Post-fire Shrubland Rodent Densities: Edge vs. Center


Intense burning in California’s shrubland habitat means that small mammals that do not survive the fire will need to recolonize by migrating from unburned areas into the burned area. This study by Dylan Schwilk and Jon Keeley was the first to sample early recolonization after fire at the scale of the large wildfires that account for the majority of area burned in southern California. They examined whether distance from source populations at the edge of the fire might affect rodent community composition and whether rodent communities were different in chaparral than in coastal sage scrub.

They found that neither species richness nor diversity was significantly related to either habitat type or fire edge distance. However the overall densities were significantly greater on the coastal sage scrub than the chaparral sites. Species common to mature chaparral were found in low densities and only at the edge of the burn and were not included in the habitat or distance analysis. These were the dusky-footed woodrat (Neotoma fuscipes), cactus mouse (Peromyscus eremicus) and California mouse (Peromyscus californicus).

Each of the remaining five species: the Pacific kangaroo rat (Dipodomys agilis), California pocket mouse (Chaetodipus californicus), desert woodrat (Neotoma lepida), brush mouse (Peromyscus boylii), and deer mouse (Peromyscus maniculatus) were all found in the burn area. Each exhibited its own pattern of density, habitat preference and distance from perimeter in this early stage of recolonization.

To measure initial small mammal post-fire recolonization, six sites were sampled three times in Point Mugu State Park during a short, nine week period starting in June, just six months after the October, 1993, Green Meadow Fire burned 16,215 ha in Ventura Co. Three chaparral sites were paired with three coastal sage scrub sites by their similar distances to the fire’s edge. The paired chaparral and coastal sage scrub sites in the burn’s center were >5km from the unburned edge of the fire. The two middle distance sites were 1km and 2km within the fire perimeter, and the last pair of sites were adjacent to the unburned edge. Baited live trapping stations were placed every 5m along a 110-m transect for a total of 23 stations per site, and each pair of equidistant sites was trapped for three nights in a row to comprise one sampling session.

Management Implications

- Just six months after a wildfire rodent species were already present in the burn area at significant distances from the burn perimeter. Abundance was species-specific for habitat preference and distance from the perimeter.