

# 2020 VIRTUAL FORESTRY CHALLENGE FOCUS TOPIC QUESTION

## Introduction:

The focus topic for 2020 is ***Restoration of the Mixed Hardwood Conifer Landscapes of Usal Forest***. Usal Forest contracts annually with James Able Forestry of Eureka, California to collect data on Usal Forest, and included in the data collection this year are four Mixed Hardwood Conifer units totaling 165 acres. Teams will analyze the data and use predicted outcomes from the modeling program FVS to recommend a pathway to restoring these stands to a pre-settlement coastal redwood forest.

## Focus Topic Fieldtrip Location:



Usal Redwood Forest  
Company, LLC



0 0.75 1.5 Miles

- Usal Redwood Forest
- Pacific Ocean
- Forestry Challenge
- Assessment Area

- Permanent Road (Rock)
- Seasonal Road (Dirt)
- Highway (Paved)
- Class I Watercourse
- City



The Usal Redwood Forest (Usal) is an almost 50,000 acre redwood forest located in the northwestern corner of Mendocino county on California's "Lost Coast". The landscape is almost twice as large as the city of San Francisco. Once a thriving ancient redwood and Douglas-fir forest, over-harvesting in the 1970s, 1980s, and earlier left the Usal Redwood Forest dominated by second-growth Douglas-fir and tanoak with redwood struggling to survive. The Redwood Forest Foundation is restoring the forest, planting redwoods and using sustainable harvesting practices that promote biodiversity, enhance carbon storage, and support local economies.

## **Background Information:**

### Restoration Forestry

Restoration forestry is a real-world solution for addressing the forest health and wildfire crisis California is facing. It is a practical rather than ideological course of action that uses history as a guide and science as its tool to address the problem. Restoration forestry aims to restore ecologically and economically sustainable native forests to resemble historic forests. Fortunately, a great deal is known about California's forests before European settlement. Using pre-European settlement forests as a "reference historic forest," restoration forestry can recreate similar landscapes with most of their original diversity.

By understanding the forest characteristics that were present historically in a region, forest managers can return those characteristics to the landscape. Restoration forestry simulates the dynamic character of historic forests by maintaining the natural variation of patches of older and younger trees within the forest mosaic. To get back to a natural forest landscape, trees of all ages must be harvested in different numbers at different times. While older forests must be part of the mosaic, for instance, harvesting some older trees provides space for new, young forests that are essential in establishing a sustainable cycle of forest succession.

### Forest Inventory

A forest inventory, typically called a "cruise", is a quantifiable assessment of forest resources that can help a landowner achieve desired goals such as maintaining forest health or planning timber harvests. A forest inventory will provide insights into species composition, tree density, basal area, and volume, and help document change (growth and mortality) in the forest over time.

Rather than measuring every tree on a forest "unit", a cruise using smaller samples of the unit provides relatively accurate information in a fraction of the time. A standard cruise design is a series of plots on equally spaced centers with a pre-determined size and protocol for collecting data. Once the data has been collected, it is assembled into a data set that includes a stand table, which is a summary of the species and sizes by diameter class, as well as a calculation of the volume of timber in board feet per acre. If annual growth rings are measured, the growth rate and percentage of volume increase over time can also be calculated.

## Silviculture

“Silviculture” is the art and science of managing a stand of trees for a desired outcome. Silvicultural methods can be divided into “uneven” and “even aged” methods. In uneven aged harvesting, individual trees or small groups (up to 2 ½ acres) of trees are cut, which creates and maintains an “all aged” forest. New trees are established by natural seeding, sprouting, or planting, and the resulting forest is a mix of trees of different age and size classes. In even aged harvesting, trees are removed in larger areas (typically 20 acres) so that a new stand of trees that are all the same age is planted.

At Usal Forest, only two types of silviculture are viable options due to management constraints, each best applied at specific times. Because of the degraded conditions in the Mixed Hardwood Conifer stands, variable retention is the best option for immediate harvest. In the California Forest Practice Rules, variable retention falls under neither even aged nor uneven aged silviculture but is in a category called “Special Prescriptions”. Variable retention is based on the retention of structural elements or biological legacies (trees, snags, logs, etc.) from the pre-harvest stand for integration into the post-harvest stand to achieve various ecological, social, and geomorphic objectives. The major variables in the variable retention harvest system are retention types, densities, and spatial arrangement of retained structures. In other words, variable retention does not follow a pattern or template. The harvest is designed around the existing stand and the desire to maximize diversity of the vegetation, which will create a post-harvest habitat for a wide variety of forest organisms.

If the trees in these Mixed Hardwood Conifer stands are provided more open space and 15 years to grow, they will be ready for a selection harvest, which would be a combination of single tree and group selection. Allowing the trees 15 years to grow will result in larger trees with more value that will help pay for the other restoration activities in this forest type. Income per acre for each type of harvest in their designated timeframe will be provided.

## Vegetation Treatment

One dominant species in the Mixed Hardwood Conifer landscape is tanoak, a native tree that is present in low numbers but not a dominant species in a healthy redwood forest. In order to allow space, sunlight, and water to restore the redwoods, tanoak must be managed by some form of treatment. Two options available are manual removal and “frilling”. With manual treatment, crews cut down tanoak trees and leave them where they fall, since the expense in removing the biomass is greater than any value the tree has

for lumber or energy production. Frilling is the hacking into the cambium of each tree with a hatchet and application of an herbicide to kill the tree. The trees eventually die and fall over, which poses a potential hazard while they are dead but still upright. Costs per acre for each method will be provided.

### Forest Vegetation Simulator (FVS)

The Forest Vegetation Simulator (FVS) is a family of forest growth simulation models. It is a system of highly integrated analytical tools that is based upon a body of scientific knowledge developed from decades of natural resources research and experience. Since the development of the first model for northern Idaho in 1973, FVS has evolved into a collection of “variants” which represent different geographic areas across the country. FVS can simulate a wide range of silvicultural treatments for most major forest tree species, forest types, and stand conditions. The FVS Staff of the Forest Management Service Center (FMSC) in Fort Collins, Colorado, maintains, supports, develops, and provides training for FVS. FVS and the FMSC are part of the US Forest Service.

### Landowner Goals

The Redwood Forest Foundation owns Usal Forest, and hires staff and consultants to carry out its vision and goals, which are:

- Increase the presence of conifers, particularly redwood, to more closely resemble pre-settlement forest species composition
- Create economic benefit, not only to support management activities on the forest, but to contribute to the local economy
- Minimize or eliminate the use of herbicides
- Sequester as much carbon as practical
- Reduce fire risk

### Resources:

You will be given resources in a folder in the Google Classroom, including background information, inventory data on four units of Mixed Hardwood Conifer forest, and FVS outputs for 13 possible action plan pathways. Additionally, you may use statements from foresters you speak with during Ask a Forester and office hours with Usal forestry staff.

### **Items to be Addressed in Your Presentation:**

1. The ownership, silvicultural history, and landowner goals for Usal Forest
2. Data collection methods
3. Summary of the current Mixed Hardwood Conifer stand condition
4. Options for treatment
5. FVS outputs for at least two options plus the control
6. Recommended treatment based on FVS and desired goals and objectives

### **Final Product:**

Your goal is to produce a 15 minute PowerPoint presentation that describes, in detail, **the current stand condition of Usal Forest, the options for treatment, and your recommendation for treatment for the next 60 years, based on FVS outputs.** You are encouraged to use the dataset, videos, and FVS runs provided, insights from your Ask a Forester appointment, and input from Usal Forester Jeff Houser. Additionally, use the judges' score sheet as a checklist to make sure you cover the items on which you will be scored.