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Publication Brief

Release:	Contacts:	Email:	Phone:
August 2012	Jon E. Keeley	jon_keeley@usgs.gov	559-565-3170

USGS Western Ecological Research Center | Sequoia and Kings Canyon Field Station | 47050 Generals Hwy #4, Three Rivers, CA 93271

Differences in Postfire Recovery of California and Arizona Chaparral Plant Diversity

Although postfire chaparral responses have been studied in great detail in the winter rain region of California, little is known about community responses in the bimodal rainfall region of Arizona.

USGS and UCLA researchers compared postfire recovery in the California chaparral with that in the Arizona chaparral, after 2002 fires in southeastern Arizona and 2003 fires in southern California. They report the findings in the journal *Madroño*.

One prominent difference was that woody plants were much more dominant after fire in California's Mediterranean climate, while herbaceous plants were more dominant in Arizona's bimodal rainfall climate. Although there were 44 families in common between the two regions, the dominant families differed; Poaceae and Fabaceae in Arizona and Hydrophyllaceae and Rosaceae in California. And in the first postfire year, there is a more equable distribution of families in Arizona than in California.

Due to Arizona's bimodal rainfall climate, its fall and spring growing seasons produce different herbaceous floras. In contrast, California had only a spring growing season. As a result, the total diversity for the first postfire year was significantly greater in Arizona than in California for both annuals and herbaceous perennials.

Chaparral in these two climate regimes share many dominant shrub species, but findings show that their postfire communities also are very different. This offers a glimpse into the evolution of the chaparral biome. If Arizona chaparral is a reflection of earlier chaparral stages, then the findings hint at the possible trajectory of biodiversity changes should regional climate transition from bimodal to unimodal rainfall, or at the natural selection pressures in action when chaparral species spread across climate regions.

Management Implications

- Chaparral plant communities recover after fire quite differently in Mediterranean-type climates versus non-Mediterranean-type climates.
- Bimodal rainfall regions offer multiple growing seasons, which results in substantially greater postfire diversity.
- Differences in post-fire recovery in neighboring chaparral ecosystems underscore the postfire management requirements of different regions of the western United States. Fire management and habitat recovery efforts need to be tailored to the climate and biodiversity of each region, even if they share similar woody taxa.

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Keeley, JE, CJ Fotheringham, PW Rundel. 2012. Postfire chaparral regeneration under Mediterranean and non-Mediterranean climates. Madroño 59(3): 109-127. doi: 10.3120/0024-9637-59.3.109

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Postfire herbaceous perennials in an Arizona chaparral.