

2023 SANTA CRUZ FORESTRY CHALLENGE

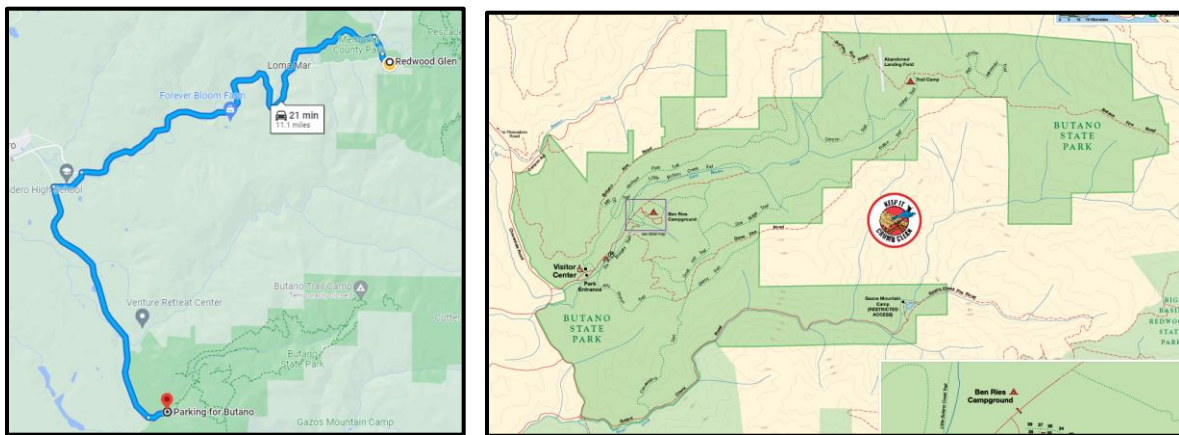
FOCUS TOPIC QUESTION

Introduction:

The focus topic is ***Hardwood Restoration at Butano State Park***. Students will collect data that will help them determine the best way to dispose of Douglas-fir that needs to be removed to restore the hardwood forest ecosystem.

Location:

Butano State Park is a 4,000 acre State Park, situated in the Santa Cruz Mountains midway between Santa Cruz and Half Moon Bay. It is an 11 mile, 21 minute drive from Redwood Glen. Students will cruise a 6.9 acre unit near the Visitor's Center.



Background Information:

Butano State Park

The word *Butano* is thought to have originated from a drinking cup made from a bull's horn. Native Americans settled the area thousands of years ago and hunted game, harvested plants, and ate a variety of seafood. In autumn, the people burned large tracts of meadowlands to manage the foods they ate, especially hazelnuts and acorns. These low intensity fires improved the growth of plants that sustained Native Americans. Starting in the late 1860s and up to the 1950s, settlers logged the canyon, transforming the old-growth redwood forest into a variety of second- and third-growth habitats. Butano State Park harbors six distinct natural communities, including Redwood Forest, Coastal Grassland, and Oak Woodland. The property was acquired by California State Parks in 1956; since then, it has more than doubled in size. Recreational activities include camping, hiking, and picnicking.

Butano State Park Forest Health Project

Butano State Park was identified as a priority location for forest health fuels reduction treatments due to unhealthy forest characteristics which left the landscape susceptible to disease, wildfire, and shifts in species composition due to the lack of low-intensity disturbance. In the absence of frequent low intensity fire that historically killed conifer ingrowth, hardwood forests are being converted to Douglas-fir forests.

The San Mateo Resource Conservation District, in collaboration with CalFire and California State Parks, is implementing a forest health project within Butano State Park. This project is intended to promote biodiversity, improve forest health, and reduce the risk of high intensity fire. Over the next 2-3 years, more than 400 acres of the Park will be treated using mechanical mastication, understory hand thinning, and thinning of Douglas-fir trees to reduce competition, fuel loading, and support biodiversity.

Project Treatments

The treatment areas are predominately comprised of overstocked Douglas-fir dominated forests, second growth coast redwood dominated forests, and various dense shrub communities. The treatment of overstocked Douglas-fir stands will include manual and mechanical thinning in concert with decking logs, chipping and spreading, or chipping and hauling biomass within the project area.

For the Douglas-fir (DF) dominant stands, the treatment goal is to create a more healthy and diverse forest through the reduction of select Douglas-fir trees >8 inches to ≤36 inches DBH. In the Entrance Kiosk Unit trees will be cut and chipped into a chip van and dumped at a location within the project area or manufactured into short logs and hauled to landings within a reasonable distance from the treatment area to be decked.

Another unit is located nearby and has a slightly different prescription. Near the Olmo Ranch House, the Douglas-fir is encroaching on the native hardwood stands and the plan is to retain only 1 or 2 Douglas-fir per acre. In that unit the trees will be manufactured into logs for utilization.

Douglas-fir Disposal Options – Pros and Cons

The two options for disposal of the Douglas-fir logs are described above and are chipping and dumping somewhere in the Park or trucking whole logs to a lumber mill to be manufactured into a product. Pros and cons are listed in the table on the next page.

Disposal Method	Pros	Cons
Logs Chipped and Piled or Moved and Decked	No significant transport cost Less fossil fuel burned	Cost of chipping Carbon release Fuel remains on landscape Wasted biomass
Transported to a Mill and Made into Products	Made into a product in demand Carbon sequestration Less fuel on landscape	Transportation cost Fossil fuel used in transport

Utilizing Logs – Income and Cost

For the logs being manufactured into products, the mill pays for the incoming logs at varying prices depending on the species. At this time, the price being paid for Douglas-fir coming from the Santa Cruz area is \$450 per thousand board feet (MBF). In California, commercial logging must be done by a Licensed Timber Operator (LTO), who charges the landowner in units of dollars per MBF. Additionally, there is a hauling cost associated with transporting the logs to the mill, including the hourly wage of the log truck driver, fuel, and truck maintenance.

Current logging costs for this area are approximately \$340 per MBF. This cost includes falling the trees, skidding them to a landing, processing them to remove the limbs and tops, and loading them onto a log truck. Hauling costs are based on the time it takes a log truck to make a round trip to the lumber mill. The current haul cost for the driver and truck is \$180 per MBF. There is a lumber mill in the Santa Cruz area and some north of San Francisco, but they do not process Douglas-fir. The closest place to take Douglas-fir is Sonora, near Yosemite. It is a 6 ½ hour round trip in a car.

The value earned (\$450 per MBF) is less than the logging and hauling costs (\$340 + \$180 = \$520/MBF) by \$70 per MBF. There are approximately 4,000 board feet of wood on a loaded truck, so each truckload leaving the site creates a deficit of \$280.

For the logs being made into chips, a chipper that will process logs up to 24" DBH costs \$400 per hour to operate. Volume per hour processed will be provided. Large chip vans that can move material offsite cost \$130 per hour and small chip vans for moving material within the Park cost \$175 per hour.

Field Trip: On the afternoon of Thursday, October 12, your team will be assigned a 1/10th acre plot for data collection, and you will determine:

- Number of conifer trees in the plot with a diameter at breast height (DBH) of 10" or greater, and their species
- Number of hardwood stems in the plot and the species present
- Basal area using an angle gauge
- Canopy cover at plot center using a densitometer

Items to be Addressed in Your Presentation:

Your presentation should address the following topics:

1. The location, size, and history of the Butano State Park
2. The purpose and funding source of the Butano State Park Forest Health Project
3. The purpose of treatments to remove Douglas-fir and options for its disposal
4. A summary of the data collection techniques and data collected
5. A calculation of the volume of Douglas-fir per acre to be harvested
6. A cost/benefit analysis and your recommendation of the best option for Douglas-fir disposal

Resources:

You will be given resources on a flash drive to load onto your team's computer, including the data set you generated. Additionally, you can use photos you take on Thursday and statements from the Foresters you worked with and interview during Ask a Forester.

Final Product:

Your goal is to produce a 15-minute PowerPoint presentation that describes, in detail, the purpose of removing Douglas-fir from the stands and the best option for its disposal. 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 presentation score sheet as a checklist to make sure you cover the items on which you will be scored.