WESTERN REDCEDAR

Thuja plicata, Cypress family—Cupressaceae

Western redcedar is an icon of the Northwestern forest, beloved for its majesty, beauty, and excellent wood. This tree's sturdy trunk, covered with fibrous bark, supports the distinctive, light-green canopy made up of drooping, fernlike sprays. It is the Northwest's common cedar and is native only to our region. It is abundant west of the Cascades as well as in moist inland areas. It achieves gargantuan proportions through tenacity, by surviving longer than its competitors even while much of its trunk and crown is dying.

To Native peoples of the Northwest coast, this was the revered tree that provided shelter, clothing, and the means for obtaining and preparing food and whose spirit was addressed as "Long Life Maker" (Stewart 1984). Explorers Lewis and Clark were delighted to discover this tree, so suitable for dugout canoes, when they finally reached the headwaters of the Columbia River in what is now northern Idaho. They recognized it as "arbor vitae"—Latin for "tree of life"—by the similarity to its smaller eastern relative, northern white-cedar (*Thuja occidentalis*). It became known as "giant arborvitae," appropriately, since it forms the largest trees in coastal and inland forests of the Northwest.

Where It Grows

Western redcedar inhabits all but the driest areas west of the Cascade crest and north of Oregon's Rogue River drainage. It extends southward along a narrow coastal strip about 100 miles (160 km) into California. It spreads northward through coastal British Columbia and into the southeastern tip of the Alaska Panhandle. It also occupies the moist inland region west of the Continental Divide from the vicinity of Grangeville in north-central Idaho to Prince George in central British Columbia, including northeastern Washington and northwestern Montana. It is designated as British Columbia's official tree. In the coastal Northwest, it grows mainly between sea level and 3500 feet (1100 m) elevation but extends somewhat higher in southwestern Oregon and up to about 5000 feet (1500 m) in Idaho.

Western redcedar is characteristically a tree of moist habitats and areas with a cool, wet climate. It is usually found where annual precipitation averages well over 30 inches (750 mm), and it thrives in valleys receiving 60 to 120 inches (1500 to 3000 mm). In relatively dry areas west of the Cascades, western redcedar becomes abundant only in wet sites such as in ravines, along streams, or on poorly drained bottomlands. Near its range limits in inland mountains, it grows almost exclusively in narrow canyons where its roots are irrigated all summer by a mountain stream.

Appearance

Young western redcedars grow straight and tall but are conspicuously lighter green than associated conifers. The oldest branchlets turn orange-brown before being shed in autumn, giving the trees a mottled, two-toned appearance. The young tree develops a broad, pyramidal canopy consisting of long, spreading branches supporting a profusion of lacy sprays. The flattened sprays droop gracefully from lower limbs that sweep out and down nearly to the ground. As a tree matures, its lower trunk swells and its buttresses connect to large, shallow roots. As centuries pass, the original top is damaged by windstorms, and branches ascend like upswept arms to take its place, eventually forming a multiforked crown of living and dead leaders. The trunk,

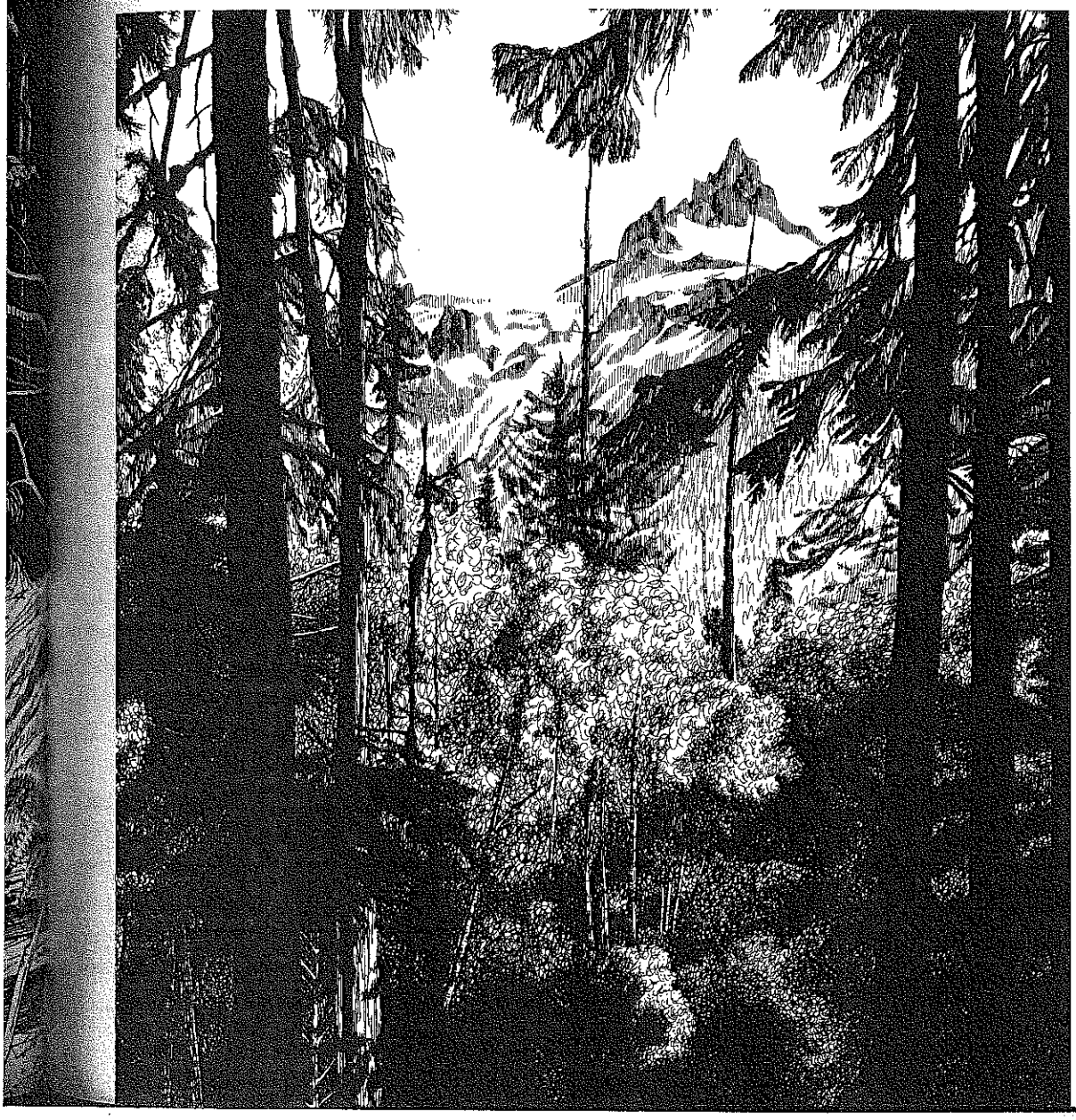

Ramona Hammerly

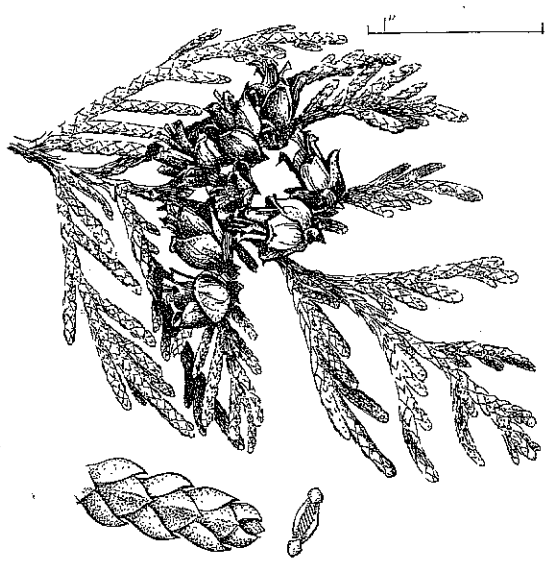
damaged by fire and decay, becomes hollow; but still the tree survives.

Ancient western redcedars in moist valleys west of the Cascades and British Columbia Coast Range often stand 8 to 10 feet (2.4 to 3 m) thick and 200 feet (60 m) tall. Trees in sheltered valleys of northern Idaho are nearly as large. Record-sized redcedars 18 to 19.5 feet (5.5 to 5.9 m) in diameter grow along the western coast of Washington and Vancouver Island (Van Pelt 2001). They have broken, many-forked, living and dead tops, and most are 150 to 180 feet (45 to 55 m) tall. Because of their great bulk and heart rot, these behemoths are virtually impossible to age, but they are estimated to be 1,000 years old or older. These gigantic redcedars differ in growth form from record-sized trees of other northwestern conifers, which often have a broken top but not the complex, many-branched trunk.

The trunk of a mature western redcedar is covered with gray-brown bark, ridged and

western redcedar in low-elevation moist forest habitat





western redcedar foliage and cones: close-up and cross section

fissured into an interlacing network of vertical fibrous strips. The bark is very thin but tough and can be peeled in long, narrow strips. The foliage consists of flat, lacy branchlets made up of scalelike leaves only about ⅛ inch (3 mm) long and pressed tightly against the twigs. Redcedar boughs give off a pleasant aromatic smell.

The fernlike sprays droop gracefully from long branches and often bear great quantities of tiny brown cones. These are about ½ inch (12 mm) long, stand upright, and are shaped like miniature roses in bud. The cones bear seeds so small—averaging roughly 400,000 per pound (880,000 per kg)—that rodents seldom bother to eat them. Western redcedar seed crops can be prodigious—up to 1 million seeds per acre (2.5 million per ha)—in mixed coastal forests containing this species.

Ecological Role

In coastal lowland forests, western redcedar seeds can germinate in fall, winter, or spring, producing an immense crop of new seedlings. Still, fungi, birds, insects, strong sunlight (lethal heating), surface soil drought, and smothering by fallen leaves of deciduous shrubs and trees take a heavy toll. Partial shade is considered beneficial for successful seedling establishment.

Western redcedar also reproduces vegetatively via three methods. Layering occurs when lower branches of existing trees are pressed against the ground (for instance, by a fallen trunk) and take root. Uprooted, fallen trees can produce a row of new trees arising from their branches. Also, live branches that break off and land on moist ground can take root. These vegetative saplings, termed "veglings," are more abundant in mature Idaho redcedar groves than is seed-produced regeneration (Habeck 1978).

Western redcedar is more tolerant of shade than its principal associates except western hemlock and Pacific silver fir. Because of its greater size and longevity, it can persist indefinitely in undisturbed old forests despite competition from hemlock. However, western redcedar seldom dominates stands except those on very wet soils where hemlock and most other conifers do poorly. In mucky soils along mountain streams, redcedar reigns supreme, forming majestic groves of giant trees with fluted butts accompanied by a luxuriant undergrowth of sprawling vine maple, tall shrubs, robust lady ferns (*Athyrium filix-femina*), devil's club (*Oplopanax horridum*), and, sometimes, skunk cabbage (*Lysichitum americanum*). Devil's club, frequent in redcedar groves and well known to hikers, has stout stems and huge maple-like leaves armed with vicious, easily detached spines. Splendid redcedar groves occupy isolated wet habitats as far inland as Glacier National Park, Montana.

Unlike giant sequoias, redwood, and coastal Douglas-fir, veteran western redcedars do not owe their long-term survival to thick bark that insulates them from surface fires. Giant redcedars often escape fire, as do Sitka spruce, by occupying sodden habitats that rarely burn, but redcedars also extend into drier, fire-prone

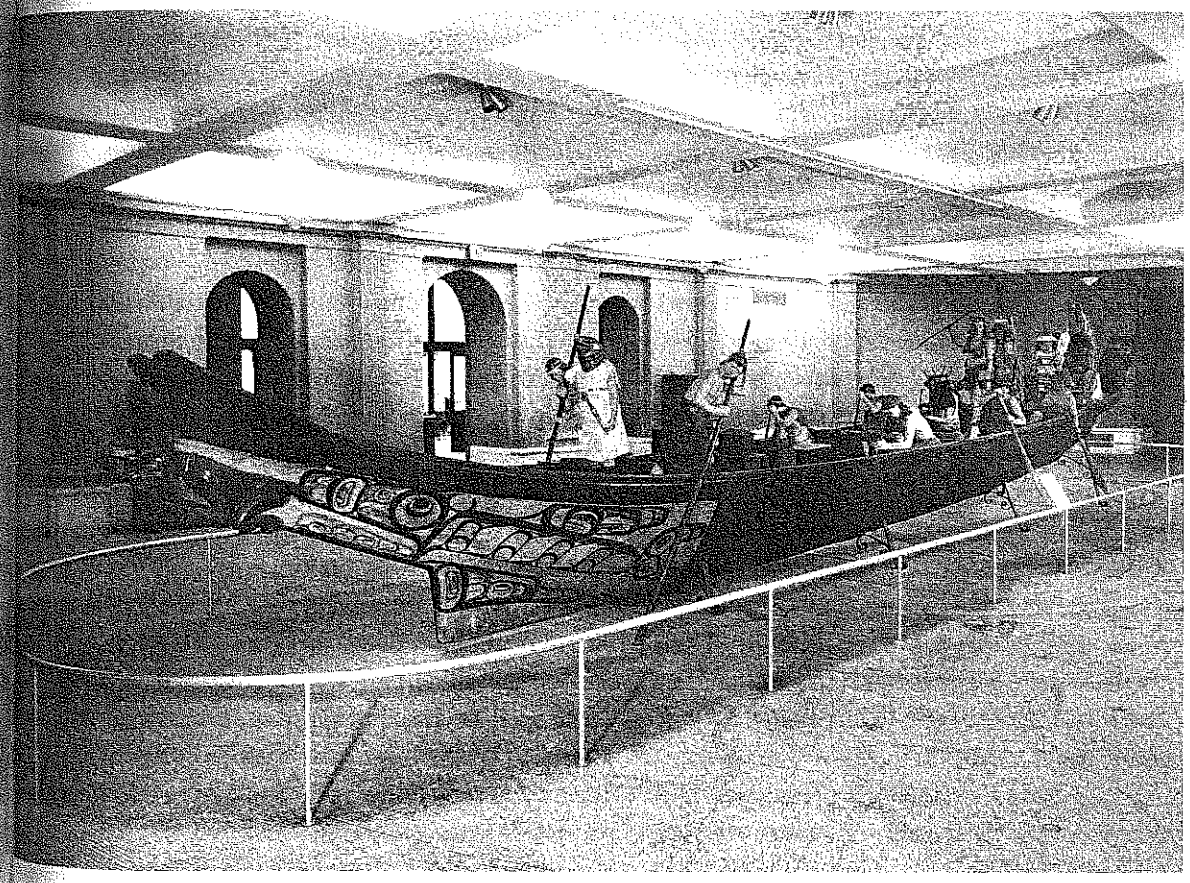
territory, especially in the Rockies. There, despite thin bark and shallow roots, ancient redcedars survive surface fires by their remarkable tenacity and decay resistance. In northern Idaho, many old redcedars have scars from two or more fires that girdled part of their circumference. Sometimes a tree several feet thick remains alive, nurtured by only a narrow strip of bark and underlying cambium that survived fires and fungi. The heartwood owes its legendary decay-resistance to a natural fungicide.

Many kinds of animals, including hibernating bears, reside in hollow redcedars. In the Rockies, any redcedar foliage within reach is eagerly devoured in winter by deer, elk, and moose.

Human History

Hillary Stewart's (1984) book, *Cedar*, explains how this tree provided a bountiful life for Natives of the Northwest Coast. When a baby was born, it was placed on a cradle of firmly woven cedar roots, with a mattress and diapers of soft, shredded cedar bark. The mother wore a cedar-bark hat, cape, and skirt to protect her from rain and cold. The people used baskets woven from long, slender cedar twigs and roots. They boiled fish, clams, and other foods by placing fire-heated rocks in water-tight boxes fashioned from steamed, bent cedar "planks." Large cedarwood boxes or root baskets were used to store foods for winter. Western redcedar also served many medicinal needs and has the most extensive catalog of uses by Native peoples among all North American plants (Moerman 1998).

Planks of various sizes and thicknesses were split by expert insertion of wedges into trunks of living or dead redcedar trees. Planks, poles, posts, and logs of cedar were used to



Oceangoing western redcedar dugout canoe at the American Museum of Natural History in New York.

construct their houses. In 1808 explorer Simon Fraser described a cedar-plank longhouse near present-day Vancouver, British Columbia, as being 650 feet (200 m) long by 60 feet (18 m) broad, under one roof, and containing apartments for families (Stewart 1984). Outside the house would stand a tall carved cedar memorial pole (totem pole) chronicling the family lineage and spiritual symbols.

Native peoples fashioned dugout canoes of many sizes from the trunk of a western redcedar. Cedar canoes would carry the people along rivers and out into the salt water to fish for salmon or even whales. Cedar was also used to make the nets and harpoons. A gigantic ocean-going cedar canoe housed at the American Museum of Natural History in New York is 64 feet long (19.5 m) and 8 feet wide (2.4 m), with a bow over 7 feet high (2.2 m) for throwing off high waves (Stewart 1984).

Pioneer settlers soon recognized many values of western redcedar as well. A few made temporary dwellings out of gigantic stumps. In 1898 Thomas Stringham, a settler in the Elwha River valley west of Port Angeles, Washington, made a family home and U.S. post office (McDonald, Washington) out of a redcedar stump on his property. The tree, which had been hollowed out by decay and fires, had been logged to a very tall stump. Stringham cut a doorway on one side and built a roof of cedar shakes.

Another traditional and modern use of redcedar is for kindling. In the rain-soaked Northwest, firestarter is often a critical need, which cedar fills easily and abundantly. Many a wet, cold camper has been thankful to find a fallen redcedar and the surefire kindling that its trunk offers. The ease of splitting redcedar wood along flat planes continues to make hand-split cedar shakes prized for a durable, natural roof. A major caveat attends such an application, however. The roof is in effect made of kindling that can burn rapidly if a firebrand (from a woodstove or nearby forest fire) lands on it! Demand for western redcedar shakes and rot-resistant fence posts and rails is so great that partially rotten butt-sections left in logging slash command a good price, and "cedar poaching" of scattered live trees or even of marketable logging slash has long been an illicit trade.

Western redcedar's wood is prized for many special uses. It is soft, weak, and brittle but quite resistant to decay; it is also fragrant and lightweight and has an attractive orange-brown color. It is easy to carve and work with tools. Used as paneling indoors or outside and sheltered from rain and sun, it requires no stain or finish, although it takes stain readily. Redcedar is also used for utility poles, house logs, decking, picnic tables, clothes closets, and clothes chests. Redcedar leaf oil is used in perfumes, insecticides, deodorants, and many other products.

Western redcedar is a handsome tree in cultivation, limbed to the ground, with long, sweeping boughs. Unlike many conifers, when pruned it sprouts new foliage (epicormic branches) along the trunk, and thus when it is trimmed properly, it can make an excellent hedge.

Although Native people regarded western redcedar as a gift from the creator, Euro-American society has often taken it for granted. Unlike other associated valuable trees such as coastal Douglas-fir and western white pine in Idaho, western redcedar is not easily propagated by planting it in logged areas. It often seeds in and regenerates naturally among the planted species, but in recent decades, more foresters want to ensure that it gets reestablished after logging. There is also a growing trend to spare and protect old redcedars in harvesting operations on public and commercial forestlands. This practice can retain an important feature in the ecosystem and provide an additional seed source for regenerating the "tree of life."