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Research Brief for Resource Managers

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Type-converting Chaparral is Bad for Biodiversity

Keeley, J.E. 2005. Fire as a threat to biodiversity in fire-type shrublands, pp 97-106. USDA Forest Service General Technical Report, PSW-GTR-195.

California shrublands, such as chaparral and sage scrub, have a disproportionately high number of rare and endangered plants. In the interest of conserving California biodiversity, further type-conversion of these lands to grassland should be avoided.

Based on the area occupied, both chaparral and sage scrub have many more rare taxa than expected. The California Native Plant Society (CNPS) ranked them 1 and 5, respectively, in 1994 for taxa of concern, with geophytes considered most rare (Table 1). Most of the rare species are not adapted to fire, and an increase in fire frequency makes them unable to compete with the non-native invasive species that come with frequent fire and the resulting grassland type-conversion of their ecosystems.

Thanks to a better understanding of the ecology of these shrublands, concerted statewide type-conversion efforts like the **1940's Range Improvement Program** have ceased, along with the once-popular idea that the best chaparral is no chaparral. Increasing human development within wildland-urban areas continues to cause an increase in wildland fire ignitions. These increases in fire frequency lead to inadvertent type-conversion over time. Despite costly fire suppression efforts and the cessation of organized type-conversion programs, we continue to lose both biodiversity and ecosystem function in these otherwise species-rich shrubland communities.

Management Implications

- Chaparral and coastal sage scrub have a higher number of rare and endangered plants in their communities than expected based on total land area occupied by these two shrubland types.
- Frequent fire and the resulting type-conversion of habitat cause non-native invasive plants to outcompete the rare and endangered plants that would normally thrive there.

Table 1—*Top-ranking habitats of California's rare plants according to all CNPS lists (data from Skinner and Pavlik 1994). These observed values are contrasted with the values expected based upon the amount of land area occupied by each habitat (data from Jones and Stokes 1987).*

Rank	Habitat	Taxa	
		Observed	Expected
1	Chaparral	516	432
2	Lower coniferous forests	359	294
3	Cismontane woodland	311	362
4	Valley/foothill grassland	247	431
5	Coastal scrub	211	132

($p < 0.001$; $\Pi^2 = 164.2 >>> \Pi^2_{0.999[3]} = 16.3$)