



Prescribed fire effects investigated

Redwood National and State Parks (California) have formed a partnership with the research branch of the USDA Forest Service in order to study the effects of prescribed fire on ecosystem function of coastal prairies. The study site is the Bald Hills, an area within Redwood National Park that includes about 1105 ha (2,729 acres) of coastal prairies and 620 ha (1,531 acres) of oak woodlands. This area has a history of occupation and burning by American Indians over the past 4,000 years, followed by a reduction in fire frequency in association with European settlement during the last 150 years. The park currently conducts the majority of its prescribed burns within the Bald Hills in an attempt to restore natural processes in this fire-dependent ecosystem. However, the effects of prescribed burning on this area are not fully understood.

The study approach is twofold. First, the research will experimentally evaluate the effects of prescribed fire on populations of small mammals and reptiles. Objectives are to determine the effects of prescribed fire on popu-

lation characteristics (e.g., density, survival, and fecundity) of small mammals and reptiles, and to determine how long potential effects last. The second research component will

evaluate associations between raptor abundance and burn history (frequency of burns and number of years since last burn) throughout the Bald Hills. The researchers hope to determine whether potential effects on prey populations observed in the first component are influencing habitat use patterns of a major group of predators in the Bald Hills. Focus of the research is on the prairie habitat, the dominant habitat type in the Bald Hills.

The study is being conducted on Maneze Prairie, an area within the Bald Hills that had not burned in at least the 20 years before this study. In preparation for prescribed burning, personnel from the parks set up rectangular grids (0.4 ha or about 1 acre in size) 80 meters apart. During September 1998, staff burned every other grid in Maneze Prairie, including a buffer strip >40 m wide, resulting in three treatment (burned) and three control (unburned) grids (see photo).

The burn provided an opportunity to obtain short-term movement and mortality information for California voles (*Microtus californicus*). The researchers radio-collared and tracked 18 adult voles in the three burned grids (6 voles per grid, 3 males and 3 females) before and up to a month after the prescribed fire. They will continue to sample small mammal and reptile populations and vegetation structure and composition four times per year for the next 2–4 years. Analysis of variance procedures will be used to compare changes in population characteristics from pre-treatment to post-treatment sample periods between burned and unburned grids.



Aerial view of Maneze Prairie seven weeks after the three study grids were burned. Each of the three treatment (burned) grids is located near the center of the burned area, and each of the three control (unburned) grids is located to the left of a burned area.

The study of association between raptor abundance and burn history was initiated during the winter of 1998–99 and will continue throughout the upcoming years. To calculate an index of raptor abundance, the researchers are conducting standardized roadside counts along the Bald Hills Road. Observations of raptors are marked on a map, and behavioral information (e.g., hovering, flying, perched) is recorded. Frequency analyses will be used to evaluate relationships between raptor abundance and measures of burn history (e.g., burn frequency and number of years since last burn).

Results from the ongoing research will be reported in a future issue of *Park Science* and in journal articles.