Ramona
Hammerly

JUNIPERS

Juniperus, Cypress family—Cupressaceae

Junipers include about sixty species of small trees and shrubs that populate some of the harshest sites throughout the northern hemisphere. From the scorching hills of North Africa to the Arctic tundra in Greenland, junipers make up in rugged hardiness what they lack in arborescent grandeur. Three species of arboreal juniper are native to the Greater Northwest; they are bushy little trees, typically 15 to 30 feet (5 to 9 m) tall on dry sites, with irregular canopies made up of foliage with tiny, scalelike leaves. Their branches radiate foliage from all sides rather than forming flat sprays like our "cedars" (western redcedar, etc.). Our western juniper (*J. occidentalis*), Rocky Mountain juniper (*J. scopulorum*), and Utah juniper (*J. osteosperma*) are adapted to the cold desert, being highly resistant to drought and extreme temperatures. They colonize parts of the sagebrush-grasslands on the Columbia Plateau and eastward beyond the Rockies, and they spread into the driest ponderosa pine and Douglas-fir forests.

In addition to the tree junipers, two species of shrubby juniper also inhabit the Greater Northwest. Matlike common juniper (*J. communis*), with small, prickly, needlelike leaves in whorls of three, is widespread in Northwest forests and woodlands, while the ground-hugging horizontal juniper (*J. horizontalis*), with small, scalelike leaves, is found mostly on stony sites along the east slope of the Rockies.

Where They Grow

Western juniper makes up the dwarf woodland that covers much of central and eastern Oregon. It extends north into the arid canyons along the Columbia and Snake rivers in southern Washington and eastward into the Owyhee Uplands of southwestern Idaho, and it is abundant southward in northeastern California.

Rocky Mountain juniper is the native juniper tree commonly found in most other dry regions of the Northwest. This species is widespread from New Mexico north through Idaho and Montana to central British Columbia and southwestern Alberta. However, it is scarce in

common juniper

Oregon and sporadic in Washington, noted locally near the Columbia River from Chelan to Vantage. Perhaps surprisingly, this arid-land tree inhabits one area of the Northwest Coast: scattered dry sites in the rain shadow formed by the Olympic Mountains, including the San Juan Islands, and northward along the Strait of Georgia.

Utah juniper is a Southwestern tree that extends north into eastern Idaho, overlapping with the more common Rocky Mountain juniper south of the Snake River and northward in the vicinity of Arco.

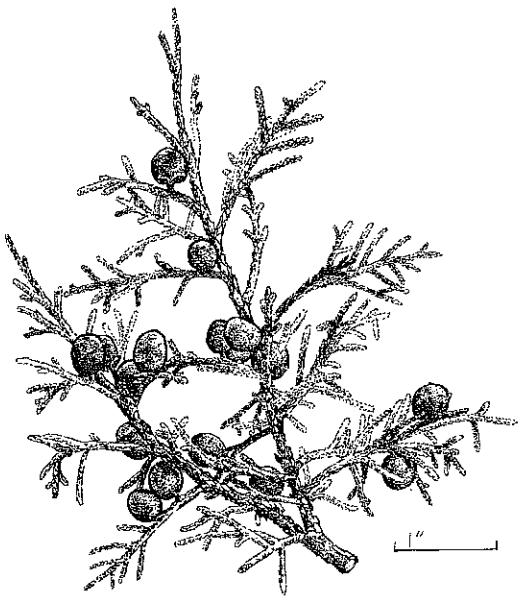
Comparative Appearance

All three of these junipers typically form ragged, bushy trees with canopies extending near the ground and commonly less than 40 feet (12 m) tall. The trunk is often divided into two or more stems near the base. On better sites, they can grow bigger, occasionally more than 30 inches (75 cm) in diameter and 50 feet (15 m) tall. Some junipers on rocky sites that have escaped fire live for several centuries. (A different variety of western juniper that grows high in the Sierra Nevada can live more than 1000 years and attain diameters of more than 6 feet [1.8 m].) The irregularly shaped trunks are covered with thin, fibrous bark that is divided into flat, interlacing ridges. The bark is reddish brown or grayish and hangs in loose vertical strips.

Juniper foliage is at first confusing, since individual trees have two kinds of leaves. Mature trees have mostly tiny, overlapping, scalelike leaves, but juvenile shoots and especially saplings are largely covered with prickly, ½-inch-long (12-mm-long) awl-like leaves. The scalelike leaves are best for identification. Juniper "berries" are technically berrylike cones. Although they are fleshy, they have the vestiges of cone scales etched into their surfaces. Immature juniper berries are green with a white, waxy bloom.

Western juniper. The scalelike leaves are arranged in whorls of three on the twigs. Foliage of western juniper is thick and stiff. Mature berries of western juniper are silvery blue and about ¼ inch (6 mm) in diameter.

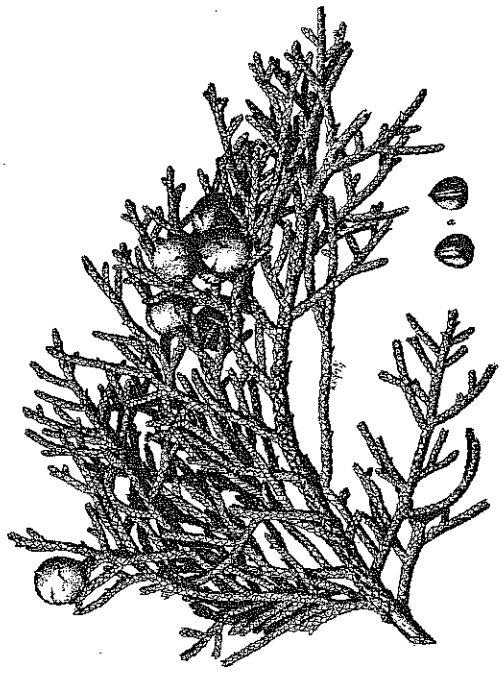
Rocky Mountain juniper. The scalelike leaves are arranged opposite each other in pairs. Foliage (ultimate branchlets) of Rocky Mountain juniper is very fine. Like western juniper, mature berries of Rocky Mountain juniper are silvery blue and about ¼ inch (6 mm) in diameter.



western juniper

Rocky Mountain juniper: juvenile shoot; mature foliage and cones

Utah juniper. The scalelike leaves are arranged opposite each other in pairs. Foliage of Utah juniper, like that of western juniper, is thick and stiff. Mature berries of Utah juniper are silvery brown and ⅜ to ½ inch (9 to 12 mm) thick.



Utah juniper

Ecological Role

Juniper trees are abundant on rocky sites in some of the driest areas of the inland Northwest. Like ponderosa pine, they readily establish deep root systems among the rocks, where they also avoid having to compete with extensive fibrous root systems of grasses and other herbs. Western juniper can survive in places receiving as little as 8 inches (200 mm) of precipitation in the average year, such as the Sahara-like Juniper Dunes Wilderness, administered by the Bureau of Land Management, northeast of Pasco, Washington. Rocky Mountain juniper requires only about 10 inches (250 mm) of rainfall, and this tree occupies dry ravines in arid badland topography, including the Missouri River Breaks in central Montana.

Junipers can form contiguous woodland on sites too dry for ponderosa pine or interior Douglas-fir. Southward in the Great Basin and Southwest, juniper woodland covers more area than pine and fir forests, and it contains several additional species of juniper as well as pinyon pines and a variety of desert shrubs. Northwest

junipers also occupy open stands of ponderosa pine and Douglas-fir on especially dry sites, but they are unable to compete with these forest trees on better sites. Junipers can endure shade in early life, but they become very intolerant of shade as they mature and are quickly overtopped by faster-growing forest trees.

Retakes of early landscape photographs and age analysis of juniper stands demonstrate that many juniper woodlands in Oregon colonized former grass and sagebrush communities in the late nineteenth and early twentieth centuries. Two factors underlie this expansion. Heavy livestock grazing starting in the 1860s removed native grasses and left bare soil receptive to establishment of junipers. Removal of grassy fuel and, later, organized fire suppression kept fire out for prolonged periods. The oldest junipers, dating to before 1850, are largely restricted to extremely rocky sites where fires were very patchy or infrequent because of sparse fuel. Junipers are commonly killed by surface fires that have little effect on ponderosa pines or larger Douglas-firs.

Stands with scattered junipers or patches of them can provide diverse and productive habitat for wildlife. However, many juniper woodlands have become so extensive and dense that they greatly reduce the forage produced by native grasses and shrubs, including bitterbrush (*Purshia tridentata*). A juniper's root system radiates far beyond the tree's canopy and is able to suppress nearby grasses. Also, junipers produce chemical compounds that inhibit growth of surrounding vegetation, a phenomenon called allelopathy.

The juniper's rich berries cling to the tree all winter and are attractive to a wide variety of birds, which eat them for their pulp. The seeds pass unharmed through birds' digestive tract, scarified and ready to germinate. Birds are apparently the principal agent for dissemination of juniper seed across the landscape. One scientist found that 900 Rocky Mountain juniper berries passed through a single bohemian waxwing in five hours. Junipers are often found growing along fence lines as a result of seeds having been deposited there by perched birds.

Although juniper berries serve as food for wildlife, the foliage is normally eaten only as a last resort. Thus, thickening woodlands produce scant forage for wildlife or livestock. These findings have spurred interest in use of fire to thin out juniper woodlands and stimulate grasses and shrubs. This is challenging because today's stands with sparse grass are difficult to burn except under conditions that would produce a severe wildfire. One alternative is to fell some of the trees (and let the foliage cure) in a pattern that creates a receptive fuel bed for prescribed fire.

Human History

Native peoples throughout the Greater Northwest made extensive use of the resinous berries and foliage of junipers as medicine—for instance, to treat colds, coughs, fever, pain, rheumatism, diarrhea, upset stomach, diabetes, pneumonia, and venereal disease; to induce vomiting, aid child birth, and serve as a sedative; and as a poultice for sores (Moerman 1998). Some tribes used the berries as food, generally cooked or roasted. The fibrous bark was employed as kindling and woven into a rope that would smolder and be used for carrying fire when traveling. Bark and roots served in basket-making, and the tough, dense wood was used for bows and firewood.

Pioneer settlers recognized juniper's potential, since they were very familiar with a juniper species in the Midwest and East: *Juniperus virginiana*, commonly called eastern redcedar. Rocky Mountain juniper is so similar to this Midwestern kin that Lewis and Clark did not distinguish it as a new species when they encountered it while approaching the Rockies in the spring of 1805.

Juniper wood is very dense and rot resistant and was used extensively for fence posts and

firewood. Most trunks are so small, limby, and irregular in shape that juniper wood is not sought for conventional wood products. However, some stands produce trunks large enough to provide high-value specialty wood. The outer band of sapwood is creamy white, and beneath lies the fragrant heartwood that is purplish or rosy red when freshly cut and has lovely grain patterns. This makes beautiful "cedar" chests and woodcrafts, which are available in a few localities.

Rocky Mountain juniper is widely planted in windbreaks and horticulturally in dry, rocky soils where irrigation may not be possible. Certain groves of Rocky Mountain and western juniper have trees with dense, spirelike growth forms. Horticulturists have propagated some of these attractive forms through cuttings and made them available for landscaping.

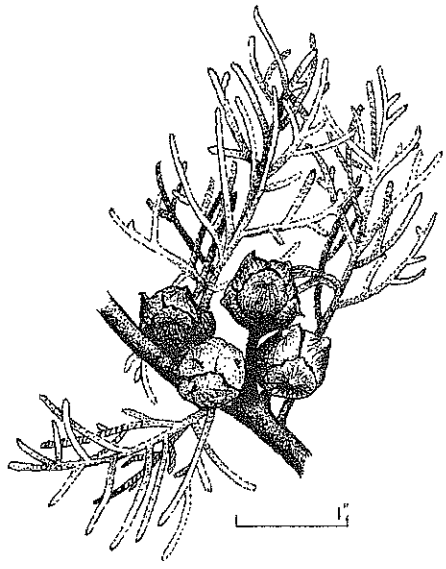
MODOC CYPRESS

Cupressus bakeri, Cypress family—Cupressaceae

Modoc or Baker cypress is a rare and intriguing tree found in small numbers at a few widely scattered sites in the inland portion of Oregon's Siskiyou region. It is slightly more common in northeastern California, ancestral home of the Modoc people. Cypresses (genus *Cupressus*) are trees of warm climates, and the Modoc cypress in Oregon appears to be the northernmost cypress in the world. Cypresses generally have foliage similar to junipers but are taller and lanky. Modoc cypress commonly has a single trunk and narrow crown 30 to 80 feet (9 to 25 m) tall. The foliage is sparser than most junipers, and trees on better sites have a narrow, pyramidal form like that of a young fir. On poor sites, the canopy is scraggly. The small, rounded, woody cones resemble those of false-cypresses—Port Orford-cedar and yellow-cedar—but are somewhat larger. On young trees, the bark is cherry red and peeling, but it becomes blocky and grayish as the tree matures.

Modoc cypress is especially interesting from an ecological viewpoint since it is adapted to and dependent on fire, much like knobcone pine. It has thin bark and is easily killed by fire, but the heat opens the closed cones on the tree and releases viable seeds onto the burned site. Also like knobcone pine, Modoc cypress is slow growing and mainly inhabits poor, rocky sites at moderately high elevations, often on serpentine rocks or lava flows. The best-known groves in Oregon are an accessible one at Miller Lake near Steve Peak in southeastern Josephine County and a more remote grove at Flounce Rock west of Prospect in Jackson County.

Tree enthusiasts traveling US 101 between Port Orford, Oregon, and the California border may by surprised at the sight of many great spreading cypress trees among the forestland and pastures. These are planted Monterey cypresses (*C. macrocarpa*), often marking old homesteads. They thrive here even though they are small and scrubby in their native home on Monterey Bay south of San Francisco.



Modoc cypress