United States
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Soil
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Service

1220 SW Third Avenue
Room 1640
Portland, OR 97204-2881

December 19, 1994

TECHNICAL NOTE
190-VI

SUBJECT: BIOLOGY TECHNICAL NOTE NO. 41 WILDLIFE ON WHITE OAKS WOODLANDS

Purpose. To transmit to all Oregon offices the above named Technical Note.

Effective Date. Upon receipt.

Filing Instructions. File in correct numerical order in the Biology section of your Technical Note binder. Replace the Table of Contents with updated attachment.

Background. The attached Technical Note is one of a series being produced by the Woodland, Fish and Wildlife Project, a cooperative effort including SCS and other resource related agencies and interest groups in Washington and Oregon. Copies of the first twelve notes have already been transmitted and should be in your Technical Note binder. The State Office still has a limited supply of each. Contact Russ Hatz, State Staff Forester for additional copies.

Roy M. Carlson, Jr.

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Leader - Technology Development

Attachments

DIST: O

Woodland
Fish and Wildlife

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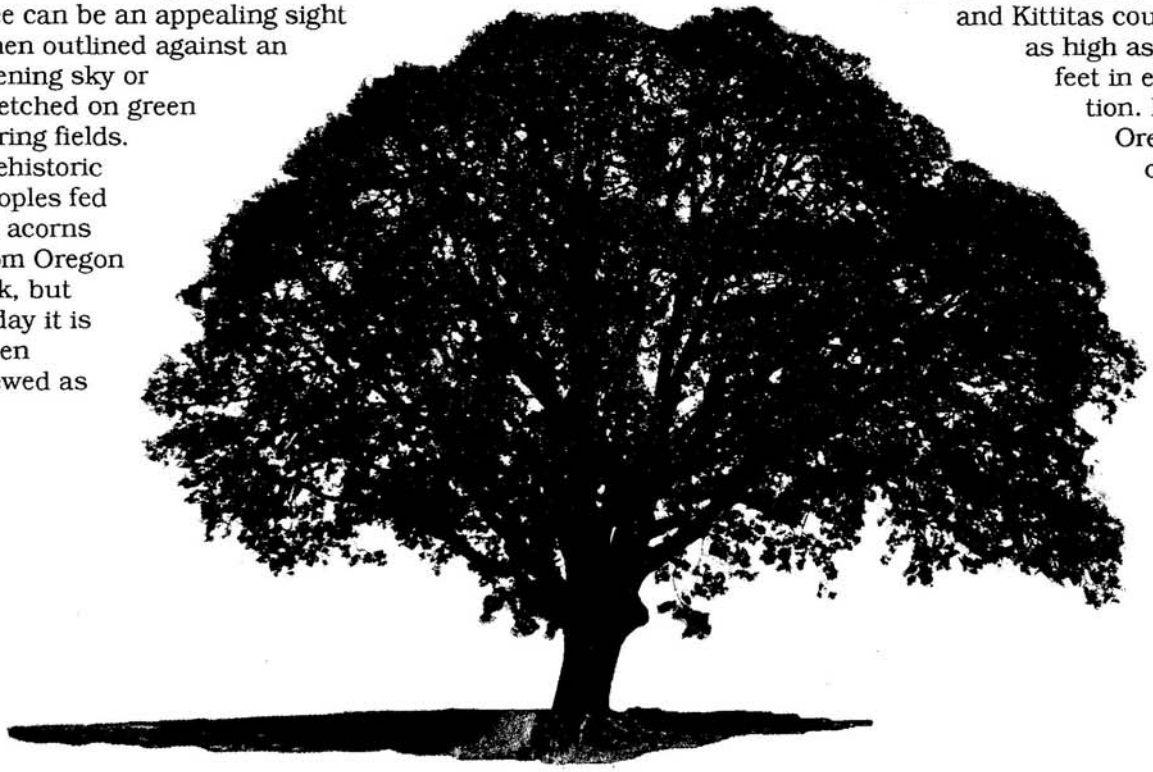
Wildlife On White Oaks Woodlands

Oregon white oak (Quercus garryana) provides visual variety to landscapes, income to woodland owners, and habitat for many wildlife species. If unrestrained by over–topping vegetation or disturbance, Oregon oak grow to impressive dimensions and ages. The foliage on spreading branches of massive oak creates shady summer retreats for wildlife and people, and this tree can be an appealing sight when outlined against an evening sky or sketched on green spring fields. Prehistoric peoples fed on acorns from Oregon oak, but today it is often viewed as an undesirable species or valued mainly for firewood. Nonetheless, Oregon oak provides important habitats for wildlife. Over 140 species of wildlife including amphibians, reptiles, birds and mammals use Oregon white oak habitats in Oregon and Washington for nesting, feeding or resting. This publication focuses on Oregon white oak and wildlife.

Oregon white oak ranges from southern Vancouver Island, Canada, south to Los Angeles County, California. It is the only oak native to Washington and the most widely distributed oak in Oregon. In Washington, oak occurs on islands in Puget Sound, on the mainland west and east of the Sound south to the Columbia River, and eastward to parts of Skamania, Klickitat, Yakima and Kittitas counties as high as 2500 feet in elevation. In Oregon, it occurs



at low elevations in much of the Willamette, Umpqua and Rogue River Valleys, and east of the Cascade Range in portions of Hood River and Wasco counties. The fastest growing stands of Oregon white oak are found in the Lewis, Cowlitz and Willamette River drainages. Scrub forms of Oregon white oak occur throughout its range, particularly on dry sites.

Ecology Of Oregon White Oak

Oregon white oak's distribution is partly due to fire. Tree-ring studies indicate that fires occurred frequently in Oregon's Willamette Valley from at least 1647 until pioneer settlement in the 1850s. During summer, Indians set fires in the Willamette Valley prairies to enhance food-gathering. By suppressing competing vegetation and tree regeneration, these fires promoted development of widely-spaced, heavily-branched "open-form" oak that with time developed spreading crowns and also thick protective bark that helped the trees withstand fire.

In the 1850s, settlers stopped the periodic fires that jeopardized homes and towns. Fire suppression coincided with the development of "closed-form" oak forests, and consequently closed-form oak are now relatively more abundant. As this term suggests, closed-form oak have relatively straight boles with few branches that tend to reach upward rather than outward.

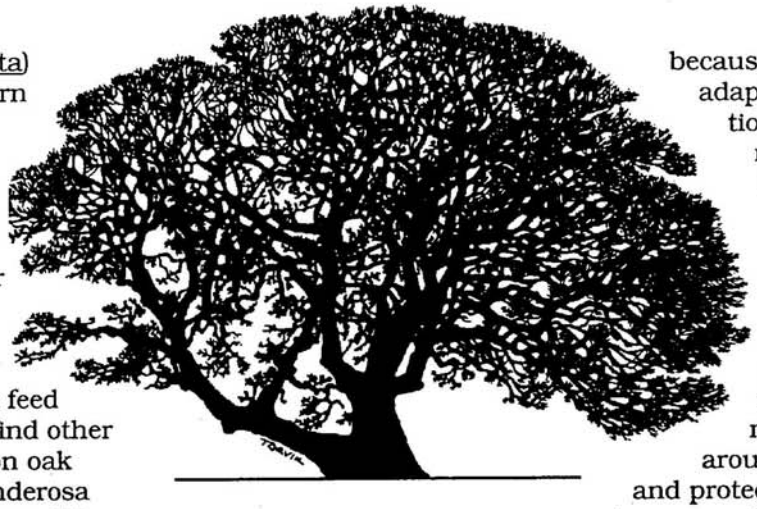
Information on growth rates of Oregon white oak is limited. On high quality sites diameter growth may exceed two inches every 5 years, while trees on poor sites grow two inches in diameter every 13-20 years. Oregon white oak trees can reach 24-40 inches in diameter-at-breast-height, 50-90 feet tall and may live 300-500 years or longer. Open-form Willamette Valley white oak greater than 36 inches in diameter-at-breast-height may be older than 300 years.

Oregon white oak often grows on gentle terrain and can occupy sites that are too droughty or poorly drained for other tree species. The multi-stemmed shoots of Oregon white oak seedlings continually die back and new stems sprout until one stem outgrows all others. The taproots of seedlings develop rapidly, aiding establishment in hot, dry sites. On better sites in the absence of fire Oregon white oak is generally crowded out by taller and faster-growing species such as Douglas-fir (Pseudotsuga menziesii) and ponderosa pine (Pinus ponderosa).

Oregon white oak occur singly, in oak groves, or in mixed stands with other deciduous or coniferous species. Oregon white oak needs ample sunlight and will decline and die if shaded out. On moist sites, bigleaf maple (Acer macrophyllum) will probably outgrow and replace the oak. Conifers will likely prevail over Oregon oak on all but the most extremely hot and dry sites. On the less severe sites, Douglas-fir seedlings can prosper in the shade of Oregon oak canopy and eventually outgrow and overtop the oak.

A wide variety of plant species occur in Oregon white oak communities. In Western Washington and the Willamette Valley more than 90 plant species are associated with Oregon white oak. Pacific poison oak (Rhus diversiloba) is common on dry sites, and California

hazel (Corylus cornuta) and western swordfern (Polystichum munitum) grow on moist Oregon white oak sites. These and other plant species provide cover for some songbirds and small mammals that live near the ground. Wildlife that feed or nest in trees will find other tree species in Oregon oak stands including ponderosa pine and Douglas–fir on drier oak sites, and western hemlock (Tsuga heterophylla) and bigleaf maple on the moist sites.



Generating Your Oregon White Oak

Without fire or human intervention, conifers and other species will naturally replace many Oregon white oak stands. Thus oak may need to be released from overtopping vegetation. Selectively harvesting conifers or other species that are encroaching on established oak can give your oak stand a new lease on life.

Steps for natural regeneration of Oregon white oak are largely untested. Techniques that are effective with other white oak species should be useful. These include natural seeding, raising and transplanting seedlings, and managing root and stump sprouts.

Regeneration by natural seeding is unreliable. For example, seed trees may be adequately distributed but animals may eat their acorns. Those acorns not eaten need favorable weather, soil and exposure conditions in order to germinate. Some seedlings may get eaten, and those that do not, often develop slowly.

Additional research will clarify the most effective techniques for raising and transplanting Oregon white oak seedlings. Persons seriously interested in raising seedlings from acorns should consult professionals knowledgeable about hardwood propagation for the most current, complete information. You can experiment using these general transplanting techniques.

Obtain acorns in the fall from the same vicinity in which you will plant them. Using local stock increases the prospects for successful transplants because these seeds are adapted to local conditions. Keep the acorns moist under a shallow layer of leaves outdoors or in cool moist storage indoors. Transplant seedlings (including taproots) to a site with ample sunlight. You may need to control weeds around the transplant, and protect seedlings with temporary fencing, plastic mesh tubing, or other devices to prevent mortality from deer (Odocoileus species) and cattle browsing. On sites severely compacted by grazing or other activity, augering planting holes may enhance seedling growth.

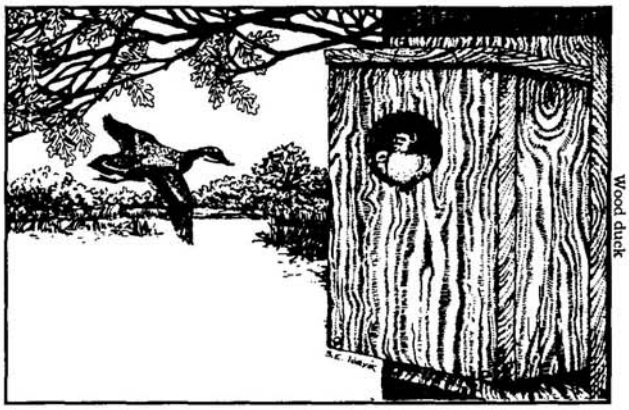
Sprouts develop naturally when oak is cut or broken. Sprouts originating from root collars, and the bases of stumps are likely to thrive. The sprouting response of Oregon white oak ranges from intermediate to vigorous, and may be influenced by many factors including the sizes and ages of stumps and differences in site quality.

Sprouts have a competitive advantage over seedlings. Whereas seedlings must establish new roots, sprouts are nourished by existing root systems. Because sprouts must manufacture sufficient energy to maintain root systems that formerly nourished larger trees, and also to grow, the sprouts need access to full sunlight.

Oak And Wildlife

Oregon white oak provides food and cover for wildlife. Acorns are important fall and early winter food for many species of wildlife including acorn woodpeckers (Melanerpes formicivorus), western gray squirrels (Sciurus griseus), and deer. Acorn woodpeckers excavate numerous small holes in dead oak limbs and store acorns in them for later use. Many woodpeckers and other birds such as white-breasted nuthatches (Sitta carolinensis) eat insects and insect eggs found in the wood or fissured bark of living and dead Oregon white oak. Oak leaves are a fair- to good-quality deer browse.

Many wildlife species nest in oak cavities or use them to avoid inclement weather or predators. Nonexcavated and excavated cavities occur in Oregon oak. Nonexcavated cavities develop after decay-causing organisms infect a wound such as a broken bole or branch and the tree grows around the wound to contain the decay. Excavated cavities are created by birds actively removing wood fiber. Open-form oak tend to provide more cavities than closed-form oak. The type of cavity provides a clue as to which species of wildlife are present. For instance, pileated woodpeckers (Dryocopus pileatus) create very large oblong to round holes, (generally 2 inches in diameter or more), in sound wood. Pileated woodpeckers, as with acorn woodpeckers, excavate their own cavities. Other species, such as Lewis' woodpecker (Melanerpes lewis), typically use cavities created by other species but may construct their own in extremely decayed wood. Some species, such as western bluebirds (Sialia mexicana), and all cavity-using mammals such as big brown bats (Eptesicus fuscus), must rely on decay pro-



Wood duck

Pileated Woodpecker

cesses or the excavations of other animals for cavities.

Decomposing oak stems and branches on the ground create reptile and amphibian havens and offer den sites for red fox (Vulpes vulpes). Wood ducks (Aix sponsa) can nest in cavities of oaks growing in riparian areas.

Managing Oregon White Oak For Wildlife

An Oregon white oak stand's characteristics (age, structure, height, health, density, and species composition) influence its suitability for different species of wildlife. As such, you have opportunity to manage your oak stand for the wildlife species that are already best suited to the stand's existing characteristics, or manage it for the characteristics needed by wildlife species you would like it to have.

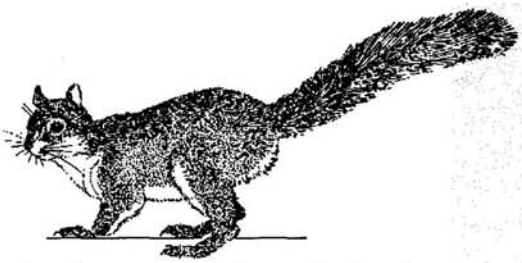
Information on managing Oregon white oak stands for specific wildlife objectives is limited, but several general principles can guide you. For example, open–canopy stands generally have more complex plant understories than closed–canopy stands and hence can support more diverse wildlife species. To increase the diversity of wildlife species in a densely wooded oak stand, you might consider thinning the stand.

While all Oregon white oak stands are important to wildlife, those with a mix of dead, decadent and healthy trees of various sizes and growth forms will probably attract a greater variety of wildlife than those with only healthy trees of uniform size. Large oak commonly have dead branches with cavities in them. By retaining such trees and managing for additional trees with cavities, you can help ensure a supply of cavities for species in your stand over time.

Strategically located conifers that do not threaten oak also increase the structural diversity of your stands. Individual conifers or hardwoods that are overtopping oak in mixed species stands can be felled. Cuts that remove most trees on about one–half acre can provide open space for new oak seedlings to

Suggestion	Benefits to oak and to wildlife
Retain existing oak	Stabilizes oak resources over time
Regenerate oak	Helps assure future oak resources
Retain large oak cavities and shade	Provides acorns for regeneration and wildlife food; also insects,
Minimize stand fragmentation	Provides aerial pathways for western gray squirrels
Promote & retain	Provides shade, acorns for oak reproduction open–form oak and food, dead limbs for acorn storage sites and cavities.
Retain live oak with dead limbs	Provides acorn storage sites for acorn woodpeckers, nesting substrate for several cavity–using species
Retain dead oak	Provides cavities; also cover for invertebrates, amphibians and reptiles; insects for insect–eating wildlife
Retain oak logs	Provide foraging surface for some woodpeckers, perching sites for birds, cover sites for some reptiles, amphibians and small mammals
Retain oak with cavities	Provide nesting sites for wildlife that use cavities

Table 1. Suggestions for enhancing Oregon white oak habitats and their associated wildlife.



develop, encourage residual oak to assume open forms, and allow existing open-form oak to persist. Sprouts can be encouraged in Oregon oak stands that have been clearcut, and seed trees can be sources of acorns adapted to local site conditions.

Determining the wildlife species you will manage for in an integrated forest system can be rewarding, and gives you more opportunities to enjoy observing and stewarding the wildlife inhabiting your Oregon white oak community.

Suggested management strategies that benefit Oregon white oak and their wild inhabitants are shown in Table 1 on Page 5.

WHERE TO GET HELP

Many sources can provide information to help you manage your oak woodlands. Extension agents and specialists at Oregon and Washington State Universities provide wildlife and forestry expertise. The USDA Soil Conservation Service (SCS) assists landowners in developing multiple use management plans for small woodlands. The USDA Agricultural Stabilization and Conservation Service (ASCS) provides assistance to forest landowners for a variety of forest improvement practices. Contact the Oregon and Washington Departments of Fish and Wildlife, the Oregon Department of Forestry, and the Washington

Reading / Reference List

Brown, E.R., tech. ed. 1985. Management of wildlife and fish habitats in forests of western Oregon and Washington. USDA Forest Service, Pacific NW Region, Portland, Oregon. Pub. No. R6-F&WL-192-1985. Two vol. 634pp.

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Integrated Hardwood Range Management Program. "Oaks 'n folks" newsletter. Cooperative Extension, USDA. University of California, Berkeley. 94720.

Stein, W.I. 1990. Quercus garryana Dougl. ex Hook: Oregon white oak in R.M. Burns and B.H. Honkala, tech. coord. Silvics of North America. USDA Forest Service Agr. Handb. 654. Volume 2: Hardwoods. USDA Forest Service, Washington D.C., Pages 650-660.

Washington Dept. of Wildlife. Priority habitats management recommendations: Oregon white oak woodlands. Wash. Dept. Wildl. Olympia. (In press).

Department of Natural Resources; these agencies can provide practical guidance on wildlife and forestry concerns, and current information on programs designed to assist woodland owners. Conservation organizations such as The Nature Conservancy, local Native Plant Societies and Audubon Societies might offer insights regarding plant and animal communities in your oak stands. If you have specific questions about growing or managing your Oregon white oak, it is prudent to seek guidance from a service forester, county extension agent, nursery expert or others who are experienced with wild plantings.

Wildlife species With Primary Breeding, Feeding Or Resting Habitats In Oregon White Oak Communities In Oregon Or Washington

	Habitat Components			
Species	**Riparian**	**Edge**	**Snags**	**Logs**
AMPHIBIANS AND REPTILES				
Northwestern salamander	X	X	X	
Long-toed salamander	X		X	
Ensatina	X	X	X	
Rough-skinned newt	X	X		
Western toad	X	X	X	
Pacific treefrog	X	X	X	
Painted turtle (3)	X	X	X	
Western pond turtle (3)	X	X	X	
Northern alligator lizard		X	X	
Southern alligator lizard		X	X	
Western fence lizard		X	X	
Western skink	X	X	X	
Racer	X	X		
Sharptail snake (3)		X	X	
Ringneck snake		X	X	
Gopher snake		X	X	
Western aquatic garter snake	X	X	X	
Western terrestrial garter snake	X	X	X	
Common garter snake	X	X	X	

Species	Habitat Components: Riparian	Edge	Snags	Logs
BIRDS				
Great blue heron	X	X		
Wood duck	X	X	X	X
Hooded merganser	X	X	X	
Common merganser	X	X	X	X
Turkey vulture	X	X	X	X
Black-shouldered kite		X		
Cooper's hawk	X	X	X	X
Red-shouldered hawk	X	X	X	
Red-tailed hawk	X	X	X	
Rough-legged hawk		X		
American kestrel	X	X	X	
Prairie falcon		X		
Ruffed grouse	X	X		X
Wild turkey (3)		X		
Northern bobwhite		X		
California quail		X	X	
Mountain quail	X			
Band-tailed pigeon	X	X		
Mourning dove	X	X		
Common barn-owl	X	X	X	
Western screech-owl	X	X	X	
Great horned owl	X	X	X	
Long-eared owl	X	X		
Northern saw-whet owl		X	X	
Common nighthawk	X	X		X
Common poorwill		X		X
Vaux's swift	X	X	X	
Anna's hummingbird		X		
Rufous hummingbird	X	X		
Allen's hummingbird		X		
Lewis' woodpecker (3)		X	X	X
Acorn woodpecker (3)		X	X	X
Downy woodpecker	X	X	X	
Northern flicker		X	X	X
Western wood peewee	X	X		
Western flycatcher	X		X	

Species	Habitat Components: Riparian	Edge	Snags	Logs
Ash-throated flycatcher	X	X		
Tree swallow	X	X	X	
Violet-green swallow	X	X	X	
Cliff swallow	X	X		
Barn swallow	X	X		
Scrub jay		X		
American crow	X	X		
Common raven		X		
Black-capped chickadee	X	X	X	
Plain titmouse			X	
Bushtit		X		
White-breasted nuthatch (3)			X	X
Bewick's wren	X	X	X	X
House wren		X	X	X
Golden-crowned kinglet*				
Ruby-crowned kinglet		X		
Blue-gray gnatcatcher		X		
Western bluebird		X	X	
American robin		X		
Wrentit		X		
Loggerhead shrike		X		
Hutton's vireo		X		
Warbling vireo		X		
Orange-crowned warbler		X		
Nashville warbler		X		
Yellow-rumped warbler	X	X		
Black-throated gray warbler		X		
Western tanager		X		
Black-headed grosbeak	X	X		
Lazuli bunting		X		
Rufous-sided towhee		X		X
Brown towhee		X		
Chipping sparrow		X		
Lark sparrow		X		
Fox sparrow		X		
Song sparrow	X	X		X
Golden-crowned sparrow		X		

Species	Habitat Components: Riparian	Edge	Snags	Logs
Dark-eyed junco		X		X
Brewer's blackbird		X		
Brown-headed cowbird		X		
Northern oriole		X		
Purple finch		X		
House finch		X	X	
Lesser goldfinch		X		
American goldfinch		X		
MAMMALS				
Masked shrew	X	X		X
Coast mole	X	X		X
Pallid bat			X	
Big brown bat	X	X	X	
Silver-haired bat	X	X	X	
Hoary bat	X	X		
California myotis	X	X	X	
Little brown myotis	X	X	X	
Fringed myotis	X		X	
Long-legged myotis	X		X	
Yuma myotis	X	X	X	
Brazilian free-tailed bat	X			
Coyote	X	X		X
Gray fox	X		X	X
Red fox	X	X		X
Ringtail	X	X	X	
Raccoon	X	X	X	X
Striped skunk	X	X		X
Spotted skunk	X	X	X	X
ElkX	X			
Mule deer	X	X		X
Black-tailed deer	X	X		X
Columbian white-tailed deer	X	X		X
Western gray squirrel (3)	X	X	X	X
(threatened in Washington)				
California ground squirrel		X		
Townsend's chipmunk	X	X		X
Camas pocket gopher		X		

Species	Habitat Components: Riparian	Edge	Snags	Logs
Western pocket gopher		X		
Northern pocket gopher		X		
Heermann's kangaroo rat*				
Dusky-footed woodrat	X	X		X
Deer mouse	X	X	X	X
California vole*				
creeping vole	X	X		X
Pacific jumping mouse	X	X		X
Black-tailed jackrabbit		X		
Brush rabbit	X	X		
INTRODUCED SPECIES				
Bullfrog	X	X		
European starling	X	X	X	
Virginia opossum	X	X	X	X
Nutria	X	X		
Eastern cottontail	X	X		

[1]Source: Brown, E.R., tech. ed. 1985. Management of wildlife and fish habitats in forests of western Oregon and Washington. USDA Forest Service, Pacific NW Region, Portland, Oregon. Pub. No. R6–F&WL–192–1985. Two vol. 634pp.

[2] This list identifies species that are known to be highly associated with Oregon white oak, as well as species that use other types of habitats in addition to Oregon oak. Some species not listed use Oregon oak as secondary and not primary habitat. This list should not be considered final because new determinations may be made as more information becomes available.

[3] Species identified as highly associated with Oregon white oak.

*Habitat components for this species not clearly established.

Acknowledgements

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Our Purpose...

This leaflet was written by:
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The Woodland Fish and Wildlife Project is a cooperative effort among the World Forestry Center, Oregon State Department of Forestry, Washington State Department of Natural Resources, Oregon State University Extension Service, Washington State University Cooperative Extension, University of Washington Center of Streamside Studies, Oregon Association of Conservation Districts, Oregon Small Woodlands Association, Washington Farm Forestry Association, Oregon Department of Fish and Wildlife, Washington Department of Fisheries, Washington Department of Wildlife, Oregon Soil Conservation Service, Washington Soil Conservation Service and the USDA Forest Service. The World Forestry Center serves as the coordinating organization for the project.

The Woodland Fish and Wildlife Project was initiated to provide information on fish and wildlife management to private woodland owners and managers. It is the intent of the organizations involved in this project to produce publications that will serve as practical guides to woodland owners.

Each publication is intended to be complete in itself. Users may find it convenient to collect all publications in this series in a three ring binder to form a permanent reference file. Woodland Fish and Wildlife Project publications range from an overview of fish and wildlife opportunities on woodland properties to specific publications concerning techniques for managing individual species.

These publications can be obtained from any of the cooperating organizations or by contacting the World Forestry Center, 4033 SW Canyon Road, Portland, OR 97221, (503) 228-1367.

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