

Project Completion Report

Rocky Mountains Cooperative Ecosystem Studies Unit (RM-CESU)

Project Title: Hydrological Analysis and Pilot Restoration Project for Weippe Prairie, Nez Perce National Historical Park, Idaho

Project Code (such as UMT-72 and/or the “P” number): CSURM-226: P11AC90688

Type of Project (Research, Technical Assistance or Education): Technical Assistance

Funding Agency: National Park Service

Partner University: Colorado State University

NPS Agreement Technical Representative:

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Start Date of Project: June 15, 2011

End Date of Project: December 31, 2014

Funding Amount: \$41,195

Project Summary, including descriptions of products, work accomplished and/or major results. If the information is restricted (e.g. location of endangered species or cultural resources), indicate the title and location of the final report. Also add web sites where project-related information may be found.

This purpose of this project was to develop and conduct a pilot restoration project on an approximately 15 acre portion of the Weippe Prairie site of Nez Perce National Historical Park. The area in question was historically a seasonally wet meadow that supported large stands of camas (*Camassia quamash*). The study area was subsequently artificially drained and very little camas remains. With the area now dry, invasive plants and grasses dominate the vegetative community.

One of the goals of the project was to develop an intensive hydrologic data collection network that would provide information on groundwater in the project area for use in future restoration of an approximately 15 acre section of the property. Starting in the spring of 2012 three soil redox potential logging stations were installed. Additionally, automated groundwater pressure transducers recording hourly water depth in nine wells and staff gauges were also installed. To broaden the spatial extent of hydrologic monitoring, NEPE staff manually measured water depth at 43 wells, 13 staff gauges, and 4 piezometers. The measurement interval was weekly from late-April through mid-July, then approximately biweekly until mid-September. These data were

collected from 2012 through fall of 2014.

With the soil moisture monitoring program installed at the site, pilot restoration work was implemented on the drainage ditch running through the project area. Three temporary plywood dams were constructed across the ditch during fall 2012. The dams were constructed to influence the water table in subsequent growing seasons by raising surface water elevation, flooding areas outside of the ditch, decreasing the hydrologic gradient between meadow groundwater and ditch surface water, and prolonging high water tables in the meadow. It was hoped construction of these three temporary dams would replicate the expected surface and near surface water conditions that would exist under a scenario where the ditch was permanently filled.

Results from the soil moisture monitoring project indicated that near surface soil moisture within the Weippe Prairie is entirely surface fed. The primary water inputs to the system are by spring snow melt and rain events. The monitoring also indicated that changes to water levels in both the ditch draining the site from south to north and near surface groundwater levels in the soils of the meadow are closely correlated. Installation of the temporary dams in the drainage ditch did have an impact on groundwater levels in the project area. Observations from summer 2013 and summer 2014 indicated that near surface groundwater persisted longer into the late spring/early summer than it had prior to dam installation.

An additional aspect of this study was to determine if changes to vegetation composition occurred via an increased presence of near surface groundwater through the growing season caused by blocking the ditch. Vegetation plots were installed and measured in 2012 (prior to dam installation) and again in 2013 & 2014. Unfortunately, the results of those studies were inconclusive based on the scale of measurement, and types of vegetation being measured. While it was clear the surface and near surface ground water remained longer into the growing season, the impacts that had on vegetative composition was not detected. This was believed to result from the tenacious nature of the vegetation in questions, the particular water years of 2013 and 2014, and the relatively short duration of the study (three growing seasons).

Taken as a whole, the study was a success and provided the park with a framework needed to develop and move forward with permanent restoration efforts at Weippe Prairie. The vegetative cover monitoring also provided information the park needed to refine the permanent restoration alternatives and make a determination on how to best address and achieve the desired vegetative composition changes over the long and short term of the permanent restoration project.

Number of students participating in this project: undergraduates, graduate students, degrees conferred. 1 Colorado State University graduate student researcher participated in the project. No degree was conferred based on this project.

Lessons Learned from this project: This project was instrumental in the park moving forward with development and implementation of a permanent restoration effort for this 15 acre portion of the Weippe Prairie site.

Other RM-CESU agencies or research partners who participated in this project: None.