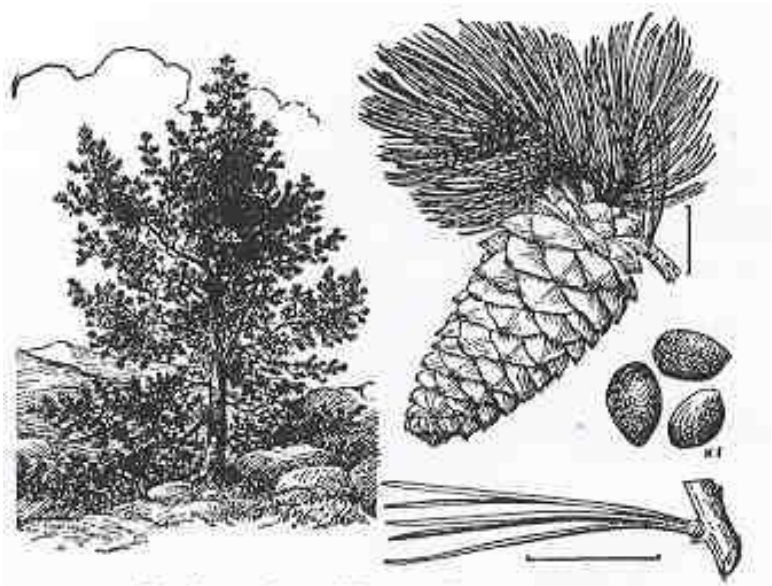
Limber Pine



Limber pine (*Pinus flexilis*). A bundle of needles; a cone; seeds

This pine is best known as a tree of high, cold, and windy ridges. Limber pine can grow well on high forest sites that are too stony, dry and windy for most other trees. It is typical on coarse dry thin soil, and on rocky hills and ridges and other exposed and windy sites, especially above 9000 feet (2750 m). Limber pine forms permanent groves where conditions are too severe for other species. It is also found in sheltered woodlands, among Lodgepole and Ponderosa, and in a rare case as low as the Pawnee Buttes on the plains northeast of Fort Collins, below 5000 feet elevation (1500 m).

Limber pine commonly has a bushy form and branching trunks, like the Bristlecone pine which is found in similar settings, but Limber pine is more abundant and reaches a larger size, commonly 20 to 50 feet tall (6 to 15 m). The upper crown may be wide-spreading, in outline exactly the opposite of neighboring tall and tapering Subalpine firs and Engelmann spruces. It has a deep tap root and is hard to blow down, and like most trees in these conditions is slow growing. Old trees can have very stout trunks: one tree in South Park is 21 feet (6.8 m) around the trunk.

Long, thin Limber pine branches can be bent completely back on themselves, into a circle, without strain or cracking. On windy sites Limber pine may be short and twisted. The tree can be bent by the wind in exposed locations, having an irregular form with a wide and irregular top. Limber pine exposed to frequent strong winds from one direction, as near tree line, will have few or no limbs on the windward side, and the bark on the upwind side is smooth with a reddish-brown tint. (Lodgepole pine can also show these characteristics.)

Some Limber pines in Colorado exceed 1000 years in age. The oldest known Colorado Limber pine is a small 1660-year-old tree in South Park. Like Bristlecone, the wood of ancient Limber pine can be sculpted by wind and ice into complex and curved forms. Some old trees have living growth on a few small branches while much of the tree is dead.

This tree is an effective pioneer in colonizing disturbed sites. Limber pine stands, often mixed with Bristlecone pine, may give way to aspen or the climax evergreen tree varieties, appropriate for the altitude, after being established following a fire or other disturbance. In places with severe conditions Limber pine can persist in permanent groves. Limber pine is occasionally damaged by bud worms, bark beetles, and dwarf mistletoe.

Limber pine needles and stem

Limber pine seeds are large and lack wings (as are Pinyon pine seeds). They must be distributed by wildlife. The seeds are eaten by nutcrackers, who also make seed caches, burying the seeds in moist soil, where they may sprout if undisturbed. Sometimes several seedlings will sprout from a single cache, and grow together into what appears to be a single tree with several main stems.

The lives of Limber pines and Clark's nutcrackers are usually closed connected. The Limber pine seeds are an important food for the nutcracker, and the nutcracker aids the tree. This is a clear case of co-evolution; the tree aids the bird and the bird aids the tree. The pine's seeds nut are large and nutritious; but the cone stays closed and only the nutcracker can get the seeds out. The cones grow horizontally from the branches, where the bird can reach them.

The nutcrackers have a pouch under the tongue which can hold dozens of the seeds, more than seems possible. From August to November Clark's nutcrackers harvest Limber pine seeds, and bury them in caches for winter food. Each bird is said to collect 20,000 to 30,000 seeds each fall – say about 200 seed each day – and they appear to remember where they bury them all. Limber pine seeds are these birds' only winter food, aside from snacks from the occasional back country skier. Snow-free sites are preferred cache sites, so that the seeds can be retrieved in mid winter.

No all seeds buried by birds or squirrels are recovered and eaten. Some sprout and grow into trees. Limber pines are common on sunny ridge sides and in spots kept free of snow by wind, seemingly unpromising sites for trees, rocky and gravely and scoured by the wind, just as the birds intended when they buried the seeds.

The presence of Limber pine at Pawnee Buttes, in a location so far from and so unlike a mountain environment, raises a question – how they get get there? It is far from any other stand of Limber pine. Did they grow from seeds left by Indians as a food cache, like the Owl Creek cache of Pinyon pines? Or by a bird caching seeds? Alternately, the trees may be a vestige of a time when the climate was cooler, and Limber pine grew from the high mountains onto the Plains, during the last Ice Age.

The Limber pine was first described for science by Edwin James, the naturalist on the Stephen Long expedition to Colorado in 1820. James first wrote about the "flexile pine" on July 4, 1820, when James and others of the expedition made the first known ascent of Pike's Peak.

The scientific name is “Pinus flexilis James,” flexilis referring to the flexible small branches.

The Whitebark pine of Yellowstone National Park is a very similar species.

Identifying Features of Limber pine

Needles

Needles are usually in bundles of five; sometimes three or four; stout or rigid, 1 1/2 to 3 inches long; often 2 inches or more. Needles tend to be tufted on the end of each branch. The needles lack the white resin specks found on Bristlecone pine needles. Bristlecone needles persist on the stems, making a bottle-brush form, unlike Limber pine's tufts. Limber pine needles' color is lighter and paler than Bristlecone pine needles. The papery sheath around the base of each new needle bundle soon weathers away.

Cones

Large; 3 to 6 inches long (7 to 15 cm) and sometimes more, oval in outline, with no bristles. Mature cones are pale or light brown; scales are thick and broad at the ends with no bristle at the tip. Seeds are 3/8 to 1/2 inch long (9 -12 mm), edible, dark brown, and wingless. The lack of the bristle distinguishes this tree from the Bristlecone pine, as does needle length, and the large wingless seed. It will be hard to find a seed in a cone.

Mature cones have drops of sticky resin on the ends of each scale. Cones grow near the ends of branches, at the base of each new year's growth. The small male cones producing pollen, as in the photo, are on branch tips.

Branches

The smaller branches are flexible, often long, and may be bent easily: more flexible than other pine trees. Thin branches often can be bent back on themselves without cracking. The branches are fairly widespreading and can droop.

Bark

On most trees the bark is pale gray, or sometimes “silvery-white.” Until it reaches 6 inch (15 cm) in diameter the bark is smooth, without scales, furrows, or resin blisters. Where exposed to strong winds, smooth bark on trunk and limbs may be reddish-brown, almost with a purplish cast. Above 6 inches the bark becomes pale gray and scaly. On thick stems and old trees it is dark gray or gray to blackish and broken into large or small scaly plates. The oldest trees may have a reddish-brown tinge to the bark.