Project Summary
Rocky Mountains Cooperative Ecosystem Studies Unit

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

Discipline: Natural Resources
Type of Project: Technical Assistance/Education
Funding Agency: National Park Service
Other Partners/Cooperators: Montana State University
Effective Dates: 6/1/2012 – 9/30/2013
Funding Amount: $4,959

Investigators and Agency Representative:
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Project Abstract: The project purpose is to help understand the demographics of whitebark pine trees in the Greater Yellowstone Ecosystem (GYE). Much of the information available on successional modeling for whitebark pine communities is based on research conducted in an ecosystem influenced by maritime conditions (Pacific North West). There are strong indications that the GYE is subjected to more continental climatic conditions and as a result, the dynamics of whitebark pine populations in the GYE may in fact be very different from those of maritime populations. For example, many stands of whitebark pine in the Pacific North West are considered seral rather than climax, and appear to experience more of a low- to mixed- severity fire regime compared to the high-intensity crown fire regime of whitebark pine forests in the GYE. Recent survey work in the GYE shows common establishment with variable recruitment of young trees in the understory of mature forests (GYWPMWG 2011a). Density and age distribution of these individuals varies greatly among stands across the ecosystem. By determining historical seedling and sapling growth rates and their relation to successional disturbances such as fire, beetle, and disease, we will be better equipped to guide restoration efforts throughout the GYE and to ensure that management decisions are based on scientific information collected from the ecosystem in which restoration efforts are actually occurring. In some areas, natural regeneration of whitebark pine is clearly the most optimal form of whitebark pine restoration following widespread mortality. In order to fully evaluate a stand for mechanical restoration, it will be important to determine the demographic structure of understory populations and the relationship between seedling/sapling age and recruitment potential into the canopy. In addition, the USFWS has listed whitebark pine as a candidate species ensuring future consideration for protection under the Endangered Species Act.

The goal of this partnership is to have MSU provide an intern that will contribute valuable information towards the following objectives: (1) To determine if live and dead 10 to 25 cm DBH (young to middle age) whitebark pine trees were a component of the understory during the last major canopy disturbance (late 1970's, early 1980's) and if so, did they experience a sudden and rapid growth event following canopy opening and (2) To determine the age distribution among whitebark pine seedling and saplings in the understory of whitebark pine long-term monitoring stands.

This internship opportunity will provide a student valuable experience working in the field of ecology that allows them to gain experience for future employment. This project will also provide an intern to work closely with the PI and NPS Technical Expert on gathering data for a research project related to the whitebark pine trees in the Greater Yellowstone Ecosystem.

Outcomes with Completion Dates: September 30, 2013

Keywords: student intern, white bark pine, demographics, Yellowstone National Park, Gran Teton National Park, Greater Yellowstone Network I & M Network, Montana State University