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Synthesis completed of post-fire recovery of native perennials in the Mojave, Sonoran Deserts

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Literature syntheses to develop status of knowledge reports are important to integrate and summarize the scattered scientific literature on a particular topic. The isolation and fragmentation of scientific literature on a topic is not necessarily a shortcoming of science. Rather, it is simply a consequence of having (1) research published in a diverse array of journals, (2) articles build on each other and therefore articles relevant to a particular topic can be published decades apart, and (3) funding virtually impossible to secure to do these periodic assessments of what we know and don't know (competitive science grants want researchers to jump into novel, new research, and land management agencies, although wishful for syntheses, cannot typically target funding out of their budgets for syntheses).

I was able to recently complete the third in a series of literature reviews (the first one was on burro grazing effects on Mojave vegetation, the second on Mojave revegetation). To synthesize post-fire recovery of perennial vegetation in the Mojave and Sonoran Deserts, I analyzed data systematically extracted from published literature to address several questions about post-fire recovery patterns.

Sprouting by desert perennials after being burned is generally limited but varies among species. For example, only 3-37% of *Larrea tridentata* sprouted compared to 64-86% of *Yucca schidigera* (the best-sprouting *Yucca* species examined). Four of five studies measuring recovery of perennial cover reported close relationships (r^2 = 0.67-0.99) between time since fire and cover (Fig. 1). In fact, three studies measuring the longest time since fire (≥ 37 years) found that cover had returned to within 10% cover of unburned areas within approximately 40 years. Conversely, post-fire species composition exhibited little convergence with unburned composition in five of six studies even 47 years after fire. *Sphaeralcea ambigua*, *Gutierrezia* spp., *Achnatherum speciosum*, *Encelia* spp., *Hymenoclea salsola*, and *Baileya multiradiata* had the highest abundances on burns relative to unburned areas, meaning that these species actually increased their relative abundance compared to other species after fire. Analyzing the literature as a whole suggested some generalities about recovery after fire (e.g., that perennial cover reestablishes faster than composition), but more work is required for improving specific knowledge about plant recovery among different fires, sites, species, and climates.

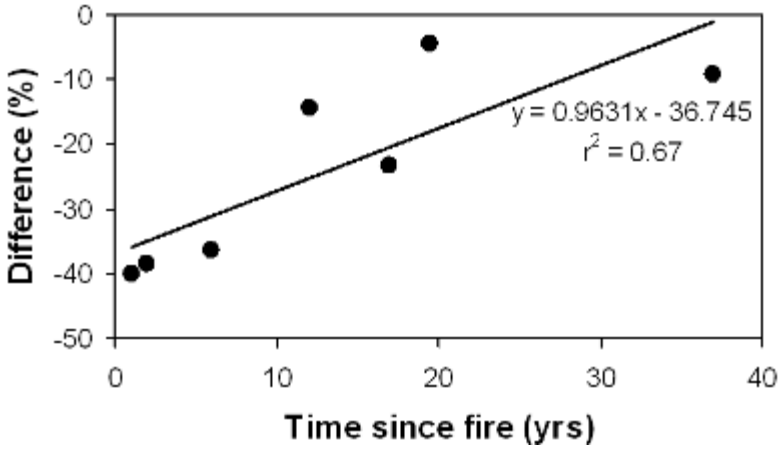

Fig. 1. Example showing one of the five studies that measured the natural reestablishment of perennial plant cover following wildfire in the Mojave Desert. This graph shows the difference between cover on burned and unburned areas (with zero at the top meaning that burned cover has recovered to levels on adjacent unburned areas) as a function of time since wildfire. The study used a chronosequence approach where each point on the graph represents a different aged wildfire. The studies generally found that native perennial cover on burns had returned to unburned levels within 40 years after fire, even though the cover was supplied by different perennial species on burned compared to unburned areas.

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