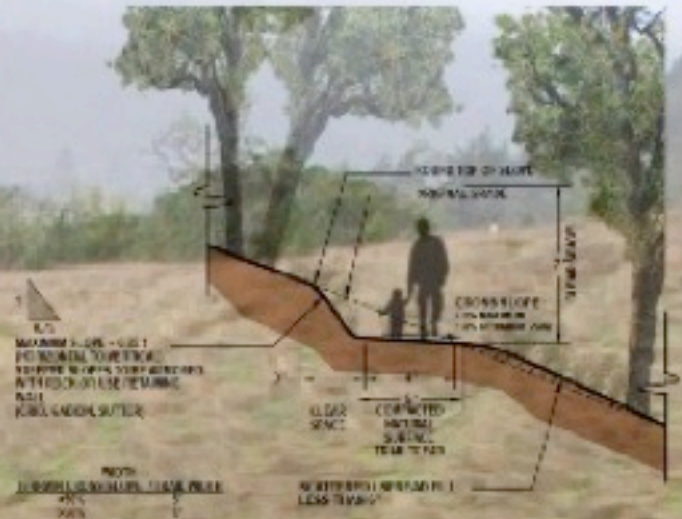
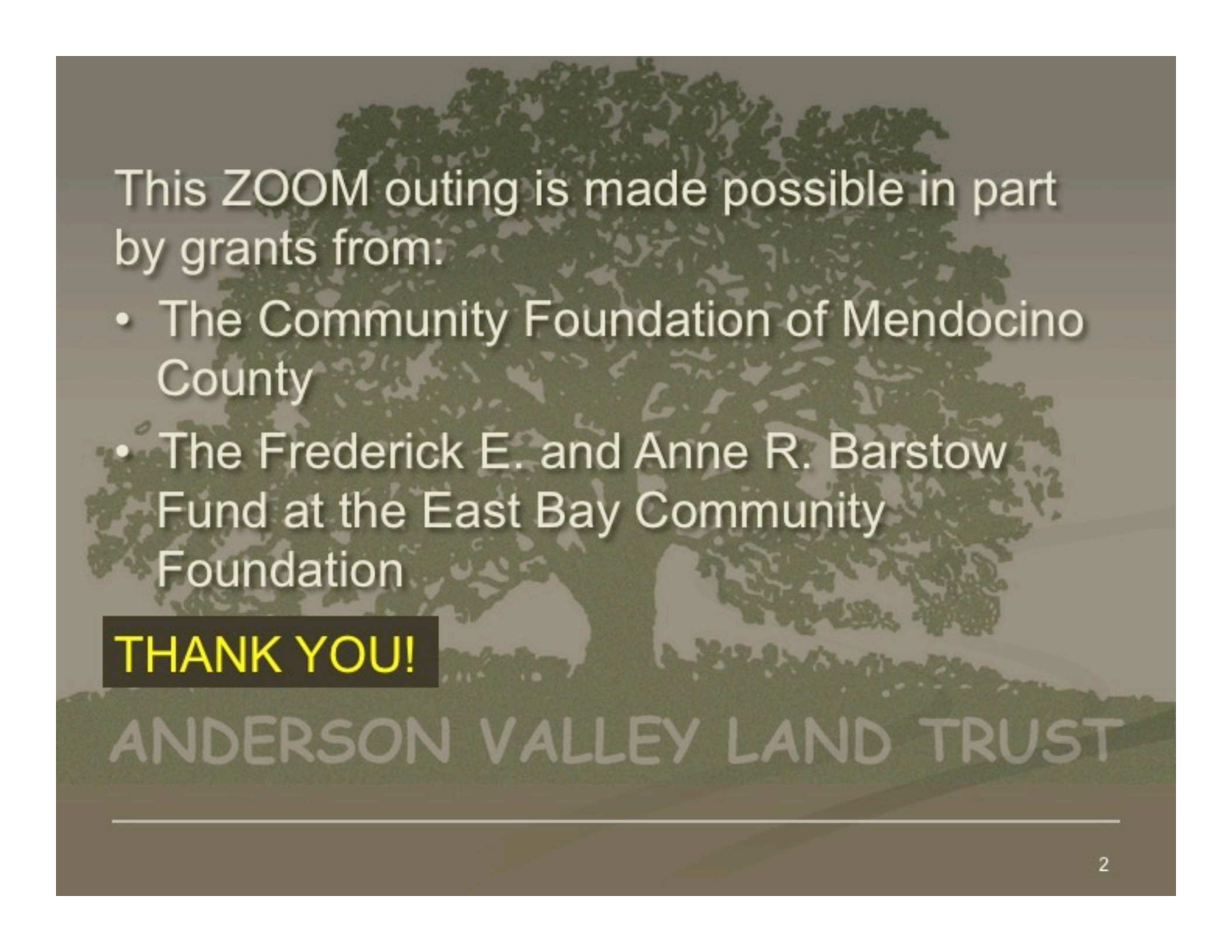


## ANDERSON VALLEY LAND TRUST



# Private Trails for Watching Wildlife + Wildflowers + Weather

A Landowner's Primer on Planning and Building Hiking Trails



This ZOOM outing is made possible in part  
by grants from:

- The Community Foundation of Mendocino  
County
- The Frederick E. and Anne R. Barstow  
Fund at the East Bay Community  
Foundation

**THANK YOU!**

ANDERSON VALLEY LAND TRUST

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Private Trails for Watching Wildlife + Wildflowers + Weather

## FOCUS: ANDERSON VALLEY NAVARRO RIVER WATERESHED



In every walk with nature, one receives far more than he seeks. (John Muir)



# AGENDA

- THINKING ABOUT TRAILS
  - Public vs. Private Trails
  - Why?
  - Seven Design Perspectives
  - Trail Design Basics
  - Alignment Planning
  - Key Trail Features
  - Tools, Construction, and Maintenance
  - Amenities
- A VIRTUAL WALK AROUND





# PUBLIC vs. PRIVATE TRAILS





## Private Trails for Watching Wildlife + Wildflowers + Weather

- What are the big similarities and big differences?
- PUBLIC
  - Safety / Acceptable risk
  - User experience
  - Topography / ADA compliance
  
  - Public engagement
  - Environmental review
  - Permitting
- PRIVATE
  - Safety / Acceptable risk
  - User experience
  - Topography / Ease of walking
  
  - Environmental stewardship
  - Limited permitting



## WHY TRAILS?

- GET OUTSIDE!
- EXPERIENCE ALL OR NEARLY ALL YOUR PROPERTY
- EXPERIENCE NATURE CHANGE OVER TIME
- ENJOY VIEWS AND . . .
- VISIT “PLACES” YOU MIGHT NEVER OTHERWISE GET TO WHERE YOU CAN APPRECIATE AND RELAX
- IT IS EASY AND FUN AND ALSO GOOD EXERCISE!  
OR SAID ANOTHER WAY. . .
- **IT IS NOT SO DIFFICULT THAT IT DISCOURAGES YOUR USE**



## Private Trails for Watching Wildlife + Wildflowers + Weather

# WILDLIFE







## Private Trails for Watching Wildlife + Wildflowers + Weather

# WILDLIFE





## Private Trails for Watching Wildlife + Wildflowers + Weather

# WILDLIFE





## WILDLIFE





# WILDFLOWERS





## Private Trails for Watching Wildlife + Wildflowers + Weather

# WILDFLOWERS





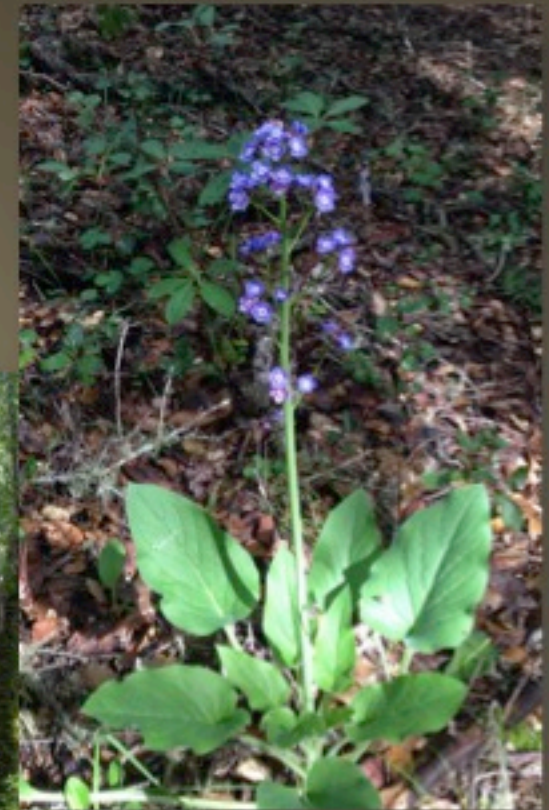
## Private Trails for Watching Wildlife + Wildflowers + Weather

### WILDFLOWERS





## OTHER VEGETATION





## OTHER VEGETATION







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## SECRET MEADOWS AND ONE-OF-A KINDS





## Private Trails for Watching Wildlife + Wildflowers + Weather

# WATER





## Private Trails for Watching Wildlife + Wildflowers + Weather

# WATER



# SEASONAL CHANGE





# SEASONAL CHANGE



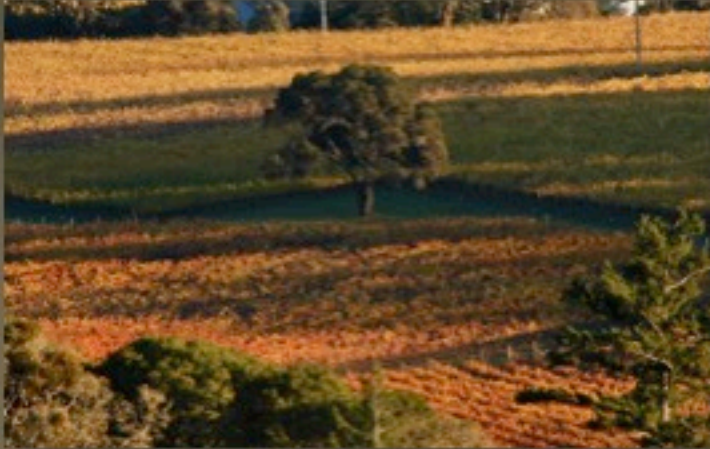


# SEASONAL CHANGE





# SEASONAL CHANGE





## Private Trails for Watching Wildlife + Wildflowers + Weather

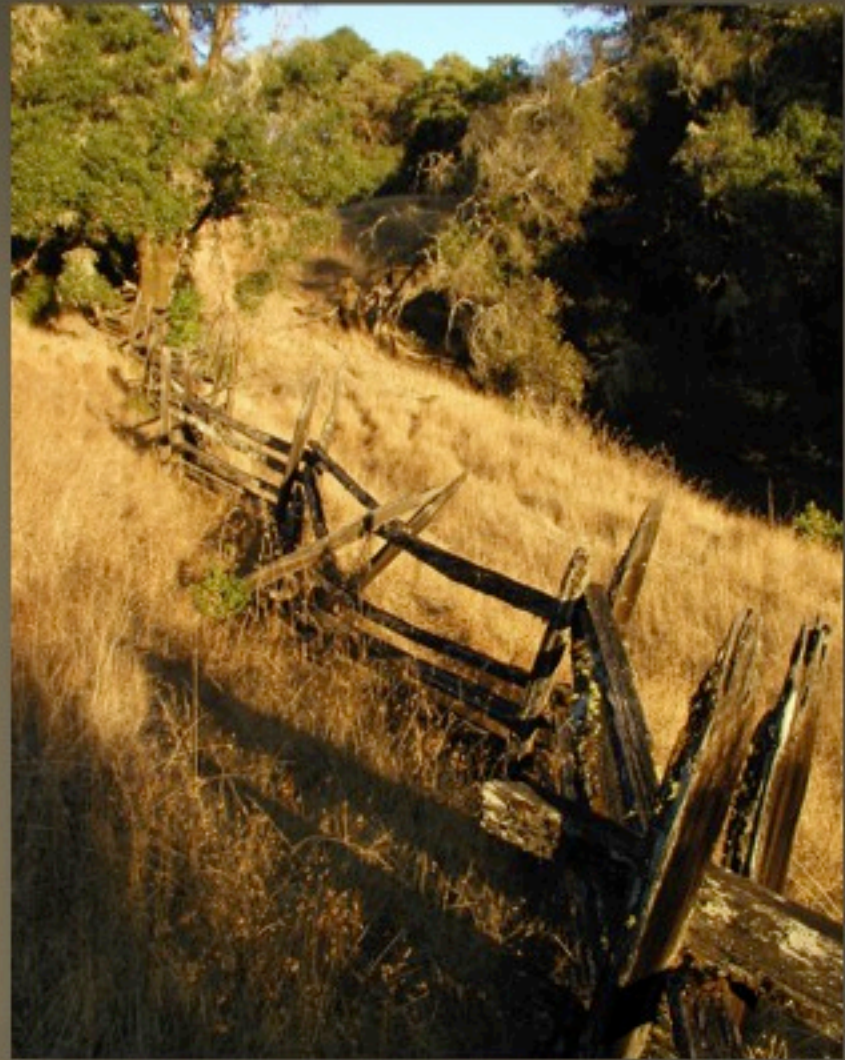
### VIEWS + VISTAS







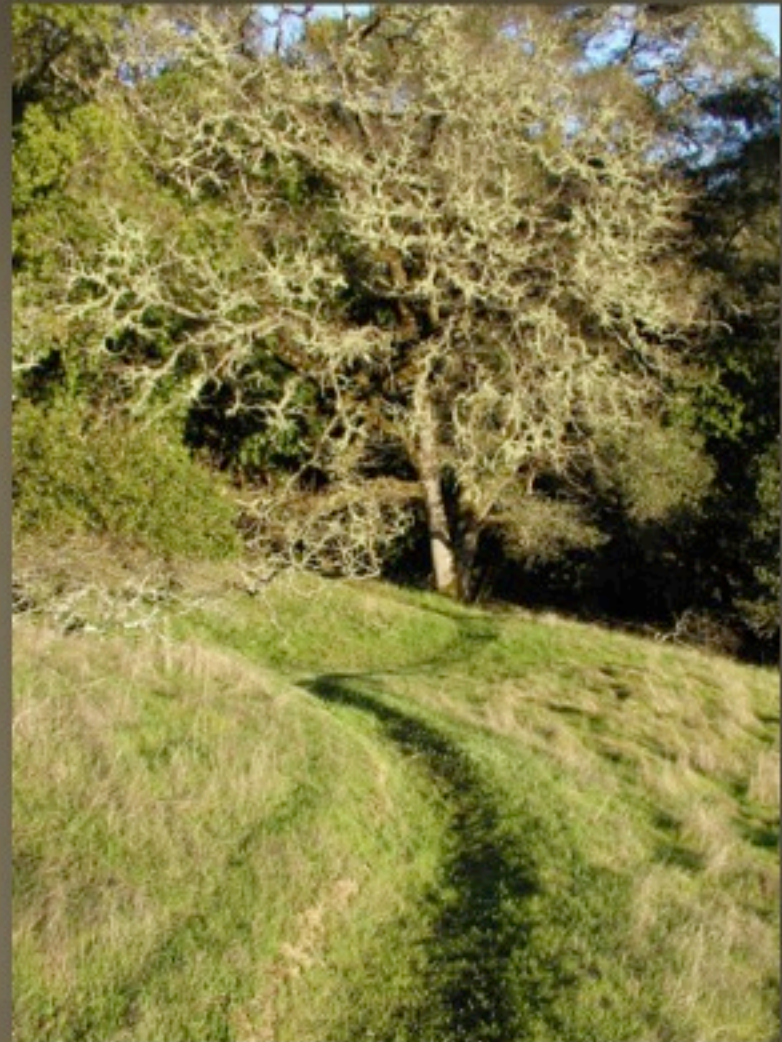
## ITEMS OF CULTURAL INTEREST





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# ADVENTURE





## Private Trails for Watching Wildlife + Wildflowers + Weather

# FUN



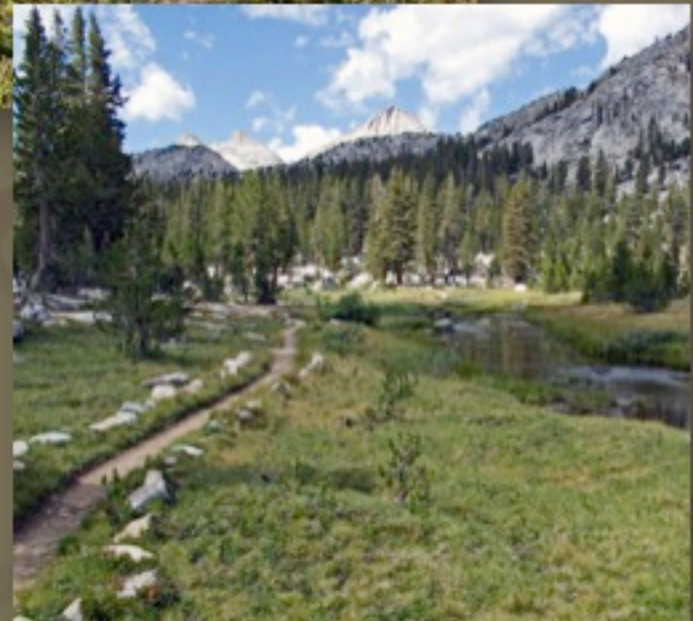


# SEVEN DESIGN PERSPECTIVES





# 1. UNDERSTAND THE FLOW OF WALKING





Private Trails for Watching Wildlife + Wildflowers + Weather

## 2. FIND THE DEER TRAILS





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## FOLLOW TOPOGRAPHY

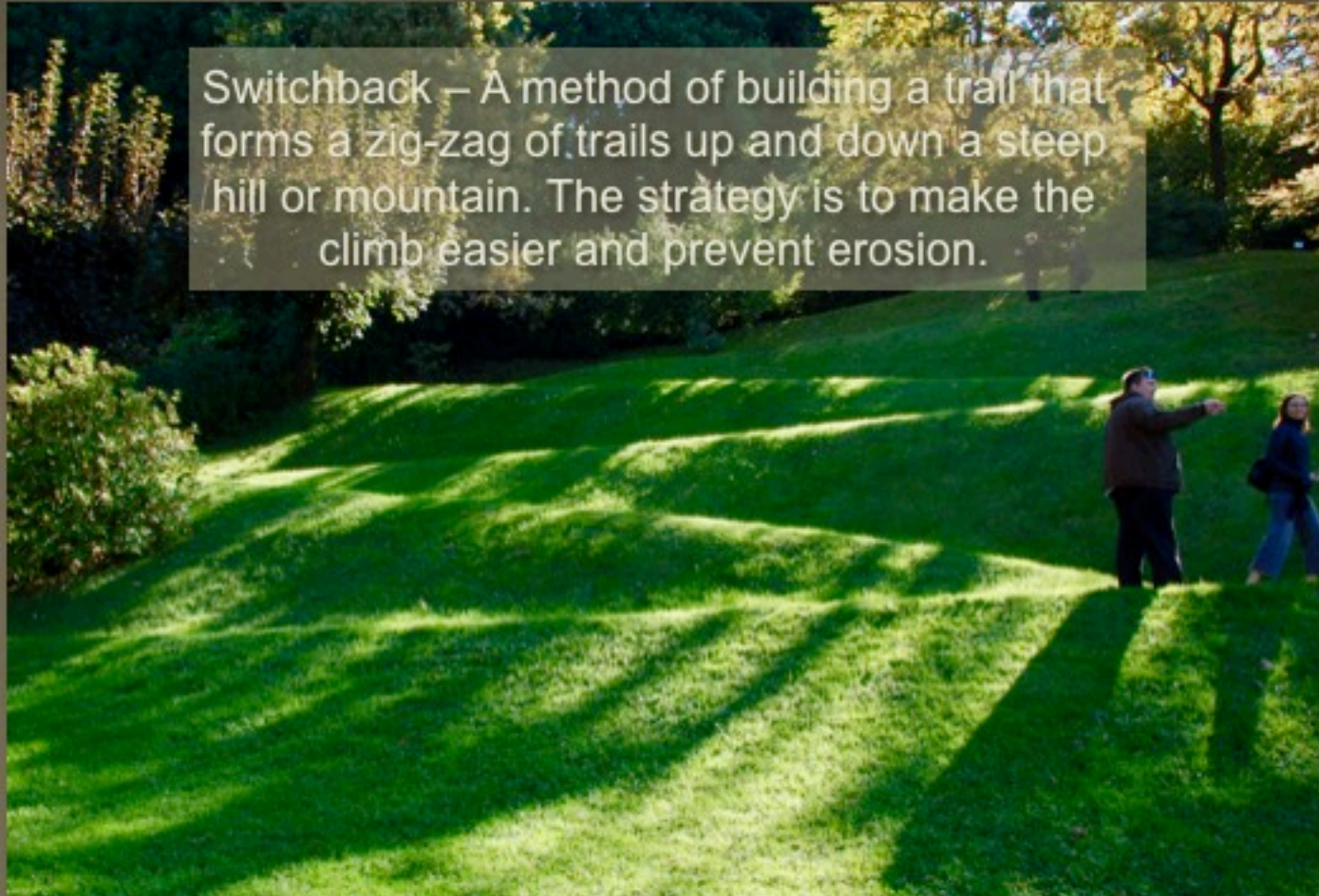
- Always curving; use straight lines only for impact





## 4. WORK THE ART OF SWITCHBACKS

Switchback – A method of building a trail that forms a zig-zag of trails up and down a steep hill or mountain. The strategy is to make the climb easier and prevent erosion.





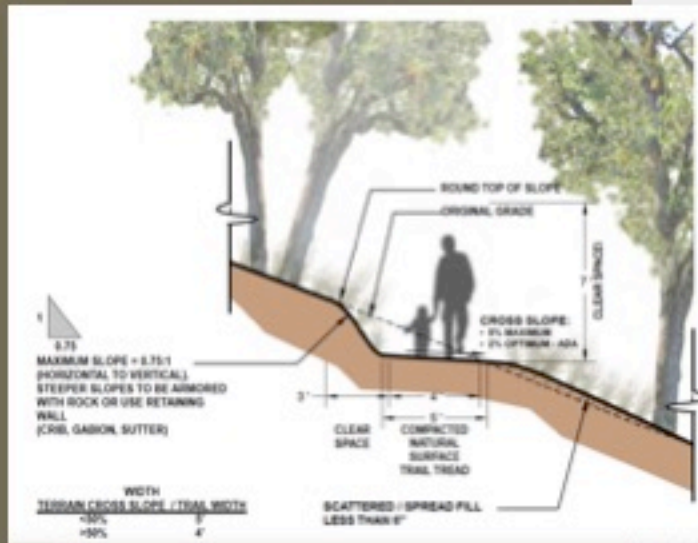


## 5. UNDERSTAND SITE CONDITIONS

- Topography / Slope
- Soils
- Vegetative Cover
- Drainage Patterns
- Aspect

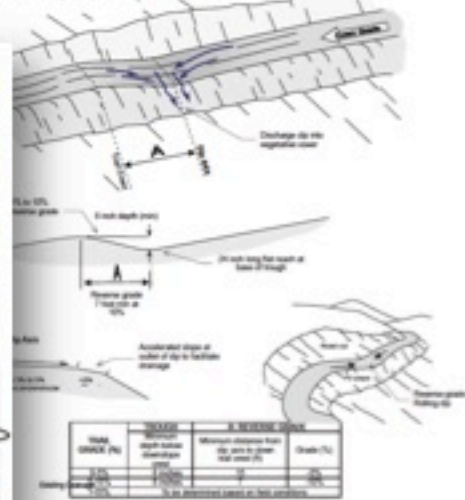


# 6. USE COMMON SENSE EVEN THOUGH BUILDING A TRAIL CAN BE VERY TECHNICAL



## REVERSE-GRADE ROLLING DIP (Typical)

A reverse-grade dip (or rolling dip) is a broad, long, permanent dip constructed into native soils. The dip is a constructed outcropped escarpment in a down-sloping trail. It is created by raising the trail grade for its full width on the downside of the dip axis to direct surface water running along the trail to the outside before stormwater has a chance to create linear gulching and erosion along the trail.



of the dip shall be a minimum of 8 inches below the elevation of the trail crest and typically incorporate a 2' reach at the base of the trough.

grade shall be sloped from 1% for a minimum of 15 feet, to 10% for a minimum of 7 feet, to form the 6" deep dip.

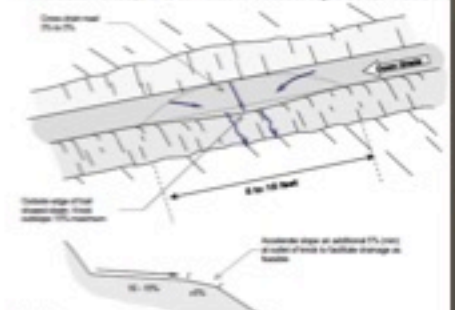
shall be outcropped (measured perpendicular to trail) 3% to 5%.

shall be located to drain into areas with adequate sediment filter quality and non-erodible material such as rock, straw, or brush.

- Based on cross slopes and soil conditions the bottom of the dip outlet may surface-rocked.
- Where natural cross slopes exceed 50%, 50 shall not be placed over the dip outlet. The trail should be realigned at the dip so that the dip outlet consists of natural grade or undisturbed soil.
- Dips should be placed as site conditions warrant but generally should be placed at maximum 75-foot spacings.

## KNICK (Typical)

A knick is a semi-circular, shallow down section of the outside edge of the trail. Knicks are...



**NOTES:**

- The center of the knick outlet is outcropped at 10% to 15% to draw water off of the trail.
- Dip outlets should be located to drain into areas with adequate sediment filter quality and non-erodible material such as rock, straw, or brush.
- Knicks to be installed based on site conditions.

## STRAW ROLL



**NOTES:**

- Placement
- Install per manufacturer's recommendations.
- Rolls to be placed on slope contour.
- Adjacent rolls to overlap. Both ends of rolls up.
- Flume? must not be allowed to run under or around the roll.



## 7. USE WET CROSSINGS

OR

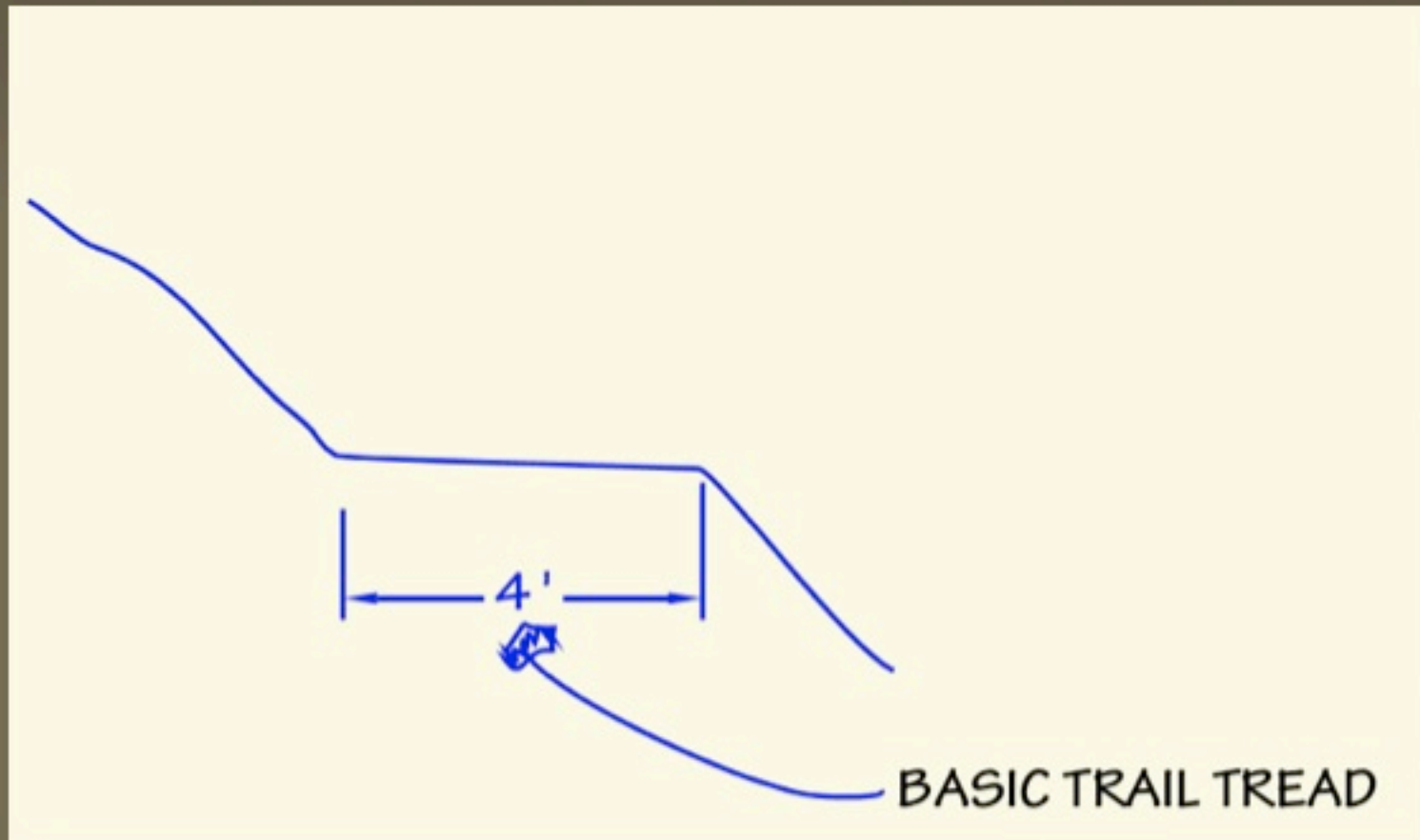
CROSS STREAMS  
AND DRAINAGES  
ON STRUCTURES  
LOCATED WELL  
OUTSIDE THE  
FLOODPLAIN





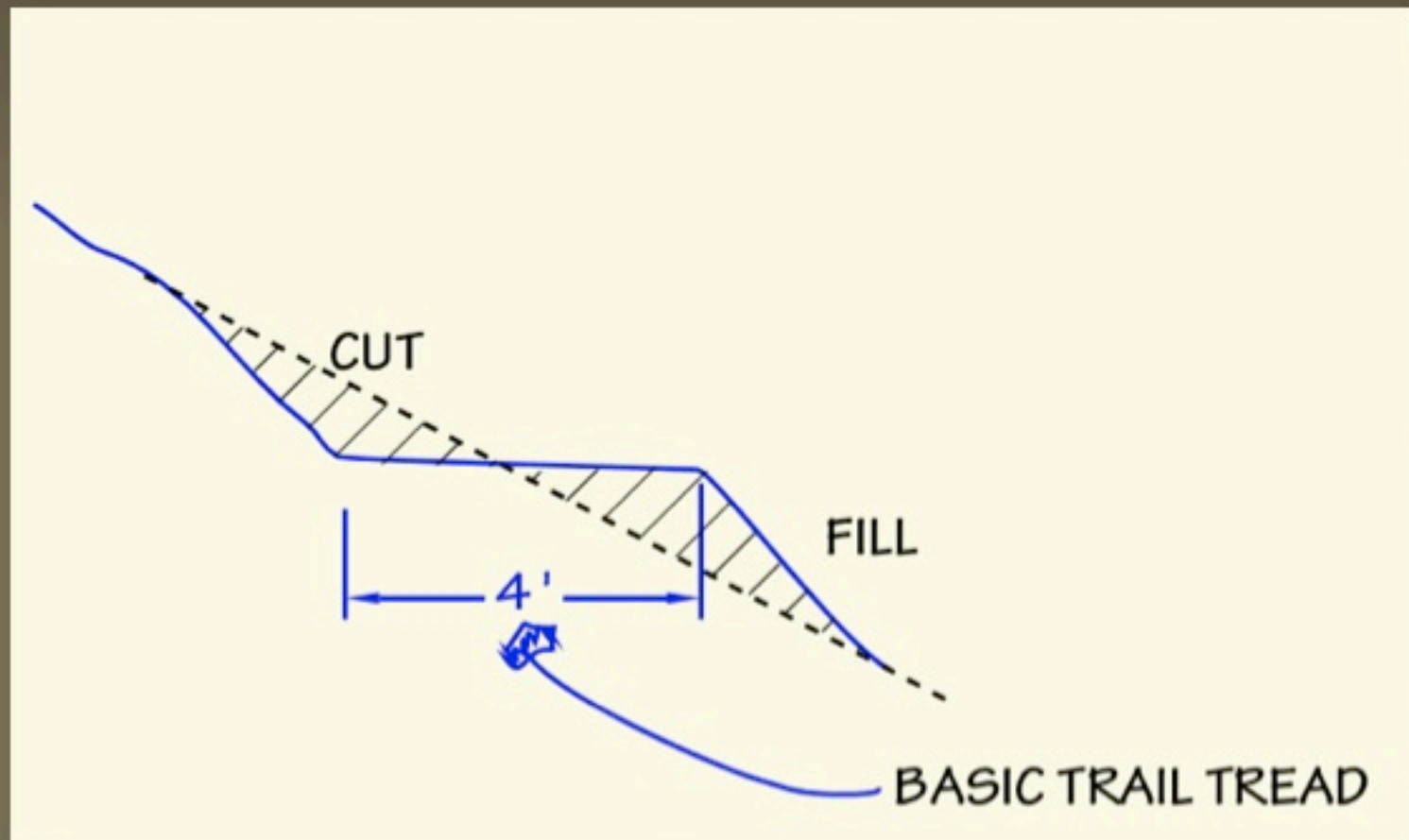
# TRAIL DESIGN BASICS

## WIDTH



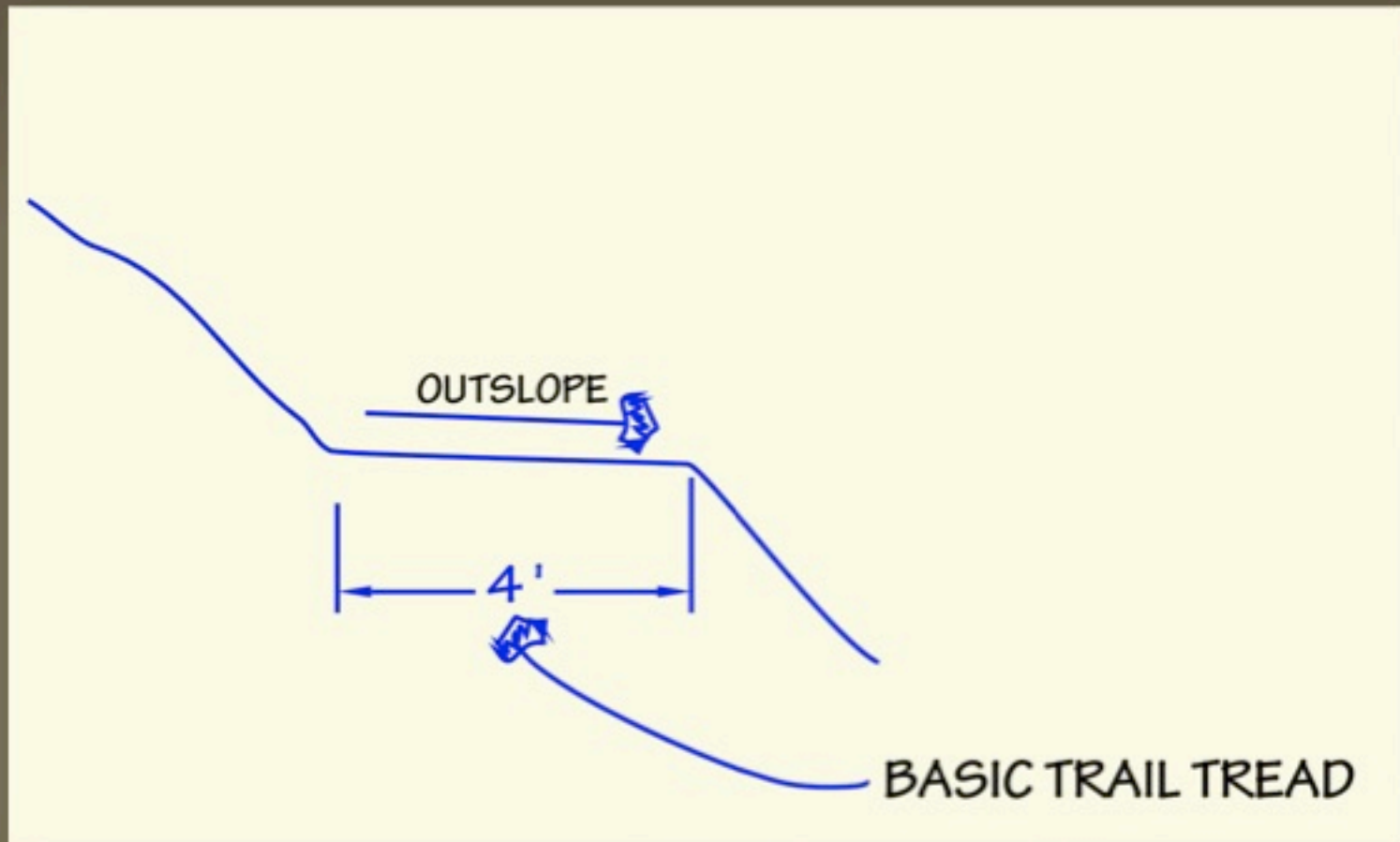


## GRADING: CUT + FILL



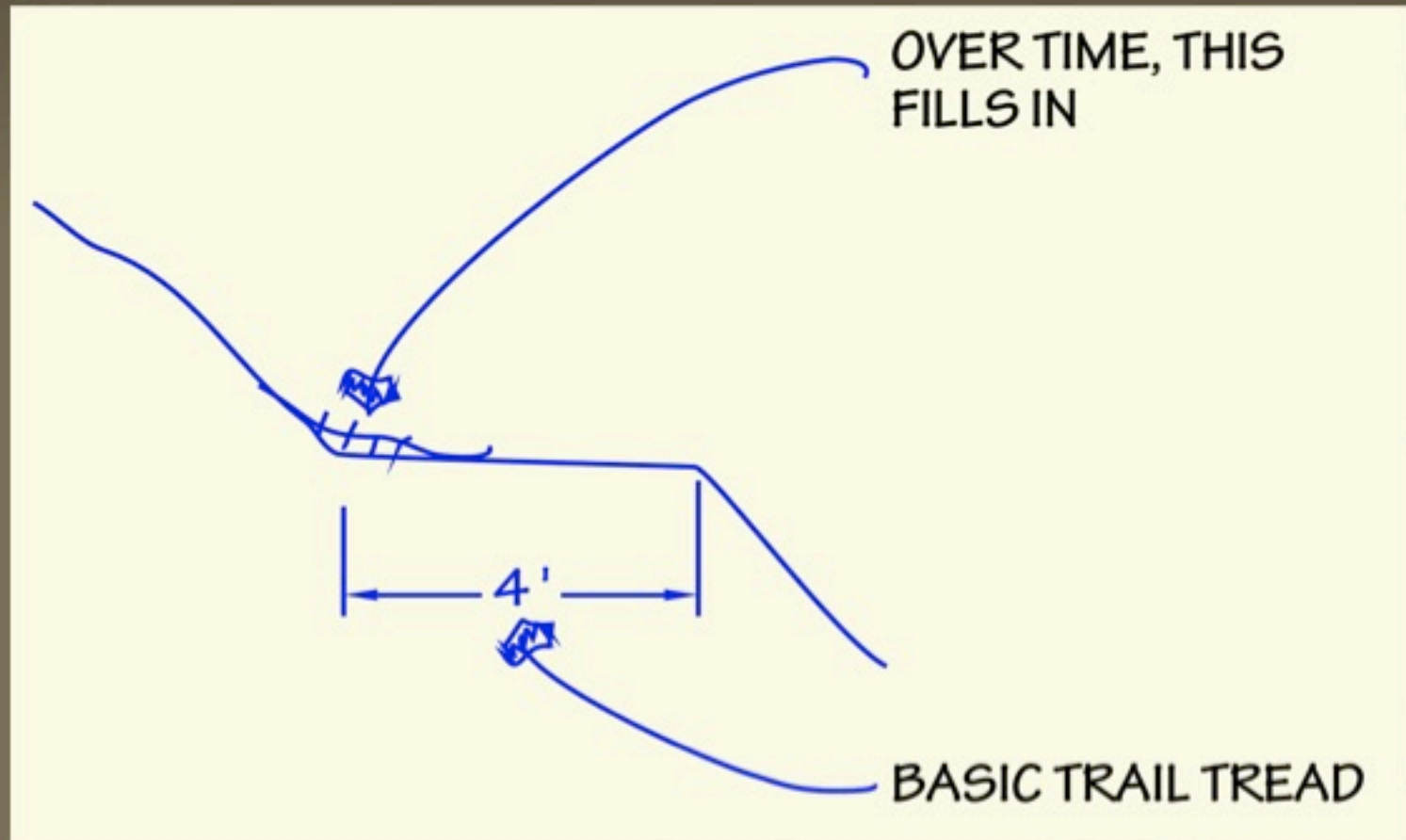


# SLOPE



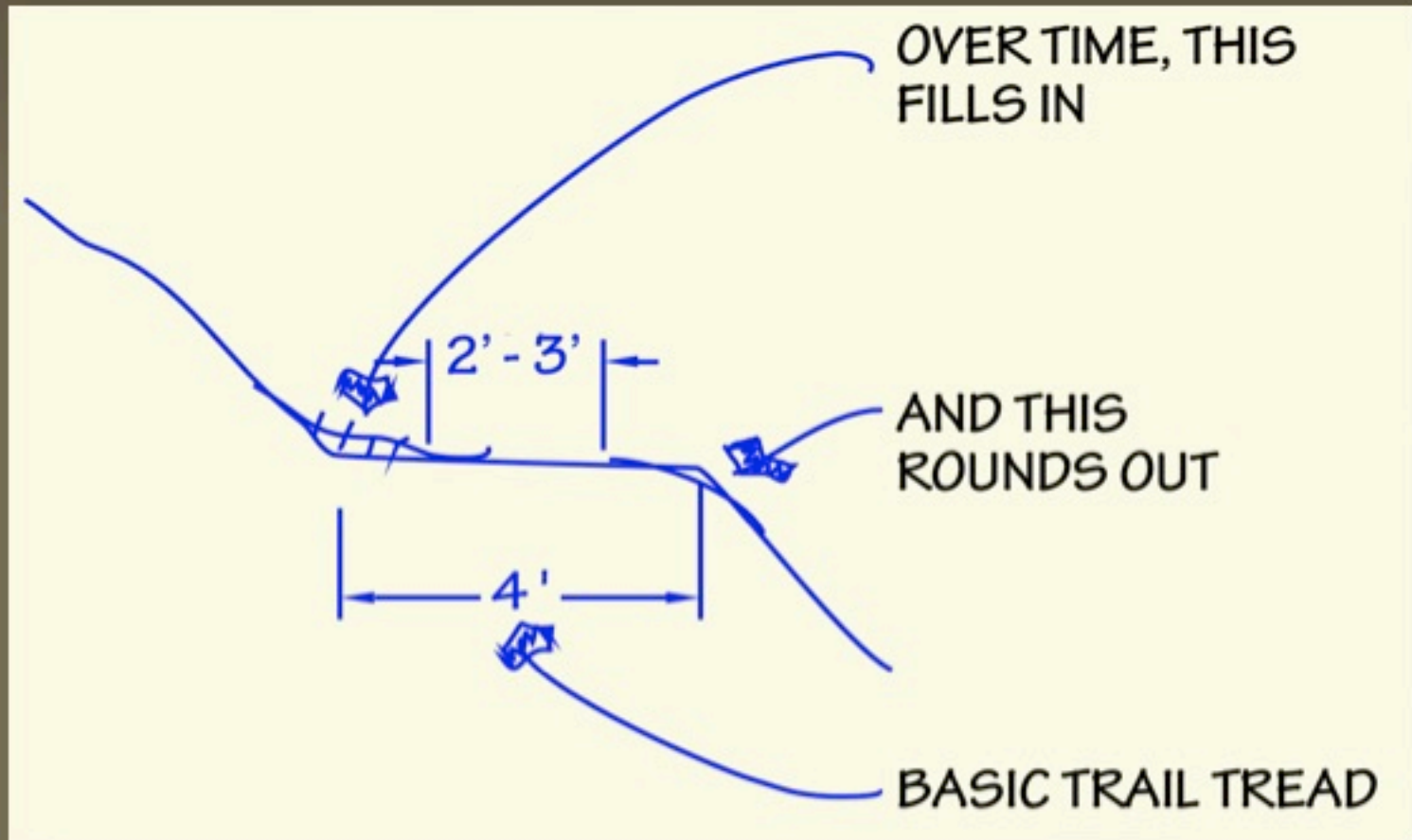


## IN TIME





## IN TIME

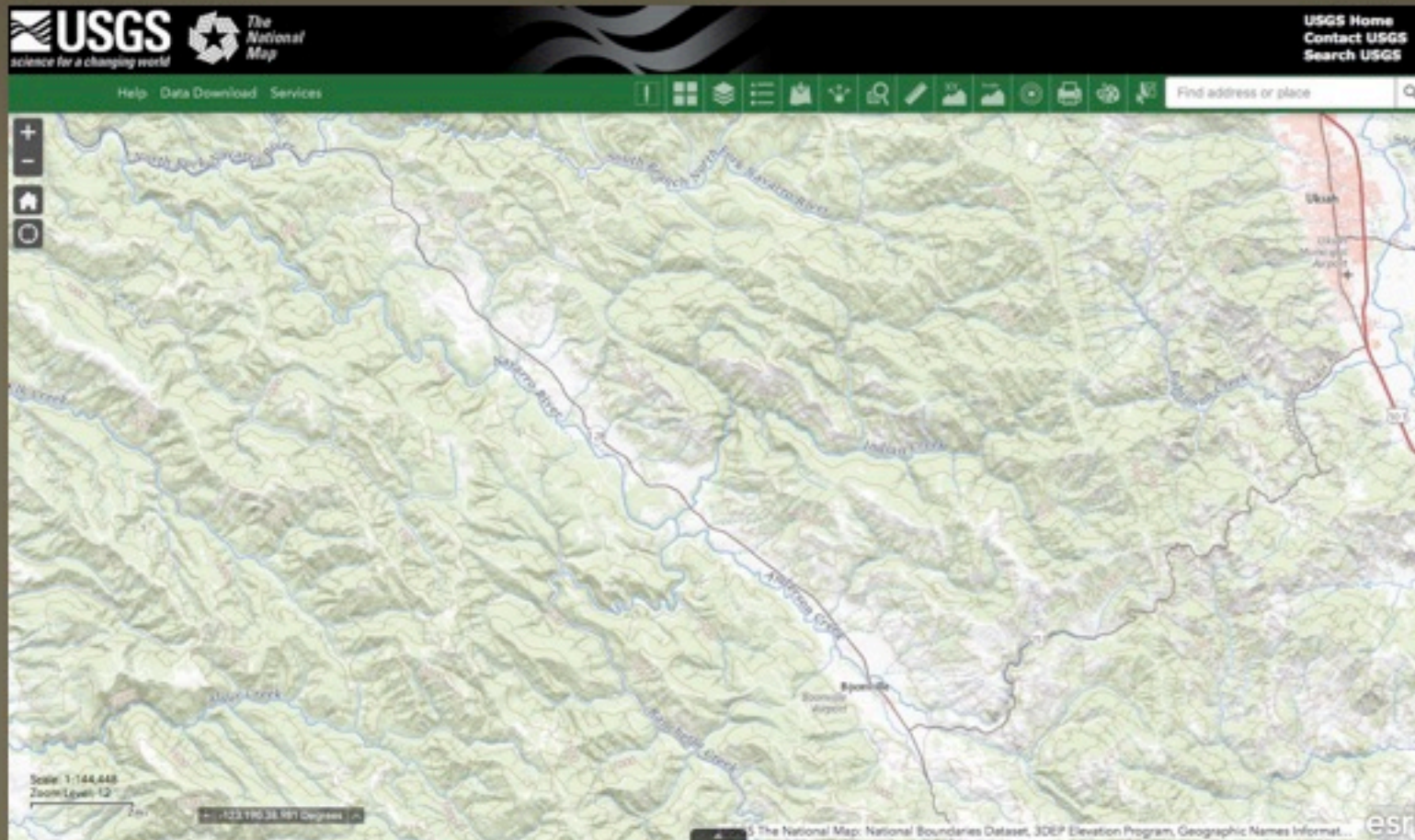






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# TOPOGRAPHY / SLOPE



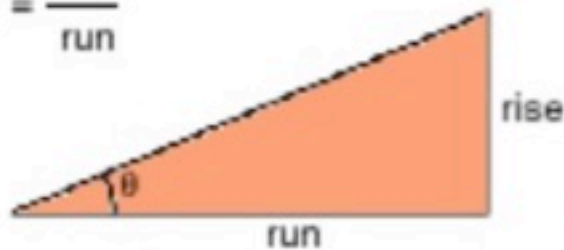


# TOPOGRAPHY / SLOPE

Degree of slope =  $\theta$

$$\text{Percent of slope} = \frac{\text{rise}}{\text{run}} * 100$$

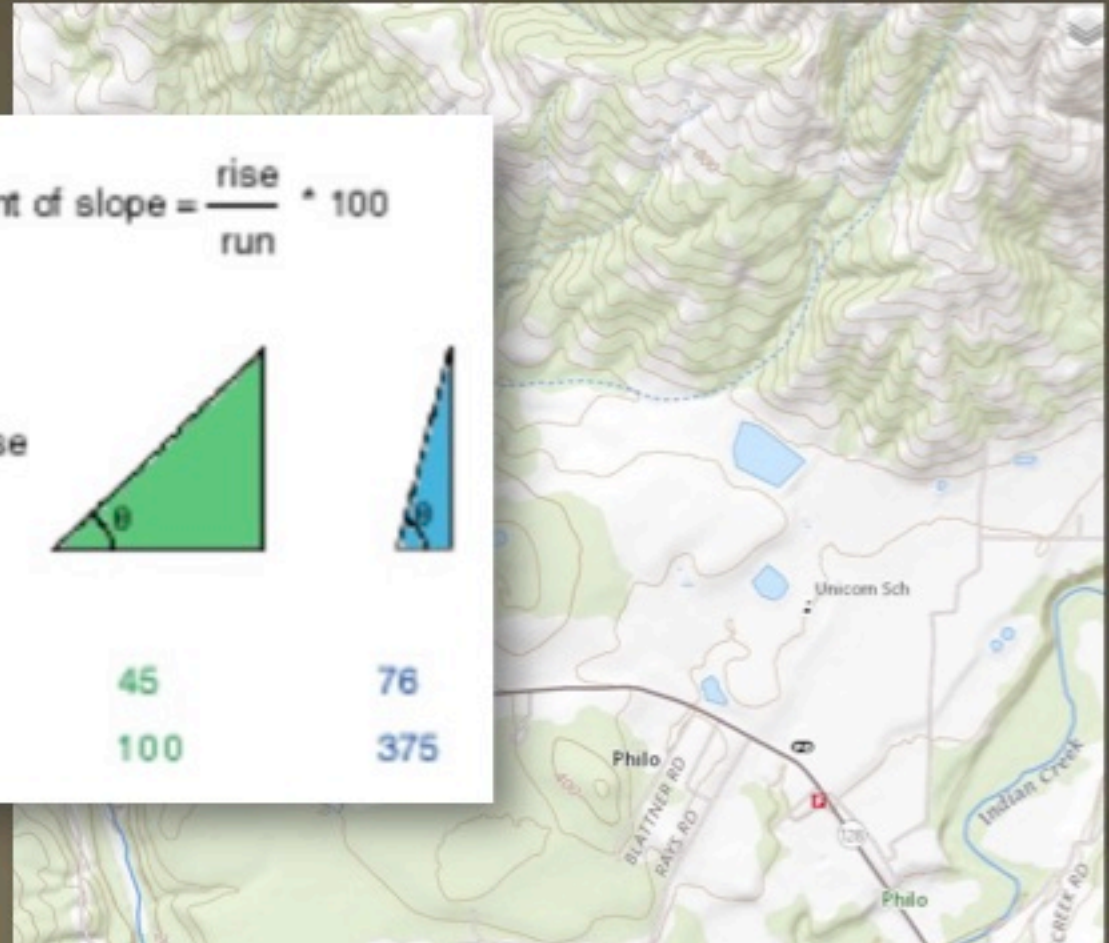
$$\tan \theta = \frac{\text{rise}}{\text{run}}$$



Degree of slope = 30  
Percent of slope = 58

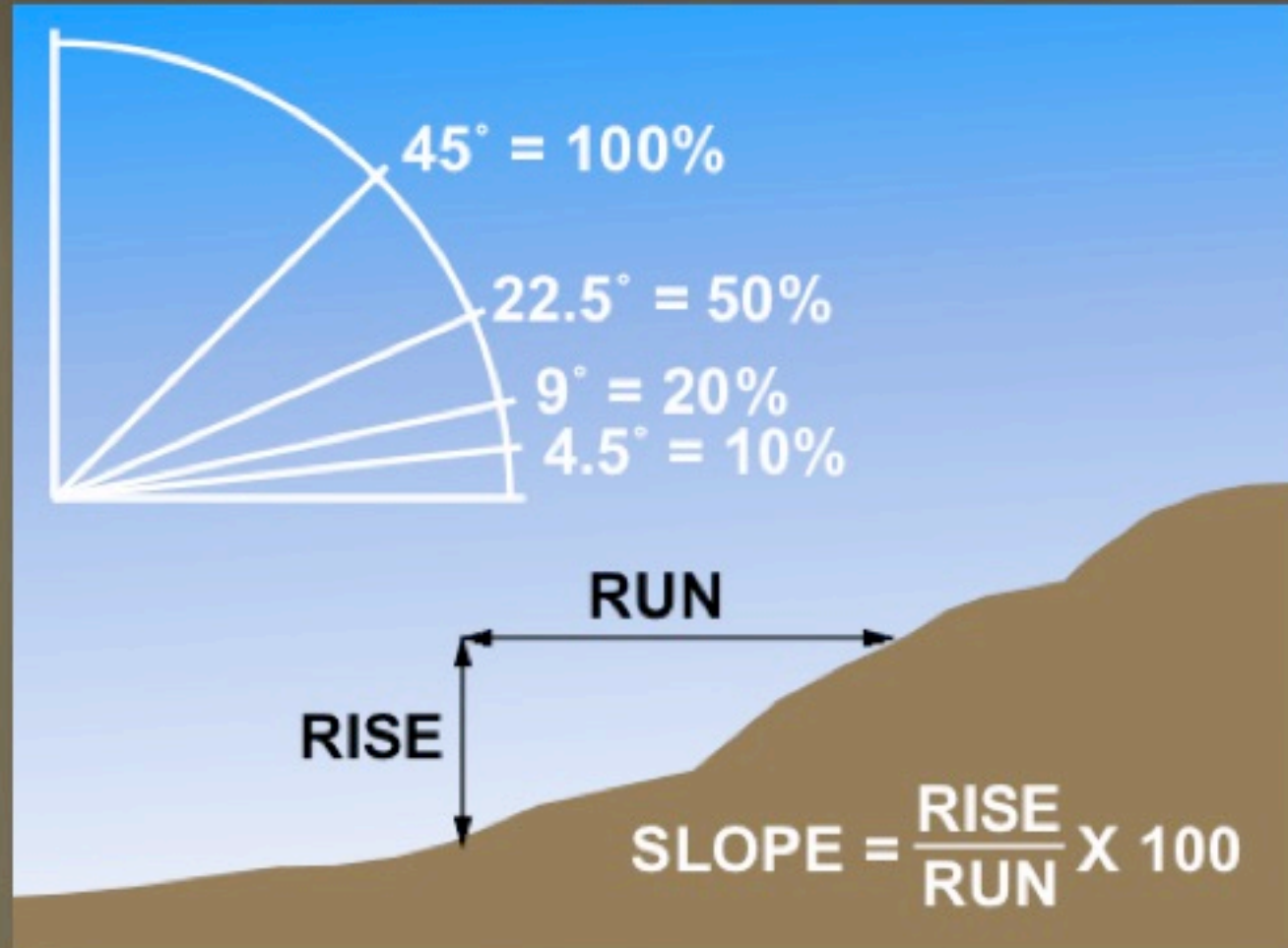
45  
100

76  
375





## TOPOGRAPHY / SLOPE





## TRAIL RUNNING SLOPE



PHOTO CREDIT: UKIAH VALLEY TRAILS GROUP



## TRAIL RUNNING SLOPE

RISE:RUN	PERCENT SLOPE
FLAT	0%
<b>1:20</b>	5%
1:12	8.33%
1:10	10%
1:8	12%

FROM	TO	DEGREE OF DIFFICULTY
FLAT	5%	EASIEST
5%	8.33%	EASY
8.33%	10%	GETTING HARD
10%	12%	HARDER
12%	30%	OUT OF BREATH
30%	REALLY STEEP	CONSIDER STEPS



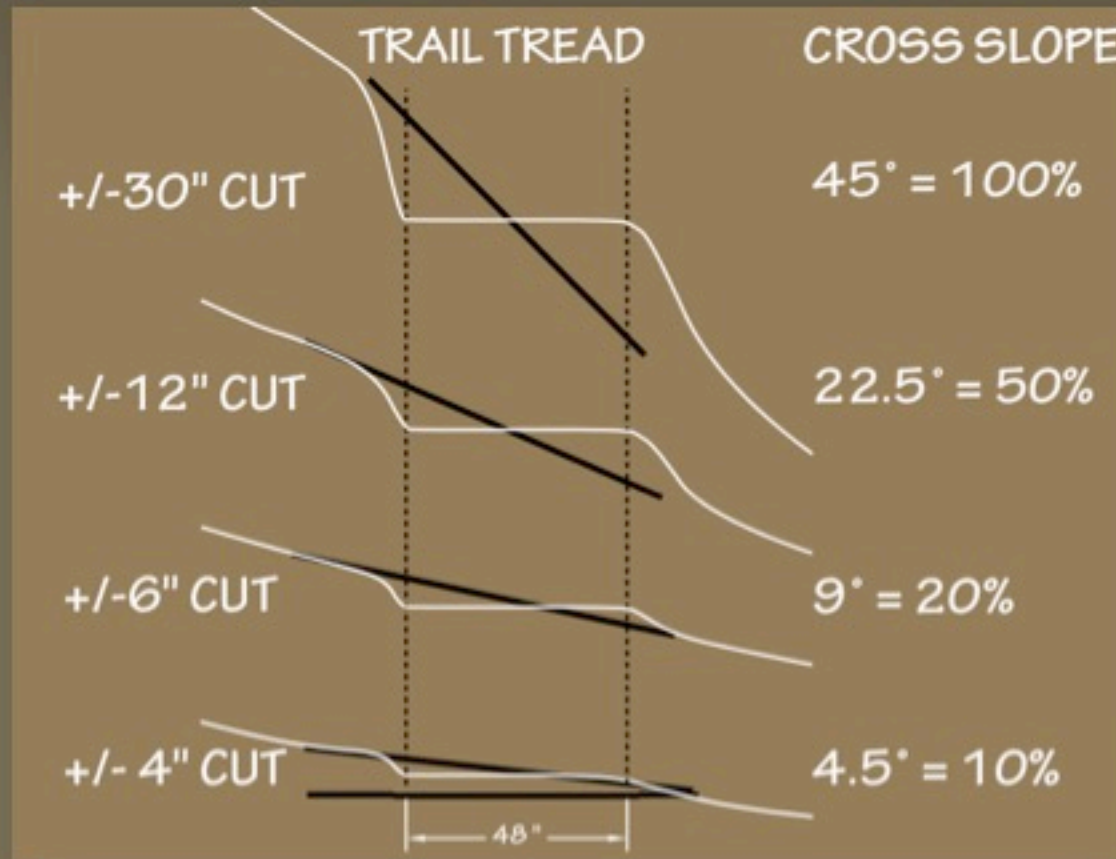
## TRAIL CROSS SLOPE



PHOTO CREDIT: UKIAH VALLEY TRAILS GROUP



## TRAIL CROSS SLOPE





## TRAIL CROSS SLOPE

FROM	TO	DEGREE OF DIFFICULTY
FLAT	10%	<ul style="list-style-type: none"><li>• LITTLE TO NO GRADING</li><li>• LESS THAN ONE SHOVEL DEPTH</li></ul>
10%	20%	<ul style="list-style-type: none"><li>• MODERATE GRADING</li><li>• ONE SHOVEL DEPTH</li></ul>
20%	50%	<ul style="list-style-type: none"><li>• HARD GRADING</li><li>• TWO SHOVEL DEPTHS</li></ul>
STEEPER THAN 50%		<ul style="list-style-type: none"><li>• GETTING PROBLEMATIC</li><li>• MANY SHOVEL DEPTHS</li><li>• MAY NEED RETAINING WALLS</li></ul>





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# GOAL: EXTEND LENGTH OF TRAIL AS MUCH AS POSSIBLE TO REDUCE RUNNING SLOPE





# ANY QUESTIONS?





## ALIGNMENT PLANNING

### WHERE DOES A TRAIL WANT TO GO?

#### FROM HOME TO:

- Water Supply (wells, pumps, tanks, springs)
- Level Areas (for decks, camps, picnic tables, benches)
- View Points
- Streams and Waterfalls (riparian habitat corridors)
- Springs and Ponds (for wildlife too)
- Specific Plants (heritage trees, one-of-a-kinds)
- Unique Geology (rock outcrops, land formations)
- Security (perimeter points / views / friendly neighbor access)
- Cultural Sites (old fences, barns, bedrock mortars)
- Any “One-of-a-Kinds”



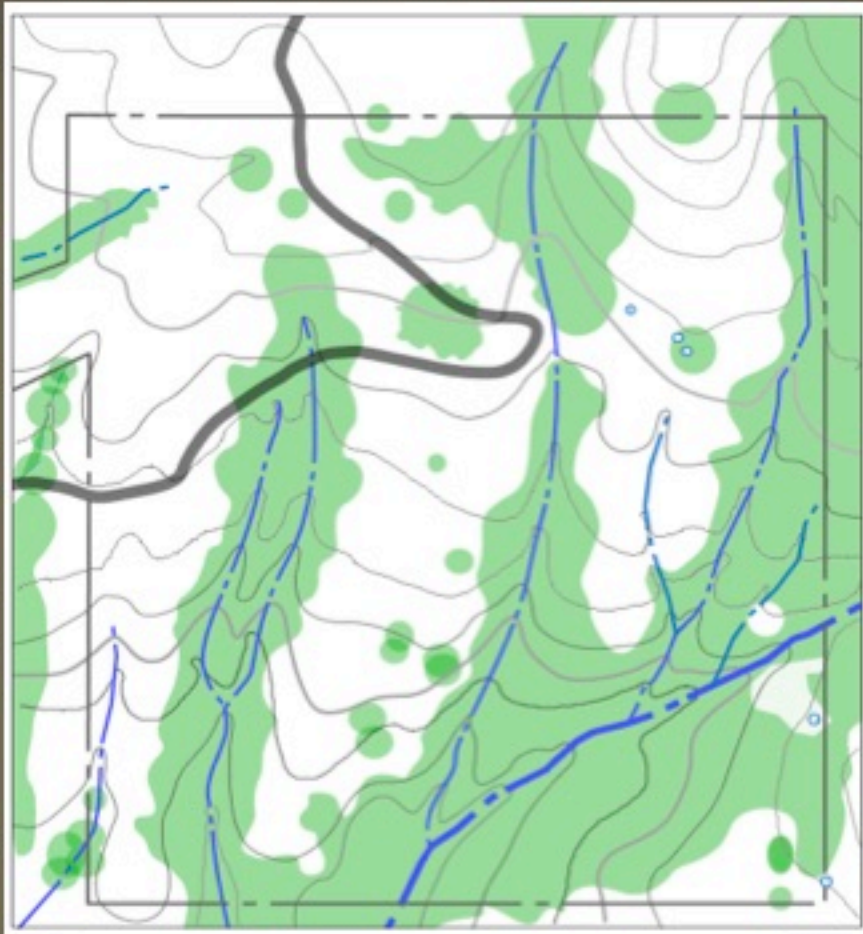
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## CASE STUDY





## START WITH A MAP





## SLOPE

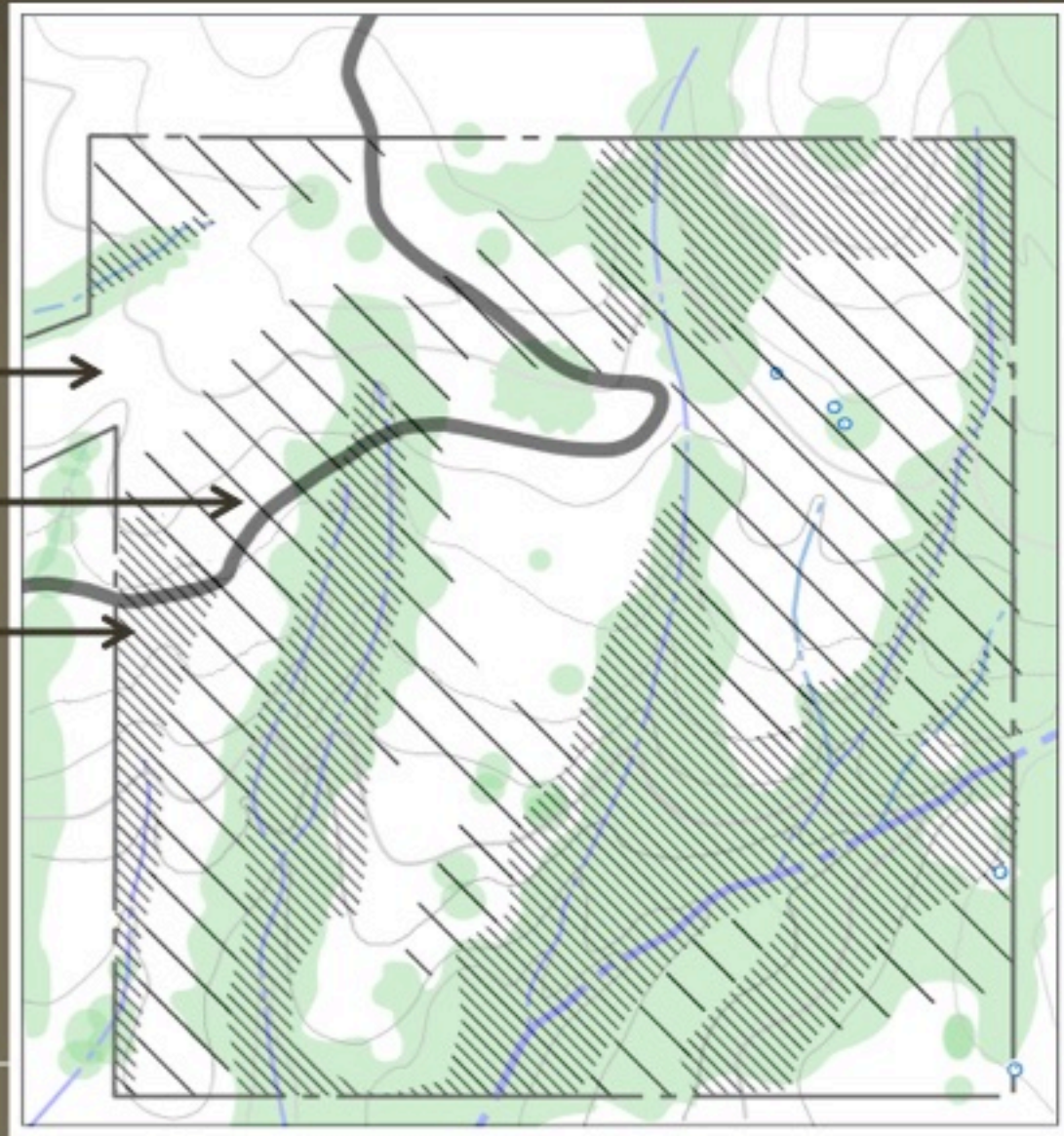
0%-30%



30%-50%

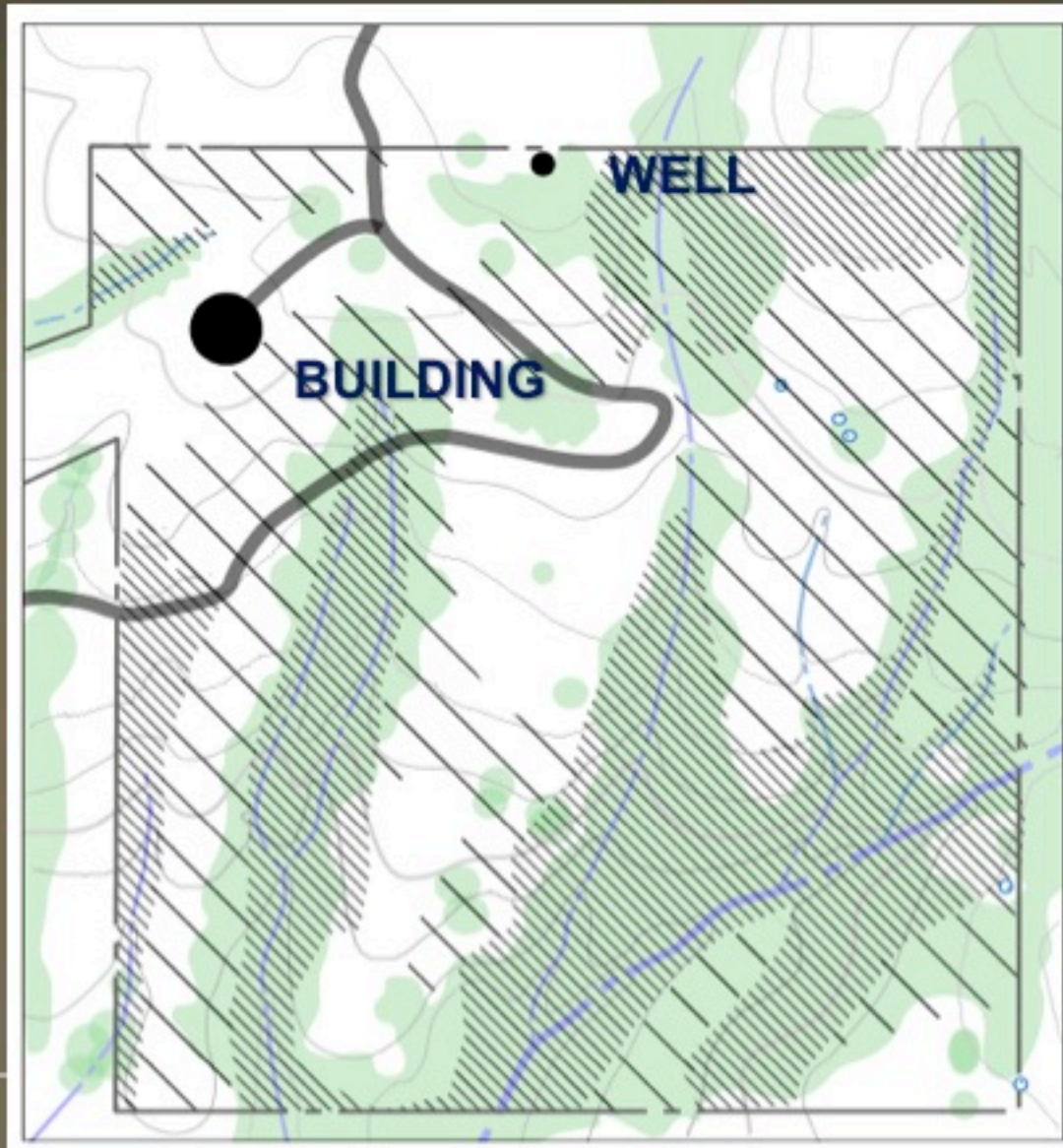


OVER 50%





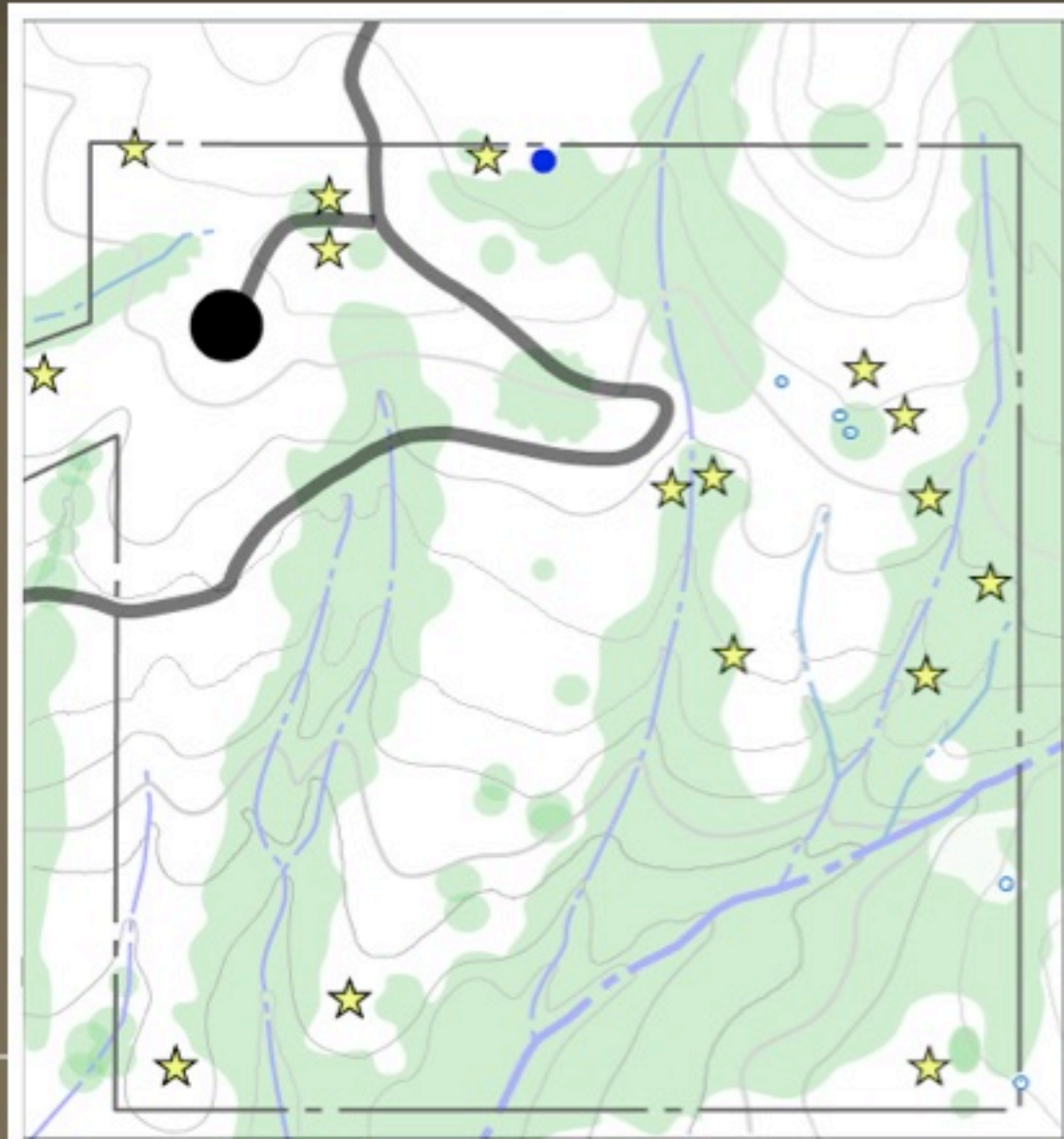
## EXISTING FACILITIES





## Private Trails for Watching Wildlife + Wildflowers + Weather

### SMALL LEVEL AREAS

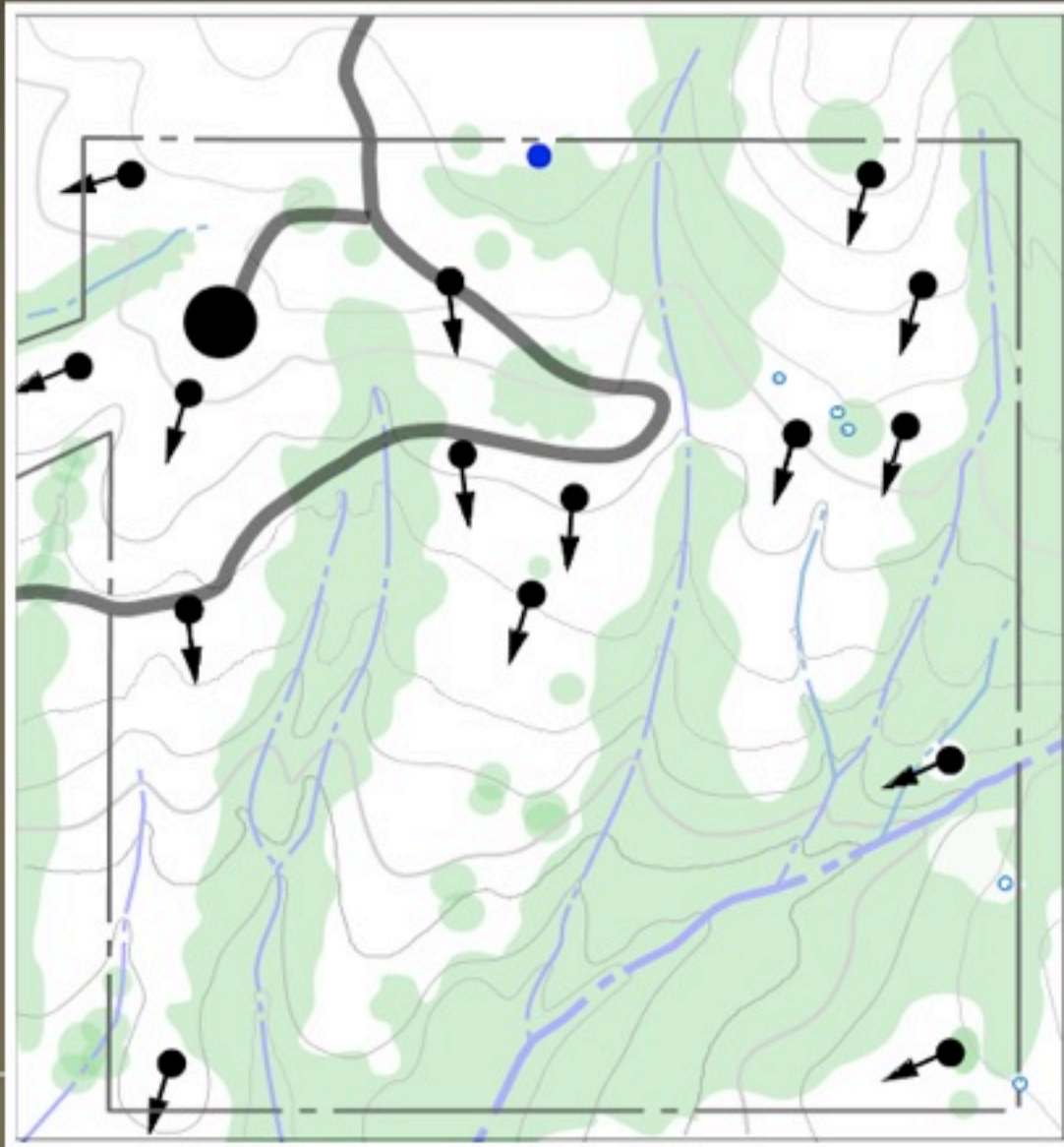






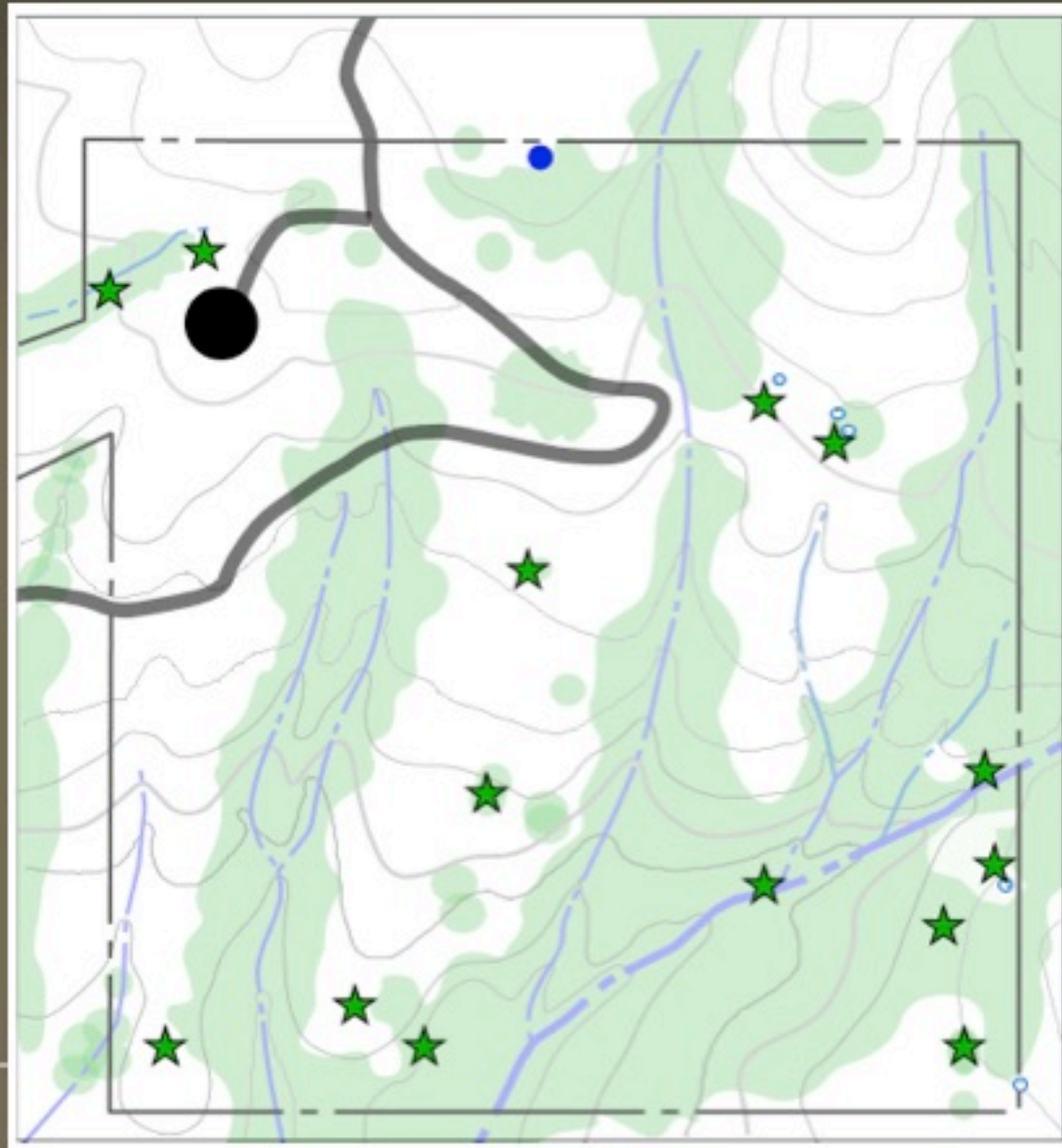
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### VIEWS





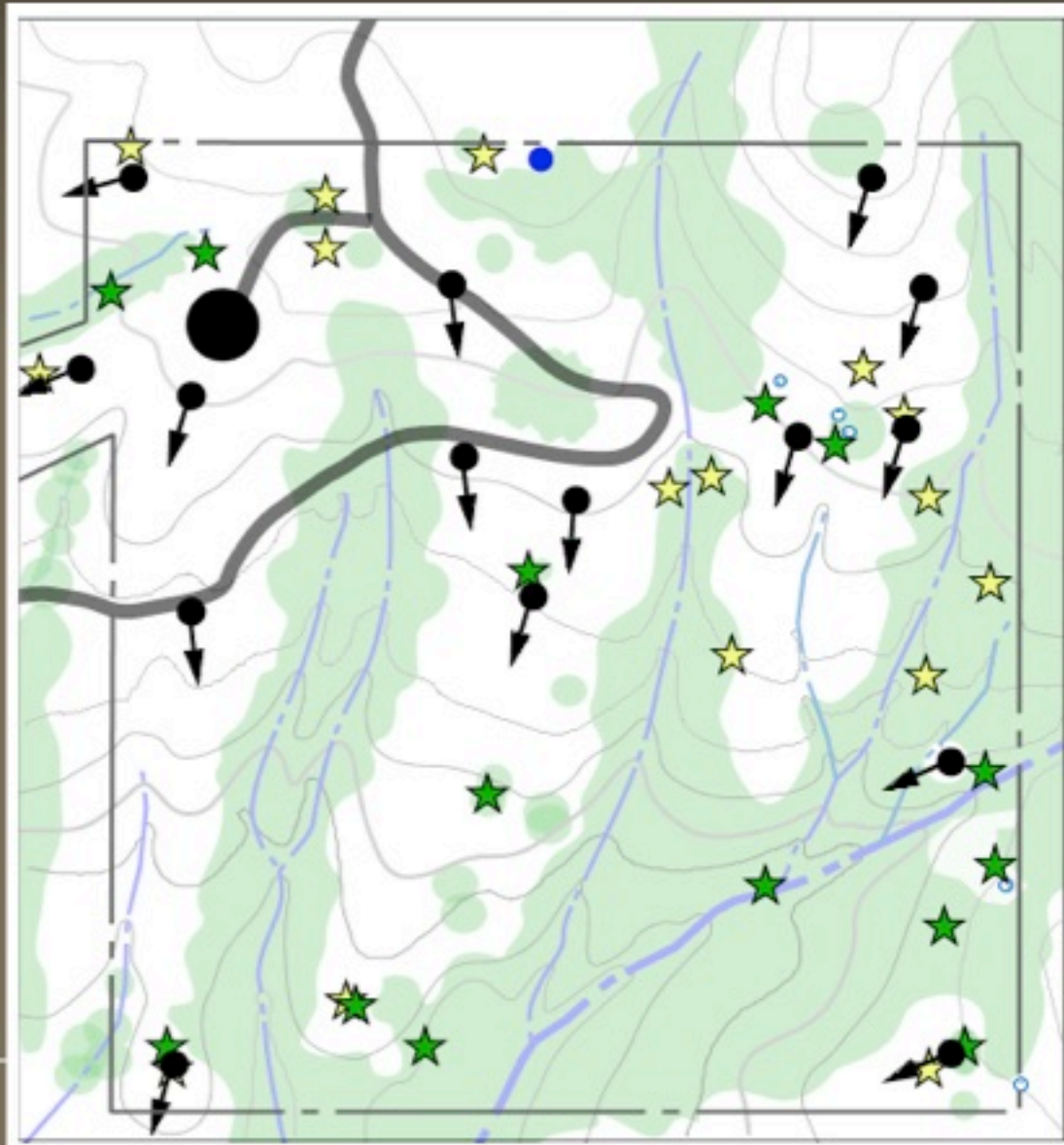
# NATURAL FEATURES





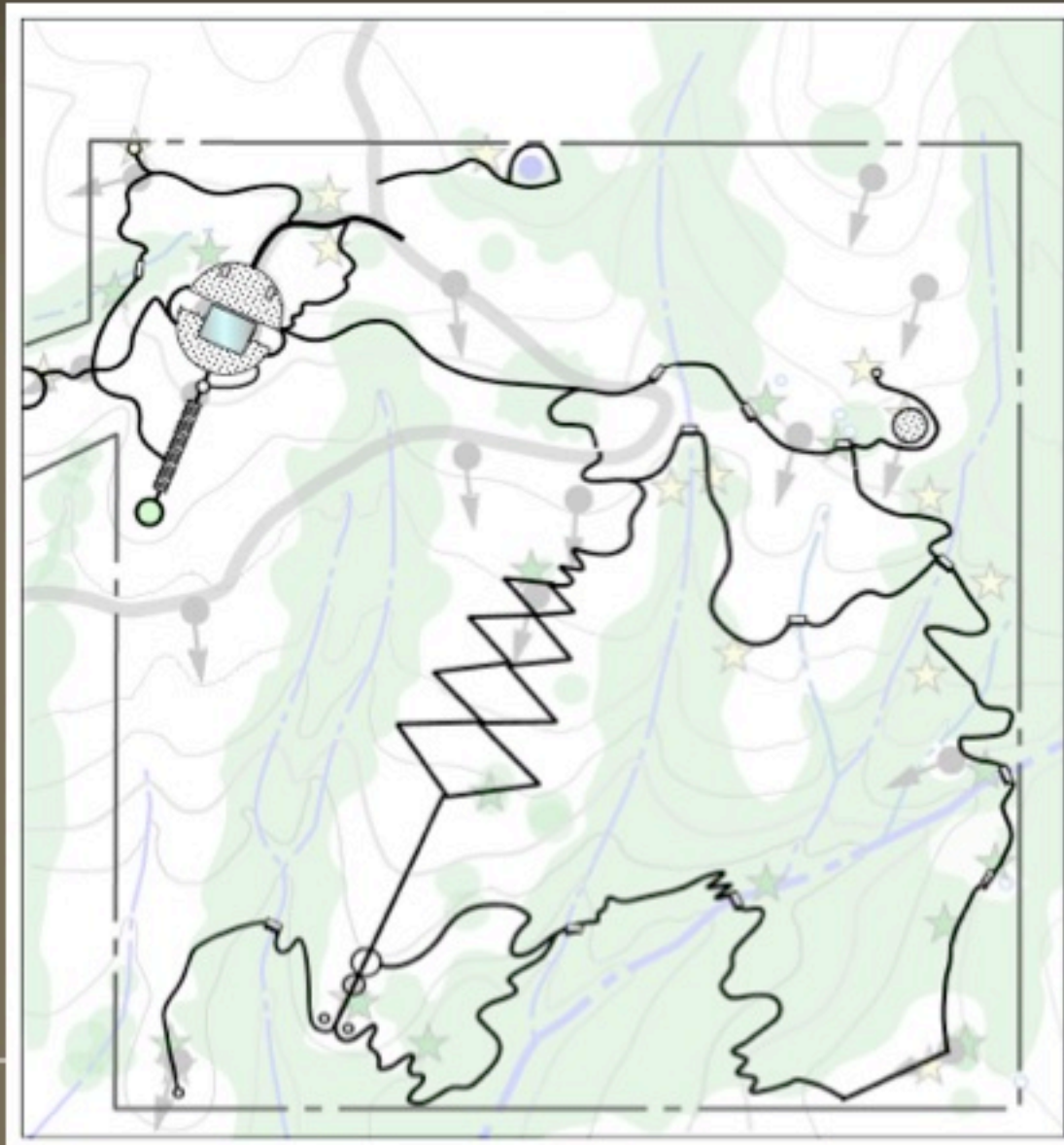
## Private Trails for Watching Wildlife + Wildflowers + Weather

### COMBINED "GO-TO" POINTS





# TRAIL SYSTEM





## Private Trails for Watching Wildlife + Wildflowers + Weather

# TRAIL SYSTEM





# KEY TRAIL FEATURES

## BASIC TRAIL





## Private Trails for Watching Wildlife + Wildflowers + Weather

### BASIC TRAIL



# BASIC TRAIL







## Private Trails for Watching Wildlife + Wildflowers + Weather

# BASIC TRAIL



**SWITCHBACKS**





## Private Trails for Watching Wildlife + Wildflowers + Weather



**OBSTACLES**



**STEPS**





## Private Trails for Watching Wildlife + Wildflowers + Weather

### STEPS





## Private Trails for Watching Wildlife + Wildflowers + Weather

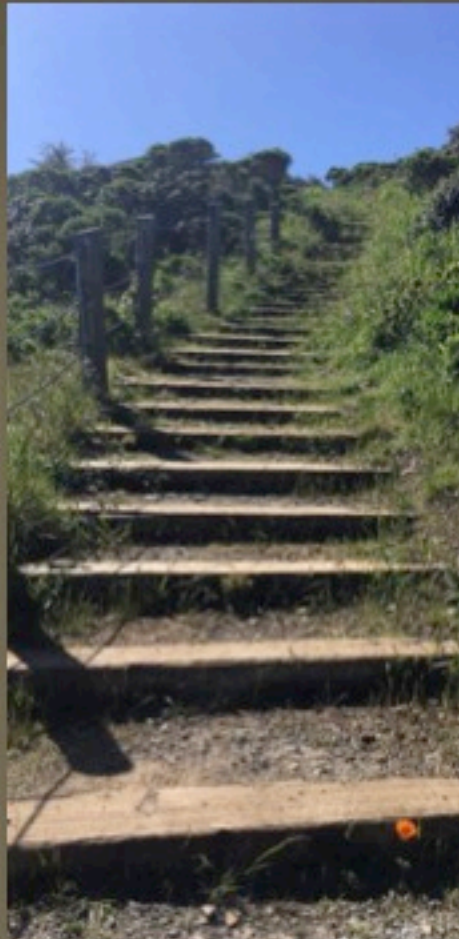
# STEPS





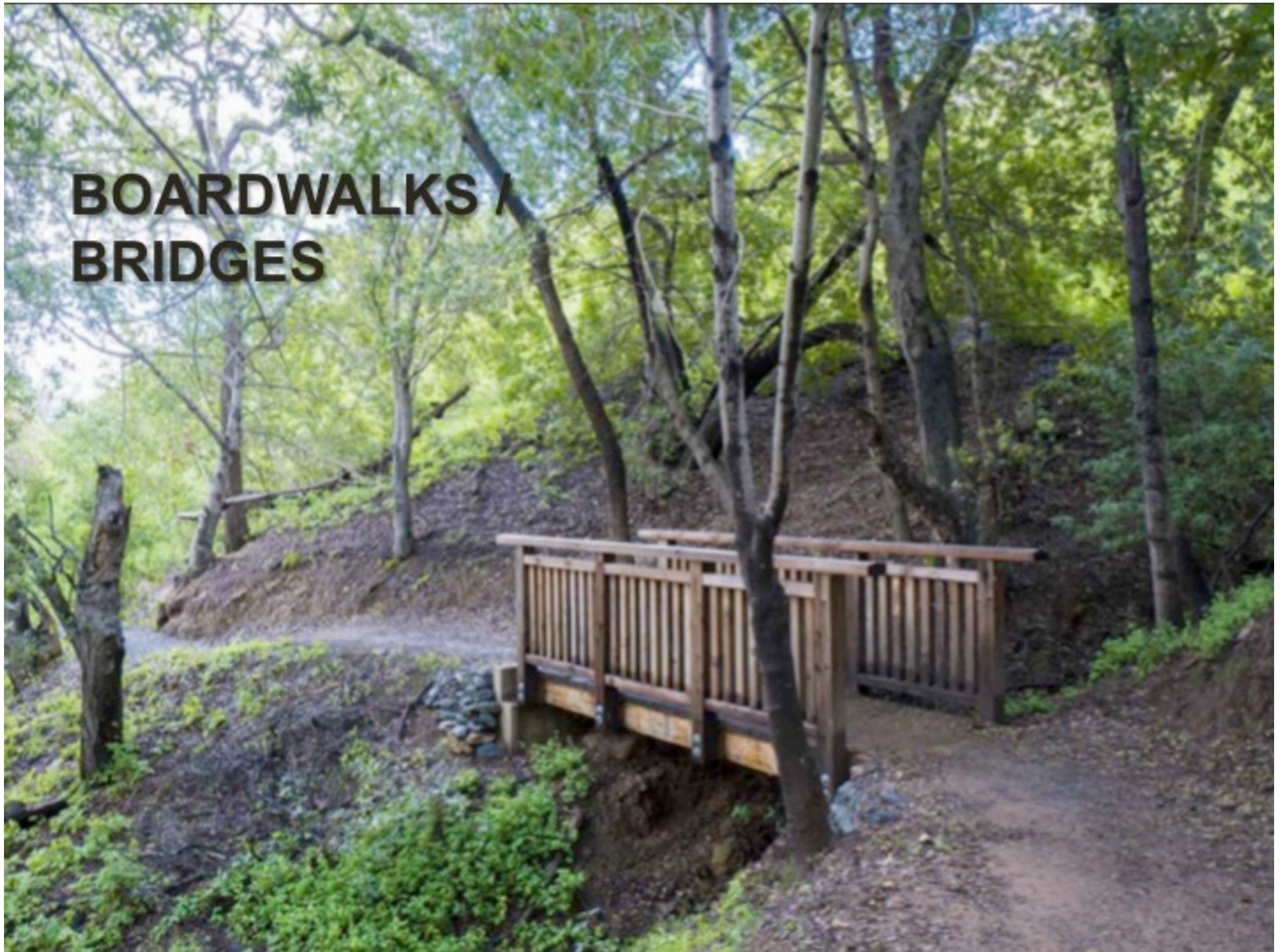
## Private Trails for Watching Wildlife + Wildflowers + Weather

# STEPS





# **BOARDWALKS / BRIDGES**





# BOARDWALKS





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## BOARDWALKS / BRIDGES





## BOARDWALKS / BRIDGES





## BRIDGES



WHIMSY





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### WHIMSY





## Private Trails for Watching Wildlife + Wildflowers + Weather

# WHIMSY







# ANY QUESTIONS?





# TOOLS, CONSTRUCTION, AND MAINTENANCE





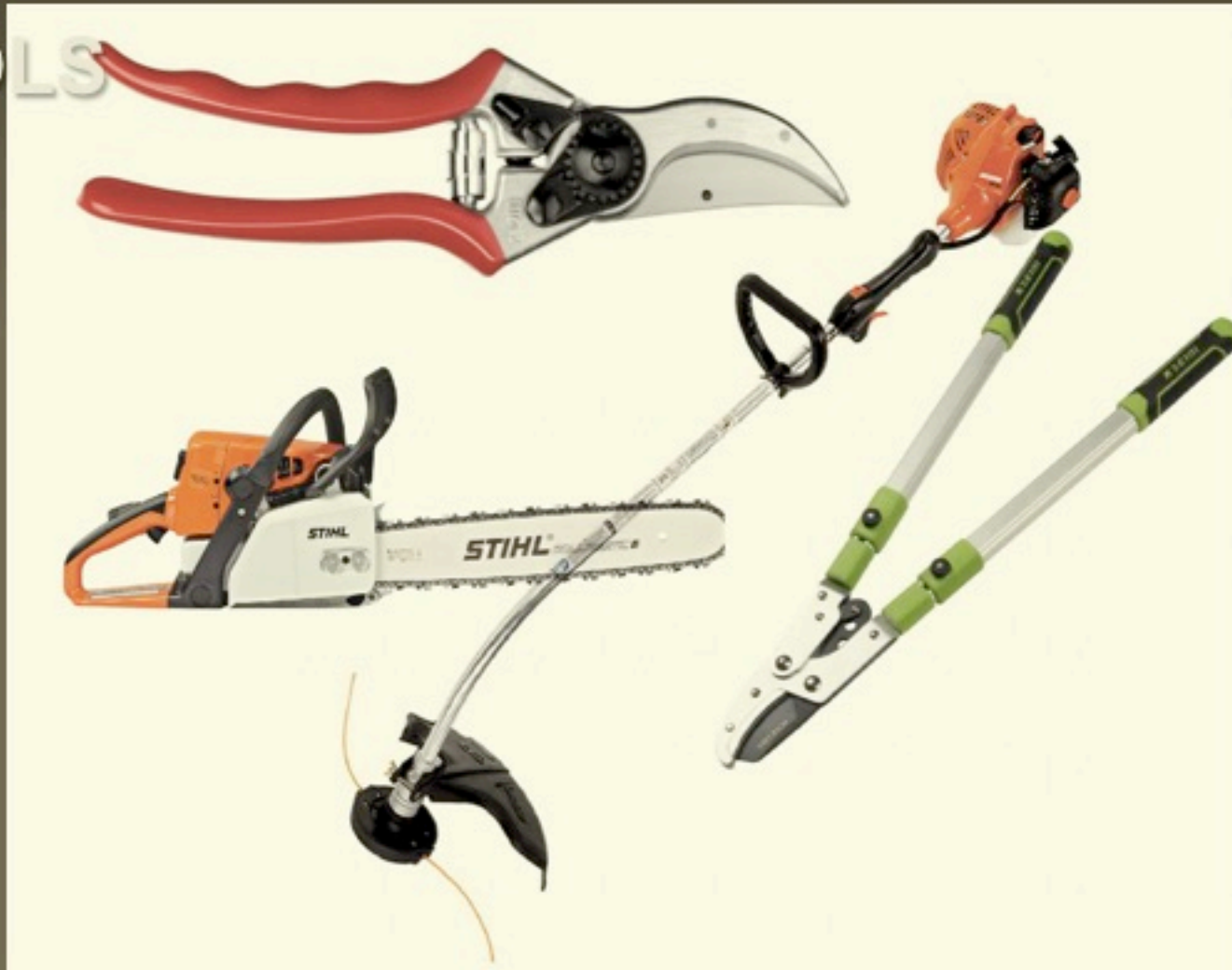
# TOOLS





## Private Trails for Watching Wildlife + Wildflowers + Weather

### TOOLS





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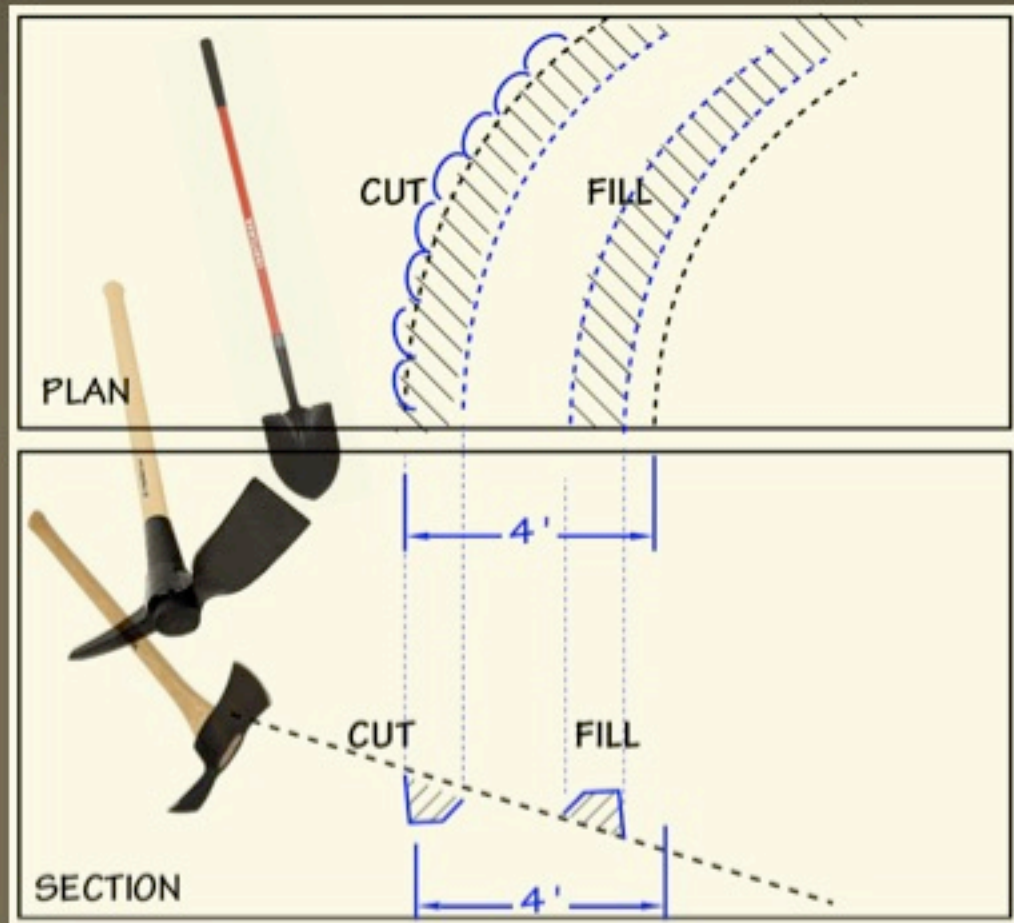
## CONSTRUCTING THE TRAIL



PHOTO CREDIT: UKIAH VALLEY TRAILS GROUP

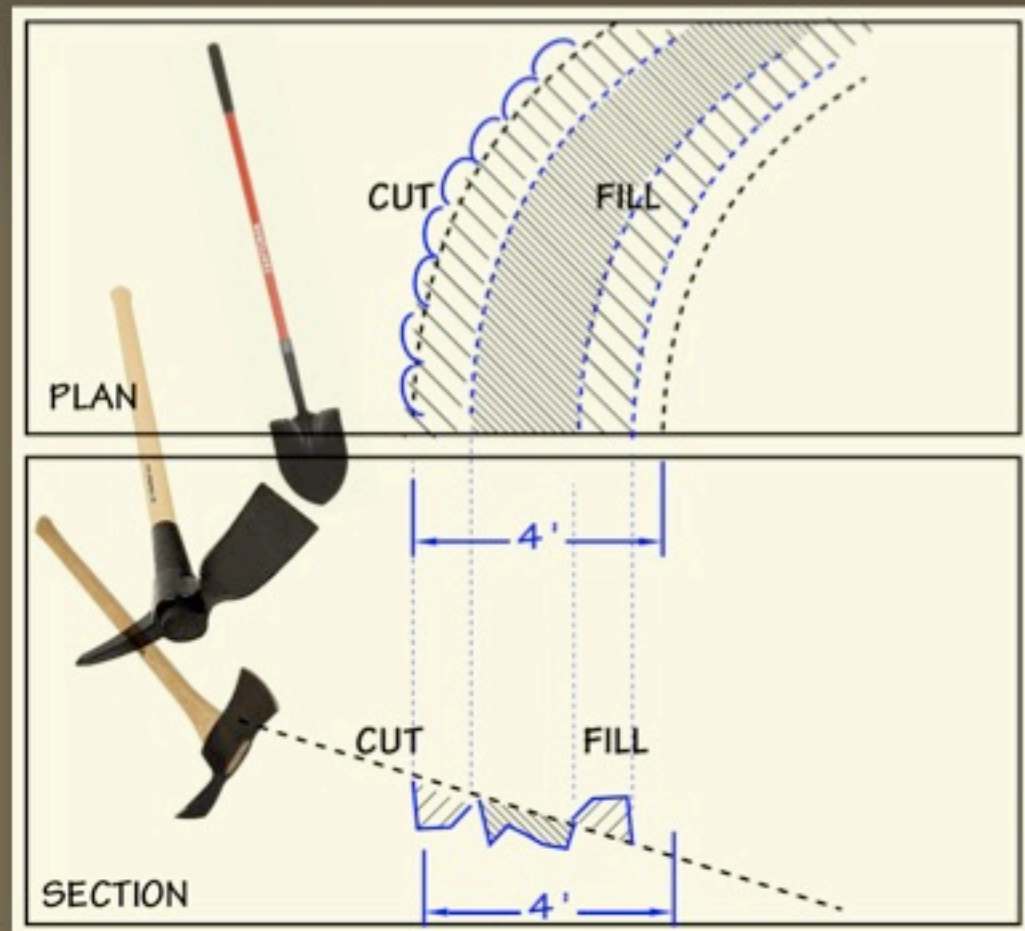


# CONSTRUCTION • STEP 1



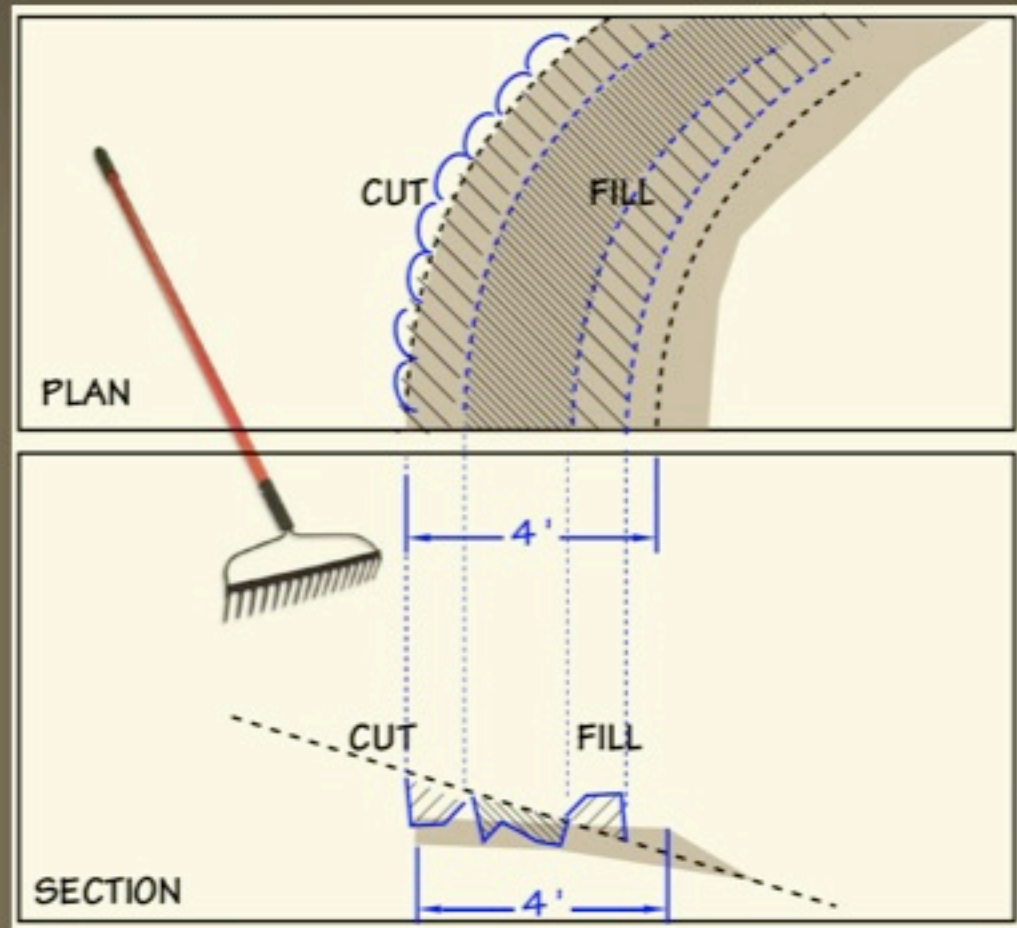


## CONSTRUCTION • STEP 2





## CONSTRUCTION • STEP 3







# TRAIL BUILDING EQUIPMENT





# CLEAR SPACE





## MAINTENANCE ACTIVITIES

- KEEPING TRAIL “FORM”
- KEEPING TRAIL “CLEAR SPACE”
- MEADOW MOWING
- VEGETATION MANAGEMENT / BRUSHING
  - LEAF DROP
  - FALLEN TREES
  - BENT OVER OR JUST GROWING



## COMMON MAINTENANCE ROUTINE

FROM	TO	ACTIVITIES
DEC	MARCH	<ul style="list-style-type: none"><li>• TRAIL CONSTRUCTION / RENOVATION</li><li>• HEAVY RAKE (UPHILL EDGE)</li><li>• RE-FORM EARTH STEPS</li><li>• REPAIR WASHOUTS</li><li>• EROSION REPAIR / ADD WATER BARS AS NEEDED</li></ul>
APRIL	AUGUST	<ul style="list-style-type: none"><li>• PRUNING CLEAR SPACE</li></ul>
JUNE	JULY	<ul style="list-style-type: none"><li>• MOWING / WEEDEATING</li><li>• LIGHT RAKE</li></ul>
SEPT	OCT	<ul style="list-style-type: none"><li>• LIGHT RAKE</li></ul>
ANYTIME		<ul style="list-style-type: none"><li>• DOWN TREES</li><li>• MADRONE LEAF RAKING</li></ul>



## Private Trails for Watching Wildlife + Wildflowers + Weather





## Private Trails for Watching Wildlife + Wildflowers + Weather





## MAINTENANCE

- **NEED TO REBUILD OR RE-ROUTE:**
  - **LANDSLIDES / WASHOUTS**
  - **SPRINGS AND SEEPS CHANGE COURSE / LOCATION**





# THINK ABOUT IT!

## AMENITIES

- TRAIL NAMES
- TRAIL MARKERS
- LEVEL AREAS
- BENCHES
- DECKS
- HAMMOCKS
- ART WORKS
  - EARTH WORKS
  - MOWING PATTERNS
  - SCULPTURE
  - KITCH







## Private Trails for Watching Wildlife + Wildflowers + Weather



**DID I MENTION WEATHER?  
THANK YOU!!!**



# Private Trails for Watching Wildlife + Wildflowers + Weather

## A Landowner's Primer on Planning and Building Hiking Trails