

Ecology and Management of Northern Spotted Owls on Commercial Timberlands in Coastal Northern California¹

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Northern spotted owls (*Strix occidentalis caurina*) have been studied on Simpson Resource Company's (formerly Simpson Timber Company) approximately 450,000 acres in coastal Del Norte and Humboldt Counties for the last 14 years. With the exception of a few small isolated old growth stands representing less than 1 percent of the ownership, Simpson's land base is made up of a mosaic of second and third growth forests. The primary silvicultural technique has been and continues to be even age management with clearcutting.

Surveys for spotted owls on Simpson's ownership have occurred continuously since 1989 when the first "hooting transects" were established. The following year in 1990, mark-recapture demography and population density studies were initiated. Since then, a Habitat Conservation Plan (HCP) was developed for the species in 1992 and two master's studies were completed in 1993 and 1997. The first master's study was done by Lee Folliard from the University of Idaho and focused on the nesting habitat associations of spotted owls. The data from this study provided much of the basis for the conservation strategy of the HCP. The second master's study, which quantified the habitat associations of spotted owls with low versus high nesting success, was done by Darrin Thome from Humboldt State University (HSU). An "in-house" radio telemetry study was conducted from 1998 to 2000 to quantify nighttime ("foraging") habitat associations of spotted owls. As a corollary to the spotted owl studies, two master's studies out of HSU were conducted on dusky-footed woodrats (*Neotoma fuscipes*); the primary prey of spotted owls in this region. Both of these studies estimated the abundance of woodrats in different aged stands. However, the first by Keith Hamm was conducted in coastal redwood (*Sequoia sempervirens*) forests, while the second thesis by Kevin Hughes was in the Douglas-fir (*Pseudotsuga menziesii*) zone.

During the course of these studies, 783 nests have been located, 1,428 owls have been captured and banded, and movement and foraging data have been obtained using night vision scopes and telemetry on 35 owls. Some of the most important conclusions generated to date from the extensive dataset are as follows:

1. Despite extensive past and current timber harvesting activities, portions of the study area have the highest densities of spotted owls reported in the northwest. Landscapes with the highest densities of spotted owls are a mosaic of mature second growth and recently harvested clearcuts (Diller and Thome 1999).

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2. Survival rates of adult owls have been high (mean annual rate = 0.85) and the owl population was relatively stable throughout the early 1990s. However, consistent with range-wide trends, presumably mostly due to unfavorable spring weather conditions and reduced fecundity, spotted owl numbers have declined in recent years.

3. Structures used for nesting by spotted owls were approximately equally divided between “enclosed” structural nests (for example, broken tops, cavities and lateral platforms) and “open” nests (for example, abandoned small mammal and bird stick nests and debris platforms) (Folliard and others 2000). Success of nests did not appear to be influenced by the type of nest, but turnover in the pair did have a negative influence on nesting success (Thome and others 2000).

4. Based on a habitat selection model developed using telemetry locations, night-time activity and foraging of spotted owls was associated with sites that were low on the slope, had relatively large trees, but also consisted of a mosaic of stand ages six to 20, 21 to 40 and >41 years of age. Direct observations of spotted owls at night indicated that they did forage in recent clearcuts, but the greatest amount of time was spent in 10 to 20 and >60 year old stands.

5. Both master’s studies on spotted owls indicated that residual older trees (trees left from the initial entry) were an important element associated with nesting habitat for spotted owls (Folliard and others 2000, Thome and others 1999). In addition, a habitat selection model developed for successful spotted owl nests in second growth forests indicated nests were most likely to occur low on the slope in mature second growth (60 to 100 years) with substantial amounts of residual basal area. However, in an area around the nest stand, a high amount of edge and good foraging habitat suitability were also included in the model to predict a high probability of locating a successful nest.

6. A mosaic of young and older forest stands provide ideal habitat for spotted owls in coastal northern California, because the owls roost and nest in the older forests, while the young forests provide habitat for their primary prey, dusky-footed woodrats.

In addition to the conclusions described above, there are other factors not specifically addressed in any of the studies on Simpson’s ownership that we believe contribute to the occurrence of spotted owls on commercial timberlands. The mild climate and abundant rainfall provide ideal growing conditions, and forest structure regenerates in a fraction of the time that may be required in harsher regions with poorer forest site classes. In addition, the region has an abundance of hardwoods (for example, tanoak, *Lithocarpus densiflorus*, madrone, *Arbutus menziesii* and California Bay *Umbellularia californica*) whose coppice growth insures a significant hardwood component in most managed stands despite efforts to control them. The hardwood component maintains vegetative diversity that is important to promote structural complexity in managed forests.

Our current knowledge of the ecology of spotted owls is sufficient to provide a high level of confidence in knowing how to provide for the future habitat needs of the species on managed timberlands lands. However, it is obviously essential that timber management be implemented in a manner consistent with the needs of spotted owls. The important habitat heterogeneity created by a mosaic of young and old stands is virtually assured by the current California forest practice rules (FPR) regulating even-age silvicultural systems. This habitat component could become problematic if extensive uneven-age management were practiced in coastal northern California.

Probably the single most critical factor in any silvicultural system is the retention and future recruitment of residual structure with late seral habitat elements (e.g. large green wildlife trees and snags). Under Simpson's spotted owl HCP, this type of structure is being retained and recruited as individual tree clumps (10 to 20 trees) or habitat retention areas of 0.5 acre or greater in size. However, the majority of future residual structure will likely be associated with Class I and II riparian management zones that will be the product of current water and lake protection zones required by California FPR and Simpson's aquatic conservation planning.

Although we may be able to provide for the future habitat needs of spotted owls, other threats may exist that are beyond our control. The invasion of northern barred owls (*Strix varia varia*) into northern California, although still a minor component on Simpson's ownership, creates a future unknown factor in the long-term persistence of spotted owls in coastal northern California.

References

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