WHY THERE IS NO FIREWOOD HARVESTING OF WHITEBARK PINE

- Whitebark pine ecosystems are declining, including live and dead components, due to blister rust infections and mortality, mountain pine beetle mortality, extensive fire events and lack of whitebark pine regeneration.
- Whitebark pine is valued for watershed protection. It's location at the timberline or at high elevations is important because the up-swept tree branches of the crown provide shade to delay snowmelt and retain snowdrifts into early to mid summer in the semi-arid mountain ranges of the northern Rocky Mountains.
- Whitebark pine grows on fragile soils which lack fine material to aid in soil development. Coarse woody debris in the form of dead and down whitebark pine is essential to soil development within these ecosystems, where soil development occurs extremely slowly.
- Whitebark pine, like all pines, depends on mycorrhizal fungi to survive and thrive in its natural environment. This fungus binds to tree roots that extend into the soil and provide a pipeline for movement of nutrients to the tree. Disruption of the soil by removing the soil, driving over the soil with vehicles or heavy equipment or other activities that could damage the soil, would be damaging to whitebark pine trees and future regeneration of whitebark pine.
- Recent research shows that whitebark pine logs may actually improve the potential for whitebark pine regeneration by providing safe sites for cached whitebark pine seed, thus enhancing the regeneration of the species. Please go to: http://www.fs.usda.gov/detail/r1/plants-animals/?cid=stelprdb5341458 for more information about the Region's efforts to preserve this important tree species.

Many National Forests do not allow removal of dead whitebark pine including the Boise NF and Humbolt-Toiyabe NF in Region 4, as well as forests in Region 1 (Montana and northern Idaho). The Payette NF has not allowed the removal of dead whitebark pine since 2010. In 2011, the U.S. Fish and Wildlife Service (USFW) found that whitebark pine should be listed as threatened or endangered under the federal Endangered Species Act. However at this time whitebark pine will not be listed threatened or endangered due to lack of funding and other priorities.

Because of the threats to the sensitive whitebark pine ecosystem and the future listing of whitebark pine as threatened or endangered, the Payette NF believes that we should err on the side of caution and prohibit firewood harvest of all whitebark pine. This approach would also comply with direction in our Forest Plan to enhance regeneration of whitebark pine, would allow for all genetic and ecological studies that may need dead trees, prohibits disruption to watershed and soil resources that may be crucial to the survival and regeneration of whitebark pine, and preserves the existing forest structure for wildlife species that live in the whitebark pine ecosystem.

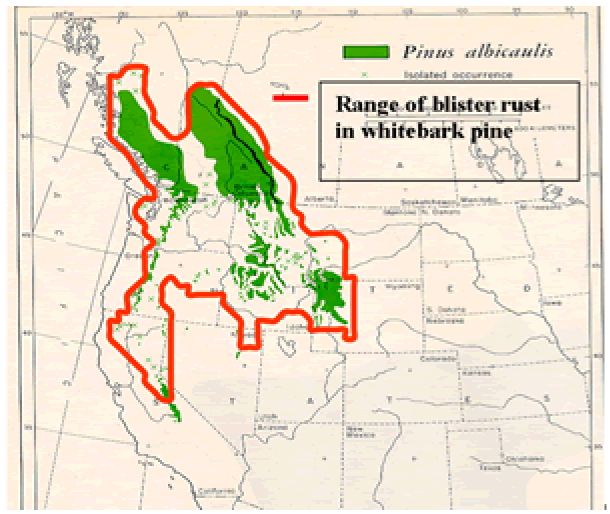
Supporting Documentation & Research

Whitebark pine (*Pinus albicaulis*) is a slow growing, long-lived, stone pine (pine tree with edible seeds) of high-elevation forests and timberlines of the northwestern United States and southwestern Canada. It is one of five stone pines worldwide and the only stone pine in North America. It occupies harsh, cold sites characterized by rocky, poorly developed soils and snowy, wind-swept exposures (Arno and Hoff 1989). Whitebark pine seeds are not wind dispersed; they develop in indehiscent cones that are harvested by Clark's nutcracker (*Nucifraga columbiana*). Nutcrackers pry open the cone scales with their bill and slip seeds into a pouch under their tongue for transport. They cache or consume seeds and those not retrieved from caches may germinate and become established as seedlings (Lanner 1980, Tomback 1978, 1982, Hutchins and Lanner 1982). Corvids, such as Clark's nutcracker and other *Nucifraga* species, have evolved with stone pines over centuries and are critical components in pine regeneration dynamics, ultimately responsible for the geographic range, spacing, successional status, and genetic s of the stone pines (Hutchins and Lanner 1982, Lanner 1982, Tomback 1982, Lanner 1996).

The 2003 Payette Land and Resource Management Plan describes whitebark pine as a species in decline and has direction to enhance and prioritize regeneration where possible. More recently in 2011, the U.S. Fish and Wildlife Service found that whitebark pine should be listed as threatened or endangered under the federal Endangered Species Act. Specifically, the Service concluded that the threats whitebark pine faces, including climate change, are of such a high magnitude and are so pressing that whitebark pine is in danger of extinction. However, they will not immediately list whitebark pine as threatened or endangered because of higher priorities and a lack of funding. In the future, because of the severe risks to whitebark pine, the agency assigned it one of its highest priorities for future listing. Several USDA Forest Service Regions have also added whitebark pine to their list of sensitive species.

This species is severely threatened by two anthropogenic issues—introduced disease and fire suppression—which are complicated by recent upsurges in mountain pine beetle (*Dendroctonus ponderosae*). White pine blister rust, a fungal disease caused by the pathogen *Cronartium ribicola*, was inadvertently introduced to Vancouver, British Columbia in 1910. In the past century, it has spread nearly rangewide in whitebark pine, except for interior Great Basin ranges (Kendall and Keane 2001, McDonald and Hoff 2001, Tomback and Achuff, MS.). The highest infection levels in whitebark pine, 50-100%, occur in the northwestern U. S. and southwestern Canada (Kendall and Keane, 2001). Whitebark pine mortality from the combination of blister rust and mountain pine beetle exceeds 50% in areas including Glacier National Park, northwestern Montana, north-central Idaho, and northern Washington (Kendall and Keane, 2001), and both infection levels and mortality are increasing rapidly in the Cascades and Sierra Nevada Range. Between 1909 and 1940 and again from the 1970s to the 1980s, widespread mountain pine beetle outbreaks killed whitebark pine throughout the U.S. Rocky Mountains, producing "ghost forests" (Arno and Hoff,1990, Wood and Unger 1996, Kendall and Keane 2001). Mountain pine beetle infestations are again at high levels within whitebark pine communities in the northern U. S. Rocky Mountains (Logan and Powell 2001). There is some evidence that whitebark pine is now the preferred host in many regions of the northern Rockies. For example, recent annual aerial surveys detected a dramatic increase in mountain pine beetle activity in the Selkirk Mountains of northern Idaho between 1998 and 1999 (Kegley et al. 2001). Recent aerial surveys indicate large-scale outbreaks of beetles in whitebark pine in northern Idaho, west-central and southwestern Montana, and the Greater Yellowstone Ecosystem (Gibson 2006). In the Greater Yellowstone Ecosystem, more than 700,000 whitebark pines were killed by beetles in 2004.

Individual whitebark pine trees can be protected by application of verbenone or insecticides such as carbaryl prior to annual beetle flights. This requires that potentially genetically resistant trees, or those with other important values, be identified and then protected every summer until the mountain pine beetle outbreak is over. With historically high mortality of whitebark pine from mountain pine beetle, and more recently from both blister rust and beetle outbreaks, unanticipated consequences are becoming evident. For example, Tomback et al. (1995) found unexpectedly low densities of whitebark pine regeneration in the Sundance Burn in the Selkirk Range of northern Idaho 25 years after stand-replacing fire, and 29% of the regeneration was infected by blister rust. The reduction in regeneration density was attributed to a severely reduced whitebark pine seed source, from past mountain pine beetle outbreaks and blister rust. Furthermore, a recent study suggests that in highly damaged whitebark pine stands, most seeds produced are consumed by nutcrackers and red squirrels (*Tamiasciurus hudsonicus*) rather than dispersed (McKinney and Tomback MS.). These observations have important implications: Heavily damaged whitebark pine stands do not produce enough seeds to lead to natural regeneration after wildland or prescribed fire. Even if genetically blister rust-resistant trees were to survive in these stands, their seeds would not be dispersed. In addition, all whitebark pine trees, including those that may harbor genetic resistance, are vulnerable to infestation by mountain pine beetle and rapid death. In some parts of the range of whitebark pine, particularly the northern Rocky Mountains of the United States and intermountain region, decades of fire suppression have led to both progressive loss of whitebark pine basal area and successional replacement by more shade-tolerant trees, such as spruce and fir. This process has been well described for whitebark pine communities in the northern Rocky Mountains of the United States (Arno 2001, and Keane 2001; see also Murray et al. 2000). For example, Murray et al. (1998) show that areal extent and fire frequency abruptly declined in 1873 in the Bitterroot Mountains (Murray et al. 1998). Advanced succession is another factor leading to regional declines in whitebark pine communities, further complicating losses caused by blister rust and mountain pine beetle. Changes in climatic regimes only further exacerbate the synergisms of the risk to whitebark pine.



The Payette National Forest has seen large declines in whitebark pine. Losses through blister rust, mountain pine beetle, extensive fire and lack of regeneration are all evident. The 2003 Payette Land and Resource Management Plan contains desired conditions for all forest types, including those with whitebark pine. Due to the effects discussed above, whitebark pine ecosystems are outside of the ranges of desired conditions, for both live and dead components. By being outside of the range of desired conditions, not only is the both the species and the forest types that it belongs to at risk, but so are wildlife in these ecosystems, soil resources, watershed protection, and the preservation of genetics important to the conservation of the whitebark pine species. Whitebark pine is valued for watershed protection (Farnes 1990). In the cold, semi-arid mountain ranges of the northern Rocky Mountains most annual precipitation falls as snow and the greatest amounts occur at high elevations. The physical position of trees on the landscape and the up-swept branches of the crown provide shade to delay snowmelt and to retain snowdrifts until early to mid-summer. Whitebark pine grows on cryic soils lacking fine material so input from coarse woody debris is crucial to soil development as decomposition occurs extremely slowly. Furthermore, like all pines, whitebark pine depends on mycorrhizal fungi to survive and thrive in natural environments. The thread-like mycelium of these mutualistic fungi binds to tree roots and extends into the soil providing a pipeline for efficient shunting of nutrients such as phosphorus and nitrogen to trees (Read 1998). These root-associated fungi also offer protection from drought, pathogens, and small grazers in the soil. Therefore disruption to the soil from removal of material, heavy equipment, etc. could be damaging to regeneration of the species. Recent research also discusses how logs pose a low fuel hazard in whitebark pine ecosystems because of the lack of fine fuels, and their presence might actually improve the potential for whitebark pine regeneration by providing safe sites for cached whitebark pine seed, enhancing regeneration of the species (Izlar 2007).

Snags in many areas would exceed the desired amounts in forest types that contain whitebark pine, due to the mortality described above. However, given the threats faced by whitebark pine ecosystems and the components that are dependent upon those ecosystems, the taking of dead wood in whitebark pine has been discouraged. The Boise NF does not allow any harvesting of dead wood in whitebark pine to allow for study and collect material from both live and dead whitebark pine that exhibit genetic resistance to disease. Region 1 of the Forest Service has a policy of saving all snags and prohibiting firewood harvest as the whitebark pine blister rust has created such conditions so far outside the range of natural variation that the FIA data are meaningless for predicting snag densities. Lacking meaningful FIA data, it has been suggested that a prescription of saving all snags was the best to follow, in light of all the threats faced by a species. The Humboldt-Toiyabe NF doesn't allow whitebark, limber or bristlecone pine trees to be cut at any time, even if they are dead. Furthermore, thirty states and some of the western National Parks have some type of firewood movement restrictions and many states have out-of-state quarantines on firewood. The rationale behind this is to stop the spread of insects and disease such as mountain pine beetle and white pine blister rust. *The Payette National Forest agrees that given the high potential of loss of the whitebark pine species, we should err on the side of caution and prohibit firewood harvest in whitebark pine. This would follow suit with direction in our Forest Plan to enhance regeneration of the species, would allow for genetic and ecological studies that may need dead trees, prohibits disruption to watershed and soil resources that may be crucial to the survival of the species, and preserves remaining structure for certain wildlife species.*