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Forest-Wildlife Management in the Pacific Northwest

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Introduction

In recent years, a rapidly expanding body of research has made wildlife biologists and land managers increasingly aware that old-growth forests are critical wildlife habitat. This has come at a time when old-growth forests are rapidly being eliminated in order to meet human demands for wood products. In Oregon, for example, it is anticipated that virtually all remaining old-growth forests on commercial forest lands will be harvested by the year 2020 (Beuter et al. 1976). Thereafter, regenerating forests on cutover areas will be intensively managed and harvested every 60–80 years on most sites. If history is a good example, it is extremely unlikely that old-growth forests will ever again be regenerated on these cutover areas. Because of the overwhelming economic pressures mandating the harvest of the remaining stands of old-growth, we believe that the single most difficult issue

facing wildlife biologists and land managers in the Pacific Northwest is how to retain viable populations of wildlife that find their optimum habitat in old-growth forests.

One species associated with old-growth forests in the Pacific Northwest is the spotted owl (*Strix occidentalis*). During the last 10 years we have been closely involved with studies and management of this species in Oregon. The purpose of this report is to briefly summarize the research that has been conducted on the spotted owl and to describe a management plan that has been proposed for the species in Oregon.

A Summary of Research Efforts

The spotted owl was first discovered in the Pacific Northwest in 1893 (Rhoads 1893), but because of its retiring nature, remained essentially unknown until the early 1970s. As interest in nongame forest wildlife increased during the early 1970s, studies were initiated in Oregon and California to determine the distribution and abundance of the spotted owl and to determine which habitats the species occurred in (Gould 1974, 1977, 1979, Forsman 1976, Forsman et al. 1977). These studies stimulated considerable interest in the spotted owl and led the USDA Forest Service (USFS) and USDI Bureau of Land Management (BLM) to initiate inventories of spotted owls on federal lands in Oregon, Washington and California. Private timber companies also became involved in the effort, in two instances conducting inventories of spotted owls on private timber lands (Postovit 1979, J. Wickham pers. comm. 1982). In many instances, private and state forest lands were also inventoried by USFS and BLM biologists in areas where federal, state, and private lands were adjacent.

As a result of the combined efforts of biologists from the federal, state and private sectors, large areas of Oregon, Washington and California were inventoried for spotted owls between 1972 and 1981. In Oregon, where the inventory effort was most intensive, we estimate that over 50 percent of the potential spotted owl habitat was searched for spotted owls. The results were surprising. Between 1972 and 1981 spotted owls were located at over 600 sites in Oregon, 400 sites in California and 200 sites in Washington (Gould 1979, Forsman unpubl. data). Considering that there were only 24 historical records of the spotted owl in Oregon prior to 1970, the location of so many pairs in a period of only 10 years seems almost unbelievable. However, considering that the number of man hours spent searching for spotted owls each year before and after 1972 went from practically none to many thousands, the results are not really that remarkable. What is remarkable is that a large predator like the spotted owl, which has turned out to be fairly widespread in forests of the Pacific Northwest, could have remained unknown for so long.

Another particularly interesting result of the spotted owl inventories conducted between 1972 and 1981 was that the vast majority of owls were found in older forests (Gould 1974, 1977, 1979, Forsman 1976, Forsman et al. 1977, Postovit 1979, Garcia 1979, Marcot and Gardetto 1980). This was not an entirely unexpected result, since most of the spotted owls reported by early ornithologists in the Pacific Northwest were observed in dense old forests (Dawson 1923, Brooks and Swarth 1925, Gabrielson and Jewett 1940, Marshall 1942, Jewett et al. 1953). However,

the large volumes of data collected between 1972 and 1981 served to conclusively document the strong preference of the spotted owl for old forests. In Oregon, for example, over 90 percent of the spotted owls located between 1970 and 1978 were found in old-growth forests or in forests of mixed old-growth and mature timber (Forsman 1976, unpubl. data). Of 47 nests located in Oregon between 1970 and 1980, all were in forests over 70 years old and most (89%) were in forests over 200 years old (Forsman 1976, unpubl. data). This is not to say, however, that spotted owls do not occur in heavily cutover areas. In Oregon, for example, some spotted owls have been found in areas where as much as 70 percent of the forest had been harvested in the previous 50 years (Forsman 1981). However, when spotted owls are found in such areas, they are usually found in the remaining patches of old-growth and mature forest (Figure 1).

The apparent preference of spotted owls for old-growth forests, which was suggested by the inventory data, has been confirmed in two recent radiotelemetry studies in Oregon during which 14 radio-tagged adult spotted owls were observed for periods ranging from 3–13 months (Forsman 1980, 1981). Radio-tagged individuals spent 63–98 percent of their foraging time in old-growth forests, even though some occupied heavily cutover areas where less than 21 percent of the land area was covered by old-growth. Recent clear-cuts and young second-growth forests were generally avoided by the owls (Figure 2). On both study areas, radio-tagged owls roosted in old-growth stands over 90 percent of the time, indicating a strong preference for old-growth forests as roost areas. Preliminary results of an ongoing radiotelemetry study in northern California also indicate that spotted owls prefer older forests for foraging and roosting in that region (D. Solis, pers. comm. 1982).

The overwhelming preference of spotted owls for older forests is undoubtedly related to their requirements for nests, food, and protective roosts. In the Pacific Northwest, spotted owls most commonly nest in large cavities in old-growth trees or in deformed clumps of limbs in mature or old-growth trees (Forsman 1976). These types of nesting sites are usually absent in young forests. The principal prey of spotted owls in Oregon and northern California are flying squirrels (*Glaucomys sabrinus*) and dusky-footed woodrats (*Neotoma fuscipes*) (Marshall 1942, Forsman 1976, Beebe and Schonewald 1977, K. Balderston, pers. comm. 1976, D. Solis, pers. comm. 1982). Although quantitative data on populations of these arboreal mammals are not available, it has been suggested that flying squirrels, at least, are most abundant in older forests where there are numerous cavities and large volumes of lichens and fungi. Lichens and fungi constitute a major source of food for flying squirrels in the Pacific Northwest (McKeever 1960, Maser et al. 1978, Forsman unpubl. observations). Forsman (1976, 1980, 1981) noted that spotted owls frequently roosted in large old-growth trees during inclement weather, apparently because such trees provided greater protection from rain and snow than did second-growth trees. It is also possible that the multi-layered canopies that characterize old-growth stands provide greater protection from high temperatures during the summer than do single-layered second-growth stands. The preference of spotted owls for cool roost sites during warm weather was noted by a number of early ornithologists (e.g., Bent 1938, Marshall 1957) and has since been documented by Forsman (1976, 1980, 1981), Barrows and Barrows (1978), and Barrows (1981).

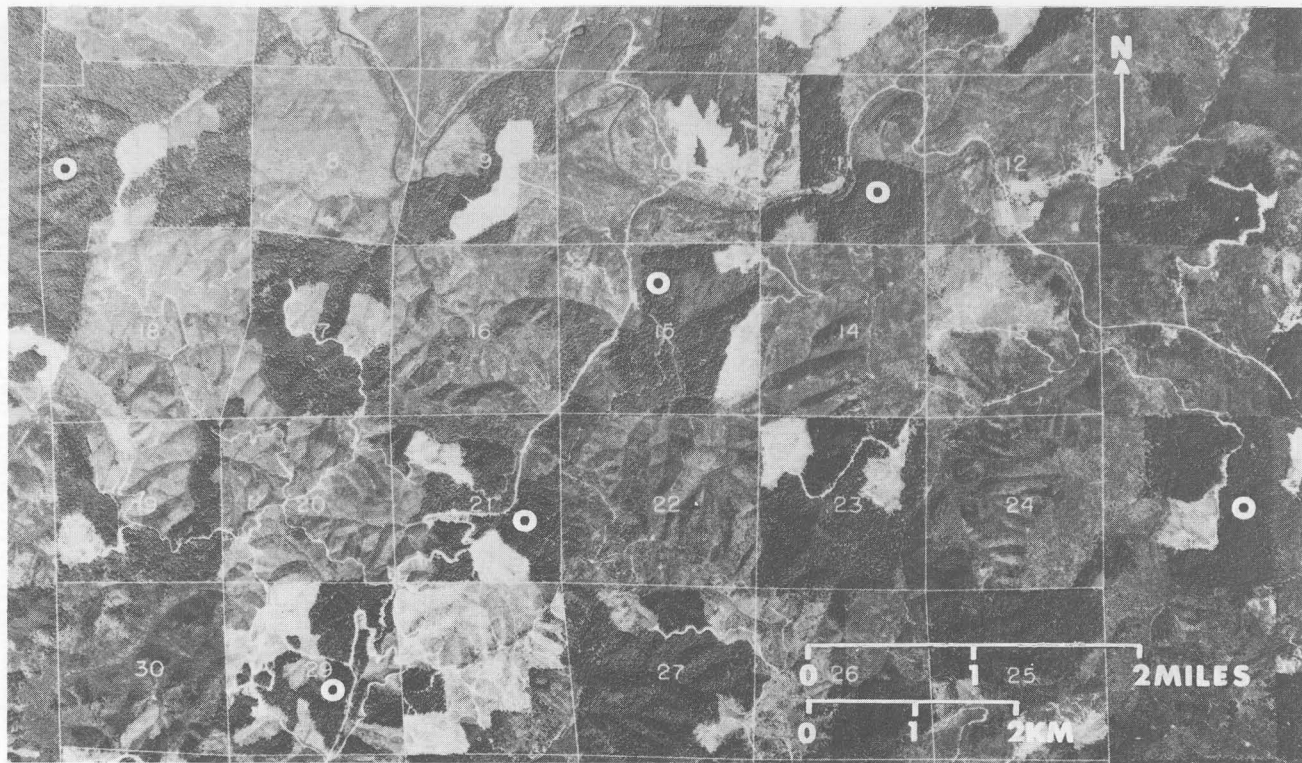


Figure 1. Distribution of pairs of spotted owls in a heavily cutover area in the Oregon Coast Range near Lorane, Lane County. Note that pair locations (indicated by circular white symbols) correspond with the remaining uncut areas of old-growth and mature forest. Of the six pairs indicated on the photo, four disappeared between 1972 and 1978 after additional clear-cutting was conducted in the areas they occupied.

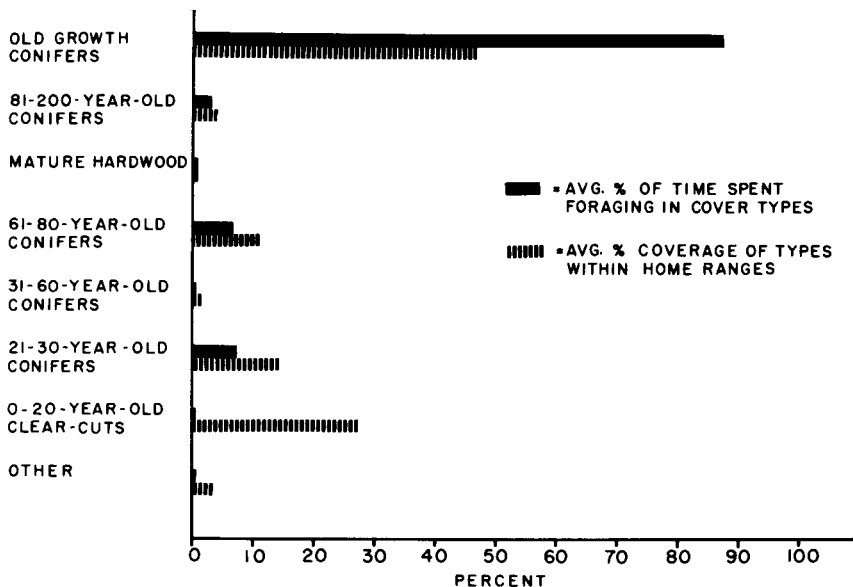


Figure 2. Use of different cover types for foraging by radio-tagged spotted owls in Oregon relative to cover type availability. The data were averaged for 14 owls studied in western Oregon. Data summarized from Forsman (1980, 1981).

Population Trends

Each year in the Pacific Northwest many old-growth stands occupied by spotted owls are harvested. When this occurs, some pairs react by simply shifting their activities into adjacent areas that have not been cutover. Other pairs, apparently confronted with insufficient habitat, simply disappear (Forsman 1976). The net result is that spotted owl populations in the Pacific Northwest and parts of California are declining (Gould 1974, 1977, 1979, Forsman 1976, 1981, Forsman et al. 1977, Postovit 1979, J. Mires, pers. comm. 1981). If present timber harvest trends continue, and there is every reason to believe that they will, it is likely that spotted owls will become very uncommon on commercial forest lands in the Pacific Northwest by the middle of the twenty-first century. Confronted with this set of circumstances, the federal land management agencies in Oregon, California, and Washington are attempting to initiate management programs that will provide habitat for spotted owls and for other wildlife that prefer old forests. One such program is described in the next section.

A Proposed Management Plan

The first attempt to develop a management plan for the spotted owl was launched in Oregon in 1973 by an interagency committee made up of biologists from the USFS, BLM, U.S. Fish and Wildlife Service, Oregon Department of Fish and

Wildlife, and Oregon State University. In recent years, the scope of the management effort has expanded to include representatives of the Washington Department of Game.

Two major issues were addressed in the management plan proposed by the above committee: (1) the number and distribution of spotted owl pairs to be managed for in Oregon; and (2) specific recommendations for habitat management. At the outset the committee agreed that the most appropriate management goal would be to maintain pairs of spotted owls distributed as uniformly as possible throughout the known range of the species. It was recommended, therefore, that a system of spotted owl management areas should be established on federal forest lands in Oregon that would provide suitable areas of spotted owl habitat spaced at intervals of 3–12 miles (4.8–19.3 km). Wider spacing between areas of suitable habitat was deemed undesirable because the available inventory data indicated that pairs of spotted owls were rarely isolated by more than a few miles from other pairs of spotted owls (Marshall 1942, Forsman 1976, unpubl. data). The management plan was restricted to federal forest lands because there was no way to control or predict management activities on private lands, and because the Oregon State Department of Forestry declined to commit state-owned commercial forest lands for management of old-growth ecosystems.

The spotted owl management committee estimated that approximately 400 pairs of owls would be required to obtain a uniform spacing of 3–12 miles (4.8–19.3 km) between pairs on federal forest lands within the range of the owl in Oregon. It was decided, therefore, that the goal for management should be to maintain enough habitat to support 400 pairs of spotted owls in Oregon. It was assumed that a population of 400 pairs (800 individuals) would insure an adequately heterozygous gene pool to maintain a healthy population, especially since that population was continuous into Washington and California (Franklin 1980, Soule 1980).

To insure that areas selected for management would be suitable for spotted owls, the committee agreed that the 400 management areas should be selected on the basis of occupancy by spotted owls. The committee did not discourage the placement of some spotted owl management areas in Wilderness Areas and other restricted use areas, but emphasized that the main objective should be to maintain a uniformly distributed population regardless of land classifications; the emphasis was added to avoid a scenario in which spotted owl management areas were crammed into special use areas (e.g., Wilderness and Roadless Areas), thereby creating a series of island populations rather than a uniformly distributed population.

In the first draft of the Oregon Spotted Owl Management Plan the interagency wildlife committee recommended that a core area of at least 300 acres (121.5 ha) of old-growth forest should be retained around the nest area of each pair of owls selected for management. In 1977 this plan was accepted as the guideline for spotted owl management by the USFS Pacific Northwest Region and the Oregon State office of the BLM.

In a recent revision of the 1977 spotted owl management plan, the interagency wildlife committee recommended that the amount of old-growth retained per pair of spotted owls be increased to 1,000 acres (405 ha), including a 300 acre (121.5 ha) old-growth core area around the nest and an additional 700 acres (283.5 ha) of old-growth distributed in patches of variable size within a 1.5 mile (2.4 km) radius

spotted owls and other wildlife will reduce timber revenues. Such concerns are not unfounded. The hard facts are that the timber industry in the Pacific Northwest long ago became dependent on the systematic liquidation of old-growth and will suffer economic setbacks if this liquidation program is curtailed.

Given the above set of economic conditions, the most optimistic prognosis is that the amount of old-growth maintained for spotted owls and other old-growth dependent wildlife will be near the bare minimum necessary to maintain viable populations. It is imperative, therefore, that further studies be initiated to more accurately determine how much old-growth is needed to sustain pairs of spotted owls and to determine what constitutes a minimum viable population of spotted owls. Hopefully, the necessary research will be initiated soon, as the options for old-growth management are rapidly disappearing; the remaining old-growth forests in many areas of the Oregon Coast Range will be liquidated within the next 15–20 years.

In conclusion, we would like to emphasize that the decline of the spotted owl population in the Pacific Northwest is just one symptom of a more general problem. The elimination of old-growth forests on commercial forest lands in the Pacific Northwest will undoubtedly have a negative influence on populations of many plants and animals that find their optimum habitat in old forests. Unfortunately, so little is known about many of these species that it is difficult to develop specific management recommendations for them. Hopefully, therefore, the management of old-growth areas for spotted owls will also provide habitat for a wide range of other species that find their optimum habitat in older forests.

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