

Lodgepole Pine

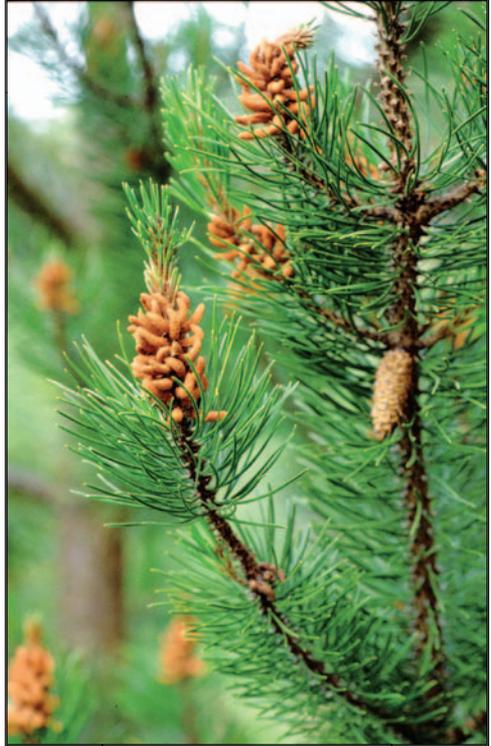
Pinus contorta Dougl.
ex Loud. var. *latifolia*
Engelm. ex S. Wats.

Alternate Names

tamarack pine

Description

Lodgepole pine is a small to large resinous evergreen tree typically growing 50 to 75 feet tall, with 8 to 12 inch trunk diameter and a narrow crown. Needles are relatively long (1 to 2¼ inches), stiff, often twisted, and clustered in bundles of two with a sheath at the base. Twigs are orange when young, becoming gray brown, rough, and stout with age. Bark is gray to dark brown and scaly. Cones are 1¼ to 2 inches long, egg-shaped, almost stalkless, and pointing outward. Typically cones do not open and release seeds until after a forest fire, however some open at maturity in Alaska. Seeds are brown and small with a long broad wing.



Kreekpoto by Jaup de Kreek

Similar Species

This species includes 2 geographic varieties in Alaska. The native coastal form, shore pine (*Pinus contorta* Dougl. ex Loud. var. *contorta*), grows in peat bogs and is generally a low spreading or scrubby tree with cones pointing towards the trunk that open at maturity but remain attached. The inland form, lodgepole pine (*Pinus contorta* Dougl. ex Loud. var. *latifolia* Engelm. ex S. Wats.), differs from shore pine in being taller with a narrow crown and thinner scaly, unfurrowed bark, and it has closed cones pointing outward.

Ecological Impact

Lodgepole pine forms dense thickets, replacing or overtopping the natural canopy (Richardson et al. 1994). Many birds and small mammals consume lodgepole pine seeds, and snowshoe hare, red squirrel, porcupine, and several vole species feed on seedlings. Moose browse on pine during the winter. The well-developed canopy likely attracts forest canopy birds and might influence the abundance of species that utilize open habitats (Hansson 1985, Sjöberg and Danell 2001, Sullivan and Sullivan 1982). Invasion by lodgepole pine can convert grassland and shrubland to forest. Increases in above-ground biomass that accompany these conversions cause increases in evapotranspiration and reduction in streamflow from catchment areas (Le Maitre et al. 1996, Richardson et al. 1994).



Photo by Larry Hufford

Biology and Invasive Potential

Lodgepole pine propagates by seeds, bare roots, and cuttings. The plant is capable of producing over 17,000 seeds per year. Some trees produce seed at less than 10 years of age (Ledgard 2001). Usually, lodgepole pine requires moderate disturbance to facilitate seedling recruitment, such as grazing, browsing, trampling, or mechanical clearing. It can also spread into areas with naturally occurring disturbances such as slope instability, fire, and flooding (Richardson et al. 1994). Although most seeds are deposited within a few meters of the parent tree, the seed wing allows long distance dispersal by wind (Despain 2001, Ledgard 2001). Small mammals, especially rodents, are also potential agents of long-distance dispersal and establishment (Despain 2001, Sjöberg and Danell 2001). Germination occurs in early spring, shortly after snowmelt; mineral soils provide optimal germination sites and moisture is required

in the first year of establishment (Stuart et al. 1989). Lodgepole pine is adapted to soil textures ranging from coarse to fine and pH levels ranging from 6.2 to 7.5. This species is shade-intolerant and prefers soils with medium fertility and moisture. It requires a minimum of 100 frost free days for reproduction but can tolerate temperatures to -70°F . It has low anaerobic-, drought-, and fire-tolerance (GRIN 2004). Because of its economic importance, lodgepole pine has been introduced to areas outside its natural range. Sixteen different pine species have spread from planting sites to invade natural or seminatural vegetation in the southern hemisphere (Richardson et al. 1994).

Distribution and Abundance

The variety of lodgepole pine of concern is native to North America, occurring naturally from southeast Alaska east to the headwaters of the Mackenzie River and south through western Alberta and British Columbia and the Rocky Mountains to Colorado and Utah. The native range in Alaska extends to the vicinity of Skagway and Haines in northern southeast Alaska, although it may be expanding northwestward. Lodgepole pine forms stands in the mixed forest with Sitka spruce, western paper birch, and subalpine fir. It has been introduced as a fast growing, hardy tree in the vicinity of Anchorage and Fairbanks, outside of its native range (Viereck and Little 1972) and is a major afforestation species in northern Europe (Hermann 1987). Invasion of natural areas by lodgepole pine has been reported in New Zealand (Ledgard 2001).

Management

No control of lodgepole pine should be undertaken in Southeast Alaska, where two native varieties occur. Different techniques for removal include grazing, burning, hand-pulling, felling, and chemical application. For areas in which lodgepole pine plantings are desired, configuration of lodgepole pine plantations in ways that reduce the spread of the species during seed dispersal is recommended (Engelmark et al. 2001).

Notes

One variety of lodgepole pine, var. *bolanderi* (Parl.) Vasey, the Mendocino Sands shore pine, is rare and endemic to California.