

Fire and Sudden Oak Death's Effect on Species Prevalence in Big Sur, California

Jacqueline Rose and **Richard Cobb**, Department of Natural Resources Management & Environmental Sciences, California Polytechnic State University, San Luis Obispo, CA; jjrose@calpoly.edu

Sudden Oak Death (caused by *Phytophthora ramorum*) has been present in the Big Sur region since the mid-1990s (or earlier) and is the primary agent of mortality in tanoaks (*Notholithocarpus densiflorus*) there. *Phytophthora ramorum* also causes significant mortality in coast live oak (*Quercus agrifolia*) and Shreve oak (*Quercus parvula* var. *shrevei*) as well as ramorum blight in other species including California bay laurel (*Umbellularia californica*). A body of work has shown this changes forest composition and species abundance in Big Sur. (Metz et al. 2011).

A plot network consisting of 280 plots was established in 2006 and 2007 to study the epidemiology and impacts of *P. ramorum* in Big Sur. The plots were established in forests dominated either by coast redwood (*Sequoia sempervirens*) or by mixed-evergreen species (Metz et al. 2011). The purpose of the plot network has shifted focus to include the interaction of *P. ramorum* and fire following the 2008 Basin Complex Fires, in which 97 plots burned; and the 2016 Soberanes Fire, in which 113 plots burned. Previous work has shown that there is increased coast redwood mortality under certain conditions of disease and fire (Metz et al. 2013) and that the resprouting patterns of tanoaks and coast redwood following fire are altered by the presence of *P. ramorum* (Simler et al. 2018). However, the recovery of species following fire and the role of *P. ramorum* in changing the composition of the plant community is unknown. This analysis uses repeated plot surveys of tree diameter, species composition, and ground fuels (Browns transect fuel measurements), performed between 2006 and 2018, to improve understanding of these interactions.

This talk will explore the recovery of a few key species following fire in plots with or without evidence of *P. ramorum* invasion prior to the 2008 Basin Complex fire. We performed previous analysis on the prevalence of several common species looking at presence or absence of *P. ramorum* and fire return interval. We found a significant difference in the prevalence of California-lilac species (*Ceanothus* spp.), a known soil nitrogen fixing plant, between plots with medium or long fire return intervals where *P. ramorum* tested positive. We expect to see decreased post-fire abundance of tanoak and oak species on plots invaded by *P. ramorum* prior to burning, and that plots on which *P. ramorum* has never been isolated will have greater post-fire abundance of those species. The decrease should be independent of the time since the burn, indicating a possible change in the composition of the plant community when compared with uninfected and unburned plots. These changes should be driven by significantly higher pre-fire fuels accumulations documented at plot establishment and in 2012 and 2013 plot surveys.

References

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