



## Special Technology Development Program Progress Report

Complete a copy of this form for: 1) each multi-year project active in the current fiscal year and not requesting funds, and 2) each project requesting funds to extend into the following fiscal year. Add lines within the form as necessary. Delete all that does not apply.

**PROJECT NUMBER** (from original application form): R2-2001-02, R4-2001-1

**PROJECT TITLE** (from original application form): Landscape scale hazard-rating system for white pine blister rust in the central Rocky Mountains

**PROJECT STATUS** (choose one of the following):

Continuing (funds are being requested for the next fiscal year to continue the project)

**EXPECTED PROJECT DURATION** (total years for project): 2 years

**ORIGINAL EXPECTED COMPLETION DATE OF THE PROJECT** (fiscal year): 2002

**EXPECTED COMPLETION DATE OF THE PROJECT** (fiscal year): 2003

**SUBJECT** (from original application form): Biological Control\_\_ Invasive Species\_2\_\_ Methyl Bromide Alternatives\_\_ Models\_1\_\_ Monitoring\_2\_\_ Organism Biology\_\_ Pesticides: Microbial\_\_ Pesticides: Synthetic\_\_ PTIPS\_\_ Population\_\_ Risk and Hazard\_1\_\_ Remote Sensing\_\_ Semi chemicals\_\_ Silvicultural Technology\_\_ Social Values\_\_ Spray Technology\_\_ Other\_\_\_\_\_

**STATUS OF SUBJECT SPECIES** (select one by deleting inapplicable option): non-native

**PROJECT OBJECTIVES** (from original application form): We will develop a landscape scale hazard rating system that is linked to a Geographic Information System (GIS) for limber pine (LP) and Colorado bristlecone pine (CBP) using findings and methodologies developed for southwestern white pine (SWWP) and whitebark pine (WBP). Existing plot systems, including PTIPS plots established in Wyoming for LP and Forest Health Monitoring plots, will be utilized, as well as GIS data and supplemental data as needed.

**BRIEF DESCRIPTION OF THE PROJECT:** Describe primary activities for each year, summarizing key accomplishments from prior year(s), this year's activities, and objectives for future years. This may be a clearly worded bulleted list or graphic of milestone activities. Each year's progress report should stand on its own without requiring the reader to wade through multiple previous reports to gain an understanding of the project's progress and accomplishments.

Candidly describe what has worked and what hasn't worked in the project, and within reason provide explanations that might help others to understand the limitations of techniques, approaches, technologies, and practices used or tried in the project.

We will adapt established concepts and techniques for hazard rating stem rusts to the recent discovery of the rust on LP in northern Colorado on the Arapaho and Roosevelt National Forest and adjacent private lands. A rating system will identify areas where LP and CBP are threatened and will indicate which control methods are likely to be effective at any particular site. We will use the current outbreak in southern Wyoming and northern Colorado as a



model system; but other areas where the rust could be a serious threat will also be identified. Empirical relations will be determined to predict expected rust severity from epidemiological factors and from site and stand features. Epidemiological factors are those direct influences related to microclimate, Ribes distribution and abundance, and white pine age and size. Because information for these epidemiological factors is not available for most sites, we will relate these direct factors to standard resource management data describing site and stand conditions (e.g., elevation, habitat type, current vegetation, and management history). Using these data, we will generate and evaluate hazard maps for the current outbreak area. We will identify additional areas within the central Rockies, which could be seriously impacted by WPBR; and we will assess the consequences of alternative vegetation management strategies on rust impact.

**CHANGES TO ORIGINAL PROJECT SCOPE OR OBJECTIVES** (changes that need to be made to the original proposal and reasons for the changes): NA

**ADDITIONS TO ORIGINAL PROJECT SCOPE OR OBJECTIVES** (describe additional accomplishments expected from the project): *Ribes* spp. identification guide

**FHP LEAD CONTACT** (FHP person submitting proposal):

<u>Name</u>	<u>Affiliation (Office or Dept.)</u>	<u>Phone, E-mail, Fax</u>
Jeri Lyn Harris	R2 Forest Health Management	303-236-3760, jharris@fs.fed.us, 303-236-9542

**FHP LEAD INVOLVEMENT**

**Role:** Oversee the project agreement with Colorado State University, Assist in delivery of the hazard rating model to Colorado forest managers.

**Time Commitment:** 2 weeks per year

**PRINCIPAL INVESTIGATOR(S) INVOLVEMENT** (add lines as necessary):

**Name:** Jim Hoffman, USDA FS FHP  
**Role:** Assist with white pine blister rust database collections and field surveys in UT and WY  
**Time Commitment:** 2 weeks

**COOPERATORS** (contributing to, but not leading, the project) (add lines as necessary):

<u>Name</u>	<u>Affiliation (Office or Dept.)</u>	<u>Phone, E-mail, Fax</u>
William Jacobi	Colorado State University	970-491-6927 william.jacobi@colostate.edu
Eric Smith	USDA FS FHTET	970-295-5841 elsmith@fs.fed.us
Brian Geils	USDA FS RMRS	520-556-2076 bgeils@fs.fed.us
Anna Schoettle	USDA FS RMRS	970-498-1333 aschoettle@fs.fed.us
Diana Tomback	University of Colorado, Denver	303-556-2657 dtomback@carbon.cudenver.edu

**COOPERATOR INVOLVEMENT** (add lines as necessary):

<u>Name</u>	<u>Role</u>	<u>Time Commitment</u>
William Jacobi	University project leader, Overseeing GIS and field work for developing the Hazard Rating model	3 months
Eric Smith	Database compilation	1 month
Brian Geils	Consulting, <i>Ribes</i> spp. identification guide	1 month
Anna Schoettle	Consulting on white pines	as needed

**PRODUCTS AND DUE DATES** (from original application form):

Project work will occur during 2001 - 2003. Completed products will be available in 2003.

1. A tested hazard rating system applicable to central Rockies relating rust severity to epidemiological factors and site and stand features.
2. Maps for various forests with white pines delimiting areas of rust hazard.
3. Microclimatological factors for southern Wyoming and northern Colorado (interpolated site conditions as corrected for topography, elevation, and other factors). These factors would also have utility for determining hazards from other forest disturbances such as wildfire, budworm, and bark beetles.
4. Disease control recommendations and vegetation management strategies linked to hazard zones. These include a determination where practices such as Ribes control, pruning, and growing white pines would be feasible.

**STATUS OF PRODUCTS/PRESENTATIONS:** (If products or presentations are not completed by the due date, explain why and indicate when the products will be completed. Indicate whether the Region/Area considers current progress on the project to be acceptable; if not, what corrective measures are planned?)

We had a difficult start to this project in 2001:

1. The original FHP leader of the project retired in 2001 and a new leader of this project (JLHarris) was assigned to take on this work in May 2001.
2. The STDP funding arrived to the Rocky Mountain Region offices in May. The new FHP leader of this project (JLHarris), R2 Regional Office Agreements staff, and Colorado State University were finally able to complete an Agreement to transfer funds for the work in Sept. 2001.
3. The CSU graduate student primarily assisting in this project performed other work assignments until funding for this project was available.

Although work on the project was delayed, the compilation of remote sensing data and other white pine data sources, the monitoring of weather data, and the development of a *Ribes* spp. plant identification guide were accomplished. **Acceptable progress** has been made on this project for 2001.

**ACCOMPLISHMENTS TO DATE:****Products/Publications/Technology Transfer:**

1. Meteorological stations were recently placed in Colorado and Wyoming:
  - HOBO H8 Pro Series Data Loggers (Onset Computer Corporation) were placed near stands of white pines (limber pine and/or bristlecone pine) throughout Colorado and Wyoming to collect temperature and relative humidity data.
  - In Colorado, 18 meteorological stations were placed in or near Rio Grande, San Isabe, Pike, and Roosevelt National Forests.
  - In Wyoming, 15 meteorological stations were placed in or near Medicine Bow, Bighorn, and Shoshone National Forests.
  - A complete list of recently placed weather stations is available from William Jacobi of Colorado State University.
2. Meteorological data was collected from existing database sources.
  - We determined the sources and locations of existing weather stations located at or above 8,000 feet elevation in CO and WY from:
    - a. Remote Automatic Weather Stations (RAWS) from NOAA for CO and WY
    - b. Colorado State Climate Center stations
  - Much of this data needs analysis for use in our project.

3. In cooperation with Brian Geils and Gene VanArsdale, a *Ribes* spp. identification guide is nearing completion. This guide will have line drawings of all species of *Ribes* found in the Central Rockies and will be used by field crews and Dept of Ag nursery inspectors over the next two - three years.
4. In cooperation with Eric Smith at FHTET, a compilation of exiting data sets and information on five needle pines in WY and CO is ongoing and should be completed in the next few months. This will help determine the location and extent of the resource at risk in CO and WY. This will also aid in future sampling and characterization of the five-needle pine resource.
  - This study will also look at site and habitat relationships of white pine occurrence. Eric Smith at FHTET has undertaken a compilation of existing data sets on five needled pines in WY and CO. A database of existing studies on limber pine in CO and WY and sources for large data sets containing white pines has been assembled and should be available online shortly. Current and ongoing efforts are focused on describing limber pine habitats in CO and WY based on data from USFS Stage 2 inventories and F.I.A. Future work will focus on determining which of the defined habitat types, based on site characteristics, would be most at risk of infection by white pine blister rust.
  - A compilation of existing white pine study reports/journal articles and site maps will be available in an online database. Larger data sources are from BLM, Stage 2 stand inventories, and FIA. This database informs foresters about study variables measured and how to contact researchers for the actual data.
5. Two coordination meetings among white pine researchers and managers were hosted by CSU in Spring and Fall 2000, and Spring and Summer 2001.
  - The most recent meeting was a two-hour coordination meeting about field detection and modeling factors on September 10 - 11, 2001 with white pine experts from around the western US at the Western International Forest Disease Work Conference in Carmel CA.
  - Our next coordination meeting is scheduled for October 25, 2001 and will include a field trip to standardize field research efforts.
6. Consultations with USDA Forest Service Districts personnel were held during the summer of 2001 to offer information about this project and the risk of white pine blister rust infection to their local white pines.
7. A day-long training/consultaion program was provided in May of 2001 to educate Colorado Department of Agriculture Nursery Inspectors about the signs and symptoms of white pine blister rust. These inspectors are a front-line defense against introduction of the fungus into new areas of the region by humans.
8. Informational posters and flyers on White Pine Blister Rust Disease and its potential impact to the region were produced. These were displayed at several forest service meetings and regional arborist meetings. A bulletin based on the poster was printed and distributed to all Forest Service District offices in Colorado that have a significant white pine component in their forests.

WPBR Poster

**FIRST FISCAL YEAR FUNDED: 2001**

**FUNDS OBLIGATED FROM BEGINNING OF PROJECT THROUGH CURRENT FISCAL YEAR:**  
 (include both monetary and in-kind, excluding FHP base funding and salaries) (extend table as needed):

	<b>Item</b>	<b>Requested Funding</b>	<b>Received Funding</b>	<b>Expended Funding</b>
<b>PREVIOUS YEAR FY 2001</b>				
<b>Administration</b>	Salary	19,000.00	29,000.00	
	Overhead			
	Travel	17,000.		
<b>Procurements</b>	Contracting	33,000.	13,000.	
	Equipment	5000.		
	Supplies	4000.		
<b>YEAR TOTALS</b>		78,000.00	42,000.	

<b>CURRENT YEAR FY 2002</b>				
<b>Administration</b>	Salary	20,000.00	29,000.00	
	Overhead			
	Travel	18,000.		
<b>Procurements</b>	Contracting	33,000.		
	Equipment	6000.		
	Supplies	4000.		
<b>YEAR TOTALS</b>		81,000.00	29,000.00	

<b>FY 2003</b>		<b>Requested FHP STDP Funding</b>	<b>Other Source Funding</b>	<b>Source</b>
<b>Administration</b>	Salary	Use of Carryover monies from STDP funding in 2001 and 2002.		
	Overhead			
	Travel			
<b>Procurements</b>	Contracting			
	Equipment			
	Supplies			
<b>YEAR TOTALS</b>				
<b>PROJECT TOTALS</b>				

**FUNDS NOT USED FROM PREVIOUS FISCAL YEAR** (If there are unused funds, what is the reason for not using them? How will the project continue without these funds?)

The STDP funding arrived to the Rocky Mountain Region offices in May. The new FHP leader of this project (JLHarris), R2 Regional Office Agreements staff, and Colorado State University were finally able to complete an Agreement to transfer funds for the work in Sept. 2001. With this Agreement, the R2 Regional Office has now obligated the STDP funding of \$78,000.00 for use by Colorado State University to work on this project. Approximately, \$9,000.00 was used in FY 2001.

<b>Fiscal Year</b>	<b>STDP Funding Allocated</b>	<b>Funds Obligated</b>	<b>Funds Unused</b>
<b>FY2001</b>	<b>78,000.00</b>	<b>78,000.00</b>	<b>0</b>

**EXPECTED BUDGET FOR NEXT FISCAL YEAR:** (include both monetary and in-kind, excluding FHP base funding and salaries) (extend table as needed):

	<b>Item</b>	<b>Requested FHP STDP Funding</b>	<b>Other-Source Funding</b>	<b>Source Colorado State University</b>
<b>Administration</b>	Salary	20,000.00	29,000.00	
	Overhead			
	Travel	18,000.		
<b>Procurements</b>	Contracting	33,000.	13,000.00	
	Equipment	6000.		
	Supplies	4000.		
<b>Totals</b>		81,000.00	42,000.00	

**DIFFERENCE BETWEEN ORIGINAL AND AMENDED REQUESTS AND JUSTIFICATION** (the difference between originally requested funds and funds needed based on changes in the budget or scope of the project. Be specific and clear about where the money will be used and by whom):

**STDP FUNDING NEEDED:**

Total estimated additional future funding needed beyond the current fiscal year.

Estimated STDP funding needed in remaining year(s) of the project by fiscal year. Show separately the funding to be requested/provided from other sources (extend the table as necessary).

<b>Fiscal Year</b>	<b>STDP Funding</b>	<b>Other-Source Funding</b>	<b>Source</b>