

breeding season roost sites would be expected to be contained within PACs, where no mechanical treatments will be allowed. Thus, loss of these trees in breeding season roost sites would be confined to the Defense zone and to effects of prescribed fire in those areas of PACs where managers could use fire without important effects.

As a result of the above protections, the primary effect of removal of trees 30 to 51 cm (12 to 20 in.) dbh will be in foraging areas, rather than at nest sites. Because the home range core areas receive the heaviest foraging use, the effects could be most important there, but everywhere outside the Defense zone, except in the threat zone outside home range core areas and PACs, trees 30 to 51 cm (12 to 20 in.) dbh will only be removed when sufficient habitat exists within 2.4 km (1.5 mi) to meet the core area habitat requirements. Thus, effects on spotted owls due to removal of trees 30 to 51 cm (12 to 20 in.) dbh are expected to be limited.

Another important effect of fuel treatments may be reduction in canopy closure. In the Defense zone, the canopy closure could be reduced to a level below the 40 percent threshold that defines habitat suitable for use by spotted owls, although according to the Forest Service, this area is often left at about 40 percent to obtain the benefits of shade in the fuel break (K. Barber, USFS pers. comm. 2003). In the threat zone, canopy cover may be reduced not more than 20 percent below current levels, and not below 50 percent cover; and in home range core areas in that zone, may not be reduced unless sufficient habitat exists within 2.4 km (1.5 mi) to meet the core area habitat requirements. In General Forest that is outside PACs, home range core areas, and patches of high quality habitat (where cover could be reduced by no more than 10 percent), canopy may be reduced by 20 percent, but generally not to lower than 50 percent cover. In westside home range core areas, and in Old Forest Emphasis areas, canopy cover may be reduced not more than 10 percent from existing levels unless habitat standards are met, and not below 50 percent cover overall.

As a result of the above measures, opportunities for reduction of canopy closure by more than 10 percent outside the Defense zone would be limited to areas outside home range core areas unless the habitat standards are met. Where the habitat standard is met, the degree of reduction would not exceed 20 percent, and would not go below 50 percent overall unless the stand was already below 50 percent canopy closure. Reduction of canopy closure by

20 percent would potentially reduce opportunities for nesting in areas where nesting does not currently occur, at least for the short term, but these prescriptions would not apply in areas designated as PACs or in any home range core areas that do not exceed the habitat standard. In all areas except the Defense zone, habitat that currently has a degree of canopy closure suitable for foraging use would retain that character after treatment.

Reduction in canopy closure might potentially have important effects on survival and reproduction of spotted owls, especially related to effects of exposure to weather and modification of forage species habitat. Potential effects of weather on adult and juvenile survival (Franklin *et al.* 2000, North *et al.* 2000) would be largely avoided in 121 ha (300-ac) PACs around all known nest sites and activity centers, where only prescribed fire is allowed to treat surface and ladder fuels, and where effects to overstory canopy would be expected to be minimal. Fuel treatments in PACs would occur only in 5 percent of PACs per year and 10 percent per decade.

In addition, reduction in canopy closure might have effects on occupancy and reproductive success of California spotted owls. North *et al.* (2000) reported on the positive influence of high foliage volume around nest sites on owl reproduction. Effects on this attribute would not be anticipated from fuel treatments under the S and Gs. Hunsaker *et al.* (2002) reported that California spotted owl reproductive success was correlated with degree of canopy cover within several radii around nests, and thus, it might be inferred that even relatively small reductions in canopy cover by fuel treatments in foraging areas could reduce reproductive success. However, prior to publication of Hunsaker *et al.* 2002, during the process of publication of that study, analysis of the data by another Forest Service scientist (Lee 2001) found that the statistical methodology of Hunsaker *et al.* (2002) was flawed, and thus, the above inference cannot be supported. The analyses of the data by both Hunsaker *et al.* (2002) and Lee (2001) found that canopy cover of at least 50 percent was desirable; that level would be maintained by the S and Gs in all areas but the Defense zone. Blakesley (2002a) reported that amount of habitat above 40 percent canopy cover was positively correlated with owl reproduction, but did not evaluate differences between increments of canopy cover. Outside the Defense zone, treatments would not

reduce higher degrees of cover to below the 40 percent level.

In many cases, the renewed growth of the crowns of the remaining stand after thinning would be expected to fill in the canopy cover within one to two decades, so effects of reduction in canopy closure due to thinning of understory trees might be temporary. Additionally, the extent of such effects would be tempered by the limitation on fuel treatments to less than 40 percent of watersheds (outside the Defense zone), and by the direction to focus treatments on the upper two-thirds of slopes.

The Service concludes that no available data firmly indicate that the removal of trees and the reduction in canopy cover as prescribed by the SNFPA S and Gs and described above would have substantial negative effects on California spotted owl reproduction and occupancy, except in the Defense zone. This does not mean that negative effects would not occur. Such effects are possible, and researchers have suggested that subtle effects could be important if they occur on a wide scale (Noon *et al.* 1992). Substantial scientific uncertainty remains regarding the effects of fuel treatments in PACs and foraging areas. However, in the absence of demonstrated effects, and considering that the potential negative impacts are also accompanied by the positive effects of fire risk reduction and faster development of high quality habitat, we find that the timber harvest and fuel treatments proposed under the SNFPA do not constitute a significant threat to the California spotted owl at this time.

Fire on nonfederal lands—The California Department of Forestry and Fire Protection (CDF 2002) reported that over 47,347 ha (117,000 ac) of nonfederal lands burned in 2002 and that for the most recent 5 year period (1998 to 2002) an average of 47,347 (117,000 ac) of nonfederal lands burned per year (CDF 2002). However, these statistics are not broken down by habitat type and, thus, do not provide an indication of losses for forest lands or spotted owl habitat.

In general, risk of catastrophic fire is probably lower on industrial timber lands than on many Federal forest lands, as a result of more active management, especially thinning, in recent decades. Risk varies on timber lands in other private ownership, according to the degree of timber harvest and fuel reduction.

#### *Threats From Urbanization*

Residential development, both through growth of communities and construction of dispersed residences,