2019 SHASTA FORESTRY CHALLENGE
## FOCUS TOPIC QUESTION

Introduction:

The focus topic for 2019 is *Silviculture for the Future in the "Big Wheels" Unit.*
Students will collect data on a 120-acre parcel of mixed conifer forest owned by
Shasta Forests Timberlands and managed by W.M. Beaty & Associates and use
Visual Forester to model the future stand using three different silvicultural options.
Teams will recommend a silvicultural option for future management/harvest.

Focus Topic Fieldtrip Location:

We will travel 10 miles to the Big Wheels unit, where we will assess the property
and collect data. Below is a map of the route. A map of the property with plot
locations will be provided upon arrival.
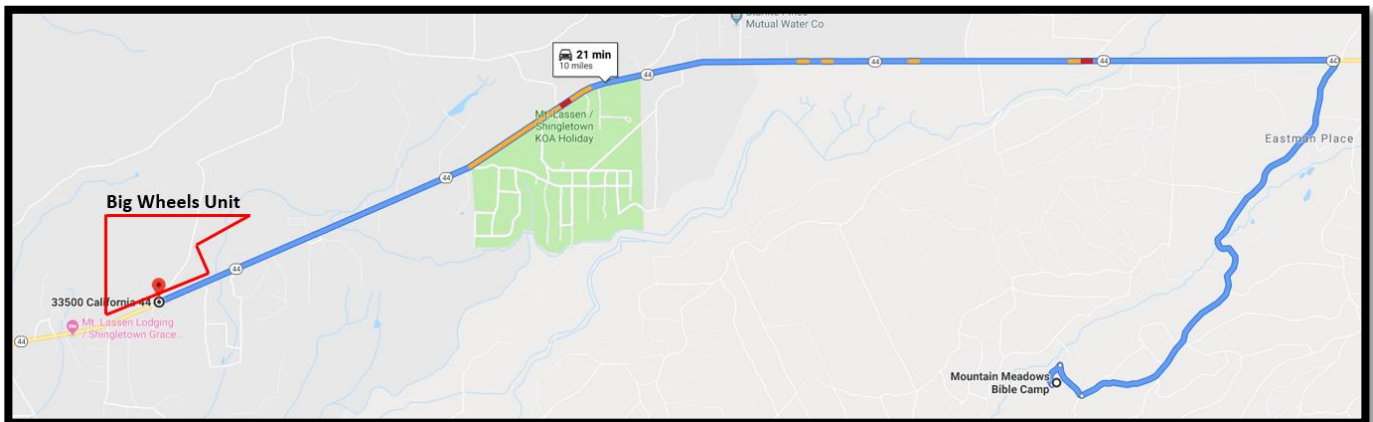
Background Information:

History of the Property

The Big Wheels unit was originally a dense forest but was damaged in a high
intensity fire in 1931. The area reseeded naturally from residual trees a few years
after the fire, but evidence of the fire remains, with occasional charred remnants of
old growth trees. The stand was left alone to grow for about 40 years. In the
meantime, W.M. Beaty & Associates assumed management responsibilities for
the unit in 1970. Between 1980 and 2000 the unit had several light thinnings to
harvest poorly performing trees. In 2011, a Timber Harvest Plan was written, and
a harvest conducted. The silvicultural prescription for the Big Wheels unit was
group selection, which created openings of up to 2.5 acres throughout the unit.
The group areas were replanted but also had natural regeneration. A second
harvest using group selection, the "Graceland" THP, is in the final approval stage.

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. New trees are established by natural seeding 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.

Visual Forester Professional

Visual Forester Professional (VFP) is a first-generation long-term forest management simulator that combines advanced silviculture and wildlife modeling with powerful data analytics and stunning stand visualizations. VFP provides professional foresters, students, landowners, regulators, and researchers with a powerful new tool to understand and communicate silvicultural decision-making and results. Alpine Land Information Services, the company developing the program, draws on nearly 30 years of experience in long term forest planning, forest inventory, habitat analysis, and long-term carbon analysis to make this simulator possible.

Landowner Goals

In 1969, Bill Beaty and four other foresters established W. M. Beaty & Associates, Inc. and opened its main office in Redding. The company was established to manage timber and associated resources for its three primary clients, Red River Forests, Shasta Forests, and Lassen Forest. Wood production is the primary use for forests owned by private companies and is the primary purpose of the Big Wheels unit. W.M. Beaty strives to manage timberland to generate an economic return on private land investments while simultaneously maintaining the resources found in healthy forests (soils, watershed processes, wildlife habitat).

Silvicultural Options and resulting stand tables

Of the four classical silvicultural systems, two will be considered as options for this exercise: a.) selection using either single tree selection or group selection; or b.) clear cut. Single tree and group selections are designed to create an uneven aged stand, and clearcutting creates an even aged stand. The California Forest Practice Rules generally limit clear cuts to 20 acres and group selections to 21/2 acres.

Clearcutting is a prescription often used for forests where the primary goal is to produce timber. Shade intolerant species such as ponderosa and sugar pine that need sun to become established thrive in clearcut units. As the 20 to 30 acre unit grows, the trees are generally in the same size class, with a size distribution curve that looks like the following:
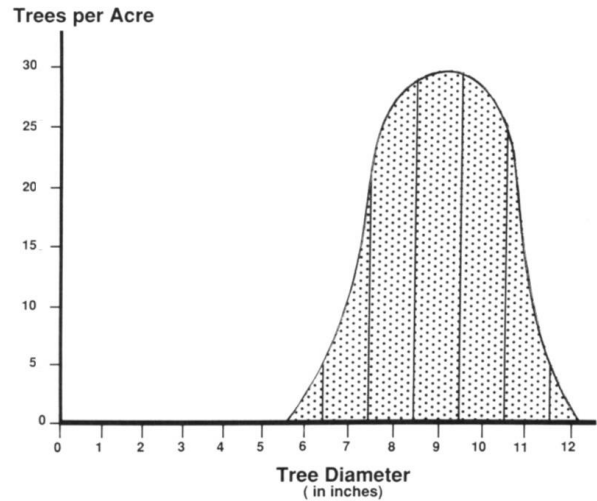
Group selection allows for regeneration of shade intolerant species without harvesting large areas. Only 20% of a mature stand can be put into groups in each harvest entry, so less and less acreage is available for groups in each entry until the original groups are mature. Over the entire stand, there are several distinct age/size classes, and the size distribution curve looks like this:
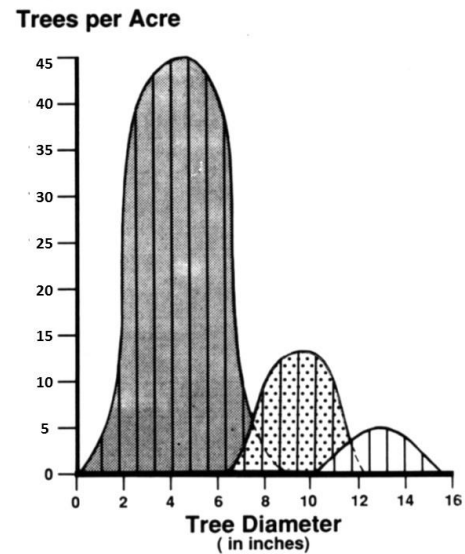
Single tree selection is designed to create an "all aged" forest. For this method, the California Forest Practice Rules specify a "retention standard" to be left after a commercial thin. For this location, the retention standard is 75 square feet of basal area per acre. That means that you cannot cut so many trees that the average drops below that level. In an all-aged forest, there are many small trees and only a few big trees. Foresters call this curve the "reversed J" curve which is indicative of uneven-aged forests.
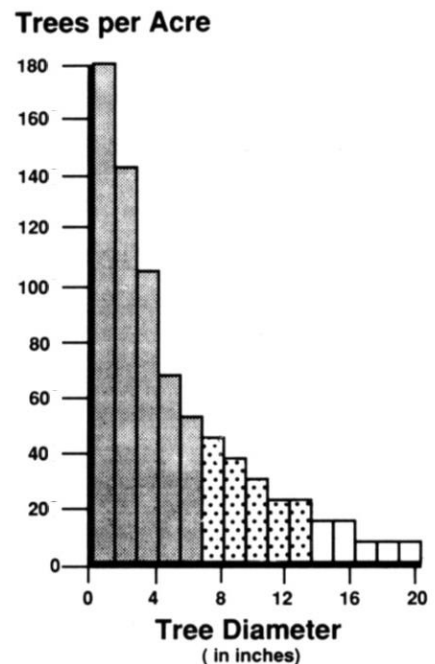
Fieldtrip:

You will visit the Big Wheels unit and will conduct a cruise of the forest to determine the current forest condition. Each team will collect data on a 1/10th acre circular plot and the data will be combined with data from all plots to create a stand table and other useful graphics. Growth and harvest options over time, represented through Visual Forester, will enable teams to recommend a silvicultural prescription for the future.

The information collected can be assembled to produce the following:
- Trees per acre
- Species composition
- Size class distribution
- Basal area
- Regeneration potential

Resources:

You will be given resources on a flash drive to load onto your team's computer. Use these resources, plus anything you brought with you or download from the internet, to help you answer the questions to be addressed in your presentation. Additionally, you can use photos you take during the fieldtrip and statements from foresters you work with and interview during Ask a Forester.

Items to be Addressed in Your Presentation:

1. The ownership, silvicultural history, and landowner goals for the unit
2. Data collection methods
3. Summary of the current stand condition
4. Options for silviculture
5. Visual representation of the options using Visual Forester
6. Recommended prescription based on 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 the Big Wheels unit, the options for a silvicultural prescription using Visual Forester, and your recommendation for silviculture for the next several decades.** 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.