

a. Project Title: Development of a Restoration Handbook for Wetlands and Riparian Areas in North-Central Montana

b. National and/or Regional Priority Area(s): 1) National Priority 1.a.d. Wetland Protection and Restoration Plan; 2) National Priority 1.b.i and ii: Improving Effectiveness of Compensatory Mitigation and Protection of Vulnerable Wetlands and Aquatic Resources; 3) Regional Priority Evaluation and Planning of Mitigation in a Watershed Context; 4) Montana Strategic Direction 4, Restoration

c. Name of Applicant: The University of Montana (a state-chartered university under Section 20-25-201 of the Montana Statutes Annotated), Montana Natural Heritage Program

d. Key personnel and contact information: Linda Vance, Ph.D., Senior Ecologist, lvance@mt.gov; 406-444-3380; Tara Luna, Restoration Ecologist, tluna@3rivers.net 406- 226-4659 Address for both: Montana Natural Heritage Program, 1515 E. 6th Avenue, Helena, MT, 59620.

e. Geographic Location: The project covers the following USGS hydrologic basins:

North-Central Montana:

1001 Saskatchewan River within Montana

1003 Missouri-Marias River, MT

1005 Milk River, MT

f. Total project cost and dollars required: \$83,126 total, with \$62,244 requested

g. Abstract:

Although there are several print and electronic resources available to managers and stakeholders wishing to undertake voluntary or mitigation-based restoration activities, they do not provide comprehensive guidelines for the restoration of specific wetland ecological communities and systems endemic to particular areas. This purpose of this project is to develop, publish and distribute a wetland and riparian area restoration handbook for north-central Montana. This publication will be the first in a series of regionally-specific handbooks that will provide a comprehensive framework for innovative technologies to enhance restoration results of degraded natural wetlands and newly created wetland mitigation sites. The output will be a wetland restoration publication specifically geared toward the north-central ecoregion of Montana. It will include a narrative of ecological reference sites, a restoration site suitability screen to support decision making about success potential, specific restoration guidelines developed for north-central Montana wetland systems and an overview of restoration activities.

a. Description of Project:

The north-central region of Montana supports a high diversity of wetland and riparian ecological systems, including a significant portion of Montana's Northwestern Great Plains prairie potholes, and headwater wetlands and riparian systems along the Rocky Mountain front. In 2008, with EPA funding, the Montana Natural Heritage Program identified a reference network for herbaceous wetlands in this region, and produced detailed ecological descriptions of the systems found in the area¹. We are currently conducting another EPA-funded project to complete a three-level probabilistic survey of herbaceous and woody wetland condition across the two major basins (Milk River and Marias River) north of the Missouri. We have also partnered with the Chippewa Cree (Rocky Boys) and Blackfeet to develop a reference network and support their assessment work. Although high-quality wetlands exist in the area, many have been degraded by grazing, agriculture, dredging, water extraction, energy development, and the long-term effects of drought. Substantial work has been done to create and restore waterfowl habitat, but this has tended to rely on introduced species to provide specific features for reproduction and rearing. By contrast, there has been little work geared towards restoration of ecological integrity, in part because there are few guidelines to support it. Hansen and others (1995) provide very brief and generic recommendations for Montana wetland rehabilitation, but comprehensive guidelines developed around specific wetland ecological systems do not exist. Using our comprehensive descriptions, reference wetland sites, and our knowledge of the most current restoration technologies, we will develop specific guidelines and benchmarks that will maximize potential for success. This will be widely distributed to tribal, state, federal and private stakeholders.

b. Project Tasks:

There are several tasks associated with this project:

1) Using our existing descriptions and previously collected data from wetland reference sites in north-central Montana, we will evaluate and describe successional trends, species composition, abiotic factors and stressors within specific wetland ecological systems. We will develop a restoration publication covering seven herbaceous and two woody wetland ecological systems. For each ecological system, we will include a) a restoration suitability screening matrix that will assist land managers with prioritizing their existing wetlands for conservation and/or suitability for restoration efforts, and b) a narrative describing the reference sites and successional benchmarks for each type of wetland ecological system.

¹ The herbaceous wetland ecological systems found in this area include Western Great Plains Closed Depression, Western Great Plains Open Depression, Western Great Plains Saline Depression, Western Great Plains, North American Arid West Emergent Marshes, and Great Plains Prairie Potholes. We have identified a new system, Western Great Plains Playa, which we are currently researching in more detail. Each of these wetland ecological systems has a characteristic set of hydrologic, soil, and vegetation features, shaped by specific dynamics. In 2009, we are also identifying reference standard for Northwestern Great Plains Riparian Woodlands and Shrublands, and Northwestern Great Plains Floodplain systems in this region.

2) We will conduct intensive literature reviews and interviews with other restoration specialists to identify and describe currently available restoration technologies that are directly applicable to these systems. This will enable us to a) develop technical restoration guidelines specific to these ecological systems, b) identify performance standards for both voluntary restoration and compensatory wetland mitigation projects, and c) construct a narrative of general restoration activities required for each kind of system; including site evaluation, project planning, site preparation, selection of plant materials and stock types, revegetation strategies, and post-planting monitoring and management activities.

3) We will distribute this publication to tribal, state, federal and private partners and other interested parties who are actively engaged in or are in the initial stages of undertaking restoration activities in this region of Montana. This publication will be made available on the MTNHP website. We will offer a minimum of three training workshops, one on the Rocky Mountain front, one in central Montana, and one in the eastern part of the region. These trainings will cover ecological system identification, site evaluation, project planning, sources for plant materials, and post-planting monitoring and management. Restoration guidelines will also be incorporated into the description for each ecological system in the online Montana Field Guide (fieldguide.mt.gov). We envision that this first publication will guide the development of three other eco-region restoration handbooks for Montana.

c. Milestone Schedule:

January 2010- March 2010. Review reference site data for the major wetland ecological systems found in north-central Montana; develop restoration-focused narratives and descriptions for each of the nine ecological systems. Circulate among ecologists familiar with the region for review.

April 2010 to June 2010 . Conduct intensive review of general technical and scientific literature; interview restoration and plant materials specialists from the NRCS, the US Forest Service, and the BLM; produce a) restoration suitability screen for potential restoration projects, b) specific technical guidelines for restoring wetland ecological systems found in north- central Montana, c) and ecosystem-specific performance standards. Circulate among interviewees for comments and feedback.

June 2010 to August 2010. Develop three field workshops and offer to tribal, state, federal and private stakeholders in north-central Montana. Field test restoration suitability screen with tribal partners in northern Montana (Blackfoot Tribe, Fort Peck Indian Reservation, and Chippewa-Cree Tribe).

September 2010 to December 2010. Incorporate comments from first round of reviews and feedback from workshop participants into a complete draft handbook, including illustrations, photographs and worksheets. Make draft handbook available for download from the MTNHP website for peer and end user review.

January 2011 to March 2011. Review comments and revisions and integrate into final handbook; print and distribute handbook to tribal, state, federal and private stakeholders. Make available for downloads from MTNHP website. Present work at Montana Wetland Council winter meeting. Submit final report to EPA.

d. Project Need:

Tribal and federal land managers in north-central Montana are seeking comprehensive information to effectively plan and implement wetland restoration projects that meet specific goals. The Montana Natural Heritage Program has been asked to provide assistance in developing restoration project planning and implementation activities by the Blackfeet Nation, Fort Peck Indian Reservation and the Rocky Boy Indian Nations and the BLM. These managers have to rely on very generic information that does not include specific planning and implementation measures that address the unique abiotic characteristics and successional processes in wetland ecological systems or newly created wetland mitigation sites in this region. We can provide assistance based on our current staff expertise, but time and funding constraints do not permit us to offer the degree of guidance that is needed. By supplying comprehensive, system-specific information in a handbook format, we can boost the capacity of tribal and agency partners to plan effective restoration activities and to monitor existing projects.

e. Link to National and/or Regional Priority

National Priority Areas: This project will address and improve the following elements under the National Priority Areas: 1. a. Wetland Program Planning: d. Development/update of a Wetland Restoration and Protection Plan and 1.b. Enhancing Wetland Protection: i.) Improving the Effectiveness of Compensatory Mitigation and ii.) Refining the Protection of Vulnerable Wetlands and Aquatic Resources.

This project will assist land managers with their wetland program planning and restoration activities, as well as improving compensatory mitigation processes and protection of wetlands by providing intensive information to properly identify unique wetland communities and develop measures to protect, restore or enhance their condition.

Regional Priority Areas: This project will address two elements under the Regional Priority Areas: a) Evaluation and planning of mitigation in a watershed context and b) Regional Technology and Information Transfer and Facilitation.

This project will assist land managers with evaluation and planning of wetland mitigation projects in this region of Montana by providing the most current ecological and restoration information available.

f. Project Goals and Objectives.

i. Stated Objective/Link to EPA's Strategic Plan: The project's main objective is to improve the restoration decision-making process, enhance managers' capacity to

undertake and evaluate restoration projects, and increase the success of restoration projects through the use of best practices and ecoregion-specific information. This is directly linked to Goal 4, Land Preservation and Restoration, Objective 4.3: “This project is linked to Goal 4, Sub-objective 4.3. because it will lead to a net increase in wetland acres. This proposal also addresses the Montana Department of Environmental Quality’s strategic direction #4: The state actively supports and encourages wetland restoration and conservation.

ii. Results of Activities (Outputs): This project will have 1 major output: 1) a wetland restoration publication specific to the north-central eco-region of Montana that will include: a narrative of ecological reference sites, a restoration site suitability screen to support decision makers of the potential of restoration success, specific restoration guidelines developed for these wetland systems and an overview of restoration activities.

iii. Anticipated Environmental Improvement (Outcomes): Outcomes of this project include 1) federal, state, tribal and private wetland managers will have a comprehensive publication allowing them to a) prioritize wetland management activities such as protection, restoration and compensatory mitigation and b) plan, implement and evaluate wetland restoration and mitigation projects.

iv. Established baseline for measurement
The finished product will provide cohesive, current information for specific wetland ecological systems so that these crucial systems and the ecological processes can be more easily understood by land managers. This in turn will directly support more informed decisions regarding identification and protection, as well as compensatory mitigation and voluntary restoration project planning. Currently, no such information exists in a single, ecoregion specific format in Montana.

i. Staffing Information:

The Montana Natural Heritage Program has a full-time staff of 24 people, including scientists, database developers and managers, a web application developer, GIS and remote sensing analysts, digitizers and cartographers, and project support staff. This project will be carried out by the Restoration Ecologist, Tara Luna. The Senior Ecologist, Linda Vance, will provide oversight, review and project management. Two Wetland Ecologists will review each stage of handbook development, and will assist with the design and delivery of workshops and training materials. The MTNHP program is a state-mandated program operated by the University of Montana under contract with the Montana State Library. Partial funding for the program comes from the State Legislature and the University of Montana, and the remainder from projects, contracts, and partner agency support. Our state funding is used as a match.

j. Applicant’s experience

The University of Montana’s Montana Natural Heritage Program collects, validates and distributes information on Montana’s native species and habitats, emphasizing those of conservation concern. The Senior Ecologist has done extensive wetland assessment work for the BLM throughout the northwestern glaciated plains and northwestern Great Plains. The program’s Wetland Ecologists have been carrying out reference site identification

and documentation in these ecoregions, and are currently acting as project leads in the Milk and Marias River Basin wetland assessment project, as well as assisting in reference site identification and wetland assessment for tribal partners. The Vegetation and Restoration Ecologist employed by the MTNHP has been working in the ecological and restoration sciences for the past 18 years. She is actively describing the vegetation and plant associations found in wetlands and recently produced a series of native plant and restoration nursery agricultural handbooks for the US Forest Service. She has also authored many other articles and publications that address restoration techniques and native plant material selection, collection, nursery culturing and out-planting. She has lived and worked in this region of Montana for the past 18 years and has been directly involved with all phases of restoration work in this region. Resumes are attached at this end of this document.

Our physical infrastructure includes office space in the Montana State Library in Helena and at the University of Montana in Missoula, plus the computing network and communication resources of the state and university, as well as our own servers, desktop and laptop computers, and field sampling equipment. We maintain extensive databases of species observations, ecological site descriptions, and habitat assessments, most viewable from our interactive web application. All our publications are available in pdf format from download from our website. We have two full-time database managers, a web developer, and an information services manager whose work includes oversight, maintenance and upgrading of the infrastructure.

k. Partnership Information:

Our partners in this project include several north-central tribes, including the Blackfeet and Chippewa-Cree Nations (Rocky Boys) and Fort Peck Indian Reservation. This publication will be developed by collaborative input from federal agency and University of Montana restoration specialists. Additional partners from these agencies will be utilized for peer review, as well as the Montana Wetland Council. The target audience will be persons employed by tribal, federal, state, and private entities actively engaged in wetland restoration activities.

l. Transfer of results and methods

We will print 50 hardcopy handbooks for distribution to partners and individuals actively involved in restoration projects. The publication will be available for download at our website. The training workshops will provide participants an opportunity to ask questions, field-test portions of the manual, and get specific advice on particular challenges. While the species-specific information will be geared towards north-central Montana, the general approach, the restoration suitability screening tool and the monitoring and evaluation guidelines will have wide applicability. Information from this project will be shared at the Montana Wetland Council. Results from this project will also be used to develop subsequent Montana handbooks.

m. Quality Assurance/Quality Control (QA/QC):

There is no data collection associated with this project. We will submit a brief Quality Assurance Project Plan (QAPP) detailing the process for handling data records and computer-generated documents.

n. Invasive Species Control – We will ensure that this project does not facilitate the introduction or spread of invasive species by cleaning the undercarriage of field vehicles, checking clothing and footwear before leaving and entering assessment sites, and educating field staff on the identification of invasive species.

3. BUDGET NARRATIVE

4. PAST PERFORMANCE

- During the last 3 years, the MTNHP Ecology program has completed twelve federally-funded (EPA, USDA Forest Service and NRCS, USDI BLM) projects on time. EPA projects include:

- Assessing Wetland Condition with GIS: A Landscape Integrity Model for Montana, completed March 2009
- Geographically Isolated Wetlands and Intermittent/Ephemeral Streams in Montana: Extent, Distribution, and Function, completed January 2009
- Wetlands of the Flathead Valley: Change and Ecological Functions, completed January 2009
- Wetlands of the Bitterroot Valley: Change and Ecological Functions, completed January 2008
- Crosswalking National Wetland Inventory attributes to hydrogeomorphic functions and vegetation communities: a pilot study in the Gallatin Valley, Montana, completed December 2006

All written progress reports have been submitted on time. Project results have been presented at the Intermountain GIS Conference, The Western Wetlands Monitoring and Assessment Workgroup conference, the Natureserve Western Heritage Conference, and the Montana Wetland Council. The MTNHP Zoology, Botany, and Aquatics programs have also completed numerous federal projects. All project reports are available at our website: www.mtnhp.org. Additionally, we have completed NWI mapping for over 400 1:24K quads in the past three years.