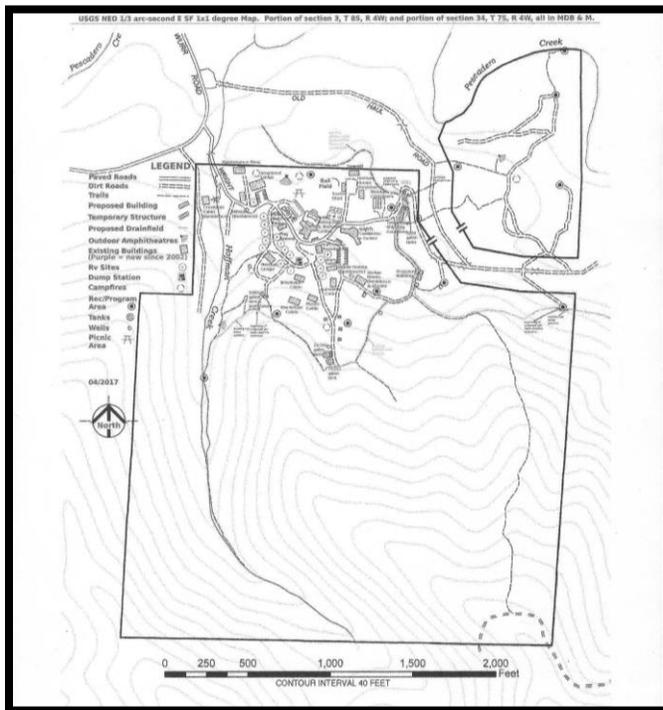


2021 SANTA CRUZ FORESTRY CHALLENGE FOCUS TOPIC QUESTION

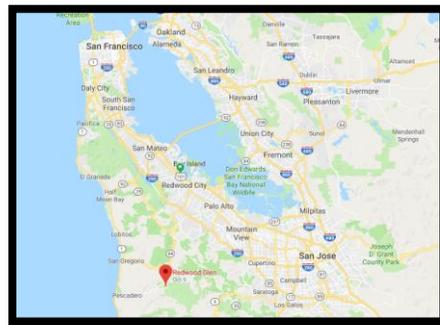
Introduction:

The focus topic is ***Post-Fire Timber Assessment at Redwood Glen***. Students will collect data at Redwood Glen to create a data set on the post-fire condition of the redwood and Douglas-fir trees and will report on anticipated volumes of these species if Redwood Glen decides to pursue a timber harvest under a Notice of Emergency Timber Operations.

Location:



Redwood Glen is a 165 acre property independently owned and operated as a Christian camp. It was originally purchased and converted to a camp in 1958, with the main buildings built in the 1960's and the Siden Conference Center built in the early 1990's.



Background Information:

Timber Harvest at Redwood Glen

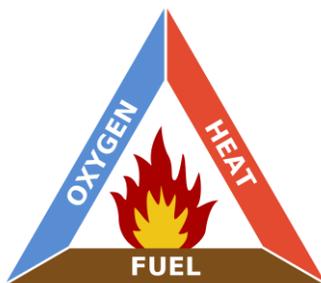
The primary purpose of the Redwood Glen property is to host organized groups for retreats and conferences. However, in addition to the developed area of the property, there is a large portion of the property that is undeveloped timberland. The timber has the potential to grow and be harvested for a profit that can be invested back into the camp infrastructure. In recent history, Redwood Glen hired a Registered Professional Forester to write plans and carry out two harvests, one in 2004 and one in 2011.

The CZU Lightning Complex of 2020

The CZU Lightning Complex fires were wildfires that burned in San Mateo and Santa Cruz counties in August and September of 2020. The fires were the result of thunderstorms that started hundreds of fires throughout California. The lightning strikes near Redwood Glen initially started separate fires on what would become the northern edge of the CZU Complex. Two days after the fires began, a change in wind conditions caused these fires to rapidly expand and merge, becoming a “complex”.

The fire burned 120 acres of Redwood Glen at low to moderate intensity, with the moderate burn being on the ridgetop that runs from northwest to southeast on the property. CalFire announced in December 2020 that the fire was controlled, but “controlled” does not mean that the fire was completely extinguished; areas of unburned fuel continued to smolder well into 2021.

Fire Behavior



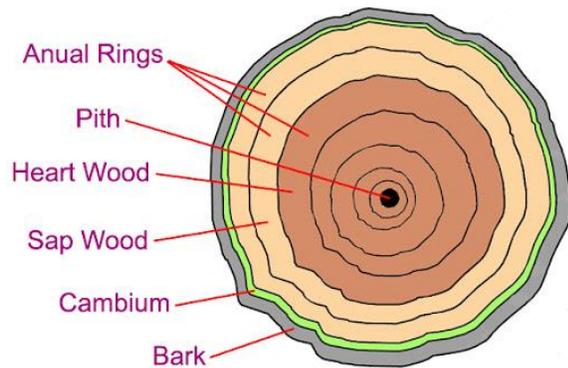
Here are diagrams of the Fire Triangle and the Fire Behavior Triangle. Notice that the one element common to both triangles and the one humans can most directly influence is Fuel.



In a forested environment, “Fuel” is all live and dead organic matter, including needles and branches littered on the forest floor, grass, brush, and trees of all sizes. When large amounts of trees and brush are continuous from the ground to the treetops or “crowns”, a “fuel ladder” exists that can carry a surface fire up into the crowns, where the fire becomes far more dangerous and difficult to control. A crown fire can sustain itself when trees are close to each other, spreading from crown to crown. Therefore, to reduce the chances of a crown fire, it is necessary to separate, or “disconnect”, these fuels, both vertically and horizontally.

Because the harvests at Redwood Glen in 2004 and 2011 removed trees and reduced crown continuity, it is quite possible that the severity of the CZU Complex to the property was reduced. Nonetheless, a significant number of trees were either damaged or killed. As in other areas of the fire, many trees at Redwood Glen were smoldering and flaring up several months after the fire was officially declared to be controlled.

Tree Morphology



A slice through a tree trunk reveals many layers, including the cambium, where cells divide to form both the sapwood and the bark. The cambium can be damaged or killed by either direct flame or indirect heat from a fire that can rupture the cambium cells. Once damaged, the tree does not grow properly and is permanently weakened.

Notice of Emergency Timber Operations

The California Forest Practice Rules were created in 1973 to ensure that logging is done in a manner that will preserve and protect fish, wildlife, forests, and streams. CalFire is the agency that enforces the rules, which apply to all commercial harvesting operations. The Timber Harvesting Plan (THP) is the environmental document that outlines what timber will be harvested, how it will be harvested, and the steps that will be taken to prevent damage to the environment. THPs are prepared by Registered Professional Foresters (RPFs) and can range from about 100 pages to more than 500 pages.

In the event of an emergency such as a wildfire, an RPF may file a Notice of Emergency Timber Operations instead of preparing a THP. The Emergency Notice allows the harvest of trees that are damaged, dead, or dying as a result of the fire. While harvest operations under an Emergency Notice must follow all of the Forest Practice Rules, it is a streamlined process. An Emergency Notice must be approved by CalFire within 5 days of the date it is filed but once it is filed, the harvest must be completed in a year.

Burned Tree Evaluation

A combination of factors is considered when deciding which trees may be harvested under an Emergency Notice. One or more of the following criteria must be evaluated to determine whether a tree is dead, dying, or damaged as a result of the fire:

- cambium damage on multiple sides of the tree
- extensive root damage with voids under the tree
- extensive crown consumption or scorching that kills limbs
- significant prior defect combined with damage

You will classify the trees into three categories: dead, significantly damaged, and not significantly damaged. Cruise data will determine the volume of timber per acre for each of these categories. Those values, with logging and

hauling costs subtracted, will give Redwood Glen an idea of whether it would make economic sense to pursue a Notice of Emergency Timber Operations.

Fieldtrip: On the afternoon of Thursday, October 14, your team will be assigned one 1/5 acre plot for data collection, and you will determine:

- The diameter at breast height (dbh) of trees with a dbh class of 12" or greater (actual dbh of 11.1 or greater)
- The height of one tree in the plot
- The species of each tree in the plot
- Basal area using an angle gauge, which will be compared to the calculation made from raw data of each tree's dbh
- The fire damage of each tree, divided into three categories: no damage, light to moderate damage, or moderate to severe damage

Items to be Addressed in Your Presentation:

Your presentation should address the following topics:

1. The location, size, and current use of Redwood Glen
2. The CZU Complex and its impact to the forest at Redwood Glen
3. Fire's effect on trees and how to evaluate fire damage
4. The method of data collection and a summary of the data
5. A summary of the volume of trees that could be harvested under a Notice of Emergency Timber Operations and a cost/profit analysis

Resources:

You will be given resources on a flash drive to load onto your team's computer. Additionally, you can use photos you take during the fieldtrip and statements from foresters you work with and interview during Ask a Forester.

Final Product:

Your goal is to produce a 15-minute PowerPoint presentation that describes, in detail, the current forest conditions at Redwood Glen and a recommendation on whether Redwood Glen should pursue an emergency harvest. You are encouraged to use photos and information collected on the fieldtrip, interviews with resource professionals during the Challenge, and the maps, tables, and information in the resources provided. Additionally, use the judges' score sheet as a checklist, to make sure you cover the items on which you will be scored.