OREGON WHITE OAK OR GARRY OAK

Quercus garryana, Beech family—Fagaceae

Stout, craggy oak trees with broad, rounded canopies stand scattered across a rolling landscape of sun-bleached grass. This scene is reminiscent of California's golden foothills, but the trees are Oregon white oaks growing in dry valleys west of the Cascades from west-central Oregon to southernmost British Columbia, where they are called Garry oaks. Historically, open oak woodlands and oak-sprinkled prairies were heavily occupied by Native Americans. Later, these habitats were among the first areas settled by Oregon Trail pioneers. Today, Oregon white oak is recognized as a special tree because it is the cornerstone of an increasingly scarce and highly diverse plant and animal community.

Where It Grows

Fifteen species of oak are native to California, and three of them as well as their relative tanoak reach southwestern Oregon. However, Oregon white oak grows 400 miles (650 km) farther north than the others, occupying the warmest, driest sites west of the Cascades. It spreads along the rain-sheltered, southeastern coast of Vancouver Island from Victoria to Courtenay and inhabits two localities on the British Columbia mainland: Sumas Mountain and Yale in the Fraser River Canyon. Southward, patches of Oregon white oak grow in the San Juan Islands and at Sequim in the rain shadow of the Olympic Mountains in Washington. Oregon oak is now rare in most of the Puget Sound area but is still found at the Fort Lewis Prairies south of Tacoma, Washington. It becomes more common south of Chehalis; its dark, rounded form is seen on the south-facing hills east of Interstate 5.

Oregon white oak extends upstream along the Columbia River past the Dalles, occupying dry hills and then spreading north along the parched eastern foothill slopes of the Cascades to the drainages west of Yakima. Otherwise, Oregon oak is mostly restricted to west of the Cascades.

It is plentiful in warm, dry habitats of the Willamette and Umpqua river valleys in Oregon, but from the Rogue River drainage southward, it is increasingly replaced by California black oak and other more southerly species, especially on moderately moist sites. Still, Oregon white oak retains a presence in the mixed oak woodlands throughout much of northern California.

Appearance

Oregon white oak is a tree of modest stature but striking appearance. Its dark green foliage stands out at the end of big, long, crooked limbs that radiate from the top of a stout trunk covered with gray, fissured bark. On fertile valley soils, mature trees 36 inches (90 cm) in diameter and 80 feet (25 m) tall are fairly common. The biggest oaks on Sauvie Island in the Columbia River floodplain northwest of Portland, Oregon, are 5 feet (1.5 m) in diameter and perhaps as much as 500 years old, although ages of venerable oaks are hard to determine because of heart rot. On dry, infertile sites, the oaks are much smaller, and the maximum horizontal spread of their canopy may exceed the tree's height. On extremely rocky, wind-exposed sites, Oregon oaks grow as tall shrubs.

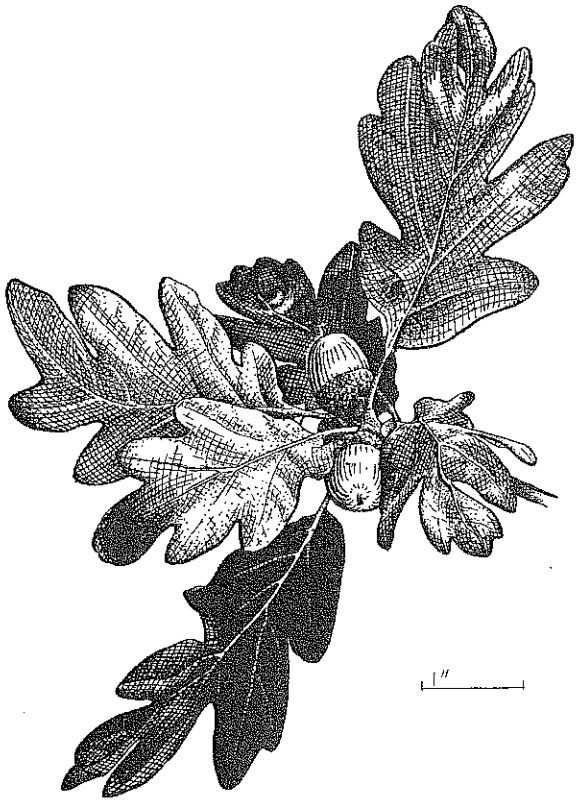
Oregon white oak and California black oak (see the next chapter) are the Northwest's only native deciduous oaks. (Evergreen oaks have thick, leathery leaves.) Oregon white oak has dark green leaves with rounded lobes, whereas the leaves of California black oak are yellow-green and have bristle-tipped lobes. Oregon

white oak's leaves average about 5 inches (13 cm) long and 3 inches (7.5 cm) wide and have five to seven lobes. They are lustrous dark green on the upper surface and pale green with fine, rusty hairs below. The waxy upper surface and hairy underside evidently helps them retain moisture during the long, droughty summer.

Oregon oak's acorn develops in one season. It is about 1 inch (2.5 cm) long and is heavy—about 85 per pound (190 per kg). Good nut crops are borne about every other year and can produce 1000 pounds per acre (1100 kg per ha).

Large, bushy clusters of the leafy (Christmas) mistletoe *Phoradendron flavescens*, a parasitic plant, are often seen in the crowns of oak trees. Mistletoe clumps and lichens hanging from the gnarled, leafless limbs impart an eerie appearance to old oak trees on a winter night.

Oregon oaks often have large, round galls attached to their leaves and twigs. These hard-shelled, hollow spheres are calluses in the foliage induced by two species of gall wasps (harmless to people), which use them as egg chambers (Furniss and Carolin 1977). The leaf galls, called poppers, are a favorite of children, who stomp on them to make a popping sound.



Oregon white oak (Garry oak)

Ecological Role

Some species of oak grow almost exclusively on certain kinds of soils, but Oregon white oak is more of an opportunist, growing wherever it will not be readily crowded out by conifers or more aggressive broad-leaved trees. Douglas-fir and bigleaf maple, for example, are not only more tolerant of shade than oaks are, they also grow faster and have replaced oak communities at an alarming rate. Today oak is mostly restricted to the driest areas; shallow, rocky soils; and south-facing slopes—and even in these habitats it may be giving way to other trees and tall shrubs. But how then can we account for the historic abundance of Oregon white oak even as far north as southern British Columbia?

To understand the ecology of Oregon white oak, we need to consider the role that human activities have played, probably for thousands of years. Oregon white oak forms self-perpetuating woodlands only in habitats too arid for other more-competitive trees, and few sites west of the Cascades are actually too dry for Douglas-fir. Yet mid-nineteenth-century government land surveys and other evidence confirm that open oak woodlands and prairies with scattered oaks covered more than a million acres in the Willamette Valley alone (Boyd 1999; U.S. Forest Service 1990).

In 1826, botanical explorer David Douglas became the first of many journalists to witness the fires set annually by Native Americans in the Willamette and other valleys. Native peoples burned these valleys to favor production of camas (*Camassia*) and other food plants and to herd deer and attract them to areas by producing succulent new forage (Davies 1980).

Frequent burning favors the oak since older trees are moderately resistant to fire damage. Fire induces stump sprouts and root suckers in oak. (In contrast, the slow-growing Douglas-fir saplings on dry sites are readily killed by fires.) Also, oak seedlings have a low survival rate in sod or heavy duff and are more successful when this material has been burned.

Evidence from many sources now indicates that the expansive oak woodlands and prairies historically found west of the Cascades were largely a result of deliberate burning by aboriginal people. In these areas, dry lightning storms are uncommon, and even fewer occur when vegetation is parched enough to carry fire; thus it is doubtful that lightning ignitions alone could have perpetuated the oak communities. In the 1840s and 1850s, thousands of Oregon Trail pioneers established homesteads west of the Cascades among the oak woodlands and prairies. The Native peoples and their burning practices were displaced, and within a century the oak communities, especially those in relatively moist sites, were crowded out by Douglas-fir and other woody vegetation, or they were destroyed by land development.

Today, conservation organizations and government agencies recognize the plight of the Oregon white oak and its associated native prairie communities. The Garry Oak Meadow Preservation Society headquartered in Victoria, British Columbia, is concerned about declining oak communities, which are among British Columbia's most diverse terrestrial ecosystems, containing many imperiled species. In western Washington, the Nature Conservancy estimates that only 3 percent of the original oak-prairie communities still exist, and many of those are being colonized by Douglas-fir or invaded by Scotch broom and other noxious plants. Washington's Department of Fish and Wildlife lists measures for restoring oak woodlands, which it considers priority habitat because of its myriad of plants and animals, including species rarely found elsewhere. The acorn crop is a special feature of oak communities that provides abundant food for diverse wildlife.

yellow bells in Oregon white oak habitat

Fire ecologist Jim Agee (1996) has evaluated different techniques for restoring Oregon white oak communities. He points out that many of these habitats have deteriorated to the point that simply reintroducing fire may not help. Douglas-fir or aggressive weeds might regenerate better than the few remnant oaks. Coordinated restoration treatments may be needed, including removal of conifers, weed control, fuel removal, burning, and planting of oaks and native herbs.

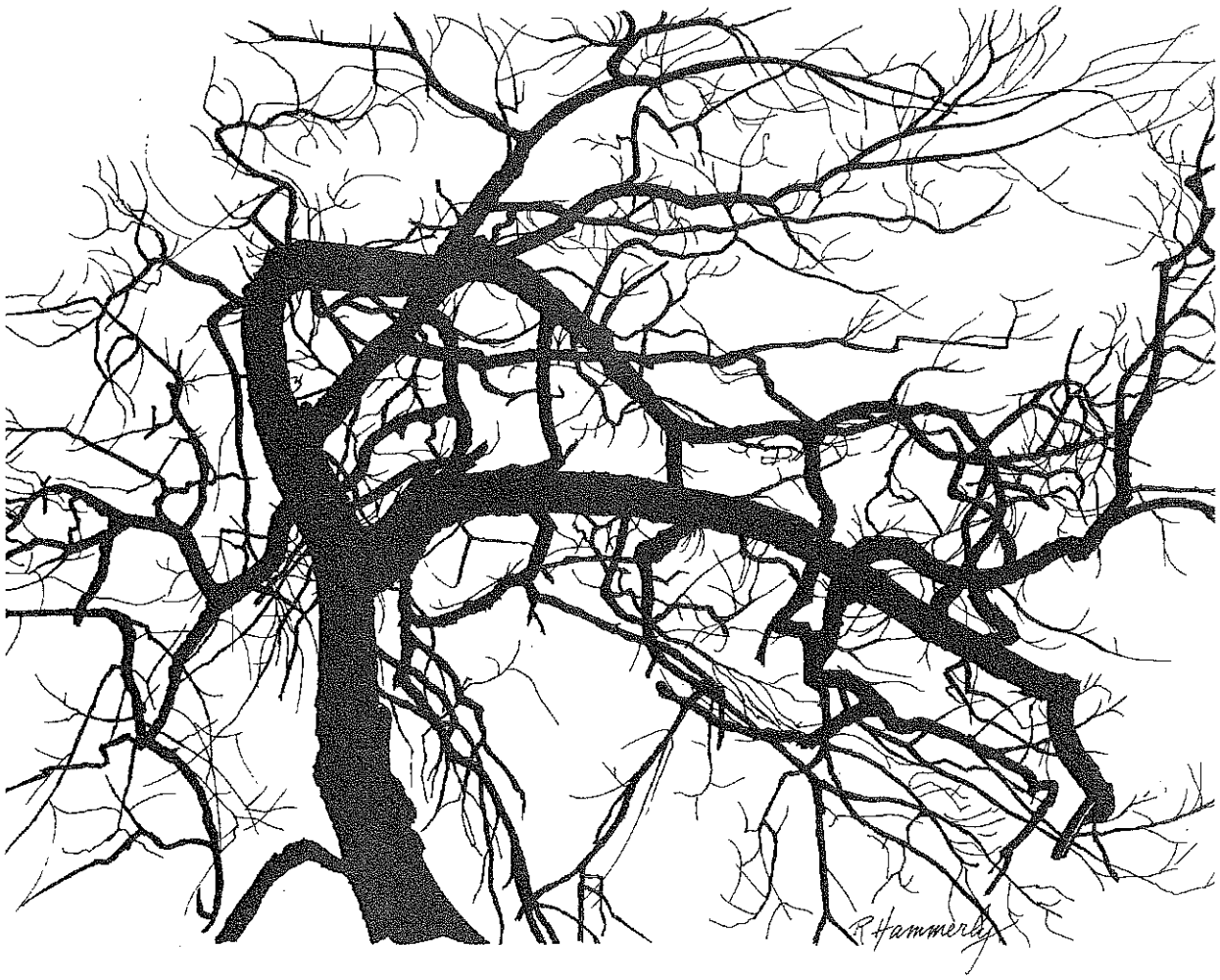
Human History

Native peoples made heavy use of Oregon white oak acorns, eating them raw, roasted, or sun-dried; making them into soup, mush, pancakes, or bread; and also storing them (Moerman 1998). Some anthropologists suspect that these people long ago aided the northward spread of this tree by carrying acorns. Another theory is that these oaks and other warm-climate plants, including Pacific madrone, spread northward in the warmer climatic period that the Northwest experienced a few thousand years ago (Long and others 1998).

Botanist David Douglas discovered Oregon white oak in the 1820s and named it for Nicholas Garry, an official of the Hudson Bay Company who aided his explorations. During the late 1800s and early 1900s, Oregon white oak supplied much of the hardwood lumber needs of the Northwest. Its wood compares with eastern oaks in many qualities, including hardness. It is fine-grained, heavy, hard, and strong and was used for agricultural implements, wedges for felling trees, furniture, flooring, and ship construction.

Today, little Oregon white oak is harvested for lumber, in part because of the modest supply and the fact that much of it grows on countless small properties not managed for producing timber. However, the oak commands high prices for firewood and fence posts, uses aided by the fact that the wood splits readily. The heartwood is so durable that oak fence posts last almost twice as long in the ground as those of western redcedar.

Today the greatest value of craggy old Oregon white oaks probably lies in the way they enhance wildlife habitat and scenery. However, while visiting oak woodlands, particularly in the Willamette Valley, it is a good idea to watch out for its major undergrowth associate, poison oak (*Rhus diversiloba*), which forms both a low shrub and a vine in the trees.



silhouette of Oregon white oak (Garry oak)