

Project Title: Moore Creek Stream and Wetland Restoration Project
Design-Engineering Proposal for Phase 1

Date: November 11, 2022

Applicability to Project 2188 License Article(s)

This proposal will fund final design and regulatory permitting for restoration of a 2-mile reach of Moore Creek, a tributary to Ennis Lake north of Ennis, Montana (Figure 1). NorthWestern Energy (NWE) is successfully enhancing Project 2188 wildlife habitats through funding aimed to protect, restore, and enhance riparian, wetland, and upland habitats on private lands. This final design and permitting phase will lead to the implementation of on-the-ground restoration projects to help offset impacts to river resources associated with Project 2188 (Madison-Missouri River). The project meets the purpose and intent of License Article 423, which requires development of a vegetation and wildlife monitoring and enhancement plan intended to enhance native plants and wildlife populations on Project 2188 wildlife habitats adjacent to the Madison River. Specifically, NWE is successfully enhancing Project 2188 wildlife habitats through funding aimed to protect, restore, and enhance riparian, wetland, and upland habitats on private lands.

Priority Classification

The Moore Creek project area classifies as a Priority 2 2188 license project. The project is located on Moore Creek, a snowmelt dominated, cold-water tributary to Ennis Lake located within 0.5 miles of the Madison River. The project will address limiting factors related to degraded wildlife, wetland, and aquatic resources.

Project Sponsor(s): Valley Garden Land & Cattle, LLC
River Design Group, Inc.
NorthWestern Energy, Inc.

Location of Proposed Project

The project is in Madison County approximately one mile north of the town of Ennis, Montana (Figure 1) and is located entirely on private land owned by Valley Garden Land & Cattle, LLC.

- Geocode: 25-0510-15-1-01-01-0000
- DMS: 45° 23' 54.38" N; 111° 42' 49.39" W
- DD: Latitude: 45.395°N; Longitude: 111.717°W
- Sections 10, 15, 21 and 22, Township 5 South, Range 1 West

Total Project Cost: \$63,805

WildTAC Funds (Cost-Share) Requested for Project: \$63,805

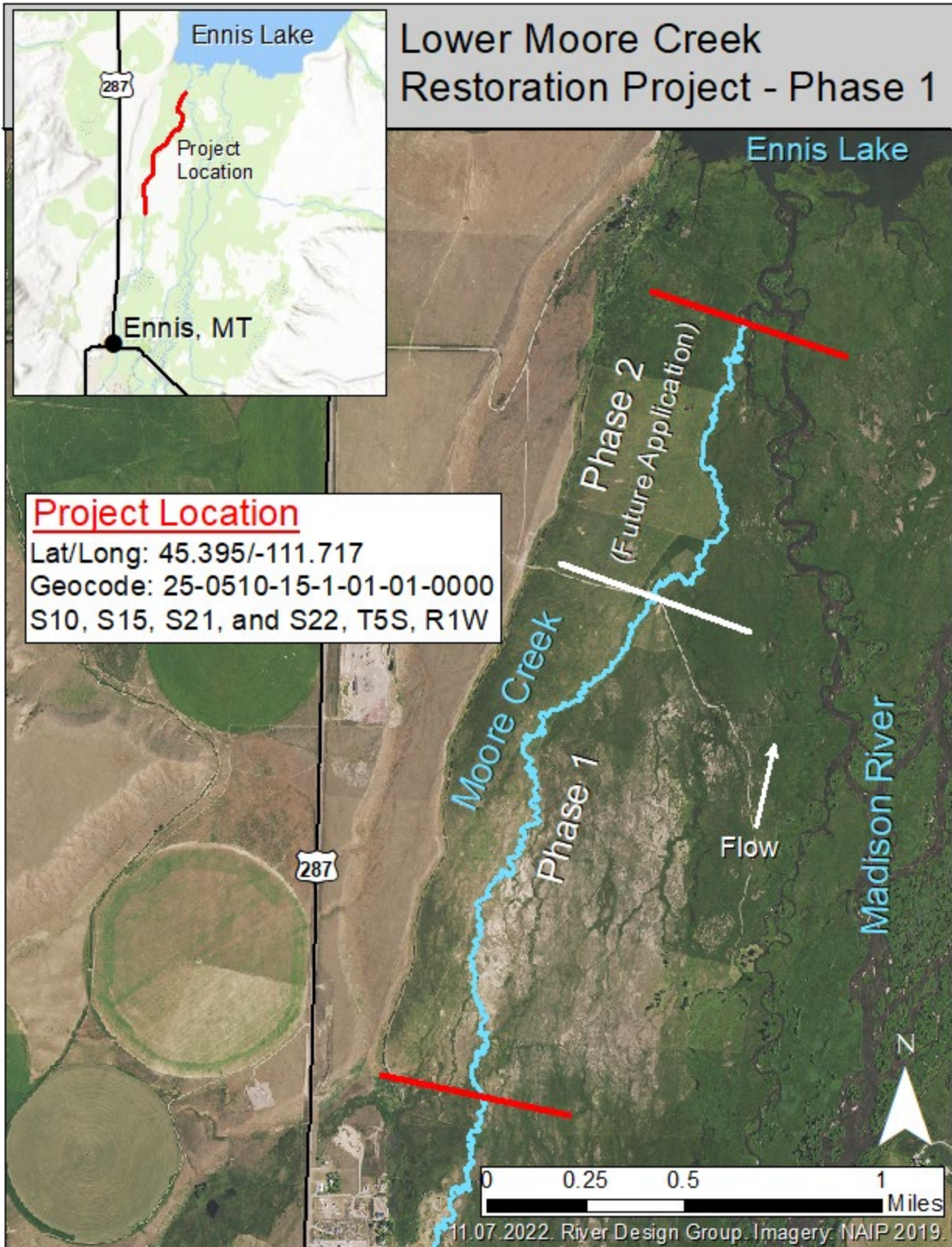


Figure 1. Project area map noting the upstream and downstream extents of Phase 1, and Phase 2 (future application).

I. INTRODUCTION

Moore Creek is an important cold-water, snowmelt dominated tributary to Ennis Lake. Agencies and resource managers have recently expressed interest in pursuing restoration actions on Moore Creek to improve water quality and address degraded aquatic, riparian and wetland resources. In 2022, NorthWestern Energy funded an assessment of existing channel morphology, habitat, and riparian and wetland conditions on a four-mile reach of Moore Creek located on the Valley Garden Ranch, a working cattle ranch owned by Valley Garden Land & Cattle, LLC. Results of this assessment will be presented at the annual TAC meeting. The conceptual design contemplates a phased implementation schedule that will include three to four phases of restoration on Moore Creek focusing on aquatic, riparian, terrestrial and wetland environments. This proposal is requesting funds to design and permit the Phase 1 of Moore Creek starting at the south property line and extending north approximately two miles on the Valley Garden Ranch.

The project area includes Moore Creek, tributary channels and springs, and prior converted wetlands. Moore Creek has been impacted by livestock grazing, channelization, ditching, and agricultural practices that have led to stream incision, entrenchment, high rates of bank erosion, and compromised aquatic and wetland habitats. In the mid-1900's, a four-mile-long drainage ditch was constructed on the west side of the valley to intercept springs and seeps to drain emergent and scrub-shrub wetlands. The ditch was subsequently plugged to create open water wetlands. These efforts were mostly unsuccessful, and the current ditch system and open water features provide marginal wetland functions and values and continue to alter wetland hydrology.



Figure 2. Photo point of Moore Creek illustrating high rates of bank erosion, simplified aquatic habitat conditions, and altered channel geometry (photo left). The existing ditch system intercepts an intermittent stream, springs and seeps, altering wetland hydrology and overall functions and values (photo right).

The purpose of future restoration projects will be to improve aquatic, riparian, terrestrial and wetland habitat conditions across the Moore Creek landscape. We envision this will be accomplished by re-establishing wetland hydrology, establishing site conditions to promote the establishment of diverse riparian and upland vegetation communities, constructing emergent and

open water wetland complexes to enhance wildlife habitat and water quality, and reconstructing Moore Creek within a diverse, vegetated floodplain corridor.

Specifically, restoration goals will include: 1) improving aquatic, riparian, and terrestrial habitat diversity for fish and wildlife; 2) establishing riffle and pool sequences and reconnecting floodplains; 3) modifying the existing ditch system to create a complex matrix of variable depth wetlands; 4) isolating wetlands from the channel to lower stream temperature; 5) converting areas within the existing upland herbaceous plant communities to emergent and scrub-shrub wetlands by creating new, lower floodplain surfaces adjacent to Moore Creek and tributary channels; and 6) restoring willow and riparian shrub communities in patches along streambanks and within portions of the floodplain.

II. Objectives

The following objectives have been developed for the Moore Creek Phase 1 Stream and Wetland Restoration Project:

1. Complete a detailed geomorphic assessment of Reach 1 Lower Moore Creek including reference reach data collection to refine channel and aquatic habitat design criteria;
2. Convert the existing ditch system into a series of emergent and open water wetlands, incorporating design criteria from “*Considerations and Prescriptions for the Design, Construction and Management of Shallow Water Wetlands for Spring through Fall by Use by Trumpeter Swans in Western Wyoming*” (Wyoming Game and Fish Department, 2004);
3. Establish site conditions to support the establishment of diverse riparian and terrestrial vegetation community types;
4. Develop final design drawings, cost estimates for implementation, and prepare regulatory permit documents including Madison Conservation District (310 Permit), US Army Corps of Engineers (Section 404), and Montana Department of Environmental Quality (318 Authorization).
5. Coordinate work with upstream restoration activities on Moore Creek being sponsored by NorthWestern Energy, Madison Conservation District and Montana Fish, Wildlife & Parks.

III. Methods

Data Collection Tasks

- Delienate wetlands and inventory existing vegetation communities, including reference conditions;
- Calibrate design discharge (Q_{bkf}) and survey existing channel thalweg, water surface and bankfull profile in Reach 1;
- Conduct detailed reference reach surveys to support development of channel design criteria;
- Collect high resolution UAS orthophoto in Reach 1;

- Prepare preliminary design drawings for Reach 1;
- Prepare off-channel wetland designs for 2-3 shallow emergent and open water complexes;
- Refine construction phasing plan and cost estimates for construction;
- Conduct routine wetland delineation for Phase 1 project area, including wetland reporting and impact analysis to support regulatory permitting; and
- Prepare Joint Permit Application.

IV. Schedule

Table 1 includes a proposed project schedule. Work will begin immediately following contract award, and the field assessment will be completed in the summer of 2023. A draft conceptual plan will be distributed to project stakeholders for review by December 2023. Based on comments received, a final design plan set will be prepared.

Table 1. 2023 project schedule for design and permitting of the Moore Creek Phase 1 Stream and Wetland Restoration Project.

Task	Quarter 1	Quarter 2	Quarter 3	Quarter 4 or 2024
Task 1. Assessment and Field Data Collection				
Task 2. Final Design Drawings				
Task 3. Regulatory Permitting				

V. Personnel

The project will be guided and implemented by a diverse group of stakeholders including NorthWestern Energy, Valley Garden Land & Cattle, LLC, Montana Fish, Wildlife & Parks, U.S. Fish & Wildlife Service, and agency partners. Our continued collaboration and history working in the Madison River Valley underscores the importance we place on offering a team that will continue to be compatible with the community and stakeholders.

RDG is an approved consultant on NorthWestern Energy’s Qualified Vendor’s List for stream and wetland restoration services. John Muhlfeld, Principal Restoration Hydrologist with RDG, will serve as the project manager and technical lead on behalf of the design team. Selita Ammond, RDG’s Geographic Information Systems analyst and Wetland Ecologist, will participate in the assessment and prepare the wetland designs and regulatory permitting documents. Nate Wyatt, PE and Senior Project Engineer, will prepare design drawings and coordinate RDG engineering resources.

VI. Budget

Table 2 includes a not-to-exceed cost estimate to perform the Scope of Work (SOW). The total cost to perform the SOW is \$63,805. The landowner has expressed his commitment facilitating restoration work including materials donations, development and implementing grazing management strategies that will complement restoration actions and providing some level of cash match to facilitate implementation of the Phase 1 project. The team plans to seek additional grant opportunities including Section 319 funding through the Montana Department of Environmental Quality.

Table 2. Project Budget Lower Moore Creek Stream and Wetland Restoration Project - Phase 1 Design- Engineering		Direct Expense (Lodging, Per Diem, Mileage, Equipment)	John Muirfield Project Manager & Hydrologist	Selita Ammondt, GISP Arian Brazenwood Restoration Ecologist s	Nate Wyatt, PE Staff Engineer	Andy Beiski, PLS Land Surveyor/AutoCAD	David Busby Fluvial Geomorphologist	Loren Smith AutoCAD Drafting	Hours Subtotal
Task 1 - Assessment and Field Data Collection									
1.1	Hydraulic Cross-Sections and Existing Profile	\$ 450	8				8		16
1.2	Reference Reach Data Collection	\$ 900	16				16		32
1.3	Wetland Delineation and Vegetation Inventory	\$ 575	24	60			24		108
1.4	UAS OrthoPhoto	\$ 300					16		16
Subtotal Task 1		\$ 2,225	\$ 7,200	\$ 7,800	\$ -	\$ -	\$ 6,400	\$ -	\$ 23,625
Task 2 - Preliminary and Final Design Drawings									
2.1	Develop Typical Cross-Sections		16						16
2.2	Design Dimensions, Pattern and Profile		16						16
2.3	Develop Open Water Wetland Design Criteria			8					8
2.4	Develop Emergent Wetland Design Criteria		8	16	16	16			56
2.5	Final Design Drawings and Engineering		8		60	24		60	152
Subtotal Task 2		\$ -	\$ 7,200	\$ 3,120	\$ 10,260	\$ 5,800	\$ -	\$ 6,300	\$ 32,680
Task 3 - Regulatory Permitting									
3.1	Routine Wetland Delineation and Reporting			30					30
3.2	Prepare Joint Permit Application		24						24
Subtotal Task 3		\$ -	\$ 3,600	\$ 3,900	\$ -	\$ -	\$ -	\$ -	\$ 7,500
TOTAL		\$ 2,225	\$ 18,000	\$ 14,820	\$ 10,260	\$ 5,800	\$ 6,400	\$ 6,300	\$ 63,805
		2003 WildTAC REQUEST \$ 63,805							
<i>Total Labor Hours for Individuals:</i>			120	114	76	40	64	60	474
<i>Individual Hourly Labor Rates:</i>			\$150	\$130	\$135	\$145	\$100	\$105	
Total Cost:		\$ 2,225	\$ 18,000	\$ 14,820	\$ 10,260	\$ 5,800	\$ 6,400	\$ 6,300	\$ 63,805

VII. Deliverables

Project deliverables will include the following:

- Preliminary and final design drawings and technical specifications.
- Regulatory permit submittals.
- Construction cost estimate and phasing plan.

VIII. Cultural Resources

This project will not result in ground disturbance or active construction therefore a cultural resources survey is not needed.

IX. Water Rights

Appropriate analysis will be performed to demonstrate the projects comply with the intent of Montana DNRC's "*Guidance for Landowners and Practitioners Engaged in Stream and Wetland Restoration Activities*", issued by the Water Resources Division on March 9, 2016.

DNRC guidelines state that "any wetland project (restoration) whose final design approximates the natural characteristics of adjacent natural wetlands or approximates something smaller in magnitude does not require a water right". The guidelines also state that restored wetlands should have characteristics similar to other natural wetlands in the area and should function entirely in the absence of artificial controls and diversions of water that intentionally appropriate water for wetland use.