Block	6	2360.133469	1635.480042	2.282298088
Alternative B (Reserves)	Big River Inventory Block	7	2873.643059	1122.3454	1.907402158
Alternative B (Reserves)	Big River Inventory Block	8	2778.506302	1217.749645	1.639814854
Alternative B (Reserves)	Big River Inventory Block	9	2998.439651	999.4562206	0
Alternative B (Reserves)	Big River Inventory Block	10	3078.90892	918.9869142	0
Alternative B (Reserves)	Garcia River Inventory Block	0	103.594326	1641.914566	0
Alternative B (Reserves)	Garcia River Inventory Block	1	91.95170212	1652.000793	1.556324244
Alternative B (Reserves)	Garcia River Inventory Block	2	93.99118423	1651.517715	0
Alternative B (Reserves)	Garcia River Inventory Block	3	108.9394732	1636.569321	0
Alternative B (Reserves)	Garcia River Inventory Block	4	128.3882141	1617.120667	0
Alternative B (Reserves)	Garcia River Inventory Block	5	290.9026403	1454.606247	0
Alternative B (Reserves)	Garcia River Inventory Block	6	607.8659	1137.642921	0
Alternative B (Reserves)	Garcia River Inventory Block	7	1000.284473	745.2243729	0
Alternative B (Reserves)	Garcia River Inventory Block	8	1070.282421	675.2263718	0
Alternative B (Reserves)	Garcia River Inventory Block	9	1056.086082	689.4227371	0
Alternative B (Reserves)	Garcia River Inventory Block	10	1248.517223	496.9915504	0
Alternative B (Reserves)	Navarro East Inventory Block	0	115.0005312	3475.598251	45.8839823
Alternative B (Reserves)	Navarro East Inventory Block	1	115.0005312	3343.905334	177.5768248
Alternative B (Reserves)	Navarro East Inventory Block	2	131.0947771	3502.445755	2.942150623
Alternative B (Reserves)	Navarro East Inventory Block	3	333.795269	3299.046616	3.640851289
Alternative B (Reserves)	Navarro East Inventory Block	4	355.0311375	3281.451645	0
Alternative B (Reserves)	Navarro East Inventory Block	5	611.9397717	3024.542885	0
Alternative B (Reserves)	Navarro East Inventory Block	6	1440.40482	2196.077923	0
Alternative B (Reserves)	Navarro East Inventory Block	7	2181.502124	1454.980576	0
Alternative B (Reserves)	Navarro East Inventory Block	8	2365.134222	1271.34848	0
Alternative B (Reserves)	Navarro East Inventory Block	9	2190.043051	1446.439644	0
Alternative B (Reserves)	Navarro East Inventory Block	10	2172.815651	1463.667057	0
Alternative B (Reserves)	Navarro West Inventory Bloc	0	715.04844	2305.937408	10.20029008
Alternative B (Reserves)	Navarro West Inventory Bloc	1	689.2568398	2325.560944	16.36833322
Alternative B (Reserves)	Navarro West Inventory Bloc	2	726.8019489	2298.302368	6.081753612
Alternative B (Reserves)	Navarro West Inventory Bloc	3	1158.197708	1871.175751	1.81262958
Alternative B (Reserves)	Navarro West Inventory Bloc	4	1396.420762	1634.765396	0
Alternative B (Reserves)	Navarro West Inventory Bloc	5	1554.503096	1476.682983	0
Alternative B (Reserves)	Navarro West Inventory Bloc	6	1991.157078	1040.029083	0
Alternative B (Reserves)	Navarro West Inventory Bloc	7	2253.368343	777.8177528	0
Alternative B (Reserves)	Navarro West Inventory Bloc	8	2165.101574	866.0845299	0
Alternative B (Reserves)	Navarro West Inventory Bloc	9	2230.930832	800.2552261	0
Alternative B (Reserves)	Navarro West Inventory Bloc	10	2320.463905	710.7222633	0

Alternative	Inventory Block	Decade	Advanced Successional	Mid Successional	Early Successional
Alternative B (Reserves)	Noyo Inventory Block	0	33.27655029	2011.763275	33.09272742
Alternative B (Reserves)	Noyo Inventory Block	1	33.27655029	2038.55069	6.305299759
Alternative B (Reserves)	Noyo Inventory Block	2	36.12766409	2042.004837	0
Alternative B (Reserves)	Noyo Inventory Block	3	77.11015952	1999.089394	1.932900429
Alternative B (Reserves)	Noyo Inventory Block	4	134.0951692	1942.104385	1.932900429
Alternative B (Reserves)	Noyo Inventory Block	5	425.7945538	1652.337936	0
Alternative B (Reserves)	Noyo Inventory Block	6	1042.854687	1035.277802	0
Alternative B (Reserves)	Noyo Inventory Block	7	1181.898369	896.2341232	0
Alternative B (Reserves)	Noyo Inventory Block	8	1238.067673	840.064785	0
Alternative B (Reserves)	Noyo Inventory Block	9	1280.326057	795.8734741	1.932900429
Alternative B (Reserves)	Noyo Inventory Block	10	1230.048695	848.0837822	0
Alternative B (Reserves)	Rockport Inventory Block	0	138.7646518	4185.307648	33.15410832
Alternative B (Reserves)	Rockport Inventory Block	1	52.78357124	4261.977203	42.46572685
Alternative B (Reserves)	Rockport Inventory Block	2	184.037323	4161.371674	11.81751251
Alternative B (Reserves)	Rockport Inventory Block	3	718.2122087	3634.238235	4.776046395
Alternative B (Reserves)	Rockport Inventory Block	4	1142.965782	3214.260696	0
Alternative B (Reserves)	Rockport Inventory Block	5	1599.372726	2757.85376	0
Alternative B (Reserves)	Rockport Inventory Block	6	2307.312637	2049.913918	0
Alternative B (Reserves)	Rockport Inventory Block	7	2658.65937	1695.836952	2.730075359
Alternative B (Reserves)	Rockport Inventory Block	8	2944.494156	1412.732338	0
Alternative B (Reserves)	Rockport Inventory Block	9	3002.528687	1354.697769	0
Alternative B (Reserves)	Rockport Inventory Block	10	3046.746338	1310.480259	0
Alternative B (Reserves)	South Coast Inventory Block	0	93.60006809	4299.81366	6.480538368
Alternative B (Reserves)	South Coast Inventory Block	1	67.33804512	4329.623993	2.932237685
Alternative B (Reserves)	South Coast Inventory Block	2	36.6998148	4363.194489	0
Alternative B (Reserves)	South Coast Inventory Block	3	770.8865509	3629.007629	0
Alternative B (Reserves)	South Coast Inventory Block	4	1150.996492	3244.817612	4.080116034
Alternative B (Reserves)	South Coast Inventory Block	5	1892.064812	2505.877548	1.95189786
Alternative B (Reserves)	South Coast Inventory Block	6	2210.676208	2189.218056	0
Alternative B (Reserves)	South Coast Inventory Block	7	2721.075958	1678.818202	0
Alternative B (Reserves)	South Coast Inventory Block	8	3210.16153	1189.732722	0
Alternative B (Reserves)	South Coast Inventory Block	9	3213.970596	1183.971728	1.95189786
Alternative B (Reserves)	South Coast Inventory Block	10	3214.696884	1185.197405	0
Alternative B (Reserves)	Ukiah Inventory Block	0	16.48711967	373.5062256	5.19844532
Alternative B (Reserves)	Ukiah Inventory Block	1	16.48711967	376.010437	2.694207191
Alternative B (Reserves)	Ukiah Inventory Block	2	16.48711967	376.010498	2.694207191
Alternative B (Reserves)	Ukiah Inventory Block	3	16.48711967	376.0104675	2.694207191
Alternative B (Reserves)	Ukiah Inventory Block	4	28.50668907	363.9909058	2.694207191
Alternative B (Reserves)	Ukiah Inventory Block	5	140.8933105	254.2984619	0
Alternative B (Reserves)	Ukiah Inventory Block	6	207.1988373	187.9929504	0
Alternative B (Reserves)	Ukiah Inventory Block	7	222.0578308	173.1339722	0
Alternative B (Reserves)	Ukiah Inventory Block	8	179.8102722	215.3815308	0
Alternative B (Reserves)	Ukiah Inventory Block	9	280.8840942	114.307724	0
Alternative B (Reserves)	Ukiah Inventory Block	10	285.4741821	109.7176285	0
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	0	520.6319656	1415.767586	4.353695571
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	1	433.1620636	1498.7603	8.830896139
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	2	1256.737122	677.3325653	6.683594882
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	3	1399.999878	540.7533875	0
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	4	1444.300499	496.4527512	0
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Albion Inventory Block	10	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	0	29.50982136	3943.416229	24.96969986
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	1	24.3447575	3959.341919	14.20921946
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	2	172.2075367	3815.69809	9.990278959
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	3	433.133399	3559.184395	5.57806778
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	4	1025.032547	2971.68716	1.176133633
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Big River Inventory Block	10	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	0	103.594326	1641.914566	0
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	1	87.16225815	1656.790253	1.556324244
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	2	121.9024277	1623.606461	0
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	3	194.4094162	1551.099411	0
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	4	327.6986256	1417.810242	0
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Garcia River Inventory Block	10	0	0	0

Alternative	Inventory Block	Decade	Advanced Successional	Mid Successional	Early Successional
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	0	115.0005312	3475.598251	45.8839823
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	1	115.0005312	3516.518181	4.963859588
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	2	138.8399303	3497.16893	0.473861247
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	3	412.3131452	3224.169556	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	4	779.3549218	2857.1278	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro East Inventory Block	10	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	0	715.04844	2305.937408	10.20029008
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	1	727.5794249	2297.524918	6.081753612
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	2	701.8684635	2329.317734	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	3	1363.305008	1666.068451	1.81262958
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	4	1635.005508	1396.180618	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Navarro West Inventory Bloc	10	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	0	33.27655029	2011.763275	33.09272742
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	1	26.20671654	2045.620407	6.305299759
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	2	105.2865925	1972.845879	0
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	3	137.5065594	1940.625877	0
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	4	324.60478	1753.527664	0
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Noyo Inventory Block	10	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	0	138.7646518	4185.307648	33.15410832
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	1	51.69530296	4266.342224	39.18888283
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	2	190.6905165	4154.718475	11.81751251
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	3	984.9168811	3368.811691	3.497908592
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	4	1539.12079	2818.105713	0
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Rockport Inventory Block	10	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	0	93.60006809	4299.81366	6.480538368
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	1	78.99332523	4317.968597	2.932237685
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	2	35.84803891	4364.046143	0
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	3	995.4236832	3402.518677	1.95189786
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	4	1520.264732	2879.629486	0
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	South Coast Inventory Block	10	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	0	16.48711967	373.5062256	5.19844532
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	1	16.48711967	376.0104675	2.694207191
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	2	16.48711967	376.010498	2.694207191
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	3	16.48711967	376.010498	2.694207191
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	4	21.93626785	370.5613403	2.694207191
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	5	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	6	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	7	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	8	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	9	0	0	0
Alternative C (HCP Only and Shorter ITP Ter	Ukiah Inventory Block	10	0	0	0
No Action (No HCP/No Permit)	Albion Inventory Block	0	520.6319656	1415.767586	4.353695571
No Action (No HCP/No Permit)	Albion Inventory Block	1	326.6962395	1606.026352	8.030636966
No Action (No HCP/No Permit)	Albion Inventory Block	2	1271.475498	662.5941544	6.683594882
No Action (No HCP/No Permit)	Albion Inventory Block	3	1398.82835	541.9249039	0
No Action (No HCP/No Permit)	Albion Inventory Block	4	1424.557713	516.1955719	0
No Action (No HCP/No Permit)	Albion Inventory Block	5	1506.631638	434.1216431	0
No Action (No HCP/No Permit)	Albion Inventory Block	6	1648.364685	292.3885593	0
No Action (No HCP/No Permit)	Albion Inventory Block	7	1681.360992	259.3922348	0
No Action (No HCP/No Permit)	Albion Inventory Block	8	1659.84964	280.9036083	0
No Action (No HCP/No Permit)	Albion Inventory Block	9	1653.867737	286.885498	0
No Action (No HCP/No Permit)	Albion Inventory Block	10	1646.478943	294.2743263	0

Alternative	Inventory Block	Decade	Advanced Successional	Mid Successional	Early Successional
No Action (No HCP/No Permit)	Big River Inventory Block	0	29.50982136	3943.416229	24.96969986
No Action (No HCP/No Permit)	Big River Inventory Block	1	23.50924206	3774.112259	200.2743325
No Action (No HCP/No Permit)	Big River Inventory Block	2	159.7605553	3838.1353	0
No Action (No HCP/No Permit)	Big River Inventory Block	3	261.6989994	3736.196831	0
No Action (No HCP/No Permit)	Big River Inventory Block	4	590.9590492	3406.93679	0
No Action (No HCP/No Permit)	Big River Inventory Block	5	1332.315224	2665.580658	0
No Action (No HCP/No Permit)	Big River Inventory Block	6	2314.183495	1683.712418	0
No Action (No HCP/No Permit)	Big River Inventory Block	7	2882.145584	1115.750275	0
No Action (No HCP/No Permit)	Big River Inventory Block	8	3038.072372	959.823452	0
No Action (No HCP/No Permit)	Big River Inventory Block	9	2981.76915	1016.126698	0
No Action (No HCP/No Permit)	Big River Inventory Block	10	2966.316528	1031.579231	0
No Action (No HCP/No Permit)	Garcia River Inventory Block	0	103.594326	1641.914566	0
No Action (No HCP/No Permit)	Garcia River Inventory Block	1	67.04638195	1676.906204	1.556324244
No Action (No HCP/No Permit)	Garcia River Inventory Block	2	69.01254368	1676.496262	0
No Action (No HCP/No Permit)	Garcia River Inventory Block	3	109.9032745	1635.605606	0
No Action (No HCP/No Permit)	Garcia River Inventory Block	4	153.2911205	1592.217728	0
No Action (No HCP/No Permit)	Garcia River Inventory Block	5	411.2073097	1334.301483	0
No Action (No HCP/No Permit)	Garcia River Inventory Block	6	765.3795547	980.1292839	0
No Action (No HCP/No Permit)	Garcia River Inventory Block	7	1109.848923	635.6599274	0
No Action (No HCP/No Permit)	Garcia River Inventory Block	8	1145.922722	599.5861244	0
No Action (No HCP/No Permit)	Garcia River Inventory Block	9	1123.182045	622.3267975	0
No Action (No HCP/No Permit)	Garcia River Inventory Block	10	1117.204933	628.3038979	0
No Action (No HCP/No Permit)	Navarro East Inventory Block	0	115.0005312	3475.598251	45.8839823
No Action (No HCP/No Permit)	Navarro East Inventory Block	1	115.0005312	3304.7108	216.7713012
No Action (No HCP/No Permit)	Navarro East Inventory Block	2	134.3092871	3499.705124	2.468289375
No Action (No HCP/No Permit)	Navarro East Inventory Block	3	432.2533526	3204.229446	0
No Action (No HCP/No Permit)	Navarro East Inventory Block	4	461.4417498	3175.040985	0
No Action (No HCP/No Permit)	Navarro East Inventory Block	5	960.8106098	2675.672112	0
No Action (No HCP/No Permit)	Navarro East Inventory Block	6	2117.924185	1518.558517	0
No Action (No HCP/No Permit)	Navarro East Inventory Block	7	2551.557264	1084.925449	0
No Action (No HCP/No Permit)	Navarro East Inventory Block	8	2727.190313	909.2923317	0
No Action (No HCP/No Permit)	Navarro East Inventory Block	9	2764.331707	872.1508856	0
No Action (No HCP/No Permit)	Navarro East Inventory Block	10	2801.755493	834.7272511	0
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	0	715.04844	2305.937408	10.20029008
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	1	690.0992765	2323.52182	17.56505597
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	2	699.1439085	2327.799026	4.243173242
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	3	1267.023965	1762.349548	1.81262958
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	4	1376.078804	1655.107353	0
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	5	1697.474701	1333.711411	0
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	6	2029.111198	1002.074932	0
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	7	2399.527046	631.6590042	0
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	8	2337.86203	693.3240776	0
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	9	2404.326706	626.8593864	0
No Action (No HCP/No Permit)	Navarro West Inventory Bloc	10	2337.880852	693.3052521	0
No Action (No HCP/No Permit)	Noyo Inventory Block	0	33.27655029	2011.763275	33.09272742
No Action (No HCP/No Permit)	Noyo Inventory Block	1	33.27655029	2038.550636	6.305299759
No Action (No HCP/No Permit)	Noyo Inventory Block	2	71.38444042	2006.747993	0
No Action (No HCP/No Permit)	Noyo Inventory Block	3	132.3387346	1945.793724	0
No Action (No HCP/No Permit)	Noyo Inventory Block	4	295.1614861	1782.971039	0
No Action (No HCP/No Permit)	Noyo Inventory Block	5	658.3819103	1419.750572	0
No Action (No HCP/No Permit)	Noyo Inventory Block	6	1435.35022	642.7822533	0
No Action (No HCP/No Permit)	Noyo Inventory Block	7	1543.948891	534.1835938	0
No Action (No HCP/No Permit)	Noyo Inventory Block	8	1527.453293	550.679143	0
No Action (No HCP/No Permit)	Noyo Inventory Block	9	1542.920219	535.2122259	0
No Action (No HCP/No Permit)	Noyo Inventory Block	10	1538.417435	539.7150536	0
No Action (No HCP/No Permit)	Rockport Inventory Block	0	138.7646518	4185.307648	33.15410832
No Action (No HCP/No Permit)	Rockport Inventory Block	1	49.65195847	4267.43634	40.13808846
No Action (No HCP/No Permit)	Rockport Inventory Block	2	211.837348	4133.571671	11.81751251
No Action (No HCP/No Permit)	Rockport Inventory Block	3	841.713995	3512.014511	3.497908592
No Action (No HCP/No Permit)	Rockport Inventory Block	4	1410.341707	2946.884766	0
No Action (No HCP/No Permit)	Rockport Inventory Block	5	2096.631622	2260.594818	0
No Action (No HCP/No Permit)	Rockport Inventory Block	6	3024.578598	1332.647789	0
No Action (No HCP/No Permit)	Rockport Inventory Block	7	3241.858124	1115.368385	0
No Action (No HCP/No Permit)	Rockport Inventory Block	8	3634.020416	723.2060089	0
No Action (No HCP/No Permit)	Rockport Inventory Block	9	3500.055084	857.1713066	0
No Action (No HCP/No Permit)	Rockport Inventory Block	10	3512.471146	844.7553635	0
No Action (No HCP/No Permit)	South Coast Inventory Block	0	93.60006809	4299.81366	6.480538368
No Action (No HCP/No Permit)	South Coast Inventory Block	1	85.79192448	4311.170013	2.932237685
No Action (No HCP/No Permit)	South Coast Inventory Block	2	20.47590566	4377.4664	1.95189786
No Action (No HCP/No Permit)	South Coast Inventory Block	3	885.241787	3512.700546	1.95189786
No Action (No HCP/No Permit)	South Coast Inventory Block	4	1354.28289	3043.659515	1.95189786
No Action (No HCP/No Permit)	South Coast Inventory Block	5	2190.478714	2207.463707	1.95189786
No Action (No HCP/No Permit)	South Coast Inventory Block	6	2723.330719	1676.563507	0
No Action (No HCP/No Permit)	South Coast Inventory Block	7	2943.835831	1454.106491	1.95189786
No Action (No HCP/No Permit)	South Coast Inventory Block	8	3280.454117	1117.488213	1.95189786
No Action (No HCP/No Permit)	South Coast Inventory Block	9	3235.060791	1164.833467	0
No Action (No HCP/No Permit)	South Coast Inventory Block	10	3405.322906	992.6194115	1.95189786

Alternative	Inventory Block	Decade	Advanced Successional	Mid Successional	Early Successional
No Action (No HCP/No Permit)	Ukiah Inventory Block	0	16.48711967	373.5062256	5.19844532
No Action (No HCP/No Permit)	Ukiah Inventory Block	1	16.48711967	376.010437	2.694207191
No Action (No HCP/No Permit)	Ukiah Inventory Block	2	16.48711967	376.010498	2.694207191
No Action (No HCP/No Permit)	Ukiah Inventory Block	3	16.48711967	376.0104675	2.694207191
No Action (No HCP/No Permit)	Ukiah Inventory Block	4	18.89434433	373.603241	2.694207191
No Action (No HCP/No Permit)	Ukiah Inventory Block	5	257.039978	138.1518097	0
No Action (No HCP/No Permit)	Ukiah Inventory Block	6	282.3748474	112.8169556	0
No Action (No HCP/No Permit)	Ukiah Inventory Block	7	267.7463684	127.4454193	0
No Action (No HCP/No Permit)	Ukiah Inventory Block	8	272.9203491	122.271431	0
No Action (No HCP/No Permit)	Ukiah Inventory Block	9	284.0244141	111.1673737	0
No Action (No HCP/No Permit)	Ukiah Inventory Block	10	345.140686	50.05110931	0
Proposed Action (HCP/NCCP)	Albion Inventory Block	0	520.6319656	1415.767586	4.353695571
Proposed Action (HCP/NCCP)	Albion Inventory Block	1	433.1620636	1498.7603	8.830896139
Proposed Action (HCP/NCCP)	Albion Inventory Block	2	1256.737122	677.3325653	6.683594882
Proposed Action (HCP/NCCP)	Albion Inventory Block	3	1399.999878	540.7533875	0
Proposed Action (HCP/NCCP)	Albion Inventory Block	4	1444.300499	496.4527512	0
Proposed Action (HCP/NCCP)	Albion Inventory Block	5	1517.648865	423.1043663	0
Proposed Action (HCP/NCCP)	Albion Inventory Block	6	1561.878265	378.8749809	0
Proposed Action (HCP/NCCP)	Albion Inventory Block	7	1563.288971	377.4643211	0
Proposed Action (HCP/NCCP)	Albion Inventory Block	8	1570.607269	370.1460381	0
Proposed Action (HCP/NCCP)	Albion Inventory Block	9	1561.320404	379.4328575	0
Proposed Action (HCP/NCCP)	Albion Inventory Block	10	1568.67334	372.0799522	0
Proposed Action (HCP/NCCP)	Big River Inventory Block	0	29.50982136	3943.416229	24.96969986
Proposed Action (HCP/NCCP)	Big River Inventory Block	1	24.3447575	3959.341919	14.20921946
Proposed Action (HCP/NCCP)	Big River Inventory Block	2	172.2075367	3815.69809	9.990278959
Proposed Action (HCP/NCCP)	Big River Inventory Block	3	433.133399	3559.184395	5.57806778
Proposed Action (HCP/NCCP)	Big River Inventory Block	4	1025.032547	2971.68716	1.176133633
Proposed Action (HCP/NCCP)	Big River Inventory Block	5	1546.24115	2448.914619	2.739975691
Proposed Action (HCP/NCCP)	Big River Inventory Block	6	2854.084633	1133.570839	10.24032497
Proposed Action (HCP/NCCP)	Big River Inventory Block	7	3305.525375	691.3299046	1.040577173
Proposed Action (HCP/NCCP)	Big River Inventory Block	8	3386.773605	603.2821903	7.840023041
Proposed Action (HCP/NCCP)	Big River Inventory Block	9	3392.937103	602.1516151	2.807160139
Proposed Action (HCP/NCCP)	Big River Inventory Block	10	3392.250931	595.8181419	9.826826096
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	0	103.594326	1641.914566	0
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	1	87.16225815	1656.790253	1.556324244
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	2	121.9024277	1623.606461	0
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	3	194.4094162	1551.099411	0
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	4	327.6986256	1417.810242	0
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	5	619.7975502	1125.711266	0
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	6	1063.890038	681.6188488	0
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	7	1331.71035	413.7984562	0
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	8	1359.009087	386.4997864	0
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	9	1360.355782	385.1530857	0
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	10	1357.991371	387.5174809	0
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	0	115.0005312	3475.598251	45.8839823
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	1	115.0005312	3516.518181	4.963859588
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	2	138.8399303	3497.16893	0.473861247
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	3	412.3131452	3224.169556	0
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	4	779.3549218	2857.1278	0
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	5	1219.835705	2416.647022	0
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	6	2219.348101	1416.396645	0.737960398
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	7	2616.028275	1020.454411	0
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	8	2844.855011	791.6276627	0
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	9	2863.12426	773.3584099	0
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	10	2861.958107	774.5246544	0
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	0	715.04844	2305.937408	10.20029008
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	1	727.5794249	2297.524918	6.081753612
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	2	701.8684635	2329.317734	0
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	3	1363.305008	1666.068451	1.81262958
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	4	1635.005508	1396.180618	0
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	5	1967.049385	1064.136734	0
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	6	2189.654137	841.5320396	0
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	7	2410.95623	620.2298584	0
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	8	2411.810875	619.3752708	0
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	9	2416.525719	614.6604385	0
Proposed Action (HCP/NCCP)	Navarro West Inventory Bloc	10	2428.717705	602.4684525	0
Proposed Action (HCP/NCCP)	Noyo Inventory Block	0	33.27655029	2011.763275	33.09272742
Proposed Action (HCP/NCCP)	Noyo Inventory Block	1	26.20671654	2045.620407	6.305299759
Proposed Action (HCP/NCCP)	Noyo Inventory Block	2	105.2865925	1972.845879	0
Proposed Action (HCP/NCCP)	Noyo Inventory Block	3	137.5065594	1940.625877	0
Proposed Action (HCP/NCCP)	Noyo Inventory Block	4	324.60478	1753.527664	0
Proposed Action (HCP/NCCP)	Noyo Inventory Block	5	827.2454033	1250.887077	0
Proposed Action (HCP/NCCP)	Noyo Inventory Block	6	1578.490067	499.6424084	0
Proposed Action (HCP/NCCP)	Noyo Inventory Block	7	1644.378067	433.7543983	0
Proposed Action (HCP/NCCP)	Noyo Inventory Block	8	1656.534012	421.598484	0
Proposed Action (HCP/NCCP)	Noyo Inventory Block	9	1658.751266	419.3812332	0
Proposed Action (HCP/NCCP)	Noyo Inventory Block	10	1662.176727	415.9557457	0

Successional Stage (riparian) by Inventory Block

Alternative	Inventory Block	Decade	Advanced Successional	Mid Successional	Early Successional
Proposed Action (HCP/NCCP)	Rockport Inventory Block	0	138.7646518	4185.307648	33.15410832
Proposed Action (HCP/NCCP)	Rockport Inventory Block	1	51.69530296	4266.342224	39.18888283
Proposed Action (HCP/NCCP)	Rockport Inventory Block	2	190.6905165	4154.718475	11.81751251
Proposed Action (HCP/NCCP)	Rockport Inventory Block	3	984.9168811	3368.811691	3.497908592
Proposed Action (HCP/NCCP)	Rockport Inventory Block	4	1539.12079	2818.105713	0
Proposed Action (HCP/NCCP)	Rockport Inventory Block	5	2159.349617	2197.876839	0
Proposed Action (HCP/NCCP)	Rockport Inventory Block	6	3103.875549	1253.350929	0
Proposed Action (HCP/NCCP)	Rockport Inventory Block	7	3327.491074	1029.735519	0
Proposed Action (HCP/NCCP)	Rockport Inventory Block	8	3372.165543	985.0609131	0
Proposed Action (HCP/NCCP)	Rockport Inventory Block	9	3390.278	966.9484749	0
Proposed Action (HCP/NCCP)	Rockport Inventory Block	10	3429.702637	927.5238724	0
Proposed Action (HCP/NCCP)	South Coast Inventory Block	0	93.60006809	4299.81366	6.480538368
Proposed Action (HCP/NCCP)	South Coast Inventory Block	1	78.99332523	4317.968597	2.932237685
Proposed Action (HCP/NCCP)	South Coast Inventory Block	2	35.84803891	4364.046143	0
Proposed Action (HCP/NCCP)	South Coast Inventory Block	3	995.4236832	3402.518677	1.95189786
Proposed Action (HCP/NCCP)	South Coast Inventory Block	4	1520.264732	2879.629486	0
Proposed Action (HCP/NCCP)	South Coast Inventory Block	5	2737.905067	1661.989258	0
Proposed Action (HCP/NCCP)	South Coast Inventory Block	6	3206.193558	1193.700745	0
Proposed Action (HCP/NCCP)	South Coast Inventory Block	7	3483.074814	916.8194046	0
Proposed Action (HCP/NCCP)	South Coast Inventory Block	8	3546.129562	853.7646332	0
Proposed Action (HCP/NCCP)	South Coast Inventory Block	9	3539.928665	859.9655991	0
Proposed Action (HCP/NCCP)	South Coast Inventory Block	10	3549.517563	850.376709	0
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	0	16.48711967	373.5062256	5.19844532
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	1	16.48711967	376.0104675	2.694207191
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	2	16.48711967	376.010498	2.694207191
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	3	16.48711967	376.010498	2.694207191
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	4	21.93626785	370.5613403	2.694207191
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	5	178.1882172	217.0035706	0
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	6	238.1413574	157.0504456	0
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	7	237.7873077	157.40448	0
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	8	236.1919861	158.9998016	0
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	9	248.7917786	146.4000244	0
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	10	286.4602356	108.7315674	0

Alternative	Inventory Block	Decade	24-32	>32
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	0	11.924097	2.8599968
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	1	7.8279105	2.7614913
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	2	9.2789085	2.9552749
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	3	9.4674408	4.3557806
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	4	9.3900073	5.3400805
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	5	10.350742	6.0786272
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	6	11.704004	7.2098294
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	7	12.826318	8.0876105
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	8	13.418282	9.1021514
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	9	13.379638	10.551876
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	10	12.353563	12.117865
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	0	3.4712492	0.5881005
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	1	3.1338431	0.6681144
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	2	4.2179493	0.8124914
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	3	5.3791444	1.3428007
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	4	7.0442316	1.950077
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	5	10.066071	2.7980216
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	6	13.053844	3.6388594
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	7	13.344067	4.2996273
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	8	13.360178	5.6001212
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	9	12.811864	7.4748135
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	10	12.081218	8.6867262
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	0	5.4362293	0.6649129
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	1	4.7008692	0.8100525
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	2	5.5024577	0.9065752
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	3	6.550695	1.4800569
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	4	7.3885181	2.1379094
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	5	9.3922115	2.9757742
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	6	10.797389	3.7448822
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	7	11.373323	4.4328019
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	8	11.656766	5.3037577
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	9	11.852776	6.3673701
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	10	12.236112	7.2290898
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	0	3.0781922	0.3470891
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	1	2.8043951	0.4340608
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	2	3.9322746	0.5073183
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	3	5.7774261	0.9425141
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	4	6.9341438	1.4383751
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	5	9.3328613	2.1907491
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	6	11.433767	3.0723429
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	7	11.89486	3.9456491
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	8	12.310895	5.0960608
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	9	11.757315	6.488649
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	10	11.087582	7.6362623
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	0	5.519385	1.7733866
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	1	4.8781081	2.0135005
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	2	6.6429803	1.9651037
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	3	8.5854399	2.8279549
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	4	9.9709553	3.5825553
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	5	11.746868	4.6975567
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	6	13.952139	5.5450875
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	7	14.799397	6.7014621
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	8	15.664465	7.7751933
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	9	15.012398	9.2061056
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	10	14.485762	11.032577
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	0	3.8888905	0.5338884
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	1	3.7622039	0.6623658
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	2	5.4616524	0.7929456
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	3	7.5738443	1.4923646
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	4	8.95693	2.3577818
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	5	10.934887	2.9230854
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	6	12.544474	3.5778437
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	7	13.251896	4.5375548
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	8	13.217832	5.5868812
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	9	12.349975	7.0697127
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	10	11.981004	8.0586734
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	0	4.1818362	0.7020614
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	1	3.5491929	0.7693785
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	2	4.8668943	0.8632844
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	3	6.2680868	1.3279235
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	4	7.1685341	1.9900747
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	5	9.1620227	2.7188833
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	6	10.929904	3.7297949
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	7	11.321008	4.5582092
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	8	11.1622	5.6278435
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	9	11.087585	6.8880406
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	10	10.7463	7.9297385

Alternative	Inventory Block	Decade	24-32	>32
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	0	6.0285402	1.3866278
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	1	5.3907278	1.509231
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	2	7.6350055	1.6016684
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	3	9.079676	2.3275265
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	4	9.5181561	3.0262966
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	5	11.507588	3.6466609
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	6	12.377868	4.8487422
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	7	13.264579	5.8863214
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	8	13.825602	7.5627018
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	9	13.701851	9.0413148
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	10	14.168368	10.50942
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	0	5.449462	0.9018514
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	1	4.2906123	0.8226935
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	2	5.1188187	0.935724
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	3	5.5622712	1.4080915
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	4	5.604294	1.8616614
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	5	7.1430159	2.3740786
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	6	10.906027	3.1407012
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	7	12.732427	4.0682347
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	8	11.594517	4.7733636
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	9	9.9174716	6.7976445
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	10	8.2403206	8.8866701
Alternative B (Reserves)	Albion Inventory Block	0	11.924097	2.8599968
Alternative B (Reserves)	Albion Inventory Block	1	8.2318454	2.9477657
Alternative B (Reserves)	Albion Inventory Block	2	9.6697855	3.0321205
Alternative B (Reserves)	Albion Inventory Block	3	9.3745734	4.2413601
Alternative B (Reserves)	Albion Inventory Block	4	9.0599954	5.1986573
Alternative B (Reserves)	Albion Inventory Block	5	10.303904	6.0588618
Alternative B (Reserves)	Albion Inventory Block	6	12.971904	7.5407341
Alternative B (Reserves)	Albion Inventory Block	7	15.98213	8.7740517
Alternative B (Reserves)	Albion Inventory Block	8	15.789429	11.020724
Alternative B (Reserves)	Albion Inventory Block	9	15.682627	13.79695
Alternative B (Reserves)	Albion Inventory Block	10	14.353006	17.064534
Alternative B (Reserves)	Big River Inventory Block	0	3.4712492	0.5881005
Alternative B (Reserves)	Big River Inventory Block	1	3.3985375	0.6879766
Alternative B (Reserves)	Big River Inventory Block	2	4.7611001	0.8433265
Alternative B (Reserves)	Big River Inventory Block	3	5.7489327	1.3241181
Alternative B (Reserves)	Big River Inventory Block	4	7.8020278	2.0125925
Alternative B (Reserves)	Big River Inventory Block	5	10.598334	2.6855716
Alternative B (Reserves)	Big River Inventory Block	6	15.628336	3.7114265
Alternative B (Reserves)	Big River Inventory Block	7	17.580107	4.9771205
Alternative B (Reserves)	Big River Inventory Block	8	16.767096	7.5924872
Alternative B (Reserves)	Big River Inventory Block	9	13.907112	11.785926
Alternative B (Reserves)	Big River Inventory Block	10	12.127262	14.995657
Alternative B (Reserves)	Garcia River Inventory Block	0	5.4362293	0.6649129
Alternative B (Reserves)	Garcia River Inventory Block	1	5.2000972	0.8562603
Alternative B (Reserves)	Garcia River Inventory Block	2	6.4641163	0.9969781
Alternative B (Reserves)	Garcia River Inventory Block	3	6.7305844	1.4183774
Alternative B (Reserves)	Garcia River Inventory Block	4	7.6751264	2.0010716
Alternative B (Reserves)	Garcia River Inventory Block	5	9.7178251	2.4657443
Alternative B (Reserves)	Garcia River Inventory Block	6	11.857785	3.4760592
Alternative B (Reserves)	Garcia River Inventory Block	7	12.979678	4.6192692
Alternative B (Reserves)	Garcia River Inventory Block	8	12.957204	6.5610126
Alternative B (Reserves)	Garcia River Inventory Block	9	13.442585	8.1996106
Alternative B (Reserves)	Garcia River Inventory Block	10	13.540618	10.657885
Alternative B (Reserves)	Navarro East Inventory Block	0	3.0781922	0.3470891
Alternative B (Reserves)	Navarro East Inventory Block	1	2.96531	0.4464744
Alternative B (Reserves)	Navarro East Inventory Block	2	4.2417545	0.5259558
Alternative B (Reserves)	Navarro East Inventory Block	3	5.0725217	0.8201363
Alternative B (Reserves)	Navarro East Inventory Block	4	5.7837608	1.1898586
Alternative B (Reserves)	Navarro East Inventory Block	5	7.4712968	1.5547459
Alternative B (Reserves)	Navarro East Inventory Block	6	9.8804437	2.0454432
Alternative B (Reserves)	Navarro East Inventory Block	7	10.700659	2.7793087
Alternative B (Reserves)	Navarro East Inventory Block	8	11.136237	3.8402009
Alternative B (Reserves)	Navarro East Inventory Block	9	9.6455048	5.2849863
Alternative B (Reserves)	Navarro East Inventory Block	10	8.4028698	7.3770287
Alternative B (Reserves)	Navarro West Inventory Block	0	5.519385	1.7733866
Alternative B (Reserves)	Navarro West Inventory Block	1	4.9700754	2.0492616
Alternative B (Reserves)	Navarro West Inventory Block	2	6.811781	2.0717204
Alternative B (Reserves)	Navarro West Inventory Block	3	8.0588566	2.7212234
Alternative B (Reserves)	Navarro West Inventory Block	4	9.330153	3.3059537
Alternative B (Reserves)	Navarro West Inventory Block	5	10.850337	4.1621452
Alternative B (Reserves)	Navarro West Inventory Block	6	15.108177	5.2980945
Alternative B (Reserves)	Navarro West Inventory Block	7	17.23288	6.9038417
Alternative B (Reserves)	Navarro West Inventory Block	8	19.07857	9.405362
Alternative B (Reserves)	Navarro West Inventory Block	9	18.326902	12.533056
Alternative B (Reserves)	Navarro West Inventory Block	10	16.986804	16.075205

Alternative	Inventory Block	Decade	24-32	>32
Alternative B (Reserves)	Noyo Inventory Block	0	3.8888905	0.5338884
Alternative B (Reserves)	Noyo Inventory Block	1	3.8360406	0.6396996
Alternative B (Reserves)	Noyo Inventory Block	2	5.7616166	0.7890014
Alternative B (Reserves)	Noyo Inventory Block	3	6.8593824	1.2639011
Alternative B (Reserves)	Noyo Inventory Block	4	7.7123263	1.9033926
Alternative B (Reserves)	Noyo Inventory Block	5	8.2872582	2.0285147
Alternative B (Reserves)	Noyo Inventory Block	6	10.812029	2.9778005
Alternative B (Reserves)	Noyo Inventory Block	7	11.873775	4.0613253
Alternative B (Reserves)	Noyo Inventory Block	8	12.566258	5.5840759
Alternative B (Reserves)	Noyo Inventory Block	9	12.507158	7.3771644
Alternative B (Reserves)	Noyo Inventory Block	10	11.544077	9.7262522
Alternative B (Reserves)	Rockport Inventory Block	0	4.1818362	0.7020614
Alternative B (Reserves)	Rockport Inventory Block	1	3.8114134	0.8139461
Alternative B (Reserves)	Rockport Inventory Block	2	5.572411	0.9401597
Alternative B (Reserves)	Rockport Inventory Block	3	6.7736301	1.2952958
Alternative B (Reserves)	Rockport Inventory Block	4	8.0532399	1.8309642
Alternative B (Reserves)	Rockport Inventory Block	5	9.3251897	2.4503531
Alternative B (Reserves)	Rockport Inventory Block	6	12.08923	3.5714726
Alternative B (Reserves)	Rockport Inventory Block	7	14.473467	4.7965653
Alternative B (Reserves)	Rockport Inventory Block	8	14.277954	7.0261072
Alternative B (Reserves)	Rockport Inventory Block	9	13.045759	9.7024392
Alternative B (Reserves)	Rockport Inventory Block	10	11.4615	12.803529
Alternative B (Reserves)	South Coast Inventory Block	0	6.0285402	1.3866278
Alternative B (Reserves)	South Coast Inventory Block	1	5.6676977	1.5685227
Alternative B (Reserves)	South Coast Inventory Block	2	8.839051	1.728473
Alternative B (Reserves)	South Coast Inventory Block	3	10.877833	2.5149508
Alternative B (Reserves)	South Coast Inventory Block	4	11.842928	3.3392521
Alternative B (Reserves)	South Coast Inventory Block	5	15.589656	4.5927909
Alternative B (Reserves)	South Coast Inventory Block	6	18.965162	6.8673013
Alternative B (Reserves)	South Coast Inventory Block	7	21.261574	9.7840784
Alternative B (Reserves)	South Coast Inventory Block	8	21.704744	14.178382
Alternative B (Reserves)	South Coast Inventory Block	9	20.47601	18.811905
Alternative B (Reserves)	South Coast Inventory Block	10	20.210321	22.611599
Alternative B (Reserves)	Ukiah Inventory Block	0	5.449462	0.9018514
Alternative B (Reserves)	Ukiah Inventory Block	1	5.1504243	0.9332905
Alternative B (Reserves)	Ukiah Inventory Block	2	5.0387704	0.9095727
Alternative B (Reserves)	Ukiah Inventory Block	3	4.5951957	1.3291009
Alternative B (Reserves)	Ukiah Inventory Block	4	4.4301943	1.4476974
Alternative B (Reserves)	Ukiah Inventory Block	5	5.7392071	1.7386598
Alternative B (Reserves)	Ukiah Inventory Block	6	9.2872467	2.0800026
Alternative B (Reserves)	Ukiah Inventory Block	7	9.2086153	2.042222
Alternative B (Reserves)	Ukiah Inventory Block	8	7.9533571	2.3646635
Alternative B (Reserves)	Ukiah Inventory Block	9	7.8447128	3.1194269
Alternative B (Reserves)	Ukiah Inventory Block	10	5.9648081	5.3175746
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	0	11.924097	2.8599968
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	1	9.5842061	3.4574048
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	2	11.546009	3.7767036
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	3	10.829559	5.6051623
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	4	10.149854	6.5010688
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	10	0	0
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	0	3.4712492	0.5881005
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	1	3.1089033	0.6608366
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	2	4.1684194	0.7992272
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	3	5.1771299	1.2690818
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	4	6.4354574	1.7599001
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	10	0	0
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	0	5.4362293	0.6649129
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	1	4.6653755	0.7887723
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	2	5.3604075	0.8728421
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	3	6.2513669	1.3867749
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	4	6.7310649	1.9251921
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	10	0	0

Large Tree Density (TPA) (forestwide) by Inventory Block

Alternative	Inventory Block	Decade	24-32	>32
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	0	3.0781922	0.3470891
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	1	2.7917536	0.4326483
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	2	3.8963046	0.5000557
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	3	5.6114075	0.9085566
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	4	6.3516044	1.3596496
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	10	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	0	5.519385	1.7733866
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	1	4.7946032	1.9732244
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	2	6.1603132	1.795983
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	3	7.6390668	2.4922218
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	4	8.3994364	2.9412374
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	10	0	0
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	0	3.8888905	0.5338884
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	1	3.7176539	0.6523152
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	2	5.1798763	0.7679527
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	3	6.8411051	1.3866669
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	4	7.4643663	2.0125842
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	10	0	0
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	0	4.1818362	0.7020614
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	1	3.5068192	0.7514988
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	2	4.7186952	0.8260106
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	3	5.9068995	1.2458821
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	4	6.5900211	1.8054677
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	10	0	0
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	0	6.0285402	1.3866278
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	1	5.0363099	1.4272346
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	2	6.8891428	1.44719
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	3	8.0307236	2.0566674
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	4	7.9871359	2.5613837
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	10	0	0
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	0	5.449462	0.9018514
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	1	2.9326602	0.564102
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	2	3.4910711	0.6505701
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	3	3.7766386	0.9587179
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	4	3.7353579	1.2399542
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	10	0	0
No Action (No HCP/No Permit)	Albion Inventory Block	0	11.924097	2.8599968
No Action (No HCP/No Permit)	Albion Inventory Block	1	9.0932969	3.2959113
No Action (No HCP/No Permit)	Albion Inventory Block	2	10.409852	3.5266168
No Action (No HCP/No Permit)	Albion Inventory Block	3	9.9906031	5.1613079
No Action (No HCP/No Permit)	Albion Inventory Block	4	9.7524785	6.1696469
No Action (No HCP/No Permit)	Albion Inventory Block	5	10.116681	6.2430814
No Action (No HCP/No Permit)	Albion Inventory Block	6	11.917306	6.9515195
No Action (No HCP/No Permit)	Albion Inventory Block	7	12.438136	7.3758955
No Action (No HCP/No Permit)	Albion Inventory Block	8	12.415594	8.2716934
No Action (No HCP/No Permit)	Albion Inventory Block	9	11.090062	9.1754808
No Action (No HCP/No Permit)	Albion Inventory Block	10	10.179094	10.406405

Large Tree Density (TPA) (forestwide) by Inventory Block

Alternative	Inventory Block	Decade	24-32	>32
No Action (No HCP/No Permit)	Big River Inventory Block	0	3.4712492	0.5881005
No Action (No HCP/No Permit)	Big River Inventory Block	1	3.2063801	0.6744062
No Action (No HCP/No Permit)	Big River Inventory Block	2	3.786193	0.7635666
No Action (No HCP/No Permit)	Big River Inventory Block	3	4.376055	1.1247739
No Action (No HCP/No Permit)	Big River Inventory Block	4	5.7484725	1.5773798
No Action (No HCP/No Permit)	Big River Inventory Block	5	7.1095243	1.8544373
No Action (No HCP/No Permit)	Big River Inventory Block	6	8.0991348	2.1003304
No Action (No HCP/No Permit)	Big River Inventory Block	7	7.7901802	2.3535527
No Action (No HCP/No Permit)	Big River Inventory Block	8	7.3802423	2.7007589
No Action (No HCP/No Permit)	Big River Inventory Block	9	6.9287327	3.2278637
No Action (No HCP/No Permit)	Big River Inventory Block	10	6.0505579	3.5444701
No Action (No HCP/No Permit)	Garcia River Inventory Block	0	5.4362293	0.6649129
No Action (No HCP/No Permit)	Garcia River Inventory Block	1	5.1889038	0.7848876
No Action (No HCP/No Permit)	Garcia River Inventory Block	2	6.0271435	0.7762442
No Action (No HCP/No Permit)	Garcia River Inventory Block	3	6.729888	1.2145209
No Action (No HCP/No Permit)	Garcia River Inventory Block	4	7.1076292	1.6956464
No Action (No HCP/No Permit)	Garcia River Inventory Block	5	7.2158111	1.8895613
No Action (No HCP/No Permit)	Garcia River Inventory Block	6	6.9228579	2.0689053
No Action (No HCP/No Permit)	Garcia River Inventory Block	7	6.8279914	2.3526272
No Action (No HCP/No Permit)	Garcia River Inventory Block	8	6.1456741	2.70697
No Action (No HCP/No Permit)	Garcia River Inventory Block	9	5.6297127	3.0796463
No Action (No HCP/No Permit)	Garcia River Inventory Block	10	5.6978463	3.1463649
No Action (No HCP/No Permit)	Navarro East Inventory Block	0	3.0781922	0.3470891
No Action (No HCP/No Permit)	Navarro East Inventory Block	1	3.0091062	0.4393847
No Action (No HCP/No Permit)	Navarro East Inventory Block	2	4.1247915	0.5114
No Action (No HCP/No Permit)	Navarro East Inventory Block	3	5.2836115	0.8799371
No Action (No HCP/No Permit)	Navarro East Inventory Block	4	5.9206242	1.1827652
No Action (No HCP/No Permit)	Navarro East Inventory Block	5	6.5300971	1.52074
No Action (No HCP/No Permit)	Navarro East Inventory Block	6	7.3172272	1.8490041
No Action (No HCP/No Permit)	Navarro East Inventory Block	7	6.8628709	2.0684086
No Action (No HCP/No Permit)	Navarro East Inventory Block	8	6.3675927	2.2660107
No Action (No HCP/No Permit)	Navarro East Inventory Block	9	5.8671646	2.4617667
No Action (No HCP/No Permit)	Navarro East Inventory Block	10	5.2796816	2.6305434
No Action (No HCP/No Permit)	Navarro West Inventory Block	0	5.519385	1.7733866
No Action (No HCP/No Permit)	Navarro West Inventory Block	1	4.3666689	1.8358263
No Action (No HCP/No Permit)	Navarro West Inventory Block	2	5.2114002	1.7627444
No Action (No HCP/No Permit)	Navarro West Inventory Block	3	6.4574955	2.2789186
No Action (No HCP/No Permit)	Navarro West Inventory Block	4	7.013249	2.674714
No Action (No HCP/No Permit)	Navarro West Inventory Block	5	7.5877485	3.1752536
No Action (No HCP/No Permit)	Navarro West Inventory Block	6	8.7130568	3.4733497
No Action (No HCP/No Permit)	Navarro West Inventory Block	7	9.2660255	4.0221246
No Action (No HCP/No Permit)	Navarro West Inventory Block	8	9.6348435	4.5789299
No Action (No HCP/No Permit)	Navarro West Inventory Block	9	9.2833115	5.180242
No Action (No HCP/No Permit)	Navarro West Inventory Block	10	8.4225208	5.9365944
No Action (No HCP/No Permit)	Noyo Inventory Block	0	3.8888905	0.5338884
No Action (No HCP/No Permit)	Noyo Inventory Block	1	3.6801089	0.6281632
No Action (No HCP/No Permit)	Noyo Inventory Block	2	4.616268	0.7027041
No Action (No HCP/No Permit)	Noyo Inventory Block	3	5.9270747	1.1667331
No Action (No HCP/No Permit)	Noyo Inventory Block	4	7.1143722	1.7820795
No Action (No HCP/No Permit)	Noyo Inventory Block	5	6.7564545	1.9554832
No Action (No HCP/No Permit)	Noyo Inventory Block	6	7.0296224	2.1757374
No Action (No HCP/No Permit)	Noyo Inventory Block	7	7.5166437	2.4758626
No Action (No HCP/No Permit)	Noyo Inventory Block	8	7.0207991	2.7109106
No Action (No HCP/No Permit)	Noyo Inventory Block	9	6.2977144	3.0745767
No Action (No HCP/No Permit)	Noyo Inventory Block	10	5.5846142	3.1137658
No Action (No HCP/No Permit)	Rockport Inventory Block	0	4.1818362	0.7020614
No Action (No HCP/No Permit)	Rockport Inventory Block	1	3.6307072	0.769896
No Action (No HCP/No Permit)	Rockport Inventory Block	2	4.4437534	0.793889
No Action (No HCP/No Permit)	Rockport Inventory Block	3	5.3047686	1.0896883
No Action (No HCP/No Permit)	Rockport Inventory Block	4	6.1112456	1.5161447
No Action (No HCP/No Permit)	Rockport Inventory Block	5	6.4668542	1.8523191
No Action (No HCP/No Permit)	Rockport Inventory Block	6	6.3267776	2.1183364
No Action (No HCP/No Permit)	Rockport Inventory Block	7	6.2193446	2.3223917
No Action (No HCP/No Permit)	Rockport Inventory Block	8	6.567051	2.640293
No Action (No HCP/No Permit)	Rockport Inventory Block	9	6.2460289	2.953043
No Action (No HCP/No Permit)	Rockport Inventory Block	10	6.0125038	3.0774023
No Action (No HCP/No Permit)	South Coast Inventory Block	0	6.0285402	1.3866278
No Action (No HCP/No Permit)	South Coast Inventory Block	1	5.0174579	1.4826514
No Action (No HCP/No Permit)	South Coast Inventory Block	2	6.2902426	1.4184252
No Action (No HCP/No Permit)	South Coast Inventory Block	3	8.0919848	2.0381535
No Action (No HCP/No Permit)	South Coast Inventory Block	4	8.3239418	2.5779403
No Action (No HCP/No Permit)	South Coast Inventory Block	5	7.6185253	2.499128
No Action (No HCP/No Permit)	South Coast Inventory Block	6	7.4789414	2.927906
No Action (No HCP/No Permit)	South Coast Inventory Block	7	8.2610905	3.3417551
No Action (No HCP/No Permit)	South Coast Inventory Block	8	7.9602374	3.8467454
No Action (No HCP/No Permit)	South Coast Inventory Block	9	7.3773538	4.428022
No Action (No HCP/No Permit)	South Coast Inventory Block	10	7.0185782	4.9228409

Alternative	Inventory Block	Decade	24-32	>32
No Action (No HCP/No Permit)	Ukiah Inventory Block	0	5.449462	0.9018514
No Action (No HCP/No Permit)	Ukiah Inventory Block	1	4.376839	0.8438613
No Action (No HCP/No Permit)	Ukiah Inventory Block	2	5.7557769	0.8694339
No Action (No HCP/No Permit)	Ukiah Inventory Block	3	6.0322136	1.241609
No Action (No HCP/No Permit)	Ukiah Inventory Block	4	6.2716735	1.7991817
No Action (No HCP/No Permit)	Ukiah Inventory Block	5	6.0887914	1.8238008
No Action (No HCP/No Permit)	Ukiah Inventory Block	6	9.8250819	2.3572632
No Action (No HCP/No Permit)	Ukiah Inventory Block	7	10.9893	3.4363557
No Action (No HCP/No Permit)	Ukiah Inventory Block	8	9.1511743	4.0346797
No Action (No HCP/No Permit)	Ukiah Inventory Block	9	6.402314	5.3335244
No Action (No HCP/No Permit)	Ukiah Inventory Block	10	4.2114933	6.5998385
Proposed Action (HCP/NCCP)	Albion Inventory Block	0	11.924097	2.8599968
Proposed Action (HCP/NCCP)	Albion Inventory Block	1	7.6993542	2.7362541
Proposed Action (HCP/NCCP)	Albion Inventory Block	2	8.8725971	2.833684
Proposed Action (HCP/NCCP)	Albion Inventory Block	3	8.9573105	4.101677
Proposed Action (HCP/NCCP)	Albion Inventory Block	4	8.8743903	4.8557795
Proposed Action (HCP/NCCP)	Albion Inventory Block	5	9.6879001	5.4684636
Proposed Action (HCP/NCCP)	Albion Inventory Block	6	11.207631	6.4726117
Proposed Action (HCP/NCCP)	Albion Inventory Block	7	11.994564	7.131414
Proposed Action (HCP/NCCP)	Albion Inventory Block	8	12.696275	7.8168432
Proposed Action (HCP/NCCP)	Albion Inventory Block	9	12.551084	8.7654079
Proposed Action (HCP/NCCP)	Albion Inventory Block	10	11.747059	9.9276237
Proposed Action (HCP/NCCP)	Big River Inventory Block	0	3.4712492	0.5881005
Proposed Action (HCP/NCCP)	Big River Inventory Block	1	3.106591	0.6619358
Proposed Action (HCP/NCCP)	Big River Inventory Block	2	4.145453	0.797325
Proposed Action (HCP/NCCP)	Big River Inventory Block	3	5.1520166	1.2879583
Proposed Action (HCP/NCCP)	Big River Inventory Block	4	6.5328543	1.8305772
Proposed Action (HCP/NCCP)	Big River Inventory Block	5	9.0413111	2.5477104
Proposed Action (HCP/NCCP)	Big River Inventory Block	6	11.217877	3.2315876
Proposed Action (HCP/NCCP)	Big River Inventory Block	7	11.296404	3.717685
Proposed Action (HCP/NCCP)	Big River Inventory Block	8	11.7544	4.5943327
Proposed Action (HCP/NCCP)	Big River Inventory Block	9	11.318443	5.8135813
Proposed Action (HCP/NCCP)	Big River Inventory Block	10	10.349754	6.4425854
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	0	5.4362293	0.6649129
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	1	4.6543942	0.7834968
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	2	5.3555511	0.8755057
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	3	6.3382288	1.4205246
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	4	6.9932042	1.9953569
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	5	8.800805	2.7773711
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	6	10.286133	3.3906149
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	7	10.394801	3.8322879
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	8	10.377736	4.4185244
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	9	10.000644	5.0896391
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	10	10.041676	5.3809831
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	0	3.0781922	0.3470891
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	1	2.7881521	0.4324504
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	2	3.8670478	0.4996294
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	3	5.6361711	0.916553
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	4	6.5570511	1.3897988
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	5	8.327642	2.0618656
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	6	10.183947	2.6916056
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	7	10.419263	3.3568931
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	8	10.805	3.9910738
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	9	10.395639	4.7213816
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	10	9.3934584	5.1579742
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	0	5.519385	1.7733866
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	1	4.7526085	1.9641631
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	2	6.047432	1.785508
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	3	7.566914	2.4749537
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	4	8.4317057	3.0142052
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	5	9.8839242	3.8468216
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	6	11.571455	4.4469127
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	7	12.102905	5.1733805
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	8	13.166451	5.8973685
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	9	12.537213	6.8450098
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	10	12.500668	7.683167
Proposed Action (HCP/NCCP)	Noyo Inventory Block	0	3.8888905	0.5338884
Proposed Action (HCP/NCCP)	Noyo Inventory Block	1	3.7102923	0.6519755
Proposed Action (HCP/NCCP)	Noyo Inventory Block	2	5.1837463	0.7661503
Proposed Action (HCP/NCCP)	Noyo Inventory Block	3	6.8552568	1.3995514
Proposed Action (HCP/NCCP)	Noyo Inventory Block	4	7.5975727	2.0631305
Proposed Action (HCP/NCCP)	Noyo Inventory Block	5	8.966786	2.4711838
Proposed Action (HCP/NCCP)	Noyo Inventory Block	6	10.410254	3.0908423
Proposed Action (HCP/NCCP)	Noyo Inventory Block	7	10.849507	3.7852342
Proposed Action (HCP/NCCP)	Noyo Inventory Block	8	10.876996	4.4030273
Proposed Action (HCP/NCCP)	Noyo Inventory Block	9	10.241865	5.191973
Proposed Action (HCP/NCCP)	Noyo Inventory Block	10	9.9857669	5.5472246

Alternative	Inventory Block	Decade	24-32	>32
Proposed Action (HCP/NCCP)	Rockport Inventory Block	0	4.1818362	0.7020614
Proposed Action (HCP/NCCP)	Rockport Inventory Block	1	3.5115983	0.7546669
Proposed Action (HCP/NCCP)	Rockport Inventory Block	2	4.6880628	0.8284816
Proposed Action (HCP/NCCP)	Rockport Inventory Block	3	5.8775536	1.2454235
Proposed Action (HCP/NCCP)	Rockport Inventory Block	4	6.6744146	1.8477227
Proposed Action (HCP/NCCP)	Rockport Inventory Block	5	8.4774558	2.5214946
Proposed Action (HCP/NCCP)	Rockport Inventory Block	6	10.071394	3.3857252
Proposed Action (HCP/NCCP)	Rockport Inventory Block	7	10.235322	4.033064
Proposed Action (HCP/NCCP)	Rockport Inventory Block	8	10.030229	4.7486807
Proposed Action (HCP/NCCP)	Rockport Inventory Block	9	10.161138	5.1394752
Proposed Action (HCP/NCCP)	Rockport Inventory Block	10	9.7240456	5.4209529
Proposed Action (HCP/NCCP)	South Coast Inventory Block	0	6.0285402	1.3866278
Proposed Action (HCP/NCCP)	South Coast Inventory Block	1	5.2196556	1.4838085
Proposed Action (HCP/NCCP)	South Coast Inventory Block	2	7.1470018	1.5225528
Proposed Action (HCP/NCCP)	South Coast Inventory Block	3	8.446757	2.1903049
Proposed Action (HCP/NCCP)	South Coast Inventory Block	4	8.5748762	2.7915764
Proposed Action (HCP/NCCP)	South Coast Inventory Block	5	10.34982	3.3291406
Proposed Action (HCP/NCCP)	South Coast Inventory Block	6	11.264186	4.4642779
Proposed Action (HCP/NCCP)	South Coast Inventory Block	7	11.651791	5.2750452
Proposed Action (HCP/NCCP)	South Coast Inventory Block	8	11.605765	6.1709477
Proposed Action (HCP/NCCP)	South Coast Inventory Block	9	11.429078	6.9434918
Proposed Action (HCP/NCCP)	South Coast Inventory Block	10	11.619507	7.6239743
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	0	5.449462	0.9018514
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	1	4.2644191	0.8213711
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	2	5.0769745	0.9473888
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	3	5.5020556	1.4044059
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	4	5.3883756	1.8190803
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	5	6.6630318	2.3115359
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	6	10.111909	3.088325
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	7	11.081727	3.7116873
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	8	10.057666	4.1909339
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	9	9.4844131	5.8475928
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	10	6.7628842	7.3909946

Alternative	Inventory Block	Decade	24-32	>32
No Action (No HCP/No Permit)	Albion Inventory Block	0	16.304792	3.8081625
No Action (No HCP/No Permit)	Albion Inventory Block	1	14.885314	5.2094525
No Action (No HCP/No Permit)	Albion Inventory Block	2	18.924284	6.116315
No Action (No HCP/No Permit)	Albion Inventory Block	3	18.609855	10.800023
No Action (No HCP/No Permit)	Albion Inventory Block	4	18.530056	13.502832
No Action (No HCP/No Permit)	Albion Inventory Block	5	18.889753	13.80502
No Action (No HCP/No Permit)	Albion Inventory Block	6	22.061547	14.944368
No Action (No HCP/No Permit)	Albion Inventory Block	7	25.247744	15.383365
No Action (No HCP/No Permit)	Albion Inventory Block	8	24.72891	16.890534
No Action (No HCP/No Permit)	Albion Inventory Block	9	22.640038	17.783762
No Action (No HCP/No Permit)	Albion Inventory Block	10	20.000084	20.052541
No Action (No HCP/No Permit)	Big River Inventory Block	0	6.4298012	1.5290544
No Action (No HCP/No Permit)	Big River Inventory Block	1	6.3336608	1.9543852
No Action (No HCP/No Permit)	Big River Inventory Block	2	9.4988163	2.3237585
No Action (No HCP/No Permit)	Big River Inventory Block	3	11.165574	3.4764789
No Action (No HCP/No Permit)	Big River Inventory Block	4	16.005477	4.5937408
No Action (No HCP/No Permit)	Big River Inventory Block	5	19.477281	5.8747258
No Action (No HCP/No Permit)	Big River Inventory Block	6	23.111008	7.0225612
No Action (No HCP/No Permit)	Big River Inventory Block	7	25.346138	8.05876
No Action (No HCP/No Permit)	Big River Inventory Block	8	23.772254	9.5656202
No Action (No HCP/No Permit)	Big River Inventory Block	9	20.415223	11.95244
No Action (No HCP/No Permit)	Big River Inventory Block	10	17.111113	13.163843
No Action (No HCP/No Permit)	Garcia River Inventory Block	0	8.4019518	1.5632066
No Action (No HCP/No Permit)	Garcia River Inventory Block	1	8.4458303	1.9669975
No Action (No HCP/No Permit)	Garcia River Inventory Block	2	12.716547	2.1045574
No Action (No HCP/No Permit)	Garcia River Inventory Block	3	13.861529	3.4694067
No Action (No HCP/No Permit)	Garcia River Inventory Block	4	16.134531	4.7611219
No Action (No HCP/No Permit)	Garcia River Inventory Block	5	19.529808	5.9395913
No Action (No HCP/No Permit)	Garcia River Inventory Block	6	19.227471	7.5945381
No Action (No HCP/No Permit)	Garcia River Inventory Block	7	22.885461	8.6758652
No Action (No HCP/No Permit)	Garcia River Inventory Block	8	21.701098	10.497802
No Action (No HCP/No Permit)	Garcia River Inventory Block	9	20.159018	11.284147
No Action (No HCP/No Permit)	Garcia River Inventory Block	10	18.201675	11.518293
No Action (No HCP/No Permit)	Navarro East Inventory Block	0	5.2958344	0.9944241
No Action (No HCP/No Permit)	Navarro East Inventory Block	1	5.4207979	1.2097257
No Action (No HCP/No Permit)	Navarro East Inventory Block	2	8.6187767	1.5472633
No Action (No HCP/No Permit)	Navarro East Inventory Block	3	11.631441	3.0805687
No Action (No HCP/No Permit)	Navarro East Inventory Block	4	14.769847	3.9050261
No Action (No HCP/No Permit)	Navarro East Inventory Block	5	19.307748	5.0875333
No Action (No HCP/No Permit)	Navarro East Inventory Block	6	24.389015	6.3380925
No Action (No HCP/No Permit)	Navarro East Inventory Block	7	23.944545	7.8701945
No Action (No HCP/No Permit)	Navarro East Inventory Block	8	22.314692	9.4923856
No Action (No HCP/No Permit)	Navarro East Inventory Block	9	19.363298	10.604058
No Action (No HCP/No Permit)	Navarro East Inventory Block	10	16.209294	11.705793
No Action (No HCP/No Permit)	Navarro West Inventory Block	0	9.9300914	4.9076798
No Action (No HCP/No Permit)	Navarro West Inventory Block	1	9.3161082	5.8183867
No Action (No HCP/No Permit)	Navarro West Inventory Block	2	13.129769	5.8748501
No Action (No HCP/No Permit)	Navarro West Inventory Block	3	15.026098	7.7691194
No Action (No HCP/No Permit)	Navarro West Inventory Block	4	17.838483	9.0299627
No Action (No HCP/No Permit)	Navarro West Inventory Block	5	19.911871	10.930537
No Action (No HCP/No Permit)	Navarro West Inventory Block	6	22.743877	12.33321
No Action (No HCP/No Permit)	Navarro West Inventory Block	7	25.329463	14.067961
No Action (No HCP/No Permit)	Navarro West Inventory Block	8	25.710991	15.558957
No Action (No HCP/No Permit)	Navarro West Inventory Block	9	23.675495	17.200468
No Action (No HCP/No Permit)	Navarro West Inventory Block	10	21.187904	18.944119
No Action (No HCP/No Permit)	Noyo Inventory Block	0	5.5965547	1.0344516
No Action (No HCP/No Permit)	Noyo Inventory Block	1	6.1041249	1.3658657
No Action (No HCP/No Permit)	Noyo Inventory Block	2	9.1232366	1.6369363
No Action (No HCP/No Permit)	Noyo Inventory Block	3	13.516582	2.9916082
No Action (No HCP/No Permit)	Noyo Inventory Block	4	17.598712	4.9119991
No Action (No HCP/No Permit)	Noyo Inventory Block	5	20.480603	6.0612676
No Action (No HCP/No Permit)	Noyo Inventory Block	6	21.704401	7.4320179
No Action (No HCP/No Permit)	Noyo Inventory Block	7	22.544681	9.4363639
No Action (No HCP/No Permit)	Noyo Inventory Block	8	21.101694	10.840141
No Action (No HCP/No Permit)	Noyo Inventory Block	9	18.178804	12.846799
No Action (No HCP/No Permit)	Noyo Inventory Block	10	16.082482	12.171786
No Action (No HCP/No Permit)	Rockport Inventory Block	0	6.889893	1.2656001
No Action (No HCP/No Permit)	Rockport Inventory Block	1	6.6864778	1.6626955
No Action (No HCP/No Permit)	Rockport Inventory Block	2	11.731669	1.9625574
No Action (No HCP/No Permit)	Rockport Inventory Block	3	15.752117	3.403853
No Action (No HCP/No Permit)	Rockport Inventory Block	4	18.673799	5.3369329
No Action (No HCP/No Permit)	Rockport Inventory Block	5	21.935505	7.0976332
No Action (No HCP/No Permit)	Rockport Inventory Block	6	21.675299	8.8878931
No Action (No HCP/No Permit)	Rockport Inventory Block	7	20.646563	10.01324
No Action (No HCP/No Permit)	Rockport Inventory Block	8	22.931041	11.457087
No Action (No HCP/No Permit)	Rockport Inventory Block	9	19.4743	12.465279
No Action (No HCP/No Permit)	Rockport Inventory Block	10	17.435141	12.107645

Alternative	Inventory Block	Decade	24-32	>32
No Action (No HCP/No Permit)	South Coast Inventory Block	0	8.1688276	2.0369914
No Action (No HCP/No Permit)	South Coast Inventory Block	1	7.8583325	2.4866019
No Action (No HCP/No Permit)	South Coast Inventory Block	2	12.843414	2.8233201
No Action (No HCP/No Permit)	South Coast Inventory Block	3	16.778396	4.5888137
No Action (No HCP/No Permit)	South Coast Inventory Block	4	17.571104	6.4041455
No Action (No HCP/No Permit)	South Coast Inventory Block	5	19.105122	7.1612316
No Action (No HCP/No Permit)	South Coast Inventory Block	6	19.909653	9.0154787
No Action (No HCP/No Permit)	South Coast Inventory Block	7	21.17636	10.537005
No Action (No HCP/No Permit)	South Coast Inventory Block	8	21.627357	11.805271
No Action (No HCP/No Permit)	South Coast Inventory Block	9	20.517555	13.096696
No Action (No HCP/No Permit)	South Coast Inventory Block	10	19.965401	14.202914
No Action (No HCP/No Permit)	Ukiah Inventory Block	0	7.0343546	1.4694705
No Action (No HCP/No Permit)	Ukiah Inventory Block	1	6.7850698	1.8491451
No Action (No HCP/No Permit)	Ukiah Inventory Block	2	9.6123542	1.9048041
No Action (No HCP/No Permit)	Ukiah Inventory Block	3	12.248716	3.3737347
No Action (No HCP/No Permit)	Ukiah Inventory Block	4	13.183649	5.2460764
No Action (No HCP/No Permit)	Ukiah Inventory Block	5	19.050385	7.3687566
No Action (No HCP/No Permit)	Ukiah Inventory Block	6	31.466348	10.262349
No Action (No HCP/No Permit)	Ukiah Inventory Block	7	32.330488	14.385245
No Action (No HCP/No Permit)	Ukiah Inventory Block	8	30.226031	17.675069
No Action (No HCP/No Permit)	Ukiah Inventory Block	9	18.342971	27.391538
No Action (No HCP/No Permit)	Ukiah Inventory Block	10	9.6255205	35.104799
Proposed Action (HCP/NCCP)	Albion Inventory Block	0	16.304792	3.8081625
Proposed Action (HCP/NCCP)	Albion Inventory Block	1	13.244434	5.0599419
Proposed Action (HCP/NCCP)	Albion Inventory Block	2	17.371972	5.7475499
Proposed Action (HCP/NCCP)	Albion Inventory Block	3	18.409996	10.064599
Proposed Action (HCP/NCCP)	Albion Inventory Block	4	18.13913	13.50859
Proposed Action (HCP/NCCP)	Albion Inventory Block	5	20.54907	16.198865
Proposed Action (HCP/NCCP)	Albion Inventory Block	6	23.086682	19.804158
Proposed Action (HCP/NCCP)	Albion Inventory Block	7	27.991193	20.971732
Proposed Action (HCP/NCCP)	Albion Inventory Block	8	27.624902	23.171505
Proposed Action (HCP/NCCP)	Albion Inventory Block	9	27.391952	24.833894
Proposed Action (HCP/NCCP)	Albion Inventory Block	10	23.524698	28.024345
Proposed Action (HCP/NCCP)	Big River Inventory Block	0	6.4298012	1.5290544
Proposed Action (HCP/NCCP)	Big River Inventory Block	1	6.2788372	1.9395142
Proposed Action (HCP/NCCP)	Big River Inventory Block	2	9.5948491	2.4170321
Proposed Action (HCP/NCCP)	Big River Inventory Block	3	11.804694	4.0059563
Proposed Action (HCP/NCCP)	Big River Inventory Block	4	17.060757	5.4482123
Proposed Action (HCP/NCCP)	Big River Inventory Block	5	22.726752	7.9147746
Proposed Action (HCP/NCCP)	Big River Inventory Block	6	29.274562	10.477967
Proposed Action (HCP/NCCP)	Big River Inventory Block	7	34.359226	13.185982
Proposed Action (HCP/NCCP)	Big River Inventory Block	8	35.228933	17.825299
Proposed Action (HCP/NCCP)	Big River Inventory Block	9	31.19077	23.494422
Proposed Action (HCP/NCCP)	Big River Inventory Block	10	27.092623	27.055674
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	0	8.4019518	1.5632066
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	1	8.4191027	2.0661277
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	2	12.863846	2.3195417
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	3	14.83444	4.0360148
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	4	19.197907	5.610596
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	5	24.143643	8.017787
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	6	26.12576	11.190331
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	7	30.737984	13.545727
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	8	30.109204	18.071945
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	9	28.796868	20.277151
Proposed Action (HCP/NCCP)	Garcia River Inventory Block	10	25.931724	22.520491
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	0	5.2958344	0.9944241
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	1	5.3705953	1.2025568
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	2	8.4971057	1.4985244
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	3	12.195159	3.1365408
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	4	17.312937	4.4414808
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	5	22.774318	6.6772619
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	6	30.303651	9.3832948
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	7	32.049925	13.129159
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	8	31.675734	17.933792
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	9	28.82764	21.745641
Proposed Action (HCP/NCCP)	Navarro East Inventory Block	10	25.240256	24.374433
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	0	9.9300914	4.9076798
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	1	9.4407703	6.1258847
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	2	13.72099	6.2456177
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	3	16.680126	8.6942925
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	4	20.134493	10.606421
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	5	23.031683	13.838995
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	6	26.587162	16.213792
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	7	29.269922	19.454487
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	8	31.315335	21.480578
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	9	27.941764	24.794215
Proposed Action (HCP/NCCP)	Navarro West Inventory Block	10	26.769461	26.894355

Alternative	Inventory Block	Decade	24-32	>32
Proposed Action (HCP/NCCP)	Noyo Inventory Block	0	5.5965547	1.0344516
Proposed Action (HCP/NCCP)	Noyo Inventory Block	1	6.0398517	1.3174076
Proposed Action (HCP/NCCP)	Noyo Inventory Block	2	9.4443153	1.5983136
Proposed Action (HCP/NCCP)	Noyo Inventory Block	3	13.943208	3.036378
Proposed Action (HCP/NCCP)	Noyo Inventory Block	4	18.861471	5.3096045
Proposed Action (HCP/NCCP)	Noyo Inventory Block	5	24.479202	7.6099893
Proposed Action (HCP/NCCP)	Noyo Inventory Block	6	31.414776	10.744201
Proposed Action (HCP/NCCP)	Noyo Inventory Block	7	31.011577	15.264431
Proposed Action (HCP/NCCP)	Noyo Inventory Block	8	31.286388	19.493145
Proposed Action (HCP/NCCP)	Noyo Inventory Block	9	25.440002	23.455701
Proposed Action (HCP/NCCP)	Noyo Inventory Block	10	25.59221	24.213314
Proposed Action (HCP/NCCP)	Rockport Inventory Block	0	6.889893	1.2656001
Proposed Action (HCP/NCCP)	Rockport Inventory Block	1	6.5266136	1.6098782
Proposed Action (HCP/NCCP)	Rockport Inventory Block	2	11.074898	1.87131
Proposed Action (HCP/NCCP)	Rockport Inventory Block	3	16.003539	3.2731525
Proposed Action (HCP/NCCP)	Rockport Inventory Block	4	19.757378	5.7428655
Proposed Action (HCP/NCCP)	Rockport Inventory Block	5	26.370356	8.7472781
Proposed Action (HCP/NCCP)	Rockport Inventory Block	6	29.545183	13.576396
Proposed Action (HCP/NCCP)	Rockport Inventory Block	7	30.202842	17.640888
Proposed Action (HCP/NCCP)	Rockport Inventory Block	8	27.263765	23.186877
Proposed Action (HCP/NCCP)	Rockport Inventory Block	9	26.971053	24.006362
Proposed Action (HCP/NCCP)	Rockport Inventory Block	10	24.271021	24.76353
Proposed Action (HCP/NCCP)	South Coast Inventory Block	0	8.1688276	2.0369914
Proposed Action (HCP/NCCP)	South Coast Inventory Block	1	7.7082369	2.4769084
Proposed Action (HCP/NCCP)	South Coast Inventory Block	2	12.890049	2.7492515
Proposed Action (HCP/NCCP)	South Coast Inventory Block	3	17.988826	4.6615897
Proposed Action (HCP/NCCP)	South Coast Inventory Block	4	20.843607	7.0841982
Proposed Action (HCP/NCCP)	South Coast Inventory Block	5	28.550282	9.8034316
Proposed Action (HCP/NCCP)	South Coast Inventory Block	6	29.24133	14.454786
Proposed Action (HCP/NCCP)	South Coast Inventory Block	7	29.971259	18.900095
Proposed Action (HCP/NCCP)	South Coast Inventory Block	8	27.839208	22.121644
Proposed Action (HCP/NCCP)	South Coast Inventory Block	9	27.18604	25.0086
Proposed Action (HCP/NCCP)	South Coast Inventory Block	10	26.657198	26.689946
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	0	7.0343546	1.4694705
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	1	6.674351	1.8411302
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	2	9.4771101	1.8968285
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	3	11.83803	3.3049552
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	4	12.246568	4.9991833
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	5	16.973863	6.9653969
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	6	27.942592	9.6946365
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	7	30.020034	13.679292
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	8	27.614442	16.815053
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	9	18.032678	26.851169
Proposed Action (HCP/NCCP)	Ukiah Inventory Block	10	9.6513674	35.105288
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	0	16.304792	3.8081625
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	1	13.737148	5.237222
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	2	18.81791	6.2854858
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	3	20.208085	11.131122
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	4	20.103411	15.932534
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	5	22.90932	19.225307
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	6	26.173544	23.736934
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	7	32.446818	26.8969
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	8	32.570907	31.413204
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	9	31.990705	36.937576
Alternative A (Enhanced HCP/NCCP)	Albion Inventory Block	10	28.468902	43.120083
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	0	6.4298012	1.5290544
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	1	6.3345007	1.957658
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	2	9.8562096	2.4711389
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	3	12.350126	4.1858286
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	4	18.34417	5.7230292
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	5	24.998264	8.4588988
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	6	34.872659	11.391946
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	7	40.764695	15.268859
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	8	42.68864	22.535634
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	9	38.893935	31.945738
Alternative A (Enhanced HCP/NCCP)	Big River Inventory Block	10	35.760537	39.126501
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	0	8.4019518	1.5632066
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	1	8.640936	2.0945588
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	2	13.910384	2.4676089
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	3	16.41106	4.4345871
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	4	21.697586	6.4045234
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	5	28.384798	9.2717143
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	6	31.050009	13.531258
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	7	37.686146	17.507183
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	8	39.726906	24.613234
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	9	41.539321	29.535867
Alternative A (Enhanced HCP/NCCP)	Garcia River Inventory Block	10	42.601203	35.833404

Alternative	Inventory Block	Decade	24-32	>32
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	0	5.2958344	0.9944241
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	1	5.4464329	1.2127538
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	2	8.8925796	1.552138
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	3	13.086757	3.317874
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	4	19.693136	4.7719645
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	5	28.839439	7.4870797
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	6	36.745477	12.093761
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	7	40.434941	17.207567
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	8	40.688554	25.81924
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	9	37.117119	34.522886
Alternative A (Enhanced HCP/NCCP)	Navarro East Inventory Block	10	35.247094	41.775401
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	0	9.9300914	4.9076798
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	1	9.5069242	5.9616674
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	2	14.442873	6.3802848
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	3	18.108796	9.1296481
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	4	22.565357	11.689071
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	5	26.180223	15.648686
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	6	31.396915	19.401258
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	7	35.611503	24.083443
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	8	39.114265	28.710135
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	9	36.506176	34.910646
Alternative A (Enhanced HCP/NCCP)	Navarro West Inventory Block	10	33.473513	41.363512
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	0	5.5965547	1.0344516
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	1	6.1839108	1.3709711
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	2	9.870921	1.6850122
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	3	15.03749	3.2882828
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	4	20.724617	5.862352
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	5	27.804971	8.5300228
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	6	36.977461	12.164722
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	7	37.230398	18.244991
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	8	39.508976	24.772186
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	9	33.835951	33.476776
Alternative A (Enhanced HCP/NCCP)	Noyo Inventory Block	10	35.072447	38.145567
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	0	6.889893	1.2656001
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	1	6.7128502	1.6711263
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	2	12.033571	1.9918796
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	3	17.841013	3.6258223
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	4	22.364486	6.5030354
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	5	29.941258	9.9380578
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	6	33.713119	15.777945
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	7	37.049985	21.425845
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	8	34.973262	30.049274
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	9	34.372873	37.631011
Alternative A (Enhanced HCP/NCCP)	Rockport Inventory Block	10	31.599781	43.980489
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	0	8.1688276	2.0369914
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	1	7.9123727	2.5368846
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	2	13.883039	2.9454721
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	3	19.785737	5.1489705
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	4	23.379789	7.9879629
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	5	31.775012	11.094879
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	6	32.851653	16.478183
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	7	37.235848	21.840499
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	8	37.434534	29.600225
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	9	40.397149	36.344322
Alternative A (Enhanced HCP/NCCP)	South Coast Inventory Block	10	40.250836	42.87953
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	0	7.0343546	1.4694705
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	1	6.7884954	1.8491467
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	2	9.6126812	1.9048188
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	3	12.381384	3.3897944
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	4	13.682899	5.3299283
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	5	19.123342	7.4053025
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	6	32.46357	10.659282
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	7	34.65575	15.328251
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	8	32.335091	19.838021
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	9	20.929981	31.816796
Alternative A (Enhanced HCP/NCCP)	Ukiah Inventory Block	10	12.3605	41.044755
Alternative B (Reserves)	Albion Inventory Block	0	16.304792	3.8081625
Alternative B (Reserves)	Albion Inventory Block	1	12.38755	4.8428386
Alternative B (Reserves)	Albion Inventory Block	2	14.851521	5.1069583
Alternative B (Reserves)	Albion Inventory Block	3	15.244944	7.6452416
Alternative B (Reserves)	Albion Inventory Block	4	15.675754	10.120347
Alternative B (Reserves)	Albion Inventory Block	5	18.112382	11.883348
Alternative B (Reserves)	Albion Inventory Block	6	21.376397	13.759266
Alternative B (Reserves)	Albion Inventory Block	7	24.531884	15.349839
Alternative B (Reserves)	Albion Inventory Block	8	26.023265	18.184148
Alternative B (Reserves)	Albion Inventory Block	9	26.513732	21.000698
Alternative B (Reserves)	Albion Inventory Block	10	23.20892	25.889125

Large Tree Density (TPA) (riparian) by Inventory Block

Alternative	Inventory Block	Decade	24-32	>32
Alternative B (Reserves)	Big River Inventory Block	0	6.4298012	1.5290544
Alternative B (Reserves)	Big River Inventory Block	1	6.0899533	1.8561809
Alternative B (Reserves)	Big River Inventory Block	2	8.7370731	2.1654447
Alternative B (Reserves)	Big River Inventory Block	3	10.680438	3.2442225
Alternative B (Reserves)	Big River Inventory Block	4	15.384841	4.4295182
Alternative B (Reserves)	Big River Inventory Block	5	19.572587	6.1804376
Alternative B (Reserves)	Big River Inventory Block	6	26.186335	7.7251868
Alternative B (Reserves)	Big River Inventory Block	7	29.877616	10.213629
Alternative B (Reserves)	Big River Inventory Block	8	30.081676	14.438458
Alternative B (Reserves)	Big River Inventory Block	9	27.991371	20.35823
Alternative B (Reserves)	Big River Inventory Block	10	25.816763	24.30646
Alternative B (Reserves)	Garcia River Inventory Block	0	8.4019518	1.5632066
Alternative B (Reserves)	Garcia River Inventory Block	1	8.0640396	1.9992355
Alternative B (Reserves)	Garcia River Inventory Block	2	11.889689	2.1832802
Alternative B (Reserves)	Garcia River Inventory Block	3	12.27351	3.1715198
Alternative B (Reserves)	Garcia River Inventory Block	4	15.402475	4.1203439
Alternative B (Reserves)	Garcia River Inventory Block	5	19.861796	5.7082861
Alternative B (Reserves)	Garcia River Inventory Block	6	20.604627	7.7871175
Alternative B (Reserves)	Garcia River Inventory Block	7	26.678439	9.6768258
Alternative B (Reserves)	Garcia River Inventory Block	8	26.83392	13.112353
Alternative B (Reserves)	Garcia River Inventory Block	9	26.511772	15.384125
Alternative B (Reserves)	Garcia River Inventory Block	10	27.062622	19.057083
Alternative B (Reserves)	Navarro East Inventory Block	0	5.2958344	0.9944241
Alternative B (Reserves)	Navarro East Inventory Block	1	5.2184651	1.1943007
Alternative B (Reserves)	Navarro East Inventory Block	2	7.6472893	1.4681138
Alternative B (Reserves)	Navarro East Inventory Block	3	10.070815	2.5852584
Alternative B (Reserves)	Navarro East Inventory Block	4	12.76021	3.289195
Alternative B (Reserves)	Navarro East Inventory Block	5	17.329394	4.405756
Alternative B (Reserves)	Navarro East Inventory Block	6	21.03819	5.6785058
Alternative B (Reserves)	Navarro East Inventory Block	7	22.839278	7.6312037
Alternative B (Reserves)	Navarro East Inventory Block	8	24.299501	10.153892
Alternative B (Reserves)	Navarro East Inventory Block	9	21.897996	12.180938
Alternative B (Reserves)	Navarro East Inventory Block	10	20.391043	15.076821
Alternative B (Reserves)	Navarro West Inventory Block	0	9.9300914	4.9076798
Alternative B (Reserves)	Navarro West Inventory Block	1	9.0765393	6.1036953
Alternative B (Reserves)	Navarro West Inventory Block	2	12.401709	6.1653038
Alternative B (Reserves)	Navarro West Inventory Block	3	14.428795	8.245413
Alternative B (Reserves)	Navarro West Inventory Block	4	18.439627	9.5937497
Alternative B (Reserves)	Navarro West Inventory Block	5	20.831078	12.257613
Alternative B (Reserves)	Navarro West Inventory Block	6	25.359839	14.597884
Alternative B (Reserves)	Navarro West Inventory Block	7	28.104634	17.596115
Alternative B (Reserves)	Navarro West Inventory Block	8	30.728863	21.199961
Alternative B (Reserves)	Navarro West Inventory Block	9	29.68393	25.336669
Alternative B (Reserves)	Navarro West Inventory Block	10	28.230982	29.578006
Alternative B (Reserves)	Noyo Inventory Block	0	5.5965547	1.0344516
Alternative B (Reserves)	Noyo Inventory Block	1	5.4602023	1.2537599
Alternative B (Reserves)	Noyo Inventory Block	2	7.7511065	1.3883412
Alternative B (Reserves)	Noyo Inventory Block	3	11.608056	2.3251898
Alternative B (Reserves)	Noyo Inventory Block	4	15.156075	3.5719811
Alternative B (Reserves)	Noyo Inventory Block	5	18.34036	4.8356558
Alternative B (Reserves)	Noyo Inventory Block	6	22.863917	6.2018186
Alternative B (Reserves)	Noyo Inventory Block	7	23.08938	8.6203899
Alternative B (Reserves)	Noyo Inventory Block	8	23.791487	10.90297
Alternative B (Reserves)	Noyo Inventory Block	9	23.452228	13.694729
Alternative B (Reserves)	Noyo Inventory Block	10	21.714698	16.540358
Alternative B (Reserves)	Rockport Inventory Block	0	6.889893	1.2656001
Alternative B (Reserves)	Rockport Inventory Block	1	6.456866	1.6129971
Alternative B (Reserves)	Rockport Inventory Block	2	10.315123	1.8615626
Alternative B (Reserves)	Rockport Inventory Block	3	14.320083	2.9651956
Alternative B (Reserves)	Rockport Inventory Block	4	17.178123	4.4690718
Alternative B (Reserves)	Rockport Inventory Block	5	20.464763	6.2850535
Alternative B (Reserves)	Rockport Inventory Block	6	22.008522	9.124148
Alternative B (Reserves)	Rockport Inventory Block	7	24.636523	11.679098
Alternative B (Reserves)	Rockport Inventory Block	8	25.12716	15.039797
Alternative B (Reserves)	Rockport Inventory Block	9	25.296483	18.33691
Alternative B (Reserves)	Rockport Inventory Block	10	22.931578	21.825099
Alternative B (Reserves)	South Coast Inventory Block	0	8.1688276	2.0369914
Alternative B (Reserves)	South Coast Inventory Block	1	7.5454369	2.438046
Alternative B (Reserves)	South Coast Inventory Block	2	12.008512	2.6248921
Alternative B (Reserves)	South Coast Inventory Block	3	16.196131	4.1415816
Alternative B (Reserves)	South Coast Inventory Block	4	18.428528	5.9977525
Alternative B (Reserves)	South Coast Inventory Block	5	24.595016	7.9200185
Alternative B (Reserves)	South Coast Inventory Block	6	26.540833	11.474966
Alternative B (Reserves)	South Coast Inventory Block	7	29.252946	15.044333
Alternative B (Reserves)	South Coast Inventory Block	8	30.808366	20.549058
Alternative B (Reserves)	South Coast Inventory Block	9	31.748866	25.53008
Alternative B (Reserves)	South Coast Inventory Block	10	31.922762	30.039249

Large Tree Density (TPA) (riparian) by Inventory Block

Alternative	Inventory Block	Decade	24-32	>32
Alternative B (Reserves)	Ukiah Inventory Block	0	7.0343546	1.4694705
Alternative B (Reserves)	Ukiah Inventory Block	1	6.7852451	1.8491578
Alternative B (Reserves)	Ukiah Inventory Block	2	8.1178746	1.5314758
Alternative B (Reserves)	Ukiah Inventory Block	3	9.6074684	2.6318263
Alternative B (Reserves)	Ukiah Inventory Block	4	12.04287	3.2433006
Alternative B (Reserves)	Ukiah Inventory Block	5	14.884896	4.9758264
Alternative B (Reserves)	Ukiah Inventory Block	6	20.156598	5.5410811
Alternative B (Reserves)	Ukiah Inventory Block	7	25.580542	7.5650148
Alternative B (Reserves)	Ukiah Inventory Block	8	21.743014	9.0900387
Alternative B (Reserves)	Ukiah Inventory Block	9	19.35906	12.044903
Alternative B (Reserves)	Ukiah Inventory Block	10	15.708549	16.442216
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	0	16.304792	3.8081625
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	1	13.244434	5.0599419
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	2	17.371972	5.7475499
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	3	18.409996	10.064599
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	4	18.13913	13.50859
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	Albion Inventory Block	10	0	0
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	0	6.4298012	1.5290544
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	1	6.2788372	1.9395142
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	2	9.5948491	2.4170321
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	3	11.804694	4.0059563
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	4	17.060757	5.4482123
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	Big River Inventory Block	10	0	0
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	0	8.4019518	1.5632066
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	1	8.4191027	2.0661277
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	2	12.863846	2.3195417
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	3	14.83444	4.0360148
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	4	19.197907	5.610596
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	Garcia River Inventory Block	10	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	0	5.2958344	0.9944241
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	1	5.3705953	1.2025568
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	2	8.4971057	1.4985244
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	3	12.195159	3.1365408
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	4	17.312937	4.4414808
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro East Inventory Block	10	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	0	9.9300914	4.9076798
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	1	9.4407703	6.1258847
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	2	13.72099	6.2456177
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	3	16.680126	8.6942925
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	4	20.134493	10.606421
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	Navarro West Inventory Block	10	0	0
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	0	5.5965547	1.0344516
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	1	6.0398517	1.3174076
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	2	9.4443153	1.5983136
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	3	13.943208	3.036378
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	4	18.861471	5.3096045
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	Noyo Inventory Block	10	0	0

Alternative	Inventory Block	Decade	24-32	>32
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	0	6.889893	1.2656001
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	1	6.5266136	1.6098782
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	2	11.074898	1.87131
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	3	16.003539	3.2731525
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	4	19.757378	5.7428655
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	Rockport Inventory Block	10	0	0
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	0	8.1688276	2.0369914
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	1	7.7082369	2.4769084
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	2	12.890049	2.7492515
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	3	17.988826	4.6615897
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	4	20.843607	7.0841982
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	South Coast Inventory Block	10	0	0
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	0	7.0343546	1.4694705
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	1	6.674351	1.8411302
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	2	9.4771101	1.8968285
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	3	11.83803	3.3049552
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	4	12.246568	4.9991833
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	5	0	0
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	6	0	0
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	7	0	0
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	8	0	0
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	9	0	0
Alternative C (HCP Only and Shorter ITP Term)	Ukiah Inventory Block	10	0	0

Marbled Murrelet Habitat Plan Area

Alternative	Inventory Block	MaMu Zone	Suitability	0	10	20	30	40	50	60	70	80	90	100
Alternative A (Enhanced HCP/NCCP)	Plan Area	Zone I	PS	1840.76	1177.94	2212.40	4588.89	5871.44	8512.97	11384.68	12886.49	13359.42	13514.52	13583.25
Alternative A (Enhanced HCP/NCCP)	Plan Area	Zone II	PS	257.16	329.64	291.40	297.85	348.76	615.96	1045.28	1323.39	2530.48	3402.13	4377.57
Alternative A (Enhanced HCP/NCCP)	Plan Area	Zone III	PS	88.41	69.58	45.20	45.20	45.20	45.20	45.20	64.14	237.22	389.28	864.48
Alternative B (Reserves)	Plan Area	Zone I	PS	1840.76	1384.22	2490.33	6390.71	8339.45	11654.69	20219.34	26322.23	29325.35	30561.53	31335.57
Alternative B (Reserves)	Plan Area	Zone II	PS	257.16	340.24	343.36	336.84	352.19	598.83	807.60	1072.86	2431.35	3119.03	3908.23
Alternative B (Reserves)	Plan Area	Zone III	PS	88.41	23.95	0.00	0.00	0.00	0.00	0.00	18.94	83.68	388.56	1264.93
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	Zone I	PS	1840.76	1111.78	1967.54	4025.69	4955.57	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	Zone II	PS	257.16	329.64	271.88	286.45	337.35	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	Zone III	PS	88.41	69.58	45.20	45.20	45.20	0.00	0.00	0.00	0.00	0.00	0.00
No Action (No HCP/No Permit)	Plan Area	Zone I	PS	1840.76	1168.97	1967.77	3892.44	5237.67	6688.07	9940.68	10669.71	11335.55	11547.16	11484.43
No Action (No HCP/No Permit)	Plan Area	Zone II	PS	257.16	346.59	269.87	260.25	291.02	399.71	504.76	647.14	1041.93	1227.67	1801.26
No Action (No HCP/No Permit)	Plan Area	Zone III	PS	88.41	114.19	89.80	40.08	40.08	40.08	40.08	59.02	92.86	252.83	560.12
Proposed Action (HCP/NCCP)	Plan Area	Zone I	PS	1840.76	1111.78	1967.54	4025.69	4955.57	7320.65	9712.89	10749.17	11135.32	11181.73	11335.61
Proposed Action (HCP/NCCP)	Plan Area	Zone II	PS	257.16	329.64	271.88	286.45	337.35	518.89	1007.33	1279.61	2035.23	2833.68	3688.59
Proposed Action (HCP/NCCP)	Plan Area	Zone III	PS	88.41	69.58	45.20	45.20	45.20	45.20	45.20	64.14	85.74	214.91	349.12

Alternative	Inventory Block	Year	Nesting-Roosting Habitat	Foraging Habitat	Non-Suitable Habitat	Percent Suitable	Percent Non-Suitable
No Action (No HCP/No Permit)	Plan Area	0	47357.87	131463.01	24049.22	88%	12%
No Action (No HCP/No Permit)	Plan Area	10	40013.61	126708.20	36148.30	82%	18%
No Action (No HCP/No Permit)	Plan Area	20	63213.71	97406.29	42250.10	79%	21%
No Action (No HCP/No Permit)	Plan Area	30	67559.11	103589.09	31721.91	84%	16%
No Action (No HCP/No Permit)	Plan Area	40	56913.40	130603.20	15353.50	92%	8%
No Action (No HCP/No Permit)	Plan Area	50	47480.82	142476.25	12913.03	94%	6%
No Action (No HCP/No Permit)	Plan Area	60	45714.77	146665.65	10489.68	95%	5%
No Action (No HCP/No Permit)	Plan Area	70	44595.87	153377.67	4896.57	98%	2%
No Action (No HCP/No Permit)	Plan Area	80	41770.42	158681.90	2417.78	99%	1%
No Action (No HCP/No Permit)	Plan Area	90	44425.07	156336.55	2108.48	99%	1%
No Action (No HCP/No Permit)	Plan Area	100	44162.06	157006.20	1701.84	99%	1%
Proposed Action (HCP/NCCP)	Plan Area	0	47357.87	131463.01	24049.22	88%	12%
Proposed Action (HCP/NCCP)	Plan Area	10	39948.11	123111.70	39810.29	80%	20%
Proposed Action (HCP/NCCP)	Plan Area	20	57117.25	102496.55	43256.31	79%	21%
Proposed Action (HCP/NCCP)	Plan Area	30	71668.78	110898.12	20303.20	90%	10%
Proposed Action (HCP/NCCP)	Plan Area	40	76893.94	115739.29	10236.86	95%	5%
Proposed Action (HCP/NCCP)	Plan Area	50	62942.28	123820.34	16107.48	92%	8%
Proposed Action (HCP/NCCP)	Plan Area	60	77289.74	110572.23	15008.14	93%	7%
Proposed Action (HCP/NCCP)	Plan Area	70	68815.36	116349.76	17704.98	91%	9%
Proposed Action (HCP/NCCP)	Plan Area	80	62903.94	120407.66	19558.51	90%	10%
Proposed Action (HCP/NCCP)	Plan Area	90	60861.68	123226.87	18781.55	91%	9%
Proposed Action (HCP/NCCP)	Plan Area	100	59655.16	124015.45	19199.49	91%	9%
Alternative A (Enhanced HCP/NCCP)	Plan Area	0	47357.87	131463.01	24049.22	88%	12%
Alternative A (Enhanced HCP/NCCP)	Plan Area	10	41408.71	126648.91	34812.48	83%	17%
Alternative A (Enhanced HCP/NCCP)	Plan Area	20	57877.55	105592.36	39400.19	81%	19%
Alternative A (Enhanced HCP/NCCP)	Plan Area	30	71162.19	110530.38	21177.53	90%	10%
Alternative A (Enhanced HCP/NCCP)	Plan Area	40	86388.48	105895.73	10585.90	95%	5%
Alternative A (Enhanced HCP/NCCP)	Plan Area	50	70535.91	123951.65	8382.54	96%	4%
Alternative A (Enhanced HCP/NCCP)	Plan Area	60	77996.30	114439.53	10434.27	95%	5%
Alternative A (Enhanced HCP/NCCP)	Plan Area	70	71125.55	118773.94	12970.61	94%	6%
Alternative A (Enhanced HCP/NCCP)	Plan Area	80	73532.68	115432.51	13904.91	93%	7%
Alternative A (Enhanced HCP/NCCP)	Plan Area	90	70785.78	118313.17	13771.15	93%	7%
Alternative A (Enhanced HCP/NCCP)	Plan Area	100	69152.55	120048.64	13668.91	93%	7%
Alternative B (Reserves)	Plan Area	0	47357.87	131463.01	24049.22	88%	12%
Alternative B (Reserves)	Plan Area	10	44076.30	107855.21	50938.59	75%	25%
Alternative B (Reserves)	Plan Area	20	74989.98	78317.13	49562.99	76%	24%
Alternative B (Reserves)	Plan Area	30	90433.19	61593.40	50843.51	75%	25%
Alternative B (Reserves)	Plan Area	40	92723.96	66559.68	43586.47	79%	21%
Alternative B (Reserves)	Plan Area	50	98409.06	67694.89	36766.15	82%	18%
Alternative B (Reserves)	Plan Area	60	112057.26	61318.93	29493.92	85%	15%
Alternative B (Reserves)	Plan Area	70	114414.00	56923.77	31532.33	84%	16%

Northern Spotted Owl Habitat (forestwide) Plan Area

Alternative	Inventory Block	Year	Nesting-Roosting Habitat	Foraging Habitat	Non-Suitable Habitat	Percent Suitable	Percent Non-Suitable
Alternative B (Reserves)	Plan Area	80	114734.27	51586.02	36549.81	82%	18%
Alternative B (Reserves)	Plan Area	90	101004.27	54245.31	47620.52	77%	23%
Alternative B (Reserves)	Plan Area	100	103300.97	58533.38	41035.75	80%	20%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	0	47357.87	131463.01	24049.22	88%	12%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	10	39948.11	123111.70	39810.29	80%	20%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	20	57117.25	102496.55	43256.31	79%	21%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	30	71668.78	110898.12	20303.20	90%	10%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	40	76893.94	115739.29	10236.86	95%	5%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	50	0.00	0.00	0.00	0%	0%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	60	0.00	0.00	0.00	0%	0%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	70	0.00	0.00	0.00	0%	0%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	80	0.00	0.00	0.00	0%	0%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	90	0.00	0.00	0.00	0%	0%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	100	0.00	0.00	0.00	0%	0%

Appendix R

Timber Model Output Tables for the Air Quality Environmental Effects Analysis

Alternative	Inventory Block	Year	Total Volume (bf)	Conifer Volume (bf)	Conifer Volume (bf) per Acre	Conifer Growth (bf)	Conifer Growth per Acre per Year(bf)	Conifer Percentage Growth per Year (bf)
Alternative A (Enhanced HCP/NCCP)	Plan Area	0	3127526100	2603705906	12834	0	0	0%
Alternative A (Enhanced HCP/NCCP)	Plan Area	10	3300703615	2892921535	14260	970681202	478	3%
Alternative A (Enhanced HCP/NCCP)	Plan Area	20	3682495916	3379398494	16658	1104232387	544	3%
Alternative A (Enhanced HCP/NCCP)	Plan Area	30	4275445751	3973903859	19588	1243876761	613	3%
Alternative A (Enhanced HCP/NCCP)	Plan Area	40	4930943926	4638244027	22863	1374718251	678	3%
Alternative A (Enhanced HCP/NCCP)	Plan Area	50	5475924105	5190865946	25587	1426981799	703	3%
Alternative A (Enhanced HCP/NCCP)	Plan Area	60	5988493455	5706863955	28131	1455404331	717	3%
Alternative A (Enhanced HCP/NCCP)	Plan Area	70	6492905709	6217887472	30650	1507623768	743	2%
Alternative A (Enhanced HCP/NCCP)	Plan Area	80	7019042204	6748941509	33267	1577259045	777	2%
Alternative A (Enhanced HCP/NCCP)	Plan Area	90	7615230689	7345433533	36208	1646994094	812	2%
Alternative A (Enhanced HCP/NCCP)	Plan Area	100	8330729856	8059207763	39726	1739971327	858	2%
Alternative B (Reserves)	Plan Area	0	3127526100	2603705906	12834	0	0	0%
Alternative B (Reserves)	Plan Area	10	3293515597	2837002236	13984	972339039	479	3%
Alternative B (Reserves)	Plan Area	20	3996319619	3608938937	17789	1119630987	552	3%
Alternative B (Reserves)	Plan Area	30	4502118370	4150380929	20458	1211152184	597	3%
Alternative B (Reserves)	Plan Area	40	5108065931	4758965256	23458	1357291199	669	3%
Alternative B (Reserves)	Plan Area	50	5873155928	5524977069	27234	1526273391	752	3%
Alternative B (Reserves)	Plan Area	60	6692047358	6348768575	31295	1692089555	834	3%
Alternative B (Reserves)	Plan Area	70	7562847492	7218086443	35580	1799140812	887	2%
Alternative B (Reserves)	Plan Area	80	8693625887	8348944433	41154	1956337692	964	2%
Alternative B (Reserves)	Plan Area	90	9685329048	9337614963	46028	2029675038	1000	2%
Alternative B (Reserves)	Plan Area	100	10927308996	10576133685	52133	2203629946	1086	2%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	0	3127517212	2603697022	12834	0	0	0%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	10	3276014848	2874618539	14170	959391600	473	3%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	20	3561718938	3277322651	16155	1061616026	523	3%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	30	4039861139	3766012145	18564	1183994787	584	3%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	40	4586110059	4329465512	21341	1301523525	642	3%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	50	0	0	0	0	0	0%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	60	0	0	0	0	0	0%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	70	0	0	0	0	0	0%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	80	0	0	0	0	0	0%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	90	0	0	0	0	0	0%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	100	0	0	0	0	0	0%
No Action (No HCP/No Permit)	Plan Area	0	3127526100	2603705906	12834	0	0	0%
No Action (No HCP/No Permit)	Plan Area	10	3422863859	2958540027	14583	989234889	488	3%
No Action (No HCP/No Permit)	Plan Area	20	3778910724	3408607273	16802	1051757216	518	3%
No Action (No HCP/No Permit)	Plan Area	30	4159049038	3832709717	18892	1146939127	565	3%
No Action (No HCP/No Permit)	Plan Area	40	4544905688	4243109141	20915	1231483158	607	3%
No Action (No HCP/No Permit)	Plan Area	50	4721072786	4459750796	21983	1229629033	606	3%
No Action (No HCP/No Permit)	Plan Area	60	4758011991	4522639061	22293	1222202691	602	3%
No Action (No HCP/No Permit)	Plan Area	70	4857134936	4634121407	22843	1239804042	611	3%
No Action (No HCP/No Permit)	Plan Area	80	5016120340	4801391335	23667	1270347053	626	3%
No Action (No HCP/No Permit)	Plan Area	90	5185805277	4975639443	24526	1299684106	641	3%
No Action (No HCP/No Permit)	Plan Area	100	5313323940	5105198660	25165	1320283627	651	3%
Proposed Action (HCP/NCCP)	Plan Area	0	3127517212	2603697022	12834	0	0	0%
Proposed Action (HCP/NCCP)	Plan Area	10	3276014848	2874618539	14170	959391600	473	3%
Proposed Action (HCP/NCCP)	Plan Area	20	3561718938	3277322651	16155	1061616026	523	3%
Proposed Action (HCP/NCCP)	Plan Area	30	4039861139	3766012145	18564	1183994787	584	3%

Alternative	Inventory Block	Year	Total Volume (bf)	Conifer Volume (bf)	Conifer Volume (bf) per Acre	Conifer Growth (bf)	Conifer Growth per Acre per Year(bf)	Conifer Percentage Growth per Year (bf)
Proposed Action (HCP/NCCP)	Plan Area	40	4586110059	4329465512	21341	1301523525	642	3%
Proposed Action (HCP/NCCP)	Plan Area	50	5022820361	4779994688	23562	1348817209	665	3%
Proposed Action (HCP/NCCP)	Plan Area	60	5460032720	5226612627	25763	1368318473	674	3%
Proposed Action (HCP/NCCP)	Plan Area	70	5816420885	5592411100	27566	1392874714	687	2%
Proposed Action (HCP/NCCP)	Plan Area	80	6158372170	5938878961	29274	1433895157	707	2%
Proposed Action (HCP/NCCP)	Plan Area	90	6468717219	6249094238	30803	1458113021	719	2%
Proposed Action (HCP/NCCP)	Plan Area	100	6753778627	6533286075	32204	1488465583	734	2%

Alternative	Inventory Block	Year	Total Conifer Harvest (bf)	Conifer Harvest per Year (bf)	Acres Harvested in Period	Average Yield (bf) per Acre	Total Hardwood Volume (bf)	Harvest as % of Inventory	Harvest % of Growth
Alternative A (Enhanced HCP/NCCP)	Plan Area	0	-	-	0	0	523829695	0%	0%
Alternative A (Enhanced HCP/NCCP)	Plan Area	10	447,728,645	44,772,865	64784	6911	407784765	15%	46%
Alternative A (Enhanced HCP/NCCP)	Plan Area	20	563,262,510	56,326,251	64549	8726	303101415	17%	51%
Alternative A (Enhanced HCP/NCCP)	Plan Area	30	602,404,544	60,240,454	74360	8101	301548717	15%	48%
Alternative A (Enhanced HCP/NCCP)	Plan Area	40	761,424,862	76,142,486	75065	10144	292708059	16%	55%
Alternative A (Enhanced HCP/NCCP)	Plan Area	50	896,835,230	89,683,523	80870	11090	285073532	17%	63%
Alternative A (Enhanced HCP/NCCP)	Plan Area	60	923,132,182	92,313,218	79011	11684	281640505	16%	63%
Alternative A (Enhanced HCP/NCCP)	Plan Area	70	1,021,288,443	102,128,844	84911	12028	275040696	16%	68%
Alternative A (Enhanced HCP/NCCP)	Plan Area	80	999,483,437	99,948,344	80907	12353	270127917	15%	63%
Alternative A (Enhanced HCP/NCCP)	Plan Area	90	1,008,048,273	100,804,827	85011	11858	269829570	14%	61%
Alternative A (Enhanced HCP/NCCP)	Plan Area	100	958,262,361	95,826,236	80263	11939	271558654	12%	55%
Alternative B (Reserves)	Plan Area	0	-	-	0	0	523829695	0%	0%
Alternative B (Reserves)	Plan Area	10	308,906,631	30,890,663	49346	6260	456516156	11%	32%
Alternative B (Reserves)	Plan Area	20	455,559,409	45,555,941	47319	9628	387388565	13%	41%
Alternative B (Reserves)	Plan Area	30	772,275,474	77,227,547	47096	16398	351744066	19%	64%
Alternative B (Reserves)	Plan Area	40	636,708,184	63,670,818	41347	15399	349109936	13%	47%
Alternative B (Reserves)	Plan Area	50	841,191,855	84,119,186	44263	19004	348193417	15%	55%
Alternative B (Reserves)	Plan Area	60	579,937,153	57,993,715	47298	12261	343296003	9%	34%
Alternative B (Reserves)	Plan Area	70	906,984,020	90,698,402	42503	21339	344783871	13%	50%
Alternative B (Reserves)	Plan Area	80	829,646,931	82,964,693	45503	18233	344720158	10%	42%
Alternative B (Reserves)	Plan Area	90	1,143,785,571	114,378,557	46865	24406	347760829	12%	56%
Alternative B (Reserves)	Plan Area	100	648,887,593	64,888,759	42044	15433	351233844	6%	29%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	0	-	-	0	0	523829695	0%	0%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	10	488,590,044	48,859,004	68491	7134	401399112	17%	51%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	20	635,256,862	63,525,686	70640	8993	284399608	19%	60%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	30	624,920,500	62,492,050	80908	7724	273855858	17%	53%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	40	802,812,847	80,281,285	84294	9524	256656206	19%	62%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	50	-	-	0	0	0	0%	0%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	60	-	-	0	0	0	0%	0%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	70	-	-	0	0	0	0%	0%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	80	-	-	0	0	0	0%	0%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	90	-	-	0	0	0	0%	0%
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	100	-	-	0	0	0	0%	0%
No Action (No HCP/No Permit)	Plan Area	0	-	-	0	0	523829695	0%	0%
No Action (No HCP/No Permit)	Plan Area	10	368,356,404	36,835,640	38462	9577	464326805	12%	37%
No Action (No HCP/No Permit)	Plan Area	20	708,744,966	70,874,497	74550	9507	370309588	21%	67%
No Action (No HCP/No Permit)	Plan Area	30	691,984,034	69,198,403	88315	7835	326347772	18%	60%
No Action (No HCP/No Permit)	Plan Area	40	791,073,225	79,107,323	114427	6913	301808461	19%	64%
No Action (No HCP/No Permit)	Plan Area	50	1,214,765,682	121,476,568	141185	8604	261337833	27%	99%
No Action (No HCP/No Permit)	Plan Area	60	1,119,038,398	111,903,840	153403	7295	235390046	25%	92%
No Action (No HCP/No Permit)	Plan Area	70	1,084,082,246	108,408,225	162337	6678	223035056	23%	87%
No Action (No HCP/No Permit)	Plan Area	80	1,099,633,697	109,963,370	169116	6502	214756396	23%	87%
No Action (No HCP/No Permit)	Plan Area	90	1,147,436,784	114,743,678	173069	6630	210196642	23%	88%
No Action (No HCP/No Permit)	Plan Area	100	1,179,236,662	117,923,666	176508	6681	208160627	23%	89%
Proposed Action (HCP/NCCP)	Plan Area	0	-	-	0	0	523829695	0%	0%
Proposed Action (HCP/NCCP)	Plan Area	10	488,590,044	48,859,004	68491	7134	401399112	17%	51%
Proposed Action (HCP/NCCP)	Plan Area	20	635,256,862	63,525,686	70640	8993	284399608	19%	60%
Proposed Action (HCP/NCCP)	Plan Area	30	624,920,500	62,492,050	80908	7724	273855858	17%	53%

Alternative	Inventory Block	Year	Total Conifer Harvest (bf)	Conifer Harvest per Year (bf)	Acres Harvested in Period	Average Yield (bf) per Acre	Total Hardwood Volume (bf)	Harvest as % of Inventory	Harvest % of Growth
Proposed Action (HCP/NCCP)	Plan Area	40	802,812,847	80,281,285	84294	9524	256656206	19%	62%
Proposed Action (HCP/NCCP)	Plan Area	50	903,869,009	90,386,901	90644	9972	242837361	19%	67%
Proposed Action (HCP/NCCP)	Plan Area	60	935,933,194	93,593,319	91212	10261	233430716	18%	68%
Proposed Action (HCP/NCCP)	Plan Area	70	1,069,606,417	106,960,642	96577	11075	224028129	19%	77%
Proposed Action (HCP/NCCP)	Plan Area	80	1,077,967,816	107,796,782	94066	11460	219515608	18%	75%
Proposed Action (HCP/NCCP)	Plan Area	90	1,189,184,218	118,918,422	97636	12180	219656798	19%	82%
Proposed Action (HCP/NCCP)	Plan Area	100	1,193,563,425	119,356,342	94719	12601	220528968	18%	80%

Alternative	Inventory Block	Year	Net Growth % of Inventory	Harvest Volume (bd. ft.)	Timber Growth (per acre per year)	Timber Growth (per acre)	Total Slash Burned for Removal (Tons)	Slash Burned per Acre Harvested (Tons/Acre)
Alternative A (Enhanced HCP/NCCP)	Plan Area	0	0%	-	-	-	-	-
Alternative A (Enhanced HCP/NCCP)	Plan Area	10	18%	447,728,645	478	4,785	98,500	1.52
Alternative A (Enhanced HCP/NCCP)	Plan Area	20	16%	563,262,510	544	5,443	123,918	1.92
Alternative A (Enhanced HCP/NCCP)	Plan Area	30	16%	602,404,544	613	6,131	132,529	1.78
Alternative A (Enhanced HCP/NCCP)	Plan Area	40	13%	761,424,862	678	6,776	167,513	2.23
Alternative A (Enhanced HCP/NCCP)	Plan Area	50	10%	896,835,230	703	7,034	197,304	2.44
Alternative A (Enhanced HCP/NCCP)	Plan Area	60	9%	923,132,182	717	7,174	203,089	2.57
Alternative A (Enhanced HCP/NCCP)	Plan Area	70	8%	1,021,288,443	743	7,431	224,683	2.65
Alternative A (Enhanced HCP/NCCP)	Plan Area	80	9%	999,483,437	777	7,775	219,886	2.72
Alternative A (Enhanced HCP/NCCP)	Plan Area	90	9%	1,008,048,273	812	8,118	221,771	2.61
Alternative A (Enhanced HCP/NCCP)	Plan Area	100	10%	958,262,361	858	8,577	210,818	2.63
Alternative B (Reserves)	Plan Area	0	0%	-	-	-	-	-
Alternative B (Reserves)	Plan Area	10	23%	308,906,631	479	4,793	67,959	1.38
Alternative B (Reserves)	Plan Area	20	18%	455,559,409	552	5,519	100,223	2.12
Alternative B (Reserves)	Plan Area	30	11%	772,275,474	597	5,970	169,901	3.61
Alternative B (Reserves)	Plan Area	40	15%	636,708,184	669	6,690	140,076	3.39
Alternative B (Reserves)	Plan Area	50	12%	841,191,855	752	7,523	185,062	4.18
Alternative B (Reserves)	Plan Area	60	18%	579,937,153	834	8,341	127,586	2.70
Alternative B (Reserves)	Plan Area	70	12%	906,984,020	887	8,868	199,536	4.69
Alternative B (Reserves)	Plan Area	80	13%	829,646,931	964	9,643	182,522	4.01
Alternative B (Reserves)	Plan Area	90	9%	1,143,785,571	1,000	10,005	251,633	5.37
Alternative B (Reserves)	Plan Area	100	15%	648,887,593	1,086	10,862	142,755	3.40
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	0	0%	-	-	-	-	-
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	10	16%	488,590,044	473	4,729	107,490	1.57
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	20	13%	635,256,862	523	5,233	139,757	1.98
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	30	15%	624,920,500	584	5,836	137,483	1.70
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	40	12%	802,812,847	642	6,416	176,619	2.10
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	50	0%	-	-	-	-	-
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	60	0%	-	-	-	-	-
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	70	0%	-	-	-	-	-
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	80	0%	-	-	-	-	-
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	90	0%	-	-	-	-	-
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	100	0%	-	-	-	-	-
No Action (No HCP/No Permit)	Plan Area	0	0%	-	-	-	-	-
No Action (No HCP/No Permit)	Plan Area	10	21%	368,356,404	488	4,876	81,038	2.11
No Action (No HCP/No Permit)	Plan Area	20	10%	708,744,966	518	5,184	155,924	2.09
No Action (No HCP/No Permit)	Plan Area	30	12%	691,984,034	565	5,654	152,236	1.72
No Action (No HCP/No Permit)	Plan Area	40	10%	791,073,225	607	6,070	174,036	1.52
No Action (No HCP/No Permit)	Plan Area	50	0%	1,214,765,682	606	6,061	267,248	1.89
No Action (No HCP/No Permit)	Plan Area	60	2%	1,119,038,398	602	6,025	246,188	1.60
No Action (No HCP/No Permit)	Plan Area	70	3%	1,084,082,246	611	6,111	238,498	1.47
No Action (No HCP/No Permit)	Plan Area	80	4%	1,099,633,697	626	6,262	241,919	1.43
No Action (No HCP/No Permit)	Plan Area	90	3%	1,147,436,784	641	6,406	252,436	1.46
No Action (No HCP/No Permit)	Plan Area	100	3%	1,179,236,662	651	6,508	259,432	1.47
Proposed Action (HCP/NCCP)	Plan Area	0	0%	-	-	-	-	-
Proposed Action (HCP/NCCP)	Plan Area	10	16%	488,590,044	473	4,729	107,490	1.57
Proposed Action (HCP/NCCP)	Plan Area	20	13%	635,256,862	523	5,233	139,757	1.98
Proposed Action (HCP/NCCP)	Plan Area	30	15%	624,920,500	584	5,836	137,483	1.70

Alternative	Inventory Block	Year	Net Growth % of Inventory	Harvest Volume (bd. ft.)	Timber Growth (per acre per year)	Timber Growth (per acre)	Total Slash Burned for Removal (Tons)	Slash Burned per Acre Harvested (Tons/Acre)
Proposed Action (HCP/NCCP)	Plan Area	40	12%	802,812,847	642	6,416	176,619	2.10
Proposed Action (HCP/NCCP)	Plan Area	50	9%	903,869,009	665	6,649	198,851	2.19
Proposed Action (HCP/NCCP)	Plan Area	60	8%	935,933,194	674	6,745	205,905	2.26
Proposed Action (HCP/NCCP)	Plan Area	70	6%	1,069,606,417	687	6,866	235,313	2.44
Proposed Action (HCP/NCCP)	Plan Area	80	6%	1,077,967,816	707	7,068	237,153	2.52
Proposed Action (HCP/NCCP)	Plan Area	90	4%	1,189,184,218	719	7,187	261,621	2.68
Proposed Action (HCP/NCCP)	Plan Area	100	5%	1,193,563,425	734	7,337	262,584	2.77

Appendix S

Greenhouse Gas and Carbon Data for the Climate and Climate Change Environmental Effects Analysis

Greenhouse Gas Accounting Methodology and Data

The estimated quantity of carbon sequestration is determined from the estimated growth of trees on Mendocino Redwood Company (MRC) property and from carbon stored in wood products and landfills. The calculation of carbon dioxide (CO_2) emissions includes harvested wood that does not end up in wood products or landfills, plus non-biological emissions associated with site preparation, timber falling, yarding, loading, trucking, and milling.

Greenhouse gas emissions were calculated using CAL FIRE's "Greenhouse Gas Calculator[1]" (CAL FIRE 2010). Assumptions used for the MRC data were developed utilizing the built in multipliers and conversion factors of the CAL FIRE Greenhouse Gas Calculator, and MRC-specific data, such as fuel usage, described below.

Whole-Tree Carbon per MBF[2] Ratio

Whole tree carbon per MBF ratios are developed using the conversion factors for redwood, Douglas-fir, pines, hardwoods and true fir within the Greenhouse Gas Calculator (Table S-1). The average species mix for conifers from the current forest condition of the covered lands is used to develop the conversion factor for conifers for all subsequent periods. Only the off-site Monterey pine / knobcone-Monterey mix stands are expected to lessen over time, as these are converted to redwood/Douglas-fir type. The "off-site" stands are composed of non-native pine species planted by former landowners, and are very minor in component across the covered lands, so no attempt to modify the conversion factor was made. MRC designates all non-Douglas-fir, non-redwood conifers as "other". These species consist of western hemlock, grand fir, bishop pine, Monterey pine and sugar pine. These "other" species are divided equally between "true firs" and "pines" to help determine the overall conifer conversion factor to estimate total carbon tonnes per MBF.

Table S-1. Greenhouse Gas Calculator Factors for whole tree carbon per MBF ratios (CAL FIRE 2010).

Forest type	Approximate percentage of conifers by volume within the harvest plan	Multiplier from cubic feet (merchantable) to total biomass	Pounds carbon per cubic foot
Douglas-fir	43%	1.675	14.38
Redwood	55%	1.675	13.42
Pines	1%	2.254	12.14
True firs	1%	2.254	11.18
Hardwoods		2.214	11.76
Multipliers to estimate total carbon metric tonnes per MBF	Conifer	1.74	
	Hardwoods	1.95	
Multipliers to estimate merchantable carbon metric tonnes per MBF	Conifer	1.03	
	Hardwoods[a]	0	

[a] Hardwoods are not harvested for merchantable wood products, such as lumber.

[1] Greenhouse Gas Calculator – Greenhouse gas emissions calculator is a tool for use in assessing the short- and long-term greenhouse gas sequestration and emissions resulting from timber harvest activities.

[2] MBF—thousand board feet

The hardwood factor from the Greenhouse Gas Calculator was also used in the calculations. Currently, hardwoods from MRC's property are not converted to merchantable products, although some hardwood removal is used for firewood, offsetting energy produced from fossil fuels. However, for this EIS/PTEIR's CO_2 accounting, all hardwood removed is considered an immediate emission at the end of each period. Hardwood growth is generally not accounted for because MRC's treatment of these species to promote conifer growth results in a net volume loss for each period until around year 2065, when growth and treatment equalizes (within the Proposed Action, as an example). Because of this, the reduced hardwood inventory at the end of each period is considered an emission. For example, for the Proposed Action, between the first and second five year period, hardwood inventory declines 122.4 MMBF[3] due to silvicultural treatment. The decline is accounted as a carbon emission.

Fuel Usage in Timber Harvest Operations

Fuel usage for MRC's harvesting operations in based on the assumptions used in the carbon-fuel usage worksheet (Table S-2). Fuel usage per MBF declines over the 80 year permit term as trees become larger, load averages increase, and yarding efficiencies increase due to more volume per acre. The mid-point fuel usage figure of 2051 (0.0252 metric tonnes per MBF harvested) is used to project fuel usage for all decades (Table S-3). While the earlier years have a higher fuel usage per MBF, the later years harvest much more volume, so these are assumed to roughly offset each other. Overall, fuel usage in harvesting is a very minor component of CO_2 emissions.

[3] MMBF—Million board feet

Table S-2. Fuel usage for logging and trucking activities.

Year	Cable			Tractor			Helicopter			Falling/ Landing	Trucking	Total	
	Pounds / mbf	% of Harvest	Weighted lbs[a]	Pounds / mbf	% of Harvest	Weighted lbs[a]	Pounds / mbf	% of Harvest	Weighted lbs[a]	Pounds / mbf	Pounds / mbf	Pounds / mbf	Metric tonnes
2011	30.60	49%	15.00	25.25	49%	12.37	30.60	2.00%	0.61	2.19	34.97	65.14	0.029545
2021	24.63	49%	12.07	20.32	49%	9.96	28.30	2.00%	0.57	2.19	34.16	58.93	0.026732
2041	21.91	49%	10.74	18.08	49%	8.86	27.62	2.00%	0.55	2.19	33.38	55.72	0.025273
2061	22.51	49%	11.03	18.57	49%	9.10	27.75	2.00%	0.55	2.19	32.64	55.51	0.025177
2081	21.50	49%	10.53	17.73	49%	8.69	27.55	2.00%	0.55	2.19	31.93	53.89	0.024444
2101	20.57	49%	10.08	16.97	49%	8.32	27.41	2.00%	0.55	2.19	31.25	52.38	0.02376

[a] Weighted lbs are derived by multiplying the pounds of fuel usage per MBF by the percentage of harvest associated with the yarding technique.

Table S-3. The conversion factors used for Greenhouse Gas Accounting (W. M. Beaty & Associates 2011, CAL FIRE 2010).

Conversion of board feet to cubic feet	**0.165**
Pounds per metric tonne	2,204
Conversion of carbon to CO_2 (tonnes CO_2 per 1 tonne Carbon)	3.67
Efficiency rating from mills in California (DOE 1605b) for conifers	0.67
CO_2 equivalent tonnes in conifer wood products in use—100-year weighted average/acre and landfill (The weighted average carbon remaining for conifers in use at year 100 is 46.3% plus the carbon in landfills for conifers at year 100 is 29.8% of the initial carbon produced in wood products)	0.761
Mid-point average fuel usage per MBF in metric tonnes[a]	0.0252
Site preparation assumption based on Red River Accounting method = carbon emitted per acre prepped in metric tonnes (0.362 * (2000/2204)	0.329
Gallons of diesel used per MBF—mid-point at year 2051 (10.6 gallons per MBF at year 1, and 8.66 gallons per MBF at 2091)	9.08
Pounds of carbon per gallon of diesel	6.12

[a] The fuel usage for decades 2041 and 2061 was averaged to come up with a mid-point fuel usage for 2051.

Site Preparation

Site preparation emissions are based on two variables. The Red River Forest Sustained Yield Plan uses a total emission (fuel and biological) of 0.362 USA tons per clearcut acre. Biological emissions are the result of other plant species being removed during site preparation. Tons (USA) are then converted to metric tonnes (2000/2204 * 0.362) to come up with 0.329 tonnes per acre emitted (Table S-3). The acres used for calculating site preparation were based on combining the CRYPTOS[4] modeled Variable Retention (VR) and Rehabilitation (rehab) silviculture acres. This is completed for all actions in the EIS/PTEIR except for Alternative B, described below. For example, for the Proposed Action, the first 5-year period predicts approximately 10,000 acres will be treated with either VR or rehab silvicultures. For alternatives other than Alternative B (Reserves), 20% of the combined VR and rehab acres were then assumed to receive site preparation. This equates to 400 acres per year for the first 5 years predicted to be have site preparation. This number is actually greater than what MRC has averaged in site preparation since it started in 1998. The steep terrain in MRCs coastal lands prevents much tractor site preparation. Broadcast burning has yet to occur on the covered lands since MRC took ownership.

Alternative B of the EIS/PTEIR would be expected to have higher site preparation numbers due to clearcutting and post-harvest broadcast burning. However, increasing regulations have made large scale burning more restrictive, so the site preparation calculations for Alternative B were assumed to be 60% of the acres where clearcutting or rehab were used in any decade, and zero when other prescriptions were used. The site preparation would be expected to be about 20% tractor piled and burned, 40% broadcast burned, and 40% with no site preparation due to various concerns, such as viewshed aesthetics, adjacent neighbors, smoke concerns, etc.

Losses from Solid Wood Product

MRC uses the overall efficiency rating from mills in California, as described in the Greenhouse Gas Calculator, of 0.67 (67% of logs are converted to long term products, such as lumber) (Table S-3). MRC's logs are shipped to sawmills that only produce lumber. No veneer or particle board products are produced. Approximately 70% of logs from MRC's covered lands go to the Mendocino Forest Products (MFP) mill. From the MFP mill, approximately 75% of the logs are converted to lumber, so the .67 efficiency rating is considered a conservative estimate. Mendocino Forest Products sells its residual biomass to an operator who distributes the waste to various sources, such as landscaping. About 20% of this waste is sent to power plant operations, so could be considered an offset to normal fossil fuels. For this calculation, however, all biomass from the mill is considered an emission because the power operations offsets are not completely known. Mendocino Forest Products is working on developing a plan to more efficiently capture what is being used for power generation; however this plan was not completed at the time of the greenhouse gas calculations. Also, it is unknown what happens to the waste stream from the 30% of logs that are shipped to mills other than Mendocino Forest Products. So, in summary, all sawdust, bark and chips are considered an emission.

The average of remaining lumber in use at 100 years, and stored in landfills, is the same as lumber values from the Climate Action Reserve (CAR) draft protocol version 3.1 (CAR 2009). A value of 0.463 is considered permanently stored in lumber and a value of 0.298 is considered

[4] CRYPTOS—Cooperative Redwood Yield Project Timber Output Simulator; a timber growth simulator for the redwood and Douglas-fir region.

permanently stored in engineered landfills, for a total permanent storage factor of 0.761 (Table S-3).

Greenhouse Gas Calculator inputs and outputs

The Greenhouse Gas Calculator is an Excel spreadsheet file, consisting of five worksheets. These include:

1. Inventory and Growth worksheet where the user enters harvest and growth projections and assumptions for the next 100 years.
2. Harvesting emissions worksheet, which consists of an estimate of the daily harvest production rate in MBF brought to landings per day, the number of pieces of equipment, volume per truck, and haul time as a basis for estimating trucking emissions;
3. Milling and wood product worksheet where the user enters the percentage of conifer and hardwood volumes that are delivered to the mill. Emissions associated with milling lumber and sequestration of carbon in wood products are calculated here.
4. Project sequestration and summary worksheet where the user inputs the number of project acres so that the total project sequestration and emissions can be calculated from the per-acre values.
5. Annual tracking worksheet, which tracks stocking by year over the planning horizon. This worksheet is used to estimate the time needed to recoup the emissions associated with biological emissions during harvest. No input is required.

More detailed information regarding data inputs for the Greenhouse Gas Calculator can be found in CAL FIRE (2010).

Greenhouse Gas Modeling

The Greenhouse Gas Calculator was used to estimate the total tonnage of carbon sequestered in the current timber inventory and what will be sequestered through timber volume growth over the next 80 years. Subtracted from this value were carbon emissions resulting from harvest and shipping activities, mill efficiency, wood waste, hardwood removal, and site preparation. The result of these carbon additions and losses was the estimated net gain of carbon on MRC lands. The CO_2 equivalent was then calculated from the carbon net gain by multiplying by the 3.67 conversion factor (Table S-2). The tables below detail carbon additions, losses, and net gains per decade for each of the EIS/PTEIR Alternatives.

No Action Alternative

No Action carbon accounting summary

Decade	MBF		Metric tonnes carbon			CO_2 eq.
	Harvest	Growth	Addition	Losses	Net gain	Net gain
1	368,356	989,235	1,721,269	562,566	1,158,702	4,248,962
2	708,745	1,051,757	1,830,058	1,042,162	787,895	2,889,213
3	691,984	1,146,939	1,995,674	923,532	1,072,142	3,931,545
4	791,073	1,231,483	2,142,781	1,005,344	1,137,437	4,170,980
5	1,214,766	1,229,629	2,139,555	1,549,239	590,315	2,164,686

No Action carbon accounting summary						
Decade	**MBF**		**Metric tonnes carbon**			**CO_2 eq.**
	Harvest	**Growth**	**Addition**	**Losses**	**Net gain**	**Net gain**
6	1,119,038	1,222,203	2,126,633	1,404,827	721,806	2,646,862
7	1,084,082	1,239,804	2,157,259	1,335,918	821,341	3,011,858
8	1,099,634	1,270,347	2,210,404	1,346,776	863,628	3,166,923
9[a]	1,147,437	1,299,684	2,261,450	1,397,363	864,087	3,168,607
10[a]	1,179,237	1,320,284	2,297,294	1,430,918	866,375	3,176,998

[a] Data for decades 9 and 10 are provided for PTEIR purposes.

No Action decade 1 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	989,235
Growth (metric tonnes carbon)	1,721,269
Total addition, (metric tonnes carbon)	1,721,269
Losses from harvesting activities	
Thousand board feet harvest	368,356
Conversion of MBF to metric tonnes carbon	640,940
Merchantable Carbon (metric tonnes)	379,407
Non-merchantable carbon—total carbon minus merch (metric tonnes)	261,533
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	174,908
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	116,031
Harvesting and shipping fuel usage (metric tonnes carbon)	9,292
Site prep for regeneration (metric tonnes)	803
Total loss (metric tonnes)	562,566
Net carbon addition (metric tonnes)	**1,158,702**
CO_2 equivalent	4,248,962

No Action decade 2 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,051,757
Growth (metric tonnes carbon)	1,830,058
Total addition, (metric tonnes carbon)	1,830,058
Losses from harvesting activities	
Thousand board feet harvest	708,745
Conversion of MBF to metric tonnes carbon	1,233,216
Merchantable Carbon (metric tonnes)	730,007
Non-merchantable carbon—total carbon minus merch (metric tonnes)	503,209
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	336,536
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	183,334
Harvesting and shipping fuel usage (metric tonnes carbon)	17,878
Site prep for regeneration (metric tonnes)	1,205
Total loss (metric tonnes)	1,042,162
Net carbon addition (metric tonnes)	**787,895**
CO_2 equivalent	2,889,213

No Action decade 3 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,146,939
Growth (metric tonnes carbon)	1,995,674
Total addition, (metric tonnes carbon)	1,995,674
Losses from harvesting activities	
Thousand board feet harvest	691,984
Conversion of MBF to metric tonnes carbon	1,204,052
Merchantable Carbon (metric tonnes)	712,744
Non-merchantable carbon—total carbon minus merch (metric tonnes)	491,309
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	328,577
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	85,726
Harvesting and shipping fuel usage (metric tonnes carbon)	17,455
Site prep for regeneration (metric tonnes)	465
Total loss (metric tonnes)	923,532
Net carbon addition (metric tonnes)	**1,072,142**
CO_2 equivalent	3,931,545

No Action decade 4 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,231,483
Growth (metric tonnes carbon)	2,142,781
Total addition, (metric tonnes carbon)	2,142,781
Losses from harvesting activities	
Thousand board feet harvest	791,073
Conversion of MBF to metric tonnes carbon	1,376,467
Merchantable Carbon (metric tonnes)	814,805
Non-merchantable carbon—total carbon minus merch (metric tonnes)	561,662
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	375,628
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	47,852
Harvesting and shipping fuel usage (metric tonnes carbon)	19,955
Site prep for regeneration (metric tonnes)	247
Total loss (metric tonnes)	1,005,344
Net carbon addition (metric tonnes)	**1,137,437**
CO_2 equivalent	4,170,980

No Action decade 5 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,229,629
Growth (metric tonnes carbon)	2,139,555
Total addition, (metric tonnes carbon)	2,139,555
Losses from harvesting activities	
Thousand board feet harvest	1,214,766
Conversion of MBF to metric tonnes carbon	2,113,692
Merchantable Carbon (metric tonnes)	1,251,209
Non-merchantable carbon—total carbon minus merch (metric tonnes)	862,484
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	576,812
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	78,918
Harvesting and shipping fuel usage (metric tonnes carbon)	30,643
Site prep for regeneration (metric tonnes)	384
Total loss (metric tonnes)	1,549,239
Net carbon addition (metric tonnes)	**590,315**
CO_2 equivalent	2,164,686

No Action decade 6 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,222,203
Growth (metric tonnes carbon)	2,126,633
Total addition, (metric tonnes carbon)	2,126,633
Losses from harvesting activities	
Thousand board feet harvest	1,119,038
Conversion of MBF to metric tonnes carbon	1,947,127
Merchantable Carbon (metric tonnes)	1,152,610
Non-merchantable carbon—total carbon minus merch (metric tonnes)	794,517
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	531,357
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	50,598
Harvesting and shipping fuel usage (metric tonnes carbon)	28,228
Site prep for regeneration (metric tonnes)	126
Total loss (metric tonnes)	1,404,827
Net carbon addition (metric tonnes)	721,806
CO_2 equivalent	2,646,862

No Action decade 7 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,239,804
Growth (metric tonnes carbon)	2,157,259
Total addition, (metric tonnes carbon)	2,157,259
Losses from harvesting activities	
Thousand board feet harvest	1,084,082
Conversion of MBF to metric tonnes carbon	1,886,303
Merchantable Carbon (metric tonnes)	1,116,605
Non-merchantable carbon—total carbon minus merch (metric tonnes)	769,698
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	514,759
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	24,092
Harvesting and shipping fuel usage (metric tonnes carbon)	27,346
Site prep for regeneration (metric tonnes)	22
Total loss (metric tonnes)	1,335,918
Net carbon addition (metric tonnes)	**821,341**
CO_2 equivalent	3,011,858

No Action decade 8 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,270,347
Growth (metric tonnes carbon)	2,210,404
Total addition, (metric tonnes carbon)	2,210,404
Losses from harvesting activities	
Thousand board feet harvest	1,099,634
Conversion of MBF to metric tonnes carbon	1,913,363
Merchantable Carbon (metric tonnes)	1,132,623
Non-merchantable carbon—total carbon minus merch (metric tonnes)	780,740
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	522,143
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	16,143
Harvesting and shipping fuel usage (metric tonnes carbon)	27,738
Site prep for regeneration (metric tonnes)	11
Total loss (metric tonnes)	1,346,776
Net carbon addition (metric tonnes)	**863,628**
CO_2 equivalent	3,166,923

No Action decade 9 carbon accounting[a]	
Addition from forest growth	
Thousand board feet growth (MBF)	1,299,684
Growth (metric tonnes carbon)	2,261,450
Total addition, (metric tonnes carbon)	2,261,450
Losses from harvesting activities	
Thousand board feet harvest	1,147,437
Conversion of MBF to metric tonnes carbon	1,996,540
Merchantable Carbon (metric tonnes)	1,181,860
Non-merchantable carbon—total carbon minus merch (metric tonnes)	814,680
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	544,842
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	8,892
Harvesting and shipping fuel usage (metric tonnes carbon)	28,944
Site prep for regeneration (metric tonnes)	6
Total loss (metric tonnes)	1,397,363
Net carbon addition (metric tonnes)	**864,087**
CO_2 equivalent	3,168,607

[a] Data for decades 9 and 10 are provided for PTEIR purposes.

No Action decade 10 carbon accounting[a]	
Addition from forest growth	
Thousand board feet growth (MBF)	1,320,284
Growth (metric tonnes carbon)	2,297,294
Total addition, (metric tonnes carbon)	2,297,294
Losses from harvesting activities	
Thousand board feet harvest	1,179,237
Conversion of MBF to metric tonnes carbon	2,051,872
Merchantable Carbon (metric tonnes)	1,214,614
Non-merchantable carbon—total carbon minus merch (metric tonnes)	837,258
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	559,942
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	3,970
Harvesting and shipping fuel usage (metric tonnes carbon)	29,746
Site prep for regeneration (metric tonnes)	2
Total loss (metric tonnes)	1,430,918
Net carbon addition (metric tonnes)	**866,375**
CO_2 equivalent	3,176,998

[a] Data for decades 9 and 10 are provided for PTEIR purposes.

Proposed Action Alternative

Proposed Action carbon accounting summary

Decade	MBF		Metric tonnes carbon			CO_2 eq.
	Harvest	Growth	Addition	Losses	Net gain	Net gain
1	488,590	959,392	1,669,341	831,297	838,044	3,073,108
2	35,257	1,061,616	1,847,212	997,764	849,448	3,114,924
3	624,920	1,183,995	2,060,151	776,784	1,283,367	4,706,107
4	802,813	1,301,524	2,264,651	1,005,008	1,259,642	4,619,109
5	903,869	1,348,817	2,346,942	1,120,689	1,226,252	4,496,668
6	935,933	1,368,318	2,380,874	1,150,882	1,229,992	4,510,380
7	1,069,606	1,392,875	2,423,602	1,312,648	1,110,954	4,073,869
8	1,077,968	1,433,895	2,494,978	1,313,211	1,181,766	4,333,537
9[a]	1,189,184	1,458,113	2,537,117	1,438,709	1,098,408	4,027,861
10[a]	1,193,563	1,488,466	2,589,930	1,442,581	1,147,349	4,207,328

[a] Data for decades 9 and 10 are provided for PTEIR purposes.

Proposed Action decade 1 carbon accounting

Addition from forest growth	
Thousand board feet growth (MBF)	959,392
Growth (metric tonnes carbon)	1,669,341
Total addition, (metric tonnes carbon)	1,669,341
Losses from harvesting activities	
Thousand board feet harvest	488,590
Conversion of MBF to metric tonnes carbon	850,147
Merchantable Carbon (metric tonnes)	503,248
Non-merchantable carbon—total carbon minus merch (metric tonnes)	346,899
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	231,999
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	238,740
Harvesting and shipping fuel usage (metric tonnes carbon)	12,325
Site prep for regeneration (metric tonnes)	1,335
Total loss (metric tonnes)	831,297
Net carbon addition (metric tonnes)	**838,044**
CO_2 equivalent	3,073,108

Proposed Action decade 2 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,061,616
Growth (metric tonnes carbon)	1,847,212
Total addition, (metric tonnes carbon)	1,847,212
Losses from harvesting activities	
Thousand board feet harvest	635,257
Conversion of MBF to metric tonnes carbon	1,105,347
Merchantable Carbon (metric tonnes)	654,315
Non-merchantable carbon—total carbon minus merch (metric tonnes)	451,032
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	301,641
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	228,149
Harvesting and shipping fuel usage (metric tonnes carbon)	16,024
Site prep for regeneration (metric tonnes)	917
Total loss (metric tonnes)	997,764
Net carbon addition (metric tonnes)	**849,448**
CO_2 equivalent	3,114,924

Proposed Action decade 3 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,183,995
Growth (metric tonnes carbon)	2,060,151
Total addition, (metric tonnes carbon)	2,060,151
Losses from harvesting activities	
Thousand board feet harvest	624,920
Conversion of MBF to metric tonnes carbon	1,087,362
Merchantable Carbon (metric tonnes)	643,668
Non-merchantable carbon—total carbon minus merch (metric tonnes)	443,694
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	296,733
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	20,560
Harvesting and shipping fuel usage (metric tonnes carbon)	15,764
Site prep for regeneration (metric tonnes)	33
Total loss (metric tonnes)	776,784
Net carbon addition (metric tonnes)	**1,283,367**
CO_2 equivalent	4,706,107

Proposed Action decade 4 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,301,524
Growth (metric tonnes carbon)	2,264,651
Total addition, (metric tonnes carbon)	2,264,651
Losses from harvesting activities	
Thousand board feet harvest	802,813
Conversion of MBF to metric tonnes carbon	1,396,894
Merchantable Carbon (metric tonnes)	826,897
Non-merchantable carbon—total carbon minus merch (metric tonnes)	569,997
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	381,203
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	33,539
Harvesting and shipping fuel usage (metric tonnes carbon)	20,251
Site prep for regeneration (metric tonnes)	18
Total loss (metric tonnes)	1,005,008
Net carbon addition (metric tonnes)	**1,259,642**
CO_2 equivalent	4,619,109

Proposed Action decade 5 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,348,817
Growth (metric tonnes carbon)	2,346,942
Total addition, (metric tonnes carbon)	2,346,942
Losses from harvesting activities	
Thousand board feet harvest	903,869
Conversion of MBF to metric tonnes carbon	1,572,732
Merchantable Carbon (metric tonnes)	930,985
Non-merchantable carbon—total carbon minus merch (metric tonnes)	641,747
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	429,188
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	26,947
Harvesting and shipping fuel usage (metric tonnes carbon)	22,800
Site prep for regeneration (metric tonnes)	8
Total loss (metric tonnes)	1,120,689
Net carbon addition (metric tonnes)	**1,226,252**
CO_2 equivalent	4,496,668

Proposed Action decade 6 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,368,318
Growth (metric tonnes carbon)	2,380,874
Total addition, (metric tonnes carbon)	2,380,874
Losses from harvesting activities	
Thousand board feet harvest	935,933
Conversion of MBF to metric tonnes carbon	1,628,524
Merchantable Carbon (metric tonnes)	964,011
Non-merchantable carbon—total carbon minus merch (metric tonnes)	664,513
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	444,413
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	18,343
Harvesting and shipping fuel usage (metric tonnes carbon)	23,609
Site prep for regeneration (metric tonnes)	5
Total loss (metric tonnes)	1,150,882
Net carbon addition (metric tonnes)	**1,229,992**
CO_2 equivalent	4,510,380

Proposed Action decade 7 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,392,875
Growth (metric tonnes carbon)	2,423,602
Total addition, (metric tonnes carbon)	2,423,602
Losses from harvesting activities	
Thousand board feet harvest	1,069,606
Conversion of MBF to metric tonnes carbon	1,861,115
Merchantable Carbon (metric tonnes)	1,101,695
Non-merchantable carbon—total carbon minus merch (metric tonnes)	759,421
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	507,885
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	18,335
Harvesting and shipping fuel usage (metric tonnes carbon)	26,981
Site prep for regeneration (metric tonnes)	26
Total loss (metric tonnes)	1,312,648
Net carbon addition (metric tonnes)	**1,110,954**
CO_2 equivalent	4,073,869

Proposed Action decade 8 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,433,895
Growth (metric tonnes carbon)	2,494,978
Total addition, (metric tonnes carbon)	2,494,978
Losses from harvesting activities	
Thousand board feet harvest	1,077,968
Conversion of MBF to metric tonnes carbon	1,875,664
Merchantable Carbon (metric tonnes)	1,110,307
Non-merchantable carbon—total carbon minus merch (metric tonnes)	765,357
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	511,856
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	8,799
Harvesting and shipping fuel usage (metric tonnes carbon)	27,192
Site prep for regeneration (metric tonnes)	7
Total loss (metric tonnes)	1,313,211
Net carbon addition (metric tonnes)	**1,181,766**
CO_2 equivalent	4,333,537

Proposed Action decade 9 carbon accounting[a]	
Addition from forest growth	
Thousand board feet growth (MBF)	1,458,113
Growth (metric tonnes carbon)	2,537,117
Total addition, (metric tonnes carbon)	2,537,117
Losses from harvesting activities	
Thousand board feet harvest	1,189,184
Conversion of MBF to metric tonnes carbon	2,069,181
Merchantable Carbon (metric tonnes)	1,224,860
Non-merchantable carbon—total carbon minus merch (metric tonnes)	844,321
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	564,665
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	(275)
Harvesting and shipping fuel usage (metric tonnes carbon)	29,997
Site prep for regeneration (metric tonnes)	1
Total loss (metric tonnes)	1,438,709
Net carbon addition (metric tonnes)	**1,098,408**
CO_2 equivalent	4,027,861

[a] Data for decades 9 and 10 are provided for PTEIR purposes.

Proposed Action decade 10 carbon accounting[a]	
Addition from forest growth	
Thousand board feet growth (MBF)	1,488,466
Growth (metric tonnes carbon)	2,589,930
Total addition, (metric tonnes carbon)	2,589,930
Losses from harvesting activities	
Thousand board feet harvest	1,193,563
Conversion of MBF to metric tonnes carbon	2,076,800
Merchantable Carbon (metric tonnes)	1,229,370
Non-merchantable carbon—total carbon minus merch (metric tonnes)	847,430
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	566,744
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	(1,701)
Harvesting and shipping fuel usage (metric tonnes carbon)	30,108
Site prep for regeneration (metric tonnes)	-
Total loss (metric tonnes)	1,442,581
Net carbon addition (metric tonnes)	**1,147,349**
CO_2 equivalent	4,207,328

[a] Data for decades 9 and 10 are provided for PTEIR purposes.

Alternative B

Alternative B carbon accounting summary						
Decade	MBF		Metric tonnes carbon			CO_2 eq.
	Harvest	Growth	Addition	Losses	Net gain	Net gain
1	308,907	972,339	1,691,870	506,952	1,184,918	4,345,093
2	455,559	1,119,631	1,948,158	687,152	1,261,006	4,624,109
3	772,275	1,211,152	2,107,405	1,008,743	1,098,662	4,028,793
4	636,708	1,357,291	2,361,687	778,461	1,583,226	5,805,690
5	841,192	1,526,273	2,655,716	1,023,822	1,631,894	5,984,154
6	579,937	1,692,090	2,944,236	713,149	2,231,087	8,181,395
7	906,984	1,799,141	3,130,505	1,099,011	2,031,494	7,449,489
8	829,647	1,956,338	3,404,028	1,007,663	2,396,364	8,787,468
9[a]	1,143,786	2,029,675	3,531,635	1,384,326	2,147,308	7,874,180
10[a]	648,888	2,203,630	3,834,316	779,401	3,054,915	11,202,373

[a] Data for decades 9 and 10 are provided for PTEIR purposes.

Alternative B decade 1 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	972,339
Growth (metric tonnes carbon)	1,691,870
Total addition, (metric tonnes carbon)	1,691,870
Losses from harvesting activities	
Thousand board feet harvest	308,907
Conversion of MBF to metric tonnes carbon	537,498
Merchantable Carbon (metric tonnes)	318,174
Non-merchantable carbon—total carbon minus merch (metric tonnes)	219,324
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	146,679
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	131,261
Harvesting and shipping fuel usage (metric tonnes carbon)	7,792
Site prep for regeneration (metric tonnes)	1,896
Total loss (metric tonnes)	506,952
Net carbon addition (metric tonnes)	**1,184,918**
CO_2 equivalent	4,345,093

Alternative B decade 2 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,119,631
Growth (metric tonnes carbon)	1,948,158
Total addition, (metric tonnes carbon)	1,948,158
Losses from harvesting activities	
Thousand board feet harvest	455,559
Conversion of MBF to metric tonnes carbon	792,673
Merchantable Carbon (metric tonnes)	469,226
Non-merchantable carbon—total carbon minus merch (metric tonnes)	323,447
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	216,315
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	134,799
Harvesting and shipping fuel usage (metric tonnes carbon)	11,491
Site prep for regeneration (metric tonnes)	1,099
Total loss (metric tonnes)	687,152
Net carbon addition (metric tonnes)	**1,261,006**
CO_2 equivalent	4,624,109

Alternative B decade 3 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,211,152
Growth (metric tonnes carbon)	2,107,405
Total addition, (metric tonnes carbon)	2,107,405
Losses from harvesting activities	
Thousand board feet harvest	772,275
Conversion of MBF to metric tonnes carbon	1,343,759
Merchantable Carbon (metric tonnes)	795,444
Non-merchantable carbon—total carbon minus merch (metric tonnes)	548,316
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	366,703
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	69,507
Harvesting and shipping fuel usage (metric tonnes carbon)	19,481
Site prep for regeneration (metric tonnes)	4,737
Total loss (metric tonnes)	1,008,743
Net carbon addition (metric tonnes)	**1,098,662**
CO_2 equivalent	4,028,793

Alternative B decade 4 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,357,291
Growth (metric tonnes carbon)	2,361,687
Total addition, (metric tonnes carbon)	2,361,687
Losses from harvesting activities	
Thousand board feet harvest	636,708
Conversion of MBF to metric tonnes carbon	1,107,872
Merchantable Carbon (metric tonnes)	655,809
Non-merchantable carbon—total carbon minus merch (metric tonnes)	452,063
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	302,331
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	5,137
Harvesting and shipping fuel usage (metric tonnes carbon)	16,061
Site prep for regeneration (metric tonnes)	2,870
Total loss (metric tonnes)	778,461
Net carbon addition (metric tonnes)	**1,583,226**
CO_2 equivalent	5,805,690

Alternative B decade 5 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,526,273
Growth (metric tonnes carbon)	2,655,716
Total addition, (metric tonnes carbon)	2,655,716
Losses from harvesting activities	
Thousand board feet harvest	841,192
Conversion of MBF to metric tonnes carbon	1,463,674
Merchantable Carbon (metric tonnes)	866,428
Non-merchantable carbon—total carbon minus merch (metric tonnes)	597,246
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	399,426
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	1,787
Harvesting and shipping fuel usage (metric tonnes carbon)	21,219
Site prep for regeneration (metric tonnes)	4,143
Total loss (metric tonnes)	1,023,822
Net carbon addition (metric tonnes)	**1,631,894**
CO_2 equivalent	5,984,154

Alternative B decade 6 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,692,090
Growth (metric tonnes carbon)	2,944,236
Total addition, (metric tonnes carbon)	2,944,236
Losses from harvesting activities	
Thousand board feet harvest	579,937
Conversion of MBF to metric tonnes carbon	1,009,091
Merchantable Carbon (metric tonnes)	597,335
Non-merchantable carbon—total carbon minus merch (metric tonnes)	411,755
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	275,374
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	9,550
Harvesting and shipping fuel usage (metric tonnes carbon)	14,629
Site prep for regeneration (metric tonnes)	1,841
Total loss (metric tonnes)	713,149
Net carbon addition (metric tonnes)	**2,231,087**
CO_2 equivalent	8,181,395

Alternative B decade 7 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,799,141
Growth (metric tonnes carbon)	3,130,505
Total addition, (metric tonnes carbon)	3,130,505
Losses from harvesting activities	
Thousand board feet harvest	906,984
Conversion of MBF to metric tonnes carbon	1,578,152
Merchantable Carbon (metric tonnes)	934,194
Non-merchantable carbon—total carbon minus merch (metric tonnes)	643,959
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	430,667
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	(2,901)
Harvesting and shipping fuel usage (metric tonnes carbon)	22,879
Site prep for regeneration (metric tonnes)	4,408
Total loss (metric tonnes)	1,099,011
Net carbon addition (metric tonnes)	**2,031,494**
CO_2 equivalent	7,449,489

Alternative B decade 8 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,956,338
Growth (metric tonnes carbon)	3,404,028
Total addition, (metric tonnes carbon)	3,404,028
Losses from harvesting activities	
Thousand board feet harvest	829,647
Conversion of MBF to metric tonnes carbon	1,443,586
Merchantable Carbon (metric tonnes)	854,536
Non-merchantable carbon—total carbon minus merch (metric tonnes)	589,049
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	393,944
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	124
Harvesting and shipping fuel usage (metric tonnes carbon)	20,928
Site prep for regeneration (metric tonnes)	3,617
Total loss (metric tonnes)	1,007,663
Net carbon addition (metric tonnes)	**2,396,364**
CO_2 equivalent	8,787,468

Alternative B decade 9 carbon accounting[a]	
Addition from forest growth	
Thousand board feet growth (MBF)	2,029,675
Growth (metric tonnes carbon)	3,531,635
Total addition, (metric tonnes carbon)	3,531,635
Losses from harvesting activities	
Thousand board feet harvest	1,143,786
Conversion of MBF to metric tonnes carbon	1,990,187
Merchantable Carbon (metric tonnes)	1,178,099
Non-merchantable carbon—total carbon minus merch (metric tonnes)	812,088
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	543,108
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	(5,929)
Harvesting and shipping fuel usage (metric tonnes carbon)	28,852
Site prep for regeneration (metric tonnes)	6,207
Total loss (metric tonnes)	1,384,326
Net carbon addition (metric tonnes)	**2,147,308**
CO_2 equivalent	7,874,180

[a] Data for decades 9 and 10 are provided for PTEIR purposes.

Alternative B decade 10 carbon accounting[a]	
Addition from forest growth	
Thousand board feet growth (MBF)	2,203,630
Growth (metric tonnes carbon)	3,834,316
Total addition, (metric tonnes carbon)	3,834,316
Losses from harvesting activities	
Thousand board feet harvest	648,888
Conversion of MBF to metric tonnes carbon	1,129,064
Merchantable Carbon (metric tonnes)	668,354
Non-merchantable carbon—total carbon minus merch (metric tonnes)	460,710
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	308,114
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	(6,772)
Harvesting and shipping fuel usage (metric tonnes carbon)	16,368
Site prep for regeneration (metric tonnes)	981
Total loss (metric tonnes)	779,401
Net carbon addition (metric tonnes)	**3,054,915**
CO_2 equivalent	11,202,373

[a] Data for decades 9 and 10 are provided for PTEIR purposes.

Alternative C

Alternative C carbon accounting summary

Decade	MBF		Metric tonnes carbon			CO_2 eq.
	Harvest	Growth	Addition	Losses	Net gain	Net gain
1	488,590	959,392	1,669,341	831,297	838,044	3,073,108
2	35,257	1,061,616	1,847,212	997,764	849,448	3,114,924
3	624,920	1,183,995	2,060,151	776,784	1,283,367	4,706,107
4	802,813	1,301,524	2,264,651	1,005,008	1,259,642	4,619,109

Alternative C decade 1 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	959,392
Growth (metric tonnes carbon)	1,669,341
Total addition, (metric tonnes carbon)	1,669,341
Losses from harvesting activities	
Thousand board feet harvest	488,590
Conversion of MBF to metric tonnes carbon	850,147
Merchantable Carbon (metric tonnes)	503,248
Non-merchantable carbon—total carbon minus merch (metric tonnes)	346,899
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	231,999
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	238,740
Harvesting and shipping fuel usage (metric tonnes carbon)	12,325
Site prep for regeneration (metric tonnes)	1,335
Total loss (metric tonnes)	831,297
Net carbon addition (metric tonnes)	**838,044**
CO_2 equivalent	3,073,108

Alternative C decade 2 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,061,616
Growth (metric tonnes carbon)	1,847,212
Total addition, (metric tonnes carbon)	1,847,212
Losses from harvesting activities	
Thousand board feet harvest	635,257
Conversion of MBF to metric tonnes carbon	1,105,347
Merchantable Carbon (metric tonnes)	654,315
Non-merchantable carbon—total carbon minus merch (metric tonnes)	451,032
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	301,641
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	228,149
Harvesting and shipping fuel usage (metric tonnes carbon)	16,024
Site prep for regeneration (metric tonnes)	917
Total loss (metric tonnes)	997,764
Net carbon addition (metric tonnes)	**849,448**
CO_2 equivalent	3,114,924

Alternative C decade 3 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,183,995
Growth (metric tonnes carbon)	2,060,151
Total addition, (metric tonnes carbon)	2,060,151
Losses from harvesting activities	
Thousand board feet harvest	624,920
Conversion of MBF to metric tonnes carbon	1,087,362
Merchantable Carbon (metric tonnes)	643,668
Non-merchantable carbon—total carbon minus merch (metric tonnes)	443,694
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	296,733
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	20,560
Harvesting and shipping fuel usage (metric tonnes carbon)	15,764
Site prep for regeneration (metric tonnes)	33
Total loss (metric tonnes)	776,784
Net carbon addition (metric tonnes)	**1,283,367**
CO_2 equivalent	4,706,107

Alternative C decade 4 carbon accounting	
Addition from forest growth	
Thousand board feet growth (MBF)	1,301,524
Growth (metric tonnes carbon)	2,264,651
Total addition, (metric tonnes carbon)	2,264,651
Losses from harvesting activities	
Thousand board feet harvest	802,813
Conversion of MBF to metric tonnes carbon	1,396,894
Merchantable Carbon (metric tonnes)	826,897
Non-merchantable carbon—total carbon minus merch (metric tonnes)	569,997
Emission of merchantable solid wood product, metric tonnes carbon (merchantable wood minus mill declines and minus wood remaining after 100 years or in landfills)	381,203
Hardwood removal metric tonnes carbon (decline in net hardwood inventory *1.95)	33,539
Harvesting and shipping fuel usage (metric tonnes carbon)	20,251
Site prep for regeneration (metric tonnes)	18
Total loss (metric tonnes)	1,005,008
Net carbon addition (metric tonnes)	**1,259,642**
CO_2 equivalent	4,619,109

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Appendix T

Herbicide Use Projections

HERBICIDE USE PROJECTIONS BY ALTERNATIVE

MRC herbicide use projections were developed in order to estimate total gallons of herbicide applied by decade for each of the alternatives. Silviculture method, acres harvested, and herbicide application rates (gallons per acre) for triclopyr and imazapyr were used to calculate total herbicide use in upland stands (Table T-1). MRC does not currently use herbicides in riparian buffer zones. While the Proposed Action, Alternative A, and Alternative C allow for some riparian restoration harvests, these harvests are severely restricted and it would be very difficult to calculate where these may occur, if at all. Herbicide application rates for each silviculture method remain static throughout the 80-year analysis period. The following additional assumptions were used for each alternative.

No Action Alternative

Coastal Zone Selection, Selection (High BA), Selection (Old Growth II) and High Retention Selection (Carbon) silviculture methods would not require herbicide use. This assumption is based on previous herbicide use amounts in similar types of stands. Heavy basal area stands such as these have few hardwoods, and would likely be at the 15-ft^2-minimum retention to begin with.

Rehabilitation silviculture would require application of 0.2 gallons per acre of triclopyr and 0.22 gallons per acre of imazapyr. This assumption is based on an average herbicide application rate for heavy hardwood stands. Many stands receive no triclopyr use, while others may use up to 0.5 gallons per acre.

Seed Tree Removal silviculture would require 0.18 gallons per acre of imazapyr. This assumption is based on average historical application rates used by MRC.

Selection and Transition silviculture would require 0.1 gallons per acre of imazapyr. This is based on average historical application rates used by MRC.

Variable Retention silviculture would require 0.2 gallons per acre triclopyr and 0.22 gallons per acre of imazapyr. This is based on an average herbicide application rate for heavy hardwood stands. Many stands receive no triclopyr use, while others may use up to 0.5 gallons per acre.

Proposed Action

Coastal Zone Selection, Medium Retention Selection, Selection (Wildlife), Selection (Old Growth II) and High Retention Selection (Carbon) silviculture would require no herbicide use. This assumption is based on previous use amounts in similar types of stands. Heavy basal area stands have few hardwoods and probably would be at the 15-ft^2-minimum retention to begin with.

Rehabilitation silviculture would require 0.2 gallons per acre of triclopyr and 0.22 gallons per acre of imazapyr. This assumption is based on an average herbicide application rate for hardwood stands. Many stands receive no triclopyr use, while others may use up to 0.5 gallons per acre.

Seed Tree Removal silviculture would require 0.18 gallons per acre of imazapyr. This is based on average historical application rates used by MRC.

Selection and Transition silviculture would require 0.1 gallons per acre of imazapyr. This is based on average historical application rates used by MRC.

Variable Retention silviculture would require 0.2 gallons per acre triclopyr and 0.22 gallons per acre of imazapyr. This assumption is based on an average herbicide application rate for hardwood stands. Many stands receive no triclopyr use, while others may use up to 0.5 gallons per acre.

Alternative A

Coastal Zone Selection, Medium Retention Selection, Selection (Wildlife), Selection (Old Growth II) and High Retention Selection (Carbon) silviculture would require no herbicide use. This is based on previous use amounts in similar stands. Heavy basal area stands have few hardwoods, and probably would be at the 15-ft^2-minimum retention to begin with.

Rehabilitation silviculture would require 0.2 gallons per acre of triclopyr and 0.22 gallons per acre of imazapyr. This is based on average use of heavy hardwood stands. This assumption is based on an average herbicide application rate for hardwood stands. Many stands receive no triclopyr use, while others may use up to 0.5 gallons per acre.

Seed Tree Removal silviculture would require 0.18 gallons per acre of imazapyr. This is based on average historical application rates used by MRC.

Selection and Transition silviculture would require 0.1 gallons per acre of imazapyr. This is based on average historical application rates used by MRC.

Variable Retention silviculture would require 0.2 gallons per acre of triclopyr and 0.22 gallons per acre of imazapyr. This is based on average use of heavy hardwood stands. This assumption is based on an average herbicide application rate for hardwood stands. Many stands receive no triclopyr use, while others may use up to 0.5 gallons per acre.

Alternative B

Coastal Zone Selection and High Retention Selection silviculture would require no herbicide use. This is based on previous use amounts in similar stands. Heavy basal area stands have few hardwoods, and probably would be at the 15 square foot minimum retention to begin with.

Rehabilitation silviculture would require 0.2 gallons per acre of triclopyr and 0.22 gallons per acre of imazapyr. This is based on average use of heavy hardwood stands. This assumption is based on an average herbicide application rate for hardwood stands. Many stands receive no triclopyr use, while others may use up to 0.5 gallons per acre.

Seed Tree Removal silviculture would require 0.18 gallons per acre of imazapyr. This is based on average historical application rates used by MRC.

Selection silviculture would require 0.1 gallons per acre of imazapyr. This is based on average historical application rates used by MRC.

Clearcut would require 0.5 gallons per acre of triclopyr and 0.18 gallons per acre of imazapyr. This assumption is based on the expected average hardwood component (i.e., approximately even with Seed Tree Removal basal area patterns) and up to two applications of foliar herbicide (triclopyr) as part of site preparation. Planting would be followed with one or two foliar application of herbicides. These rates are based on herbicide use in intensive forestry operations in other coastal locations where clearcut is used.

Commercial thinning would require 0.07 gallons per acre of imazapyr. This is based on the assumption that the thinning is used to capture mortality and promote growth for the regeneration harvest, so only a minor hardwood herbicide application rate would be needed.

Table T-1. Total gallons of herbicide over each decade for each alternative. Based on herbicide use projections provided by MRC and analyzed by the agencies.

Decade	Silviculture type	Acres	Percent of total area by decade	Triclopyr (gallons per acre)	Imazapyr (gallons per acre)	Total gallons herbicide by decade
No Action Alternative						
1	Coastal Zone Selection	261	1%	-	-	-
	Rehabilitation	1,698	4%	0.20	0.22	713
	Seed Tree Removal	583	2%	-	0.18	104
	Selection	17,108	45%	-	0.10	1,710
	Selection (High BA)	866	2%	-	-	-
	Selection (Old Growth II)	14	0%	-	-	-
	Transition	7,076	19%	-	0.10	707
	Variable Retention	10,486	28%	0.20	0.18	3,984
	Total for Decade	**38,091**	**100%**	**0.40**	**0.78**	**7,220**
2	Coastal Zone Selection	66	0%	-	-	-
	High Retention Selection (Carbon)	178	0%	-	-	-
	Rehabilitation	1,263	2%	0.20	0.22	530
	Seed Tree Removal	840	1%	-	0.18	151
	Selection	45,297	62%	-	0.10	4,529
	Selection (High BA)	2,451	3%	-	-	-
	Selection (Old Growth II)	63	0%	-	-	-
	Transition	5,780	8%	-	0.10	577
	Variable Retention	17,081	23%	0.20	0.18	6,490
	Total for Decade	**73,019**	**100%**	**0.40**	**0.78**	**12,280**

Decade	Silviculture type	Acres	Percent of total area by decade	Triclopyr (gallons per acre)	Imazapyr (gallons per acre)	Total gallons herbicide by decade
3	Coastal Zone Selection	333	0%	-	-	-
	High Retention Selection (Carbon)	5	0%	-	-	-
	Seed Tree Removal	95	0%	-	0.18	17
	Selection	73,101	86%	-	0.10	7,310
	Selection (High BA)	2,427	3%	-	-	-
	Selection (Old Growth II)	46	0%	-	-	-
	Transition	1,552	2%	-	0.10	155
	Variable Retention	7,075	8%	0.20	0.18	2,688
	Total for Decade	**84,634**	**100%**	**0.20**	**0.56**	**10,171**
4	Coastal Zone Selection	66	0%	-	-	-
	High Retention Selection (Carbon)	249	0%	-	-	-
	Seed Tree Removal	380	0%	-	0.18	68
	Selection	102,534	94%	-	0.10	10,253
	Selection (High BA)	2,266	2%	-	-	-
	Selection (Old Growth II)	71	0%	-	-	-
	Variable Retention	3,866	4%	0.20	0.18	1,469
	Total for Decade	**109,431**	**100%**	**0.20**	**0.46**	**11,790**
5	Coastal Zone Selection	369	0%	-	-	-
	High Retention Selection (Carbon)	5	0%	-	-	-
	Seed Tree Removal	197	0%	-	0.18	35
	Selection	121,861	92%	-	0.10	12,186
	Selection (High BA)	4,650	3%	-	-	-
	Selection (Old Growth II)	176	0%	-	-	-
	Variable Retention	5,827	4%	0.20	0.18	2,214
	Total for Decade	**133,083**	**100%**	**0.20**	**0.46**	**14,435**
6	Coastal Zone Selection	66	0%	-	-	-
	High Retention Selection (Carbon)	249	0%	-	-	-
	Seed Tree Removal	72	0%	-	0.18	12
	Selection	141,272	98%	-	0.10	14,127
	Selection (High BA)	990	1%	-	-	-
	Selection (Old Growth II)	106	0%	-	-	-
	Variable Retention	1,917	1%	0.20	0.18	728
	Total for Decade	**144,672**	**100%**	**0.20**	**0.46**	**14,868**

Decade	Silviculture type	Acres	Percent of total area by decade	Triclopyr (gallons per acre)	Imazapyr (gallons per acre)	Total gallons herbicide by decade
7	Coastal Zone Selection	369	0%	-	-	-
	High Retention Selection (Carbon)	5	0%	-	-	-
	Seed Tree Removal	165	0%	-	0.18	29
	Selection	151,109	99%	-	0.10	15,110
	Selection (High BA)	324	0%	-	-	-
	Selection (Old Growth II)	176	0%	-	-	-
	Variable Retention	340	0%	0.20	0.18	129
	Total for Decade	**152,488**	**100%**	**0.20**	**0.46**	**15,269**
8	Coastal Zone Selection	66	0%	-	-	-
	High Retention Selection (Carbon)	249	0%	-	-	-
	Seed Tree Removal	2	0%	-	0.18	0.43
	Selection	158,001	100%	-	0.10	15,800
	Selection (High BA)	125	0%	-	-	-
	Selection (Old Growth II)	106	0%	-	-	-
	Variable Retention	170	0%	0.20	0.18	64
	Total for Decade	**158,720**	**100%**	**0.20**	**0.46**	**15,865**
Proposed Action Alternative						
1	Coastal Zone Selection	320	0%	-	-	-
	Medium Retention Selection	52	0%	-	-	-
	Rehabilitation	8,035	12%	0.20	0.22	3,374
	Seed Tree Removal	50	0%	-	0.18	9
	Selection	25,542	38%	-	0.10	2,554
	Selection (Old Growth II)	33	0%	-	-	-
	Selection (Wildlife)	447	1%	-	-	-
	Transition	20,435	30%	-	0.10	2,043
	Variable Retention	12,245	18%	0.20	0.18	4,653
	Total for Decade	**67,160**	**100%**	**0.40**	**0.78**	**12,634**

Decade	Silviculture type	Acres	Percent of total area by decade	Triclopyr (gallons per acre)	Imazapyr (gallons per acre)	Total gallons herbicide by decade
2	Coastal Zone Selection	36	0%	-	-	-
	High Retention Selection (Carbon)	183	0%	-	-	-
	Rehabilitation	3,743	5%	0.20	0.22	1,572
	Seed Tree Removal	44	0%	-	0.18	7
	Selection	38,646	56%	-	0.10	3,864
	Selection (Old Growth II)	66	0%	-	-	-
	Selection (Wildlife)	395	1%	-	-	-
	Transition	15,473	22%	-	0.10	1,547
	Variable Retention	10,209	15%	0.20	0.18	3,879
	Total for Decade	**68,796**	**100%**	**0.40**	**0.78**	**10,871**
3	Coastal Zone Selection	382	0%	-	-	-
	Medium Retention Selection	82	0%	-	-	-
	Seed Tree Removal	114	0%	-	0.18	20
	Selection	74,893	97%	-	0.10	7,489
	Selection (Old Growth II)	66	0%	-	-	-
	Selection (Wildlife)	490	1%	-	-	-
	Transition	600	1%	-	0.10	60
	Variable Retention	499	1%	0.20	0.18	189
	Total for Decade	**77,127**	**100%**	**0.20**	**0.56**	**7,759**
4	Coastal Zone Selection	49	0%	-	-	-
	High Retention Selection (Carbon)	254	0%	-	-	-
	Seed Tree Removal	10	0%	-	0.18	1
	Selection	77,568	99%	-	0.10	7,756
	Selection (Old Growth II)	75	0%	-	-	-
	Selection (Wildlife)	435	1%	-	-	-
	Variable Retention	278	0%	0.20	0.18	105
	Total for Decade	**78,669**	**100%**	**0.20**	**0.46**	**7,864**
5	Coastal Zone Selection	382	0%	-	-	-
	Medium Retention Selection	330	0%	-	-	-
	Seed Tree Removal	38	0%	-	0.18	6
	Selection	81,624	98%	-	0.10	8,162
	Selection (Old Growth II)	217	0%	-	-	-
	Selection (Wildlife)	490	1%	-	-	-
	Variable Retention	121	0%	0.20	0.18	45
	Total for Decade	**83,202**	**100%**	**0.20**	**0.46**	**8,215**

Decade	Silviculture type	Acres	Percent of total area by decade	Triclopyr (gallons per acre)	Imazapyr (gallons per acre)	Total gallons herbicide by decade
6	Coastal Zone Selection	49	0%	-	-	-
	High Retention Selection (Carbon)	254	0%	-	-	-
	Medium Retention Selection	93	0%	-	-	-
	Selection	80,921	99%	-	0.10	8,092
	Selection (Old Growth II)	75	0%	-	-	-
	Selection (Wildlife)	435	1%	-	-	-
	Variable Retention	78	0%	0.20	0.18	29
	Total for Decade	**81,905**	**100%**	**0.20**	**0.28**	**8,121**
7	Coastal Zone Selection	382	0%	-	-	-
	Medium Retention Selection	413	0%	-	-	-
	Selection	84,461	98%	-	0.10	8,446
	Selection (Old Growth II)	240	0%	-	-	-
	Selection (Wildlife)	490	1%	-	-	-
	Variable Retention	394	0%	0.20	0.18	149
	Total for Decade	**86,381**	**100%**	**0.20**	**0.28**	**8,595**
8	Coastal Zone Selection	49	0%	-	-	-
	High Retention Selection (Carbon)	254	0%	-	-	-
	Medium Retention Selection	113	0%	-	-	-
	Selection	81,917	99%	-	0.10	8,191
	Selection (Old Growth II)	75	0%	-	-	-
	Selection (Wildlife)	451	1%	-	-	-
	Variable Retention	112	0%	0.20	0.18	42
	Total for Decade	**82,970**	**100%**	**0.20**	**0.28**	**8,234**
Alternative A						
1	Coastal Zone Selection	382	1%	-	-	-
	Rehabilitation	8,359	13%	0.20	0.22	3,510
	Seed Tree Removal	91	0%	-	0.18	16
	Selection	23,593	36%	-	0.10	2,359
	Transition	19,911	31%	-	0.10	1,991
	Variable Retention	12,412	19%	0.20	0.18	4,716
	Total for Decade	**64,748**	**100%**	**0.40**	**0.78**	**12,594**

Decade	Silviculture type	Acres	Percent of total area by decade	Triclopyr (gallons per acre)	Imazapyr (gallons per acre)	Total gallons herbicide by decade
2	Coastal Zone Selection	49	0%	-	-	-
	High Retention Selection (Carbon)	178	0%	-	-	-
	Medium Retention Selection	4	0%	-	-	-
	Rehabilitation	3,826	6%	0.20	0.22	1,606
	Seed Tree Removal	44	0%	-	0.18	7
	Selection	35,115	54%	-	0.10	3,511
	Transition	15,117	23%	-	0.10	1,511
	Variable Retention	10,141	16%	0.20	0.18	3,853
	Total for Decade	**64,474**	**100%**	**0.40**	**0.78**	**10,491**
3	Coastal Zone Selection	382	1%	-	-	-
	Seed Tree Removal	126	0%	-	0.18	22
	Selection	72,544	98%	-	0.10	7,254
	Transition	492	1%	-	0.10	49
	Variable Retention	499	1%	0.20	0.18	189
	Total for Decade	**74,043**	**100%**	**0.20**	**0.56**	**7,515**
4	Coastal Zone Selection	49	0%	-	-	-
	High Retention Selection (Carbon)	254	0%	-	-	-
	Medium Retention Selection	183	0%	-	-	-
	Seed Tree Removal	45	0%	-	0.18	8
	Selection	73,518	99%	-	0.10	7,351
	Variable Retention	278	0%	0.20	0.18	105
	Total for Decade	**74,327**	**100%**	**0.20**	**0.46**	**7,465**
5	Coastal Zone Selection	382	0%	-	-	-
	Seed Tree Removal	89	0%	-	0.18	15
	Selection	78,866	99%	-	0.10	7,886
	Variable Retention	207	0%	0.20	0.18	78
	Total for Decade	**79,544**	**100%**	**0.20**	**0.46**	**7,981**
6	Coastal Zone Selection	49	0%	-	-	-
	High Retention Selection (Carbon)	254	0%	-	-	-
	Medium Retention Selection	210	0%	-	-	-
	Selection	76,809	99%	-	0.10	7,680
	Variable Retention	36	0%	0.20	0.18	13
	Total for Decade	**77,358**	**100%**	**0.20**	**0.28**	**7,694**

Decade	Silviculture type	Acres	Percent of total area by decade	Triclopyr (gallons per acre)	Imazapyr (gallons per acre)	Total gallons herbicide by decade
7	Coastal Zone Selection	382	0%	-	-	-
	Selection	82,203	99%	-	0.10	8,220.26
	Variable Retention	262	0%	-	0.10	26.22
	Total for Decade	**82,847**	**100%**	**-**	**0.20**	**8,246.48**
8	Coastal Zone Selection	49	0%	-	-	-
	High Retention Selection (Carbon)	254	0%	-	-	-
	Medium Retention Selection	210	0%	-	-	-
	Selection	78,018	99%	-	0.10	7,801
	Variable Retention	128	0%	0.20	0.18	48
	Total for Decade	**78,660**	**100%**	**0.20**	**0.28**	**7,850**
Alternative B						
1	Clearcut	1,066	2%	0.50	0.18	724
	Coastal Zone Selection	151	0%	-	-	-
	Commercial Thinning	11,060	25%	-	0.07	774
	Rehabilitation	8,333	19%	0.20	0.22	3,499
	Seed Tree Removal	23,814	53%	-	0.18	4,286
	Selection	508	1%	-	0.10	50
	Total for Decade	**44,932**	**100%**	**0.70**	**0.75**	**9,335**
2	Clearcut	3,676	8%	0.50	0.18	2,499
	Coastal Zone Selection	254	1%	-	-	-
	Commercial Thinning	22,670	52%	-	0.07	1,586
	High Retention Selection	11	0%	-	-	-
	Rehabilitation	1,895	4%	0.20	0.22	795
	Seed Tree Removal	14,916	34%	-	0.18	2,684
	Selection	404	1%	-	0.10	40
	Total for Decade	**43,825**	**100%**	**0.70**	**0.75**	**7,607**
3	Clearcut	22,835	54%	0.50	0.18	15,527
	Coastal Zone Selection	197	0%	-	-	-
	Commercial Thinning	8,169	19%	-	0.07	571
	High Retention Selection	32	0%	-	-	-
	Rehabilitation	1,230	3%	0.20	0.22	516
	Seed Tree Removal	9,389	22%	-	0.18	1,689
	Selection	430	1%	-	0.10	43
	Total for Decade	**42,282**	**100%**	**0.70**	**0.75**	**18,349**

Decade	Silviculture type	Acres	Percent of total area by decade	Triclopyr (gallons per acre)	Imazapyr (gallons per acre)	Total gallons herbicide by decade
4	Clearcut	14,304	38%	0.50	0.18	9,726
	Coastal Zone Selection	254	1%	-	-	-
	Commercial Thinning	21,830	58%	-	0.07	1,528
	Rehabilitation	341	1%	0.20	0.22	143
	Seed Tree Removal	623	2%	-	0.18	112
	Selection	114	0%	-	0.10	11
	Total for Decade	**37,465**	**100%**	**0.70**	**0.75**	**11,521**
5	Clearcut	20,909	53%	0.50	0.18	14,217
	Coastal Zone Selection	197	0%	-	-	-
	Commercial Thinning	18,124	46%	-	0.07	1,268
	Rehabilitation	153	0%	0.20	0.22	64
	Seed Tree Removal	295	1%	-	0.18	53
	Total for Decade	**39,678**	**100%**	**0.70**	**0.65**	**15,603**
6	Clearcut	9,187	22%	0.50	0.18	6,247
	Coastal Zone Selection	254	1%	-	-	-
	Commercial Thinning	31,756	76%	-	0.07	2,222
	High Retention Selection	32	0%	-	-	-
	Rehabilitation	192	0%	0.20	0.22	80
	Seed Tree Removal	55	0%	-	0.18	9
	Selection	336	1%	-	0.10	33
	Total for Decade	**41,812**	**100%**	**0.70**	**0.75**	**8,594**
7	Clearcut	22,281	59%	0.50	0.18	15,150
	Coastal Zone Selection	197	1%	-	-	-
	Commercial Thinning	15,044	40%	-	0.07	1,053
	Rehabilitation	73	0%	0.20	0.22	30
	Selection	219	1%	-	0.10	21
	Total for Decade	**37,815**	**100%**	**0.70**	**0.57**	**16,256**
8	Clearcut	18,367	45%	0.50	0.18	12,489
	Coastal Zone Selection	254	1%	-	-	-
	Commercial Thinning	21,321	53%	-	0.07	1,492
	Seed Tree Removal	10	0%	-	0.18	1
	Selection	475	1%	-	0.10	47
	Total for Decade	**40,428**	**100%**	**0.50**	**0.53**	**14,031**

Decade	Silviculture type	Acres	Percent of total area by decade	Triclopyr (gallons per acre)	Imazapyr (gallons per acre)	Total gallons herbicide by decade
Alternative C						
1	Coastal Zone Selection	382	1%	-	-	-
	Rehabilitation	8,359	13%	0.20	0.22	3,510
	Seed Tree Removal	91	0%	-	0.18	16
	Selection	23,593	36%	-	0.10	2,359
	Transition	19,911	31%	-	0.10	1,991
	Variable Retention	12,412	19%	0.20	0.18	4,716
	Total for Decade for Decade	**64,748**	**100%**	**0.40**	**0.78**	**12,594**
2	Coastal Zone Selection	49	0%	-	-	-
	High Retention Selection (Carbon)	178	0%	-	-	-
	Medium Retention Selection	4	0%	-	-	-
	Rehabilitation	3,826	6%	0.20	0.22	1,606
	Seed Tree Removal	44	0%	-	0.18	7
	Selection	35,115	54%	-	0.10	3,511
	Transition	15,117	23%	-	0.10	1,511
	Variable Retention	10,141	16%	0.20	0.18	3,853
	Total for Decade	**64,474**	**100%**	**0.40**	**0.78**	**10,491**
3	Coastal Zone Selection	382	1%	-	-	-
	Seed Tree Removal	126	0%	-	0.18	22
	Selection	72,544	98%	-	0.10	7,254
	Transition	492	1%	-	0.10	49
	Variable Retention	499	1%	0.20	0.18	189
	Total for Decade	**74,043**	**100%**	**0.20**	**0.56**	**7,515**
4	Coastal Zone Selection	49	0%	-	-	-
	High Retention Selection (Carbon)	254	0%	-	-	-
	Medium Retention Selection	183	0%	-	-	-
	Seed Tree Removal	45	0%	-	0.18	8
	Selection	73,518	99%	-	0.10	7,351
	Variable Retention	278	0%	0.20	0.18	105
	Total for Decade	**74,327**	**100%**	**0.20**	**0.46**	**7,465**

Appendix U

Timber Model Output Tables for the Visual Resources Environmental Effects Analysis

Acres Visual Polygons by Canopy Closure (Structure Class) Plan Area

Alternative	Inventory Block	Year	5	7	8	9	10	11	12	13	14	15	16	17	18
No Action (No HCP/No Permit)	Plan Area	0	73.38	0.00	0.00	126.70	221.97	0.00	147.39	38.99	27.63	0.00	0.00	0.00	212.83
No Action (No HCP/No Permit)	Plan Area	10	73.38	0.00	0.00	64.10	240.89	0.00	152.46	32.17	0.00	27.63	0.00	253.16	455.33
No Action (No HCP/No Permit)	Plan Area	20	73.38	0.00	0.00	0.00	195.61	0.00	135.30	11.50	4.94	27.63	0.00	111.28	489.43
No Action (No HCP/No Permit)	Plan Area	30	73.38	0.00	0.00	0.00	24.90	0.00	7.51	0.00	4.94	27.63	0.00	67.16	676.43
No Action (No HCP/No Permit)	Plan Area	40	30.98	0.00	0.00	0.00	89.54	0.00	14.91	0.00	4.94	0.00	0.00	18.64	1051.11
No Action (No HCP/No Permit)	Plan Area	50	0.00	0.00	0.00	0.00	77.13	0.00	38.37	0.00	4.94	0.00	0.00	7.92	941.38
No Action (No HCP/No Permit)	Plan Area	60	0.00	0.00	0.00	0.00	35.00	0.00	38.37	0.00	0.00	4.94	0.00	7.92	904.75
No Action (No HCP/No Permit)	Plan Area	70	0.00	0.00	0.00	0.00	0.00	0.00	38.37	0.00	0.00	4.94	0.00	7.92	1030.65
No Action (No HCP/No Permit)	Plan Area	80	0.00	0.00	0.00	0.00	0.00	0.00	37.40	0.00	0.00	4.94	0.00	14.46	961.04
No Action (No HCP/No Permit)	Plan Area	90	0.00	0.00	0.00	0.00	0.00	0.00	37.40	0.00	0.00	15.27	0.00	7.92	714.83
No Action (No HCP/No Permit)	Plan Area	100	0.00	0.00	0.00	0.00	0.00	0.00	26.41	0.00	0.00	4.94	0.00	14.46	767.61
Proposed Action (HCP/NCCP)	Plan Area	0	73.38	0.00	0.00	126.70	221.97	0.00	147.39	38.99	27.63	0.00	0.00	0.00	212.83
Proposed Action (HCP/NCCP)	Plan Area	10	73.38	6.82	0.00	12.81	239.19	0.00	138.82	32.17	0.00	27.63	0.00	166.98	537.85
Proposed Action (HCP/NCCP)	Plan Area	20	73.38	0.00	0.00	0.00	208.43	0.00	105.54	11.50	4.94	109.70	0.00	0.00	915.81
Proposed Action (HCP/NCCP)	Plan Area	30	73.38	0.00	0.00	0.00	37.72	0.00	7.51	0.00	4.94	28.82	0.00	0.00	1376.08
Proposed Action (HCP/NCCP)	Plan Area	40	38.37	0.00	0.00	0.00	47.50	0.00	7.51	0.00	0.00	149.95	0.00	63.51	1334.49
Proposed Action (HCP/NCCP)	Plan Area	50	0.00	0.00	0.00	0.00	72.39	0.00	7.81	0.00	0.00	140.48	0.00	166.31	1063.86
Proposed Action (HCP/NCCP)	Plan Area	60	0.00	0.00	0.00	0.00	0.00	0.00	38.37	0.00	0.00	235.62	0.00	16.00	1175.51
Proposed Action (HCP/NCCP)	Plan Area	70	0.00	0.00	0.00	0.00	0.00	0.00	37.40	0.00	0.00	118.39	0.00	113.88	1307.68
Proposed Action (HCP/NCCP)	Plan Area	80	0.00	0.00	0.00	0.00	0.00	0.00	37.40	0.00	0.00	393.70	0.00	0.00	1124.93
Proposed Action (HCP/NCCP)	Plan Area	90	0.00	0.00	0.00	0.00	0.00	0.00	37.40	0.00	0.00	146.36	0.00	10.55	1492.30
Proposed Action (HCP/NCCP)	Plan Area	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	432.72	0.00	3.19	1068.16
Alternative A (Enhanced HCP/NCCP)	Plan Area	0	73.38	0.00	0.00	126.70	221.97	0.00	147.39	38.99	27.63	0.00	0.00	0.00	212.83
Alternative A (Enhanced HCP/NCCP)	Plan Area	10	73.38	0.00	0.00	12.81	212.73	0.00	156.55	38.99	27.63	0.00	0.00	21.07	229.42
Alternative A (Enhanced HCP/NCCP)	Plan Area	20	73.38	0.00	0.00	0.00	186.13	0.00	114.04	0.00	32.57	6.82	0.00	11.50	189.31
Alternative A (Enhanced HCP/NCCP)	Plan Area	30	73.38	0.00	0.00	0.00	39.75	0.00	0.00	0.00	4.94	27.63	0.00	0.00	125.38
Alternative A (Enhanced HCP/NCCP)	Plan Area	40	38.37	0.00	0.00	0.00	53.08	0.00	7.51	0.00	0.00	4.94	0.00	0.00	188.68
Alternative A (Enhanced HCP/NCCP)	Plan Area	50	6.43	0.00	0.00	0.00	65.41	0.00	21.46	0.00	0.00	4.94	0.00	0.00	382.44
Alternative A (Enhanced HCP/NCCP)	Plan Area	60	0.00	0.00	0.00	0.00	35.00	0.00	45.88	0.00	0.00	78.02	0.00	0.00	389.72
Alternative A (Enhanced HCP/NCCP)	Plan Area	70	0.00	0.00	0.00	0.00	0.00	0.00	38.37	0.00	0.00	37.12	0.00	0.00	316.53
Alternative A (Enhanced HCP/NCCP)	Plan Area	80	0.00	0.00	0.00	0.00	0.00	0.00	38.37	0.00	0.00	82.06	0.00	0.00	357.81
Alternative A (Enhanced HCP/NCCP)	Plan Area	90	0.00	0.00	0.00	0.00	0.00	0.00	30.99	0.00	0.00	50.77	0.00	0.00	484.66
Alternative A (Enhanced HCP/NCCP)	Plan Area	100	0.00	0.00	0.00	0.00	0.00	0.00	29.10	0.00	0.00	70.63	0.00	0.00	187.00
Alternative B (Reserves)	Plan Area	0	73.38	0.00	0.00	126.70	221.97	0.00	147.39	38.99	27.63	0.00	0.00	0.00	212.83
Alternative B (Reserves)	Plan Area	10	73.38	6.82	0.00	21.97	222.39	0.00	126.03	32.17	0.00	78.40	0.00	247.90	427.03
Alternative B (Reserves)	Plan Area	20	73.38	0.00	0.00	0.00	145.47	0.00	127.33	11.50	4.94	48.45	0.00	14.53	599.59
Alternative B (Reserves)	Plan Area	30	73.38	5.78	0.00	0.00	24.90	0.00	28.35	0.00	0.00	80.44	0.00	0.00	640.90
Alternative B (Reserves)	Plan Area	40	20.92	14.49	0.00	0.00	64.95	1.93	23.81	15.26	0.00	4.94	0.00	10.90	567.00
Alternative B (Reserves)	Plan Area	50	0.00	0.00	0.00	0.00	56.07	0.00	27.59	25.90	0.00	4.94	0.00	8.60	163.35
Alternative B (Reserves)	Plan Area	60	0.00	0.00	0.00	0.00	0.00	3.45	38.37	0.00	0.00	242.70	0.00	6.37	7.06
Alternative B (Reserves)	Plan Area	70	0.00	0.00	0.00	0.00	0.00	0.00	38.37	0.00	0.00	268.08	0.00	10.83	90.50
Alternative B (Reserves)	Plan Area	80	0.00	0.00	0.00	0.00	0.00	0.00	40.91	0.00	0.00	347.08	0.00	1.46	121.24
Alternative B (Reserves)	Plan Area	90	0.00	5.78	0.00	0.00	0.00	0.00	41.76	0.00	0.00	336.30	0.00	0.00	255.52
Alternative B (Reserves)	Plan Area	100	0.00	14.54	0.00	0.00	0.00	0.00	23.69	17.14	0.00	144.46	0.00	0.00	129.32
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	0	73.38	0.00	0.00	126.70	221.97	0.00	147.39	38.99	27.63	0.00	0.00	0.00	212.83
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	10	73.38	6.82	0.00	12.81	239.19	0.00	138.82	32.17	0.00	27.63	0.00	166.98	537.85
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	20	73.38	0.00	0.00	0.00	208.43	0.00	105.54	11.50	4.94	109.70	0.00	0.00	915.81
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	30	73.38	0.00	0.00	0.00	37.72	0.00	7.51	0.00	4.94	28.82	0.00	0.00	1376.08
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	40	38.37	0.00	0.00	0.00	47.50	0.00	7.51	0.00	0.00	149.95	0.00	63.51	1334.49
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Alternative	Inventory Block	Year	19	20	21	22	23	24
No Action (No HCP/No Permit)	Plan Area	0	83.70	0.00	416.76	1410.66	692.63	39.70
No Action (No HCP/No Permit)	Plan Area	10	144.00	0.00	349.49	1142.15	501.49	56.14
No Action (No HCP/No Permit)	Plan Area	20	99.27	0.00	161.87	1605.86	520.17	56.14
No Action (No HCP/No Permit)	Plan Area	30	112.68	0.00	17.15	1715.14	671.00	94.46
No Action (No HCP/No Permit)	Plan Area	40	71.87	0.00	0.00	1223.05	883.59	103.77
No Action (No HCP/No Permit)	Plan Area	50	207.35	0.00	0.00	896.58	1060.71	258.00
No Action (No HCP/No Permit)	Plan Area	60	228.77	0.00	0.00	670.99	1301.92	299.72
No Action (No HCP/No Permit)	Plan Area	70	345.32	0.00	0.00	328.01	1377.48	359.70
No Action (No HCP/No Permit)	Plan Area	80	501.22	0.00	2.85	324.97	1083.63	561.88
No Action (No HCP/No Permit)	Plan Area	90	402.68	0.00	0.00	398.55	1172.64	743.09
No Action (No HCP/No Permit)	Plan Area	100	414.31	39.13	80.91	175.29	1015.91	953.41
Proposed Action (HCP/NCCP)	Plan Area	0	83.70	0.00	416.76	1410.66	692.63	39.70
Proposed Action (HCP/NCCP)	Plan Area	10	83.70	0.00	271.52	1254.88	606.89	39.70
Proposed Action (HCP/NCCP)	Plan Area	20	56.03	0.00	53.93	1370.09	543.30	39.70
Proposed Action (HCP/NCCP)	Plan Area	30	93.15	0.00	17.15	1060.47	704.48	88.65
Proposed Action (HCP/NCCP)	Plan Area	40	21.61	0.00	54.49	667.57	1009.38	97.96
Proposed Action (HCP/NCCP)	Plan Area	50	70.18	0.00	72.73	560.05	1069.06	269.47
Proposed Action (HCP/NCCP)	Plan Area	60	77.22	0.00	34.37	326.84	1244.08	344.34
Proposed Action (HCP/NCCP)	Plan Area	70	30.86	0.00	5.31	177.67	1250.56	450.59
Proposed Action (HCP/NCCP)	Plan Area	80	28.40	0.00	1.17	261.19	1070.26	575.30
Proposed Action (HCP/NCCP)	Plan Area	90	0.00	0.00	0.00	154.27	845.20	806.26
Proposed Action (HCP/NCCP)	Plan Area	100	19.06	0.00	0.00	284.50	655.96	1028.76
Alternative A (Enhanced HCP/NCCP)	Plan Area	0	83.70	0.00	416.76	1410.66	692.63	39.70
Alternative A (Enhanced HCP/NCCP)	Plan Area	10	180.85	0.00	455.17	1388.23	655.80	39.70
Alternative A (Enhanced HCP/NCCP)	Plan Area	20	160.62	0.00	161.87	1767.47	748.93	39.70
Alternative A (Enhanced HCP/NCCP)	Plan Area	30	83.70	0.00	0.00	2062.73	981.25	93.58
Alternative A (Enhanced HCP/NCCP)	Plan Area	40	116.58	0.00	0.00	1550.01	1430.28	102.89
Alternative A (Enhanced HCP/NCCP)	Plan Area	50	78.28	0.00	0.00	1004.96	1581.80	346.64
Alternative A (Enhanced HCP/NCCP)	Plan Area	60	34.05	0.00	0.00	554.78	1781.43	573.45
Alternative A (Enhanced HCP/NCCP)	Plan Area	70	115.68	0.00	17.15	468.49	1809.97	689.02
Alternative A (Enhanced HCP/NCCP)	Plan Area	80	252.82	0.00	0.00	566.05	1260.41	934.81
Alternative A (Enhanced HCP/NCCP)	Plan Area	90	41.48	0.00	0.00	638.43	1035.92	1210.11
Alternative A (Enhanced HCP/NCCP)	Plan Area	100	6.60	0.00	0.00	750.58	942.33	1506.09
Alternative B (Reserves)	Plan Area	0	83.70	0.00	416.76	1410.66	692.63	39.70
Alternative B (Reserves)	Plan Area	10	91.58	0.00	227.08	1342.78	538.66	56.14
Alternative B (Reserves)	Plan Area	20	63.40	0.00	161.87	1585.35	606.01	50.53
Alternative B (Reserves)	Plan Area	30	36.38	0.00	17.15	1805.02	702.02	78.01
Alternative B (Reserves)	Plan Area	40	44.03	0.00	30.30	1607.96	1002.07	83.78
Alternative B (Reserves)	Plan Area	50	76.65	0.00	75.93	1449.07	1298.68	305.57
Alternative B (Reserves)	Plan Area	60	39.34	0.00	67.64	986.05	1559.61	541.75
Alternative B (Reserves)	Plan Area	70	68.74	0.00	23.75	647.39	1685.05	659.64
Alternative B (Reserves)	Plan Area	80	156.66	0.00	21.97	422.68	1520.99	859.34
Alternative B (Reserves)	Plan Area	90	86.39	0.00	3.45	211.70	1295.86	1255.58
Alternative B (Reserves)	Plan Area	100	78.12	0.00	13.15	348.90	1082.58	1640.44
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	0	83.70	0.00	416.76	1410.66	692.63	39.70
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	10	83.70	0.00	271.52	1254.88	606.89	39.70
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	20	56.03	0.00	53.93	1370.09	543.30	39.70
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	30	93.15	0.00	17.15	1060.47	704.48	88.65
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	40	21.61	0.00	54.49	667.57	1009.38	97.96
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	50	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	60	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	70	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	80	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	90	0.00	0.00	0.00	0.00	0.00	0.00
Alternative C (HCP Only and Shorter ITP Term)	Plan Area	100	0.00	0.00	0.00	0.00	0.00	0.00

Appendix V

Timber Model Output Tables for the Social and Economic Conditions Environmental Effects Analysis

Jobs, Payrolls and Taxes
Plan Area

Alternative	Year	Volume Harvested	Timber Jobs	Regional Jobs	Timber Payrolls	Regional Payrolls	Yield Tax	Sales Tax
No Action (No HCP/No Permit)	0	0	0	0	0	0	0	0
No Action (No HCP/No Permit)	10	368,129,195	4,490	8,942	$100,942,400	$161,404,800	$5,015,840	$2,298,528
No Action (No HCP/No Permit)	20	710,244,344	8,662	17,253	$194,753,000	$311,406,000	$9,677,300	$4,434,660
No Action (No HCP/No Permit)	30	690,273,348	8,418	16,767	$189,267,000	$302,634,000	$9,404,700	$4,309,740
No Action (No HCP/No Permit)	40	792,004,963	9,662	19,246	$217,245,600	$347,371,200	$10,794,960	$4,946,832
No Action (No HCP/No Permit)	50	1,214,966,354	14,823	29,525	$333,274,500	$532,899,000	$16,560,450	$7,588,890
No Action (No HCP/No Permit)	60	1,121,549,827	13,688	27,265	$307,764,600	$492,109,200	$15,292,860	$7,008,012
No Action (No HCP/No Permit)	70	1,084,395,724	13,225	26,341	$297,341,200	$475,442,400	$14,774,920	$6,770,664
No Action (No HCP/No Permit)	80	1,099,877,880	13,420	26,730	$301,730,000	$482,460,000	$14,993,000	$6,870,600
No Action (No HCP/No Permit)	90	1,147,009,154	13,993	27,872	$314,622,100	$503,074,200	$15,633,610	$7,164,162
No Action (No HCP/No Permit)	100	1,179,168,058	14,384	28,650	$323,399,700	$517,109,400	$16,069,770	$7,364,034
Proposed Action (HCP/NCCP)	0	0	0	0	0	0	0	0
Proposed Action (HCP/NCCP)	10	488,590,044	5,966	11,883	$134,132,700	$214,475,400	$6,665,070	$3,054,294
Proposed Action (HCP/NCCP)	20	635,256,862	7,747	15,431	$174,180,500	$278,511,000	$8,655,050	$3,966,210
Proposed Action (HCP/NCCP)	30	624,920,500	7,625	15,188	$171,437,500	$274,125,000	$8,518,750	$3,903,750
Proposed Action (HCP/NCCP)	40	802,812,847	9,797	19,513	$220,262,900	$352,195,800	$10,944,890	$5,015,538
Proposed Action (HCP/NCCP)	50	903,869,009	11,029	21,967	$247,967,200	$396,494,400	$12,321,520	$5,646,384
Proposed Action (HCP/NCCP)	60	935,933,194	11,419	22,745	$256,744,800	$410,529,600	$12,757,680	$5,846,256
Proposed Action (HCP/NCCP)	70	1,069,606,417	13,054	26,001	$293,501,000	$469,302,000	$14,584,100	$6,683,220
Proposed Action (HCP/NCCP)	80	1,077,967,816	13,152	26,195	$295,695,400	$472,810,800	$14,693,140	$6,733,188
Proposed Action (HCP/NCCP)	90	1,189,184,218	14,506	28,893	$326,142,700	$521,495,400	$16,206,070	$7,426,494
Proposed Action (HCP/NCCP)	100	1,193,563,425	14,567	29,014	$327,514,200	$523,688,400	$16,274,220	$7,457,724
Alternative A (Enhanced HCP/NCCP)	0	0	0	0	0	0	0	0
Alternative A (Enhanced HCP/NCCP)	10	447,728,645	5,466	10,886	$122,886,400	$196,492,800	$6,106,240	$2,798,208
Alternative A (Enhanced HCP/NCCP)	20	563,262,510	6,869	13,681	$154,430,900	$246,931,800	$7,673,690	$3,516,498
Alternative A (Enhanced HCP/NCCP)	30	602,404,544	7,344	14,629	$165,128,600	$264,037,200	$8,205,260	$3,760,092
Alternative A (Enhanced HCP/NCCP)	40	761,424,862	9,284	18,492	$208,742,300	$333,774,600	$10,372,430	$4,753,206
Alternative A (Enhanced HCP/NCCP)	50	896,835,230	10,943	21,797	$246,047,100	$393,424,200	$12,226,110	$5,602,662
Alternative A (Enhanced HCP/NCCP)	60	923,132,182	11,261	22,429	$253,178,900	$404,827,800	$12,580,490	$5,765,058
Alternative A (Enhanced HCP/NCCP)	70	1,021,288,443	12,456	24,810	$280,060,300	$447,810,600	$13,916,230	$6,377,166
Alternative A (Enhanced HCP/NCCP)	80	999,483,437	12,188	24,276	$274,025,700	$438,161,400	$13,616,370	$6,239,754
Alternative A (Enhanced HCP/NCCP)	90	1,008,048,273	12,298	24,494	$276,494,400	$442,108,800	$13,739,040	$6,295,968
Alternative A (Enhanced HCP/NCCP)	100	958,262,361	11,688	23,279	$262,779,400	$420,178,800	$13,057,540	$5,983,668
Alternative B (Reserves)	0	0	0	0	0	0	0	0
Alternative B (Reserves)	10	308,904,954	3,770	7,509	$84,758,700	$135,527,400	$4,211,670	$1,930,014
Alternative B (Reserves)	20	456,139,705	5,563	11,081	$125,080,800	$200,001,600	$6,215,280	$2,848,176
Alternative B (Reserves)	30	772,008,107	9,418	18,760	$211,759,600	$338,599,200	$10,522,360	$4,821,912
Alternative B (Reserves)	40	636,727,598	7,771	15,479	$174,729,100	$279,388,200	$8,682,310	$3,978,702
Alternative B (Reserves)	50	842,698,310	10,272	20,461	$230,960,600	$369,301,200	$11,476,460	$5,259,132
Alternative B (Reserves)	60	580,871,997	7,076	14,094	$159,094,000	$254,388,000	$7,905,400	$3,622,680
Alternative B (Reserves)	70	906,986,877	11,065	22,040	$248,790,100	$397,810,200	$12,362,410	$5,665,122
Alternative B (Reserves)	80	829,762,785	10,126	20,169	$227,669,000	$364,038,000	$11,312,900	$5,184,180
Alternative B (Reserves)	90	1,143,787,392	13,957	27,799	$313,799,200	$501,758,400	$15,592,720	$7,145,424
Alternative B (Reserves)	100	647,614,349	7,918	15,771	$178,020,700	$284,651,400	$8,845,870	$4,053,654
Alternative C (HCP Only and Shorter ITP Term)	0	0	0	0	0	0	0	0
Alternative C (HCP Only and Shorter ITP Term)	10	488,590,044	5,966	11,883	$134,132,700	$214,475,400	$6,665,070	$3,054,294
Alternative C (HCP Only and Shorter ITP Term)	20	635,256,862	7,747	15,431	$174,180,500	$278,511,000	$8,655,050	$3,966,210
Alternative C (HCP Only and Shorter ITP Term)	30	624,920,500	7,625	15,188	$171,437,500	$274,125,000	$8,518,750	$3,903,750
Alternative C (HCP Only and Shorter ITP Term)	40	802,812,847	9,797	19,513	$220,262,900	$352,195,800	$10,944,890	$5,015,538
Alternative C (HCP Only and Shorter ITP Term)	50	-	-	-	$0	$0	$0	$0
Alternative C (HCP Only and Shorter ITP Term)	60	-	-	-	$0	$0	$0	$0
Alternative C (HCP Only and Shorter ITP Term)	70	-	-	-	$0	$0	$0	$0
Alternative C (HCP Only and Shorter ITP Term)	80	-	-	-	$0	$0	$0	$0
Alternative C (HCP Only and Shorter ITP Term)	90	-	-	-	$0	$0	$0	$0
Alternative C (HCP Only and Shorter ITP Term)	100	-	-	-	$0	$0	$0	$0

Multipliers	
Timber Jobs	12.2
Regional Jobs	24.3
Timber Payrolls	274300
Regional Payrolls	438600
Yield Tax	13630
Sales Tax	6246

Appendix W

Letter of Review and Certification from California Licensed Professional Geologist

PACIFIC WATERSHED ASSOCIATES

Date: January 25, 2012

To: A. J. Keith, Senior Aquatic Ecologist
Stillwater Sciences
2855 Telegraph Avenue, Suite 400
Berkeley, CA 94705

From: Danny Hagans, Earth Scientist
John M. Coyle, CEG 1263
Pacific Watershed Associates
Arcata, CA 95518

Subject: Mendocino Redwood Company EIS/PTEIR

Pacific Watershed Associates provided oversite and technical review of the soils, geology, and geomorphology impacts analysis for the Mecdocino Redwood Company EIS/PTEIR. This oversite and technical review included review of the data and review of the analysis of the data, discussions with Mr. Keith and Mr. Stallman of Stillwater Sciences, and review of drafts and approval of the final versions of the soils, geology, and geomorphology sections of the EIS/ PTEIR.

Danny Hagans

Danny Hagans
Earth Scentist
Pacific Watershed Associates, Inc.

John M Coyle

CERTIFIED ENGINEERING GEOLOGIST
JOHN M. COYLE
CEG 1263
Exp. 1/30/13
ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

John M. Coyle
CEG 1263
Associate