

## Publication Brief for Resource Managers

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# Large California Fires Cause Shift in Reptile and Amphibian 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 the *Journal of Herpetology* reports that after the fires, burned chaparral and coastal sage scrub (CSS) plots lost herpetological diversity and displayed a significant shift in overall community structure.

To examine the effects of the 2003 Cedar and Otay Fires, USGS researchers sampled 55 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 herpetofauna and vegetative communities at all locations had been surveyed before the fires.

At burned plots, shrub and tree cover had decreased by 53% in chaparral and 75% in CSS habitats, when averaged across the second and third post-fire years. Additionally, post-fire herpetofauna communities in burned plots became more similar to communities in unburned grasslands. In contrast, in grassland and woodland/riparian plots where shrub and tree cover were not significantly affected by fires, no differences were found in herpetofauna communities.

While herpetofauna can seek shelter during fires, subsequent losses in cover and understory and increases in open ground can continue to impact organisms. Species dependent on moist leaf litter, such as salamanders, remained undetected during two years of post-fire sampling in chaparral plots. In contrast, habitat generalists like the western fence lizard remained the most abundant reptile in both chaparral and CSS plots.

The evidence suggests that in Southern California, a continued unnatural fire regime and subsequent landscape changes could result in a simplification of reptile and amphibian communities.

### Management Implications

- Large-scale fires induce more changes in chaparral and CSS than in grasslands/woodlands in terms of community structure and species diversity.
- In chaparral and CSS, it may take two or more years post-fire for some reptile and amphibian species to be detected again, and for community structure to recover to the pre-fire state.
- Repeat fires convert vegetative community from chaparral/CSS assemblage to that of grasslands; reptile and amphibian communities can be expected to shift as well.

#### THIS BRIEF REFERS TO:

Rochester, C.J., C.S. Brehme, D.R. Clark, D.C. Stokes, S.A. Hathaway, and R.N. Fisher. 2010. Reptile and Amphibian Responses to Large-Scale Wildfires in Southern California. *Journal of Herpetology*: 44(3) p.333-351. doi: 10.1670/08-143.1

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

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4113>



Amphibians dependent on vegetative cover, such as this *Ensatina eschscholtzii*, may be lost after large, repeated wildfires as chaparral and coastal sage scrub landscapes shift to more open habitats. Photo: Chris Brown/USGS.