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Strategy Habitat: Oak Woodlands

Ecoregions:

Oak woodlands are a Strategy Habitat in the Coast Range, East Cascades, Klamath Mountains, West Cascades, and Willamette Valley ecoregions. Oak habitats also occur to a lesser extent in the West Cascades and western portion of the Columbia Plateau ecoregion.

Characteristics:

Oak woodlands are characterized by an open canopy dominated by Oregon white oak. Depending on the ecoregion and site characteristics, oak woodlands may also have ponderosa pine, California black oak, and/or Douglas-fir, or, on steep slopes, canyon live oak. In general, the understory is relatively open with shrubs, grasses and wildflowers. The tree canopy of an oak woodlands obscures between 30 percent - 70 percent of the sky as you look up at it. Oak habitats are maintained through fire, which removes small conifers and maintains a low to moderate shrub cover.

In the Coast Range and West Cascades, oak habitats are found in drier landscapes, such as south-facing slopes and foothills bordering the Willamette Valley. In the Klamath Mountains, oak woodlands are found in low elevations, on dry sites or in areas with frequent low-intensity fires. Here, woodlands may occur in a mosaic with chaparral and dry conifer woodlands. In the Willamette Valley, oaks were originally found in a mosaic of prairies, oak savanna, and riparian habitats throughout the valley floor and low elevation slopes. Oaks were most common on flat to moderately rolling terrain, usually in drier landscapes, and often are found between prairie remnants and conifer forests. Today, oak woodlands often are found in small isolated pockets surrounded by other land-uses, such as development or agriculture.

In the East Cascades, oak woodlands occur primarily on the north end of the ecoregion and in the Klamath River Canyon. They are located at the transition between ponderosa pine or mixed conifer forests in the mountains, and the shrublands or grasslands to the east. Oak habitats

in the East Cascades are different in structure and composition than those in western Oregon, but are just as important to a variety of wildlife as well as rare plants.

Oak woodlands grade into oak savannas. Oak savannas are characterized by primarily upland prairie with widely-spaced large Oregon white oak and conifers. Oak savannas are discussed in the grasslands section. Oak woodlands also grade into pine-oak habitats in the Klamath Mountains, which are discussed in the ponderosa pine section.

Conservation Overview:

Oak woodlands once covered almost one million acres in the Coast Range and 400,000 acres in the Willamette Valley. However, the Coast Range now has less than four percent of its estimated historic oak woodlands and the Willamette Valley less than seven percent. Habitat loss has been less severe in the East Cascades, where fire suppression may have led to expansion of oaks into former shrub-steppe and grassland habitats, and in the Klamath Mountains.

Oak woodlands have been impacted by conversion to other land uses, invasive species, and vegetation changes due to fire suppression. As a result of conifer plantings and changes in fire frequency and intensity after European settlement, Douglas-fir now dominates in many of areas of the Coast Range and Willamette Valley foothills. Oak habitats are being converted to agriculture, residential and other uses in Willamette Valley, the Coast Range foothills and the coastal hills in southern Oregon. Although loss of oak woodland in the Klamath Mountains is not currently as severe as in the Willamette Valley, increasing development threatens these habitats. The same rolling hills and scenic landscapes that indicate healthy pine-oak habitat also attract new residents and developers. Because much of the remaining oak woodlands are in private ownership and maintenance of these habitats require active management, cooperative incentive-based approaches are crucial to conservation.

Loss of oaks, particularly large diameter open-structured trees valuable to wildlife, are of particular concern because oak trees have a slow growth rate and require a long time to regenerate, slowing restoration. In addition, reproduction and recruitment of younger trees is poor in many areas.

Depending on the area, Strategy Species associated with oak woodlands include Columbian white-tailed deer, chipping sparrow, slender-billed (white-breasted) nuthatch, Lewis' woodpecker, white rock larkspur, and wayside aster.

Limiting Factors in Oak Woodlands

Factor: Fire suppression and fir encroachment: With fire suppression, Douglas-fir encroaches into oak habitats and eventually shades out oak trees and seedlings, as well as other plants that require open growing conditions. Many oak woodlands are now dominated by Douglas-fir. Without active management, they will eventually become conifer forests. In some areas of the East Cascades, fire suppression combined with grazing has influenced fine fuel production and led to encroachment by conifers and establishment of dense patches of small, shrubby oaks.

Approach: Use multiple tools, including prescribed fire, mowing, graz-

ing and selective harvest to maintain open canopy oak-dominated woodlands. Ensure that tools are site-appropriate and implemented to minimize impacts to native species. Re-establish site-appropriate native grasses, herbaceous plants, and shrubs.

Factor: Land use conversion and continued habitat loss: Particularly in the Willamette Valley and Klamath Mountains, oak woodlands continue to be converted to agricultural (especially vineyards), rural residential, and urban uses.

Approach: Much of the remaining oak woodland habitat occurs on private land, so cooperative incentive programs are the best approach. Work with private landowners to maintain and restore oak habitats. Develop oak products compatible with conservation to promote maintenance of oak as an economic use. Work with local communities to plan development in a manner that conserves critical habitats.

Factor: Loss of habitat structure: Large-diameter oak trees with lateral limb structure and cavities have been lost. In many areas, there are not sufficient numbers of replacement trees to maintain these habitat elements over time. In the absence of fire, densely-stocked regenerating oaks often do not develop open-grown

Oregon White Oak and Wildlife

With its sweeping branches, graceful form, and sometimes impressive size, the Oregon white oak adds drama to open landscapes. Oregon white oak ranges from southern British Columbia to southern California. It is the most widely distributed oak species in Oregon and the dominant oak of the Willamette Valley. Its acorns once fed the Calapooia people, and its wood is now used for special products such as fine furniture and oak barrels. It provides food and shelter for a great variety of wildlife. Acorn woodpeckers and western gray squirrels feed on the acorns. Birds forage for insects among the variety of lichens and mosses that grow on the large limbs. Mistletoe parasitizes its branches,

providing fruit as important winter food for western bluebirds and is a host plant for Nelson's hairstreak (butterfly). Probably the most valuable habitat features of white oak are its dead branches and cavities, which provide safe places for wildlife to rest and raise young. Oregon white oaks are slow-growing and shade intolerant. Open-canopy, large-diameter trees are continuing to be lost due to overshadowing by conifers, removal and natural causes, but are not being replaced. Landowners can maintain the oak's legacy by conserving older trees and managing younger trees

Oregon Oak Communities Working Group

Since 1999, people interested in Oregon's oak communities have been meeting informally to better understand the ecology and management of savanna and woodland oak communities found throughout the state. Participants include private landowners, foresters, wildlife biologists, nursery owners, botanists, parks managers, planners, restoration specialists, and researchers from over 40 organizations, universities, and agencies. Under the umbrella of the Oregon Oak Communities Working Group, this diverse group of people is drawn together by a common

interest in oak habitats and the wildlife and plants associated with oaks. The group meets 2-4 times a year to share information on restoration and management techniques, restoration projects, research findings, and grant and financial incentive opportunities. The meetings always involve a field trip to a project site for better discussion of issues and techniques. By providing a forum for information sharing, the group assists landowners with a variety of management goals and approaches and increases our overall understanding of oak communities.

structures due to shading. In the East Cascades, grazing or very hot fires can lead to development of brushy-structured trees. The shaded or grazed oaks do not develop the lateral limbs, cavities and higher acorn crops of open-grown trees, thus are less valuable to wildlife. Woodcutting often removes snags.

Approach: Maintain a diversity of tree size and age across the stand, in particular large oak and ponderosa pine trees. Remove conifers or small oaks that are competing with larger oaks. Maintain snags and create snags from competing conifers to provide cavity habitat. Encourage oak reproduction through planting or protective exclosures. It may be appropriate to use nest boxes as a temporary cavity habitat in oak restoration project areas. Improve methods to promote oak reproduction and creation of open-grown structures.

Factor: Invasive species: Depending on the ecoregion and site, invasive plants such as Armenian (Himalayan) blackberry, evergreen blackberry, Scotch broom, English hawthorn, false brome, yellowstar thistle, diffuse knapweed, and puncturevine invade and degrade oak woodlands. In many oak woodland stands, the overstory is intact but the understory is highly degraded.

Approach: Identify the best remaining native oak woodlands and work with landowners to maintain quality and limit the spread on

invasives. Emphasize prevention, risk assessment, early detection and quick control to prevent new invasives from becoming fully established. Prioritize control efforts and use site-appropriate methods to control newly-established invasive plant species for which management can be most effective. Re-seed with site-appropriate native grasses and forbs after control efforts. Prescribed burning may be useful for management of some invasive species, particularly shrubs.



Photo © Bruce Newhouse

Acorns and *Quercus garryana* (Oregon White Oak) Acorn Production Study

The number of Oregon oak species range from 5 in southwest Oregon to just one, the Oregon white oak, in the northern Willamette Valley and East Cascades ecoregions. Oaks are probably most famous for their acorns. Oregon's Native Americans boiled Oregon white oak acorns to remove the tannins, then ground the acorns into meal. Acorns are eaten by a variety of wildlife and are particularly important in the winter, when other foods are scarce. During the fall, jays, woodpeckers, and rodents busily cache acorns for later meals. Wildlife that either regularly or occasionally eat acorns include wood duck, band-tailed pigeon, California quail, varied thrush, western scrub jay, Steller's jay, Lewis' woodpeckers, acorn woodpeckers, black bear, western gray squirrel, Douglas tree squirrel, mice, raccoons, black-tailed deer, and mule deer. Oregon's oak habitats have declined due to habitat conversion and fire suppression. Research and restoration projects are being implemented to help understand and reverse the decline.

In the *Quercus garryana* Acorn Production Study, citizens are helping scientists learn more about oaks and acorns. The USFS Olympia Forest Sciences Laboratory has been conducting a volunteer-based

survey of Oregon white oak acorn production since 1999. As of March 2004, over 1400 trees have been measured across the tree's range in Oregon, Washington and British Columbia. The survey is intended to find out patterns in acorn production, especially related to environmental characteristics. Volunteers record tree and site characteristics and then estimate acorn production each year using standard categories. Although new study trees are added each year, some trees have been followed for 6 years. These measurements over time give an idea of average acorn crop size and how often good and bad acorn crops occur over time. By using volunteers, the survey can measure more trees in more places than foresters on their own. In addition, school classes can adopt an oak tree to study as a science project. The survey will provide insight into factors that help oak reproduction, as well as food sources for wildlife. For more information, visit www.fs.fed.us/pnw/olympia/silv/oak-studies. In addition to the acorn survey, the Olympia Forest Sciences Laboratory maintains an oak literature database that allows landowners, land managers, biologists and other interested people to search for information about Oregon white oak. It is at www.fs.fed.us/pnw/olympia/silv/oak-studies/oak-bibliography.shtml.