

Northwest Connections

Long-term Restoration Strategies for Whitebark Pine in the Mission Mountains Wilderness

INTRODUCTION

In 2005, Northwest Connections received a grant from the National Forest Foundation's "Wilderness Stewardship Challenge Grant" program for fieldwork and collaboration for whitebark pine restoration. With funds provided through this program, and matched by donations from individuals supporting Northwest Connections, work began in the summer of 2005.

BACKGROUND

Located along the western edge of the NCDE, the Mission Mountain Wilderness serves as a stronghold for many threatened and endangered species innate to the Northern Rockies. In the upper subalpine ecosystems of this region, the whitebark pine is considered a keystone species. The presence of these trees increases the biodiversity of the area by providing a food source to a number of wildlife species that include not only Clark's nutcrackers, red squirrels, and grizzly bears, but also black bears, chipmunks, ground squirrels, mice, ravens, woodpeckers, gray jays, Stellar jays, chickadees, nuthatches, and finches.

The symbiotic relationship that exists between the whitebark pine and the Clark's nutcracker illustrates the importance of maintaining viable whitebark pine stands. The seed from the cones of the whitebark pine provide the high-energy food source that the Clark's nutcracker depends on to maintain healthy and viable numbers within its population. In turn, research has shown that the Clark's nutcracker is the primary reason behind the majority of new whitebark pine seedling establishment. This process takes place due to seed dispersal from the caching habits of the Clark's nutcracker. This bird will dislodge the heavy seeds from the cone, storing up to 80 seeds in its sublingual pouch beneath its tongue, and then carry the seeds to another area and cache them. One to fifteen seeds are cached approximately one inch deep in the soil, mostly in open areas that have been recently burned. Using its keen intelligence and memory, the Clark's nutcracker uses triangulation to remember where its multitude of caches are located for future retrieval. Any unused seed may germinate and grow into a new whitebark tree. (Lanner, 1996; Tomback, et al, 2001)

The Issue:

Across the Northern Continental Divide Ecosystem (NCDE), whitebark pine is experiencing tough times due to the cumulative effects of white pine blister rust,

mountain pine beetle attacks, and the results from the lack of fire on the landscape. Due to this combination of factors, many of these stands are converting from whitebark pine stands to subalpine fir/spruce stands.

Mountain pine beetle attacks are leading to the demise of many of the older surviving mature whitebark pine trees that had seemingly survived the brunt of the blister rust and beetles that moved through many of these high elevation stands in the past. The attacking insects are now devastating areas that were reasonably healthy a few years ago. The increased mortality of whitebark pine and subsequent diminished food source that it has historically provided is seriously impacting the habits and numbers of wildlife in these upper subalpine ecosystems.



Mission Range Historical Accounts:

Observations from local people note that that the vigor of both whitbark pine stands and Clark's nutcracker populations are diminishing. The following historical accounts help to describe the trends in the Mission Mountain's whitebark pine ecosystem and the impact this trend is having on the threatened grizzly bear.

Life-long Mission Valley resident, outfitter, and visitor to the Mission Range, Bud Cheff Sr. in his book, Indian Trails, and Grizzly Tales states,

Over the same time that I've noticed that the limber (whitebark) pine was not producing nuts, we've observed the decline of the grizzly, and those that are around are not as large or fat as they had been in years past. I believe that most, or at least a large number of these bears have died in hibernation, for the simple reason that without these nuts, they were unable to put on enough fat to be able to survive the winters." He goes on to say, "I am very concerned about the disappearance of the limber [whitebark] pine nut. They are the first of the plant life that I have seen go and as I ride through these beautiful mountains that were once so lush and are now fast changing, with the many of the plants looking sick or dying, I am saddened. I am also afraid as I view these changes – if the plant life goes, so will we, and all other animal life. We should be very concerned. (Cheff, 1993)

Leonard Moore, a life-long Swan Valley resident, packer, and retired USFS employee, who has spent a lifetime in the mountains of the Bob Marshall Wilderness and the Mission Range made the comment that the grizzlies could often be spotted in the higher basins,

They favor high, rocky country an awful lot. The way their feeding habits had to change over the years has made quite a difference. They are losing a lot of the big pinion (whitebark) nut feed. The pine nuts, on the high ridges like in the Missions...grow a cone that's about eight to twelve inches long. Big seeds. When those cones start to drop, the bears get up there and rattle the seeds out of those cones, and make a meal out of it. But there's so much of that that's dying out. They aren't there anymore. He added about the bears, "Their world's changing." (Moore, 2003)

Another long-time Swan Valley resident, Dee Morton, recognized the importance of the whitebark pine when as a logger in 1962 he helped cut a stand of whitebark pine trees in the area northeast of Cedar Peak (just outside of today's wilderness boundary). He lamented, "When we cut pinyon [whitebark] pine. Cut all them nice nut trees up there so the bears didn't have nothing to eat. That was a disaster" (Morton, 2000).

Justification:

Recognizing that the fate of the whitebark pine and the influence it plays in the upper subalpine ecosystem is in jeopardy, Northwest Connections, a nonprofit conservation and education organization located in Swan Valley, has been collaborating with the Flathead National Forest on a long-term restoration strategy for the whitebark pine forests in the Mission Mountains Wilderness of northwest Montana.

One of the primary goals of this effort is to support the Forest Service in changing the current fire management plan to accommodate prescribed restoration burns in this small, but important wilderness area. With over 70 years of fire suppression, the Mission Mountains Wilderness is in need of restoring fire upon its landscape. Presently, all fire in the Mission Mountains Wilderness is suppressed due to a number of factors, but mostly relating to wind patterns that flow from southwest to northeast. This prevailing wind pattern has the potential to bring fire out of the wilderness and across the Swan Valley where the communities of Condon and Salmon Prairie lie.

Over the past several years, Northwest Connections has initiated a number of ecological monitoring projects that aim to fill critical information gaps for ecosystem management and restoration related to whitebark pine. Prior to 2005, this organization had installed numerous permanent whitebark pine plots in the Mission and Swan Ranges. Following a US Forest Service restoration burn in 2002, Northwest Connections' Wildland Volunteer Corps program, in cooperation with the Flathead National Forest, helped plant 2000 whitebark pine seedlings in the Jewel Basin area of the Swan Range. Similar restoration efforts would be beneficial in the Mission Mountains Wilderness. The 2005 field season described below builds on these past efforts.



2005 FIELD SEASON

Methodology:

Collectively, the Swan Lake Ranger District staff and Northwest Connections staff agreed that the first step was to gather baseline data in the Mission Mountains Wilderness. The fieldwork consisted of mapping whitebark pine stands, followed by taking photo points and a health assessment of the whitebark pine conditions within those stands. Due to the limited scope of the project, a representation of stands was selected across the length of the wilderness area. Standardized data forms were developed to provide consistent information (See Appendix A). Equipment and maps were procured.

Observations:

During the 2005 field season, a number of observations were recorded.

- Up until the past few years several whitebark pine stands within the Mission Range experienced much lower levels of infection rates, insect damage, tree mortality than average stands in the rest of the Mission Mountains and Swan Range. These isolated, healthy stands were most likely due to topographic buffering from air flow which assist insect dispersal as well as air flow during early fall weather systems that transport white pine blister rust spores. Unfortunately, the mountain pine beetles have now moved into many of these stands and are killing off the intermediate and older age class trees. 
- In many of these stands unnatural conditions exist. The overall lack of fire on the landscape from the past 70 years has led to a much higher level of competition from subalpine fir and spruce in many of the whitebark pine stands. Fire exclusion has favored the shade tolerant spruce and alpine fir while reducing the ecological integrity of these historically whitebark pine dominated stands. 

- There was a noticeable lack of bear sign throughout the Mission Range during the 2005 field season. This observed lack of bear presence was a distinct contrast to historic bear activity observed by the field staff in these environments over the past thirty years. There was a corresponding lack of bear sign on mountain slopes and ridgelines that were traversed to access the high elevation whitebark pine stands. This observation was surprising given the abundance of whitebark pine cone production, as well as the decent huckleberry crop found on the mid elevation slopes.
- An interesting observation was noted in a younger whitebark pine stand on Mollman Ridge that dated to a 1950's era forest fire. From a distance the stand appeared vibrant, cone producing, and healthy. But upon closer inspection, it was found that a black bear had recently entered the stand and proceeded to strip the bark from around the lower trunk of many of the trees in order to eat the sweet cambium layer. The bear seemed to pick the most vigorous trees within the stand to strip. Whereas this type of feeding by bears is often seen in the young western larch trees at low to mid elevations, this was the first time we had observed this kind of extensive feeding on whitebark pine trees.
- On a separate project, Clark's nutcrackers were observed flying through the Smith Creek Pass area of the Swan Range heading toward the Mission Range with whitebark pine seeds to cache. It was surmised by their direction of travel that those birds were heading to the Crazy Horse Fire area that burned in 2003.





- On the positive side there are a number of younger aged whitebark pine trees that are relatively healthy and overall seem to be doing well. Also, 2005 was a good cone-producing year for the whitebark pine surviving trees. Clark's nutcrackers were present and busily taking advantage of the available seed.

Recommendations

There is agreement among leading scientists that management intervention is essential to reverse the cascading negative effects of whitebark pine decline. The Mission Mountains Wilderness presents both unique opportunities and challenges to implement meaningful restoration efforts.

- There needs to be considerable public outreach to elevate awareness on the issue both in understanding the ecological implications of whitebark pine decline and increase understanding for restoration strategies.
- At first glance the Mission Mountains appears problematic in implementing prescribed fire for whitebark pine restoration, however field surveys revealed some important areas that lend themselves to low risk restoration burning.
- There needs to be a fire management plan developed and implemented for the Mission Mountains Wilderness on the Flathead National Forest.
- Managed by the Salish-Kootenai Confederated Tribes in conjunction with the Bureau of Indian Affairs, the adjoining Mission Mountains Tribal Wilderness to the west of the Mission Mountains Wilderness does have a fire management plan that allows for restoration burning. Coordination between the various agencies would be paramount in restoring the ecosystems through restoration burning.

- If fire was to be put back onto the landscape, some of these stands would benefit from subtle manipulation to protect existing healthy whitebark pine trees.
- In addition to restoration burning, the planting of whitebark pine seedlings or seeds should be an option to consider, as the limited seed available for planting by Clark's nutcrackers may be getting critically low.
- The use of the anti-aggregation pheromone, verbenone on 'Plus Trees' should be considered.
- Long Term Monitoring.
- Research. Encourage research that supports restoration objectives.

Specific Areas to consider for restoration burning:

We feel that the location of the 2003 Crazy Horse Fire along the eastern edge of the Missions has given the Forest Service a golden opportunity to reintroduce fire. Much of the black area from that fire would provide a safety net to protect the community downwind from prescribed restoration burns in the interior of the Mission Mountains Wilderness. In addition, there are several other areas within the wilderness boundary with significant physical barriers providing natural firebreaks that could be utilized to safely engage in restoration burning efforts. We have prioritized the following three areas:

- 1) Any area immediately west of the Crazy Horse Fire boundary. This area has extensive black that would offer reasonable protection to the settlement areas down wind.
- 2) Gray Wolf Lake area. Due to the topographical barriers of bare rock and high cliffs there are areas north of Gray Wolf Lake that could be reasonably burned.
- 3) Elk Lake area.

PUBLIC OUTREACH

This project has afforded us the opportunity to initiate essential outreach strategies to expand the understanding and importance of maintaining and restoring vigorous whitebark pine stands. During the 2005 field season we used volunteers from both the Missoula and Condon areas. In addition, we relied on local knowledge to identify representative stands, and access those stands with familiar knowledge of the trails and terrain.

During the winter of 2006, Northwest Connections is planning to do a number of public and school presentations/seminars concerning whitebark pine education and restoration strategies to diverse audiences. In addition, media coverage will be pursued to help educate the public to the plight of the Whitebark ecosystems.

CONCLUSION

Due to the seriousness of the problems facing the whitebark pine and the integrity of the upper subalpine ecosystem, Northwest Connections will continue to actively support agencies and people in the restoration efforts that help to maintain the natural connections upon the landscape.

Bibliography

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