2026 Proposal Form for NorthWestern Energy (NWE) Project 2188 TAC Funds

Project 2188 (Madison-Missouri River) License Protection, Mitigation and Enhancement (PM&E) projects are required to offset impacts to river resources from the continued operation of one or more of NWE's nine hydro developments (Hebgen, Madison, Hauser, Holter, Black Eagle, Rainbow, Cochrane, Ryan and Morony Dams). PM&E projects need to be prioritized toward in-river or on-the-ground measures that directly benefit fisheries and/or wildlife populations and their habitats:

Priority 1: 2188 License projects which meet License Article requirements and PM&E for fisheries or wildlife populations or their habitats within the main stem Madison River (Hebgen Reservoir to Three Forks) or Missouri River (Hauser Reservoir to Fort Peck Reservoir)

Priority 2: 2188 License projects which meet License Article requirements and PM&E for fisheries or wildlife populations or their habitats in primary tributaries or on adjacent lands and, in doing so, provide PM&E for Madison River (Hebgen Reservoir to Three Forks) or Missouri River (Hauser Reservoir to Fort Peck Reservoir) resources.

Priority 3: 2188 License PM&E projects which meet License Article requirements by providing scientific or other tangible PM&E benefits to Madison-Missouri River fisheries or wildlife populations or their habitats. These projects must be located in the greater Missouri River drainage upstream from Fort Peck Reservoir, but not necessarily located on the main stem Madison River or Missouri River or their adjacent lands or primary tributaries.

All TAC project proposals must include the following information:

Project Title: Re-evaluation of Missouri River Substrate Conditions and Invertebrate Study

Date: November 10, 2025

Explain how this Project addresses a specific Project 2188 License Article(s):

Article 416 requires specific mitigation and enhancement measures and post-licensing evaluation and monitoring for Holter Lake and the Holter Dam tailwaters through an approved fisheries protection, mitigation, and enhancement plan. This study aims to monitor and evaluate subtrate conditions, which influenes trout survival. This study will inform and provide context to annual trout population monitoring, which is required as part of the 5-year plan (#4 - Evaluate the effect of short-term flow fluctuations on the resident fish community in the tailwaters).

Provide justification for Priority 1, 2 or 3 (above) that you selected:

This project is Priority 1 as it is located on the mainstem Missouri River, downstream of Holter Dam.

Project Sponsor (submitted by): Jason Mullen, Region 4 Fisheries Manager, MTFWP

Location of Proposed Project:

Missouri River from Holter Dam to near Cascade

Geocode (in decimal degrees ex 46.89743)
Upstream (near Holter Dam): 46.99954, -112.00505
Downstream (irrigation pump downstream of Pelican Point): 47.22658, -111.76260

Total Project Cost: $9,445

Other associated funding: total project cost does not include an additional estimated $6,500 for a paired Marias River study that will be funded through other means.

TAC Funds Requested for Project**: $9,445**

I. Introduction; brief statement of project to be completed with pertinent background information.

In 2008, a study funded through the TAC, was conducted to evaluate substrate composition utilizing core sampling and pebble counts to develop survival to emergence estimates for trout in the Missouri River from Holter Dam to near Cascade (Strainer and Grisak 2009). Substrate sampling in 2008 followed an extended drought period where peak flows were below average and below the threshold for substrate mobilization for nine consecutive years. Despite the lack of flushing flows and prolongued drought,

results suggested adequate spawning gravel existed for rainbow trout and brown trout reproduction but the percent of fine sediment was near the threshold for 50% survival to emergence.

Strainer and Grisak (2009) also documented that a peak flow of 15,000 cfs at Holter and 16,300 cfs below the confluence with the Dearborn River was sufficient to mobilize fine sediments, and alluvium was also mobilized at this flow downstream of Sheep Creek. This magnitude of flow is similar to another study that identified a flow of 15,000 cfs being needed to mobilize substrate in the Missouri River downstream of Holter Reservoir (R2 Resource Consultants 1993). However, R2 Resource Consultants (1993) found 16% fines less than 0.85 mm at a site near Craig compared to the overall average of 12.1% in Strainer and Grisak (2009). R2 Resource Consultants (1993) noted that 16% fines results in reduced survival to emergence for salmonid eggs.

We propose a study to replicate the study by Strainer and Grisak in 2008, following another period of extended drought. Since 2008, only 4 of the 17 (23.5%) years have had peak flows of 15,000 cfs or greater (Figure 1). This is less than the 17 years prior to 2008 where 6 years (35%) exceeded 15,000 cfs. Canyon Ferry Dam was completed in 1954. Since 1955, peak flows met or exceeded 15,000 cfs 19 of the first 35 years (54%) compared to 11 of the last 36 years (31%), raising concerns about the relatively infrequent flushing flows, potential for fine sediment accumulation, and trout spawning success. Furthermore, substrate indices were near the threshold for 50% survival to emergence in the prior study with 50% survival being considered productive. This study will provide another data point to understand if conditions remain similar or if they have worsened with persistent drought conditions.

Benthic invertebrate samples will also be collected at a subset of the sites. This was not conducted in 2008 but will provide an evaluation of the benthic invertebrate community related to substrate composition. In addition, FWP is pursuing additional funding to complete an identical study on the Marias River. This will allow for a comparison of substrate and bentic invertebrate metrics between two different tailwaters with both experiencing prolongued drought conditions.

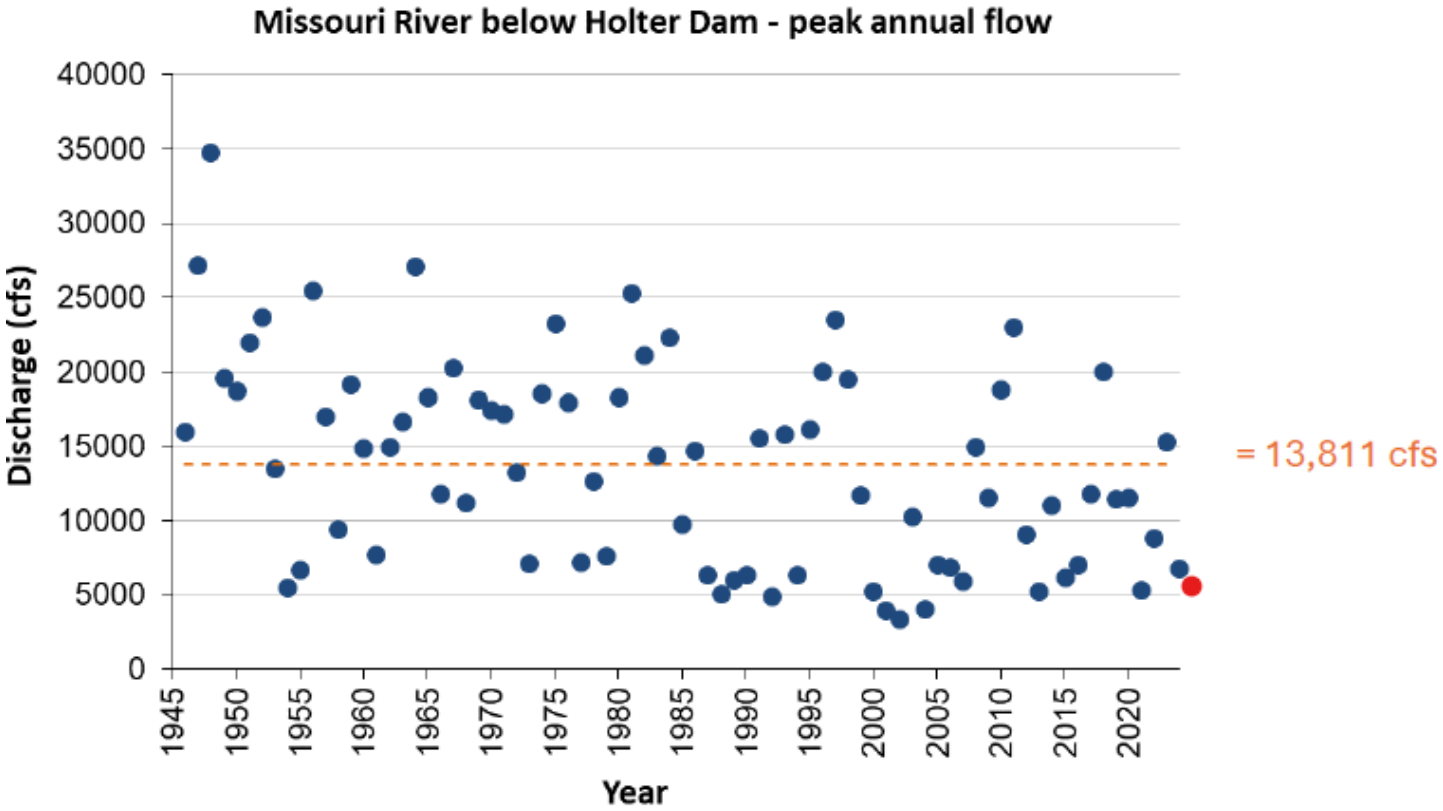

Figure 1. Peak annual flow for the Missouri River below Holter from 1946 through 2025. Peak flow in 2025 is shown in red.

References Cited

R2 Resource Consultants, Inc. 1993. Supplemental Report. Determination of flushing flow needs – Madison and upper Missouri rivers. Report prepared for Montana Power Company.

Stainer, A. C., and G. G. Grisak. 2009. An evaluation of trout spawning substrate composition and substrate changes following spring run-off in the Missouri River below Holter Dam. Montana Fish, Wildlife and Parks. Report prepared for PPL-Montana, FERC Project 2188 (#023-08).

II. Objectives; explicit statement(s) of what is intended to be accomplished.

1. Evaluate substrate composition and determine survival to emergence estimates for trout in the Missouri River downstream of Holter Dam.
2. Compare results to 2008 study, following another period of prolongued drought.
3. Evaluate benthic invertebrate community and relate to substrate composition.
4. Compare results to a paired study on the Marias River.

III. Methods; description of how Project objectives will be accomplished.

Sampling, processing, and reporting will replicate methods utilized in the prior Missouri River substrate study in 2008 (Strainer and Grisak 2009). The new benthic invertebrate sampling will be conducted utilizing a Hess sampler and following standard benthic invertebrate protocols.

IV. Schedule; when the Project work will begin and end.

April 2026……....Collect cores samples (n = 40 at 20 previously identified sites), macroinvertebrate samples (n = 10 at 5 sites), and perform Pebble Counts (n = 10 sites)
Summer 2026……...Process samples
September 2026 …… .Additional pebble count, if a high flow has occurred
December 2026……Final report

V. Personnel; who will do the work? Identify Project leader or principal investigator.

Project Leader: Jason Mullen; Region 4 Fisheries Manager, FWP – coordinate activities, project liaison, review, etc.

Project Biologist: Adam Geik, Management Biologist, FWP – technical expertise, report review, etc.

Contracted Services: Dave Stagliano, Montana Biological Survey (MBS) – collect data, process samples, reporting.

NorthWestern Energy Intern or Technician, or FWP technician to provide field assistance to MBS.

VI. Project budget must include amounts for the following:

Direct Labor = $9,010
Travel and Living = $435
Materials - NA
Other Direct Expenses - NA
Direct Overhead - NA
All contribution amounts $9,445

Detailed project budget provided by MBS below.

Performing All Aquatics/Fisheries Tasks Under the Direction of the Prime Contractor (FWP)

Date Quote *10/15/2025*
Prepared by: D. Stagliano

PROFESSIONAL ENVIRONMENTAL SERVICES

Re-Evaluation of Trout Spawning Substrate Composition and Changes in the Missouri River below Holter Dam since 2008

TASKS 1-7

Field Work/Macroinvertebrate & Core Sample Processing/Reporting

LABOR						
DATE	DESCRIPTION	Senior Aquatic Ecologist	Field Ag. Ecologist	Technical Expert	Technician II	Technician I
2026	1) Substrate Monitoring Plan: Project Management / Meetings	4	0	0	0	0
Apr-26	2) Travel to the 20 designated sites on the Missouri River from Holter to Cascade to collect core samples (n=2), take macroinvert Hess samples (n=2 @ subset of sites) and Perform pebble Counts (n=10 sites)	0	24	0	0	
Jun-26	3) Prep core samples, sieve and process (n=40)	0	40	0	0	0
Jun-26	4) Process and Identify Macroinvertebrate Hess samples (n=10)	10	0	0	10	0
Aug-Sept 26	5) Enter core and pebble count data, calculate Freidle Index, % fines, D25, D50, etc.	4	0	0	0	10
Sep-26	6) Travel to 10 sites on the Missouri River from Holter to Cascade for Pebble Counts	0	10	0	0	
Nov-Dec 26	7) Finalize Summary Report (prior to Decemeber 30, 2026)	12	0	0	0	0
	Total Hours	30	74	0	10	10
	Cost Per Hour	$92.00	$75.00	$75.00	$40.00	$30.00
	Total Labor Cost	$2,760.00	$5,550.00	$0.00	$400.00	$300.00
	SUBTOTAL					$9,010

EXPENSES				
DESCRIPTION	Units	Quanity	Unit Cost	Total
Electrofisher Charge Per Day	Day	0	$50.00	$0
Stay in Missoula (2 nights)	Day	0	$200.00	$0
Per Diem for Field Crew (2 @ 3 days)	Day	6	$32.00	$192
1 Trip Visit = RT Helena to sites (140 miles+/- 20 miles) x 3 trips	Miles	450	$0.54	$243
SUBTOTAL				$435

SUMMARY	
ITEM	
LABOR	$9,010
EXPENSES	$435
ESTIMATED PROJECT COSTS	$9,445
PROJECT CEILING ± 10%	$10,000

VII. Deliverables; Annual Presentation at MoTAC Meeting and Annual Report

How will "success" for this project be monitored or demonstrated?

–Current substrate conditions will be compared to a prior study on the Missouri River in 2008 at the same sites, both following periods of extended drought. Invertebrate data will be collected at a subset of the sites to evaluate longitudinal trends and correlate with substrate data. It is expected data will also be collected on the Marias River to allow paired comparisons to another tailwater experiencing ongoing drought. Final report submitted by MBS by the end of 2026.

VIII. Cultural Resources. Cultural Resource Management (CRM) requirements for any activity related to this Project must be completed and documented to NWE as a condition of any TAC grant. TAC 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 NWE representative for further information or assistance. Applications submitted without this section completed, will be held by the TAC, without any action, until the information has been submitted.

Summarize here how you will complete requirements for Cultural Resource Management:

-No ground disturbance is associated with this project

IX. Water Rights. For projects that involve development, restoration or enhancement of wetlands, please describe how the project will comply with the Montana DNRC's "Guidance for Landowners and Practitioners Engaged in Stream and Wetland Restoration Activities", issued by the Water Resources Division on 9March2016.

Summarize here how you will comply with Montana water rights laws, policies and guidelines:

-No water rights or wetland development associated with this project.

All TAC Project proposals should be 7 pages or less and emailed (as a WORD file) to each of:

- Andrew.Welch@Northwestern.com
- Jon.Hanson@Northwestern.com
- Grant.Grisak@Northwestern.com

Further questions about TAC proposals or Project 2188 license requirements or related issues may be addressed to: Andy Welch, Leader Hydro License Compliance, NorthWestern Energy, 1315 N Last Chance Gulch, Helena, MT 59601; 406-444-8115 (office); 406-565-7549 (cell); Andrew.Welch@northwestern.com.