Report as of FY2007 for 2006MT105B: "Student fellowship: Water quality function in subalpine wetlands in response to disturbance and restoration"

Publications

Project 2006MT105B has resulted in no reported publications as of FY2007.

Report Follows

Water quality function in subalpine wetlands in response to disturbance and restoration

Final Report January 18, 2007

Sunni Heikes-Knapton - Master's of Science candidate at Montana State University, Land Resources and Environmental Sciences

Upon being granted a Montana Water Center Student Fellowship Grant, awardee Sunni Heikes-Knapton and advisor Dr. Duncan Patten commenced with site investigation for the research project titled; Subalpine Fen Wetlands: Environmental Drivers and Response to Human Perturbation and Restoration. Throughout the early summer of 2006, numerous wetlands were located and evaluated for research potential within a subalpine region of Southwest Montana. Discussion was held to determine the best options for the direction of the study and to ensure that the chosen sites were able to address the research questions. By mid July, 28 wetlands were identified to be part of the study, all within the boundaries of Moonlight Basin ski area.

Following site selection, appropriate research methods were chosen to examine the parameters of interest for the study. A hand held field meter with 2 pH probes and 2 oxidation/reduction probes were purchased for use in examination of the soils. A small diameter soil core probe was also purchased to take soil samples with the least disturbance to the study area. To examine the water table parameter of the study, multiple sections of 2 inch slotted PVC pipe and associated caps and couplers were purchased to construct the shallow monitoring wells. Three auger heads, two handles, and three 1 meter extensions were purchased to core into the soil to install the monitoring wells. Two 50 meter tapes were purchased to examine the landscape parameters with the use of an eye level. A digital camera was also purchased for recording images of the research. Funds from the Fellowship grant were used to purchase some of this equipment, and also used to offset costs of traveling and working in the field during the 2006 season.

The remaining equipment needs for the study are a soil probe for measuring moisture content, and miscellaneous field gear for recording data. Numerous unmentioned pieces of equipment are available for use through Dr. Patten's Hydroecology Lab. Additional expenses will be associated with analysis of soil organic C content and vegetation biomass.

Through the remainder of the 2006 field season, over 70 monitoring wells were manually installed by Dr. Patten and Sunni Heikes-Knapton. During the installation of the wells, the sites were evaluated for characteristic similarities in vegetation, hydrology, soils, and landscape parameters. A field tour was also performed with the environmental compliance officer from Moonlight basin to gain background information on the restored/constructed wetland sites. Data collection sheets have been composed, and limited initial data collection was performed including preliminary water table

measurements, soil profile data, and identification of wetland plant species. Further field work was prevented by weather in mid September.

Enrollment in LRES 500 was completed in Fall 2006. The course requirements included a presentation of the research topic with some additional preliminary findings. Sunni Heikes-Knapton received a grade of A- for the class. Shortly thereafter, a similarly structured presentation was given at the 2006 Montana AWRA conference in Polson, Montana. This presentation was awarded the first prize student presenter award. The MSU news service also interviewed Sunni for a story on the project to be featured in the "Research Roundup" section of the web publication.

Tasks for spring 2007 include enrollment in 5 thesis credits. A formal proposal of the research was written, and will be reviewed by the graduate committee on January 24, 2007. Following this meeting, a clear set of objectives for the remainder of the research will be laid out, as well as a job description for a field assistant during the 2007 field season. Ideally, the field assistant will be assigned and paid by MSU's Undergraduate Scholars Program.

Remaining time under the Water Center's Fellowship Program will be spent on literature review and outlining and formatting of the draft thesis. Additionally, an application may be submitted for acceptance as a presenter at the 2007 National Society of Wetland Scientists conference early June in Sacremento, California. Weather dependent, the field season and data collection will commence either shortly before or after this conference. Data analysis and additional writing will commence during or directly after the 2007 field season. Defense of the thesis is intended to take place by December 2007.

It is with much appreciation that I have been able to accomplish the previously listed tasks. The Water Center's Fellowship Program has undoubtedly increased the productivity and progress of the project.

Sunni Heikes Knapton