



## TREES AND SHRUBS

### Black Hills Forest Species Urban Forest Species

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# PINES OF SOUTH DAKOTA

## PONDEROSA PINE

(*Pinus ponderosa*)

### Description

*Pinus* is from the Latin name for pine, from the Sanskrit *pitu*. *Ponderosa* is from the Latin *pondus*, meaning great weight or bulk in reference to its size. Other common names are: western yellow pine, yellow pine, blackjack pine and bull pine. The Lakota referred to ponderosa pines as *wazican*.

Ponderosa pine is a member of Pinaceae, the pine family along with Black Hills spruce (*Picea glauca* var. *densata*). The leaves are evergreen, 5 inches to 11 inches (13 to 28 cm) long, dark gray-green to yellow-green with needles in bunches of 3's or 2's on the same tree.

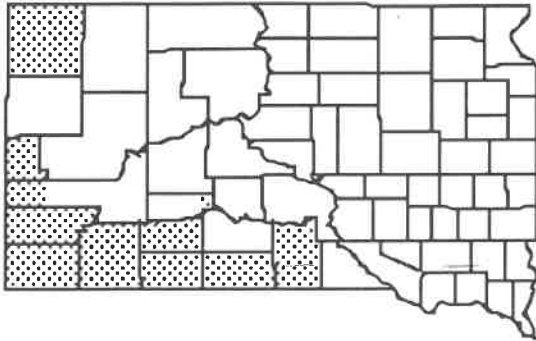
Male cones are orange or yellow and are located in small clusters near the tips of the branches. The female cone is oval, woody, and 3" to 6" (8 to 15 cm) long, with a small prickle at the tip of each scale. Twigs are stout and give off a turpentine odor when broken. Bark varies, sometimes brown to black and deeply furrowed, otherwise brown to dark red and broken into flat, scaly plates.



### Distribution

Ponderosa pine is native from British Columbia, throughout the western U.S. and into central Mexico. It extends as far east as central South Dakota and Nebraska and west to the Pacific coast of Oregon. It has been the state tree of Montana since 1949. In South Dakota, it occurs as far east as Todd, Mellette and

Tripp Counties, then westward to the border. Ponderosa pine is found in the Black Hills and in scattered pockets in Harding County. Ponderosa pine is the dominant tree in West River, covering over 1.3 million acres.



**Native Distribution**

Ponderosa pine is classified as intolerant, but it is a *climax species* in much of the Black Hills. Ponderosa pine associates with several other plants forming distinct communities. For example, in the drier, southern part of the Black Hills, primarily on the steep, rocky slopes, ponderosa pine occurs with Rocky mountain juniper (*Juniperus scopulorum*) as an understory species. In the northern part of the Black Hills, ponderosa pine is found with bur oak (*Quercus macrocarpa*) as the understory species. These are just two examples of the adaptability of ponderosa pine.

Ponderosa pine grows on drier sites so it is more common on west and south-facing slopes where it may be found from the base to the peak of the mountain. On the north and east-facing slopes, where conditions are cool and moist, ponderosa pine may be replaced by spruce above 6,000 feet (183 km).

### Natural History

One reason for the adaptability of ponderosa pine is the early formation of a *taproot*. Four year-old seedlings may have a *taproot* that extends down 5 feet (152 cm) while only showing a foot (30.5 cm) of shoot growth above ground. The early formation of a deep root system al-

lows the pine to survive droughts. The *taproot* does not continue to develop as the tree matures, typically the root system only extends down 5 or 6 feet (152 to 183 cm), with most of the roots found in the upper foot of soil. Ponderosa pine, while being intolerant, responds well to release. This means that the tree will usually not die when suppressed by surrounding trees, but instead continue to grow slowly. In the Black Hills there are "*dog-hair*" stands of ponderosa pine which often contain 20,000 to 40,000 trees per acre. The competition for water among all the trees prevents any from growing and the stand stagnates. Once some of the trees are removed, the remaining trees begin to grow and develop into healthy pines.

Uncontrolled fires were once the greatest threat to ponderosa pines. Fire scars on old trees testify to the continual presence of fire, often occurring every 10 years or so. Young trees were often seriously injured or killed by fires that scoured their crowns. Usually only the healthiest trees survived these fires. While fires were a threat to individual ponderosa pines, they were also a benefit to the forest. By eliminating the weaker trees, the stronger ones had more room. With the absence of fire, many "*dog-hair*" stands developed. Today, instead of fire eliminating the weaker trees, these forests are thinned out by forest harvesting.

Another threat to ponderosa pine is attacks by the mountain pine beetle (*Dendroctonus ponderosae*). This small bark beetle is one of the most destructive insects in the western states. During the 1895-1908 outbreak in the Black Hills, over one billion *board feet* of ponderosa pine were killed. To provide some perspective to this number, the average single family home is made of 10,000 *board feet* of lumber.

The mountain pine beetle primarily attacks lodgepole (*P. contorta*) and ponderosa pine. The beetles feed on the food-conducting tissue found just beneath the bark. They attack a tree in

large numbers then move to the surrounding trees. This is the reason groups of trees are killed. The beetle attacks trees that are stressed by drought, have been injured by lightening or are over 80 years old.

**Life Span:** Ponderosa pine is a fairly long-lived tree, as are most evergreen trees. They live to be about 300 to 500 years old, though a tree over 800 years old has been found in Utah. In the Black Hills, the mature ponderosa pines are 90 to 290 years old, though one individual is documented to be 690 years old. This tree is growing in Reno Gulch near Hill City. The rocky terrain surrounding it has provided protection from fire and the saw.

**Size:** Ponderosa pine often become 150 to 230 feet tall (46 to 70 m) and 60 to 96 inches (152 to 244 cm) in circumference. In the Black Hills, most are only 80 to 100 feet (24 to 30 m) tall. The national champion in Pluma, California, is 287 inches (729 cm) in circumference, 223

feet (68 m) tall, with a crown spread of 68 feet (21 m). The state champion ponderosa pine is near Custer. The tree is 129 inches (328 cm) in circumference, 132 feet (40 m) tall and has a crown spread of 32 feet (9.8 m). This champion tree is also the tallest tree in South Dakota.

## Significance

Ponderosa pine is the second most important *softwood* for lumber production in the United States. In South Dakota, it is by far and away our most abundant and important timber species. Ponderosa pine is a strong, light wood used for lumber to frame houses and in general construction. It is also sometimes used as a furniture wood.

Ponderosa pine is also a valuable wind-break and *ornamental* species. While not native to the East River prairie environment, it has adapted well and is extensively planted.

## ARE THERE ANY OTHER NATIVE PINES IN THE BLACK HILLS?

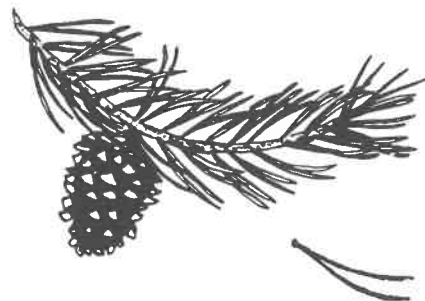
There are two other pines native to the Black Hills, but none native to the eastern part of the state. Both western species occupy a very small area of the Hills.

## LODGEPOLE PINE

(*Pinus contorta*)

Lodgepole pine is called *Wazi* by the Lakota. Its needles always come in 2's and are only 1 to 3 inches (2.54 to 7.6 cm) long, so they are not easily confused with ponderosa pine. Lodgepole pine occurs from the Yukon to southern California and from Colorado to the Pacific shores. In South Dakota, it is found in a small area in the Black Hills west of Nahant. Here the lodgepole pines grow on the northern aspect of a ridge, just beneath the crest.

Lodgepole pine is a fire species, meaning fire is important to its establishment. The *cones* of lodgepole pine remain attached



to the tree and closed for as long as 15 to 20 years. After a fire, the cones open and thousands of seeds fall to the freshly exposed mineral soil. Lodgepole pines grow quickly and soon a dense stand of pine results.

Lodgepole pine can live for 200 years or more and may reach 90 to 100 feet (27

to 30.5 m) in height. The trees in the Black Hills are much shorter. There is not a designated state champion tree.

Lodgepole pine gets its name from the American Indians using the light, strong wood for lodge poles. The trees grow tall and slender, with few branches along the lower trunk making it an ideal pole.

## LIMBER PINE

*(Pinus flexilis)*

Limber pine has no known Lakota name. The species has needles in clusters of 5's, the only native pine to do this. The needles are about 2.5 inches (6.4 cm) long. Limber pine grows in the mountains at elevations of 4,000 to 10,000 feet (122 to 305 km) from southern British Columbia to southern California. It occurs as far east as parts of Wyoming expect for a single stand of trees in the Black Hills. In the Black Hills a small group is found in the Cathedral Spires area of the central Hills. These trees are found on very steep north-facing slopes, which is a common habitat throughout their range.

Limber pine is a small, slow growing tree that rarely becomes taller than 50 feet (15 m). There is not a designated champion in South Dakota.



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