FORESTRY CHALLENGE CHAMPIONSHIP
FOCUS TOPIC QUESTION

Introduction:

The Focus Topic is "Developing a Silvicultural Prescription for the Forestry Challenge Unit of the Lyons Tract". The Lyons Tract is owned by Sierra Pacific Industries (SPI), a private family-owned company in the timber production business in California and Washington. The Unit is 49 acres, one small part of approximately 93,000 acres in the Sonora District and the 1.7 million acres of forestland owned by SPI in California. This unit is primarily an uneven-aged stand of mixed conifer forest type. The tract has changed ownership several times over the last 50 years but has been managed by all owners for industrial timber production. Because of bark beetle attacks brought on by the recent 5-year drought, there was significant mortality and the area was salvage harvested in 2017.

Your challenge is to assess the stand and recommend a silvicultural prescription. You need to take into account the stand data you collect to come up with a prescription that is economical, practical, and is legal according to the California Forest Practice Act.

Focus Topic Fieldtrip Location:

We will use school vehicles to travel down Highway 108 and on Lyons Creek Road to the 49-acre Forestry Challenge Unit, where we will collect data and discuss silvicultural prescription options. A map of the fieldtrip location and plot layout will be provided.

Background Information:

Sierra Pacific Industries (SPI)

Sierra Pacific Industries is based in Anderson, California. The company owns and manages 2 million acres of timberland in California and Washington and is among the largest lumber producers in the United States. SPI is committed to managing its lands in a responsible and sustainable manner to protect the environment, while providing quality wood products and renewable power for consumers. SPI is a certified participant in the independent Sustainable Forestry Initiative (SFI). The expertise of its professional foresters and natural resource specialists assures that wildlife habitat, water quality, and other forest values are protected.

Silviculture

"Silviculture" is the art and science of managing a stand of trees to meet identified management objectives. Silviculture is rooted in "silvics", which is a study of the relationship between trees and their environment (water, soil, air, and other plants). "Silviculture", then, is the art of applying the science learned in "silvics". There are many types of silviculture. The options for the Forestry Challenge Unit are as follows:

Even-aged:

- Clearcut – the removal of all or nearly all the trees, then planting a new stand.
- Seedtree – like a clearcut, except that a few healthy trees are left to naturally reseed the area.

Uneven-aged:

- Individual Tree Selection – removal of individual trees in all size and age classes to create/maintain a stand that is multi-storied at the desired stocking level.
- Understory Thinning – removal of the smallest trees to achieve a designated desired spacing and increase the average diameter of trees in the stand.
- Shelterwood – some trees are harvested, but many are left behind to provide shade for the regeneration below. Not used much in California, as this method favors shade tolerant species.
- Group Selection – removal of groups of trees in areas no larger than 2 ½ acres in size on up to 20% of the acreage of the unit. If group selection is chosen, individual selection can be applied to the remainder of the stand.

Rehabilitation: The Forest Practice Rules allow a clearcut type prescription for any size unit where, due to mortality, the residual basal area is less than 85 square feet per acre. The data you collect will let you know if this is an option.

Alternative: Foresters can design their own prescription, as long as it follows the spirit of the Forest Practice Act and protects the resource. That judgement is made by a Forest Practice Inspector on a case-by-case basis.

No Treatment – One option to consider for any unit is to let the stand grow and reevaluate it at a set time in the future.

California Forest Practice Rules

California is the most highly regulated place in the world in terms of forest management. Many rules are based on the Site Class of the land. Site Class is the production potential or carrying capacity of the land and is numbered I through V. The lower the number, the higher the productive capacity of the land. The Forestry Challenge Unit of the Lyons Tract is considered Site Class I.

Two important rules that apply to even age silviculture are

1. The allowable maximum unit size is 20 acres, with up to 30 acres allowed in special cases.
2. Even age prescriptions cannot be in units next to each other, unless the harvests occur at least 10 years apart. This concept is called “adjacency”.

One important rule that applies to uneven age silviculture is a “retention standard” which is the basal area of the remaining stand after harvest and is based on Site Class. The Rules specify the minimum retention standard for Site Class I is 100 square feet of basal area per acre, as averaged throughout the unit. Uneven aged units can be any size.

California’s Tree Mortality Crisis

According to the U.S. Forest Service, tree mortality from bark beetles and drought has reached over 129 million trees, up from 3.3 million trees in 2014. Most tree mortality in California has occurred in the southern Sierra Nevada and the Central Coast. Researchers have learned that approximately 58 million additional large trees are suffering from severe canopy water losses. Weakened trees are more susceptible to attacks from bark beetles.

Bark beetles are small insects, generally black, hard-shelled and approximately 5 millimeters in length—about the size of a piece of cooked rice. Bark beetles tunnel under bark, cutting off the tree’s supply of food and water needed to survive. Bark beetles can kill a tree in as little as two to four weeks during warmer months.

History of the Lyons Tract

This Area was originally inhabited by the Central Sierra Miwok. They lived in the Foothill area during the winter months, following deer herds and taking advantage of plants and animals that became available at different times of the year. Artifacts that can be found include bedrock mortars and arrowheads.

With European settlement, railways were established to provide an efficient system to transport logs to lumber mills at lower elevations. As the railways advanced across the landscape, small logging camps would be established along the way. A highly used railroad grade runs through the Lyons Tract, and artifacts from that era (1921 to 1965) can sometimes be found.

Logging and Biomass Considerations

Individuals conversant in logging costs and methods and the practicality of sending biomass to power generation facilities will be available for consultation.

Landowner Objectives:

1. Maintain optimum growth on plantation
2. Reduce hazards, that is, make the plantation more resistant to fire and bark beetle attack
3. Economics – The value of products derived from harvest must exceed the costs of maintaining the unit over time and includes plan preparation and logging costs.

Resources:

On Thursday evening, you will be given resources on a flash drive to load onto your team's computer. During preparation time we will attempt to have computers available to do internet research. Additionally, you can use photos you take during the fieldtrip and statements from foresters you work with and interview during Ask a Forester.

Preparing Your Presentation:

Your team will come up with a specific silvicultural prescription for the Forestry Challenge Unit. Your presentation should address the following:

- Brief history of the Lyons Tract, from native and early European activities up to recent mortality and harvest activity. Include one or more maps to show the general location of the Tract and specific location of the Unit, and give details about the Unit, such as predominant vegetation types and where sampling occurred.
- Sampling methods: Explain the procedure used to collect the data.
- Current Stand Condition: Report the findings of the data collection. Specify species composition, diameter class distribution, basal area, tree height, crown position distribution, defect, and seedlings per acre.
- **The silvicultural prescription you recommend for the Forestry Challenge Unit. Explain how the prescription you chose is legal according to the California Forest Practice Rules.**
- Also explain why your prescription is practical, economically feasible, and preferable to the other options available.

Final Product:

Your goal is to produce a 15-minute PowerPoint presentation that **describes, in detail, the current stand parameters of the Forestry Challenge Unit and your silvicultural prescription for the stand.** You can use photos and information collected on the fieldtrip, interviews with resource professionals, and 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. Remember, there is no "right" answer! Your ideas will be taken into account when a harvest plan is written for the Unit.