

# 2002-2023 FORESTRY CHALLENGE CHAMPIONSHIP FOCUS TOPIC QUESTION

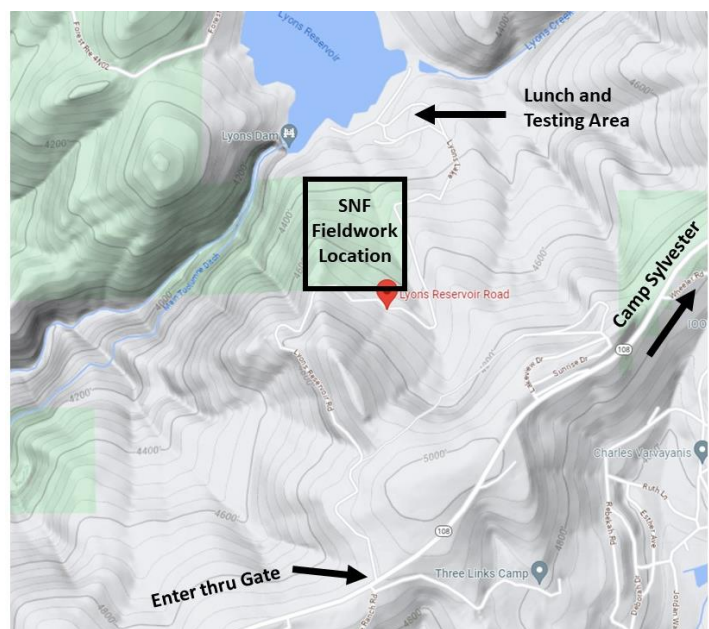
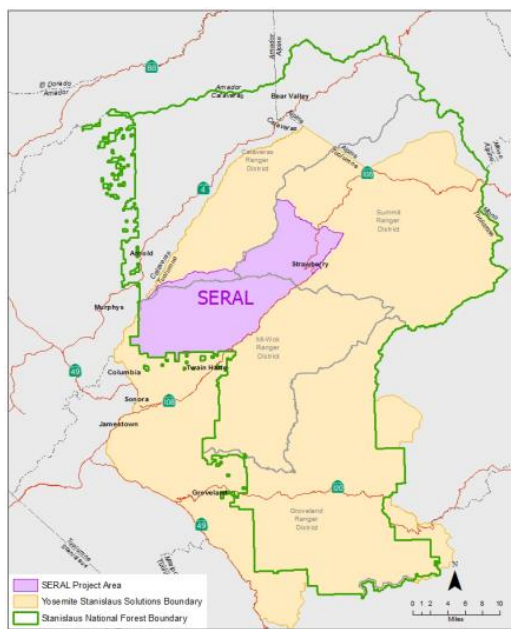
## Introduction:

The focus topic is ***Creating a Fire Resilient Landscape in the Stanislaus National Forest***. Students will analyze existing stand conditions compared to historic conditions, understand the treatment prescription of the Social and Ecological Resilience Across the Landscape project (SERAL), then mark a 1/5 acre plot to illustrate how such a treatment will create a resilient forest within the parameters of the SERAL document.

## Location:

The SERAL project is centrally located on the Stanislaus National Forest (SNF) and is within the Yosemite Stanislaus Solutions (YSS) collaborative area. The project area is almost entirely to the north and west of Highway 108. The project is the largest green forest management project in the 124-year history of the Stanislaus National Forest. The project is planned on an area that totals 118,808 acres of public and private lands, including 94,823 acres in Forest Service jurisdiction.

Our fieldwork will be conducted on the SNF near Lyons Reservoir, a 14-mile, 21-minute drive from Camp Sylvester.



## **Background Information:**

### Historic Conditions Compared to Today's Forests

There are many photos of forests in the Sierra Nevada from the early 1900's that show an open stand with large trees widely spaced. However, there is not much data from that era that quantifies the forest. Luckily, a thorough inventory was conducted on what is now the SNF which measured all confers with a DBH of 6 inches or more and tallied them by species. Malcolm North and a team of researchers compared the 1911 data to 2011 data taken at the exact same locations. They used trees per acre and basal area to assign a unitless value called Stand Density Index (SDI). SDI is widely used by foresters as a measure of stocking level because its calculation, based on a combination of the size and number of trees, can be used as a relative measure of inter-tree competition or how 'crowded' a stand is. Between 1911 and 2011, tree densities on average increased by six to seven-fold, while average tree size was reduced by 50%. Relative SDI for historical forests was 23–28% of maximum, in the ranges considered 'free of' (<25%) to 'low' competition (25–34%). In contrast, most contemporary stands were in the range of 'full competition' (35–59%) or 'imminent mortality' (≥60%).

### Megafires in the Sierra Nevada

Wildfires have been growing in size, duration, and destructivity over the past 20 years, including in the Sierra Nevada Mountains of California. Here is the sequence of events that has led to large-scale wildfires burning at high intensity that are new and unprecedented:

- Increase in vegetation density over the last 100 years, as described above.
- Seven of the past 11 years have been very dry.
- The dry years 2012-2017 caused a beetle epidemic that killed 147 million trees in California. The hardest hit region was the southern Sierra Nevada.
- Hot, dry weather during the fire season coupled with lightning events and human-caused ignitions resulted in record acreage burned at high intensity during the 2020 and 2021 fire seasons.

With the exception of the 2013 Rim Fire, Tuolumne County has not had a megafire, and the Highway 108 corridor has remained essentially unburned. There is an opportunity to treat the landscape to increase resilience to fire so when it does happen, the forest will be able to self-renew.

## Confronting the Wildfire Crisis – the Stanislaus Landscape

From the introduction to the January 2022 Forest Service publication “Confronting the Wildfire Crisis - A Strategy for Protecting Communities and Improving Resilience in America’s Forests”:

*“Wildfires have been growing in size, duration, and destructivity over the past 20 years. Growing wildfire risk is due to accumulating fuels, a warming climate, and expanding development in the wildland-urban interface. The risk has reached crisis proportions in the West, calling for decisive action to protect people and communities and improve forest health and resilience. It will take a paradigm shift in land management across jurisdictional boundaries to reduce risk and restore fire-adapted landscapes. In response, the U.S. Department of Agriculture, Forest Service is establishing a strategy for working with partners to dramatically increase fuels and forest health treatments by up to four times current treatment levels in the West.”*

In April of 2022 the agency identified 10 “firesheds” that are most capable of generating large wildfire disasters and with the highest probability of fuels reduction success. One of them is called the Stanislaus Landscape and was chosen in part because of the existence of a collaborative called YSS that was formed in 2010. With this designation, funding is now available to implement the SERAL project.

## The SERAL Project – Origins and Specifics of Planned Treatments

After collaborating with YSS starting in the fall of 2019, on July 16, 2020, the Forest Service put a notice in the Federal Register to begin the scoping process of the SERAL project. The overall purpose of the project is to increase the landscape's resilience to natural disturbances such as fire, drought, insects, and disease by restoring the forest structure and composition to its natural range of variation. On March 28, 2022, SNF Supervisor Jason Kuiken signed the first of three decisions to date to implement the project. In the meantime, the Forest Service did some preliminary forest inventory in selected areas of the project. You will be provided with a dataset from an area near where you will do your fieldwork.

The project will be implemented based on the highest priority Potential Operation Delineation units, or PODS. A map of the PODS will be provided. Thinning guidelines will also be provided.

**Fieldtrip:** On Friday, April 21, your team will be assigned a 1/5 acre plot for data collection and “marking”, where you will:

- Determine the number of trees in the plot with a diameter at breast height (dbh) of 10” or greater, and their species.
- Map the location of the trees in the plot using the template provided.
- Calculate the basal area using your data.
- Use two colors of flagging to show which trees you would retain versus remove to create a resilient forest that is within the legal parameters of the SERAL document.
- Determine if the mark will create a resilient forest and one that is similar to historic conditions.
- Record the amount of understory vegetation and woody debris, in relative terms (low, medium, or high) and suggest treatment for it.

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

Your presentation should address the following topics:

1. The location, size, history, and purpose of the SERAL Project
2. Historic versus modern (FIS and 2021 SERAL CSE) data
3. Your plot layout including trees per acre (TPA) and basal area, and a calculation of SDI
4. A diagram showing which trees you would retain and remove and why
5. How your “mark” is within the SERAL treatment guidelines and, if not, why the SERAL document needs amendment.

### **Resources:**

On Thursday evening, you will be given resources on a flash drive to load onto your team’s computer, including the results of the 2021 SERAL CSE cruise. Additionally, you can use photos you take during the data collection and statements from foresters you work with and interview during Ask a Forester.

### **Final Product:**

Your goal is to produce a PowerPoint presentation that describes SERAL, historic versus current inventory, your plot characteristics, and your sample mark and the reasoning behind it. 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.