

2021 Cost-Share Proposal for NorthWestern Energy (NWE) Project 2188 TAC Funds

Project Title: Beaver Creek Phase II Stream and Wetland Restoration Project
Construction Implementation

Date: 11/2/2020

Applicability to Project 2188 License Article(s):

Beaver Creek Phase II will offset impacts to river resources associated with Project 2188 (Madison-Missouri River). The project meets the purpose and intent of License Article 423 to enhance native plants and wildlife populations on lands and waters associated with the project. The current 5 year wildlife plan states that restoration and enhancement of riparian lands and wetlands has been a primary goal of the wildlife and vegetation enhancement plan. The project also meets the purpose of article 416, which supports spawning and rearing habitat enhancement projects on Holter Reservoir and in tributaries to the reservoir and tailwaters. Specifically, Project 2188 license for Holter reservoir identifies Beaver Creek as a primary spawning tributary to Holter where potential habitat enhancement could likely contribute to natural reproduction of the Holter Reservoir fishery. This proposal addresses wildlife, fisheries, and floodplain habitat in a primary tributary that enters the Missouri River between Hauser Dam and Upper Holter lake and would be designated a Priority 2 measure.

Priority Classification:

Beaver Creek Phase II Restoration Project classifies as a Priority 2 2188 license project. The project is located on Beaver Creek, a major spawning tributary to large adfluvial rainbow and brown trout that migrate from Holter Reservoir. Restoration efforts would improve fisheries resources by reconstructing the stream channel and floodplain to more natural conditions, improving habitat and riparian complexity, addressing sediment impairments and restoring hydrologic processes.

Project Sponsor (submitted by): USFS Helena-Lewis and Clark National Forest, Helena Ranger District
Contact: Alli Russell

Location of Proposed Project:

The project located in Lewis and Clark County approximately 14 miles northeast of Helena, MT. Beaver Creek is a large watershed originating on National Forest lands flowing 18 miles to the confluence of the Missouri River just below Hauser Dam. The project area lies entirely on FS lands on the Helena Ranger District approximately 1.3 miles upstream from its mouth at the Missouri River. The area was originally homesteaded by Charles Cochrane in 1909 and the Helena National Forest later acquired the land from Chester French in 1974. The legal description of the project area is NW1/4 and NE1/4 Section 20, Township 12 North, Range 2 West; SE1/4 Section 17, Township 12 North, Range 2 West; refer to Figure 1.



Figure 1. Beaver Creek Restoration Project vicinity map.

Geocode (in decimal degrees) Lat; 46.797

Lon: -111.877

Total Project Cost: \$522,129

TAC Funds (Cost-Share) Requested for Project: \$150,000

I. Introduction

Beaver Creek and the Missouri River (Hauser tailrace) provide the majority of spawning habitat for the large adfluvial rainbow and brown trout that migrate from Holter Reservoir, which are the aquatic focal species of this restoration project. Beaver Creek is within the Holter Lake system and supports a very popular recreational fishery for both rainbow and brown trout. Holter Lake ranked 6th in the state for fishing pressure and observed approximately 96,103 angler days from March 2017- February 2018. The Missouri River just above and below Beaver Creek observed over 18,800 angler days during this time frame (Strainer, MT FWP). The project proposes to restore 1.2 miles of lower Beaver Creek to improve instream habitat for fish and enhance riparian areas to provide nesting and foraging habitat for migratory songbirds and wetland areas for amphibians.

Beaver Creek Phase I was implemented Fall 2020 in partnership with the Helena-Lewis and Clark NF, Pat Barnes Trout Unlimited Chapter, and Montana Fish Wildlife and Parks Future Fisheries Improvement Program. 2016-2020 MoTAC funds supported an alternative analysis, final designs and in part, construction of Phase I.

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Figure 2. The River Design Group and TNT Excavating started Beaver Creek construction October 2020. Anticipated date of completion will be December 2020. Work will include reconstruction of 0.6 miles of stream channel and approximately 7 acres of reconstructed floodplain and wetland habitat. Volunteers and FS personnel have collected over 20,000 willow for streambank construction and floodplain revegetation.



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Phase II proposes to restore the remaining 0.6 miles of Beaver Creek and associated floodplain and wetland habitat. The lower reaches of Beaver Creek are also highly impaired from past agricultural, grazing practices, and rip-rap stabilization that resulted in stream channelization, and removal of riparian vegetation, refer to Figure 2. These impacts have led to degradation of the channel form, bank stability and eventual channel incision and substantial loss of floodplain connectivity.

Specific goals of the Beaver Creek restoration project include: 1) improving aquatic, riparian and terrestrial habitat diversity for fish and wildlife; 2) creating a matrix of variable depth wetlands within the existing channel; 3) converting areas within the existing upland plant communities to wetland areas by creating new, lower floodplain surfaces adjacent to Beaver Creek. In particular, shrub riparian areas will provide nesting and foraging habitat for migratory songbirds such as Wilson's warbler, orange-crowned warbler, MacGillivray's warbler, yellow warbler, American redstart, marsh wren, willow flycatcher, and calliope hummingbird. The establishment of large cottonwoods would provide habitat for Bullock's oriole. Creating a more complex matrix of riparian and associated upland habitats would also benefit a broad variety of frogs, snakes, and turtles.

There are also many benefits to native plant and pollinators within the project area. Restoring the floodplain and reducing non-native species in this project area will increase the desired native species and plant diversity in this drainage. Several FS Sensitive Species and Montana Species of Concern have habitat in the project area and would benefit from a restored floodplain, increasing available habitat while reducing the impact of noxious weeds to these uncommon or endemic species in the long-term.



Figure 3. Pictures display channel incision and bank instability and lack of floodplain connectivity in Reach 3. Rip-rap streambank modification/stabilization is common throughout the project area, implemented in response to the 1975 flood events. Beaver Creek is listed for sediment impairments (MT DEQ).

II. Objectives

The final plan set for Phase II needs further refinement with field verification but, will be finalized winter 2020/2021. The new channel and floodplain design was developed to provide a landscape capable of sustaining geomorphic processes to support desired aquatic habitat and riparian conditions. The proposed design would reduce channel entrenchment, establish pools, address stream flows and ponding, and modify channel hydraulics to produce flows that would support a mobile gravel bed i.e. functional and naturally maintained spawning areas. The shape of the new channel and adjacent floodplain work was determined through hydrologic analysis, terrain model development, earthwork analysis and hydraulic modeling. To achieve the desired condition of floodplain connectivity and habitat complexity, a combination of restoration strategies would be applied:

- Re-connect former abandoned floodplain surfaces.
- Reconnect abandoned oxbows to increase stream length and reduce channel slope, and create aquatic habitat.
- Construct new channel characteristic of a riffle-pool C4 stream type, within a terraced valley and broadly connected floodplain.
- Transition to Reach 4 with a moderately entrenched B4 stream type by increasing floodplain width and placement of 3 log weirs/step pools.
- Convert the existing channel to emergent wetlands (0.45 acres) and construct and preserve approximately 0.3 acres of shallow open water and scrub/shrub wetlands. Constructed side channel habitat (100 linear feet) would connect a portion of the emergent wetland habitat to the main channel. Beaver dam analog placement (6 each) on side channel habitat would facilitate the development of wetland habitat.
- Install naturalized streambank structures to allow bank vegetation to become established while also improving habitat complexity. Approximately 37 large wood structures would be constructed and 5,445 linear feet of vegetated/wood matrix streambank treatment.
- Riparian and upland revegetation which would increase the coverage of woody shrubs and trees.
- Reconstruct floodplain surface with microtopography grading and placement of coarse wood material (7.2 acres).
- Dispersed campsite reclamation/improvements at dispersed campsite #2 and #3.

III. Methods

Construction will be implemented using a qualified, experienced stream restoration contractor (TNT Excavating). Given the sensitive resource conditions, construction specifications will utilize low-pressure ground equipment including off-road articulated trucks (minimum 14 cubic yard), tracked excavators with hydraulic thumb minimum bucket volume of 1 cubic yard, an All Surface Vehicle (ASV), D5 dozer or equivalent, and harrow for de-compacting soils and construction access roads. The excavators will be GPS compatible to ensure the project is implemented in accordance with the design specifications and drawings. The ASV will be equipped with sod tracks to minimize disturbance and one tree spade to transplant large vegetative material. RDG will provide construction oversight and ensure compliance with permits drawings and specifications. The contractor will also be responsible for seed bed preparation and both riparian and upland broadcast seeding.

- Streambed treatments will consist of complex aquatic habitat including riffle, run, pool, and glide features
- Streambank treatments will be composed of wood, alluvium, native rock and vegetation.

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- Floodplain treatments will include the use of swales, side channels, off-channel wetlands, microtopography and placement of course wood material.
- Existing vegetation would be salvaged and transplanted into constructed floodplain surfaces and streambanks.
- Native weed free seed will be used onsite; existing vegetation will be preserved or salvaged for floodplain construction.

IV. Schedule

The following project schedule had been developed. The Helena Ranger District signed the Decision Memo for the Beaver Creek Restoration Project on June 10, 2019. All regulatory permitting is complete, 124 stream permits/318 authorizations will be renewed winter 2021. A cultural resource investigation with SHPO clearance was completed by the USFS September 2019.

Table 1. Project Schedule for the Beaver Creek Phase II Restoration Project					
Task	Jan-March	April-July			August-November
Finalize Phase II designs					
Task 1. Pre-construction Services					
Task 2. Construction Implementation, includes wood material procurement					
Task 3. Direct Costs					

V. Personnel

The Beaver Creek Restoration Project Phase II will be implemented under the sponsorship of a diverse group of stakeholders including the USFS Helena-Lewis and Clark National Forest, Montana Fish Wildlife and Parks, Pat Barnes Trout Unlimited Chapter, and RDG. RDG is an approved consultant on NorthWestern Energy’s Qualified Vendor’s List for stream and wetland restoration services. RDG prepared the preliminary analysis and alternative development and final designs for the Beaver Creek project including Phases 1 and 2. Mr. John Muhlfeld will serve as the project manager and technical lead on behalf of the design team. Mr. Nate Wyatt, P.E., with RDG, will serve as the project engineer. Alli Russell will be the principle USFS contact for the project.

VI. Project budget

Table 2 below includes a cost estimate to perform the Scope of Work (SOW). The total cost to perform the SOW is \$522,129 (2.8% contingency consideration). As noted, project partners have \$30,250 committed in cost-share and an additional \$38,460 in-kind services (willow collection). The potential total cost-share match accounts for 33% of the total project cost. This proposal is requesting TAC funds in the amount of \$200,000. The total budget provides for a contingency fund of 2.8%.

VII. Deliverables

Table 2. Beaver Creek Phase II Cost Estimate	
Task	Cost
1. Pre-Construction Services and Construction	\$66,248.84

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Management, and Direct Cost	
2. Construction	
Clear and Grub site, Floodplain and Upland Seeding	\$ 6,250
Construct and Decommission Diversions	\$ 4,000
Salvage, Preserve and Transplant Existing Vegetation	\$11,000
Construct and Improve Roads and Staging Areas	\$ 5,500
Excavate, Haul and Place Floodplain backfill	\$ 48,622.20
Excavate, Haul and Place Fill in Repositories	\$ 20,687.70
Furnish Wood	\$ 25,000
Furnish Streambed fill	\$ 55,880
Construct Channel Streambed	\$ 44,550
Construct Large Wood Structures	\$ 50,875
Construct Log Step Pool	\$ 3,600
Construct Vegetated Matrix Type 1	\$ 43,890
Construct Vegetated Matrix Type 2	\$ 27,324
Construct Vegetated Matrix Type 3	\$ 3,330
Install Beaver Dam Analogs	\$ 1,980
Furnish Willow Cuttings	\$ 38,460
Construct Side Channels	\$330
Install Floodplain Roughness and wetlands	\$11,880
3. Mobilization, GPS Equipment, Crew Per Diem	\$38,500
Estimated Project Cost	\$522,129.16*
Cost-Share Future Fisheries Improvement Program- June 2021 request	\$50,000
Cost-Share PBCTU-Secured	\$4,000
Cost-Share USFS-Secured	\$64,710
Cost-Share MT DNRC-not secured	\$53,418
Funding request to WildTAC -not secured	\$150,000
Total TAC Funds Requested	\$200,000

*Accounts for a 2.8% contingency fund

VIII. Cultural Resources.

The Helena Ranger District received SHPO concurrence on the Beaver Creek Restoration Project on 9/17/2019 (R#2018011700047). Montana SHPO concurred there were No Adverse Effects and no properties on or eligible for NRHP appear likely to exist within project impact area. A copy of the SHPO memo is available upon request.

IX. Water Rights

The Beaver Creek project intends to restore wetland habitat by lowering floodplain surfaces to more natural conditions, converting 0.2 acres of existing stream channel habitat to ephemeral wetlands and the development of 1.0 acres of shallow open water wetland features and development of shrub/scrub wetlands. Wetland development will not involve the construction of any berms, dams, or dikes; and will not involve any diversion of water; wetland and new channel construction will offset the loss of riverine wetland habitat; and will not increase water consumption. The proposed project complies with the intent of Montana DNRC's "Guidance for Landowners and Practitioners Engaged in Stream and Wetland Restoration Activities".