



INVESTIGATOR'S ANNUAL REPORT

United States Department of the Interior
National Park Service

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All or some of the information you provide may become available to the public.

Reporting Year: 2010	Park: Yellowstone NP	Select the type of permit this report addresses: Scientific Study	
Name of principal investigator or responsible official: James Blodgett		Office Phone: (605) 716-2783	
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Additional investigators or key field assistants (first name, last name, office phone, office email)			
Name: Emma, Gustke		Phone:	Email:
Name: Brittany, Deranleau		Phone:	Email:
Project Title (maximum 300 characters): White Pine Blister Rust Pest Trend-Impact Plots			
Park-assigned Study or Activity #: YELL-02176	Park-assigned Permit #: YELL-2010-SCI-2176	Permit Start Date: Jan 01, 2010	Permit Expiration Date: Dec 31, 2010
Scientific Study Starting Date: Jul 01, 1998		Estimated Scientific Study Ending Date: Dec 31, 2061	
For either a Scientific Study or a Science Education Activity, the status is: Continuing		For a Scientific Study that is completed, please check each of the following that applies:	
		<input type="checkbox"/> A final report has been provided to the park or will be provided to the park within the next two years	
		<input type="checkbox"/> Copies of field notes, data files, photos, or other study records, as agreed, have been provided to the park	
		<input type="checkbox"/> All collected and retained specimens have been cataloged into the NPS catalog system and NPS has processed loan agreements as needed	
Activity Type: Monitoring			
Subject/Discipline: Land Use / Forestry			

Purpose of Scientific Study or Science Education Activity during the reporting year (maximum 4000 characters):
<p>To re-measure, analyze, manage data, and report information from a series of white pine blister rust permanent plots representing a wide range of stand conditions in WY. This data will be used for the calibration of rust disease models, and to report historical trends in the development of this important invasive disease.</p> <p>This study will continue for several years, with re-measurements and reports every 4 years. We would be in the park for about 1/2 day, but do not know the exact day (please see Field Sched.).</p>

Findings and status of Scientific Study or accomplishments of Science Education Activity during the reporting year (maximum 4000 characters):

White pine blister rust disease (WPBR) caused by the fungus, *Cronartium ribicola*, is an exotic-invasive disease of five-needle pines. This disease is severely affecting whitebark pine (*Pinus albicaulis*) and limber pine (*P. flexilis*) in the northern Rocky Mountains and is well established in five-needle pine stands of Wyoming forests. USDA-Forest Service, Rocky Mountain Region, Forest Health Protection established permanent plots in five-needle pine stands with the disease, representing a wide range of stand conditions. These plots were designed to collect long-term data on this disease. Results will be used to report historical trends in the continuing impact of this important disease. The three permanent plots in Yellowstone National Park, established in July 1998, were revisited on July 28, 2010.

When the Yellowstone NP plots were originally established, live whitebark pine made up 23% of the trees with a diameter (DBH) \hat{a} \approx 4 inches. The composition of live whitebark pine has decreased to 10% in 2010. Of the original whitebark pine trees, 71% have died since the plots were established. Most of the mortality (67%) occurred before 2006, with 4% mortality occurring between 2006 and 2010. Forty-six percent of this mortality was attributed to mountain pine beetle (MPB) acting alone, 21% from MPB together with WPBR, and 8% due to WPBR acting alone.

Abundant regeneration is starting to replace the dead trees with approximately 3,333 stems per acre consisting of 2,100 seedling (height < 4.5 feet) stems per acre and 1,233 sapling (height > 4.5 feet and a DBH < 4 inches) stems per acre. Whitebark pine made up 22% of the seedling and 35% of the saplings regeneration. The remaining percentage of regeneration was subalpine fir. One of the whitebark pine saplings and none of the seedlings were infected with WPBR in 2010.

For Scientific Studies (not Science Education Activities), were any specimens collected and removed from the park but not destroyed during analysis?

No

Funding specifically used in this park this reporting year that was provided by NPS (enter dollar amount):
\$0

Funding specifically used in this park this reporting year that was provided by all other sources (enter dollar amount):
\$0

List any other U.S. Government Agencies supporting this study or activity and the funding each provided this reporting year:

USDA Forest Service [\$800]

Paperwork Reduction Act Statement: A federal agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. Public reporting for this collection of information is estimated to average 1.625 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the forms. Direct comments regarding this burden estimate or any aspect of this form to Dr. John G. Dennis, Natural Resources (3127 MIB), National Park Service, 1849 C Street, N.W., Washington, DC 20240.