

# Forestry Challenge

## Team #22

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# 01

# Background

Noble Demonstration  
Forest + Info






# Demonstration Forests

- CAL Fire operates 16 forests on 85,135 acres
  - Different regions demonstrate different needs for management
  - Used for recreational and lumber purposes
  - Test out alternate management techniques to see what their effect is on the forest
  - Watershed protection
  - Preserving animal habitats



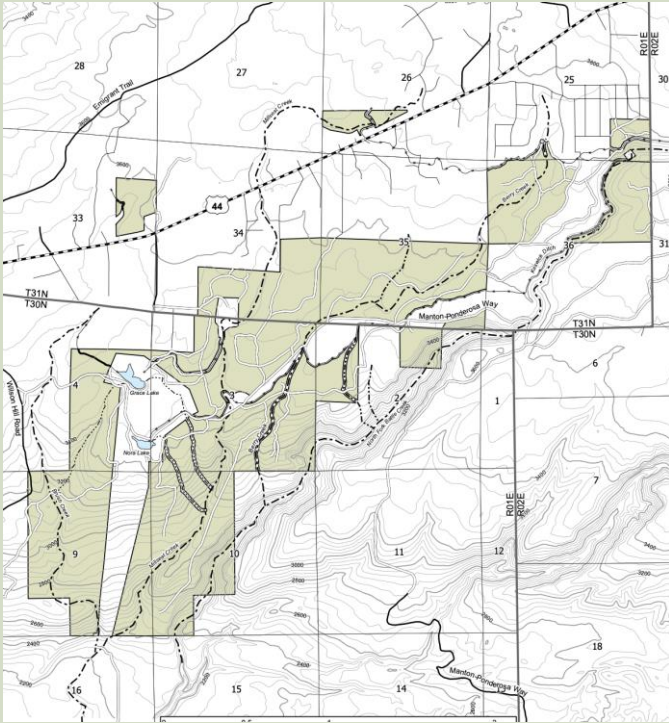


“Demonstration state forests were put in place to demonstrate management practices and a variety of management”

- David Bakke retired RPF #2054



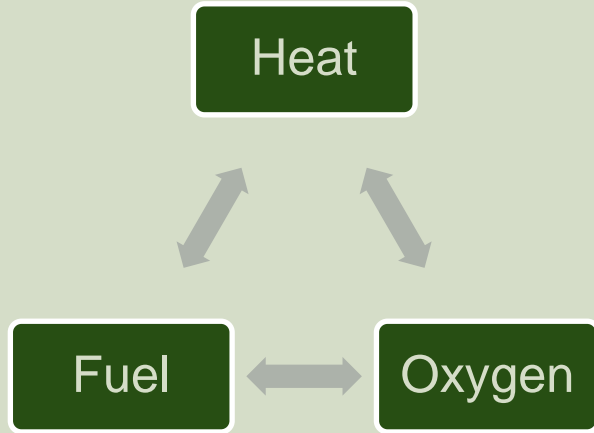
# Noble Demonstration State Forest



- Acquired by CAL Fire in December 2022
- Got it from PG&E in bankruptcy
- 2,050 acres
- 13 miles West of Mountain Meadows Bible Camp in the Shingletown area
- No current developments on the property
- Managed out of the La Tour DSF



# Forest Fires

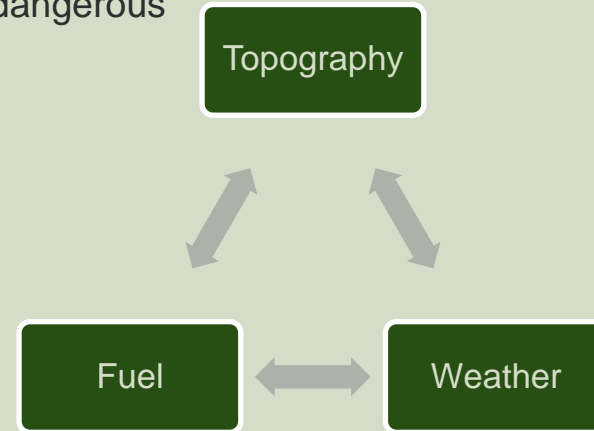


## Fire Triangle:

- All three are necessary for a fire to survive
- This knowledge can help firefighters combat fires

## Fire Behavior Triangle:

- Effects the magnitude, direction, and intensity
- Erratic patterns of one of these three results in extreme fire behavior which is dangerous





# Fuel Structure

## Vertical

- Ladder fuels
  - Biomass causing the spread of fire into the canopy from the ground

## Horizontal

- The fire spreading across the ground or just the crown
- Less dangerous than a vertical fuel structure







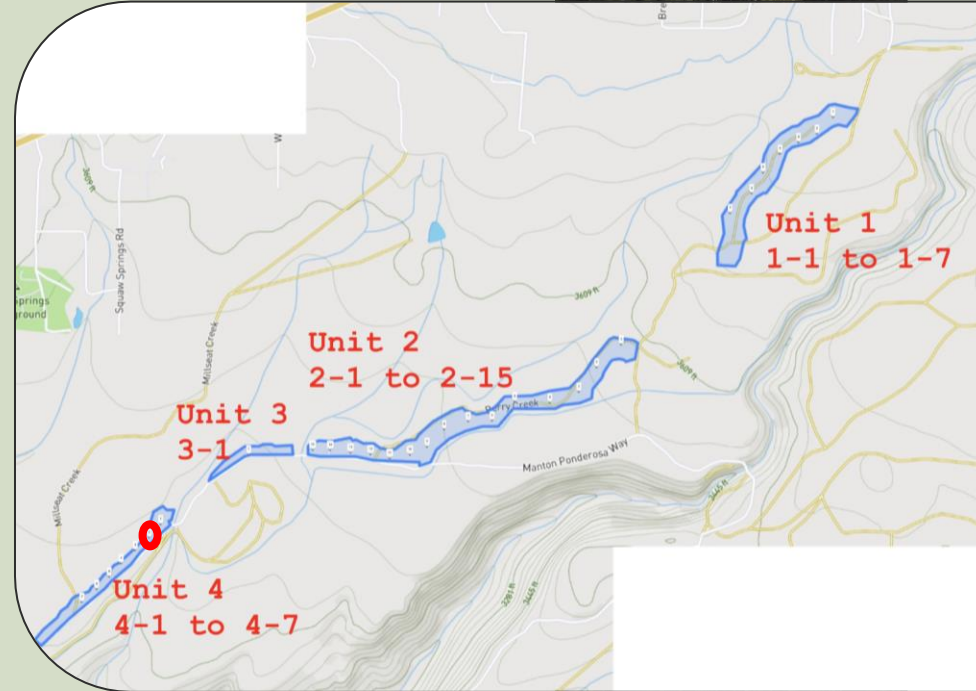
# 02

## Data at NDF

Data Collection Methods +  
the Data that was Collected

# Plot Layout

- 30 plots found across the Noble Demonstration State Forest
- Divided into four sections
- All along the fuel break of the main access road
- We were plot 4-2





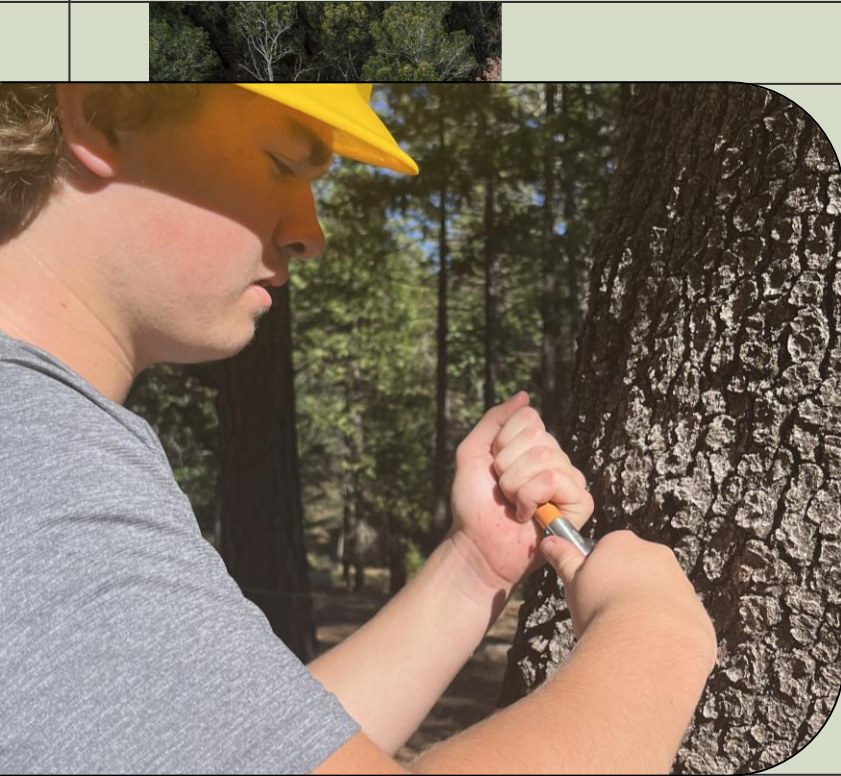
# Fixed Radius Plot

- 57.2 ft. radius -> 1/5 of an acre
- Plots are surveyed to get a sample of the property
- More plots being sampled translates to more accurate data

# 20 Factor Angle Gauge

- Used for a variable radius plot
- Trees wider than the gauge are out
- Trees smaller than the gauge are in





# Increment Borer

- Takes a core sample from a tree
- Displays the growth rate
- Visualize long term health status of the forests

# Clinometer

- Measures the height of trees
- We used it to find the distance from the base of the tree to the live canopy





# Densitometer

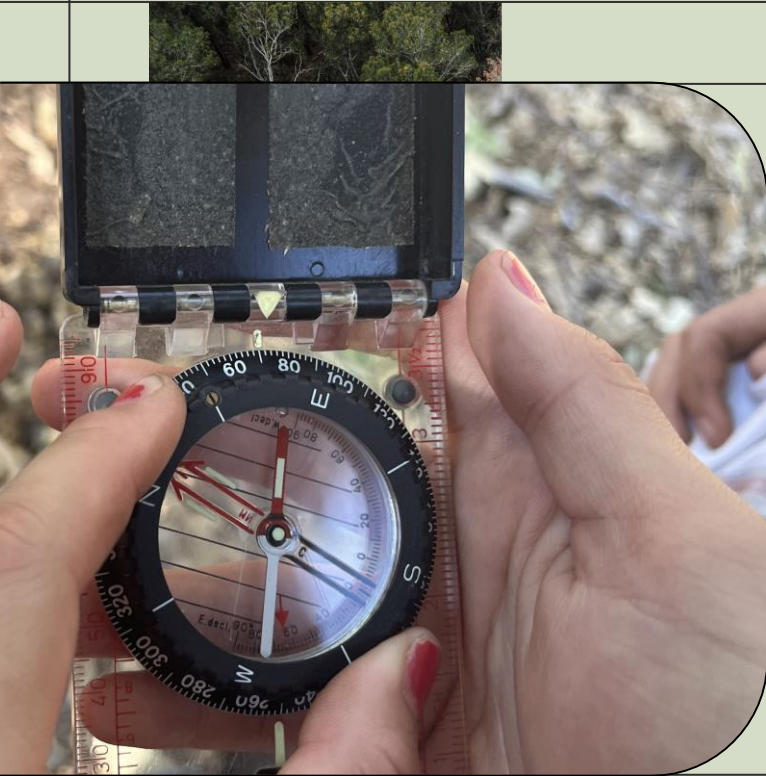
- Shows the canopy cover
- The % demonstrates the danger of crown fires

# DBH

- Stands for diameter at breast height
- Measure at 4'6"
- Shows the diameter of trees







# Compass

- Shows true North where you start the radius plots
- Allows you to go into three equidistant directions when measuring canopy cover



# 74

Trees per Acre

# 128

Basal Area w/ Angle Gauge

# 65%

Canopy Cover



# Tree Growth

1.19 in

The growth of dominant trees over the last ten years.

1.19 in

The growth of dominant trees 10-20 years ago





# 30 ft

Average distance to live crown

# 14.5 ft

Average distance to nearest tree

# 84%

Trees with canopy overlap



# 03

## Fuel Break

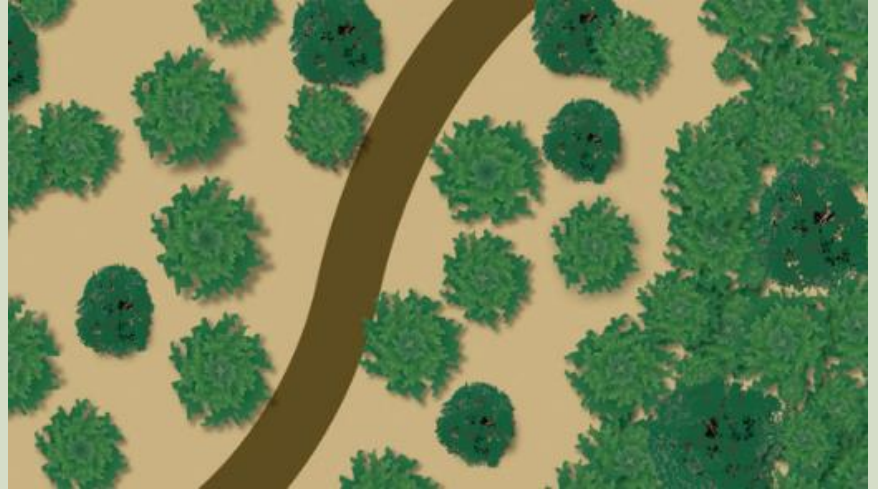
The Current State + Plan  
for the Fuel Break



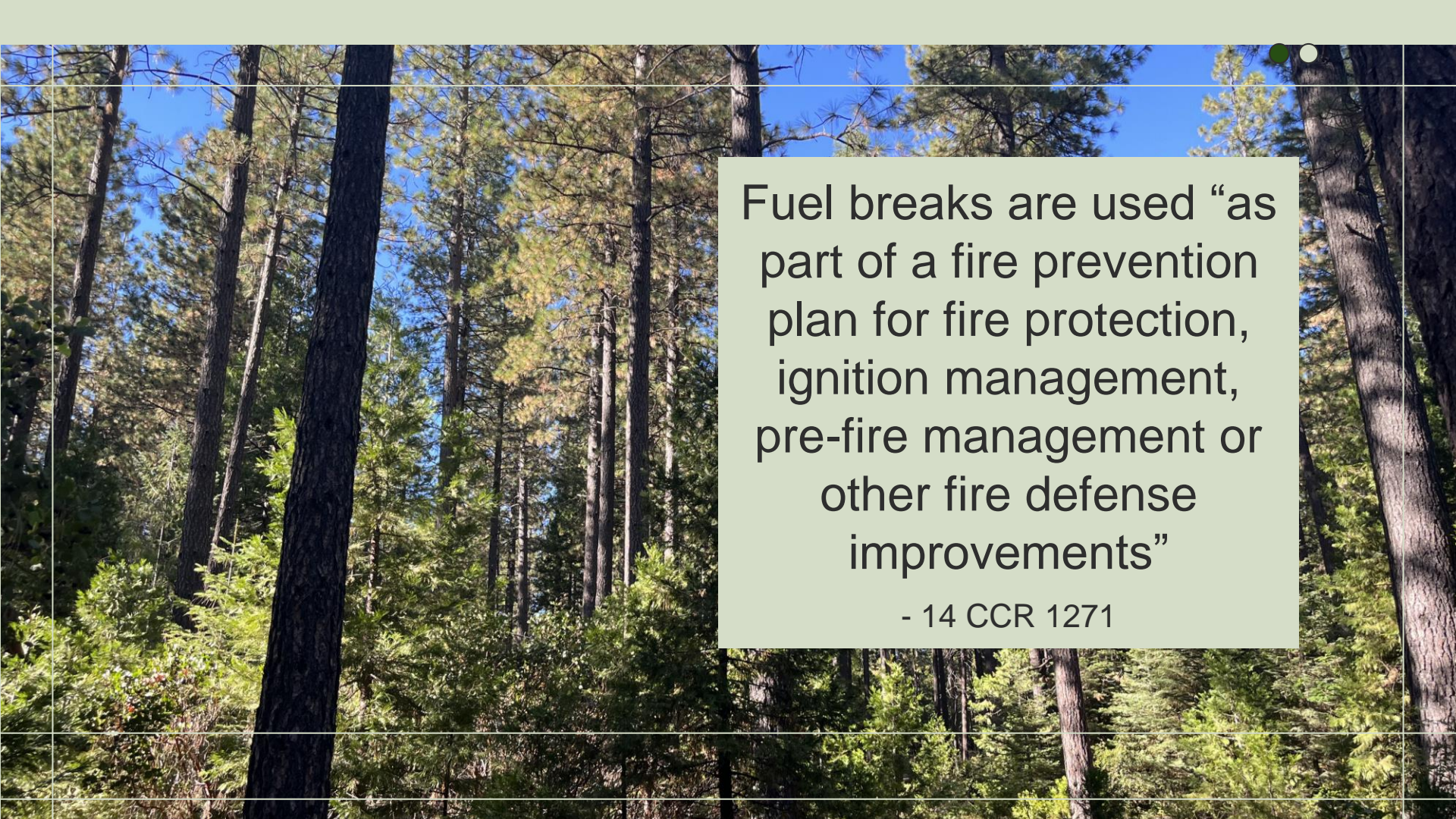
# Fuel Breaks: Definition

## Definition:

- Properly approved by the local fire agency
- Vegetation is controlled and limited
- Reduces potential wildfire risk
- A concrete area in a forest designed to slow the spread of fires



Reducing Fire Risks on Your Forest Property, 2010,  
Oregon State University, University of Idaho &  
Washington State University

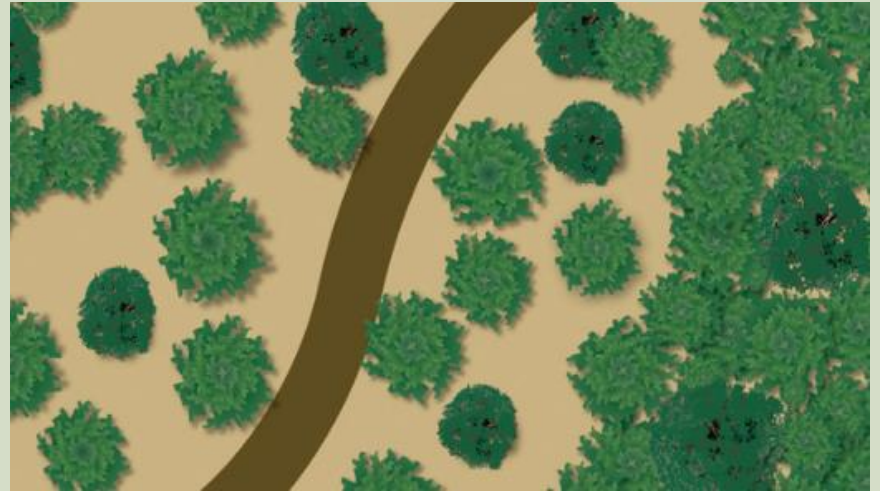


Fuel breaks are used “as part of a fire prevention plan for fire protection, ignition management, pre-fire management or other fire defense improvements”

- 14 CCR 1271

# Fuel Breaks: Creation

- Accessing a property for the density of tree and the interconnectedness of the crown
- Thinning out trees
- Thinning out the basal area
- Dependent on the landscape and the needs of a fuel break



Reducing Fire Risks on Your Forest Property, 2010, Oregon State University, University of Idaho & Washington State University



# Conditions of Noble Fuel Break

- Technically, it meets the legal definition of a fuel break
- Does not function as a fuel break primarily due to the overlapping canopy that is consistently present





# Creating a Fuel Break in Noble

- Strategically removing co-dominant and intermediate trees to limit the interconnectedness of the canopy
- Taking away the majority of suppressed trees and brush cover to prevent flames from reaching the canopy level
- Targets include 40% canopy coverage, 20% canopy interconnectedness and 50-60 basal area/acre

# Barriers: Fuel Break

- Very costly to instate
- Time consuming and expensive to maintain
- Due to the very large distance the fuel break would have to cover
- Communication with private landowners





# 04

## Management

Protection from Wildfires + Maintaining  
Value for the Community



# Management Plan

## Balancing

Wildlife habitat,  
commercial viability  
and resilience

## Compatibility

The forest must work  
with the fuel break

## Management

The fuel break plan to  
a lesser extent

## Limiting

Ladder fuels throughout  
the property

## Reducing

Canopy  
interconnectedness

“The goal is to achieve 40% crown cover. In a region with 65% crown cover, 15-30% crown removal is optimal”

-Len Lindstrand RPF 624,  
current private consultant



# Barriers: Management Plan

- Very large land area which makes it difficult to manage
- Difficult cooperation with private landowners
- Challenging to access most of the land



# References

- Credit to the design from Slides Go
- Thank you to Len Lindstrand, Greg Mayer, and all the other foresters that assisted us throughout the Forestry Challenge
- Also a thank you to Mr. Parento who has been a wonderful chaperone throughout the length of the trip

