



Research Brief for Resource Managers

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Effects of fire on spotted owl occupancy in a late-successional forest

Roberts, S.L., J.W. van Wagtenonk, A.K. Miles, and D.A. Kelt. 2011. Effects of fire on spotted owl occupancy in a late-successional forest. *Biological Conservation* 144:610-619.

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4195>

An increase in the frequency and spatial extent of stand-replacing fires in western North America has prompted concern for California spotted owls (*Strix occidentalis occidentalis*) and other sensitive species associated with late-successional forests. A 2011 study published by Roberts and others suggests that a regime of frequent, low to moderate severity fires would likely promote and protect the types of forest characteristics that California spotted owls rely upon for nesting and roosting.

The authors examined the effect of fire on owl habitat characteristics by surveying for California spotted owls in burned and unburned sites throughout late-successional montane forests in Yosemite National Park, California. Of the 32 survey sites, half had burned in the previous 15 years, mostly at either low or moderate severity, while the other half had not burned in more than 75 years.

The authors found that spotted owl detection and occupancy rates (based on 19 owl pairs) were similar between burned and unburned sites. The density estimates of California spotted owl pairs were also similar between burned and unburned forests.

Nesting and roosting by California spotted owls were most common in (a) forests with high total tree basal

Management Implications

- California spotted owl site occupancy rates and densities were similar between recently burned (<15 years) and unburned (>75 years) montane forests of Yosemite National Park.
- Low to moderate severity fires can help maintain habitat features that are important for California spotted owls.
- Landscape-scale application of low to moderate severity fire would probably help to protect spotted owl habitat from large, stand-replacing fires.



The California spotted owl (*Strix occidentalis occidentalis*) is a late-seral associated species that primarily occupies unburned and low to moderate severity burned habitats. *Image Credit: Ronan Donovan/USGS.*

area (primarily from large DBH trees rather than many small trees), (b) low cover of coarse woody debris, and (c) forests with high canopy closure. The abundance of large trees had a clear association with spotted owl nest and roost sites. The authors point out that large trees and increased canopy closure are also associated with northern flying squirrels - a primary prey of California spotted owls in Sierra Nevada montane forests.

The authors suggest that fire, especially fire resulting in low to moderate levels of tree mortality, can help to maintain habitat features that are important for roosting and nesting California spotted owls. They also point out that the application of wildland fire at the landscape-scale would probably help to protect these habitats, in the long-term, from large, stand-replacing fires, and create the types of diverse landscapes conducive to maintenance of the species.

Additional references for this topic:

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<http://fireecology.net/docs/Journal/pdf/Volume04/Issue02/083.pdf>