



USDA Forest Service
State and Private Forestry
Forest Health Protection

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**Produce Graphics for Whitebark Pine Educational Display
at Montana Natural History Center**

Background

The need for whitebark pine restoration is urgent, but public knowledge of this keystone species and its dire status is limited. People will not support what they do not know about. Increased public awareness and understanding are needed to sustain resources for protection and restoration of whitebark pine. An educational display telling the whitebark story was initiated in 2005 by RMRS in partnership with the Montana Natural History Center, and work continued through spring 2007 with support from RMRS, the Fire Sciences Lab, and the Whitebark Pine Ecosystem Foundation. However, funds were lacking to produce final, high-quality graphics for the display. With support from the Whitebark Pine Restoration Project, graphics were produced and the display was completed in September. It resides at the Montana Natural History Center in Missoula, a location visited each year by hundreds of students in outdoor education classes. The completed display, 12' wide, 11' high, and 8' deep, depicts the whitebark story clearly and vividly. Constructed in front of a dramatic photo of whitebark pines on a high ridge, the display features real biological specimens: two grizzly bears, a Clark's nutcracker, a pine squirrel, a whitebark snag, and beetle-riddled bark. Animal specimens are provided by The University of Montana. The interpretive text for the display is appended to this report, along with small photos and a map showing the location of the Natural History Center. A complete set of photos on CD is available from the Project Contact. Greater awareness and understanding in the public is expected to lead to increased demand for protection of whitebark pine and greater support of restoration activities, such as planting and use of prescribed fire.

Progress to Date

Support from the Whitebark Pine Restoration Project was the last piece of the puzzle needed to finish this 3-year educational project. The display was visited by a small group who attended a field trip to a whitebark pine site in the Swan Range on Sept. 22, and the completed display was officially opened to the public on September 26, when it formed the background for a presentation about whitebark pine ecology to 20 members of the public, given by University of Colorado at Denver Professor Diana Tomback.

An article on the display will be published in the next issue of *Nutcracker Notes*, and an article is in preparation for the Montana Natural History Center's *Montana Naturalist*.

The Project Contact will inspect the display each year to make sure its quality is maintained. The Montana Natural History Center will record the approximate number of students/teachers/adults or visitors viewing the display each year.

Project Contact

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Appendix. Text of whitebark pine display

1) Background wall

Whitebark Pine Forests

The Good, the Bad & the Beautiful

Whitebark pines grow on a high ridge in twisted beauty.

The wind whistles constantly through their upward-reaching branches. They are the sentinels for the forest below—a mixture of stout pines with slender spruces and firs, and also hundreds of dead, whitened whitebark pines.

A chorus of voices cuts across the wind: Clark’s nutcrackers fly in to harvest seeds from the purple cones perched on the pine branches. A red squirrel scolds the bears that raid its winter food supply of whitebark cones. More than 100 kinds of living things—plants, animals, insects and birds—depend on the whitebark pine. Even people benefit when whitebark pines act as a snow fence, slowing spring runoff for a dependable water flow in the valleys below.

Without this tree, the rich, high country fabric of life unravels. A whitebark pine can live for 500 years or more, yet today, this guardian of the high country is in grave trouble. Blister rust is killing the pines at an alarming rate. The few trees that resist the fungus face two more threats: mountain pine beetles and lack of fire. The interaction of these three forces has created “ghost forests” containing hundreds of dead whitebark pines.

Can whitebark pine forests be restored?

Biologists are planting seedlings, offspring from rust-resistant trees. Using fire, they create openings for nutcrackers to cache seed and to produce a better environment for seedling growth. Hike to a high ridge in 50 years to see if these efforts succeed.



2) Sign at right front

What goes around, comes around.

Clark's nutcracker: Most pine trees have winged seeds that can glide on the wind when the cones open. But whitebark pine's wingless seeds remain sealed in their cones on the tree—waiting.

Then the nutcrackers arrive. A Clark's nutcracker pries open a sealed cone with its strong, pointed bill, then extracts as many as 100 seeds. Perching on a snag in a recent burn, the bird selects a location for a cache, where it buries a few seeds at a time about an inch underground. A single bird can “plant” up to 100,000 seeds a year. Nutcrackers use their extraordinary memory to retrieve caches, but many seeds remain in the ground and are able to start a new forest. **Look up to find this industrious seed planter.**

Bears eat constantly through the summer to prepare for their deep winter sleep. The high-calorie seeds of whitebark pines help them put on enough fat to survive. If whitebark pines produce an especially large seed crop, the next spring often sees especially large numbers of bear cubs. Can you tell what kind of bear is in front of you?

Red squirrels gather whitebark pine cones from the tree tops before nutcrackers can get all of them. They store the cones in huge “middens” on the forest floor. There the cones remain cool and stay fresh for years—unless something else, like a grizzly bear, takes advantage of their hard work. **Look around the midden to find this ever-busy gatherer of pine cones.**



3) Sign at left front

Why so many dead trees?

Blister rust, a fungus imported to North America, weakens whitebark pines, resulting in the production of fewer cones and often death. Since the cone-producing branches die first, squirrels, nutcrackers and bears find fewer seeds each year.

- Look for clusters of red needles or dead tops on the whitebark pines.
- Swollen areas on pine branches and trunks, leaking sap and covered with powdery orange spores, are other signs of fungal infection.

Mountain pine beetles are not much bigger than a grain of rice, but when thousands of them mate and lay eggs under a tree's bark, the tree will not survive.

- Beetle larvae feed on the tree's delicate inner bark, leaving a network of tunnels, as you see in the underside of the bark to your right.
- Whitebark pines stressed by drought or crowded by spruces and firs are especially vulnerable to pine beetle attack. Thousands of mature trees can be killed in a few years.

Pines need fire. Low-intensity fires kill small trees, but mature, cone-bearing pines can survive. With smaller trees removed, more water and nutrients are available for the mature pines.

- Severe fires produce ideal openings for nutcracker seed caches and for whitebark seedling growth.
- Keeping fire out of the high country allows spruce and fir trees to thrive, crowding and weakening the pines and reducing sites for nutcracker seed caches.

4) Small note on left front sign

For more information, go to
www.whitebarkfound.org.

Provided by the Whitebark Pine Ecosystem Foundation, Montana Natural History Association, and U.S.D.A. Forest Service, Rocky Mountain Research Station and Forest Health Protection.



5) Location of Montana Natural History Center

