

**MISSOURI-MADISON RIVER FUND RECREATION PROJECT
FY2024 GRANT APPLICATION FORM**

Project Name: Headwaters State Park Streambank Stabilization Project

Reservoir or River Segment: Hebgen-Madison Region County(ies) Gallatin

Site Name (or project location): Missouri Headwaters State Park

Applicant Name: Linnaea Schroer

Position and Agency: Region 3 Recreation Manager, Montana FWP

Telephone: (406) 437-1750

Email: lschroer@mt.gov

Project Sponsor Name: Same as above

Position and Agency: _____

Telephone: _____

Email: _____

Project Cost Breakdown and Financial Request:

Complete the financial section below by providing total project cost (to the nearest dollar), contributions by applicant and cooperators, request for NorthWestern Energy match of agency funds (see detailed instruction), and River Fund Grant request. Document in-kind contributions by public agencies for determination of NorthWestern Energy match request. A description of funding sources and in-kind contributions should be included in the Project Description.

Total project cost:	<u>\$42,399</u>	
Applicant Contributions – cash	<u>\$8,500</u>	
Applicant Contributions – value of in-kind:	<u>\$</u>	
Other Contributions – Please list by source:		
	<u>\$</u>	
	<u>\$</u>	
	<u>\$</u>	
	<u>\$</u>	Percentage of Total Project Cost:
Total Applicant and Other Contributions:	<u>\$8,500</u>	<u>20%</u>
NorthWestern Energy Match Request:	<u>\$2,125</u>	<u>5%</u>
River Fund Grant Request:	<u>\$31,774</u>	<u>75%</u>
Proposed Project Implementation Period:	<u>2024</u>	

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1. Has this project been previously submitted for funding consideration by the River Fund Board, either as a separate project or part of another project? Yes No

A related project in the same location –the Madison/Jefferson Confluence Revegetation Project-- was applied for in FY2021 and received \$2,919 in funding from the River Fund.

2. **Project Description:** Provide a description of the proposed project. Be sure to include specific project elements that are planned, and any associated cost detail.

► Missouri Headwaters State Park is a National Historic Landmark featuring several different historic, natural, and recreational sites. Missouri Headwaters State Park was listed as a National Historic Landmark largely for its association with Lewis and Clark, but the park was also one of North America’s great crossroads during both precontact and historic times. The park also holds remnants of the early settlement of Gallatin City which became the first county seat of Gallatin County and held the first flour mill in Montana. Missouri Headwaters is referenced during Lewis and Clark’s expedition of 1804-1806, as well as holding extensive local history and importance.

The park provides habitat for a variety of wildlife, such as moose, deer, and black bears, and is listed as an Important Birding Area (IBA) by the National Audubon Foundation. The Madison, Gallatin, Jefferson, and Missouri rivers also support popular rainbow and brown trout fisheries. The park provides a wide range of recreational use including hiking, biking, camping, boating, swimming, birding, fishing, and hosts many school groups and special events throughout the year.

During the settlement era much of what is now park land was developed for agriculture. This required the removal of many naturally occurring shrubs and trees, especially along the riverbanks. The removal of native vegetation combined with the natural forces of the river has resulted in highly unstable banks and severe erosion. The erosion is particularly a problem at the confluence of the Madison and Jefferson rivers, where high visitor use suppresses regrowth of vegetation and further threatens the integrity of the streambank. The unstable banks create steep, undercut banks that can easily give way unexpectedly, which creates a public safety concern. The resulting movement of the river also threatens infrastructure such as interpretive panels, a life-saving station, and a memorial bench (see Figures 1-5). These items can be moved, but it is unclear at this time how far the river might move barring intervention. The erosion accounts for a loss of an estimated 7,500 sf of state park land in the last two years. The bare, eroding ground also provides an opportunity for noxious weed colonization and disrupts the natural riparian habitat.

The riverbank is so steep and unstable that park management has closed the area to visitor use (see Figure 2), which has been unpopular with people, because visitors want to see the actual headwaters of the Missouri for which the park is named, and if possible, touch or at least be close to the water. Even with the barrier and signage however, visitors still attempt to get down to the river or walk along the edge, creating public safety concerns and contributing to further erosion.

To try to address this issue, FWP applied for and received \$2919 in funding from RTF in FY2021 to try to revegetate the confluence area with native plants. This revegetation included the planting of deep-root native grasses and trees along the banks and in the terrace zone to assist with bank stabilization, as well as to rebuild the natural riparian habitat and environment. Unfortunately, that approach was insufficient to address the issue, so bank treatments, more extensive revegetation efforts, and improved management practices are needed to fully address bank erosion around the confluence area.

3. **Project Phasing:** Briefly discuss whether the project could be phased over more than one year or construction season.

- ▶ This project involves a geomorphological analysis of the confluence area including a list of proposed bank treatments involving native materials but will not include implementation of any recommendations.

The attached quote from River Design Group outlines four tasks. This grant request is to complete Tasks 1 & 2 only.

4. **Cultural Resource Management:** Cultural Resource Management (CRM) requirements for any activity related to this Project must be completed and documented to NorthWestern Energy as a condition of awarded River Fund grant funds or NorthWestern Energy matching funds. Grant and matching funds may not be used for any land-disturbing activity, or the modification, renovation, or removal of any buildings or structures until the CRM consultation process has been completed. Agency applicants must submit a copy of the proposed project to a designated Cultural Resource Specialist for their agency. Private parties or non-governmental organizations are encouraged to submit a copy of their proposed project to a CRM consultant they may have employed. Private parties and non-governmental organizations may also contact the NorthWestern Energy representative for further information or assistance. Applications submitted without this section completed will be held without any action until the information has been submitted.

Summarize how you will complete requirements for Cultural Resource Management.

- ▶ This project would fund an analysis only and would not involve any ground disturbance.

5. **Scoring Criteria.** Respond to the following Scoring Criteria. Put answers in the cell after ▶.

5.1 Does the project occur at a 2188 license site?

- ▶ No

5.2 Project is for operation and maintenance of an existing recreation site. Describe if the project will meet operation and maintenance needs. Higher points awarded to projects that are higher priority and are not a recurring expense. Lower points awarded to projects that are low priority and/or have been previously funded. It is unlikely that the timeframe of River Fund would address emergency operation and maintenance needs but could support non-emergency operation and maintenance needs.

- ▶ The proposed project would provide the needed analysis for how to address the ongoing erosion and highly dynamic situation at the confluence long-term. The confluence is one of the most popular visitation points within the park, and it is critical that park managers come up with a plan that will protect public safety, restore fluvial function, restore riparian habitat, and honor indigenous and others values of respecting the river. The best way to achieve that is by contracting the services of River Design Group to provide expert opinion on potential channel migration if a no action alternative is selected as well as potential bank treatments that will slow bank erosion, reduce safety concerns, and improve instream and riparian habitats.

5.3 Project involves collaboration with other agencies or organizations. Identify project partners other than NorthWestern Energy or River Fund, if any, and describe their participation. Document all funding sources and all in-kind support and services to a project because all are sources of partnerships and in-kind contributions from public agencies qualify for calculation of NorthWestern Energy matching funds. If there are no project partners, explain why.

- ▶ There is no collaboration with other agencies or partners for funding survey and design since most funding sources prefer to support implementation costs. FWP will pursue additional funding sources for implementation should the agency pursue bank treatments and revegetation efforts. Potential partners include local conservation groups (e.g., Trout Unlimited) and other state and federal funding sources (e.g., Bureau of Reclamation WaterSMART Grants). FWP staff may also pursue grant funding sources (e.g., Future Fisheries Improvement Program Grants).

5.4 Project provides a benefit to public recreation in the Project Area and addresses specific issues and goals of the Missouri-Madison Comprehensive Recreation Plan (CRP). Identify how the project provides a benefit to public recreation and describe how the project specifically addresses issues and goals in Chapter 2-1 of the CRP.

- ▶ Issue: Inter-relationship between recreation uses and other resources
Goal: To encourage communication between technical committees on shared resource concerns and to cooperate with other committees and groups on partnership opportunities that advance shared goals.

A properly functioning river and associated wetlands and riparian zones and stability of riparian and shoreline vegetation are critical components for the management and enjoyment of Missouri Headwaters State Park. This analysis is needed to provide an informed picture of how park managers and administrators should best respond to the ongoing erosion and bank instability at the confluence.

Issue: Public Safety

Goal: To maintain or proactively increase public safety for recreationists in the Project Area.

Resource protection is an important pathway towards increasing public safety, and this funding request is an example of that. As the photos show, the confluence area is currently quite dangerous for visitors and especially for children who, who are especially drawn to water features and overlooks. If people fall off the bank, they could hurt themselves simply from the fall, or they could be swept away in the water. Emergency responders may not be able to make it in time to save the individual, and such incidents create a burden and drain on local staff, volunteers, and responders.

5.5 Project responds to a clearly identified need. Describe and document the need for this project and how the project would address that need. Cite specific sources, as possible, to establish need and support the project. Discuss consequences if the funding request is unsuccessful. For a new construction or acquisition project, identify how post-project, long-term costs (such as site maintenance and management) will be provided.

- ▶ The proposed analysis of the confluence area has two goals. 1) to evaluate what the river is likely to do without any human intervention. How much further will the river likely migrate east? How much more land will be lost before it finds equilibrium and relative stability? And 2), what options do we have to address and hopefully arrest the river's movement, or at least significantly slow such movement down? How much would those options cost? What chances do we have of success?

If we do not fund this analysis, we will be unable to plan for future recreation and interpretive elements in that portion of the park because we don't know how far the river will continue to move, and how fast it will do so. And, if we don't fund the analysis and try to do small projects to combat the erosion like we did with the revegetation project in 2021, we will waste money and resources.

5.6 Project design options have been considered, estimated, and a preferred design selected. Well-designed projects reduce occurrences of budgetary overages, design changes, and additional complications. Discuss the current design phase for this project, demonstrate that the project has been well vetted, and include cost estimates.

- ▶ A variety of options to address bank instability will be considered including a no action alternative. Such an approach will provide FWP staff with all the viable options after taking permitting constraints into consideration. The contractor has extensive experience designing complex projects on large rivers, so we anticipate that design and budget constraints will be anticipated prior to implementing the preferred alternative. Extensive cultural surveys will be completed by FWP in coordination with the proposed activities to ensure any potential tribal concerns are considered prior to pursuing any additional work. FWP staff will also take future recreational use into consideration to maximize the success of any potential bank treatments and revegetation efforts.

5.7 Project supports or protects other resources and is consistent with or supports resource plans in the Project Area. Describe how this project will protect resource values (such as public access, water quality, fisheries, wildlife, habitats, and cultural resources) and support other resource and agency plans, including Project 2188 License plans and land use and land management plans in place in the Corridor. Management plans should provide justification for the project.

- ▶ The proposed projects will allow FWP to develop a long-term strategy to restore the ecological integrity of the Missouri headwaters area, which also represents an important cultural area for Native Americans. Continued bank erosion would undoubtedly compromise the invaluable culture resources adjacent to the Madison and Missouri rivers, so a better understanding of expected channel migration and potential bank treatments to slow erosion is needed to protect those resources. Given the popularity of the area with park visitors, the proposed project could serve as a great educational opportunity about proper conservation efforts that can help restore natural ecosystem functions while maintaining other important uses.

6. Insert map(s) showing the location of the proposed project, drawings and design work related to the project, and a reasonable number of photos (as available) here.

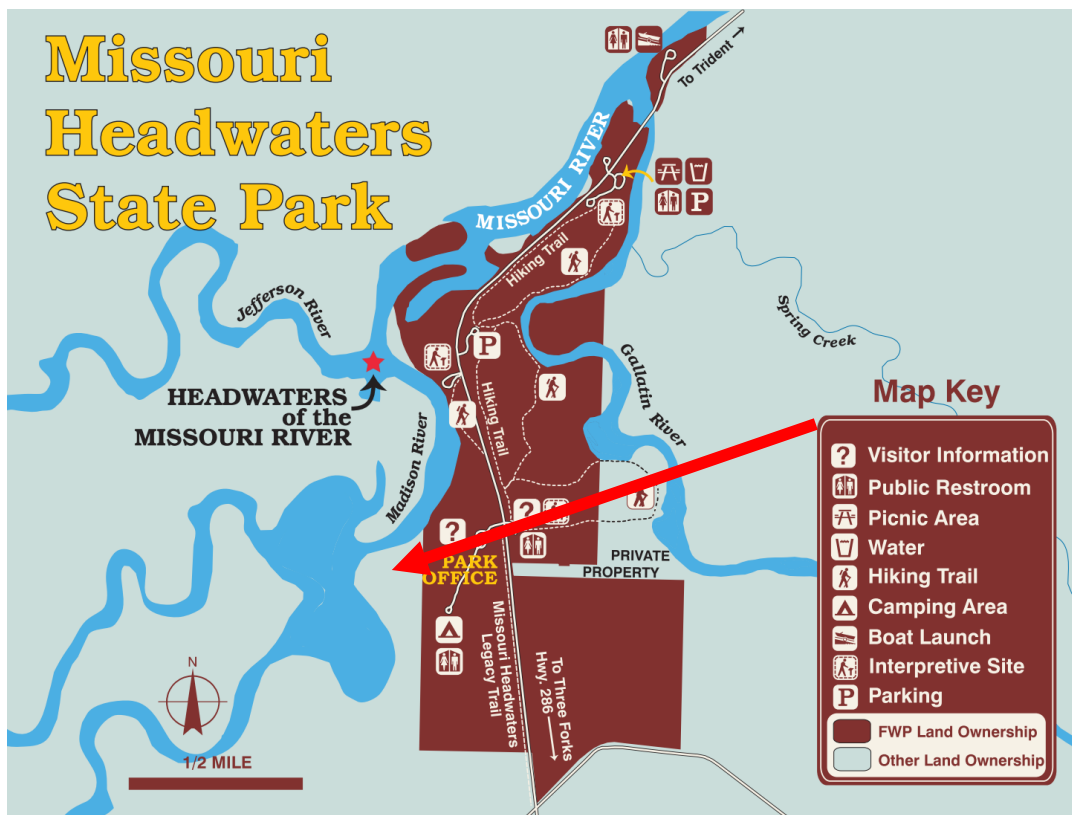


Figure 1. Location of the confluence area at Missouri Headwaters State Park indicated by the red star and arrow.



Figure 2. The confluence area is currently closed to visitor access because of the unstable banks. The remnant of trail gives an idea of how far the bank has moved in the last two years.



Figure 3. Photo of the confluence area showing non-native vegetation, evidence of past agricultural use, and some of the remaining trees and shrubs that were planted to try to combat the erosion.



Figure 4. Photo showing the sloughing, unstable banks looking downstream from the confluence.



Figure 5. Photo showing sloughing, unstable banks and dangerous conditions for visitors looking upstream from the confluence.



Date: September 11, 2023

To: Mike Duncan
Region 3 Fisheries Program Manager
Montana Fish, Wildlife & Parks
1400 South 19th Avenue
Bozeman, Montana 59718

From: John M. Muhlfeld
Restoration Hydrologist
River Design Group, Inc.
5098 Highway 93 South
Whitefish, Montana 59937

Nate Wyatt, P.E.
Project Engineer

Subject: Scope of Work and Cost Estimate
Missouri Headwaters State Park Streambank Stabilization Project

River Design Group, Inc. (RDG) appreciates the opportunity to submit the following scope of work and cost estimate (SOW) to provide assessment, engineering, and regulatory permitting services for the Missouri Headwaters State Park Streambank Stabilization Project near Three Forks, Montana. The SOW was developed based on two field visits conducted with representatives from Montana Fish, Wildlife & Parks and NorthWestern Energy in 2022 and 2023, and subsequent correspondence. The project area is located at the Missouri Headwaters State Park at the confluence of the Madison and Jefferson Rivers (Figure 1). The site is located on an outside bend of both the Madison and Jefferson Rivers and has been subjected to erosion and accelerated down-valley meander bend migration, compromising bank stability along a 1,300-foot section of both rivers. A parking area and trail system with interpretive signage is located on the upper terrace. Montana Fish, Wildlife & Parks is concerned with continued erosion and subsequent risk to park infrastructure as the river continues to migrate down valley at an accelerated rate due to point bar accretion. Between 1995 and 2021, the bank has retreated approximately 250 feet (Figure 1 inset), and this trajectory is anticipated to continue in the absence of active stabilization.

This SOW includes four primary tasks and multiple deliverables, as described in Table 1.

- Task 1. Geomorphic Assessment and Survey
- Task 2. Preliminary Design
- Task 3. Final Design
- Task 4. Regulatory Permitting

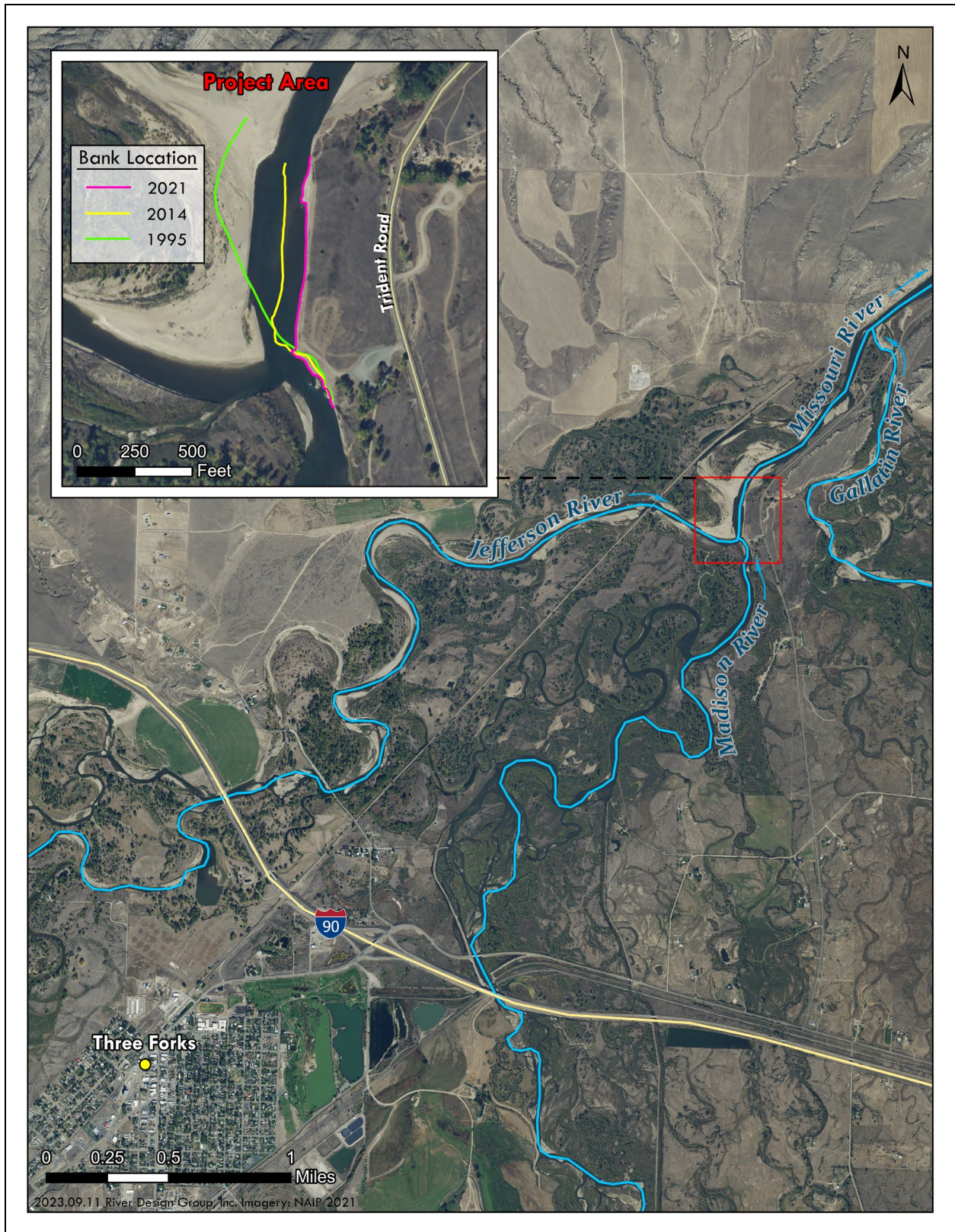


Figure 1. Missouri Headwaters State Park Streambank Stabilization Project vicinity map showing project area location and both current (2021) and historical (1995, 2014) bank locations.

Table 1. Summary of project tasks and deliverables for the Missouri Headwaters State Park project.

Task	Task Elements and Deliverables
<p>Task 1. Geomorphic Assessment and Site Survey</p>	<ul style="list-style-type: none"> • Attend kick-off, preliminary and final design meetings with MFWP and project partners. • Conduct channel migration analysis to quantify erosion rates and river trajectory and risk to park infrastructure under a ‘no action’ scenario. • Prepare LiDAR base maps and collect high resolution UAS orthophoto. • Site survey including streambank topography, channel bathymetry and park infrastructure including trail alignments, interpretive signage, parking lot etc. • Perform routine wetland delineation to support Section 404 permitting. • Data processing. <p><i>Deliverables: Geomorphic technical memo, GIS mapping products, raw field data</i></p>
<p>Task 2: Preliminary Design</p>	<ul style="list-style-type: none"> • Prepare GIS exhibits illustrating pre-and post-restoration conditions using Illustrator or Photoshop. • Update flood series hydrology using basin characteristic, USGS gaging data, and regional regression equations. • Project grading and preliminary cut and fill earthwork quantities. • Integrate with MFWP regarding infrastructure needs and future vision for site. • Streambank structure design and stability analysis. • Develop riparian, streambank and upland revegetation plan and specifications. • Prepare 35% design plan set in AutoCAD Civil 3d. • Prepare internal engineer’s cost estimate for construction. • Meeting with MFWP and project partners to review preliminary design. <p><i>Deliverables: GIS illustrations, 35% preliminary design plan set, cost estimate.</i></p>
<p>Task 3. Final Design</p>	<ul style="list-style-type: none"> • Perform 1-D hydraulic modeling to evaluate project performance and size streambank fill gradation and structure stability over a range of flow conditions (Q1.5 – Q100). • Prepare technical specifications, material quantities, and specifications. • Develop access, staging, and work area isolation details. • Integrate park infrastructure improvements in final design drawings. • Prepared 95% final design plan set in AutoCAD Civil3d. • Author <i>Basis of Design</i> technical memorandum • Prepare opinion of probable cost for construction. <p><i>Deliverables: Final design drawings, technical specifications, basis of design technical memorandum, cost estimate.</i></p>
<p>Task 4. Regulatory Permitting</p>	<ul style="list-style-type: none"> • Joint Permit Application (SPA 124, Section 404 CWA). • Wetland impact analysis (temporary and permanent impacts and mapping exhibits). • Meeting and consultation with county floodplain administrator and DNRC to discuss floodplain permitting requirements.¹

¹ The project area is in a Zone A non-detailed flood study area. Base flood elevations have not been determined. This scope of work includes consultation with the DNRC and floodplain administrator to determine permitting requirements. Floodplain permitting would be completed under a separate task order or contract with the anticipation that a basic at-a-section no rise analysis would be acceptable.

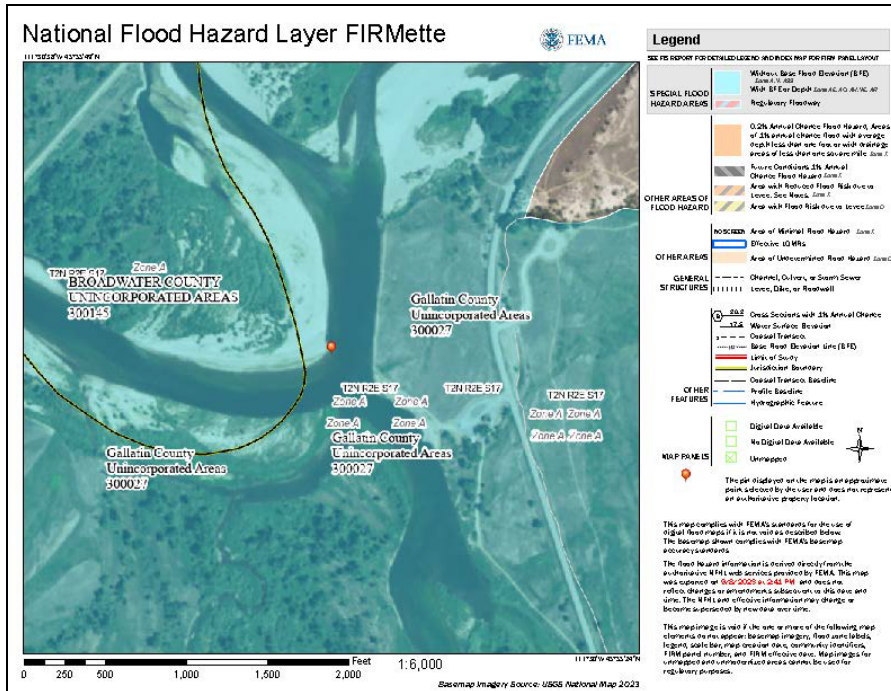


Figure 2. National Flood Hazard Layer FIRMette. The project area is in a Zone A non-detailed flood study area. A no-rise hydraulic analysis will be required to demonstrate a no net increase in 100-year base flood elevations relative to existing conditions. Task 4 of the SOW includes consulting with the DNRC and local floodplain administrator to determine floodplain permitting requirements.

RDG has experience working on large, dynamic river systems similar to the Jefferson and Madison Rivers. We have successfully designed and constructed numerous projects of this scope and complexity on the Clark Fork River, Blackfoot River, and Madison River in Montana, as well as the Kootenai River and Snake River in Idaho. These projects involved alternatives to traditional rock revetment or riprap and integrated the use of native materials including properly sized alluvium, rock, wood, and vegetation treatments to arrest bank erosion while providing benefits to the aquatic and riparian-floodplain environments.

A detailed cost estimate including assigned personnel, labor hours by task, and direct expenses is provided in Table 2 on Page 4. The work would be performed on a time and materials basis with a not-to-exceed cost of \$71,979. We envision coordinating design work closely with MFWP and projects partners including NorthWestern Energy. The project will be phased to ensure project partners have direct input throughout the design and planning process. The SOW includes initial GIS-based concept drawings, and both 35% and 95% construction ready design deliverable. RDG will integrate with MFWP on modifications to existing park infrastructure including the locations of interpretative signage, trail alignments, and other site amenities.

Table 2. Missouri Headwaters State Park Streambank Stabilization Project Geomorphic Assessment and Engineering Cost Estimate		Direct Expense		John Muhlfeld Restoration Hydrologist Project Manager	Nate Wyatt, PE Water Resources Engineer	Josh Lenderman, PLS Professional Land Surveyor	Chris Nelson, PE, CFM Water Resources Engineer	David Busby Fluvial Geomorphologist	Selita Ammond, GISP Restoration Ecologist	Loren Smith AutoCAD Technician	Hours Subtotal		
		Mileage, Lodging, Per Diem, Permit Fees	Equipment										
Task 1. Geomorphic Assessment and Site Survey													
1.1 Project Management													
1.1.1. Meetings and Correspondence with FWP and NWE			16								16		
1.2 Geomorphic Assessment and Site Survey	\$ 2,329	\$ 800											
1.2.1. Channel Migration Assessment and Technical Memo			8					20					
1.2.2. Wetland Delineation									24		24		
1.2.3. Topography and Planimetrics/Infrastructure Surveys			10		32			32			74		
1.3 Data Processing													
1.3.1. Survey Data								20			20		
1.3.2. Soils, Hydrology, Vegetation									20		20		
	\$ 2,329	\$ 800	\$ 5,270	\$ -	\$ 4,160	\$ -	\$ 8,280	\$ 5,940	\$ -	\$ -	\$ 26,779		
Task 2. Preliminary Design													
2.1 35% Design Drawings and Plan Set													
2.1.1. Develop Preliminary Design Illustrations									24		24		
2.1.2. Streambank Restoration Details			4					4			8		
2.1.3. Earthwork Grading and Quantities				10							10		
2.1.4. Materials Quantities and Specifications			4	8							12		
2.1.5. Integration with FWP on Park Improvements			8								8		
2.1.6. Revegetation Plan									8		8		
2.1.7. Plan Set Drawings										40	40		
2.1.8. Cost Estimate and Preliminary Design Technical Memo			8								8		
	\$ -	\$ -	\$ 3,720	\$ 2,520	\$ -	\$ -	\$ 460	\$ 4,320	\$ 4,600	\$ -	\$ 15,620		
Task 3. Final Design													
3.1 95% Design Drawings and Plan Set													
3.1.1. Access, Staging and Dewatering Plans			4	2							6		
3.1.2. Materials and Quantities				10							10		
3.1.3. Streambank Design Detail			4	2							6		
3.1.4. Earthwork Grading and Quantities				16							16		
3.1.5. Riparian and Upland Revegetation Plan									24				
3.1.6. Public Infrastructure and Park Improvement Details			4	4									
3.1.7. Technical Specifications			8	4							12		
3.1.8. Final Design Drawings										50	50		
3.1.9. Basis of Design Technical Memorandum			16				8						
3.1.10. Opinion of Probable Cost for Construction			8								8		
	\$ -	\$ -	\$ 6,820	\$ 5,320	\$ -	\$ 1,200	\$ -	\$ 3,240	\$ 5,750	\$ -	\$ 22,330		
Task 4. Regulatory Permitting													
4.1 Joint Permit Application													
4.1.1. Prepare Joint Permit Application			8				16				24		
4.1.2. Wetland Impact Analysis									16		16		
4.1.3. Permit Fees	\$ 250										0		
4.2 Coordination with DNRC and Floodplain Administrator													
4.2.1. Meeting to Discuss Floodplain Permitting Requirements							8				8		
	\$ 250	\$ -	\$ 1,240	\$ -	\$ -	\$ 3,600	\$ -	\$ 2,160	\$ -	\$ -	\$ 7,250		
<i>Total Labor Hours for Individuals:</i>				110	56	32	32	76	116	90	428		
<i>Individual Hourly Labor Rates:</i>				\$155	\$140	\$130	\$150	\$115	\$135	\$115			
Total Cost:				\$ 2,579	\$ 800	\$ 17,050	\$ 7,840	\$ 4,160	\$ 4,800	\$ 8,740	\$ 15,660	\$ 10,350	\$ 71,979

RDG is available to begin work on this project in the fall of 2023, with the anticipated goal of completing scope of work tasks by the spring of 2023. John Muhlfeld, Principal Restoration Hydrologist, will serve as the project manager and will be involved with all aspects of project development. Nate Wyatt, P.E. will serve as the engineer of record.

Please do not hesitate to contact me directly with any questions or if additional clarification on the SOW is needed.

--- END OF PROPOSAL ---

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