Examining abiotic and biotic factors influencing specimen black oaks (*Quercus kellogii*) in northern California to reimplement traditional ecological knowledge and promote ecosystem resilience post-wildfire

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Background

- Paleoenvironmental reconstruction shows ecosystems around the world have been shaped by human-environmental interactions over millennia.
- Traditional Ecological Knowledge (TEK) used by Tribal people to create ecological conditions that favor black oak while treating the ecosystem as a whole
- Large, specimen oaks provide additional ecological services when compared to smaller trees.
- Present day conservation depends on understanding the ecological and cultural history of a place as well as past cultural practices and the roles and benefits they played in a given ecosystem

Pepperwood PRESERVE

Pepperwood Native Advisory Council (from left to right): Lucy McKay, Clint McKay, Ben Benson, Christi Gabaldon, L. Frank, Dr. Brenda Flyswithhawks

Essie Parrish (Kashaya Pomo) pounding acorn with a milling stone, Sonoma Co.; 1960

Thank you to the indigenous people of this land, the Native Advisory Council, Dr. Matt Clark, SSU staff and faculty, Pepperwood staff, and funding (RSCAP, Norwick Memorial fund, SSU Department of Biology).

SONOMA STATE UNIVERSITY Center for Environmental Inquiry

Stephen Norwick Memorial Fund

Research Question

Where are specimen oaks located on and what drives their growth and development?

SSU Biology undergraduate, Kylie Kiech, in front of a large Black Oak at Pepperwood Preserve

Traditional Ecological Knowledge (TEK)

- Indigenous peoples ability to access land and continue cultural practices is a social justice issue and remains severely hindered.
- These cultural practices are much more than land management techniques, but rather, integral pieces of indigenous culture based in reciprocity and respect for the natural world.
- Learning from and working with indigenous peoples to incorporate TEK into modern land management practices may help preserve habitat heterogeneity and biodiversity.
- Can coming into right relationship with indigenous peoples and making space for the continued practice of timeless cultural traditions help bring balance to our society and ecosystems?

Methods

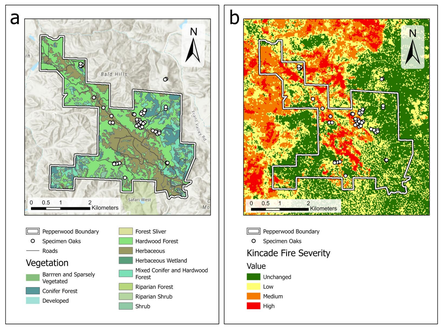
Identify trees:

1) Work with the Native Advisory Council of Pepperwood to identify the locations of specimen Black Oaks throughout the Preserve (target areas easily accessible by elders and children).
2) Record the locations of these trees with a GPS.

Measure fire fuel load, encroachment and canopy:

1) Fire: Measure ground fuel loads and ladder fuels around specimen oaks.
2) Encroachment: Record DBH and spp. of all canopy tree species in a 15m buffer zone surrounding the specimen oak.
3) Canopy dimensions: Measure DBH and crown dimensions (width, depth, volume) of each specimen oak.

GIS maps showing a) specimen oak location over vegetaions data, and b) over wildfire burn severity



Expected Impacts

1) A map of specimen oaks at Pepperwood with culturally and ecologically significant data to help reimplement tending of the trees with TEK.
2) Create more opportunity to gather traditional foods and maintain associated lifeways which are important in maintaining the biological, economic, and cultural well-being of Tribal communities
3) Outreach education related to the importance of cultural revitalization and linkages to the preservation of California biodiversity.