



Research Brief for Resource Managers

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10-Year Small Mammal Use on a Chaparral Fire Edge

Borchert, M. and S.M. Borchert. 2013. Small mammal use of the burn perimeter following a chaparral wildfire in southern California. *Bulletin Southern California Academy of Sciences* 112: 1-12.

Large chaparral fires create extensive fire perimeters that have a hard-edged boundary between burned and unburned habitat. The perimeter provides a source of small mammal populations for recolonization of the burn area. From 2002 to 2011, Sinead and Mark Borchert live-trapped small mammals in two grids across the 65-m zone on either side of the perimeter of the 2002, 8,100-ha Wolf Fire in Los Padres National Forest. They wanted to test whether there was preferential small mammal use of the edge zone over a 10-year period, and to compare succession in the edge zone to studies in burned chaparral at greater distances from the burn perimeter.

None of the four small mammal species in the study area were found to be dedicated edge specialists, despite hypotheses that proximity of two habitat types at the burn edge could provide both enhanced food resources from post fire herb seeds and greater protection from predators in the adjacent unburned chaparral. The four species exhibited uniquely changing densities throughout the decade that were consistent with known habitat preferences. Generalist **deer mice** (*Peromyscus maniculatus*) showed no significant difference among any of the habitats during the study; **pinyon mice** (*Peromyscus truei*) were consistently found in unburned chaparral and were least likely to enter the burn; **agile**

Management Implications

- Small mammals at the fire edge recover similarly to those farther from the perimeter, according to habitat preferences.
- At ten years, the small mammal community in burned areas is still not the same as in mature chaparral. Chronosequence studies are suggested to provide information on longer-term small mammal recovery.

kangaroo rats (*Dipodomys agilis*) were more common in the burn area and remained present at 10 years even as shrub cover increased (Fig.1); **California mice** (*Peromyscus californicus*) were most common in unburned chaparral but had begun to shift into the burn area by year nine.

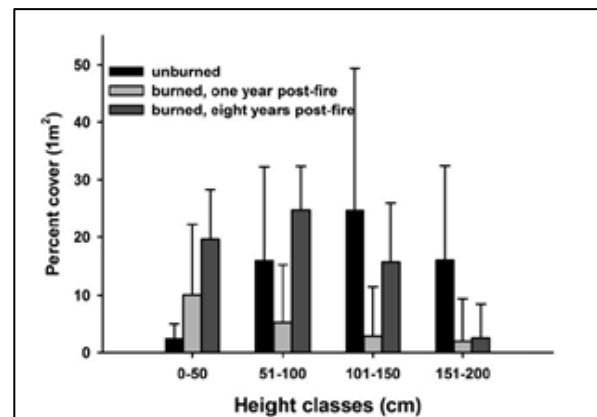


Figure 1. Height differences between burned chaparral at 1- and 8-years post-fire and unburned chaparral.

Even 10 years after the fire, mature chaparral specialists had not returned to permanently occupy the burned area. This was attributed to still incomplete development of mature chaparral stand structure at ten years (Fig.1).

Monitoring plots were set up on Sespe Creek, 15 km outside of Ojai, CA. Two 8 x12 trapping grids were set 110 m apart. Each grid straddled both the burned and 70-year old, unburned chaparral sides of the Wolf Fire edge. Centered on a 5-m wide, bulldozed fire line referred to as the fringe, this arrangement put four lines of 12 large Sherman traps spaced about 10 m apart on each side of the fringe. The trapping started in July 2002, then resumed in spring (May-July) and fall (Sept.-Nov.) to 2006. Trapping resumed again from spring 2008 to spring 2011. Animals were captured, marked and recaptured for five days each season, according to the Schanbel capture-recapture model. Shrub, herb, forb and grass cover estimates were also recorded each season. For Kruskal-Wallis analysis of variance between traps, 14 trapping sessions were lumped into yearly intervals and the edge habitat was sorted into four habitats: burned, fringe, edge and unburned. Data from the two grids were also lumped to increase the sample size.