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Publication Brief for Resource Managers

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Native American Impacts on Fire Regimes of the California Coastal Ranges

Understanding the historical pattern of human impacts on landscapes is critical to correctly interpreting the ecological basis for vegetation distribution. In some parts of the world, such as the Mediterranean Basin, there has been a long, intense utilization of resources that has greatly altered the distribution of forests and woodlands. In the most recent issue of the *Journal of Biogeography,* released in mid-April, USGS research scientist Dr. Jon E. Keeley has produced evidence that vegetation distribution in the coastal ranges of California was influenced by widespread use of fire long before EuroAmerican colonization.

Management Implications:

- Restoration of alien-dominated grassland with native bunchgrass species may be inappropriate because over large stretches of landscape, woody vegetation was likely the natural dominant cover.
- On sites formerly dominated by shrublands, conversion of annual grasslands to native grasslands may not only be inappropriate but is unlikely to be successful.
- Extensive landscape manipulations by Native Americans raise serious questions about the justifications behind restoration projects that attempt to recreate pre-EuroAmerican conditions.

Coastal ranges of California were regions of high Indian density and low frequency of lightning fires. The natural vegetation on this landscape has long been chaparral shrublands that often form dense, impenetrable stands with limited resources for Native Americans. Today, alien-dominated grasslands cover approximately one-quarter of the landscape, and less than one percent of these grasslands have a significant native grass presence. Ecological studies in the Californian coastal ranges have failed to uncover any clear soil or climate factors explaining grassland and shrubland distribution patterns. However, woody communities have weak resilience to high fire frequency and are readily displaced by annual grasses and forbs under high fire frequency. Natural fire frequencies from lightning alone are not high enough to maintain these landscapes as open shrublands/grasslands suitable for Native American subsistence, but such landscape mosaics are readily produced with additional human subsidy of ignitions.

Intact shrublands provided limited resources for Native Americans, and thus there was ample motivation for using fire to degrade this vegetation to an open mosaic of shrubland/grassland, not unlike the agropastoral modification of ecologically related shrublands by Holocene peoples in the Mediterranean Basin. It is hypothesized that a substantial fraction of the landscape was type-converted from shrubland to grassland and much of the landscape that underwent such type conversion either has been maintained by EuroAmerican land management practices or resisted recolonization by native shrubs. It appears that these patterns are disturbance dependent and result from anthropogenic alteration of landscapes initiated by Native Americans and sustained and expanded upon by EuroAmerican settlers.

Keeley, J. E. 2002. Native American impacts on fire regimes of the California Coastal Ranges. Journal of Biogeography 29:303–320.