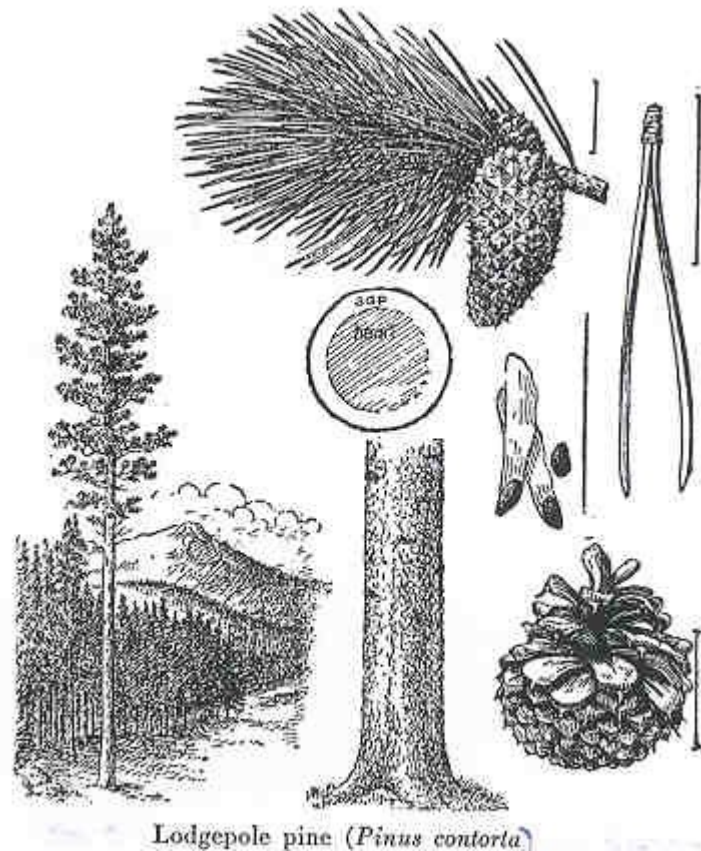


Lodgepole Pine



Lodgepole is well-known as a tall, slender tree, growing in forests composed exclusively of even-aged, tapering trees of this single species, and whose trunks are free of limbs with the proportions of a drinking straw. Lodgepole reaches a typical height of 70 to 80 feet (21 to 24 m) but usually is less than 15 inches (38 cm) in diameter, in the southern Rockies.

Less well known is the Lodgepole's ability to assume very different forms from the tall slender variety. Single Lodgepole pines mixed with other conifers may retain the characteristic height, with a thicker trunk of a foot or more in diameter. If conditions are right, it may keep full foliage all the way down to the ground. Sometimes the thick lower branches die but remain on the tree. Or it may have a thick stout trunk, branching into several equal-sized central stems near the ground, with full foliage from the ground up, and be nearly as broad as it is tall. There are forms intermediate between the two extremes. Different forms may be found very near each other, if the conditions of space and light are suitable. It appears the short thick forms require full sun for many hours a day, no other trees crowding it, and above average moisture for the roots. The tall slender form with green branches only near the top is by far the most common form, but be ready to find other shapes completely unlike the typical slender Lodgepole. A lush green pine with a thick trunk, and foliage nearly to the ground, may be a Lodgepole.

Lodgepole pine are common in Colorado, from 7000 to 9800 feet (2100 m to 3000 m) above sea level. Sometimes Lodgepoles are found as low as 6000 feet (1800 m) or as high as treeline. Lodgepole is

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generally found in forests composed entirely of this one kind of tree, but also is mixed with other trees of the Montane and Subalpine zones.

In Colorado Lodgepole usually begins at an altitude a little below where the Ponderosa leaves off, so that the two trees may be found in mixed stands. Lodgepole pine flourishes in moister conditions than Ponderosa, but it is also found on dry sites. In Colorado Lodgepole replaces Ponderosa along the west side of the Front Range, often mixed with other conifers, while Ponderosa is common on the east side. Lodgepole are common in the central mountain ranges of Colorado, north of the San Luis Valley, and on the western slope.

Forests composed entirely of Lodgepole are most often found from 8200 to 9300 feet (2500 to 2800 m) elevation. Some Lodgepole forests have trees of uniform age, and others have mixed ages. The uniform stands are the result of the simultaneous sprouting of seeds of the Lodgepole following forest fires which release seeds from the cones of existing Lodgepole pines.

Lodgepole is an aggressive and hardy pioneer species following fire, though thereafter it is a slow growing tree. Seed generation is prolific. At first the young trees are close together - as many as 10,000 per acre - forming dense groves. The trees take most of the nutrition and sunlight, suppressing other growth, including younger Lodgepole pines. The pattern of a single-aged forest of uniform sized trees is established. As time passes some trees die and more light reaches the forest floor. Lodgepole pine is mature around 200 years, and the maximum age is 500 to 600 years.

There is little shade in some mature, open, single-aged stands of Lodgepole pine, and little living ground cover. The ground is littered with fallen dead pine limbs and trunks, sometimes even piles of them. The hot sun, persisting all day, prevents decay and dries the fallen wood until it is prime fuel for a forest fire. The great fires in Yellowstone National Park in 1988 were fueled by abundant fallen dry wood, often Lodgepole pine, which had accumulated over decades without fires. Smaller fires which would have burnt the ground litter earlier, in small fires, before accumulating in dangerous quantities, had been "suppressed" (extinguished) according to the forest management policies then accepted.

Lodgepole pine pioneering disturbed sites may be replaced by Douglas fir, Engelmann spruce, or Subalpine fir, if seed trees for these species are available, and if conditions are not too dry for the seedlings of these species to survive. The Lodgepole stand may regenerate itself if fires repeat, or if fires have destroyed seed trees of other kinds, or if seedlings of other trees die for lack of moisture. A Lodgepole stand can become a climax forest. You can't tell whether a Lodgepole forest is climax just by looking at it. When Engelmann spruce moves into a Lodgepole forest, some 60 to 100 years pass before the spruce gets well started; the increase in shade and moisture created by mature pine trees is required before the spruce can grow. Subalpine fir takes even longer.

The wood of the Lodgepole is moderately strong, and its long even timbers and location near early towns made it very handy for the first settlers, who used it for railway ties, telegraph poles, corral fences, sheds, stables, bridges, barns, mine timbers, log cabins, fruit boxes, and most anything else that needed lumber.

Today lodgepole pine is used for log cabins, posts and poles, siding, and rustic furniture. And of course it was, and still is, exactly right for tipi poles. The slender trees furnished poles for the tipis or lodges of the Ute, Arapaho, and other tribes. It was highly valued by Indian tribes of the plains, who made special journeys to the mountains for lodge poles. Francis Parkman's classic first-hand account of early western life, *The Oregon Trail*, is in part about such a journey.

The slender Lodgepole pine was first described for science in *The Geologic Exploration of the Fortieth*

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Parallel (1871) whose principal author was Clarence King, one of the finest reports from the early government exploring parties. Although the Lewis and Clark expedition (1804-1806) became very familiar with this tree, and would have described it had Lewis lived long enough to publish his reports, Lodgepole was one of the last western trees described for science, although being very common.

A parasite on Lodgepole pine -- something seen during hikes in the forest -- is Dwarf mistletoe (genus *Arceuthobium*). Dwarf mistletoe is a flowering green plant, though it looks like a mass of spindly yellow twigs. The leaves are tiny and the entire mass yellow-green or yellowish. Dwarf mistletoe roots bore below the bark and extract nutrients from the host tree. Tree growth becomes deformed where Dwarf mistletoe grows. Widespread attacks can kill the tree. Mistletoe seeds ripen in late summer and shoot outwards, sometimes as much as 30 feet (10 m) or more, so that some land on neighboring trees and start new infections. Dwarf mistletoe also afflicts Ponderosa pine. Unlike many plant pests, Dwarf mistletoe does best when it attacks healthy trees.

A much more destructive pest is pine bark beetles [2010 - to rewrite this section....]

Seed generation in the Lodgepole may begin in trees as young as ten years old. The cones are numerous, small, and often stay fixed to the tree for many years. The cones weather, turn gray, and lose their bristles, but the seeds inside are still vital. Forest fires can melt the resins which glue the cone scales together, causing the cones to begin to open. Such cones are called serotinous. During a fire the cones open, more or less completely depending on exposure to heat, and seeds are released. Some seeds burn but others fall to the ground, survive, and eventually new trees sprout and grow. In this way a fire which destroys one Lodgepole forest gives rise to a new one.

You can open a closed Lodgepole cone by heating it in an oven, or by holding it on a stick over a campfire. Baked at 500 degrees F (260 C), some cones will open enough to release seeds within four minutes, and most cones are fully open in ten minutes. Less intense heat demands considerably longer to open cones completely. The cone resin appears to melt somewhere in the range of 200 to 250 degrees Fahrenheit (90 to 120 C), judging by experiments I have made. As cones are subjected to progressively higher temperatures, less time is required for them to open. This is simply due to the fact that the cone and resin heat up more rapidly at higher temperatures, so reaching the melting point faster. Forest fires can be very hot but the intense heat passes very quickly. Otherwise the seeds are burned.

Some Lodgepole cones open naturally without heating. Fires are not necessary for new Lodgepoles to sprout. Depending on the tree, 15% to 50% of Lodgepole cones will open without heating. Some trees have a much higher proportion of non-serotinous cones than other trees.

Lodgepole cones have bristles, and are usually hard to open, a problem animals such as the chickaree squirrel who loves to eat the seeds. Some cones are so firmly attached to branches that the tree trunk will eventually grow around them. You may find an old intact cone completely inside a solid trunk when splitting fire wood.

The scientific name is "Pinus contorta Douglas ex Loudon var. latifolia Engelmann." Pinus contorta means "contorted pine," and originally referred to the contorted shapes of the Lodgepole pines where the tree was first identified along the shores of the Pacific Ocean by David Douglas. Such contorted trees do not occur in Colorado, but the name recalls the variability of shape. The variety name latifolia refers to the curved cone axis.

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Identifying features of Lodgepole pine

Needles

Needles in bundles of two, 1 to 3 inches (2.5 to 7.5 cm) long; typically 1 1/2 - 2 1/2 (3.8 to 6.3 cm) inches, clustered near the ends of the branches. Needles are often curved, and twisted about half a turn along their length. Margins of needles have very tiny teeth. Light green or yellow-green, lighter and yellower than other pines in the area. Needles persist on the branches four to six years.

Cones

Mature cones are 3/4 to 2 inches long, hard, usually closed, and are attached very firmly to the stem, so much so that attempting to twist off a cone may break the stem. The axis of the cone often curves back up the stem towards the trunk. New cones have a sharp spine or bristle at the tip of each scale, but these wear away on old cones. Color varies from light brown to gray in old cones. On most trees cones stay closed and attached to the branches for years, even on dead branches, peppering the inside of the tree with cones which can be seen from distance – one way to recognize Lodgepole from a distance.

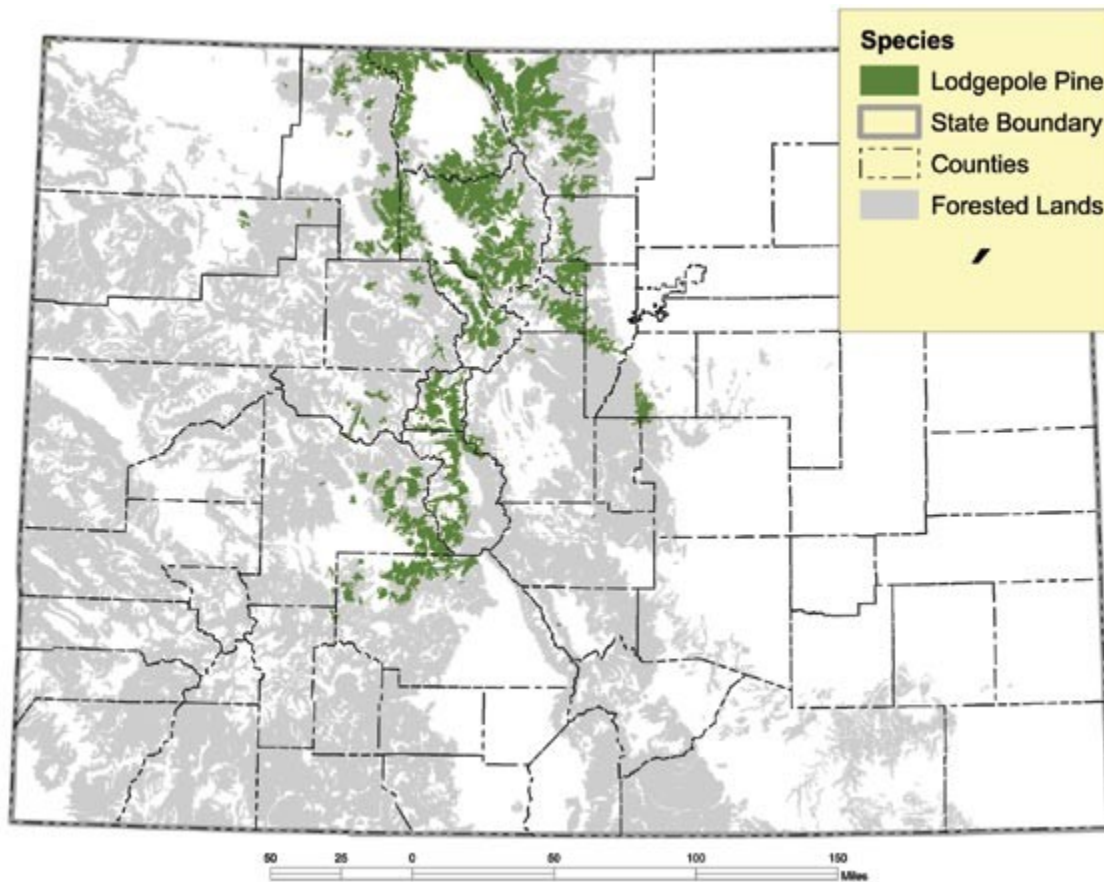
Large crops of cones occur at least every three years. Quite young trees, even 10 years old, can have cones.

Seeds are about 1/8 inch (3 mm) long, with a reddish-brown wing half an inch long.

Bark

On young trees, the bark is covered with small grayish scales. Bark of mature trees usually is uniformly gray in small thin scales, a little darker than ash-gray, to nearly black. It may have some light brown, orange-brown, or reddish-brown scales, or be orange-brown all over. It is not unusual to see one side of the tree orange-brown and the other side dark gray. The orange-brown color appears where sunlight strikes the bark. The scales may be smaller than a fingerprint or as large as three fingers in width. The orange-brown bark does not have the deep furrows of the Ponderosa pine. The orange-brown color is similar to Ponderosa pine bark and even more to some mature Engelmann spruce bark. The bark is very thin and so lacks the thick ridges and furrows of large Ponderosa, but confusion with Engelmann spruce is possible. As always, identifying a tree by the bark is often ambiguous. Lodgepole pine bark is quite thin and gives little resistance to forest fires.

Lodgepole Pine



Lodgepole Pine forests of Colorado. Map by Colorado State Forest Service.

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