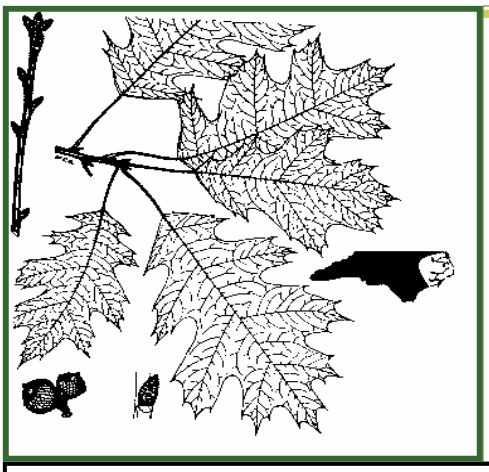


Vegetation Monitoring of the Browns Ravine Oak Habitat Enhancement Project

Questions:

1. What is the effect of conifer removal and prescribed underburning treatment within a mixed conifer black oak woodland habitat on forest structure.
2. How have ecological services and functions changed following the prescribed treatments.

Objectives:

- Monitor the response of California black oak recruitment and productivity to conifer removal treatment and/or prescribed underburning.
- Evaluate the response of understory herbaceous and shrub communities to conifer removal and/ or prescribed underburning.
- Measure the change in forest structure and tree species composition to conifer removal treatment and/or prescribed underburning.

Summary of Methods: We Established a total of 83 long-term monitoring plots throughout the project area; 44 within mechanical treatments, 6 in hand thinned treatments, and 33 control plots.

Response Variables:

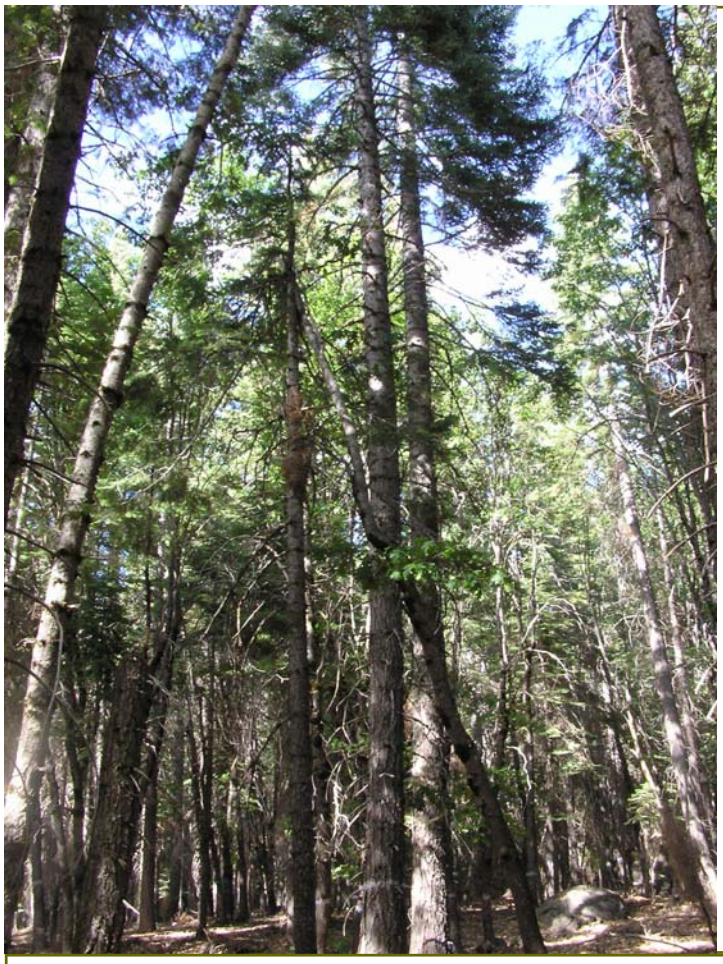
- Tree size class distribution, density, canopy cover, crown class, and species composition.
- Cover estimates for understory functional groups.
- Shrub cover estimates and species composition.
- Seedling species composition, density, and size class.

Summary of Pre Treatment Data:

Data is summarized from a subset of surveyed plots.

The pre treatment plot data verifies the management concerns that White fir dominates the landscape while shade intolerant species are becoming a minority. White fir is the dominant species, it dominates all crown dominance classes except the Open Grown designation, and has the highest number of trees within all of the dbh size class categories. This data illustrates a forest currently in a climax condition where multiple generations of shade tolerant White fir exist throughout the landscape. (see Figures)

In contrast the CA Black oak community, having the second highest species composition, represents only 14% of the overall species within the project area (see Figure 1). In addition it represents the highest percentage of trees within the Open Grown crown class. This suggests that oaks are competing better in open growing conditions where more sunlight is available. Black oak is represented within the other crown class categories but in low percentages in comparison to the percent White fir. An indication that Black oak may not be successfully replacing themselves on the landscape is reflected in Figure 3, where the majority of Black oak are within the 6-11 dbh size class category.



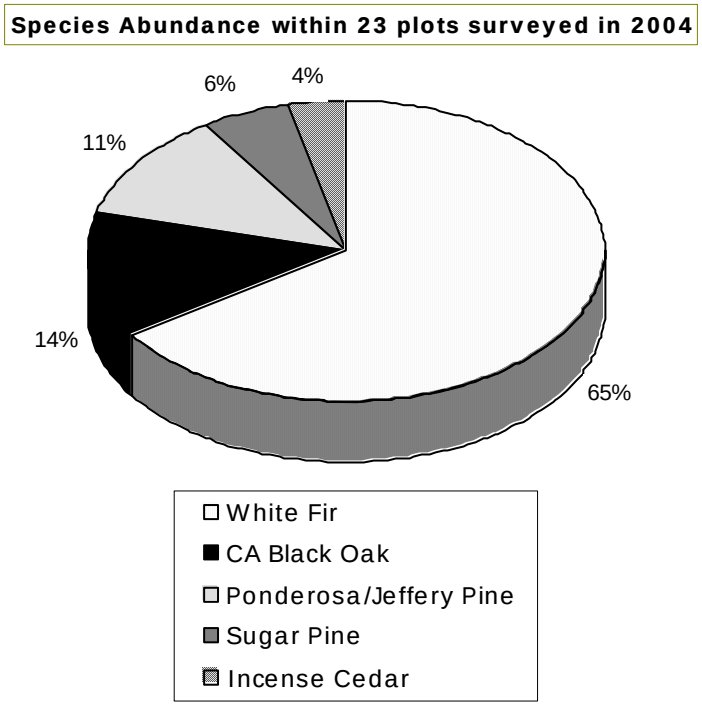


Figure 1: Species Abundance illustrating the White fir dominated project area.

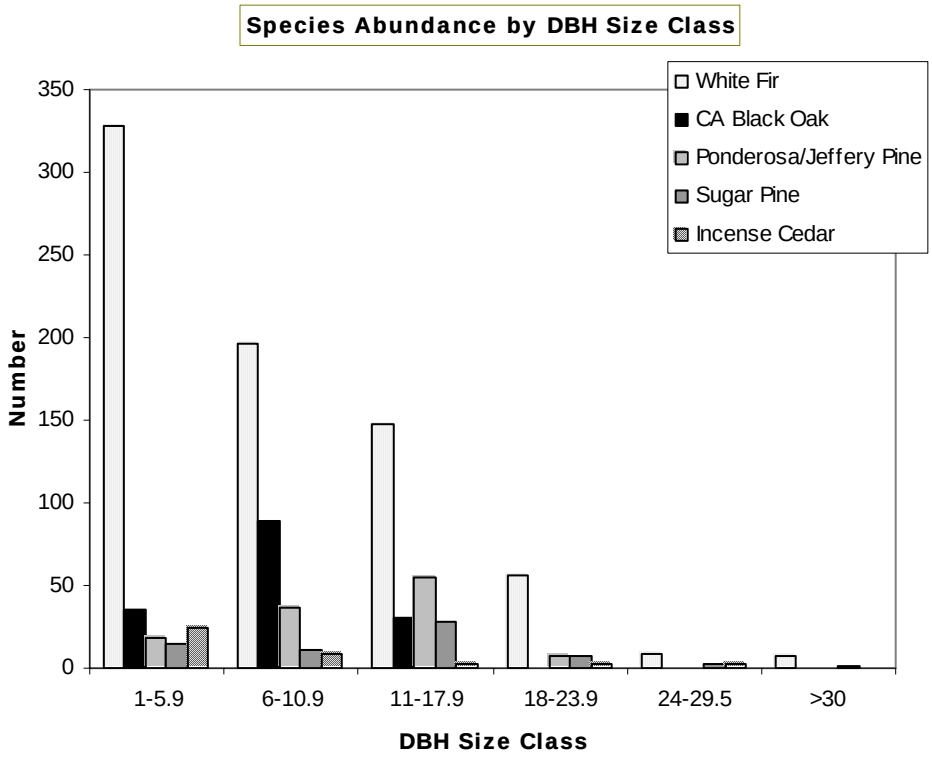
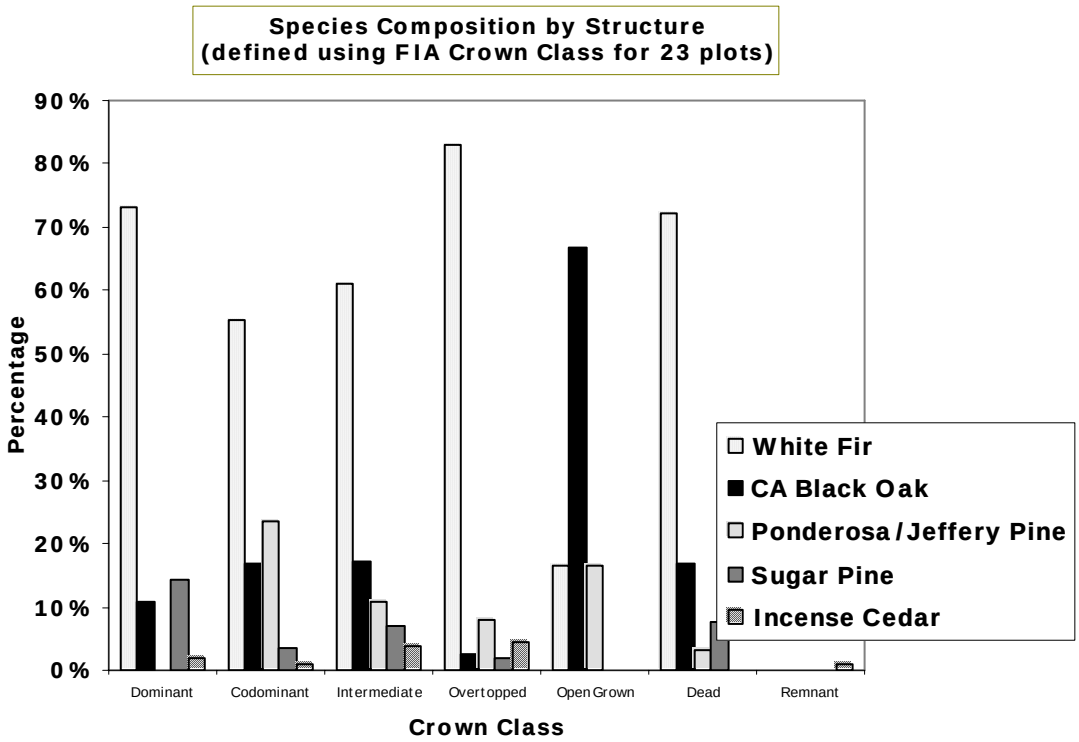


Figure 2: Species Abundance by dbh size class within 23 surveyed plots.



Fure 3: Structure illustrated by Crown classification. Method uses amount of sunlight available to an individual tree.

Planned Monitoring Effort:

1. Underburning treatment; Investigate understory vegetation response.
2. Oak productivity through catkin or acorn response.
3. Collection and Analysis of post treatment plot data.

Additional District Wide Oak Monitoring:

1. Baseline Black oak distribution inventory through District wide assessments and aerial photography.

PLOT 13
W
9/16/04

PLOT #8
S
9/1/04

Avian Monitoring of the Brown's Ravine Habitat Enhancement Project

Background and Introduction

Mixed-conifer hardwood forest is among the most avian species rich habitats in the Sierra Nevada. The high structural and floristic diversity typical of this habitat provides a wide range of niches that promotes avian diversity. In addition, several bird species are strongly associated with hardwoods in these systems and the acorns produced by oaks provide a unique and important resource for a number of bird species and array of other wildlife. In the absence of fire, these habitats have become less complex and diverse with pines, hardwoods, and understory plant communities being replaced by dense stands of fir and cedar. Management intervention is crucial, and if taken in the form of strategically designed thinning and prescribed burns, can mimic natural processes and restore the important habitat components that support the full range of associated bird species.

Nashville Warbler

A vital part of effective land management is developing a program of monitoring and adaptive feedback. As hardwood restoration treatments are a new practice in the Sierra Nevada, monitoring the response of the ecosystem and feeding information back into future treatments is key to ensure projects have the greatest benefit to wildlife. Bird monitoring is an ideal tool

Objectives:

- Work in an adaptive management based framework to help guide and evaluate an ecologically based approach to mixed conifer hardwood enhancement.
- Investigate effects of treatments on avian secondary population parameters of total bird abundance, species richness, and the abundance of individual species.
- Determine the factors influencing these metrics at pre-treatment sites and link observed changes in bird abundance to changes in habitat conditions following treatment.

Band-tailed Pigeon

Methods:

- Standardized five minute multiple distance band point count census.
- 149 stations established with 73 in stands slated for treatment and 76 in reference stands.
- Point established in treatment units to maximize sample size with 225 meter spacing between points. Equal number of reference points in representative habitat.
- 50 meter relevé vegetation surveys conducted at each point before and after treatment.

Western Tanager

Preliminary Results:

- Per point species richness and total bird abundance are lower in the project area than the average for National Forest Lands in the Northern Sierra.
- Project Area supports avian species that occupy a broad range of niches including higher abundance of understory and hardwood associated species than the forest as a whole.
- Per point avian species richness and total bird abundance were very similar at treatment and reference points prior to treatment.

Figure 1. PRBO point count locations in the Browns Ravine project area.

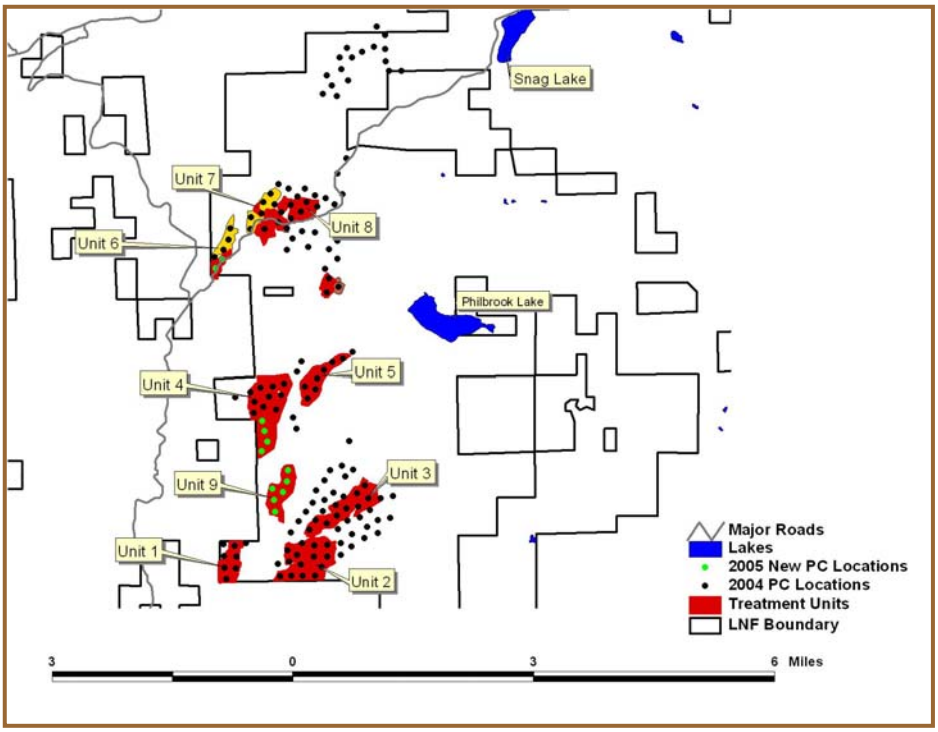
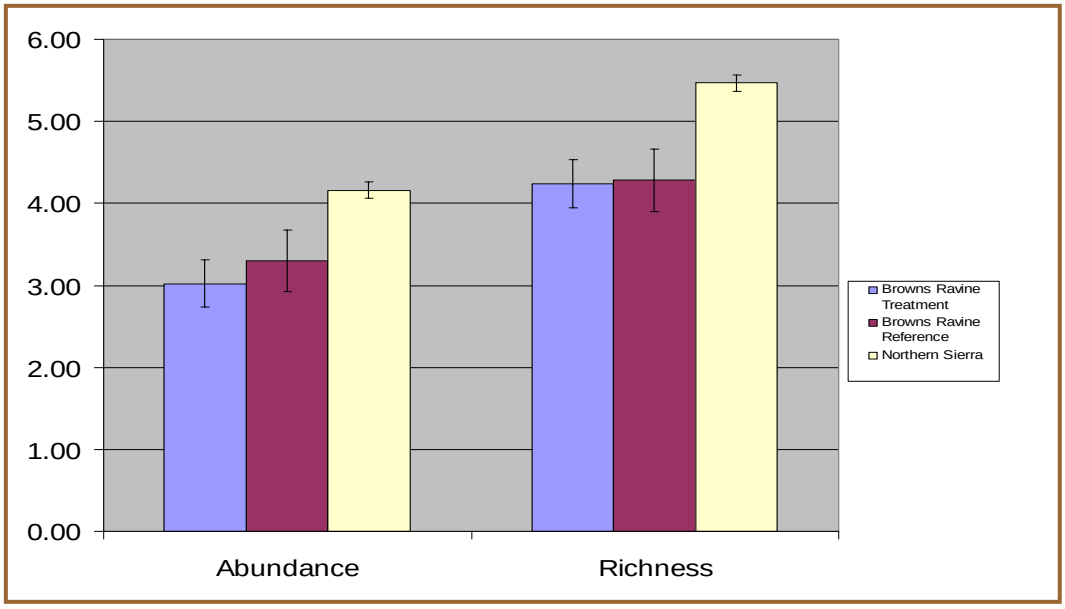


Figure 2. Total bird abundance and species richness at Browns Ravine treatment and reference and other USFS lands with a Black Oak component in the region.



Resources

In recent years there have been major efforts to advance hardwood conservation and restoration in California and throughout the west. There are now several resources available to land managers interested in restoring these habitats:

- Bird Conservation Plans ☐ **http://www.prbo.org/calpif/**
- PRBO Conservation Science ☐ **www. prbo.org & rburnett@prbo.org**
- UC Integrated Hardwood Range Management Program ☐**http://danr.ucop.edu/ihrmp/**
- California Oak Foundation ☐ **http://www.californiaoaks.org/**