

Retain Whitebark Pine

Guidelines for Harvest Practitioners

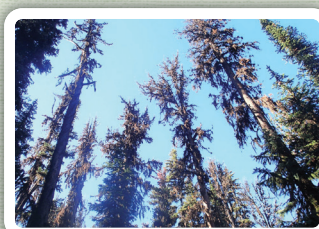
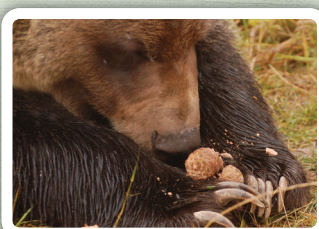
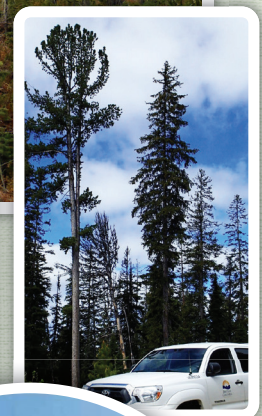
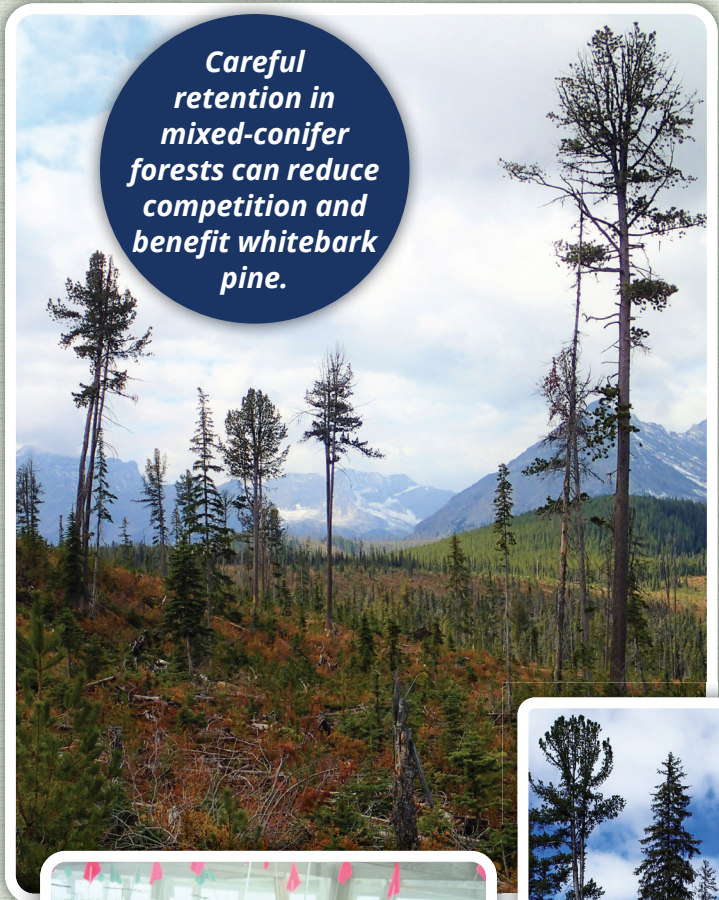
Whitebark pine (*Pinus albicaulis*) is widely distributed in the high-elevation forests of central and southern British Columbia. Its nutrient-rich seeds are the largest of all tree seeds in the subalpine zone. Culturally, whitebark pine has helped supplement the food needs of many Indigenous people at high elevations for centuries. More than two dozen species of foraging mammals and birds, including grizzly bear and Clark's nutcracker, are closely linked to whitebark pine seeds as a food source. At the highest elevations of tree growth, these trees help stabilize steep slopes and regulate snowmelt.

An introduced fungal pathogen causing the disease known as white pine blister rust is decimating populations of whitebark pine throughout most of its range. Between 1996 and 2020 blister rust infections were rising in southeastern BC, with mortality levels increasing from 26% to greater than 65% of trees in some areas. Combined with mountain pine beetle, shifting fire regimes, widespread successional replacement, and climate change – whitebark pine's future is uncertain.

Whitebark pine is the first tree in western Canada to become federally listed as endangered under the Species at Risk Act. It's also classified as endangered by the International Union for Conservation of Nature and designated as a species of special concern (blue-list) in BC.

Whitebark pine is often found in forests suitable for harvesting. Retaining healthy whitebark pines is very important.

Careful retention in mixed-conifer forests can reduce competition and benefit whitebark pine.



Retain Whitebark Pine

Pre-Harvest

🌲 **Ensure whitebark pine are accurately classified in surveys and inventories:** Tree species such as lodgepole pine and western white pine have been confused with whitebark pine.

🌲 **Plan for retaining trees:** Use Forest Stewardship Plans (FSPs) and forest landscape-level planning. Species at risk, including whitebark pine, may be addressed through stand-level biodiversity measures and wildlife as FRPA (Forest and Range Practices Act) values in an FSP, where high-value individuals may be identified for reserve selection. Patches of healthy whitebark pine are good candidates for wildlife tree reserves, Old Growth Management Areas, and Wildlife Habitat Areas for grizzly bears.

During Harvest

🌲 **Retain healthy trees and avoid damage:** Healthy trees are more likely to survive after harvest. Trees with full live crowns and lacking white pine blister rust cankers may be naturally disease resistant. As such, their seeds, dispersed by Clark's nutcrackers, provide the life-link to the pine's future.

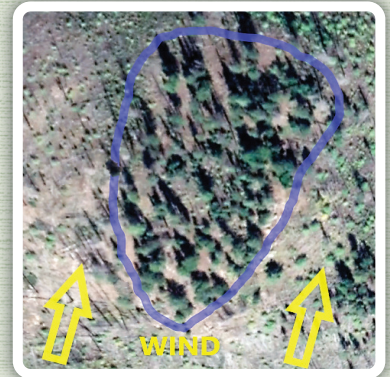
🌲 **Retain a minimum of eight neighbour trees:** Similar to other species, whitebark pine is vulnerable to post-harvest windfall. Ensuring each retention target tree has at least eight neighbours will reduce wind pressure. Neighbours are counted within a radius that equals the target tree's height. Avoid retaining neighbours within a meter of the target tree's crown because whitebark pine is a poor competitor with other tree species.

🌲 **Retain trees with greater vertical crown lengths** as measured along the stem from ground to tip of crown. Long crowns indicate good health with strong root systems that can better keep trees windfirm and resist other disturbances.

🌲 **Retain trees of average height:** The tallest trees are more prone to becoming windfall, especially if they have vertically short crowns. These top-heavy trees are more vulnerable to tipping.

🌲 **Orient retention patches according to predominant wind direction:** The wind direction is often determined as the

orientation of fallen trees (in the vicinity of the harvest). In much of interior BC, the predominant vector of strong wind events is 0-90°. Thus, ovate patches of retention are created in a southwest-to-northeast azimuth.



Post-Harvest

🌲 **Remove logging slash from beneath retention:** Surface fires can readily scorch and kill retained trees.

🌲 **Promote regeneration:** Based on Provincial stocking standards, whitebark pine is classified as an acceptable or preferred species in many biogeoclimatic units. Local stocking standards can be amended with a professional rationale in support of wildlife or biodiversity objectives.

🌲 **Carefully site seedlings:** Although whitebark pine are hardy trees, they are slow-growing and compete poorly with brush and other tree species. Plantings should target portions of harvest sites with little competing vegetation.

- **Harvest Retention Survivorship of Endangered Whitebark Pine Trees;** Forests 2021, 12(6), 654
- **Silvicultural Options for the Endangered Whitebark Pine;** Silviculture Magazine, Winter: 22-23, 2013.
- **Whitebark Pine in British Columbia;** BC Forest Genetics Council Factsheet 1, 2012.
- **Windthrow Handbook for British Columbia Forests;** BC Ministry of Forests Working Paper 9401, 1994.

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Photos: Ministry of Forests
except grizzly bear with cone
(courtesy of Kicking Horse
Mountain Resort)