

TITLE: Monitoring white pine blister rust spread and establishment in the central Rocky Mountains, Stage 2

LOCATION: This project will be located in the central Rocky Mountains (Regions 2, 3, and 4), focusing on areas that: 1). have not been surveyed in the past, 2). have been surveyed but may have been infected since then, and 3). have newly discovered white pine blister rust (WPBR) infections.

DURATION: Year 1 of 1-year project **FUNDING SOURCE:** Base

PROJECT LEADER: Kelly F. Sullivan, USFS, R2, Pathologist, Lakewood Service Center, (303) 236-8006, kfsullivan@fs.fed.us

COOPERATORS: Jim Hoffman, Plant Pathologist (R-4), John Guyon, Plant Pathologist (R-4); Brian Geils, Plant Pathologist (RMRS), and Jim Worrall Plant Pathologist (R-2)

PROJECT OBJECTIVES:

- Continue surveying white pine stands to determine the distribution of WPBR in the central Rocky Mountains. Supplement FHM/FIA plot data, evaluation monitoring plot data, and other survey data for central Rocky Mountain white pines.
- Establish long-term survey plots in and around areas with newly discovered WPBR infections to study the distribution, rates of spread, and intensity of the disease.
- Establish long-term survey plots in sensitive bristlecone pine stands that have potential to become infected.

JUSTIFICATION: The 5-needle pines (whitebark pine, limber pine, Great Basin bristlecone pine, Rocky Mountain bristlecone pine, and southwestern white pine) are well distributed within the central Rocky Mountains. White pines serve many important ecological functions such as providing food for wildlife, stabilizing slopes, and occupying harsh, rugged sites. These trees are some of the oldest and largest in the central Rockies. Bristlecone pines have been identified that are nearly 1, 500-4,000 years old, making them some of the oldest living things on earth. Their social value is exemplified by the newly developed bristlecone pine interpretive center within the Mt. Goliath Research Natural Area on Mt. Evans (Colorado State Parks) which is visited by more than 100,000 people annually.

White pine blister rust, caused by the invasive fungus *Cronartium ribicola*, is a serious disease of white pines and other 5-needle pines. Recent Evaluation Monitoring plots and other surveys have discovered that the disease is present in several areas in which it has previously never been reported. In southern Wyoming new infections have been observed in limber pines (*Pinus flexilis*) in the Snowy Mountains (Holly Kearns, CSU, personal communication). In Colorado, new infections have been found in limber pine near Mosca Pass in the Sangre de Cristo Mountains just east of the Great Sand Dunes National Monument, and in the Wet Mountains near Lake Isabel. Of particular concern in Colorado is the potential for the disease to move into Rocky Mountain bristlecone pine (*Pinus aristata*), a species that has not yet been infected but is highly susceptible, based on lab tests. Bristlecone pines are present in and around infected

limber pines in the Sangre de Cristos and the Wet Mountains, although no infected bristlecone pines have been observed as of now.

Additionally, data from FHM plots and other surveys indicate that a wave year of infection occurred in 2001. Further monitoring of white pines in the central Rocky Mountains will provide land owners and managers with useful information about the distribution, spread, and intensity of the disease. Annual FHM aerial detection surveys may not detect the early stages of WPBR in these forests. Several trend and damage evaluation plots have been established in the central Rockies to monitor white pine blister rust development; however, they do not provide a statistical basis for management and assessment associated with the potential loss of an important forest species. Standard USFS inventory work and Forest Health Monitoring (FHM) only record damages and decline to white pines, but they do not specifically measure characteristics of WPBR that provide important information on spread and intensity. Additional plot and monitoring surveys are needed to determine the distribution and extent of WPBR in the central Rockies and to evaluate severity and spread in new infection areas.

This project is feasible because we will continue to build on the methods developed for our previous EM project

DESCRIPTION:

a. Background: In 2001, Regions 2, 3 and 4 initiated an EM project to monitor white pine blister rust spread and establishment in the central Rocky Mountains. As a result of that study and other similar studies we have identified a need to continue this survey and also to do a more in-depth survey in and around new infection sites and in sensitive bristlecone pine stands. Additionally, areas still exist where we have little or no information on whether or not blister rust is present. Complicating matters, white pine stands have largely been ignored historically, so they are not well represented in vegetation datasets such as RIS. We would like to continue to identify and GPS white pine stands, survey stands that have never been surveyed, revisit areas that may have been infected since they were last surveyed, and also to establish long-term survey plots in those areas where we have new outbreaks and in sensitive bristlecone pine stands.

b. Methods:

- Analyze and synthesize FHM data, Evaluation Monitoring data, and other white pine surveys to identify sites that need to be surveyed. In doing this we will create a GIS database with plot locations and rust incidence and severity.
- Analyze and synthesize FHM data, Evaluation Monitoring data, and other white pine surveys to identify sites that may have been impacted by the wave of infection in 2001 and need to be resurveyed.
- Establish long-term survey plots in and around areas with newly discovered infections.
- Establish long-term survey plots in sensitive bristlecone pine stands.

c. Products:

- We will provide evaluation monitoring reports to forest managers and planners about wpbr incidence and severity in the central Rocky Mountains.
- We will create a GIS database with plot locations by species that includes incidence and severity.

d. Schedule of Activities:

Activity	Spring 04	Summer 04	Fall/Winter 04
Analyze existing FHM data and ID stands	*		
Plan field season	*		
Conduct surveys and establish long-term plots		*	
Analyze data			*
Final reporting			*

e. Progress/Accomplishments: NA**COSTS:**

	Item	Requested FHM EM Funding	Other- Source Funding	Source
YEAR		2004		
Administration	Salary	23,000		
	Overhead			
	Travel	13,500		
Procurements	Contracting			
	Equipment			
	Supplies	1,000		
	Total	37,500		

* R-2 FHM personnel time and travel will be contributed to accomplish this project.