

Project Number: EMC-2017-VVV

Project Name: Forest treatment effects on insect and disease generated fuels

Background and Justification: We are interested in the effectiveness of current FPA rules in controlling root disease and bark beetle outbreak. The recent drought and the subsequent bark beetle outbreak represents a major and ongoing “Rare or Large Event” (ECM strategic plan section 4). In the southern Sierra, emergency actions to control bark-beetle related fuels accumulation are being aggressively implemented. In the Northern Sierra and at higher elevations, fir mortality (Fir Engraver; Scolytus) is emerging as an additional source of mortality. We have the opportunity to identify FPA rules in terms of their capacity to reduce outbreak impacts while examining tradeoffs between native pathogen dynamics (root disease) and fuel levels. We propose to partner with Collins Pine Co., Yosemite National Park, and several National Forests (Plumas, Inyo, El Dorado, Stanislaus, Sierra, Tahoe) to collect missing monitoring information and empirically assess treatment tradeoffs among different resources.

Treatments for fuels reduction, bark beetle mortality, and root disease can be mutually exclusive or at least result in tradeoffs among resources or goals. Pre-outbreak fuels reduction can increase resiliency to future bark beetle outbreak increasing inoculum of native root pathogens, particularly Heterobasidion. In turn, Heterobasidion infection is thought to reduce future resiliency to bark beetle dynamics. High fuel loads in post-bark beetle outbreak forests provide suitable substrate for Heterobasidion inoculum buildup, especially in true fir, that could complicate goals related to forest recovery and stocking.

Objective(s) and Scope:

Our aim is to examine a range of forest treatments on National Forest lands and Yosemite National Park using a 60-year dataset and plot network designed to monitor Heterobasidion and Bark beetle dynamics. We will combine this information with new monitoring on Collins Pine Co. lands where an innovative set of treatments has been implemented to control root disease dynamics in true fir. Collins Pine Co. lands have been minimally impacted by the current bark beetle outbreak and we suspect these treatments may give insight into practices that will help reduce impacts in at risk fir forests elsewhere in the state. We will also add additional monitoring plots in highly impacted stands in the southern Sierra Nevada to understand emergency fuels treatments in terms of their potential effects on future tree mortality dynamics (bark beetle and root disease).

Forest Practice Rule(s) and Regulations: 14 CCR §§ 917 (hazard reduction); 1051.3, 1052.4 (modified THP and emergency fuels treatment rules)

EMC Critical Question or Priority: Slash treatment; stand structure (Critical Question 6 (Wildfire Hazard))

Collaborators: Cal Poly, USFS, CAL FIRE

Existing or Needed Funding: This would be a two-year project administered through CalPoly. We aim to support a full-time, two year MS student project in the Natural Resource and Environmental Science Department and two-to-four undergraduate senior thesis projects. Student projects will focus on data analysis and evaluation of specific rules. Depending on overhead and specific project details, we anticipate a total cost between \$130,000 and \$160,000.

Submitted by Richard Cobb (CAL POLY), 09/18/2017