

## Project Summary

### Rocky Mountains Cooperative Ecosystem Studies Unit

**Project Title:** Whitebark Pine recruitment within the Greater Yellowstone Ecosystem

**Type of Project:** Research  
**Discipline:** Natural  
**Funding Agency:** National Park Service  
**Other Partners/Cooperators:** University of Montana  
**Effective Dates:** 9/30/2009 - 6/30/2011  
**Funding Amount:** \$16,414

**Investigators and Agency Representative:**

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**Project Abstract:** Forest monitoring has shown a rapid and precipitous decline of whitebark pine in varying degrees throughout its range due to non-native white pine blister rust and native mountain pine beetle. Given the ecological importance of whitebark pine in the Greater Yellowstone Ecosystem, the Greater Yellowstone Network is working in partnership with federal agencies to monitor blister rust infection, survival and recruitment of whitebark pine over time. To date the whitebark Pine working group has focused its analysis and reporting on blister rust infection and survival leaving the recruitment data for future analysis.

The goal of this task agreement is to explore, analyze and report on whitebark pine recruitment data collected in the Greater Yellowstone Ecosystem beginning in 2004.

The general recruitment question being asked is "Is the current outbreak of insect and disease (and other factors) resulting in fewer whitebark pine trees reaching cone bearing age?"

The following metrics that could be calculated from the existing data structure include: 1.) Estimate the mean density of WbP seedling/sampling (*juvenile trees < 1.4 m high*) by cover type and determine if there is a significant decrease between sampling events (or time periods); 2.) Estimate the mean number of individuals < 1.4 m high with and without blister rust at 4 year intervals and determine if there is a significant increase in the number with blister rust infection; 3.) Count the total number of WbP seedling/sapling surviving to grow past 1.4 m ht after each sampling event and determine if the total number is declining over time; and 4.) Estimate the proportion of WbP trees (> 1.4 m high) that are cone bearing and determine if the proportion is declining over time.

**Outcomes with Completion Dates:**

1. Prepare a study plan to communicate key questions and analysis methods proposed for this project (October - November 2009).
2. Solicit peer review from the Greater Yellowstone Whitebark Pine working group to the refine study plan (December 2009).
3. Submit a formal request for data following the guidelines supplied by the GRYN (December 2009).
4. Analyze recruitment data e.g. descriptive summaries and other statistical analysis as described in the study plan (January - April 2010).
5. Prepare written report and graphical displays of data and summarize results in a project report (May 2010).
6. Prepare and present results at the 5-needle pine symposium sponsored by the Whitebark Pine Foundation (June 2010).
7. All final products are due to the NPS-GRYN by June 30, 2011.

**Keywords:** Whitebark Pine recruitment, Greater Yellowstone Ecosystem , Yellowstone National Park, University of Montana