North Coast Oak Woodland Restoration: Oregon White Oak and Black Oak Tree Response to Release from Douglas-fir Encroachment

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Age and stand structure of oak woodlands along a gradient of conifer encroachment in northwestern California
Madelinn Schriver et al (2018)
https://doi.org/10.1002/ecs2.2446

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Acknowledgements

Several projects 2015 to present

- ✓ Characterizing conifer encroachment (age, structure, and biodiversity)
- ✓ Evaluation of NRCS and USFWS restoration effectiveness (tree response, oak health, forage, wildlife, etc.)
- ✓ Oak regeneration: effects of cattle and deer on oak seedling success
- ✓ Water demands of conifer encroachment
- ✓ Wildfire impacts on oak stands with and without conifer removal
- ✓ Economic analysis of managing for oaks or conifers in transitioning sites

Researchers, Partners, and Funders:

Univ of CA: Lenya Quinn Davidson, Jeff Stackhouse, Brendan Twieg, Ricky Satomi, Will Cox, Dave McLean, Wallis Robinson

UC Berkeley: Maggi Kelly, Rick Standiford, Matthew Potts, Ellen Bruno, Nicolas Polask, 2 students

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USFWS: Greg Gray

Landowners: 24 research sites

Policy: Mike Miles, NC Land Trust, Buckeye, Matt Diaz, Ass. Jim Wood

Funding: University of California, NRCS

Today's talk- *Quercus kelloggii and Quercus garryana*

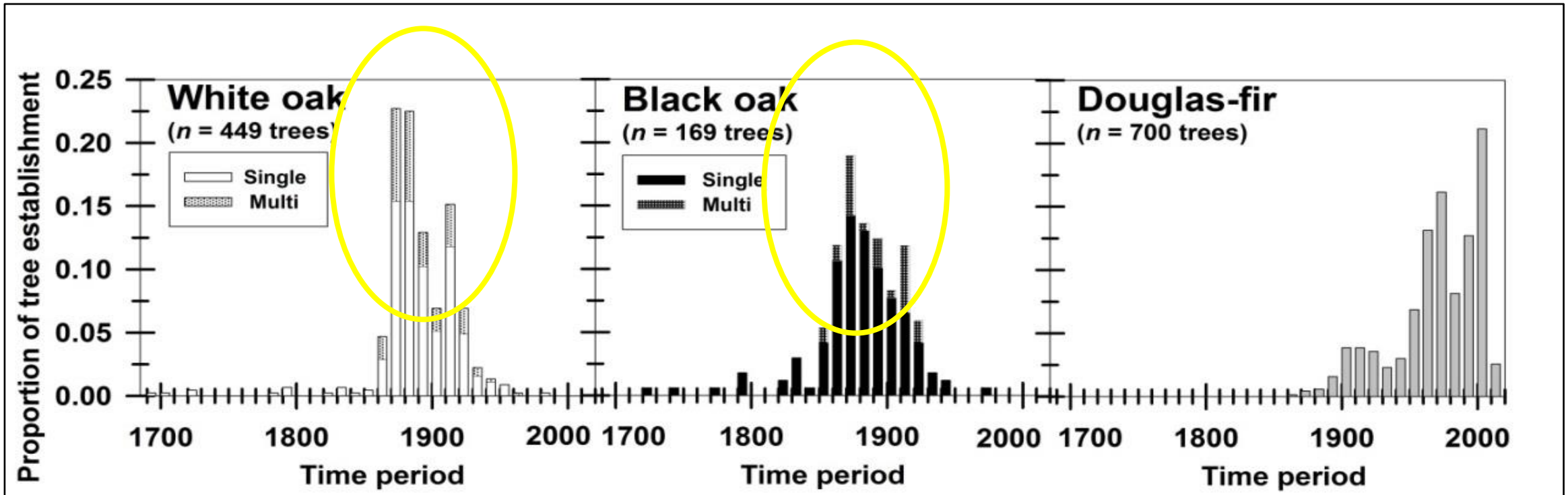
- California's dueling identities
- Deciduous oak challenge to encroachment
- Effects of conifer removal or restoration
- How do oaks fair in the face of wildfire
- Tools for landowners- rewriting California's regulatory framework to help private landowners

Douglas-fir (*Pseudotsuga menziesii*) encroachment

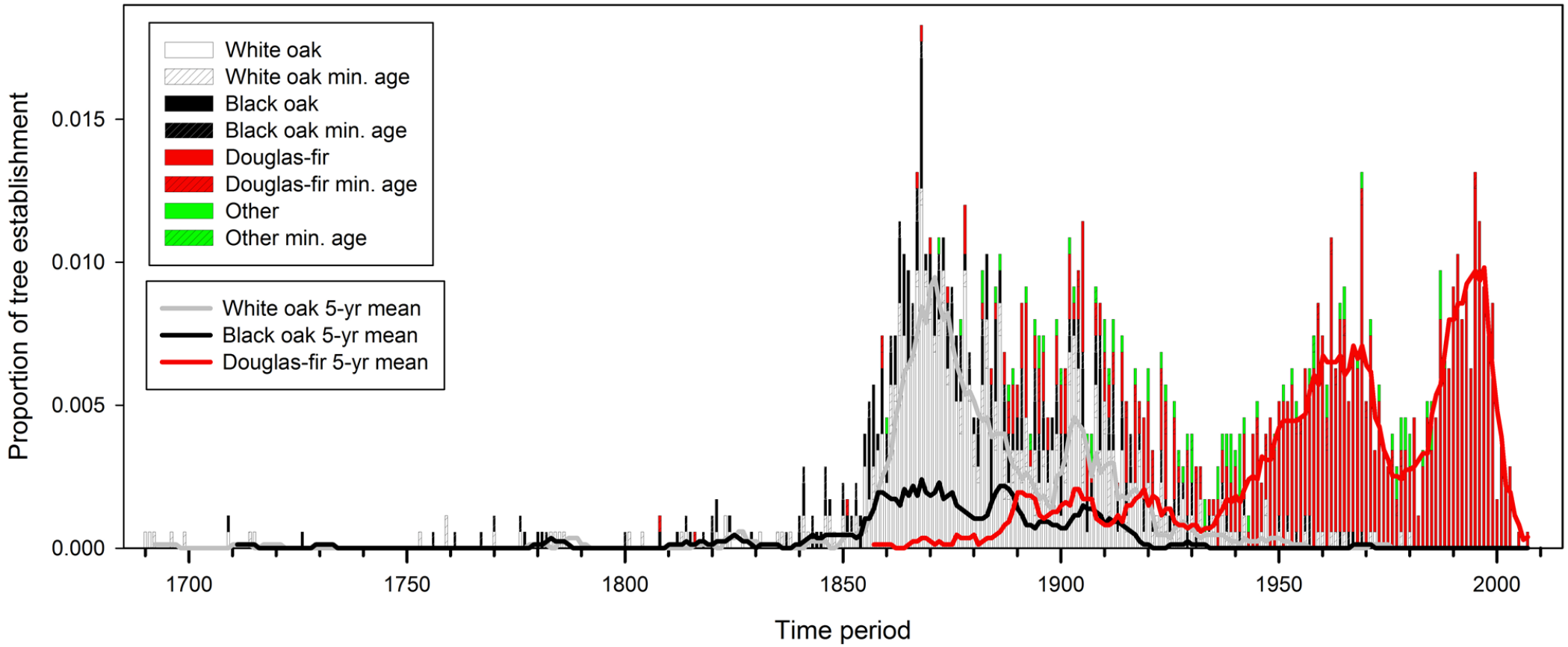
Research efforts

How old are the trees? Are oaks really older than conifers?

Multi-stemmed oaks are common

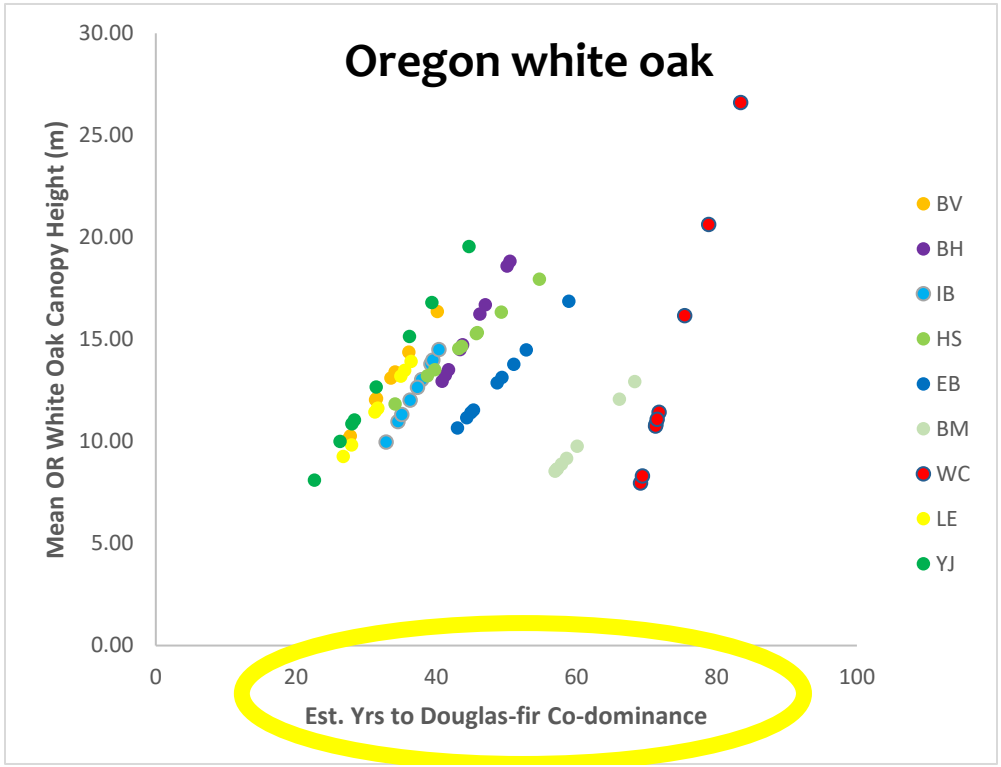


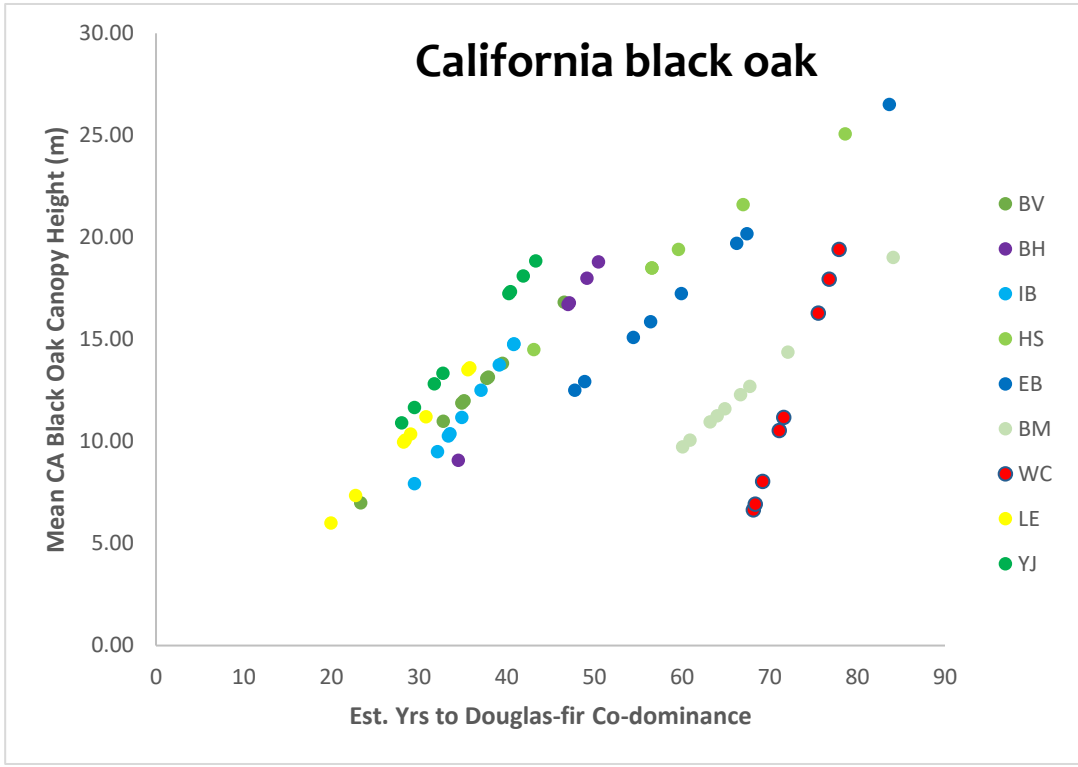
Age distributions



The proportion of tree ages of Q. garryana, Q. kelloggii, P. menziesii, and other tree species sampled from 10 mixed oak-conifer woodland sites (n = 90 plots) in northwestern California. The 5-year smoothing averages (solid horizontal lines) of tree establishment trends for each species is overlaid .

Time to conifer co-dominance Range 20-80 years





Xeric

red

green

purple

Mesic

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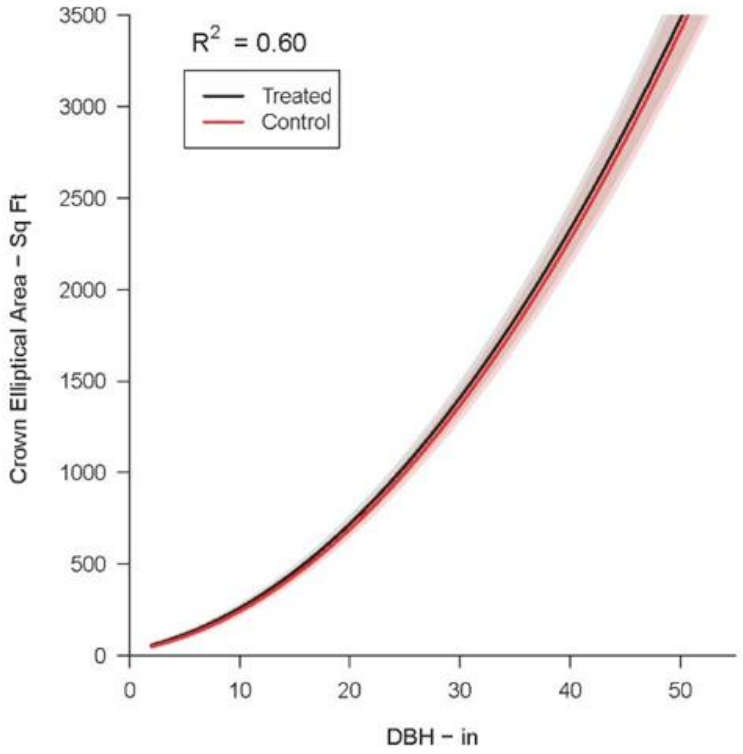
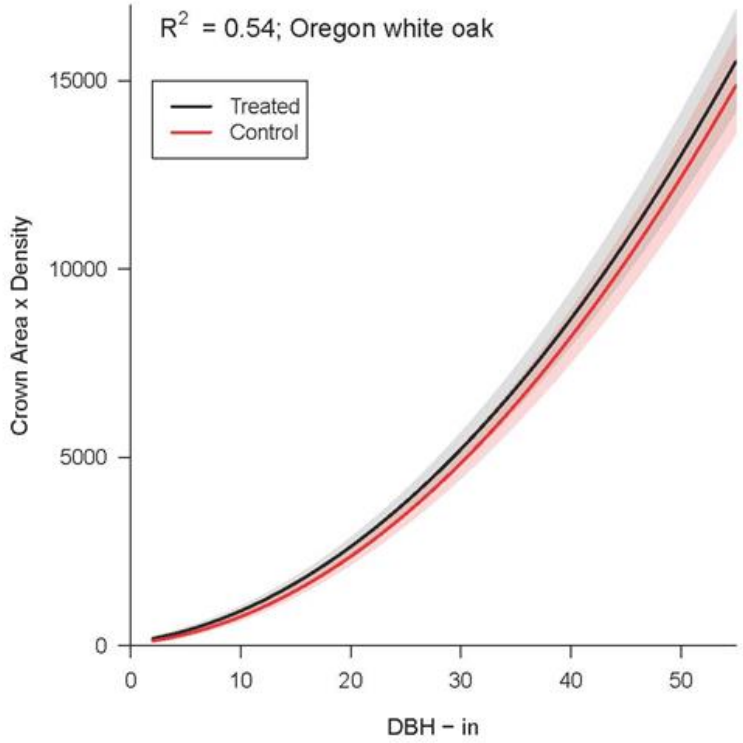
Results: oak crown release? (yes)

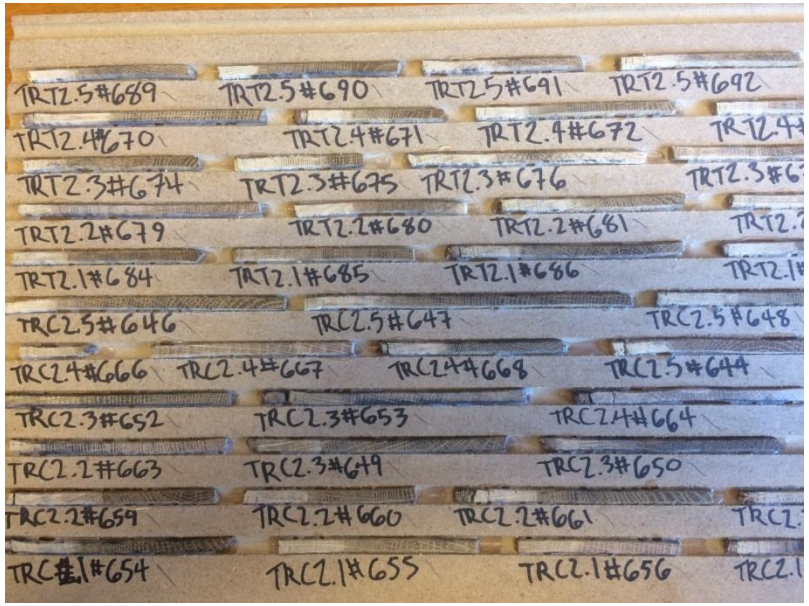


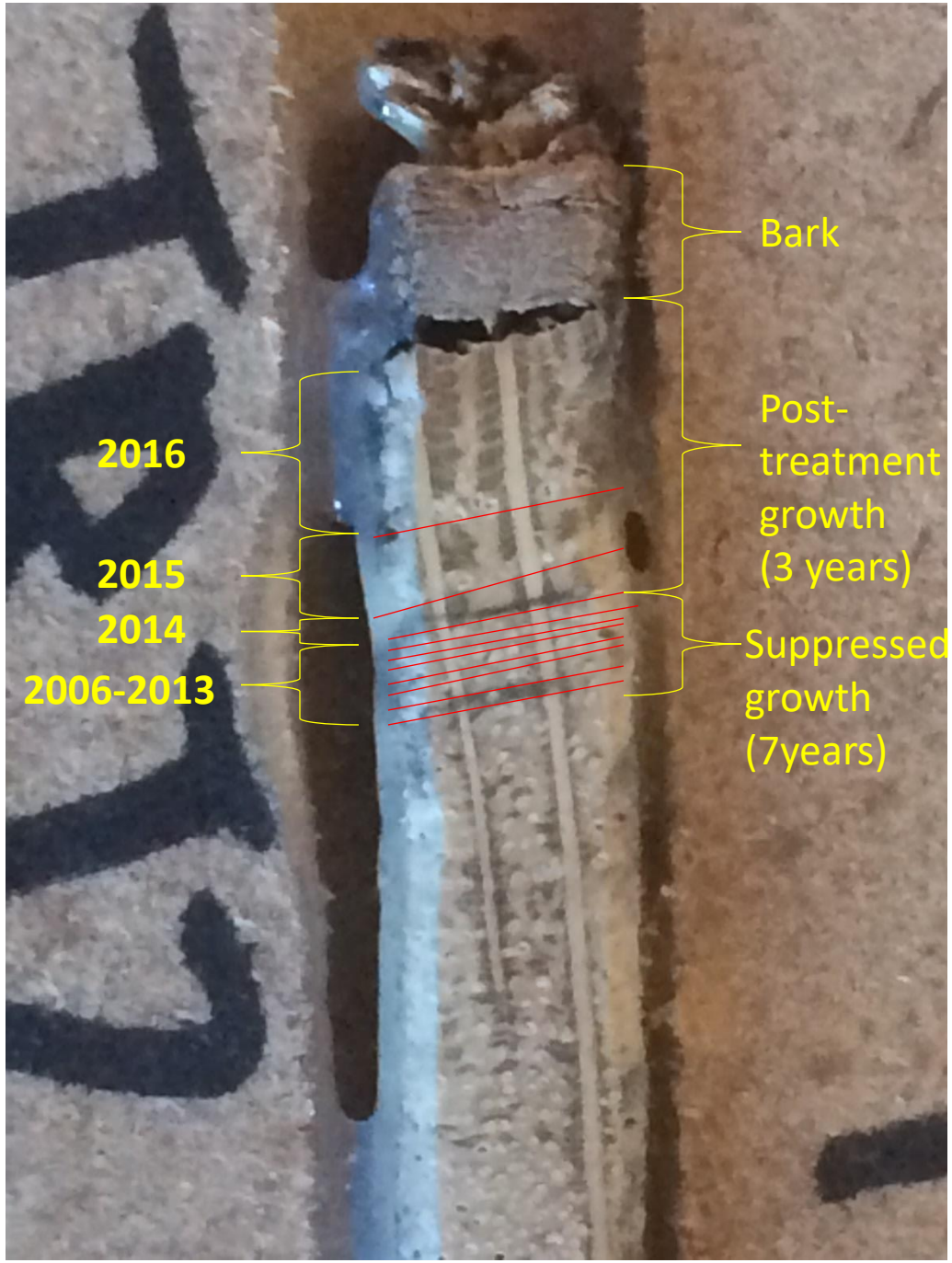
20 ft² larger in the treatment area than the controls. Short-term results.



Crown x density shows the same relationship. Note: white oak responded more than black oak

Oak core from a **control** site showing signs of slowed growth (41 Cattle Control 3).





An oak core from a treated site showing an exceptionally robust release response to the removal of encroaching conifers (41 Cattle Treatment 2).

Drought period 2015-2016

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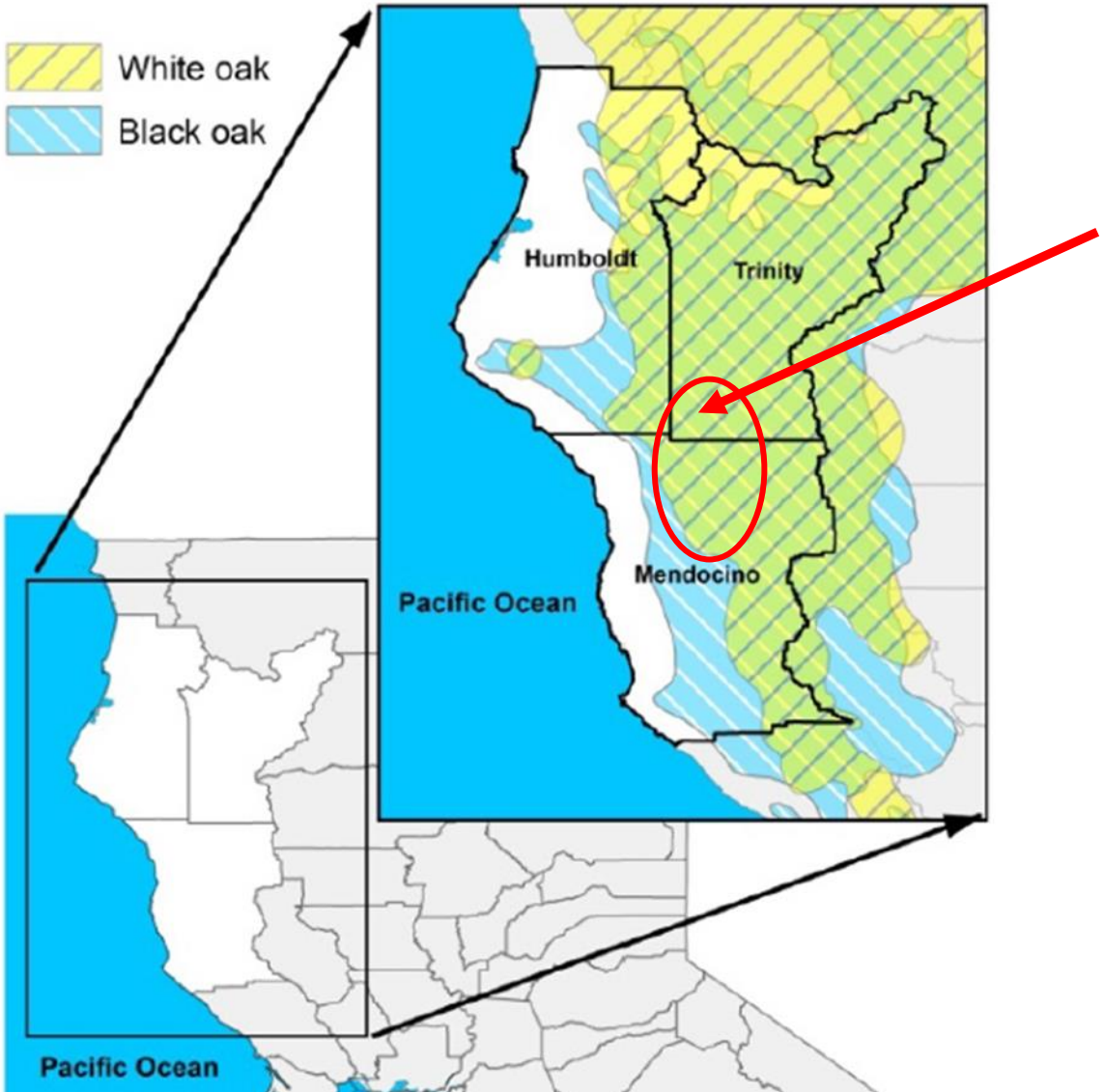
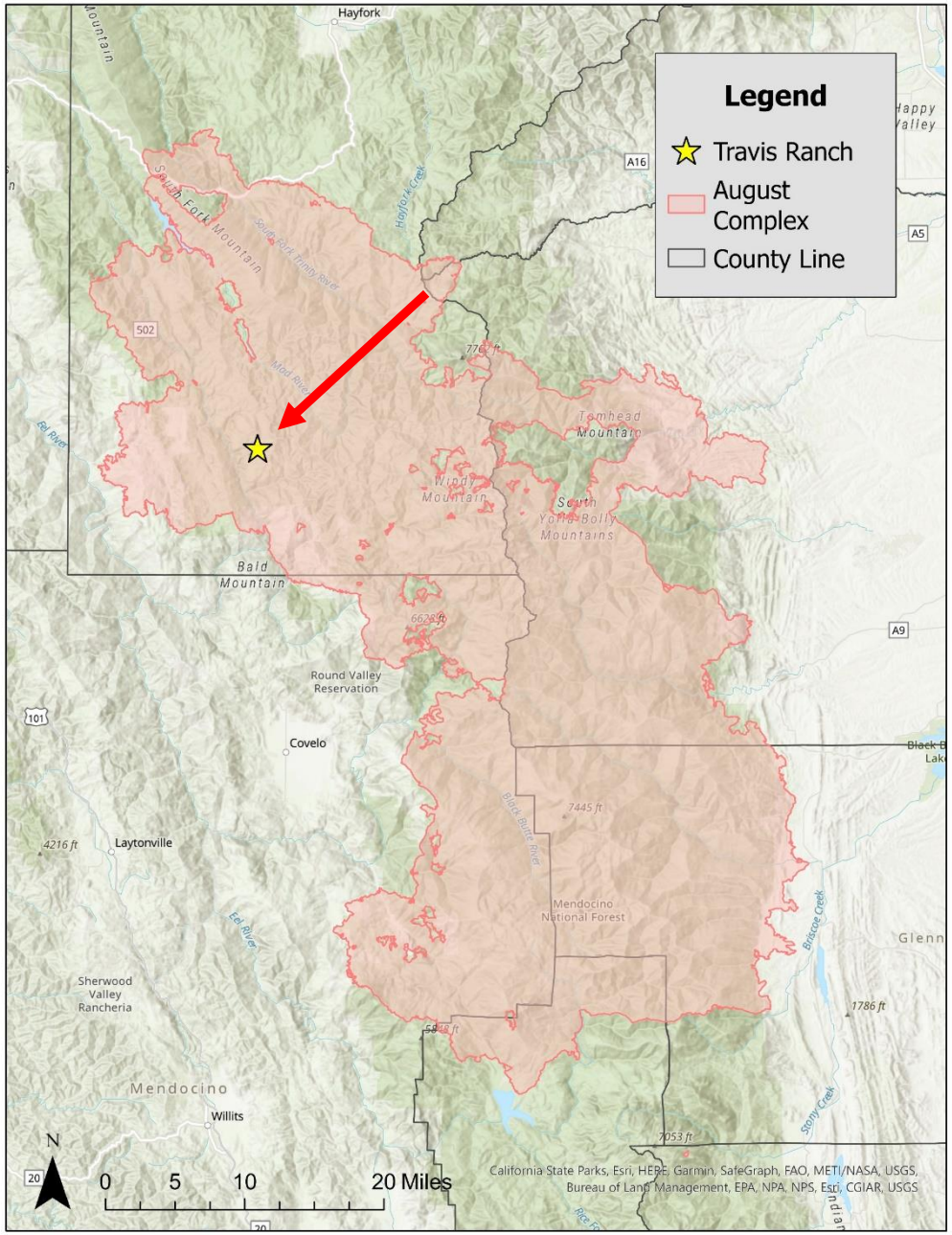
2020 August Complex

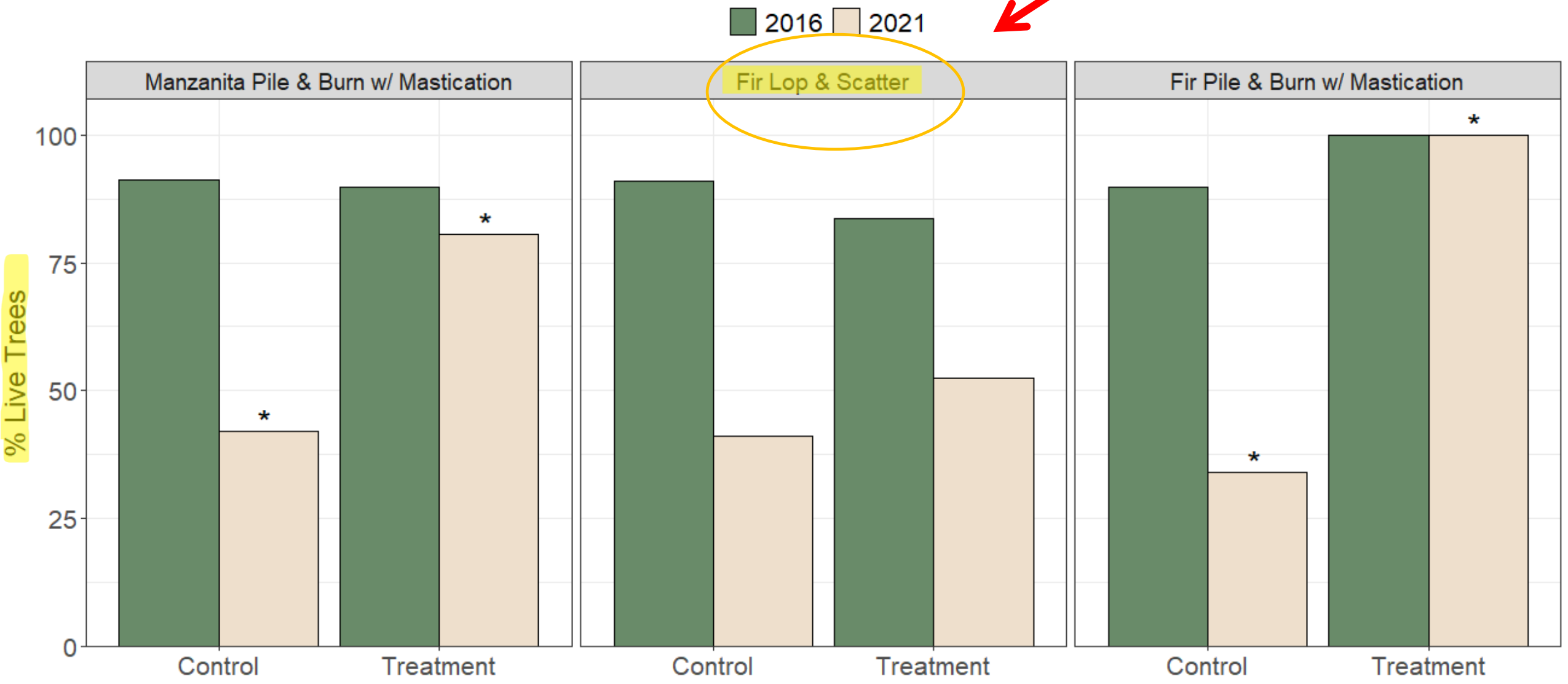




Post- 2020 August Fire

Live Trees (%) Before and After Fire

Fire severity was affected by surface fuels.



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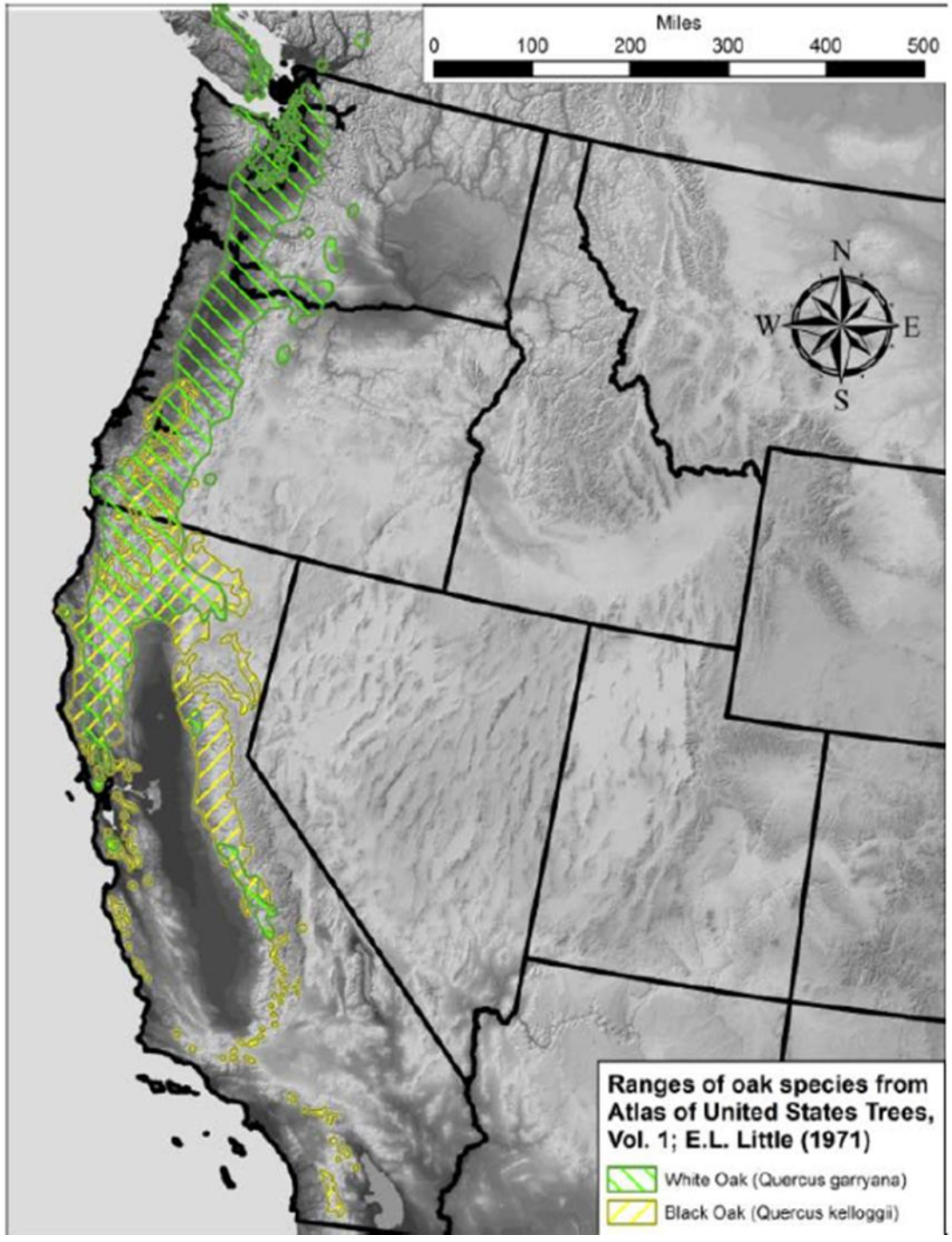
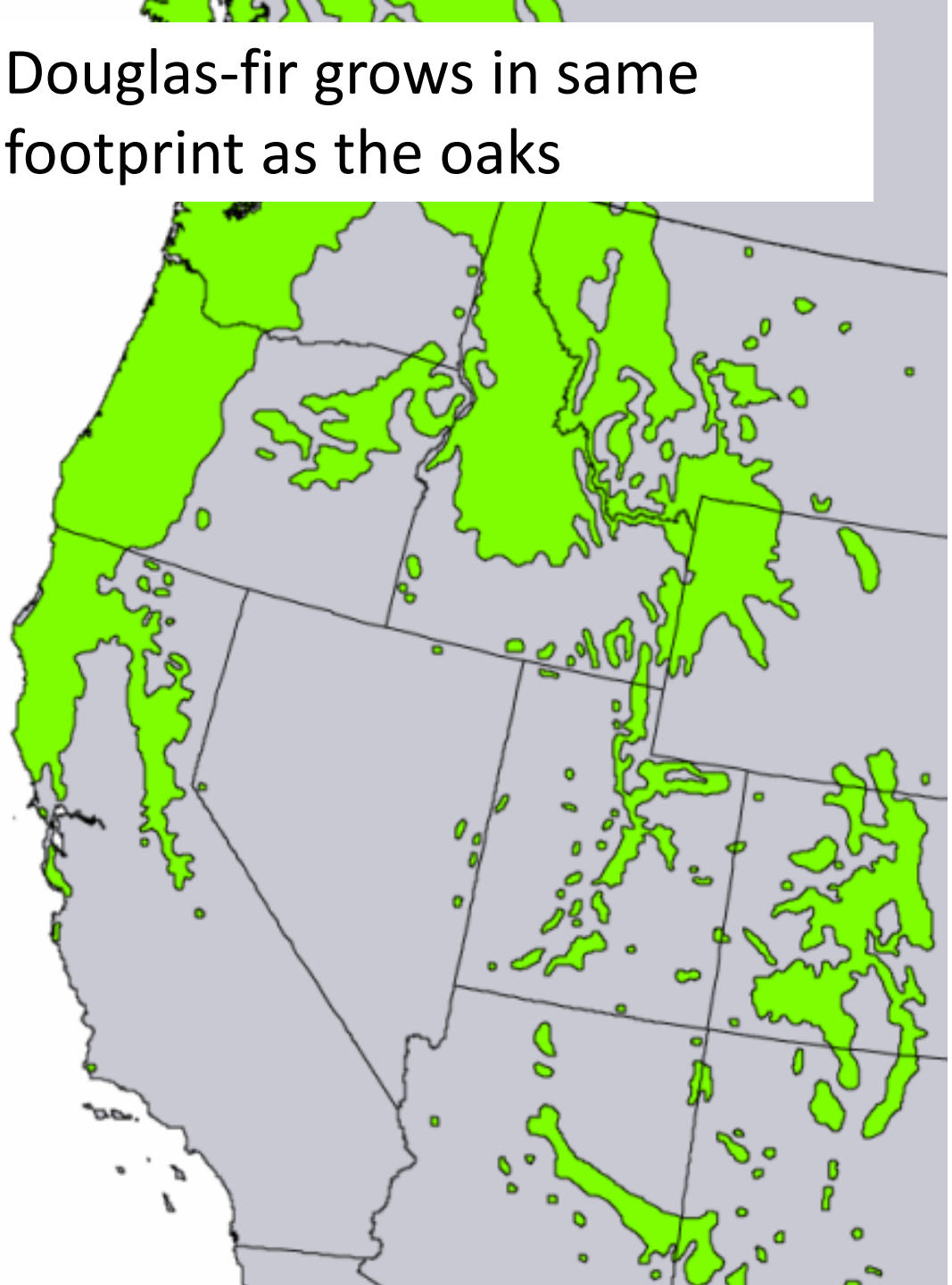
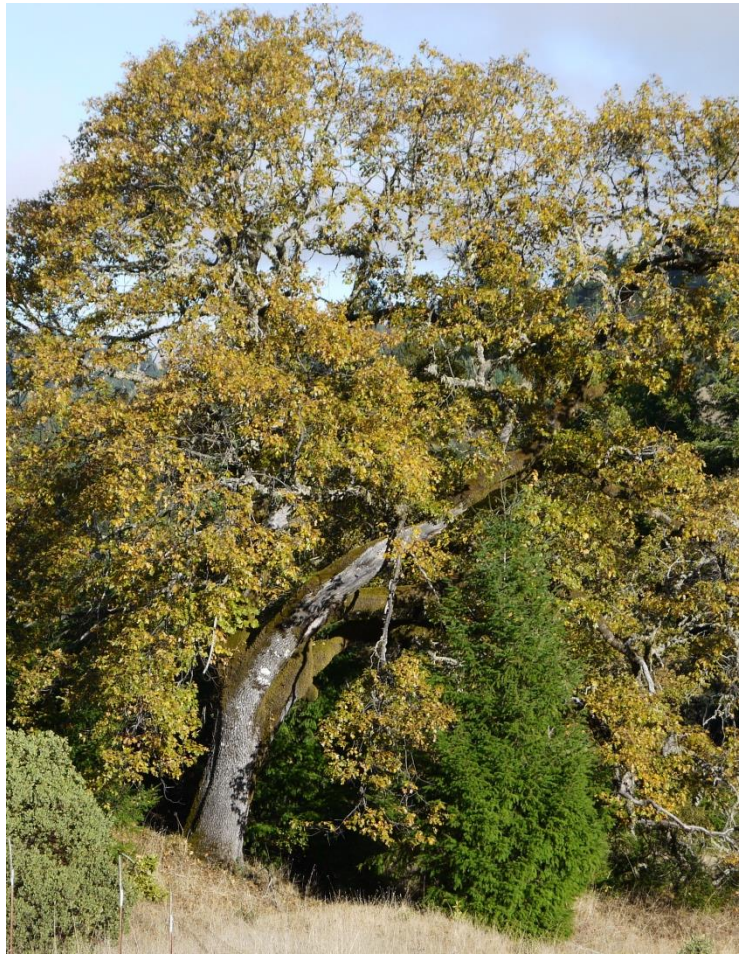


Douglas-fir grows in same footprint as the oaks



Group A versus Group B (Coast District)



Group A

- Coast redwood
- Douglas-fir
- Grand fir
- Western hemlock
- Western red cedar
- Bishop pine
- Sitka spruce
- Western white pine
- Incense cedar
- Port Orford cedar
- California red fir
- Jeffrey pine
- Ponderosa pine
- Sugar pine

Group B

- Tanoak
- Red alder
- White alder
- California black oak
- Monterey pine
- Golden chinquapin
- Pepperwood
- Oregon white oak
- Pacific madrone

Barriers in the rules

- PCR § 4561 defines a **post-harvest stocking standard**
- 14 CCR 912.7 (d) states that "the site occupancy of Group A species shall not be reduced relative to Group B".
- Gives preference to the conifers and encourage use of planting stock to meet the stocking standards
- Thinning a stand, post-harvest conditions must meet these same stocking or **proportionality** standards , it may be necessary to thin across the species in the stand to meet the pre-harvest to post-harvest proportionality standards
- "**Conversion**" maybe an issue if a stand is not stocked in 5 years – an issue for non-commercial as well as commercial activities .

Permit comparison

Green= previous rules
Orange= anticipated changes based on legislation

Special Prescription

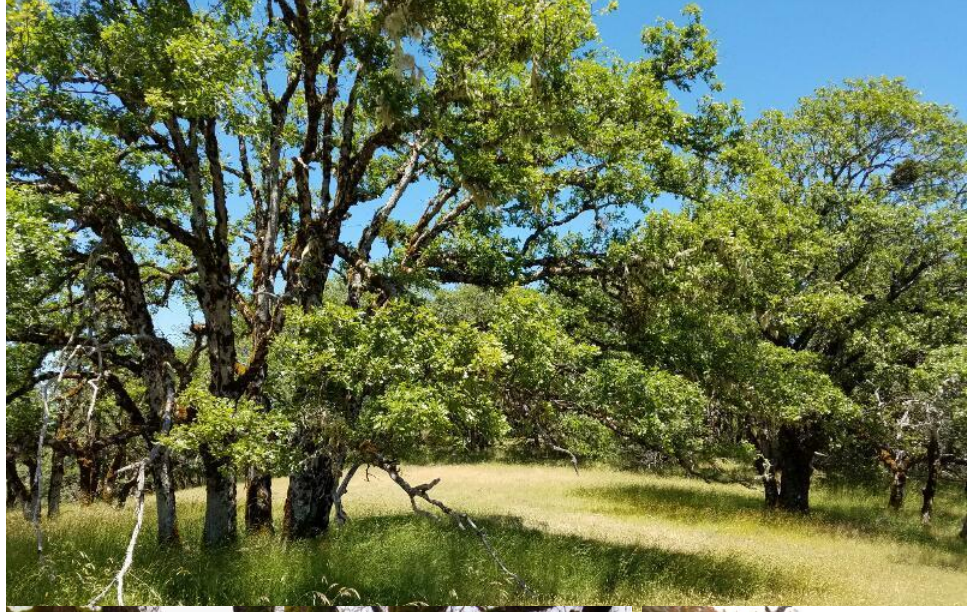
- ✓Removed conifers must be within 300' of living oak
- ✓No size constraints on removed conifers
- ✓Requires an RPF to prepare
- ✓Can amend into NTMP
- ✓No limit on project size
- ✓Allowed on steeper ground and where in lieu practices are needed
- ✓All THP requirements apply (wildlife, botany, archeological, etc.)
- ✓Requires post-harvest conifer stocking be <50% of total onsite stocking
- ✓Oak used to meet post-project stocking requirements

Exemption

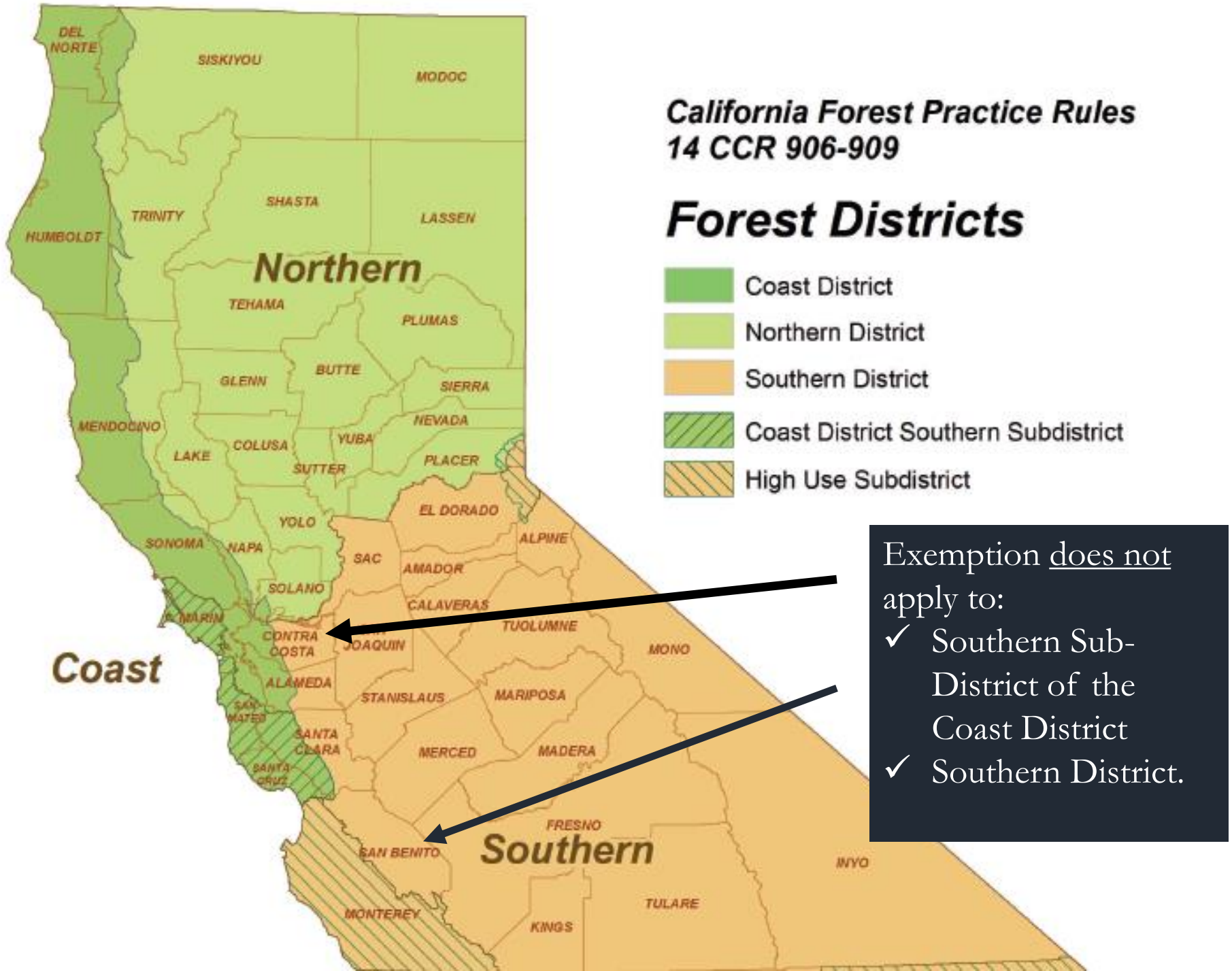
- ✓Removed conifers must be within 300' of living oak
- ✓Removed conifers must ≤26" diameter at 8" stump height. Going to <30" DBH
- ✓Requires an RPF to prepare
- ✓Allowed within existing NTMP
- ✓Limited to 300 acres/5 years/ planning watershed/ ownership
- ✗Not allowed in a WLPZ
- ✓Requires slash treatment
- ✓Requires confidential archeological letter
- ✓Requires post-harvest conifer stocking be <25% of total onsite stocking
- ~~✗Not allowed in So. Sub-Dist. of the Coast Dist. or the So. Dist.~~

Conclusions

- California's dueling identities. Given legal standing for deciduous oaks.
- Deciduous oak challenge to encroachment. Brought statewide attention to the issue.
- Effects of conifer removal or restoration. Restoration works, but attention needs to be paid to the next entry and a plan for future use of Rx fire.
- How do oaks fair in the face of wildfire. When surface fuels are low, oaks can do well.
- Tools for landowners- rewriting California's regulatory framework to help private landowners. Legal pathways for restoration and merchandizing of the cut conifers.



Photos by L. Quinn Davidson



Exemption <u>does not</u> apply to:

- ✓ Southern Sub-District of the Coast District
- ✓ Southern District.


Photo by L. Quinn Davidson


Photo by Kat Anderson


Photo by Frank Lake


Photo by L. Quinn Davidson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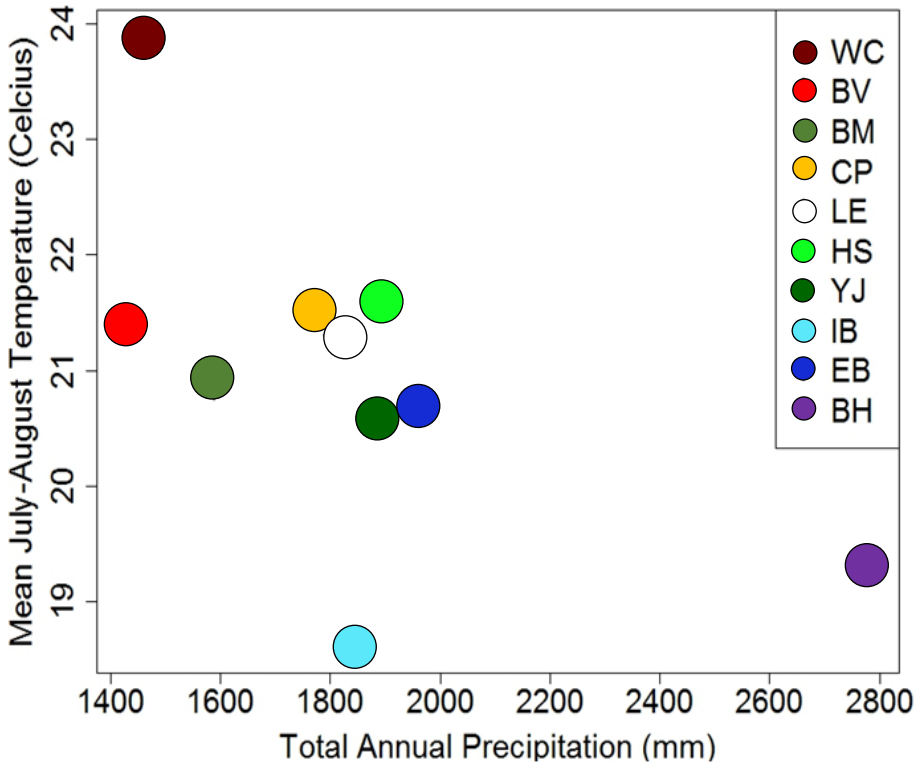
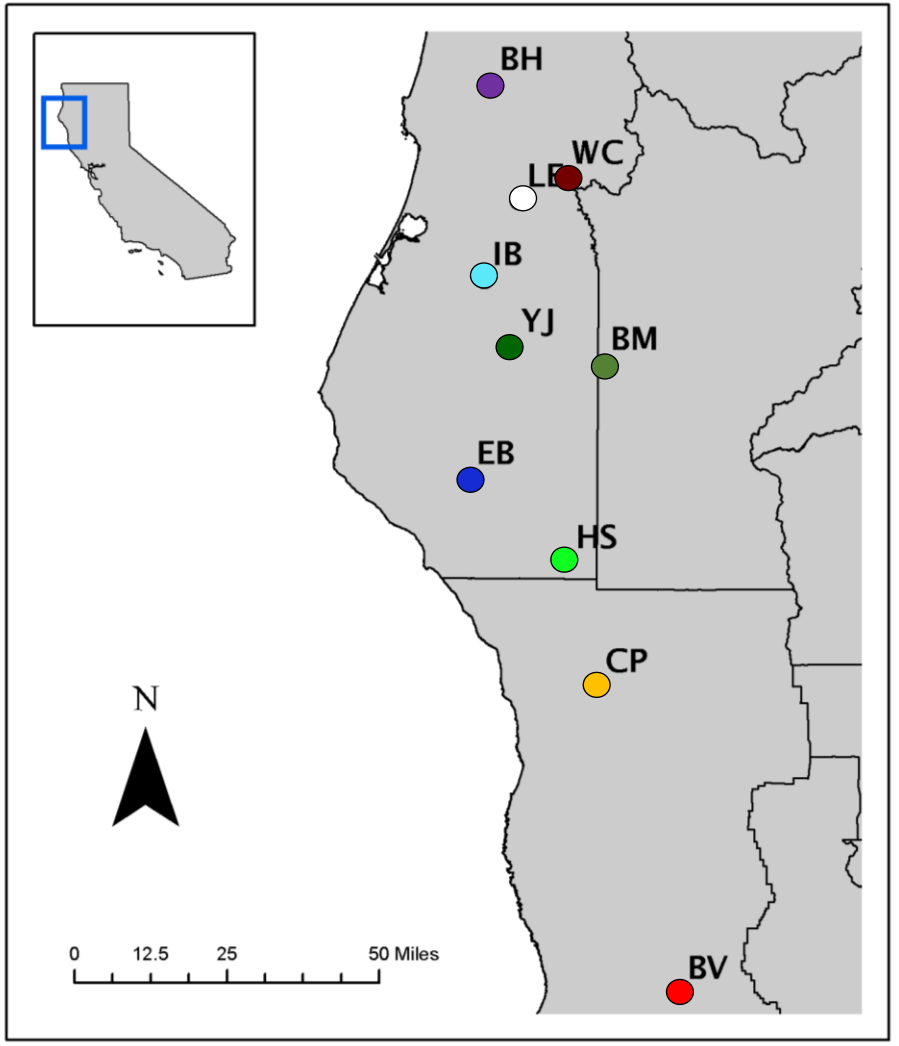
Study area

Study locations rated by climatic conditions

Xeric (warm, dry)

Mesic (cool, wet)





Tree species composition

Early Stage

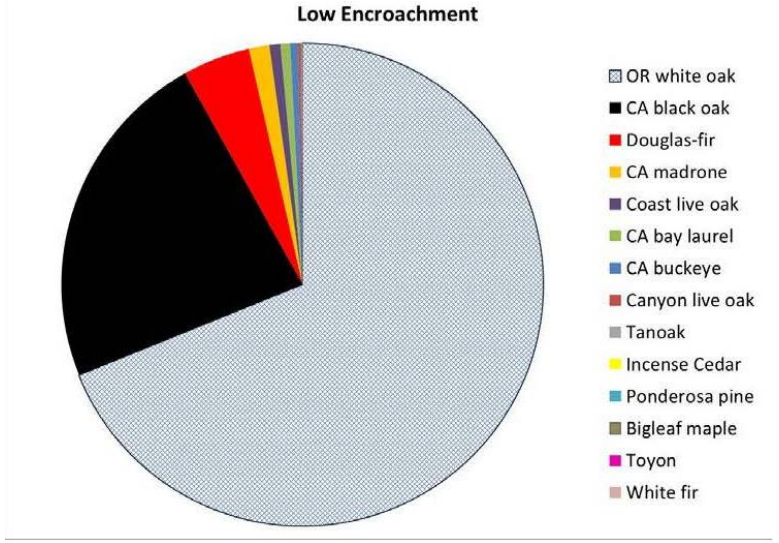
- 65% White oak
- 20% Black oak
- 10% Douglas-fir
- 5% Evergreen hardwood

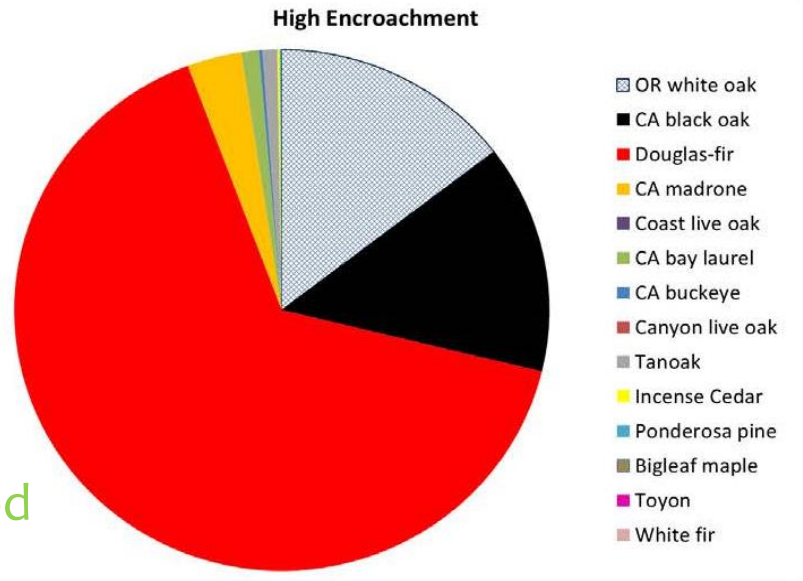
Mid Stage

- 32% White oak
- 10% Black oak
- 48% Douglas-fir
- 10% Evergreen hardwood

Late Stage

- 15% White oak
- 9% Black oak
- 68% Douglas-fir
- 8% Evergreen hardwood





Regeneration Across Sites

	Seedlings	Saplings
Early Stage		
• White oak	78%	< 1%
• Black oak	14%	< 1%
• Douglas-fir	5%	95%
• Bay Laurel	2%	2%
Mid Stage		
• White oak	36%	< 1%
• Black oak	20%	0%
• Douglas-fir	21%	55%
• Canyon live oak	4%	17%
• Bay Laurel	10%	14%
• Tanoak	3%	2%
Late Stage		
• White oak	9%	< 1%
• Black oak	39%	0%
• Douglas-fir	15%	45%
• Canyon live oak	6%	31%
• Bay laurel	13%	9%
• Tanoak	16%	9%