

# Public lands management and the fate of the Spotted Owl



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**T**WO DECADES AGO, THE SPOTTED Owl (*Strix occidentalis*) was one of the least known, least studied birds in North America. Today it is the subject of intensive study, rancorous debate, and legal battles. This sudden notoriety stems from the owl's specialized habitat requirements in the western portion of its range, where it inhabits old-growth conifer forests. These same forests are worth hundreds of millions of dollars to the timber industry, which is logging them at a rapid rate. Like the Red-cockaded Woodpecker (*Picoides borealis*), the Spotted Owl is a bird whose habitat requirements conflict with contemporary forestry practices (Ligon *et al.* 1986; Jackson 1986). Administrators in both the United States Department of Agriculture's Forest Service and the United States Department of the Interior's Bureau of Land Management are in the process of deciding how much old-growth forest to set aside for the owl, and what they decide will in all likelihood determine its fate. Given the powerful economic and political interests lined up against the Spotted Owl, the outlook for this bird is best described as bleak.



*Male Spotted Owl in the Wenatchee National Forest, Washington. Photo/Ken Bevis.*



Female Spotted Owl, Wenatchee National Forest. Photo/Ken Bevis.

## ECOLOGY OF THE SPOTTED OWL

There are three subspecies of the Spotted Owl, distinguished by rather subtle differences in size and plumage coloration. The Mexican Spotted Owl (*Strix occidentalis lucida*) occurs from southern Colorado and central Utah, south in the higher mountains through Arizona, New Mexico, and extreme western Texas into central Mexico. The California Spotted Owl (*S.o. occidentalis*) is confined to the Sierra Nevada Mountains and the coastal mountains south of San Francisco. The Northern Spotted Owl (*S.o. caurina*) occurs in southwestern British Columbia, western Washington, western Oregon, and northwestern California. Some taxonomists question whether the California and Northern subspecies should be regarded as distinct from each other (Dawson *et al.* 1986).

Although the Mexican Spotted Owl is currently under consideration for possible listing as a "Threatened" or "Endangered" species under the federal

Endangered Species Act, the other two subspecies have caused the greater controversy. The combined population of the California and Northern subspecies is estimated at 4000–6000 individuals (Dawson *et al.* 1986). The Spotted Owl is a threatened species on the state lists in Oregon and Washington, and it is a "species of special concern" in California. The Spotted Owl has also appeared on the *American Birds* "Blue List" since 1980.

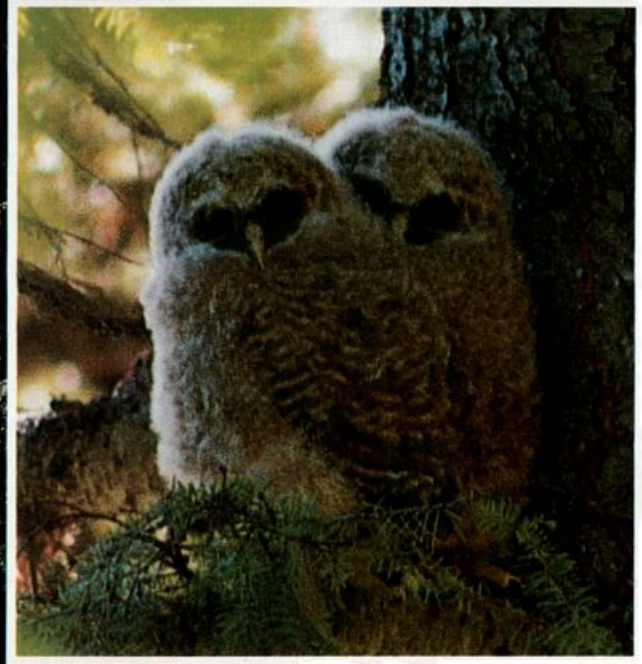
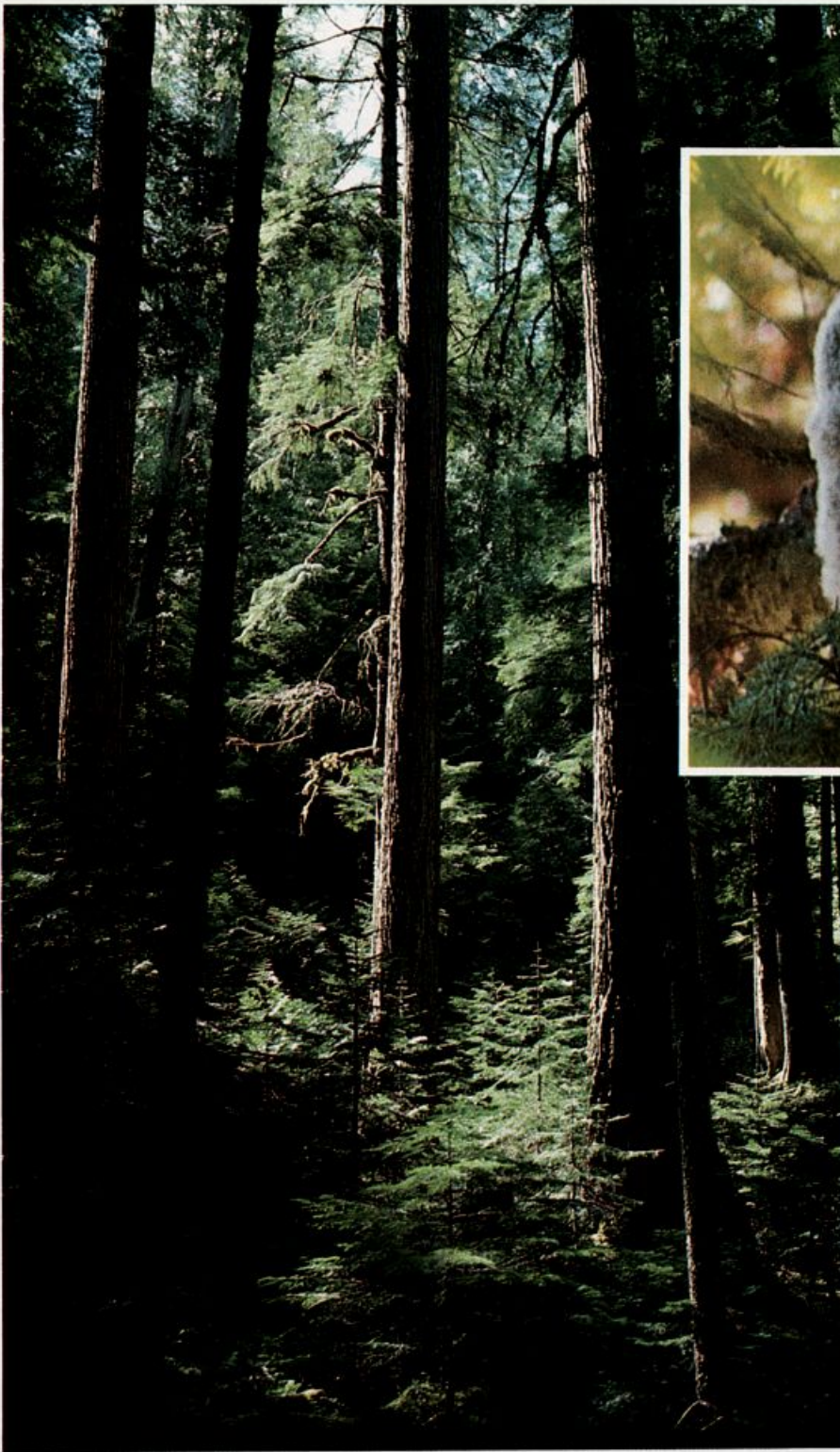
Until recently, virtually nothing was known about the ecology of the Spotted Owl in the Pacific Northwest. It was thought to be an uncommon and local bird. Studies by Eric Forsman and others in the 1970s showed the owl to be more widespread than previously suspected but also revealed its strong affinity for old-growth forests. For example, 98% of the sites in Oregon where Spotted Owls were found between 1969 and 1980 were dominated by old-growth forests or by mixed stands of old-growth and mature forest (Forsman *et al.* 1984). Typical Spotted Owl habitat in the Pacific Northwest consists of mid-to-low

elevation virgin forests dominated by Douglas-fir trees. These forests have mixed age classes of trees, including some which are very large and very old (200+ years), and an abundance of snags and downed woody debris (U.S. Forest Service 1986). Although Spotted Owls sometimes occur in mature forests other than old-growth, their preferred habitat in the Northwest is clearly old-growth (Carey 1985). Why the owls are so closely tied to such forests remains unclear. Possible explanations include the availability of nesting sites (large-diameter snags), thermal cover, and prey (principally small mammals), protection from predators, or a combination of several such factors (Dawson *et al.* 1986).

Several studies have examined how much old-growth typically is used by a pair of owls. Six pairs in Oregon had an average of 2264 acres of old-growth per home range, with a range of 1008–3786 acres (Forsman *et al.* 1984). Some of these birds were studied for only three to four months. Had they been studied for longer periods of time, their home ranges probably would have increased in size and included larger amounts of old-growth. Five pairs of owls studied year-round in Washington used approximately 4000 acres of old-growth per pair (H. Allen, *pers. comm.*), although not all of this old-growth was in one place. During the winter, the Washington owls moved to different forest tracts. Preliminary data from the Sierra Nevada suggest that 1200 acres is the average amount of old-growth in the home ranges of pairs in that region (S. Laymon, *pers. comm.* in Dawson 1986). Thus, the evidence to date suggests a north-south gradient in the amount of old-growth used per pair of owls.

## THREATS TO THE SPOTTED OWL

Commercial logging of old-growth forests is the biggest threat to the survival of the Spotted Owl. The Pacific Northwest is one of the nation's two major timber-producing regions, and the old-growth has borne the brunt of the logging. By some estimates, less than a quarter of the original old-growth remains. Also, the remaining old-growth forests are heavily fragmented and now



Left: Ideal Spotted Owl habitat in the Willamette National Forest, Oregon, old-growth forest. Photo/Barry Flamm. Above: Six-week-old Spotted Owls venture from their nest. Photo/Ken Bevis.

consist of a patchwork of old-growth and clearcuts of various ages. This fragmentation has isolated populations of owls and made it difficult for juveniles to disperse into new habitat.

Fragmentation of old-growth may also be playing an indirect role in two other threats to the Spotted Owl: competitive displacement by Barred Owls

(*Strix varia*) and predation by Great Horned Owls (*Bubo virginianus*). The Barred Owl has been expanding its range into the Pacific Northwest over the past two decades. Today it regularly occurs in Washington and Oregon, and it has been sighted repeatedly in northwestern California (contrast these records with the range cited in Peterson

1961). Regenerating clearcuts often have a higher deciduous component than old-growth stands, and this seems to suit the Barred Owl (T. Hamer, *pers. comm.*). Because Barred Owls are slightly larger and more aggressive than Spotted Owls, they seem able to displace Spotted Owls from suitable habitat. Great Horned Owls, which prey on young Spotted Owls, are quite tolerant of the edges and openings created by logging operations, and may use them to infiltrate Spotted Owl habitat. No studies, however, have examined predation rates by Great Horned Owls under different degrees of forest fragmentation.

#### THE DEMOGRAPHIC DILEMMA

Demographic data support the contention that the Spotted Owl is in trouble. Most individuals do not breed until they are three years old, surprisingly late for a medium-sized owl. Reproduction



*Spotted Owl in flight with prey. Photo/Ken Bevis.*

by Spotted Owls also fluctuates dramatically and unpredictably from year to year. In some years most pairs in a given area may breed, while in other years few even attempt to nest (Forsman 1986). In Washington, the majority of Spotted Owls have not had a successful nesting season since 1983 (H. Allen, *pers. comm.*). This variation in breeding success has been attributed to fluctuations in prey abundance, but to date no one has studied the prey base in sufficient detail to either confirm or refute the idea. Such studies are now underway.

Juvenile mortality has been extraordinarily high, both prior to and during dispersal. For example, Meslow (1985) reported that of 31 young owls radio-tagged in Oregon between 1982 and 1984, none survived as long as two years. Marcot and Holthausen (1987), reviewing a number of studies from Oregon and northern California, concluded that dispersal mortality of juveniles may average 82%.

These data, when applied to standard life table analyses or more elaborate population models, point to a population that is crashing (U.S. Forest Service 1986). Field studies confirm that Spotted Owls are declining (Forsman 1986), but the declines observed to date fall short of the precipitous drop predicted by the demographic analyses. This discrepancy suggests that either the owls are on the verge of a population collapse or some of the demographic parameters used in the population models were calculated incorrectly for estimating

population trends (U.S. Forest Service 1986).

#### THE MANAGEMENT CONTROVERSY

Virtually all of the remaining old-growth and Spotted Owls occur on public lands administered by the U.S.

Forest Service and the Bureau of Land Management (BLM). Of the two agencies, the Forest Service controls much more Spotted Owl habitat, spread out across Washington, Oregon, and California. The BLM holdings—the so-called O&C lands—are mostly in Oregon and include some critical linkages between owl populations in coastal Oregon and the Cascades. These lands were originally granted to railroad companies in order to finance the construction of the Oregon and California rail line. As a result of a scandal over management of these lands, Congress revested them into federal ownership and today they are managed by the BLM. Both the Forest Service and BLM have been involved in lengthy controversies over the Spotted Owl.

As the link between old-growth and Spotted Owls became apparent, concern for the survival of the species grew. In 1973, the Oregon Endangered Species Task Force was formed, consisting of representatives from the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife, USDA Forest Service, USDI BLM, and Oregon State University. One of the Task Force's first actions was to form a subcommittee to develop management recommendations for the Spotted Owl.

In 1977, the Spotted Owl subcommittee issued its recommendations. Each pair of owls was to be provided with a 300-acre core of old-growth centered around the known or suspected nest site. The subcommittee further recommended that a 900-acre buffer



*A nine-week-old Spotted Owl, resplendent in juvenile "fuzz." Photo/Ken Bevis.*

around each core area be managed such that at any time at least 50% of it was covered by forests more than 30 years old. To prevent pairs or groups of pairs from becoming too isolated from each other—thus magnifying the risk of extinction—the subcommittee urged that Spotted Owl management areas be spaced at 3–12 mile intervals on Forest Service and BLM lands, with an average spacing of six miles (Forsman and Meslow 1986). To achieve the desired spacing between owls, the subcommittee recommended that 400 pairs of owls be protected in Oregon. These recommendations were accepted by the Forest Service as interim guidelines pending completion of comprehensive management plans for the national forests, at which time the agency would provide final management directions. The Oregon State Director of the BLM also agreed to adopt these guidelines pending completion of timber management plans for BLM lands. Responsibility for managing the owls was divided as follows: 290 pairs on the national forests, 90 on BLM lands, and 20 on state and private lands. It was assumed at the time that 400 pairs of owls could be protected by setting aside 400 habitat areas. Only later did biologists learn that a portion of the habitat areas typically are unoccupied in a given year.

In 1980, the Oregon Endangered Species Task Force became the Oregon-Washington Interagency Wildlife Committee with the addition of representatives from Washington. As evidence grew that pairs of Spotted Owls use significantly more than 300 acres of old-growth, the new committee sought to revise the guidelines. New recommendations released in 1981 called for a minimum of 1000 acres of old-growth per pair of owls. The subcommittee also specified that the old-growth should occur within a 1.5-mile radius of the nest area because telemetry data indicated that nesting owls restricted most of their foraging activities to within 1.5 miles of the nest.

The BLM refused to adopt the new recommendations. The U.S. Forest Service, while not endorsing the 1000-acre guideline, agreed to “retain the option” to manage for the additional 700 acres of old-growth if it eventually became clear that 300 acres were insufficient (Forsman and Meslow 1986). The Forest Service decided to manage for 290 pairs of owls in Oregon and 112 pairs in Washington. In addition, an



*Fragmentation of old-growth forests caused by commercial logging at the Willamette National Forest, Oregon. Photo/Barry Flamm.*

unknown but much smaller number of pairs would receive *de facto* protection by virtue of occurring on Forest Service lands off limits to commercial logging for other reasons. It should be noted, however, that national forests in the two states were capable of supporting over twice as many owls as the agency proposed to protect (U.S. Forest Service 1986).

The greater willingness of the Forest Service to revise its owl guidelines may have stemmed from the fact that it is required by law to ensure viable populations of all native vertebrate species occurring in the national forests (Wilkinson and Anderson 1985). The BLM is under no such constraints. Indeed, the BLM's policy has been to protect the Spotted Owl only where protection does not interfere with commercial timber harvesting.

In 1984, the Forest Service released its Regional Guide for the Pacific Northwest Region, which contained the proposed final guidelines for Spotted Owl management in Oregon and Washington. The agency planned to set aside 1000 acres of old-growth for each of 263 pairs of owls (a decrease from the earlier figure of 290). The smaller number of pairs was chosen because the Forest Service felt the desired spacing could be achieved with fewer pairs, a conclusion disputed by some scientists (Forsman and Meslow 1986).

A coalition of conservation organizations quickly appealed the regional guide, charging that the Spotted Owl guidelines represented a major environmental action that required an environmental impact statement (EIS). The appeal was successful, and the Forest Service was instructed to re-examine its Spotted Owl guidelines and prepare an EIS.

In July 1986, the Forest Service released a draft of the EIS, in which it announced intentions to set aside 550 habitat areas for Spotted Owls in Washington and Oregon. Although the sizes of these areas would vary, each one would on average contain 2200 acres of old-growth forest, and be situated so as to form a well-distributed network (U.S. Forest Service 1986). Under this plan, approximately 25% of existing Spotted Owl habitat would be logged after 15 years, and 60% would be logged after 50 years, due to timber harvesting in unprotected areas. Scientists generally agree that this loss of habitat would greatly reduce the survival odds of the Spotted Owl in the Pacific Northwest. The Forest Service estimated that implementation of its proposed guidelines would result in a 5% reduction in timber harvest levels and the loss of 760–1330 jobs over the next decade.

Public response to the draft was fierce. Over 40,000 comments were received by the Forest Service. The ma-

majority of comments opposed the plan on the grounds that the economic cost was unacceptable and too little was known about the owl to warrant such steps. Most conservation groups argued that the number and sizes of the habitat areas were insufficient to ensure the survival of the Spotted Owl. They also objected to the Forest Service's economic analysis, noting that it was based on potential rather than actual timber harvest levels, thereby artificially inflating the costs of protecting the Spotted Owl. Using average timber harvest levels over the past decade as a benchmark, The Wilderness Society calculated that the Forest Service plan would not result in the loss of a single timber industry job. The Forest Service is expected to release its final EIS in January 1988. Early indications are the Spotted Owl will not be given any more protection than that outlined in the draft EIS.

In early 1986, the BLM was directed by the Secretary of the Interior's office to review the status of the Spotted Owl on its lands. The Bureau then appointed a six-member analysis team. In its report the team concluded that continued harvesting of old-growth on BLM lands would limit the agency's abilities to provide more than 300 acres of old-growth per pair, and would further fragment the habitat of the owls. In the spring of 1987, the Oregon State Office of the BLM announced that it would not reconsider its current timber management plans with respect to the Spotted Owl until at least 1990. The Sierra Club Legal Defense Fund, on behalf of a number of conservation groups, has appealed this decision before the Department of the Interior. The appeal is still pending.

#### EVENTS IN CALIFORNIA

National forests in California are managed from a different regional office than those in Oregon and Washington, and Spotted Owl management has proceeded under slightly different guidelines. As outlined in the 1984 regional guide for California, Spotted Owl habitat areas will contain, on average, 1000 acres of old-growth, situated so as to maintain a well-distributed network across the state. Unlike Washington or Oregon, the number of pairs of Spotted Owls to be protected is left up to the discretion of the individual national

forests, subject to approval from the regional office. In practice, this has resulted in the protection of habitat for 500-550 pairs of owls in northwest California and the Sierra Nevadas, and almost all of the owls in the coastal mountains of southern California.

Especially alarming to conservationists has been the regional office's belief that the old-growth forests set aside for the Spotted Owl can be "managed." In other words, the agency assumes that a combination of long rotations and other silvicultural techniques will enable them to harvest and eventually regenerate old-growth forests suitable for Spotted Owls. No strong scientific evidence for this assumption exists. Indeed, as an ecological entity, old-growth forests may be irreplaceable. A task force of the Society of American Foresters recently concluded:

Through silviculture, foresters can grow big trees and grow them faster than nature unassisted. Yet there is no evidence that old-growth conditions can be reproduced silviculturally. In fact, the question is essentially moot, as it would take 200 years or more to find an answer. Old-growth management, for the foreseeable future, will be predicated on preservation of existing old-growth stands (Society of American Foresters 1984).

In general, current Spotted Owl guidelines in California mirror those now under revision in Washington and Oregon. Whether the California guidelines also need to be revised remains a controversial question.

#### THE AUDUBON PANEL

Prior to the release of the Forest Service's draft EIS, the National Audubon Society convened an advisory panel to study the Spotted Owl controversy. The composition of the panel was determined by the presidents of the American Ornithologists' Union and the Cooper Ornithological Society. In April 1986, the panel issued its report (Dawson *et al.* 1986). It concluded that "[b]ecause this owl seems so highly dependent on old-growth forests in most of the area with which this report is concerned, because its reproductive rates are so low and variable, and because established adults are extremely sedentary, the possibility of its extinction as its habitat is further reduced must be taken seriously."

Among its many recommendations,

the panel urged that "an absolute minimum" of 1500 pairs of Spotted Owls be preserved in Washington, Oregon, northern California, and the Sierra Nevadas, and that owl habitat areas contain at least 4500 acres of old-growth in Washington, 2500 acres in Oregon and northwest California, and 1500 acres in the Sierra Nevadas. Neither the Forest Service nor the BLM provides acreages that match these recommendations. This discrepancy is greatest with the BLM, which provides Spotted Owls in Oregon with only 300 acres of old-growth per pair.

The panel also recommended that the current geographic distribution of the Spotted Owl in the Pacific Northwest should be maintained through a habitat network system like that proposed by the Forest Service. Because the current network includes many habitat areas that are unoccupied by owls, the panel further recommended that an equal number of interim home ranges with known breeding pairs of Spotted Owls be added to the network until the areas originally included in the network plan are shown to contain breeding pairs.

#### AN ENDANGERED SPECIES?

A number of conservationists and biologists now believe the Northern Spotted Owl should be on the federal list of endangered and threatened species. The environmental community has been somewhat reluctant to press the issue at a time when the Endangered Species Act itself is up for Congressional reauthorization. In January 1987, Green World, a small environmental group in Massachusetts, petitioned the U.S. Fish and Wildlife Service to list the Northern Spotted Owl as an endangered species. In response to the petition, the Service has agreed to study the Northern Spotted Owl as a possible candidate for listing. Another petition from a coalition of local and national environmental groups was received in August 1987

#### WHY ALL THE FUSS?

The Spotted Owl is certainly an appealing animal, but it would never have attracted so much attention were it not for its habitat requirements. By virtue

Resolution:

## FEDERAL PROTECTION OF THE SPOTTED OWL

RECOGNIZING that populations of the Spotted Owl (*Strix occidentalis*) in the Pacific Northwest have been declining due to commercial logging of old-growth forests, and

RECOGNIZING that rates of nesting success and juvenile survivorship of this species have been very low in recent years in the Pacific Northwest, and

WHEREAS steps taken to date by the federal government to protect the habitat of the Spotted Owl on public lands in Washington, Oregon, and northwestern California fall short of the recommendations of the advisory panel convened by the National Audubon Society and chosen by the presidents of the American Ornithologists' Union and the Cooper Ornithological Society, and

WHEREAS the old-growth forests occupied by the Spotted Owl in the Pacific Northwest are an important habitat for a variety of other plant and animal species,

THEREFORE BE IT RESOLVED that the International Council for Bird Preservation-U.S. urges the USDI Fish and Wildlife Service to declare the Spotted Owl an "Endangered Species" on the Olympic Peninsula of Washington, and a "Threatened Species" elsewhere within its range in Washington, Oregon, and northwestern California.

The following resolution was adopted by the delegates to the annual meeting of the United States section of the International Council for Bird Preservation on August 10, 1987.

of its dependence upon large tracts of old-growth forest, the Spotted Owl has become the central figure in a much larger battle over the fate of these forests.

Old-growth harbors much more than Spotted Owls. In fact, over 200 vertebrate species use these forests. About 30 species of birds, including the Vaux's Swift (*Chaetura vauxi*), Marbled Murrelet (*Brachyramphus marmoratus*), and Pileated Woodpecker (*Dryocopus pileatus*), are either restricted to old-growth or reach their maximum densities in it. How they will fare in the intensively managed, second-growth stands that replace the old-growth is an issue of growing concern to biologists in the Pacific Northwest.

Historically, the United States has not treated either its old-growth forests or the birds that depend upon them very well. A century ago, logging of the virgin bottomland forests of the Southeast marked the beginning of the end of the Ivory-billed Woodpecker (*Campephilus principalis*). This time around, if a similar fate befalls the Spotted Owl in the

Pacific Northwest, it will be the result of a deliberate decision by the federal government not to protect enough old-growth.

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