Project Completion Report
Rocky Mountains Cooperative Ecosystem Studies Unit (RM-CESU)

Project Title: Understanding whitebark pine demographics associated with established long-term monitoring plots in Yellowstone and Grand Teton National Parks, and surrounding US Forest Service lands

Project Code: P12AC10579 (MSU-247)

Type of Project: Technical Assistance

Funding Agency: National Park Service

Partner University: Montana State University

NPS Agreement Technical Representative (with complete contact information): Cathie Jean, cathie_jean@nps.gov, 406-994-7530

Principal Investigators: Erin Shanahan, Greater Yellowstone Network, 406-581-0398, erin_shanahan@nps.gov

Start Date of Project: June, 2012

End Date of Project: December, 2014

Funding Amount: $4959

Project Summary.
We successfully collected approximately 450 cores from whitebark pine trees in both control and treatment plots located within the Gallatin National Forest along the Gallatin Crest. This area turned out to provide the best historical data on late 1970s-early 1980s mountain pine beetle killed stands in the Greater Yellowstone Area. The study stands were selected based on the percentage of overstory that was removed during this time period and the opportunity for encountering non-disturbed stands adjacent to these transitioned areas. Unfortunately, information from both Yellowstone (YNP) and Grand Teton National Parks were not sufficient to warrant sampling save for one area along the northwest boundary of YNP that was subsequently burned in the Miner Complex fire. Core samples have been processed for analysis, dated and are currently being measured for ring width growth. After completion of laboratory processing and analysis, this work will be included as part of a Master's Thesis to be completed by December of 2014.

In the fall of 2012, I presented a poster of my initial methods and findings at the Yellowstone Biennial Scientific Conference in Mammoth, Wyoming and at the Graduate School's Welcome Reception. I provide an overview of my work to the Greater Yellowstone Coordinating Committee at the Whitebark Pine Subcommittee meetings and at a graduate seminar at MSU.
Number of students participating in this project: 3 undergraduates and 1graduate student.

Lessons Learned from this project: When you plan a field project, things can often go awry.

I was thwarted from sampling in areas that I had anticipated including in my study area for lack of local knowledge from agency personnel or an relevant historical data on where I might find stands of whitebark to meet my study design requirements (stands impacted by the 1970's mountain pine beetle outbreak). In some locations, once I identified and found eligible whitebark pine stands, I was unable to collect samples on several occasions due to high winds and falling trees. Unfortunately my main study area completely burned up after I had collected only a portion of the samples that I needed. I discovered that flexibility and a decent back up plan can help to minimize stress in addition to a very dependable, enthusiastic and flexible co-worker (namely the assistants whom I was able to support with the CESU grant). I also learned that you should build in about twice as much time as you anticipate to complete field and lab work. The permitting process through the Forest Service and Park Service was an interesting journey. It is best to be concise, timely in your submission of any permits and important to follow up, with the appropriate person, on anything that has been submitted. This process can essentially impede any and all progress if not performed correctly.

Other RM-CESU agencies or research partners who participated in this project:

For the initial proposal, NPS Coordinator: Dan Reinhart, Yellowstone NP, 307-344- 2145, dan_reinhart@nps.gov
And Partner park contact: Kelly McCloskey, Grand Teton NP, 307-739-3678, kelly_mccloskey@nps.gov

IS THERE ANYONE FROM THE GALLATIN THAT YOU COULD INCLUDE?

My advisor at MSU: Dave Roberts, Ph.D., Department of Ecology, Montana State University, 310 Lewis Hall, Bozeman, MT, 59717-3640 (406) 994-4548, droberts@montana.edu

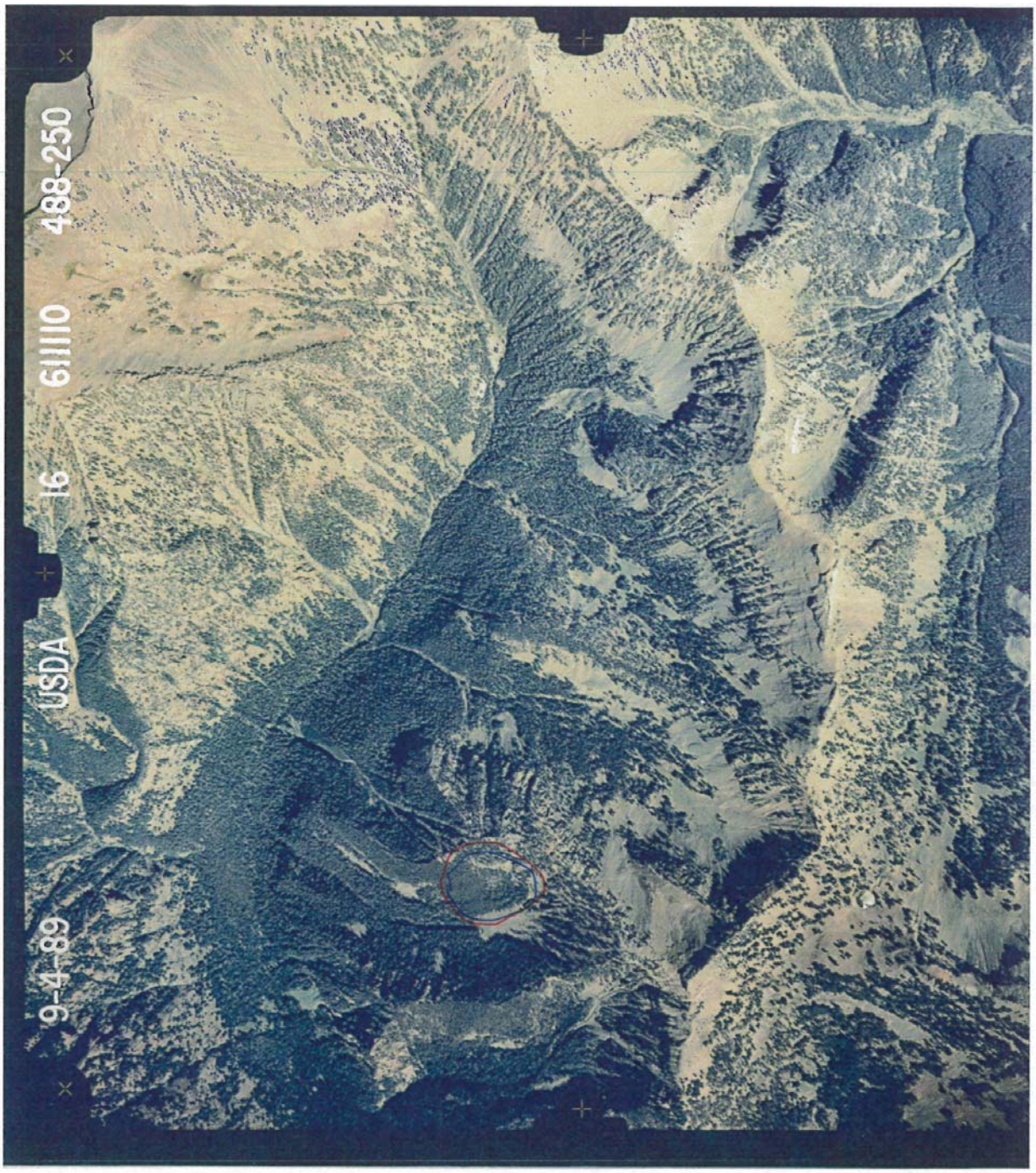
I have included 5 photos. The first 2 were taken at study site locations and the last 3 are a series of aerial photographs that I obtained from the Gallatin National Forest archives. With photo interpretation, I was able to confirm and select stands that fit the criteria for my study design. With this series of photos, I could pinpoint within a few years, when mountain pine beetle infested a stand. I was then able to date when I would expect to see understory whitebark pine, if they released, exhibit a sudden and rapid growth response.

Megan measuring and coring tree.

Megan storing core.

Aerial of target stand taken in 1971. The stand that is circled in red is intact with no sign of mountain pine beetle mortality.

This photo was taken of the same area in 1981. The stand again circled in red has telltale signs of mountain pine beetle infestation (red trees in the canopy).



This third photo, taken in 1989, shows the stand (red circle) which has now had a large percentage of the canopy removed due to beetle kill.