

Publication Brief for Resource Managers

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Southern California Wildfires Can Reduce Diversity of Rodent Species Assemblages

In 2003, Southern California experienced several large fires that burned thousands of hectares of wildlife habitats and conserved lands. A USGS study published in *Fire Ecology* reports that after the fires, rodent community structure became more simplified in all burned habitats in comparison to unburned habitats.

To examine the effects of the 2003 Cedar and Otay Fires, USGS researchers sampled 63 plots over four locations in San Diego County: Elliott Chaparral Reserve, Little Cedar Ridge, Rancho Jamul Ecological Reserve and Santa Ysabel Open Space Preserve. The insect, reptile, amphibian and vegetative communities at most locations had been surveyed before the fires.

At burned plots, shrub and tree cover had decreased in chaparral and in coastal sage scrub (CSS) habitats, when averaged across the second and third postfire years. Reduction in shrub and tree cover was highly predictive of changes in postfire rodent community structure in burned CSS and chaparral. Reduction in cover was not predictive in woodlands and grasslands.

Across vegetative habitat types postfire, generalist and open-habitat specialists (e.g. deer mouse *Peromyscus maniculatus*, Dulzura kangaroo rat *Dipodomys simulans*) typically increased in relative abundance, whereas closed-habitat specialists (e.g. California mouse *Peromyscus californicus*, brush mouse *Peromyscus boylii*) experienced a decrease.

By understanding the responses of rodent species to fire according to habitat, nesting and food preferences, managers can identify species at risk of decline or extirpation due to wildfires and predict responses of unstudied species — and help assess whether current habitat conservation plans (HCPs) in Southern California can sufficiently function under shifting fire regimes.

Management Implications

- Reduction in shrub and tree cover was predictive of rodent community changes in chaparral and coastal sage scrub habitats.
- Overall, generalist and open-habitat specialist species increased in relative abundance postfire, whereas close-habitat specialists decreased in numbers.
- If a more frequent and intense fire regime becomes the norm for Southern California, rodent communities may become simplified and dominated by generalists and disturbance specialist species, resulting in a loss of biodiversity for the region and its ecosystems.

THIS BRIEF REFERS TO:

Brehme, C.S., D.R. Clark, C.J. Rochester, R.N. Fisher. 2011. Wildfires Alter Rodent Community Structure Across Four Vegetation Types in Southern California, USA. *Fire Ecology* 7(2): 81-98. doi: 10.4996/fireecology.0702081

<http://www.werc.usgs.gov/sandiego>

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4314>



The brush mouse (*Peromyscus boylii*) is one closed-habitat specialist that experienced declines after wildfires. Image Credit: Cheryl Brehme/USGS.