

## WESTERN RED CEDAR

*Thuja plicata* Donn ex D. Don

Plant Symbol = THPL

Contributed by: USDA NRCS National Plant Data Center & the Biota of North America Program



Dendrology: Department of Botany  
© Iowa State University

### Alternate Names

Giant arborvitae, western arborvitae, giant red-cedar, Pacific red-cedar, shinglewood, canoe cedar

### Uses

**Industry:** The wood of western red cedar is primarily used in roofing for shingles and shakes, because of its attractive appearance, durability, lightness, and superior insulation qualities. It is also used in exterior finishings, utility poles, fence posts, piling, paper pulp, and various types of containers. The species is managed for timber in Europe and New Zealand. Cedar leaf oil is often the basis for production of perfumes, insecticides, medicinal preparations, veterinary soaps, shoe polishes, and deodorants.

**Wildlife:** The leaves of western red cedar are a major winter food for big game in the northern Rocky Mountains, and deer browse it all year along the coast. Many cultivars are grown for ornament, including those used for hedges. It is the provincial tree of British Columbia.

**Ethnobotanic:** Western red cedar has been called “the cornerstone of northwest coast Indian culture” and the large-scale use of its wood and bark delineates the

cultural boundary of the northwest coast peoples within its range. Wood served for house planks, house posts, roof boards, various kinds of boxes, and canoes. It is easy to split and was often used for bentwood boxes. Bark was made into skirts, capes, and complete dresses for women, and roots and limbs were used for baskets and rope. The inner bark was used for slow matches to carry the fire from camp to camp, and also as mats, and baskets. Various medicines were derived from the tree.

### Status

Please consult the PLANTS Web site and your State Department of Natural Resources for this plant’s current status, such as, state noxious status and wetland indicator values.

### Description

**General:** Cypress family (Cupressaceae). Native trees growing to 50 (-75) meters tall, often buttressed at base, with a conical to irregular crown, old individuals frequently with many leaders and many dead spike tops; branches arching, branchlets pendent, flattened, in fan-shaped sprays; bark gray to reddish-brown, 10-25 mm thick, fibrous, separated into flat, connected ridges. Leaves are evergreen, scale-like and sharply pointed, (1-) 3-6 mm long, opposite in alternating pairs (in 4 rows), glossy green above, white-striped on the lower surface, with a spicy fragrance when crushed. Seed cones are ellipsoid, 10-14 mm long, brown; seeds 8-14 per cone, 4-7.5 mm long, with lateral wings about as wide as the body. The common name pertains to the western distribution and cedar-like appearance.

**Variation within the species:** although small inter-populational differences have been documented, western red-cedar seems to show less within-species genetic variation than other northwestern conifers. Horticultural varieties with color and growth form differences have been developed (*atrovirens*, *fastigiata*, *pendula*).

**Distribution:** The range of western red-cedar is essentially in two segments: a Coast Range-Cascade Range segment from southeastern Alaska to northwestern California and a Rocky Mountain segment from British Columbia and Alberta to Idaho and Montana. For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site.

Plant Materials <<http://plant-materials.nrcs.usda.gov/>>

Plant Fact Sheet/Guide Coordination Page <<http://plant-materials.nrcs.usda.gov/intranet/pfs.html>>

National Plant Data Center <<http://npdc.usda.gov>>

### **Adaptation**

The trees occur on various substrates, commonly on moist sites (swamps, wet ravines, poorly drained depressions), but on a variety of landforms, including rocky slopes, at 0-1500 (-2300) meters elevation. They usually occur in mixed coniferous forests, rarely in pure stands. In cultivation, they prefer moist, acid, well-drained soils but have been grown in heavy clays of the Midwest.

### **Establishment**

Cone production begins in open-grown trees of western red cedar at about 10-20 years of age but peak production occurs after 70-80 years and may continue for several centuries. Good seed crops are produced at intervals of 2-3 years.

In clearcuts and other disturbed areas, seedlings account for most of the western red-cedar regeneration, but seedlings in mature stands may be less abundant than individuals produced by vegetative reproduction from layering, rooting of fallen branches, and branch development on fallen trees. Disturbed mineral soil seems to be a major requirement for regeneration from seed. Unburned soil provides better seedbed than scorched soil, but slash burning may create mineral soil surfaces in cut-over areas. In mature stands of western red cedar, rotten wood in contact with the soil provides an effective seedbed. Partial shade, which lowers evaporation and soil temperature, is beneficial to seedling growth.

Western red cedar is often present in pioneer, seral, and climax stages of forest succession. Vegetative regeneration may be predominant in ecologically stable communities, but wide seed distribution allows it to invade disturbed areas. It is highly shade-tolerant and is well suited for reforesting high brush-risk areas near the coast.

Age determination of western red-cedar is complicated by buttress formation and the associated complex growth patterns, but ring counts of trees from Washington and British Columbia indicate that some trees live at least up to 1460 years.

### **Management**

In mixed-species and uneven-aged stands, western red cedars tolerate shady understory conditions and can maintain slow but acceptable growth rates over long periods. In timber harvest of these mixed-species stands, most of these trees are taken by clearcutting. Because of steep terrain, decay, and breakage, harvesting costs are high and lumber recovery is low. Because of its high susceptibility to

windthrow in wet environments and in the moist sites where growth and yield are highest, western red cedars should not be left as scattered seed trees. Even those along clearcut margins may be lost to wind throw or exposure.

Severe browse damage to western red-cedar seedlings and saplings by deer, elk, and rodents may be the most important problem in the establishment of young stands. In near-coastal sites, western red-cedar is more severely damaged by fire than any of its associates.

### **Cultivars, Improved and Selected Materials (and area of origin)**

These plant materials are readily available from commercial sources. Contact your local Natural Resources Conservation Service (formerly Soil Conservation Service) office for more information. Look in the phone book under "United States Government." The Natural Resources Conservation Service will be listed under the subheading "Department of Agriculture."

### **References**

- Chambers, K.L. 1993. *Thuja*. Pp. 410-411, IN: *Flora of North America, north of Mexico*. Vol. 2, *Pteridophytes and gymnosperms*. Oxford Univ. Press, New York, New York.  
<[http://hua.huh.harvard.edu/cgi-bin/Flora/flora.pl?FLORA\\_ID=12395](http://hua.huh.harvard.edu/cgi-bin/Flora/flora.pl?FLORA_ID=12395)>
- Gunther, E. 1945. *Ethnobotany of western Washington*. Univ. Washington Publ. Anthropol. 10(1):1-62.
- Minore, D. 1990. *Thuja plicata*. Pp. 590-600, IN: R.M. Burns and B.H. Honkala. *Silvics of North America. Volume 1. Conifers*. USDA, Forest Service Agric. Handbook 654, Washington, D.C.  
<[http://willow.ncfes.umn.edu/silvics\\_manual/Table\\_of\\_contents.htm](http://willow.ncfes.umn.edu/silvics_manual/Table_of_contents.htm)>
- Stewart, H. 1984. *Cedar: Tree of life to the Northwest Coast Indians*. Douglas & McIntyre, Vancouver.

### **Prepared By**

*Guy Nesom*  
Formerly BONAP, North Carolina Botanical Garden, University of North Carolina, Chapel Hill, North Carolina

### **Species Coordinator**

*M. Kat Anderson*

USDA, NRCS, National Plant Data Center, c/o Plant Sciences Dept., Davis, California

Edited: 19jun02 jsp; 04jun03 ahv; 060818 jsp

For more information about this and other plants, please contact your local NRCS field office or Conservation District, and visit the PLANTS Web site <<http://plants.usda.gov>> or the Plant Materials Program Web site <<http://Plant-Materials.nrcs.usda.gov>>

*The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).*

*To file a complaint of discrimination write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.*

*Read about [Civil Rights at the Natural Resources Conservation Service](#).*