

Publication Brief for Resource Managers

Release:
August 2011

Contacts:
Tritia Matsuda
Robert Fisher

Email:
tmatsuda@usgs.gov
rfisher@usgs.gov

Phone:
619-225-6443
619-225-6422

USGS Western Ecological Research Center | San Diego Field Station | 4165 Spruance Road, Suite 200, San Diego, CA 92101

Southern California Wildfires Can Alter Ant Species Assemblages in Coastal Sage Scrub Habitats

In 2003, Southern California experienced several large fires that burned thousands of hectares of wildlife habitats and conserved lands. A USGS study published in *Environmental Entomology* reports that after the fires, burned coastal sage scrub (CSS) plots displayed a significant shift in the overall community structure of ground foraging ant species.

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 CSS habitats, when averaged across the second and third post-fire years. Ant assemblages at most habitat plots were resilient; only the CSS study plots exhibited significant ant assemblage differences post-fire. Specifically, *Messor andrei* harvester ants were at least 30% more abundant postfire and their spatial distribution jumped by at least 85%, while the acrobat ant *Crematogaster californica* exhibited an almost 19% population decrease in post-fire CSS plots.

Fire effects in CSS may explain the ant assemblage differences. Fire may increase plant seed production and availability, providing more food for harvesting by *M. andrei*. Fire can damage or remove decaying logs, plant stems and root masses, decreasing nesting sites and aphid garden sites preferred by *C. californica*.

Ant assemblages could provide important baselines for long-term monitoring of postfire ecological effects. For example, burned CSS plots exhibited an increase in the horned lizard *Phrynosoma coronatum* — a federal species of concern and an obligate feeder of harvester ants.

Management Implications

- Ant assemblages in San Diego County habitats are fairly resilient to short-term impacts of fire, and may serve as an additional baseline for postfire monitoring and studies.
- However, coastal sage scrub (CSS) habitats did exhibit ant assemblage differences, possibly due to degradation of habitat structure.
- An increase in harvester ant populations in burned CSS plots coincided with increased observations of the coastal horned lizard, which are obligate ant predators. Additional studies may reveal postfire effects on other CSS species that are codependent on ant assemblages.

THIS BRIEF REFERS TO:

Matsuda, T., G. Turschak, C. Brehme, C. Rochester, M. Mitrovich, R.N. Fisher. 2011. Effects of Large-Scale Wildfires on Ground Foraging Ants (Hymenoptera: Formicidae) in Southern California. *Environmental Entomology* 40(2): 204-216. doi: 10.1603/EN10061

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

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4310>



Coast horned lizards (*Phrynosoma coronatum*) are obligate feeders of harvester ants. Image credit: Tritia Matsuda/USGS.