

CREATING A FIRE RESILIENT LANDSCAPE IN THE STANISLAUS NATIONAL FOREST

Team #12



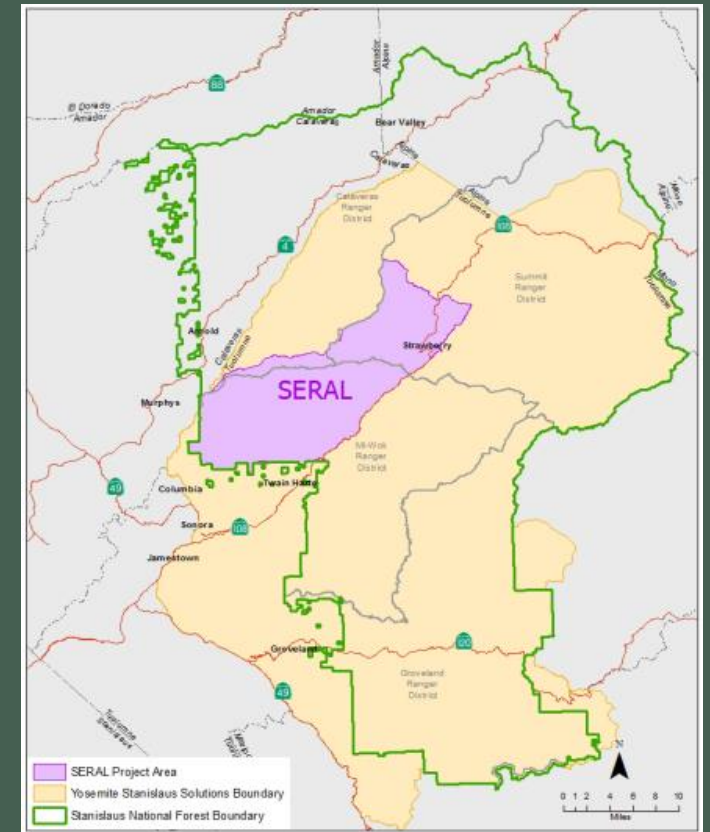
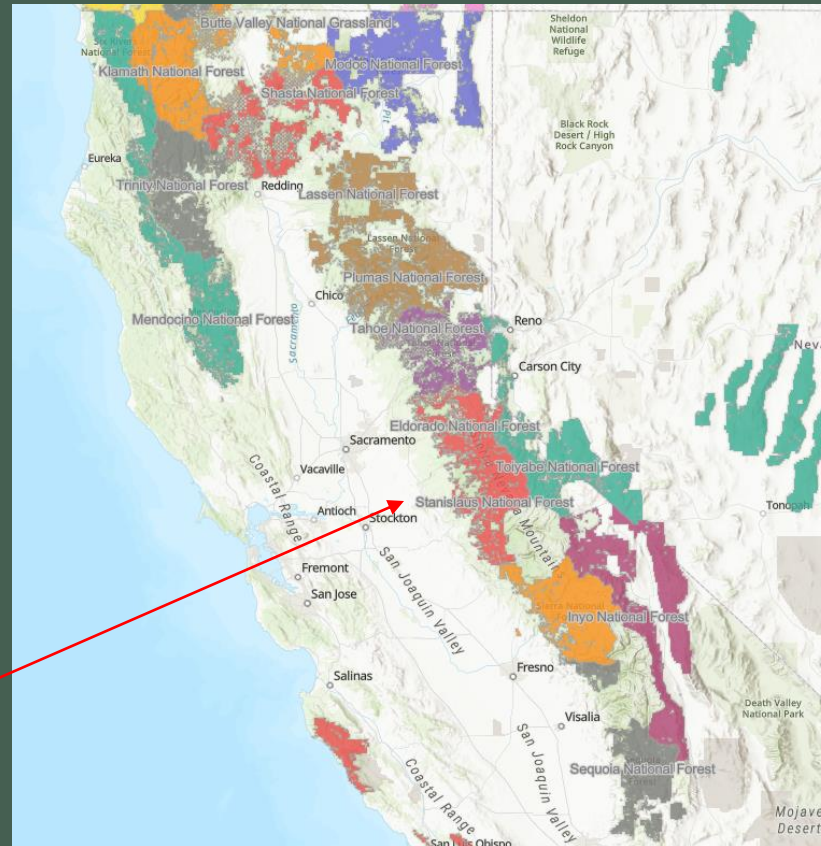


I. INTRODUCTION

SERAL PROJECT

Social & Ecological Resilience Across the Landscape

- Location
- Size: 118,808 acres
- 94,823 acres under the jurisdiction of the US Forest Service



Partnerships & Collaborative Groups

- YSS: Yosemite-Stanislaus Solutions
- Goals: restoration, health, safety, sustainable economies
- Increase pace & scale of restoration efforts
- Brings together diverse interests in the community



SERAL PROJECT

Social & Ecological Resilience Across the Landscape

- **History:**

- Collaborations with YSS beginning Fall of 2019
- July 16, 2020: USFS scoping process of SERAL began

- **Purpose & Goals:**

- Increase landscape resilience to natural disturbances
- Economic opportunities to local communities
- Maintain safe access to public lands
- Reduce the spread of invasive non-native weeds

- **Implementation Timeline:**

- Initial treatments completed within 7 years
- Initial years: mastication and fuel breaks
- Later: timber pricing and selling (Jim Junette, District Ranger)



Stand Density Index

Based on size & number of trees

Measures how 'crowded' and competitive a stand is

- Historical: 23-28%
- Current: 82-95%
- Free of competition: less than 25%
- Low competition: 25-34%
- Full competition: 35-59%
- Imminent Mortality: greater than 60%
 - (Malcom North's Research)





II. OUR MARK

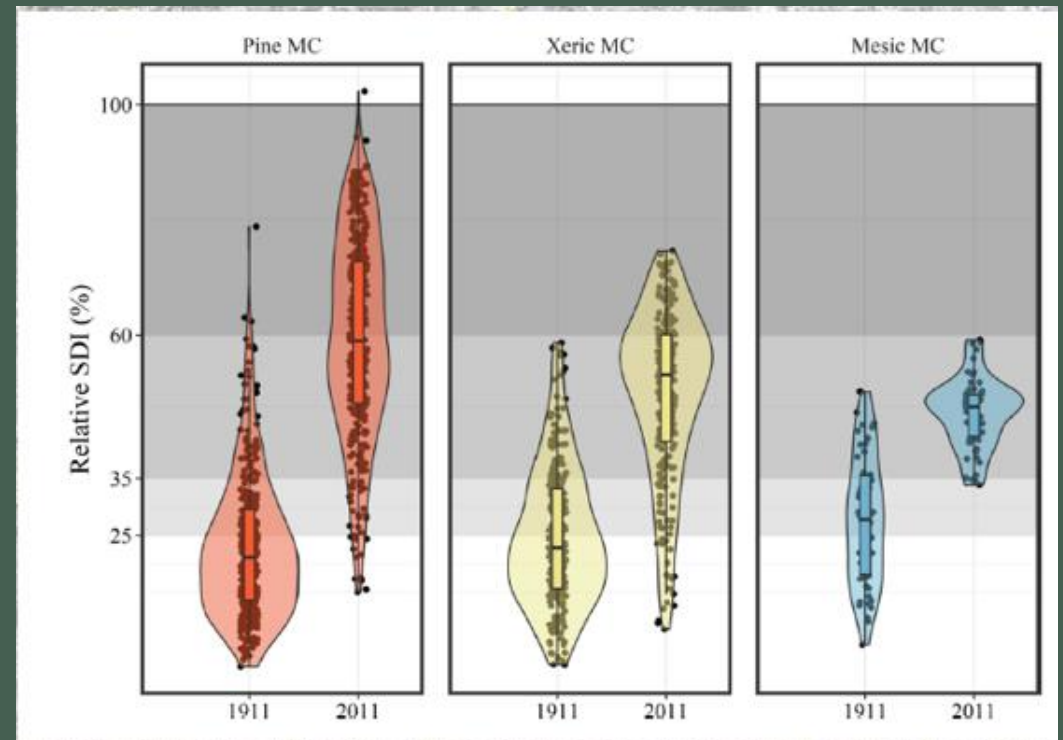
Field Exercise

- Data derived from 1/5th acre plot
- Tools used
 - Logger's tape: used to find boundaries of plot, distance of tree from center, and DBH
 - Compass: locate trees to plot on diagram
 - Increment Borer: growth rate of most dominant tree in stand (indication of suppression)
- Stand parameters
 - Plot 24- 52.7ft radius circular plot (1/5th acre)



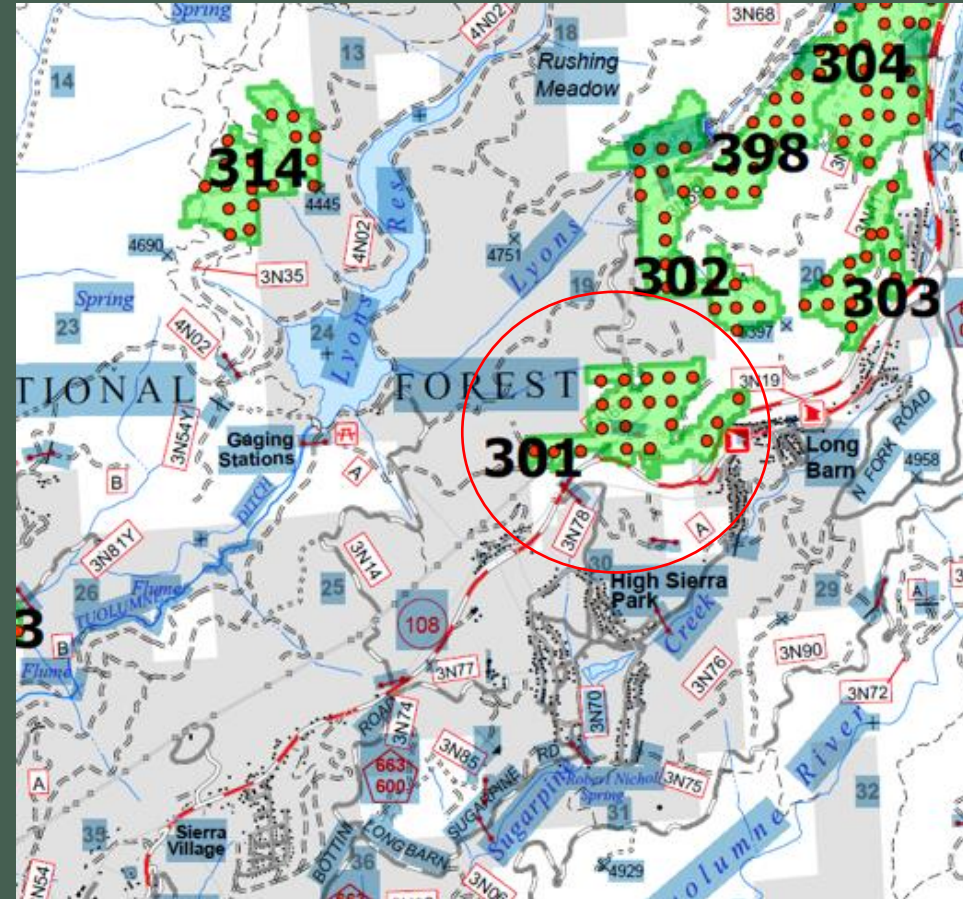
Recent Research

- Recent research conducted by Malcom North et al compared SDIs within the Stanislaus National Forest from 1911 and 2011.
- Key Finding! "[V]igorous tree growth from a lack of competition may have been the essential characteristic of their ecological resilience" (Malcom North et al).
 - SDI is the key factor to consider when cultivating resiliency.
- Found that levels under 35% of max SDI are needed to minimize competition.

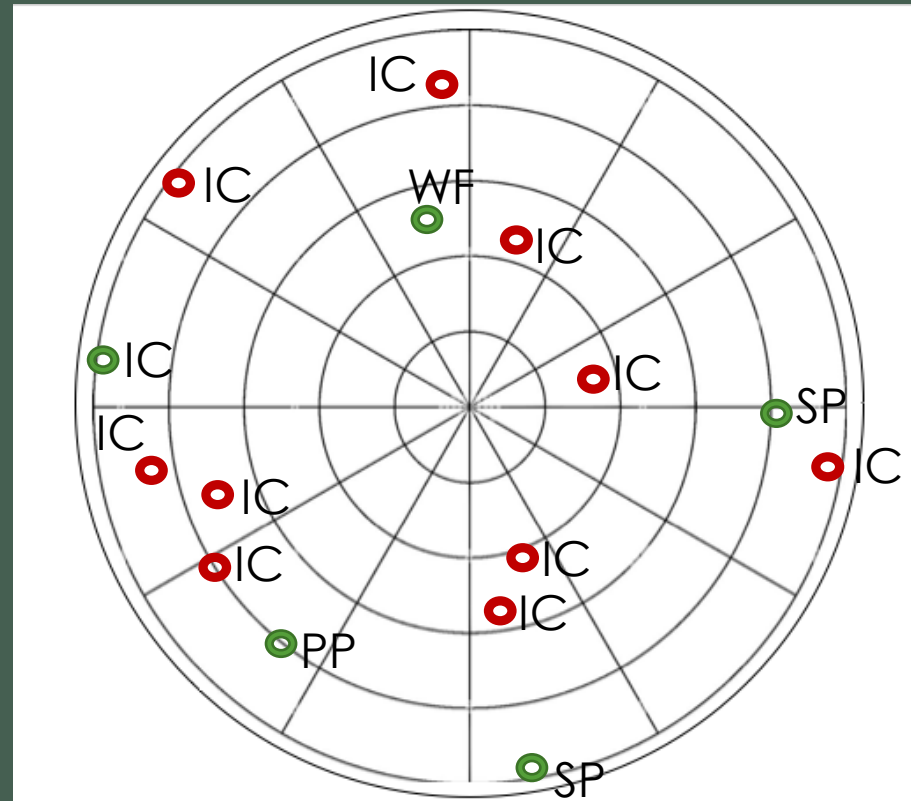


2021 Unit 301 data

- 113 acres
- 189 basal area
- 53.3% SDI



Our Mark



Team Calculations

	BEFORE treatment	AFTER proposed treatment following SERAL Guidelines
Trees Per Acre (TPA)	75	25
Basal Area per acre	288	134
SDI	79.9%	34.9%
Competition	Imminent Mortality	Full Competition



Suppression as shown in our increment borer sample

Team Calculations

- Trees Per Acre: Counted # of trees, multiplied by 5 (our plot is 1/5 acre)
 - Example: 15 trees in our plot, multiplied by 5 = 75 trees per acre
- Basal Area: $DBH^2 \times 0.005454$
 - Example: Tree #1: $31.6^2 \times 0.005454 \approx 5.45$ sq ft/acre
- Basal area per acre: take sum of basal areas & multiply by 5
 - $3.19 + 10.95 + 7.83 + 1.29 + 3.63 = 26.89$
 - $26.89 (5) = \mathbf{134.45}$ basal area/acre
- SDI: Plug into Excel sheet

Calculation for the Stand Density Index Using Individual Plot Data (Using the equation $SDI = TPA \times (QMD/10)^{**1.605}$)	
Plot Basal Area/Acre:	134
Plot Trees Per Acre (6.0" + DBH):	25
Plot Quadratic Mean DBH 6"+:	31.40
SDI	157
Relative SDI	34.9%



III. CONCLUSION

Mark Explanation

- **Would reduce competition from High Mortality to low end of full competition (35-59%)**
 - Increase tree health and resiliency to drought, disease, insects, wildfire
- **Maintaining species diversity & ecological health**
 - Increases essential nutrients and overall quality of soil
 - Maintains ecological habitats
- **Basal areas will not be at the target throughout the forest (Tom Francis RPF #2046)**
 - As long as the overall area averages out to the target goal of 100 square feet/acre.



Method of Removal

- Timber Harvest
 - Cost effective removal of trees while lowering competition
- Biomass Thinning
 - Thin conifers under 9" reducing competition for dominant and codominant conifers

SOURCES CITED

- Michael Jow: Resource management staff officer
- Brian McCrory: Timber management officer
- Jacob Baker: District Silviculturalist for Stanislaus National Forest
- Brian Wayland: Timber manager
- Jim Junette: District ranger
- Dean Lofthus: RPF #2415
- Tom Francis: RPF #2046
- Kevin Conway: RPF #2888