

# *Populus balsamifera* ssp. *trichocarpa*

## Black Cottonwood

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**T**he cottonwood tree was an important tree to the Lewis and Clark expedition. When Lewis and Clark determined they needed to portage around the Great Falls of the Missouri River, they used rounds of cottonwood trunks to make wheels and axels. Cottonwood was also used to make dug-out canoes that the expedition used on the Missouri River and provided shelter during the long, arduous trip.

Black cottonwood, *Populus balsamifera* ssp. *trichocarpa*, was common throughout the Columbia River watershed in Lewis and Clark's day, and can still be found today. Lewis made note of it in his journal on July 2, 1806 while the party was at Traveler's Rest in western Montana. He says that the "leaf of the cottonwood on this river [Bitterroot] is like that common to the Columbia narrower than that common to the lower part of the Missouri and Mississippi [plains cottonwood] and wider than that on the upper part of the Missouri [narrow-leaved cottonwood]." Lewis had obviously been looking closely at the various cottonwood trees he encountered along the route and was able to distinguish three different species. The specimen of black cottonwood that is preserved in the Lewis & Clark Herbarium at the Academy of Natural Sciences in Philadelphia has a label that was affixed by Frederick Pursh, the botanist who was engaged to look at the Lewis and Clark plant specimens. The label says, "Cotton tree of the Columbia River. Jun: 1806." Although black cottonwood was observed along the Columbia River drainage in April and May, in June 1806 the expedition was in Idaho along the Clearwater River drainage waiting to cross the Lolo Trail into Montana. To muddy the waters further, both the Clearwater and the Bitterroot Rivers are tributaries of the Columbia, of which Clark and Lewis were undoubtedly aware. Given Lewis's notation in his journal on July 2 and the developmental stage of the specimen, it is believed that the black cottonwood specimen in existence today was gathered in Mon-



Photo: Wayne Phillips

*Populus balsamifera* ssp. *trichocarpa*  
(Black Cottonwood)

tana, probably along the Bitterroot River near Traveler's Rest.

Black cottonwood has also been known by the scientific name *Populus trichocarpa* and is a member of the willow (Salicaceae) family. To make identification a bit more complicated, it hybridizes with various other members of the genus.

Black cottonwood is distributed along streams from Alaska to Baja California, and east to Nevada, Utah, Wyoming, Idaho, Montana, North Dakota, and Alberta, Canada. The species is widespread west of the Continental Divide in Montana, and can be found at higher elevations in central and eastern Montana. Black cottonwood is present throughout Idaho, Washington, and Oregon, and the expedition probably saw it frequently in those states. In west-

ern Montana, where Lewis collected the specimen, black cottonwood is often found with other trees such as ponderosa pine, Douglas-fir, Engelmann spruce, Rocky Mountain juniper and quaking aspen, and with shrubs like Wood's rose, willows, common chokecherry, snowberry and red osier dogwood.

Black cottonwood is a large tree that can reach 150 feet in height and six feet in diameter. It usually has a straight, branch-free trunk for more than half its length and a broad, open crown. The bark of older trees is deeply furrowed. Black cottonwood is a fast growing, deciduous tree and commonly lives 100 to 200 years. The flowers grow in catkins, with male and female flowers occurring on separate trees. The seeds bear long, white hairs, the "cotton" fibers that allow the seeds to be dispersed by wind or water. Black cottonwood trees normally produce seeds when they are seven to 10 years of age. Seeds disperse when river flows begin to decline after peak flows in the spring, sometimes as late as mid-summer. If it is a wet spring with lots of runoff, water flows may be so high that the seeds are carried too long and lose viability before they reach a favorable place to germinate.

Germination rates for black cottonwood seeds are high if moisture is present, but seedling mortality is also high because the depth of the water table usually falls faster than the new roots can grow. Additionally, few seedlings survive if they sprout in areas with existing vegetation. Given the precise conditions needed for black cottonwood survival, it is no wonder that the trees are declining in much of their range. In the Southwest, an estimated 70 to 95% of riparian vegetation has been lost or disturbed and in the Sacramento Valley of California the area of riparian forests has been reduced by 98.5% since 1850. In the northern Rocky Mountains, including Montana, less has been lost. The causes of decline of riparian cottonwood stands in western North America are believed to be: livestock grazing, water diversion, settlement by humans, invasion by exotic plant species, stream reservoirs and dams, channelization of water courses, clearing the land for agriculture, gravel mining, harvesting, and overuse by beavers because of the lack of historic predators.

Black cottonwood is useful for establishing native vegetation on disturbed sites. It is fast growing and does well in moist, mineral soil in full sunlight. It is often found as an early component on logged or otherwise disturbed sites.

Fires frequently damage older black cottonwood

trees and young trees and seedlings are usually killed. But black cottonwood has the ability to sprout from stumps, lateral roots, and root crowns and thus can persist. And fire can improve seedling establishment by increasing the amount of available light and exposing mineral soil, thus allowing seedlings to get started. Moisture must be available, however, or the seedlings will die.

Streamside black cottonwoods improve fish habitat by providing streambank stability and reducing erosion and the resulting siltation. A cover of black cottonwood helps maintain low water temperatures through shading, and increases nutrient-rich litter for the aquatic food chain. Black cottonwood is an important source of cover for elk, moose and deer and is used by beavers to build dams as well as for forage.

Black cottonwood is not tolerant of much grazing, and trampling and grazing by livestock can reduce the abundance of the species. Land managers are using exclosures and rotation grazing to allow black cottonwood stands to become established. The negative effects of dams and watercourse diversions on black cottonwood are also being studied.

The American Indians encountered by the Lewis and Clark expedition used black cottonwood for a number of food and medicinal needs. An infusion of the buds was used to treat sore throats and whooping cough. Various preparations, often mixed with fat, were used to treat skin problems, bruises, sores, and aching muscles. The inner cambium layer of bark was consumed as food and twigs and bark were fed to horses. Several tribes used the wood to make dugout canoes and mats, cord, baskets, bedding, and sweat lodges were also made with materials provided by the black cottonwood. The yellow buds were used to make a yellow dye and the dried inner bark could be used for soap.

The black cottonwood is clearly an important tree, both for native American culture and for western history. Efforts to enhance its habitat and preserve native stands should be supported.