

# Managing Post-fire Habitat for Birds in the Sierra Nevada

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## BACKGROUND AND INTRODUCTION

Large, infrequent disturbances are responsible for long-lasting changes in forest structure and composition; as such they are recognized as a critical element of bird community dynamics. In the Sierra Nevada, fire dynamics and landscape composition are now influenced by fire suppression, post-fire management including salvage logging, mechanical mastication and/or herbicidal treatments to reduce broadleaf shrubs, and planting of conifers for forestry products. In 2009, we began investigating landbird communities in post-fire habitat across three large fires (>10,000 acres) on the Plumas and Lassen National Forest in the Northern Sierra Nevada in order to help inform post-fire management.

## Methods

### Sampling design

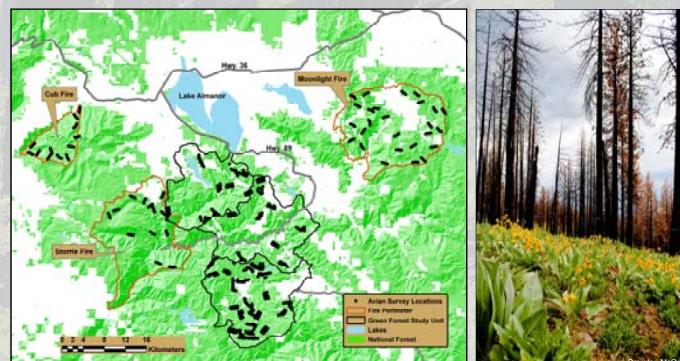
- 52 plots across the Cub (2008), Moonlight (2007), and Storrie fires (2000)
- 40 point count transects in adjacent unburned habitat (12 stations/transect)

### Songbird community composition

- 5 minute point counts at 5 stations in each post-fire plot
- Point count analysis of detections <50m from observers

### Cavity nesting bird densities

- Cavity nest search of 20ha area following 5 point counts
- Recorded size & decay class of all nest snags (n = 64) and random snags (n = 190)



Storrie Fire – High severity plot 9 years post burn with shrub understory & high density of snags

Lewis' Woodpecker – absent from green forest in the study area they select for larger and more decayed snags

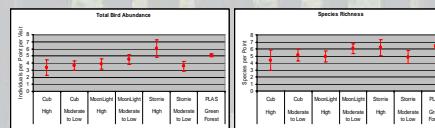
Moonlight Fire (above) – 2 years post-burn with lush herbaceous understory



## Results

### Songbird community composition

- Bird abundance and species richness were lower in high fire severity areas compared to lower severities and green forest in the first two years after fires, but higher in high severity areas 8 years after fire.

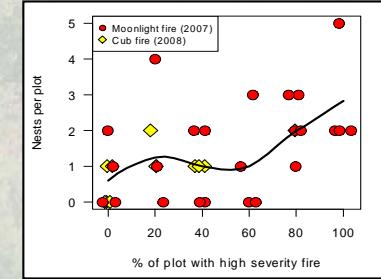


- Several passerine birds associated with broadleaf shrubs were far more abundant in high severity burn than low severity or unburned areas such as Chipping Sparrow and Lazuli Bunting.



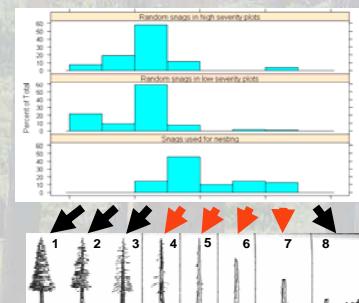
### Cavity nesting bird densities

- More nests on plots with a greater proportion of high severity habitat



### Snags used for nesting

- Most nests were in large, old snags that were not more abundant in high severity plots 1-2 years post-fire.



## Conclusions

- High Severity fire in the Sierra supports unique bird assemblage including rare and declining species
- Larger snags with greater decay are selected for by many species
- Pre-fire snag densities may be key to early post-fire cavity nesting species density
- High severity patch size appears important for cavity nesting birds
- Post-fire habitat (especially high severity) should be managed as a unique component of the Sierra ecosystem in order to sustain biological diversity

## Acknowledgements

USDA Forest Service - Plumas & Lassen N.F.'s & PSW – Sierra Nevada Research Center

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