Project Number: EMC-2017-002
Project Name: Using Automated Bird Recorders to Determine Differences in Bird Occupancy of Four Habitat Types in a Post-Fire Setting

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Background and Justification: Forest fires play an important ecological role for California's wildlife. However, in recent years, high severity wildfires have become uncharacteristically large, severe, and spatially contiguous. Forest managers utilize salvage harvesting as a mechanism to recover the value of timber lost to these fires and to prepare the area for restocking with conifer seedlings. Past studies have shown that there is an increase in cavity-nesting, insectivorous bird species such as woodpeckers in post-fire landscapes.

California Department of Fish and Wildlife (DFW) staff have been operating passive bird recorders as part of the Eco-Regional Biodiversity Monitoring project to determine occupancy and diversity of bird species across large geographic landscapes in northern California for several years and, more recently, broadly across the State.[1] Random sites are surveyed on National Forests and other public and private lands within DFW's North Central Region and the Sierra Nevada eco-region and selected from six elevation strata above 3,000 feet. This study will complement that work by focusing on collecting baseline bird occurrence and diversity for stands subject to different disturbance and/or management treatments following wildfire, with the goal of determining if significant differences exist between treatments.

Objective(s) and Scope:

Bird recording protocols utilized by DFW's Eco-Regional Biodiversity Monitoring project will be followed for this study. It will utilize three replicates in four different stand types on Boggs Mountain Demonstration State Forest (BMDSF), located in Lake County in the northern part of the California Coast Ranges:

- In areas unburned by the 2015 Valley Fire (may be reduced to two replicates depending on habitat availability and avoidance of overlapping of sites; also known as controls).
- In high severity burn areas, but not salvage harvested.
- In high severity burn areas that are salvaged, but not planted or herbicide sprayed.
- In high severity burn areas that are salvaged and intensely managed (i.e., pile and burn, rip, herbicide application, planted).

The study will utilize plots established by CAL FIRE's Fire and Resource Assessment Program (FRAP) for evaluating tree mortality, post-fire forest regeneration, understory vegetation recovery, and fuel and carbon dynamics.[2] It will use data collected by FRAP staff to characterize stand conditions and management strategies.

The goal of this study is to examine how fire and salvage harvesting affect bird presence and diversity in the post-fire setting of BMDSF. The proposed research will investigate the following objectives:

1. Establish the baseline presence and diversity of bird species in a postfire setting.
2. Compare occupancy of different habitats by bird species.
3. Compare occupancy results to the larger statewide data being collected by DFW.

FPRs and Regulations: 14 CCR § 1052

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[1] https://www.wildlife.ca.gov/Regions/2/Eco-Regional-Biodiversity-Monitoring

[2] Carbon, fire hazards, and forest regenerations dynamics following high severity wildfire in a mixed-conifer forest at Boggs Mountain Demonstration State Forest (D. Sapsis, T. Moody, D. Passovoy, and J. Leddy). There are 20 replicate units of approximately 3 ha each in a randomized block design with four unique treatments.

EMC Critical Question or Priority: See Section 2.3, Theme 10 (Sub-theme 10.4)
Are the FPRs and associated regulations effective in retaining habitat structural elements in sufficient quantity, type, and structure to provide for habitat remaining species.

Collaborators: DFW, CAL FIRE

Existing or Needed Funding:

- Partial funding received from CAL FIRE's Demonstration State Forest Program
- EMC funding requested
    - ~ $5,000 to fund contractor bird call interpretation for all three years of survey
    - ~ $1,500 for analysis software (may be a requirement of the contract with the bird call interpreter to have this software already)

Timeline and Fiscal year(s): Deployment of the bird recorders will begin in spring/summer 2017 and continue through 2019. The recorders will record bird calls during the months of May and/or June in each year of the study.

Project funding for data analysis required for years 2017-2019.

Submitted by Stacy Stanish, CAL FIRE, 03/27/2017

Reference:

Furnas, B. and R. L. Callas. 2015. Using automated recorders and occupancy models to monitor common forest birds across a large geographic region. *J. Wildl. Manage.* **79**:325–337.