

## **Effects of Fire Severity and Distance from Unburned Edge on Mammalian Community Post-fire Recovery**

Wayne D. Spencer, Ph.D., Conservation Biology Institute, San Diego Natural History Museum

Jay Diffendorfer, Ph.D., San Diego State University, Illinois Natural History Survey  
Scott Tremor, San Diego Natural History Museum, Conservation Biology Institute

**Description of the project** – This study will rely on a substantial pre-fire database and original field studies to document patterns of reestablishment by mammal populations and communities following the October 2003 wildfires in San Diego County. These processes will be examined as functions of pre-fire fuel status, burn severity, and distance from fire perimeter in order to inform future fuel management decisions in this hotspot of biological diversity and fire-prone habitats. We will build on the extensive pre-fire database of mammal species occurrences collated for the San Diego County Mammal Atlas project. Using standard field sampling methods (live-trapping, Anabat recorders, track transects) we will resample mammal populations in burned and unburned plots where we have existing pre-burn mammal data. We will also sample mammalian communities across areas of varying burn severity, different habitat types, and at varying distances inside the burn perimeter, to ascertain how pre-fire fuel conditions (e.g., as a result of previous fires or fuel treatments) and distance from unburned refugia affect patterns of reestablishment.

### **Study objectives**

- Evaluate the effects of fire on southern California rodent, large mammal, and bat diversity and study patterns of post fire recovery.
- Determine the role of burn severity on diversity and patterns of recovery.
- Determine the role of distance from burn perimeter (or from unburned refugia) on diversity and patterns of recovery.
- Use these findings to inform future prescribed fire plans.

**Methodology or approach** – Field sampling is scheduled to occur over multiple seasons for three years, beginning about one year after the October 2003 wildfires. It will entail two levels of sampling: population-level (at select sites for small mammals and bats) and community-level (at a larger number of sites for small mammals, large mammals, and bats). We will sample selected burned sites where we have pre-burn population monitoring data. In addition, we will sample sites at different distances either side of the burned-unburned ecotone. In all cases, we will use burn severity maps and site surveys to determine burn severity (following methods developed by USGS fire scientists). Initial results will be used to perfect our sampling designs and to ensure adequate sampling across gradients of burn severity.

**Accomplishments/Results** – The project hasn't officially started yet due to funding delays. We have performed limited pilot studies and have been refining our study methods and selecting study sites using a small grant from the San Diego Foundation.

Intensive field sampling, using a larger grant from the Joint Fire Science Program, is scheduled to begin during October 2004.

**Benefits to California State Park and People of California** – This monitoring program will create a foundation for effective long-term management of mammal communities that persist in, or that recolonize, burn areas in and around State Park lands. The data collected will allow State Parks to understand trends in mammal populations and communities following fire, and perhaps to recommend management interventions where necessary. The results can help guide future decisions about the size, location, and intensity of prescribed fires in various habitats as they relate to wildlife management goals.