# Pruning Blister Rust Cankers to Preserve High-Value Trees

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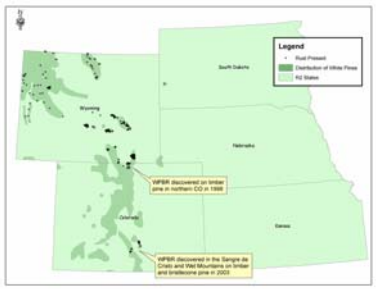
## Introduction

White pine blister rust (WPBR) is an exotic, invasive disease of five-needle pines. The fungus causes cankers which usually kill the stem above the canker, often leading to mortality. In southern WY and CO, limber and Rocky Mountain (RM) bristlecone pine are especially important because of their unique cultural and ecological characteristics. Protecting and preserving high-value trees in recreation areas is a concern for land managers, however, silvicultural strategies for rust management have not been tested for these tree species.

Management techniques are available for prolonging the life of other white pine species and these techniques may be effective and cost-efficient for limber and RM bristlecone pines. The purpose of this study was to evaluate the efficacy of canker removal treatments in reducing infections and decreasing mortality and to assess several treatments in terms of cost and feasibility.

## Distribution of WPBR in R2




*WPBR was discovered on RM bristlecone pine for the first time in its native range in 2003 in the GSDNPP.*


*Study locations included the upper portion of the Mosca Creek Trail, GSDNPP (Sangre de Cristo Mountains), CO and Vedauwoo Campground, Laramie RD, Medicine Bow National Forest, WY.*

## Methods

Sample trees were tagged and mapped. Data recorded for each tree included: DBH, needle retention, height, health status, crown class, crown ratio, and information on the amount and distribution of cankers.

Infected sample trees were randomly assigned one of four treatments: prune to a set height, prune all cankers, prune to set height and prune all cankers, and no action. Uninfected sample trees were randomly assigned one of two treatments: no treatment or prune to a set height. Trees with lethal infections were not included in the study. Trees were split into three DBH classes (< 4", 4-8", > 8"). Treatments were replicated in blocks by randomly selecting 18 trees (3 replications of each treatment) within each diameter class.

Post- treatment data collected included: number of cankers removed and remaining; number of people treating the tree; and treatment implementation time.

*Cankers were removed using pole pruners (pictured), pole saws, pruning saws, and pole chainsaws. We removed all cankers indicated for removal by treatment that were accessible and could be safely removed with our equipment.*

*We scribed the bole when branch cankers were within 12" of the main stem. Scribing was done at least 3" proximal to the visibly infected area.*

*Non-lethal stem cankers were removed by pruning the main stem 12-18 inches below the canker.*

## Preliminary Results

### *Mosca Pass*

- ✓One hundred sixty-seven trees were included in the study (14 bristlecone and 153 limber pines).
- ✓Twenty-nine percent of the bristlecone pines and 69 percent of the limber pines were infected with WPBR.
- ✓There was an average of 6 cankers per tree (range 0-54).
- ✓The average height of cankers from the ground was 12.9 feet and the average distance of cankers to the main stem was 7.8 feet.
- ✓We removed 207 cankers by pruning the entire branch, 14 by scribing, and 201 by removing a portion of the branch.
- ✓The average time to rate trees was 12 minutes and the average time to treat trees was 11 minutes.
- ✓A crew of 6-11 people completed this work in 2 weeks.

*Field crews from the South-west Youth Conservation Corps helped with data collection and pruning.*

## Preliminary Results

### *Vedauwoo*

- ✓We initiated a complete CG survey in June 2005 but cankers were difficult to identify because aecia were no longer present. We tagged and surveyed 682 limber pines.
  - ➢221 (32.6%) trees were fatally infected.
  - ➢135 (19.9%) trees were uninfected.
  - ➢321 (47.5%) were infected but treatable.
- ✓We treated 226 operational trees in 2005.
- ✓Data collection and treatment of 207 study trees will be completed in 2006.
- ✓Average treatment time was 8.5 minutes and a crew of 6-10 completed the work in one week.

*Sporulation occurred in mid May. By late June, cankers were difficult to identify.*

*One-third of the trees in Vedauwoo had lethal infections (removing canker(s) would remove over 50% of the crown).*

## Future Plans

We are summarizing data and writing a progress report. We will visit both study sites in 2006 to do an initial evaluation of the pruning treatment. Trees will be re-evaluated every 3-5 years thereafter to assess treatment effectiveness.

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