

ECOLOGICAL DIVERSITY IN CHAPARRAL FOLLOWING PRESCRIBED FIRE AND MASTICATION TREATMENTS

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ABSTRACT

Chaparral fire management has become increasingly challenging as California's population expands into the wildland fringes. Fuel management techniques such as out-of-season prescribed fire and mastication (mechanical shredding) are often used to reduce wildfire risk in chaparral; however, the ecological consequences of these treatments have not been carefully studied. To address this issue, we are investigating the effects of fall, winter, and spring prescribed fire and mastication in northern California chaparral. We are targeting three questions with our research: 1) Do plant and bird species composition–abundance differ between prescribed fire and mastication? 2) Do plant and bird species composition–abundance vary with treatment season (fall, winter, spring)? 3) Does deer herbivory alter plant species composition–cover–abundance? Pre- and post-treatment monitoring of plant and bird recovery has been ongoing since 2001 and will continue through 2005. Final data analysis will be available in 2006. With >100 acres of replicated experimental treatments, this research project is one of the only fire management studies of its kind. Preliminary results suggest that plant and bird responses vary significantly after these fuel reduction treatments, particularly in relation to nonnative grass cover and bird abundance. In particular, we are noticing substantially higher abundance and cover of nonnative plant species in all mastication plots. Nonnative grasses are especially prevalent and will not only dominate resources at the present time, but they will have the advantage of depositing seeds in the soil for future reestablishment. Nonnative grasses also have the potential to increase the ecosystem's flammability because they cure earlier than native grasses and have more extensive cover. We are also noticing substantial trends in bird composition and abundance. To date, we have found 40 bird species and 800+ individuals using post-fire habitat compared to 14 species and 60+ individuals in post-mastication habitat. Furthermore, fire and mastication plots do not share the same common species. For example, the most common post-fire species are western scrub jay (*Aphelocoma californica*), spotted towhee (*Pipilo maculatus*), and Bewick's wren (*Thryomanes bewickii*). The most common post-mastication species are California quail (*Callipepla californica*) and dark-eyed junco (*Junco hyemalis*). In effect, current chaparral fuel management practices may be significantly altering floral and faunal community composition. These patterns have not been well studied in northern California but clearly need research, especially as fuel reduction becomes more extensive in order to protect a growing number of homes from wildfire. Existing chaparral fire studies have often been opportunistic and inadequately replicated to take advantage of post-wildfire conditions. In addition, few comparative studies have focused on fire versus mastication and their seasonal timing. As a result, this research project aims to provide robust, region-specific information to chaparral managers in order to improve the quality of future fuels management.

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