

# Limber Pine



Parks &  
Open Space

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Limber pine (*Pinus flexilis*) is a long lived, five-needle white pine widely distributed in western North America.

Photo taken by BCPOS Staff.



Photo of a limber pine taken by BCPOS Staff.

## Species Description

**Needles:** Needles are yellow-green, 1 ½ – 2 ½ in. long and occur in bundles of five.

**Cones:** Cones are light brown and 3 - 6 in. long.

**Trunk:** Mature bark is a brownish to silver/grey and covered in ridges. It is considered a small- to medium-sized tree. As the species name suggest, branches tend to be pliable and can withstand high winds and heavy snow loads.

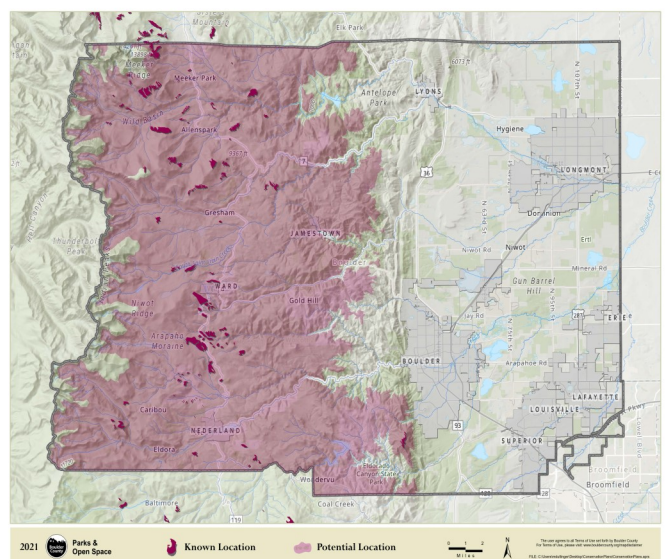
## Background

Limber pine belongs to the Pinaceae family.

In Boulder County, limber pine is a very minor forest component below 8000' elev. and is usually restricted to very dry and windy sites. Above 8000' it is more common. While not economically important, limber pine serves many functional roles in the ecosystem including soil stabilization, snow retention, controlled water runoff, and high elevation biodiversity.

## Distribution & Range

Occurs across a broad elevation gradient; elevations in Colorado range between 5,200-11,000 ft. Individuals occupying dry, high elevation sites can be extremely long lived, with the oldest trees exceeding 1000 years in age. These inhospitable sites can produce odd growth forms in the tree, from low growing krummholz to gnarled, wind-battered individuals.





## Threats

*White pine blister rust (WPBR):* WPBR is a fatal disease of five-needle white pines caused by *Cronartium ribicola*, a fungus native to Asia. The fungus eventually forms perennial cankers on branches and/or stems. Continued growth of these cankers kills living tree tissue.

*Dwarf mistletoe (DM):* Limber pine DM (*Arceuthobium cyanocarpum*) is parasitic in nature, using its host to provide food and other nutrients to itself. DM causes stress in trees which can stunt growth, reduce cone production, and cause death.

*Mountain Pine Beetle (MPB):* Native to the Colorado, MPB populations are ever present at endemic levels but, given the right climatic and forest stand conditions, can reach epidemic levels, resulting in massive tree loss.

*Wildfire:* Limber pine has thin bark and so it can tolerate only low-severity fires.

*Climate Change:* With a changing climate, we can expect limber pine populations to shift their distributions in response to these changes. Warming trends could increase the size and frequency of wildfires. The warming climate can also increase the length of the season that insect outbreaks can occur.

Limber pine infected with limber pine dwarf mistletoe.

Photo taken by BCPOS Staff.



## Management Considerations

*Mapping:* Continue locating unmapped populations both County wide and on Boulder County Parks & Open Space (BCPOS) properties.

*Monitoring:* Monitor existing population for WPBR, DM, and MPB.

*Coordinate management actions with BCPOS:*

- Report any existing populations.
- Collect cones and have seeds grown out to test for WPBR resistance.



Both photos show limber pine infected with white pine blister rust.

Photo taken by BCPOS Staff.





2021

The areas displayed in this map indicate known and potential locations of the following species in Boulder County:


*Pinus flexilis*




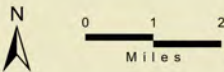
Limber Pine

Limber pine is a long lived, five-needle white pine widely distributed in western North America. As a keystone species it contributes to ecosystem function and stability. It is a Species of Special Concern in Boulder County due to multiple threats including Mountain Pine Beetle, Dwarf Mistletoe, and White Pine Blister Rust.

This map shows known limber pine co-dominant alliances that occur in Boulder County. Data was compiled from the following agencies: Rocky Mountain National Park, United States Forest Service, City of Boulder Open Space & Mountain Parks, and Boulder County Parks & Open Space.

 Known Location

 Potential Location



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