Project Summary
Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: White pine blister rust management at Great Sand Dunes National Park and Preserve
Discipline: Natural
Type of Project: Technical Assistance
Funding Agency: National Park Service
Other Partners/Cooperators: Colorado State University
Effective Dates: 5/23/2005 - 6/1/2006
Funding Amount: $12,751.00

Investigators and Agency Representative:
NPS Contact: Phyllis Pineda Bovin, 11500 Highway 150, Mosca, Colorado 81146
719-378-6363, Phyllis_bovin@nps.gov

Investigator: William R. Jacobi, Department of Bioagricultural Sciences and Pest Management, Colorado State University, Fort Collins, CO 80523w, 970-491-6927, William.Jacobi@colostate.edu

Project Abstract:

Great Sand Dunes National Park and Preserve received funds from the Forest Health Management Program of the USDA to investigate methods to control white pine blister rust in the park. Colorado State University will work with the park to evaluate if pruning and canker removal are effective and efficient techniques to protect limber and bristlecone pines from blister rust infections developing into lethal cankers.

CSU will adapt, test, and evaluate techniques for determining the circumstances for which pruning and canker removal in limber and bristlecone pine result in longer survival at costs justified by values protected. Techniques will be selected from those used in similar situations but modified for limber and bristlecone pines in the central Rocky Mountains. Work will take place at Great Sand Dunes National Park and Preserve (GRSA), Colorado. Park staff and CSU researchers will provide oversight and contribute with plan development, training, and provide cooperative assistance in carrying out this project.

The treatments to be evaluated are:
1. Do nothing.
2. Crown pruning (remove all lower branches to a set height of 6–8 feet).
3. Stem and branch canker removal
4. Crown pruning and stem and branch canker removal

Treatment trees will be mapped and permanently marked for evaluation every two years. Treatments will be randomly applied to trees in three diameter classes (0-4, 4.1-8, >8 inches). Limber and bristlecone pine trees will be selected. Tree condition and site features will be recorded before treatments are implemented. We will have a minimum of 9 trees in each size class assigned to each treatment, which is replicated 3 times at each site. We will also treat 9 trees in each size class that are not currently infected with crown pruning or no treatment.

Data will be analyzed to assess costs for treatments and future assessments will test for changes in tree attributes due to treatment. Attributes evaluated after treatment will include disease condition (including expected survival), appearance, and value; in subsequent assessments, longevity will also be evaluated. We will use ordered appearance scales such as crown health, canker presence, location and threat condition. Statistical tests will be performed with a generalized linear model, where effects include random site effects and fixed treatment effects. Results will be compared to the time, cost, and effectiveness of each treatment. Supervision of individual tree treatments will be carried out through this project. Quality control will occur through careful training of pruning crews and through periodic inspections by cooperators.

Outcomes with Completion Dates:
In cooperation with GRSA and USDA Forest Service - Forest Health Management Lakewood Service Center, we will provide planning, data collection management, field work, data entry and analysis and a report on what was accomplished in applying the treatments, relative costs and time expenditures to complete the treatments. The report will be completed by September 30, 2005.

Keywords: white pine blister rust, forest pest management, bristlecone pines, limber pines, Great Sand Dunes National Park and Preserve, Colorado State University

For Administrative Use Only:
Date Annual Report Received:
Date Final Report Received:

Publications, etc. on file: