

2020 Cost-Share 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: **2188 Operations and Personnel**

Date: October 31, 2019

Explain how this Project addresses a specific Project 2188 License Article(s): **Funding for the wages and operations of FWP 2188 project personnel who identify, develop, assesses, monitor, and implement projects that meet the FERC 2188 license conditions.**

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

MFWP 2188 Project Personnel will be involved in all three priority levels.

Project Sponsor (submitted by): **Travis Lohrenz-MFWP Fisheries Technician**

Location of Proposed Project: **Ennis, Madison River drainage**

Narrative

Geocode (in decimal degrees ex 46.89743) Lat;

Lon:

Total Project Cost: **\$196,034 MOA 015-17**

TAC Funds (Cost-Share) Requested for Project: **\$196,034**

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

Articles 404,408,409,412,413,412

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

Articles 404,408,409,412,413,412

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

Articles 404,408,409,412,413,412

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

Jan 1,2020 - June 30, 2021

V. Personnel; who will do the work ? Identify Project leader or principal investigator. **MFWP 2188 project personnel Travis Lohrenz Technician III, and Nick Larson seasonal Technician II will conduct the monitoring and enhancement activities. Program Supervisor to coordinate native species management and hydropower in R3.**

FWP 2188 project personnel Travis Lohrenz Technician III, and Nick Larson seasonal Technician II will conduct the monitoring and enhancement activities. A new position (Program Supervisor) will coordinate native species management and hydropower in R3.

VI. Project budget must include amounts for the following:

Direct Labor (See MOA with FWP 2018-2026 Aug 22)

	Item	FTE	Hours	Pay rate including benefits	Amount
Monitoring & Enhancement Activities					
TL – 37331	F&W Tech	1.00	2096	\$34.80	\$ 72,931
NL - 37322	F&W Tech	0.80	1677	\$27.76	\$ 46,545
	Travel				\$ 6,170
	Operations				\$ 29,895
	Subtotal	1.80	3,773		\$155,541
Native Species Management & Hydropower					
New	Program Supervisor	0.17	356	49.08	\$ 17,489
	Travel				\$ 2,000
	Subtotal	0.17	356		\$ 19,489
	Direct Total				\$175,031
	Overhead (12%)				\$ 21,004
	Total	1.97	4,129		\$196,034

VII. Deliverables; describe work product (reports, habitat restoration, etc.) which will result from this Project. How will “success” for this project be monitored or demonstrated?

Preparation and submittal of annual report to NWE describing the work of the previous year’s activities and how they meet FERC articles.

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:

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:

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.

2020 Cost-Share 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: **Ennis Office Rent**

Date: **October 31, 2019**

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

Provides office, shop and storage for the FWP 2188 Madison Fisheries program

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

Provides office, shop, and storage for 2188 operations, which addresses all three priority levels.

Project Sponsor (submitted by):

Travis Lohrenz-FWP Fisheries Technician

Location of Proposed Project: **Ennis**

Total Project Cost: **\$7,200.00**

TAC Funds (Cost-Share) Requested for Project: **\$7,200.00**

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

One year office and shop space for FWP Madison 2188 Fisheries

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

See I.

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

Normal billing and payment

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

2020 billing cycle

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

FWP 2188 project personnel

VI. Project budget must include amounts for the following:

Direct Labor

Travel and Living

Materials

Other Direct Expenses **\$7,200.00**

Direct Overhead

All cost-share sources and amounts, including estimation of “in-kind” contributions

VII. Deliverables; describe work product (reports, habitat restoration, etc.) which will result from this Project. How will “success” for this project be monitored or demonstrated? **NA**

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: **NA**

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:

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: Jon Jourdonnais, Leader Hydro Licensing and Compliance, NorthWestern Energy, 1801 South Russell Street, Missoula, Montana 59806; 406-490-1802 (cell); jon.jourdonnais@northwestern.com.

2019 Cost-Share 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: Emergency/contingency fund

Date: 11/1/2019

Explain how this Project addresses a specific Project 2188 License Article(s): Priority 1: This fund will be used for, but not be limited to, emergency purchasing of equipment, scoping potential stream rehab proposals, and support of 2019 approved proposals.

Provide justification for Priority 1, 2 or 3 (above) that you selected: During ongoing operations and proposal work there are times when this approved proposal would allow for immediate funding of equipment, stream restoration assessments or other conditions that may require immediate attention. This proposal will eliminate (within the \$10,000 limit) the need for TAC approval of a new proposal for spending of TAC funds.

Project Sponsor (submitted by): Jon Hanson

Location of Proposed Project: Within TAC approved proposals.

Total Project Cost: \$10,000

TAC Funds (Cost-Share) Requested for Project: \$10,000

I. Introduction; Contingency funding to be used in emergency situations

II. Objectives; To have TAC approved funding for emergency situations as noted above.

III. Methods; Funding will used for situations as noted above.

IV. Schedule; Used when needed during 2019

V. Personnel; NWE will determine and report usage of funding.

VI. Project budget must include amounts for the following:

Direct Labor
Travel and Living
Materials...yes
Other Direct Expenses...yes
Direct Overhead
All cost-share sources and amounts, including estimation of "in-kind" contributions

VII. Deliverables; describe work product (reports, habitat restoration, etc.) which will result from this Project. Spending will be reported at annual meeting.

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. Generally NA but maybe used for this if needed

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

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. NA

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

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.

2020 Cost-Share 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: **Habitat Project Consultant Assistance**

Date: **October 31, 2019**

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

408-2) evaluate the potential to enhance tributary spawning to increase the contribution of natural reproduction to the Hebgen Reservoir fishery; 4) identify, restore, and protect important riparian areas; 7) evaluate the potential to enhance tributary spawning to increase the contribution of natural reproduction to the upper Madison River fishery.

409-(1) stream structure enhancements in the upper Madison River; (2) river bank enhancements in the upper and lower Madison River to enhance trout habitat; (3) fish habitat enhancement both in main stem and tributary streams, including enhancement for all life stages of fishes; 9) riparian habitat restoration.

412-4) identify, restore, and protect important riparian areas along Ennis Lake and the lower Madison River; 10) evaluate the potential to enhance tributary spawning to increase the contribution of natural reproduction to the lower Madison River fishery

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

Project addresses 2188 License requirements for the identification and implementation of PM&E measures to benefit fisheries or wildlife populations or their habitats within the main stem Madison River (Hebgen Reservoir to Three Forks); 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). Meeting criteria for both priority 1 and 2 consideration.

Project Sponsor (submitted by):

Jon Hanson-NorthWestern Energy

Travis Lohrenz-Montana Fish, Wildlife and Parks

Location of Proposed Project:

Madison River Drainage from Hebgen to Three Forks

Total Project Cost: **\$10,000.00**

TAC Funds (Cost-Share) Requested for Project: **\$10,000.00**

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

Habitat projects addressed in the FERC license agreements (Articles 408,409,412) have been proposed and funded since the inception of the PM&E funding program. To date, viable habitat projects have been difficult to identify and even more difficult to implement. This proposal is to establish a contract with McNeal Resources (Allen McNeal) to continue working on habitat restoration projects in the Madison Valley and drainage. Consultant may also work on identifying and developing projects on other streams and rivers in the FERC Project 2188 project area as opportunities arise. This project will cover the cost of project design and permitting and also will defray construction oversight costs.

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

Investigative and scoping work on other projects will proceed during the year as time allows.

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

A contract would be established between NWE and McNeal Resources to complete this work.

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

Investigative and scoping work on other projects will proceed during the year as time allows.

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

Work on this project will be accomplished by McNeal Resources Inc. (Allen McNeal) in cooperation with private landowners, construction contractors, MDFWP staff, and staff from other organizations and agencies.

VI. Project budget must include amounts for the following:

Direct Labor- **Consultant and contractors will design and construct. FWP biologists and staff will provide oversight.**

Travel and Living-N/A

Materials- **Raw materials required for stream reconstruction will be incorporated into stream specific proposals.**

Other Direct Expenses-N/A

Direct Overhead- N/A – **claims will be submitted directly from consultant to NWE for payment**

All cost-share sources and amounts, including estimation of “in-kind” contributions

VII. Deliverables; describe work product (reports, habitat restoration, etc.) which will result from this Project. How will “success” for this project be monitored or demonstrated?

This proposal is designed to design and complete habitat projects in the MadTAC project area. Success will be measured in habitat projects completed and stream/river length that has been restored.

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:

Cultural resource surveys will be conducted and SHPO clearance will be obtained prior to the initiation of any ground disturbing activities on habitat improvement projects funded by MadTAC.

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:

All water right issues will be addressed in accordance with Montana DNRC’s “Guidance for Landowners and Practitioners Engaged in Stream and Wetland Restoration Activities”, issued by the Water Resources Division on 9-March-2016 prior to the initiation of any ground disturbing activities on habitat improvement projects on streams and wetlands funded by MadTAC.

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 .

2020 Cost-Share 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: USFS GS-7 Fisheries Biologist Position; 1 Year NTE (Not to Exceed)

Date: 11/12/2019

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

This funding proposal is for a cost-share position between the Beaverhead-Deerlodge National Forest and NWE. The position would be a permanent GS-7 entry level Fisheries Biologist with a term of one year (1 Year NTE). This position would be funded ½ by the USFS and ½ by NWE. Field work and associated deliverables would be exclusive to Articles 408, 409 and 412.

ARTICLE 408

7) Monitor fish species of special concern (i.e., Arctic grayling and westslope cutthroat trout).

ARTICLE 409

3) Fish habitat enhancement both in main stem and tributary streams, including enhancement for all life stages of fishes.

6) Inclusion or exclusion of fish barriers.

ARTICLE 412

2020 Cost-Share Proposal Form for NorthWestern Energy (NWE)
Project 2188 TAC Funds

4) Protect and aid the recovery of threatened and endangered fish species and other aquatic species of special concern, including Arctic grayling, in Madison Reservoir and the lower Madison River.

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

This position would work primarily on USFS administered lands throughout the Madison River drainage and the main-stem Madison and lower Madison River as assigned, for a one year period to compile existing information, inventory habitat restoration opportunities, assist with native species recovery efforts, and produce a 5 year aquatic habitat restoration plan.

Project Sponsor (submitted by):

Darin Watschke, Madison Ranger District

Location of Proposed Project: Ennis Montana

Total Project Cost: **\$58,500**

TAC Funds (Cost-Share) Requested for Project: **\$29,250**
(= \$20,250 in addition to \$9k in TAC funds received annually for B-D Fish Tech funding)

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

This funding proposal is for a cost-share position between the Beaverhead-Deerlodge National Forest and NWE. The position would be a permanent GS-7 entry level Fisheries Biologist with a term of one year (1 Year NTE). This position would work primarily on USFS administered lands throughout the Madison River drainage and the main-stem Madison and lower Madison River as assigned, for a one year period to compile existing information, inventory habitat restoration opportunities, assist with native species recovery efforts and produce a 5 year aquatic habitat restoration plan.

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

MT FWP, USFS, NWE and partners have been very successful in implementing large scale native species restoration projects in the Madison and adjacent river drainages over the last 25 years. Congruently, the TAC has similar large projects identified for implementation over the next 5-10 years. However, smaller scale habitat restoration projects, primarily on Federal lands, have been largely over looked due to a lack of internal capacity. These sort of projects require on the ground identification, development, review, small NEPA decisions, associated permits, implementation and monitoring. Therefore it is most effective to package many of these similar projects together, across boundaries, to provide the greatest benefit to aquatic resources on the ground – while making the most efficient use of partnership time and dollars.

This proposal intends to employ an entry level Forest Service biologist for 1 year to develop a small project habitat restoration plan for the B-D and Custer Gallatin NFs.

2020 Cost-Share Proposal Form for NorthWestern Energy (NWE)
Project 2188 TAC Funds

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

The entry level biologist would compile existing information, focus 2020 field data collection efforts (update old and develop new habitat restoration opportunities on the ground), and assist MT FWP and USFS with critical field work where assigned. Post field season, the position would develop a restoration plan to present at the 2020 Mad TAC meeting and thereafter would lead the small NEPA process and draft decision memos, that include multiple out-year restoration projects, for both National Forests.

IV. Schedule; when the Project work will begin and end. The position would be hired in spring 2020 and would continue for 364 days.

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

The position would be duty stationed and supervised out of the Madison Ranger District in Ennis, Montana.

VI. Project budget must include amounts for the following:

Direct Labor \$58,500 (\$29,250 TAC and \$29,250 B-D NF)

Travel and Living

Materials

Other Direct Expenses

Direct Overhead (8%)

All cost-share sources and amounts, including estimation of “in-kind” contributions

VII. Deliverables; describe work product (reports, habitat restoration, etc.) which will result from this Project. How will “success” for this project be monitored or demonstrated?

This position would compile existing information, conduct field investigations, develop a habitat restoration plan (that includes potential partners and funding opportunities: Turner Enterprise, Trout Unlimited, TNC, etc...), and begin the small NEPA process and permit acquisition to initiate implementation of approved projects in 2021.

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:

Not Applicable

2020 Cost-Share Proposal Form for NorthWestern Energy (NWE)
Project 2188 TAC Funds

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: Not Applicable

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

- jon.hanson@northwestern.com
- jordan.tollefson@northwestern.com

Further questions about TAC proposals or Project 2188 license requirements or related issues may be addressed to: Jon Hanson, Hydro Compliance Fisheries Biologist, NorthWestern Energy, 1903 S. Russell Street, Missoula, MT 59801; 406-542-5961 (office); 406-240-7328 (cell); Jon.Hanson@northwestern.com.

2020 Cost-Share 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: 2020 Custer Gallatin NF's seasonal technician funding

Date: 10/31/2019

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

This project would partially fund two Custer Gallatin National Forest Fish Technicians to assist NWE, MFWP, and USFS biologists with multiple projects including monitoring and surveys during the 2020 field season. General duties that address the following articles include: population & habitat monitoring for species of special concern (population estimates, presence/absence surveys, nonnative removals, collection of genetic material, temperature monitoring, riparian & stream channel monitoring, etc.); assisting with stream and lake enhancement projects; and, fish barrier site identification, reconnaissance, and maintenance.

ARTICLE 408

7) Monitor fish species of special concern (i.e., Arctic grayling and westslope cutthroat trout).

ARTICLE 409

3) Fish habitat enhancement both in main stem and tributary streams, including enhancement for all life stages of fishes.

6) Inclusion or exclusion of fish barriers.

ARTICLE 412

4) Protect and aid the recovery of threatened and endangered fish species and other aquatic species of special concern, including Arctic grayling, in Madison Reservoir and the lower Madison River.

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

Priority 2: The USFS technicians would assist with projects which meet License Article requirements and PM&E for fisheries populations and their habitats in primary tributaries and provide PM&E for Madison River resources, as directed by USFS, MFWP and NWE fisheries personnel.

Project Sponsor (submitted by): Allison Stringer, Custer Gallatin National Forest, Bozeman and Hebgen Lake Ranger District's

Location of Proposed Project: Upper Madison River and tributaries

Total Project Cost:

GS-6 Technician TAC \$157.00 x 20 days	\$ 3,140
GS-5 Technician TAC \$141.00 x 20 days	\$ 2,820
GS-6 Technician In-Kind Contribution \$157.00 x 40 days	\$ 6,280
GS-5 Technician In-Kind Contribution \$141.00 x 40 days	\$ 5,640

Overhead (1.0%)

Total = $\frac{\$ 60}{\$17,940}$

TAC Funds (Cost-Share) Requested for Project:
 $\$3,140 + \$2,820 + \$60$ (1% overhead) = $\$6,020$

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

This funding request is for cost sharing USFS Fisheries Technician salaries. The USFS Region 1 Fisheries Program has undergone considerable reductions. Limited resources are available to local FS biologists to obtain the seasonal work force required to assist NWE and MFWP in implementing the Fisheries, Wildlife, and Water Quality Protection, Mitigation and Enhancement Plan in the Madison River drainage as part of FERC licensing requirements for Project 2188.

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

The FS technicians would aid State, Federal, and NWE biologist during the summer field season with the following:

- Tepee Creek westslope trout restoration project reconnaissance
- Cabin Creek electrofishing
- Instream flow reservations
- Riparian vegetation and stream channel monitoring
- WCT population monitoring
- Thermograph deployment and retrieval
- WCT genetics collection
- Amphibian surveys and monitoring
- Aquatic Invasive Species (AIS) inventory and monitoring in the Madison River drainage – high risk waters.
- Assist MFWP and NWE staff with their annual program of work on Madison River, Hebgen and Ennis Reservoir as needed.

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

Forest Service seasonal technicians would work cooperatively with NWE and MFWP crews throughout the summer field season to accomplish the fisheries objectives outlined above within the Madison River drainage.

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

May 2020 – October 2020

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

One GS-6 and one GS-5 Fisheries Technician. Project lead is Allison Stringer, CGNF West Zone Fisheries Biologist

VI. Project budget must include amounts for the following:

Direct Labor = **\$5,960**
Travel and Living
Materials
Other Direct Expenses
Direct Overhead = **\$60**
All cost-share sources and amounts, including estimation of “in-kind” contributions

VII. Deliverables; describe work product (reports, habitat restoration, etc.) which will result from this Project. How will “success” for this project be monitored or demonstrated?

The success of this project will be demonstrated by reporting the field work days spent and annual accomplishments related to Articles 408, 409 and 412 in the Madison River drainage, reservoirs, and tributaries.

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:

N/A

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:

N/A

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.

2020 Cost-Share 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: 2020 Wall Creek Fish Barrier Construction Funding Request

Date: 11/4/2019

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

The Wall Creek Fish Passage Barrier will secure 8 stream miles of native Westslope Cutthroat trout habitat in a primary tributary to the Madison River.

ARTICLE 409

6) Inclusion or exclusion of fish barriers.

ARTICLE 412

4) Protect and aid the recovery of threatened and endangered fish species and other aquatic species of special concern, including Arctic grayling, in Madison Reservoir and the lower Madison River.

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

Priority 2: A fish barrier is needed to alleviate the concern of future introgression from Madison River rainbow trout into the Wall Creek WCT population.

2020 Cost-Share Proposal Form for NorthWestern Energy (NWE)
Project 2188 TAC Funds

Project Sponsor (submitted by):

Darin Watschke, Madison Ranger District
Travis Lohrenz, MT FWP Ennis

Location of Proposed Project: Wall Creek, tributary to Madison River

Total Project Cost: **\$254,000**
(2018 cost estimate included with the final design)

TAC Funds (Cost-Share) Requested for Project: **\$60,000**

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

Wall Creek is a tributary to the Madison River that is occupied by a Westslope Cutthroat trout population of 95% genetic purity. Currently, non-native rainbow trout are able to ascend Wall Creek and hybridize with individuals in the WCT population. In an effort to prevent further dilution of the genetic purity of the Wall Creek WCT population and risk having the population fall out of conservation status, the US Forest Service and FWP are seeking funding for the construction of a fish barrier. The barrier will protect 8.0 miles of the headwaters in the Wall Creek drainage currently occupied by the WCT population. It is highly likely that genetic purity of the population will continue to decline if no action is taken.

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

The Wall Creek WCT population and the barrier construction site are entirely on National Forest lands, administered by the Madison Ranger District of the Beaverhead-Deerlodge National Forest. Therefore, the Madison Ranger District would also administer the contract for barrier construction.

The Madison Ranger District and FWP secured a stamped design and cost estimate for construction of the Wall Creek Fish Passage Barrier in 2018. A US Forest Service Categorical Exclusion and subsequent Decision Memo, required under NEPA, will be completed in winter 2019/early 2020. Barrier construction is anticipated to occur sometime between July and October 2020. However, initiation of construction is dependent upon securing funding.

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

Once adequate funding is secured, the USFS, Beaverhead-Deerlodge National Forest intends to solicit, contract and oversee construction of the Wall Creek Fish Passage Barrier as specified in the 2018 final design.

IV. Schedule; when the Project work will begin and end. July 2020 – October 2020

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

Beaverhead-Deerlodge NF Fisheries and Engineering, USFS Contract Officer, USFS COR and Awarded Contractor

2020 Cost-Share Proposal Form for NorthWestern Energy (NWE)
Project 2188 TAC Funds

VI. Project budget must include amounts for the following:

Direct Labor (Contract) = \$254,000

Travel and Living

Materials

Other Direct Expenses

Direct Overhead (8%)

All cost-share sources and amounts, including estimation of “in-kind” contributions

Category	Total
a. Personnel	18,000
b. Travel	30,000
c. Equipment*	40,000
d. Supplies	86,000
e. Contractual	15,000
f. Construction	46,000
g. Other	19,000
TOTAL	\$254,000

Contributor	Cash	Secured?(Y/N)
USFS	\$10,000.00	Y
NW Energy	\$120,000.00	Y
Montana FWP Future Fisheries	\$20,000.00 (2018)	Y
Bring Back the Natives (WNTI)	\$9,448 .00 (2019)	Y
Sub Total	\$159,448.00	
Montana FWP Future Fisheries	\$40,000.00 (2020)*	N
NW Energy	\$60,000.00 (2020)*	N
Bring Back the Natives (WNTI)	\$47,500 (2020)*	N

***2020 funds have been applied for, but are not guaranteed.**

VII. Deliverables; describe work product (reports, habitat restoration, etc.) which will result from this Project. How will “success” for this project be monitored or demonstrated?

The long-term benefits of the project include securing eight stream miles of Wall Creek and protection of the genetic purity of Westslope Cutthroat trout upstream of the barrier from competition and hybridization with nonnative trout species. Genetic purity would therefore stay above 95% with the success of the fish barrier.

Barrier efficacy will be monitored by USFS and FWP employees by continuing to assess population genetics and species distribution throughout time. The barriers integrity will be

2020 Cost-Share Proposal Form for NorthWestern Energy (NWE)
Project 2188 TAC Funds

monitored by annual inspection at the barrier site. The structure will be cleaned of all debris and inspected for cracks or other structural deficiencies. Future barrier repair, if needed (the structure is anticipated to have a 100yr life span), will be a shared responsibility of the partners (USFS and FWP).

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:

The Wall Creek barrier construction site was reviewed and cleared by USFS Archeology in September 2018. These findings will be included in a cultural resource report that will accompany the Decision Memo produced in winter 2019.

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:

Not Applicable – compliance with waters rights laws, policies and guidelines are not required for this proposal.

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

- jon.hanson@northwestern.com
- jordan.tollefson@northwestern.com

Further questions about TAC proposals or Project 2188 license requirements or related issues may be addressed to: Jon Hanson, Hydro Compliance Fisheries Biologist, NorthWestern Energy, 1903 S. Russell Street, Missoula, MT 59801; 406-542-5961 (office); 406-240-7328 (cell); Jon.Hanson@northwestern.com.

Project Title: Impacts of changing macroinvertebrate populations on Madison River salmonids

Date Submitted: 11/01/2019

Explain how this Project addresses a specific Project 2188 License Article(s): Priority 1: This project will address how fishes in the mainstem Madison River could be influenced by changing macroinvertebrate populations. It will also assess potential management tools such as mainstem woody debris additions. Priority 2: This project will address water quality drivers of macroinvertebrates and fishes at Madison River tributary confluences. Priority 3: This project will provide scientific benefits by documenting consequences of shifts in macroinvertebrate communities for fishes. To do this, the project will employ several research approaches, including field surveys, field experiments, and leveraging a 20-year dataset on macroinvertebrates and fishes on the mainstem Madison River.

Provide justification for Priority 1, 2 or 3 (above) that you selected: The proposed research will take place in the mainstem Madison River and at tributary confluences. Sites will span the Madison River between Hebgen and Ennis Reservoirs. This work will address several components of FERC licensing Articles 408 and 409, including but not limited to riverbank enhancements, enhancement of wilderness fisheries, identifying important riparian areas, enhancement of habitats that support fish by supporting healthy food web interactions, and monitoring direct effects of project operations on food resource availability for fishes.

Project Sponsor (submitted by):

Lindsey Albertson, Montana State University
Travis Lohrenz, Montana Fish, Wildlife, and Parks
Pat Byorth, Trout Unlimited

Location of Proposed Project: Madison River and tributary confluences between Hebgen and Ennis Reservoirs

Geocode (in decimal degrees ex 46.89743)

Ennis:	Lat: 45.3346528	Lon: -111.7391053	(low salmonfly density)
Varney:	Lat: 45.2351698	Lon: -111.7584109	(high salmonfly density)
Palisades Drive:	Lat: 44.9874628	Lon: -111.6585044	(high salmonfly density)
\$3 Bridge:	Lat: 44.8310308	Lon: -111.5167266	(low salmonfly density)
Hebgen:	Lat: 44.8642379	Lon: -111.3541529	(high salmonfly density)

Total Project Cost: \$121,191.12

TAC Funds (Cost-Share) Requested for Project: \$81,191.12

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

Macroinvertebrates are critical components of river food webs, but their success and distributions are threatened by several anthropogenic factors including temperature warming, land use change, and altered flow regimes (Wallace and Webster 1996, Strayer and Dudgeon 2010). In the Madison River, compelling evidence suggests that the giant salmonfly (*Pteronarcys californica*), one focal species that is sensitive to water quality, is declining (Figure 1; Stagliano 2010; Anderson *et al.* 2019). The decline is most likely due to warm, late-summer water temperatures (Anderson *et al.* 2019), although other changing environmental factors such as fine sediment loads and oxygen dynamics likely also play a role. Our models predict that salmonflies will experience continued range contraction and reduction in density along the Madison River, especially at sites near Ennis, over the next several decades as the number of river miles with suitable habitat

for these key aquatic macroinvertebrates continues to decline (Isaak et al. 2017, Anderson et al. 2019a). Aquatic insects making the life-history transition from their aquatic larval stage to terrestrial adult stage are cued to “hatch” on the Madison River by spring water temperature (April-May), and during this time aquatic insects utilize important riparian habitats to discard their shucks and dry their wings (Baxter et al. 2005, Anderson et al. 2019b). For salmonflies on the Madison River between Yellowstone National Park and Ennis, the hatch lasts approximately one month and occurs from roughly June 15 to July 15, although exact start dates vary from year to year depending on spring water temperature. Emergence occurs over only a short six days, on average, at any given 100 m river reach (Figure 2; Anderson et al. 2019b). During these important emergence events, aquatic insects are critical components of fish diets. They also provide an important food resource to wildlife such as birds in the riparian zone. *Because salmonflies can dominate macroinvertebrate communities with their large biomass and high abundance* (Walters et al. 2018), *changes to salmonfly population size and distribution could have substantial impacts on river food webs. Previous studies in other locations reveal that salmonid fishes can eat stoneflies, including Pteronarcys specifically, but very little is known about the role of this important macroinvertebrate in salmonid resource use in southwestern Montana* (Tebo et al. 1963, Nakano et al. 1992, Woodward et al. 1994, Cox et al. 2020). We propose to document the impacts of macroinvertebrate decline on salmonid fishes in the iconic, blue-ribbon Madison River.

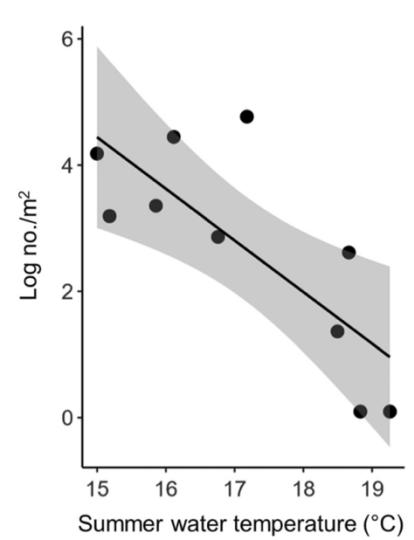


Figure 1. Density of larval salmonflies in the mainstem Madison River in 2017 for 10 sites ranging in summer temperature (measured June-August). The sites span from upstream of Hebgen Reservoir to downstream of Ennis Reservoir. Salmonfly density is significantly lower ($p < 0.01$; $R^2 = 0.60$) at sites with warmer mean summer water temperature. Salmonflies have been extirpated (undetectable; 0 larvae/m²) at sites where summer temperature exceeds 18.6 °C. In the Madison River, the two sites in this dataset where salmonflies have been extirpated are both downstream of Ennis Reservoir. Gray shading shows the 95% confidence interval.

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

Question: How does a decline and/or extirpation of macroinvertebrates on the Madison River influence salmonid resource use, population size, and per capita growth?

Rationale: This question would be timely when considered in parallel with multiple stressors, such as unintended mortality from angling and direct effects of warming water temperatures, that are building for the fishery in the Madison River. The impacts of a reduction in a major food source for stream fishes are understudied but potentially critical (Wipfli 1997, Wipfli and Baxter 2010, Naiman et al. 2012, Hamlin 2015), and this project will contribute important scientific knowledge to identify strategies for sustaining fishes that are ecologically, culturally, and economically important to Montana.

Research approach: We will use several avenues of research to determine if changes to salmonfly populations influence salmonids. Stoneflies (order: Plecoptera) such as salmonflies are indicators of good water quality (Bukantis 1998), and we will use salmonflies as a focal species to evaluate habitat quality for key macroinvertebrate food resources for fishes at mainstem and tributary confluence locations. Using complementary field surveys and field experiments, we will investigate how important salmonflies are for salmonids on the Madison River relative to other macroinvertebrate taxa, and we will investigate factors that most strongly influence food resource availability for fish consumers.

Management implications and application: In this project t, we will collect some of the first data in southwestern Montana to evaluate whether a decline in macroinvertebrates could have implications for fish populations. This project will have several outcomes that could directly inform management strategies.

Macroinvertebrates can be responsive to mitigation measures such as woody debris additions, gravel additions, and tributary restoration efforts. We will assess how important temperature is relative to other limiting factors (availability of preferred habitat, fine sediment levels, oxygen levels) for macroinvertebrates so that we can assess what might be limiting their availability as a food resource for fish. As a result, we will identify locations on the Madison River and its tributaries that house relatively large and healthy populations of sensitive macroinvertebrate taxa that could allow us to target certain management locations in the future. Mitigation efforts may include: habitat supplementation through woody debris additions, restoring and maintaining cool tributary refugia through connection to the mainstem, and riparian vegetation planting for proper vegetation morphological structure to support successful emergence.

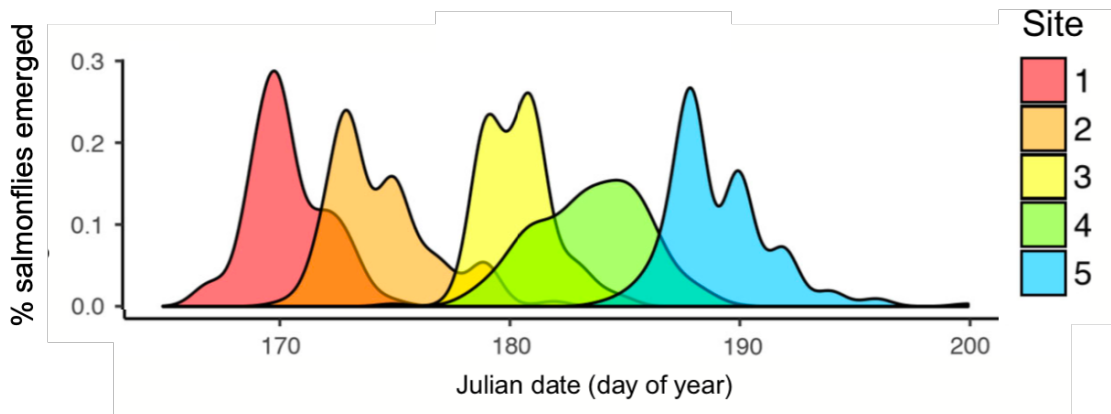


Figure 2. Emergence patterns of the salmonfly hatch on the Madison River for five sites spanning from Varney Bridge (Site 1, most downstream, red) to Hebgen Reservoir (Site 5, most upstream, blue). The start of emergence is cued by mean spring (April-May) water temperature, and sites with warmer spring temperatures emerge earlier.

III. Methods; Description of how project objectives will be accomplished.

1: How important are salmonflies to salmonids, and are macroinvertebrates (densities, species identity, distributions) a limiting factor to salmonid growth?

1A) Field sampling: Diets for multiple salmonid species will be sampled in the field at several times of year to see how extensively they feed on salmonfly larvae and emerging salmonfly adults. By comparing diets at sites along the river with low versus high salmonfly density (these sites have already been established in Anderson et al. 2019a), we can evaluate how important salmonflies are to salmonid diets. We will compare the proportion of diet abundance and biomass attributed to salmonflies relative to other taxa. We will also investigate which taxa salmonids switch to by documenting the dominant taxa in the diets at sites where salmonflies are currently not common. We will use electroshocking and non-lethal gastric lavage to sample fish diets. Samples will be preserved and sorted in the lab. We predict that all fish species consume salmonflies, salmonflies are important (>25% of diet by abundance and biomass) at all times of year and not just during emergence, and sites with higher salmonfly larval densities will have a larger proportion of their diet comprised of salmonflies for all fish species surveyed.

1B) Historical data records: Using current and ongoing sampling efforts by MFWP and NWE, we will use existing datasets to explore possible relationships between salmonid populations (abundance, body size) and macroinvertebrates (density and community composition). We predict that fish abundance and body size will be larger at sites with more salmonflies.

2: What factors influence habitat use by salmonids and macroinvertebrates?

2A) *Woody debris addition experiment*: We will add large woody debris (LWD) bundles to mainstem Madison River sites (minimum of 3 installations) to see if macroinvertebrates and salmonids utilize and select for these discrete habitats. We have observed salmonflies aggregated on woody debris and will test whether supplementing this seemingly important habitat type could be a management tool that will boost salmonfly and fish populations (Albertson, personal observation). This field experiment will employ structures that are made of natural tree trunk and limb material to enhance holding water for fish, riverbank low-flow refugia, and enhanced habitat that will support all life stages of fish that consume macroinvertebrates. The bundles will be deployed within 4 m of the riverbank. Longevity of the structures will be assessed every month during the ice-free season to determine how practical it will be to use these types of structures for long-term supplementation of macroinvertebrate and fish habitat. Structures will be surveyed regularly for macroinvertebrate use by gently scrubbing with a brush and catching drifting macroinvertebrates in a downstream net. Samples will be preserved and sorted in the lab. Electroshocking will be used in the immediate vicinity of the bundles to assess use by fishes. We are especially excited by this part of the project because of its potential to document the impacts of LWD in the Madison, which is known to influence food webs, fish and macroinvertebrate diversity, and geomorphology (Fausch and Northcote 1992, Thompson et al. 2018). LWD in many streams in the Rockies has been eliminated or reduced to due forestry and damming practices (Nowakowski and Wohl 2008), but is an important component of many U.S. restoration projects.

2B) *Spatial salmonfly survey*: This research will address habitat enhancement in both mainstem and tributary locations, as well as identify important riparian vegetation. We will use temperature logger arrays at two mainstem sites and two confluence junction sites. At each confluence junction that we study, we will have one site in the mainstem and one paired site in the tributary immediately upstream of the junction. We will conduct high-resolution spatial surveys of macroinvertebrate density and correlate several macroinvertebrate metrics with habitat characteristics such as temperature, fine sediment, woody debris, and riparian vegetation morphology. Along with density, biomass, and community richness metrics, we will assess what proportion of the macroinvertebrate community is categorized as sensitive (Ephemeroptera, Trichoptera, and Plecoptera, EPT taxa) and what proportion is giant salmonflies (*Pteronarcys californica*). We have observed salmonflies using tributaries as a potential cool-water refuge and this sampling effort will allow us to officially document use of tributaries as habitat (L. Albertson and D. Moser, personal observations). If salmonflies are using tributary confluences extensively, a follow-up project could assess fish diets, use, and movement to seek out these resource hotspots.

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

March 1, 2020 to December 31, 2022

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

Lindsey Albertson, Assistant Professor, Montana State University Ecology Department

Zach Maguire, Graduate Student, Montana State University Ecology Department

VI. Project budget must include amounts for the following (Direct Labor, Travel and Living, Materials, Other Direct Expenses, Direct Overhead):

	Year 1	Year 2	Year 3	Total
Salaries and Wages				
Grad research assistant	\$19,800.00	\$20,394.00	\$10,502.91	\$50,696.91
Grad fringe (8%)	\$1,584.00	\$1,631.52	\$840.23	\$4,055.75
Grad Tuition, fees, and benefits	\$7,238.00	\$7,455.14	\$3,839.40	\$18,532.54
Undergrad assistant	\$4,160.00	\$4,160.00	\$0.00	\$8,320.00

Undergrad fringe (1%)	\$41.60	\$41.60	\$0.00	\$83.20
PI summer salary (1 week)	\$1,922.00	\$0.00	\$0.00	\$1,922.00
PI fringe (37%)	\$711.14	\$0.00	\$0.00	\$711.14
Travel				
Vehicle use (3,000 miles in year 1 and 2 at 0.43 per mile)	\$1,290.00	\$1,290.00	\$0.00	\$2,580.00
Camping fees	\$300.00	\$300.00	\$0.00	\$600.00
Supplies				
Field and lab supplies	\$2,000.00	\$2,000.00	\$0.00	\$4,000.00
Woody debris addition (excavator, material transport)	\$5,000.00	\$5,000.00	\$0.00	\$10,000.00
Computer	\$1,700.00	\$0.00	\$0.00	\$1,700.00
Publication costs	\$0.00	\$0.00	\$700.00	\$700.00
Cultural resource consultation	\$2,000.00	\$0.00	\$0.00	\$2,000.00
IDC (17.5%)	\$7,089.03	\$6,093.00	\$2,107.55	\$15,289.58
Total	\$54,835.77	\$48,365.26	\$17,990.09	\$121,191.12

All cost-share sources and amounts, including estimation of “in-kind” contributions

\$20,000: Albertson startup university seed funding (secured)

\$20,000: Trout Unlimited (anticipated)

VII. Deliverables; describe work product (reports, habitat restoration, etc.) which will result from this Project. How will “success” for this project be monitored or demonstrated?

The project will be considered a success when the following products are produced:

- 1 annual report to MFWP and NWE
- 1 final report to MFWP and NWE
- 1 Master’s thesis approved by a committee at MSU in the Ecology Department
- 1 peer-reviewed manuscript submitted to a journal within 12 months of thesis completion
- 1 conference presentation given by the graduate student (Maguire)
- 1 regional public presentation given by the PI (Albertson)

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:

We budgeted funds for NWE’s consultant to assess our use of large woody debris bundles and any potential impacts on riverbed disturbance.

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 9 March 2016. Summarize here how you will comply with Montana water rights laws, policies and guidelines:

No water rights compliance is required for this project.

X. Literature Cited

- Anderson, H. E., L. K. Albertson, and D. M. Walters. 2019a. Water temperature drives variability in salmonfly abundance, emergence timing, and body size. *River Research and Applications* 35:1013–1022.
- Anderson, H. E., L. K. Albertson, and D. M. Walters. 2019b. Thermal variability drives synchronicity of an aquatic insect resource pulse. *Ecosphere* 10:e02852.
- Baxter, C. V., K. D. Fausch, and W. Carl Saunders. 2005. Tangled webs: reciprocal flows of invertebrate prey link streams and riparian zones. *Freshwater Biology* 50:201–220.
- Bukantis, R. 1998. Rapid bioassessment macroinvertebrate protocols: Sampling and sampling analysis SOP’s. Working draft. Montana Department of Environmental Quality. Helena, Montana.
- Cox, T., M. Lance, L. K. Albertson, A. Dutton, and A. Zale. 2020. Diet composition and resource overlap of sympatric native and introduced salmonids across neighboring streams during a peak discharge event In prep.
- Fausch, K. D., and T. G. Northcote. 1992. Large Woody Debris and Salmonid Habitat in a Small Coastal British Columbia Stream. *Canadian Journal of Fisheries and Aquatic Sciences* 49:682–693.
- Hamlin, K. 2015. Why Montana went wild: Revolutionary trout management in the 1970s. *Gallatin History Museum Quarterly* 38:23–27.
- Isaak, D. J., S. J. Wenger, E. E. Peterson, J. M. Ver Hoef, D. E. Nagel, C. H. Luce, S. W. Hostetler, J. B. Dunham, B. B. Roper, S. P. Wollrab, G. L. Chandler, D. L. Horan, and S. Parkes-Payne. 2017. The NorWeST summer stream temperature model and scenarios for the western U.S.: A crowd-sourced database and new geospatial tools foster a user community and predict broad climate warming of rivers and streams. *Water Resources Research*. 53: 9181–9205. 53:9181–9205.
- Naiman, R. J., J. R. Alldredge, D. A. Beauchamp, P. A. Bisson, J. Congleton, C. J. Henny, N. Huntly, R. Lamberson, C. Levings, E. N. Merrill, W. G. Pearcy, B. E. Rieman, G. T. Ruggerone, D. Scarnecchia, P. E. Smouse, and C. C. Wood. 2012. Developing a broader scientific foundation for river restoration: Columbia River food webs. *Proceedings of the National Academy of Sciences of the United States of America* 109:21201–7.
- Nakano, S., K. D. Fausch, T. Furukawa-Tanaka, K. Maekawa, and H. Kawanabe. 1992. Resource utilization by bull char and cutthroat trout in a mountain stream in Montana, U.S.A. *Ichthyological Research* 39:211–217.
- Nowakowski, A. L., and E. Wohl. 2008. Influences of wood load in mountain streams of the Bighorn National Forest, Wyoming, USA. *Environmental Management* 42:557–71.
- Stagliano, D. 2010. Evaluation of Salmonflies in Montana’s Rivers: Are Statewide Populations Really Declining?
- Strayer, D. L., and D. Dudgeon. 2010. Freshwater biodiversity conservation: recent progress and future challenges. *Journal of the North American Benthological Society* 29:344–358.
- Tebo, L. B., Jr., and W. W. Hassler. 1963. Food of brook, brown, and rainbow trout from streams in western North Carolina. North Carolina Academy of Sciences, Inc.
- Thompson, M. S. A., S. J. Brooks, C. D. Sayer, G. Woodward, J. C. Axmacher, D. M. Perkins, and C. Gray. 2018. Large woody debris “rewilding” rapidly restores biodiversity in riverine food webs. *Journal of Applied Ecology* 55:895–904.
- Wallace, J. B., and J. R. Webster. 1996. The role of macroinvertebrates in stream ecosystem function. *Annual review of entomology* 41:115–139.
- Walters, D. M., J. S. Wesner, R. E. Zuellig, D. A. Kowalski, and M. C. Kondratieff. 2018. Holy flux: spatial and temporal variation in massive pulses of emerging insect biomass from western U.S. rivers. *Ecology* 99:238–240.
- Wipfli, M. S. 1997. Terrestrial invertebrates as salmonid prey and nitrogen sources in streams: contrasting old-growth and young-growth riparian forests in southeastern Alaska, U.S.A. *Canadian Journal of Fisheries and Aquatic Sciences* 54:1259–1269.
- Wipfli, M. S., and C. V. Baxter. 2010. Linking ecosystems, food webs, and fish production: subsidies in Salmonid Watersheds. *Fisheries* 35:373–387.
- Woodward, D. F., W. G. Brumbaugh, A. J. Delonay, E. E. Little, and C. E. Smith. 1994. Effects on Rainbow Trout Fry of a Metals-Contaminated Diet of Benthic Invertebrates from the Clark Fork River, Montana. *Transactions of the American Fisheries Society* 123:51–62.



Patrick Byorth

Director of Montana Water, Western Water & Habitat Project

Andrew Welch
Jon.Hanson
Grant.Grisak
Northwestern Energy, Hydro Compliance
1315 N. Last Chance Gulch
Helena, MT 59601

October 31, 2019

Dear Andrew, Jon, and Grant,

I spoke with Dr. Lindsey Albertson today and reviewed her proposal for a study of salmonflies in the Madison and Gallatin rivers. As Director of TU's Water Program, I wanted to voice my support for her grant request to the MADTAC for the project. As you know, Trout Unlimited's staff and local MadisonGallatin Chapter have long been involved in the Madison basin since the early days of relicensing the Madison-Missouri Project. We are particularly gratified by the great work Northwestern Energy, Fish, Wildlife, and Parks and your MADTAC partners have accomplished over the years in fisheries restoration and research. I firmly believe the renowned trout fishery of the Madison River is a credit to the collaboration and on-the-ground work you have accomplished.

Many of us sense that change is inevitable on the Madison and events of the last decade seem to anticipate what changes might occur in the future. The shift in temperature regime due to Hebgen Dam's outlet renovation gave us a glimpse of what warmer water temperatures might mean in the future to the aquatic ecosystem. Northwestern's monitoring of aquatic macroinvertebrates during the change between surface and hypolimnetic discharge confirms that temperatures have had a measurable effect on the food web and fish populations seem to have held their own, even with remarkable increases in fishing pressure.

Dr. Albertson's study comes at a critical time in the Madison. Salmonflies are arguably a keystone prey species for trout and whitefish, yet we know painfully little about their life history and direct effects on trout abundance and life history. The impressive body of work supported by MADTAC and your partners have improved river flows, restored wetlands and streams, opened windows into fishing pressure and angling success, documented sediment transport and characterized the aquatic invertebrate community. The proposed study will help us draw a more complete picture of how all these investments drive the fishery by using salmonflies as a direct link between habitat and fish populations. I hope you'll support this project. Thanks for all the great work you do.

Sincerely,

Patrick Byorth

Trout Unlimited: America's Leading Coldwater Fisheries Conservation Organization

321 East Main Street, Suite 411, Bozeman, MT 59715

office: (406) 522-7291 • cell: (406) 548-4830 • email: pbyorth@tu.org • www.tu.org

NORTHWESTERN ENERGY 2020 MADISON TAC PROPOSAL

Project Title: Assessment of Riparian Enhancement, Stream Restoration, and Fisheries Improvement Opportunities for Madison River Tributaries

Date: January 1, 2020-March 30, 2021

How this project addresses a specific Project 2188 License Article: This project is a priority 3 that provides an assessment of Madison River tributaries for potential riparian enhancement, stream restoration, and fisheries improvement projects.

Project Sponsor: Trout Unlimited, Jeff Dunn and Pat Byorth

Location of Proposed Project: This project will encompass the entire Madison River watershed and will focus on tributary streams with sediment, nutrient, pathogen, and temperature Total Maximum Daily Loads (TMDLs), along with any other streams deemed appropriate for evaluation by local fisheries biologists, including: Antelope Creek, Bear Creek, Blaine Spring Creek, Buford Creek, Cabin Creek, Cherry Creek (Gravelly Range), Cherry Creek (Madison Range), Elk Creek, Elk River, Gazelle Creek, Horse Creek, Hot Springs Creek, Indian Creek, Jack Creek, Moore Creek, No Man Creek, North Meadow Creek, O'Dell Spring Creek, Red Canyon Creek, Ruby Creek, South Fork Madison River, South Fork Meadow Creek, Watkins Creek, West Fork Beaver Creek, West Fork Madison River, and Wigwam Creek.

Geocode: Lat: 44.953366 Long: -111.611262

Total Project Cost: \$30,634

INTRODUCTION

To support Watershed Restoration Planning (WRP) efforts currently underway in the Madison River Watershed, this Assessment of Riparian Enhancement, Stream Restoration, and Fisheries Improvement Opportunities for Madison River Tributaries will be conducted to identify potential restoration opportunities. This assessment will be conducted using aerial imagery, interviews with local fisheries biologists, and on-the-ground reconnaissance to identify locations where instream and riparian habitats could be improved to benefit the fisheries of the Madison River Watershed. This project intends to provide supporting information for the WRP, which is currently being completed by the Madison Conservation District, while also providing a foundation for the development of more detailed restoration project plans for specific tributaries of the Madison River and conceptual designs for specific projects.

OBJECTIVES

The goal of this project is to identify potential sites to conduct riparian enhancement, stream restoration, and fisheries improvement projects on Madison River tributaries. To achieve this goal, the following objectives will be accomplished 1) identify potential restoration sites using aerial imagery interpretation, 2) conduct interviews with local fisheries biologists, 3) ground-truth potential sites during

field reconnaissance, and 4) present a summary of potential sites in a report, including maps and photos.

METHODS

First, an aerial assessment will be performed using 2017 NAIP Imagery and Google Earth. This aerial assessment will further examine the riparian health conditions identified by the Montana Department of Environmental Quality (DEQ) during the TMDL assessment in which stream reaches were delineated and riparian health was assessed following DEQ's *Sediment-Habitat Reach Stratification and Riparian Assessment Procedure*. For each stream reach, riparian health has been assigned based on the following criteria:

- **Good:** mature vegetation along entire reach, averaging 100 feet in width
- **Moderate-Good:** mature vegetation along entire reach, 30-100 feet in width
- **Fair:** mature vegetation along at least half of reach, buffer not less than 30 feet
- **Moderate-Fair:** mature vegetation along 20% or less of reach, buffer generally 10 feet or less
- **Poor:** little to no mature vegetation

For this assessment of restoration opportunities, areas with poor, moderate, or fair riparian health will be further examined for potential riparian buffer enhancements, including riparian plantings, fencing, and stock water development. In addition, areas with degraded stream conditions will be identified during the aerial assessment, along with areas with the potential for floodplain restoration and reconnection. Potential stream and floodplain restoration opportunities will include streambank revegetation, stream channel restoration, instream habitat enhancement, and floodplain reconnection, including opportunities for Artificial Beaver Dams (ABDs) / Beaver Dam Analogs (BDAs).

The aerial assessment will be accompanied by a series of interviews with fisheries biologists and other conservation professionals working in the Madison River watershed to compile a list of potential projects to improve fisheries based on first-hand knowledge of the watershed and recently completed assessments. These interviews will focus on compiling information on important fisheries resources, identified areas of concern, outstanding questions regarding the current status of the fishery, and areas where fish habitat can be enhanced, including areas targeted for Westslope cutthroat trout conservation and restoration.

Following the aerial assessment and interviews with fisheries biologists, an on-the-ground reconnaissance will be performed of identified potential sites for riparian enhancement, stream restoration, and fisheries improvement opportunities. Once the on-the-ground reconnaissance is completed, a report will be compiled summarizing potential project sites, project types, landownership, and potential partners. The summary report will include maps depicting identified potential project sites and photos of existing site conditions.

SCHEDULE

The aerial assessment will be conducted in the winter and spring of 2020, field reconnaissance will be conducted in the summer and fall of 2020, and final reporting will be completed by March 30, 2021.

PERSONNEL

This project will be conducted by Jeff Dunn, with support from Pat Byorth. In addition, GIS support will be provided by a contractor.

PROJECT BUDGET

Direct Labor	\$22,000
Travel and Living	\$1,450
Materials	\$0
Other Direct Expenses	\$6,000
Direct Overhead	\$1,184
Cost share / in-kind	\$0
Total	\$30,634

DELIVERABLES

A report will be compiled including a summary of potential restoration project sites, the type of restoration project, maps depicting identified potential project sites, and photos of existing site conditions.

CULTURAL RESOURCES

Since no earthwork will be performed during this project, an evaluation of cultural resources is not necessary.

WATER RIGHTS

This project does not involve the development, restoration, or enhancement of wetlands, a water rights evaluation is not necessary.

Project Title: *O'DELL CREEK PHASE 17 AQUATIC HABITAT RESTORATION PROJECT:
DESIGN-BUILD PROPOSAL*

Date: November 1, 2019

Applicability to Project 2188 License Article(s)

Phase 17 will offset impacts to river resources associated with Project 2188 (Madison-Missouri River). The project meets the purposes and intents of License Articles 408, 409 and 412, which require: 1) developing plans to restore and protect important riparian areas; 2) enhancing fish habitat both in main stem and tributary streams to the Madison River, for all life stages of fishes; 3) restoring riparian habitat; and 4) protecting and aiding in the recovery of threatened and endangered fish species including Arctic grayling. Over the past 15 years, 13 phases of restoration have been implemented in the O'Dell Creek headwaters planning area, culminating in over 13 miles of spring creek and 780 acres of wetland restoration. For the past several years, Montana Fish, Wildlife & Parks (FWP) has been placing Arctic grayling Remote Site Incubators (RSIs) in several reaches of O'Dell Creek. This program is scheduled to continue in 2020 and project designs are developed to help optimize conditions that increase egg-to-fry survival rates.

Justification for Priority 2 Classification

The O'Dell Creek Phase 17 Stream and Wetland Restoration Project classifies as a Priority 2 2188 license project. The project is located on O'Dell Creek, a major cold-water spring creek tributary to the Madison River, within 0.3 miles of the Madison River, and will address limiting factors related to degraded aquatic habitat and riparian conditions.

Project Sponsor(s): Granger Ranches, L.P.
U.S. Fish and Wildlife Service
Madison River Foundation
River Design Group, Inc.

Location of Proposed Project

The project is located in Madison County approximately three miles south of the town of Ennis, Montana. The project is located on Granger Ranches, a working cattle ranch. The legal description of the project area is East ½ of Section 20, Township 6 South, Range 1 West. Please refer to Figure 1.

Geocode: 25-0423-20-1-01-01-0000; **Latitude:** 45.299; **Longitude:** -111.745

Total Project Cost: \$161,340

TAC Funds (Cost-Share) Requested for Project: \$15,000

I. INTRODUCTION

O'Dell Spring Creek and floodplain wetlands are important ecological resources to the Madison River. Over the past 15 years, 13 major phases of work have culminated in the restoration of 13.5 miles of spring creek, and 780 acres of improved wetland and riparian functions. Restoration suitability, willing landowners, and private-public partnerships are the reasons for the success of this large-scale, comprehensive restoration project. In 2018, NorthWestern Energy, Granger Ranches, Longhorn Ranch,

and the US Fish and Wildlife Service received the *Society for Ecological Restoration Northwest Restoration Project of the Year Award*. The award recognized the important fish and wildlife habitat gains resulting from permanently protecting and restoring aquatic and riparian ecosystems in the O'Dell Creek headwaters. Specific accomplishments of the O'Dell Creek headwaters stream and wetland restoration project include:

- 13.5 miles of stream channel restored, with an estimated ten-fold increase in the availability of adult holding and juvenile rearing habitat compared to pre-restoration conditions.
- Reduction in stream water temperatures due to reduced channel width-to-depth ratios and increased cover of vegetation that provides shade to the channels.
- Increasing the distribution and availability of complex aquatic habitat features including riffle and pool features.
- Improving water quality by eliminating chronic sources of fine sediment inputs to the channel via severe streambank erosion.
- Reconnecting and restoring approximately 780 acres of floodplain and riparian wetland habitat (drained floodplain wetlands), increasing groundwater storage and hyporheic exchange throughout the 1,500-acre project area.

This project proposal furthers restoration and conservation efforts on the Granger Ranch. The legal description of the project area is noted above, and a project vicinity map is included as Figure 1.

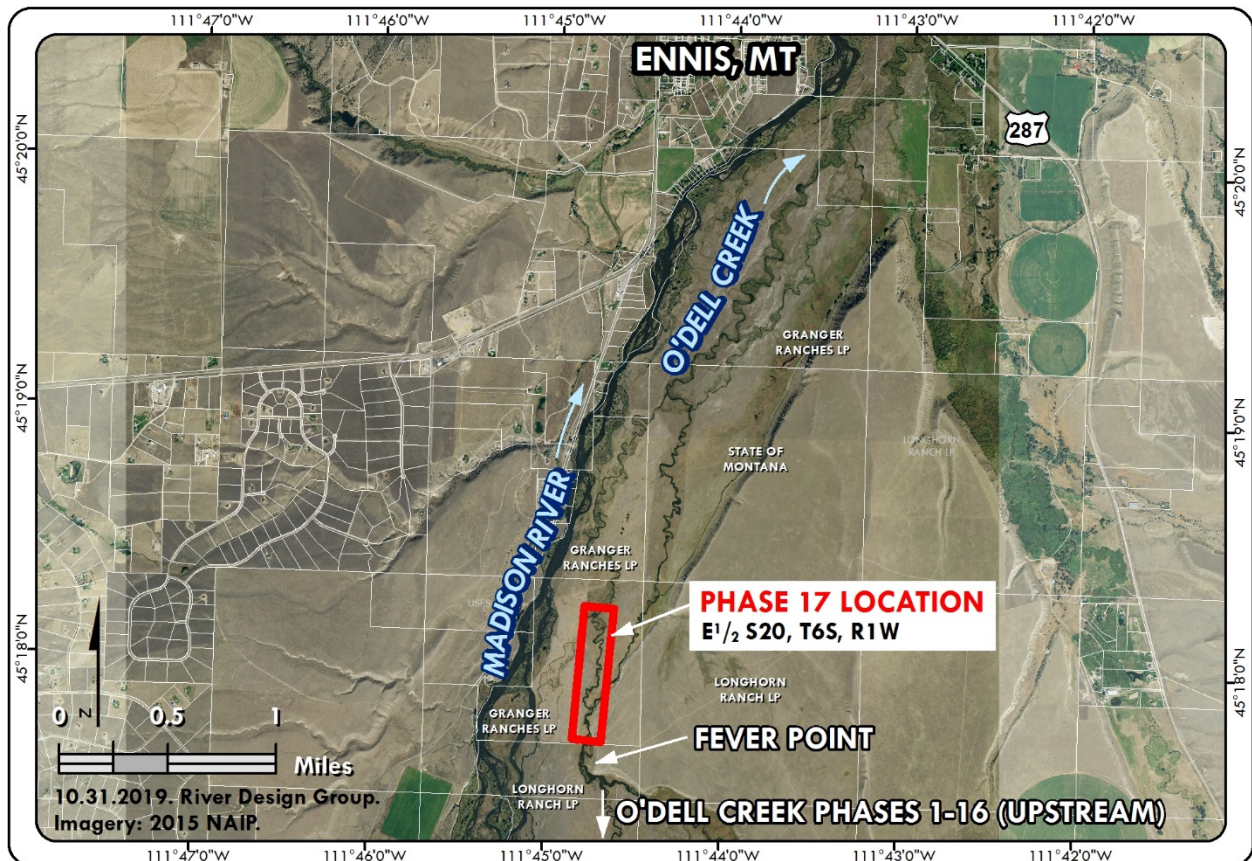


Figure 1. O'Dell Creek project vicinity map and location of the Phase 17 project area.

In 2018, the NorthWestern WildTAC funded a master plan to prioritize restoration opportunities on O'Dell Creek from Fever Point (end of Phase 16 project) to Highway 287 near Ennis, Montana (see Figure 1). River Design Group in close coordination with NorthWestern Energy and private landowners are in the process of finalizing the master plan. This proposal is for the first phase of restoration identified through this master planning effort and includes a 0.7 mile reach of O'Dell Creek north of the prominent Fever Point.

The purpose of this project is to improve aquatic habitat conditions of O'Dell Creek and associated riparian and wetland functions. This will be accomplished by restoring the proper channel and floodplain dimensions and re-establishing complex aquatic habitat features including riffles, runs, pools and glides. New floodplain surfaces supporting emergent and scrub-shrub wetland communities will be created in over-widened channel areas. The channel will be re-shaped to the appropriate geomorphic conditions given the valley setting and potential stream type. Specifically, goals of this project include: 1) improving aquatic habitat conditions by establishing riffle and pool sequences and reducing channel width-to-depth ratios; 2) creating a complex matrix of variable depth wetlands in over-widened channel sections; 3) isolating wetlands from the channel to lower stream temperature; and 4) converting areas within the existing upland herbaceous plant communities to wetlands by creating new, lower surfaces adjacent to O'Dell Creek.

II. OBJECTIVES

The following objectives have been developed for the Phase 17 project area in conjunction with the project partners and landowners:

1. Produce clean water consistent with supporting aquatic life and beneficial uses in the O'Dell Creek watershed and downstream receiving waterbody, the Madison River;
2. Create complex aquatic habitat components such as depth, velocity, substrate, cover, and pools that support populations of wild trout and other aquatic organisms;
3. Construct a stream channel that is connected to and interacts with the floodplain in terms of hyporheic flow and nutrient and sediment exchange; and
4. Create a more complex matrix of wetlands in over-widened channel sections by creating backwater areas, open water wetlands, and new floodplain surfaces that support emergent and scrub-shrub wetland communities.

III. METHODS

RDG will prepare preliminary and final design plansets in coordination with NorthWestern Energy and Granger Ranches. Regulatory permits will be prepared and coordinated with the US Army Corps of Engineers, Montana Department of Environmental Quality, and Madison Conservation District. Supplemental information needed includes a wetland delineation report with mapping exhibits illustrating existing and proposed (both temporary and permanent) wetland impacts.

Given the sensitive resource conditions, construction specifications will require the use of low-pressure ground equipment including a 14 cubic yard articulated truck with flotation tires, tracked excavators, an All Surface Vehicle, 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. RDG will oversee construction and ensure compliance with permits and all drawings and specifications. Construction will be performed by TNT Excavating, Inc.

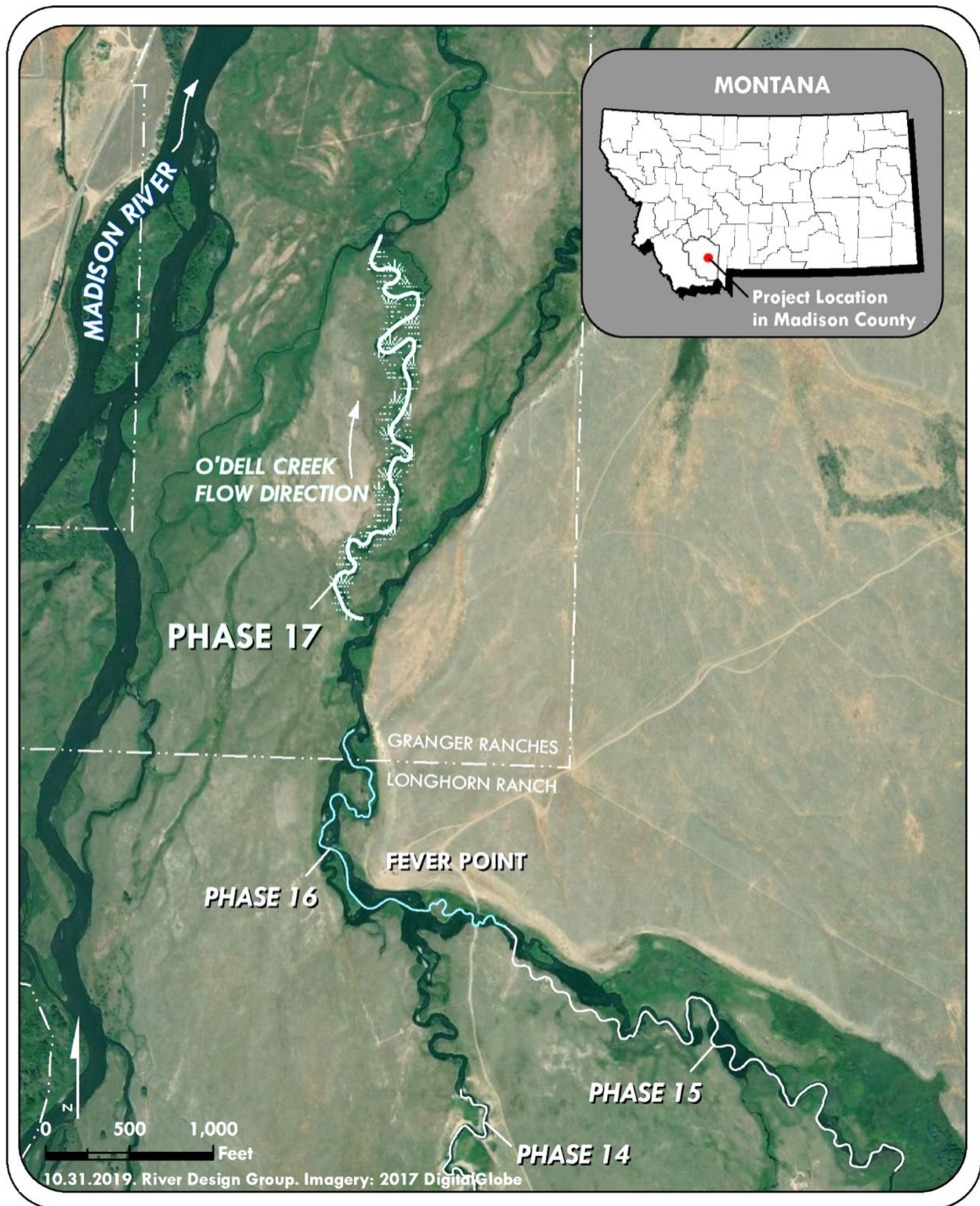


Figure 2. Phase 17 project area map, and proximity to Phases 14, 15, and 16, and Madison River.



Figure 3. Impaired (left) and reference reach (right) conditions in the project area. The project design will lower channel width-to-depth ratios, reduce bank heights by establishing an inset floodplain surface characterized by wetland vegetation, and increase the distribution and quality of aquatic habitat features including riffles, runs, pools and glides.

IV. SCHEDULE

The following project schedule has been developed. Following contract award, RDG and project partners will complete project design and regulatory permitting. A cultural resources investigation will be coordinated by NorthWestern Energy and RDG. Table 1 includes a proposed project schedule.

Table 1. Project schedule for the Phase 17 Restoration Project (2020).

Task	January	February	March	April	May	June
Task 1. Project Management						
Task 2. Engineering and Regulatory Permitting						
Task 3. Construction Implementation						
Task 4. Direct Costs						

V. PERSONNEL

Similar to past phases of restoration on O’Dell Creek, the project will be designed and implemented under the auspices of a diverse group of stakeholders including NorthWestern Energy, the US Fish and Wildlife Service, Madison River Foundation, and Granger Ranches, LP. As a team, we have established a track record of successful collaboration on 13 projects on O’Dell Creek. Our continued collaboration and history working on this project 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. RDG has prepared and implemented all previous phases of restoration on O’Dell Creek with the exception of Phases 1 and 2. John Muhlfeld will serve as the project manager and technical lead on behalf of the design team. Nate Wyatt, P.E., with RDG, will serve as the project engineer. To comply with NorthWestern Energy’s Cultural Resource Management Plan, a cultural resources investigation will be conducted prior to ground-disturbing activities.

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 \$161,340. As noted, project partners have secured \$15,000 from the US Fish and Wildlife Service, \$65,000 in cash match from the Madison River Foundation (i.e. Granger Ranches, LP), and \$66,340 from the Madison River WildTAC, accounting for 91% of the total project cost. This proposal is requesting TAC funds in the amount of \$15,000 (9%).

Table 2. O'Dell Creek Phase 17 Cost Estimate.	
Task	Cost
1. Project Management	\$ 1,500.00
Coordination with NWE, Owners, FWS, Stakeholders	\$ 1,500.00
2. Engineering, Permitting and Construction Management	\$ 31,250.00
Design, Engineering and Pre Construction Services	\$ 12,500
Regulatory Permitting (Joint Permit Application)	\$ 2,250
Routine Wetland Delineation and Permit Support Document	\$ 4,000
Construction Management	\$ 12,500
3. Construction	\$ 126,000
Excavator Class 320 with GPS	\$ 31,000
Excavator Class 320 with GPS	\$ 31,000
14 CY Articulated Off Road Truck with Flotation Tires	\$ 33,500
All Surface Vehicle	\$ 11,400
Mobilization and Demobilization	\$ 11,000
Per Diem and Lodging for Contractor (3 Person Crew)	\$ 6,000
Construction Mats	\$ 2,100
4. Direct Costs	\$ 2,590
Mileage	\$ 1,350
Per Diem	\$ 400
Lodging	\$ 840
Estimated Project Cost	\$ 161,340
<i>*Cash Match (US Fish and Wildlife Service)</i>	<i>\$ 15,000</i>
<i>*Cash Match (Granger Ranches and Madison River Foundation)</i>	<i>\$ 65,000</i>
<i>*Cash Match (Madison River WildTAC)</i>	<i>\$ 66,340</i>
Total FishTAC Funds Requested	\$ 15,000

* Cultural Resources Investigation for Phase 17 will be completed by NorthWestern Energy, Inc.

VII. DELIVERABLES

Project deliverables will include the following:

- Preliminary and final design plan sets;
- Wetland delineation report including GIS mapping exhibits and field forms;
- Joint Permit Application;
- Construction implementation - approximately 3,700 feet of spring creek; and
- 15-20 acres of improved and/or enhanced wetland functions and values.

VIII. CULTURAL RESOURCES

NorthWestern Energy will coordinate the necessary cultural resources investigations. A pedestrian cultural resources inventory covered a portion of the project in 2017, and no significant resources were encountered or observed.

IX. WATER RIGHTS

Appropriate analysis will be performed to demonstrate that the project complies 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.

This Phase 17 project intends to restore wetland habitat by enhancing existing wetlands through grading and revegetation. The restored wetlands will have identical hydrologic and vegetative characteristics to existing wetlands in the immediate area. Riverine wetland habitat will be converted to shallow open water and emergent wetlands by narrowing of the current over-widened stream channel. Wetlands will be located within the floodplain and will be very similar in size and habitat characteristics to pre-settlement open water wetlands in the area. The small open water wetlands will not involve the construction of any berms, dams, or dikes; will not involve any diversion of water; will partially offset the loss of riverine wetland habitat; and will not increase water consumption.

2019 Cost-Share 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: Storey Ditch Riparian Restoration Project

Date: November 1, 2019

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

This project addresses Priority 1 Project 2188 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).

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

The Storey Ditch Riparian Restoration Project aims to restore riparian habitat on the main stem of the Madison River to fulfill Priority 1.

Project Sponsor (submitted by): Quincey Johnson, Madison River Foundation

Location of Proposed Project: Storey Ditch Boat Launch of the Madison River within BLM Reach 635

Geocode (in decimal degrees ex 46.89743) Lat; 45.120758 **Lon:** -111.669898

Total Project Cost: \$109,126.62

TAC Funds (Cost-Share) Requested for Project: \$20,000.00

Anticipated funding from the Bureau of Land Management- NEPA compliance Dillon Field Office Aquatic and Riparian Habitat Enhancement Programmatic EA; DOI-BLM-MT-B0520-2018-0013-EA.

Anticipated contributions from BLM = \$37,548.62

Anticipated contributions from MRF = \$24,078.00

MRF Fundraising/Grants = \$27,500.00

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

The Storey Ditch Riparian Restoration project is the second project to be completed from the Madison River Riparian Restoration Master Plan, a document outlining restoration planning framework to restore and protect riparian, wetland, and aquatic habitats on the Madison River. The project area, located on the east bank of the Madison River upstream of the Storey Ditch Boat launch on BLM land, contains a stand of riparian vegetation including mature sandbar willow and pockets of cottonwood on the downstream end of the floodplain bench, but on the upstream end of the floodplain willows are decadent and the riparian vegetation community is shrinking in size. Further upstream, the streambank has little to no woody riparian vegetation, with the exception of small pockets present on low topographic features that are hydrologically connected to the Madison River. As a result of the altered flow regime due

to Hebgen Dam, the majority of riverbanks in this reach do not receive the overbank flows and scour/deposition necessary to support natural colonization by woody riparian vegetation. The glacial geology results in naturally high terraces and large substrate that are not mobilized by most flows under the current dam-controlled flow regime, limiting locations and processes that can support woody riparian vegetation. The Storey Ditch Riparian Restoration Project will involve bank treatments and wildlife exclosure fencing to enhance the woody riparian vegetation along the streambanks of the Madison River.

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

Restoration goals within the project area include: increase riparian corridor width and woody vegetation cover, create floodplain surfaces that can support natural recruitment of woody vegetation within the constraints of the altered flow regime, increase aquatic habitat complexity and provide more shade and cover for fish, increase primary production and food web support, and increase biodiversity and habitat complexity to support long-term ecosystem resilience.

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

1. **Wildlife Fence** — A wildlife fence will be installed to protect approximately ½ acre of riparian woody vegetation in the floodplain where browse has limited establishment of young willows. Wildlife fence will be an 8' tall graduated wire fence with untreated wood posts and a gate for maintenance and monitoring (Figure 1 and 2). The fence unit will be evaluated annually for maintenance and monitoring data will be collected to evaluate effectiveness. An annual monitoring report will be developed to document findings. The fence will be removed when vegetation has reached a height and maturity to be browse resistant.
2. **Bank Treatment** — Streambank treatments will be constructed along three sections of the Madison River where hydrologic connectivity is limited due to high banks and riparian woody vegetation is absent (Figure 3). The bank treatment will effectively reshape the bank so it is at bankfull height rather than terrace height to allow for hydrologically connected floodplain surfaces to develop. This will expand the riparian bench to allow for natural recruitment and development of mature riparian vegetation as more of the bank is accessed by seasonal high flows. This treatment works with the altered flow regime on the Madison River to create locations where natural processes can work to increase self-sustaining riparian vegetation. Bank treatments will consist of a combination of active and passive restoration treatment including: bank shaping brush matrices, and containerized planting. A different combination of these treatments will be applied at each location to better understand the effectiveness of the different treatments within the Madison River System.
 - a. **Bank Shaping** — To shape the bank, an excavator or dozer will move existing material from the crest of banks down toward the bank toe, or bottom (Figure 4). This will be done by starting approximately 8-10 feet back from the edge of the glacial terrace and shaving off material at a 10:1 slope to lower the scarp and create a lower bench. The material in the 'cut' substrate will consist of natural cobble or boulder material that will function to provide toe protection for the bank. The riparian bench created by moving the 'cut' substrate should extend approximately 15-20 feet from the bankfull water surface elevation into the floodplain, resulting in the bank extending 6 to 8 feet into the river relative to its current location. The bank will be shaped so as not to create an abrupt change in the bank line. This will create a floodplain surface that is hydrologically connected during high flows and will support natural recruitment and development of riparian vegetation.
 - b. **Brush Matrix** — At select locations, the bank treatment will include a brush matrix near the toe of the bank. The brush matrix will incorporate live willows and brush into the alluvium at a bankfull elevation to create a rough boundary dissipating flow energy and providing aquatic habitat and overhanging cover (Figure 5). This material would be installed in layers as the 'cut' material is moved toward the channel with the brush and willows being applied in bundles or groupings. The number of layers will depend on final elevations of the riparian bench relative to bankfull elevation. Brush and willows would extend into the channel with the stems buried and in contact with the river's baseflow elevation.
 - c. **Containerized Planting** — At select locations, containerized nursery plants will be installed as part of active restoration. Plants will be installed on the expanded riparian bench in the floodplain above base flow elevation. Due to high levels of wildlife browse, each plant will receive an individual browse protector cage (Figure 6).

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

On-the-ground project work will begin in spring 2020 and will end late summer/early fall 2020.

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

The Madison River Foundation in conjunction with Geum Environmental Consulting will coordinate the project.

VI. Project budget must include amounts for the following:

Direct Labor — \$34,925.00

Travel and Living — \$8,000.00

Materials — \$2,623.62

Other Direct Expenses — \$49,500.00

Direct Overhead — N/A

All cost-share sources and amounts, including estimation of “in-kind” contributions — \$14,078.00

VII. Deliverables; describe work product (reports, habitat restoration, etc.) which will result from this Project. How will “success” for this project be monitored or demonstrated?

The bank treatments will be monitored prior to implementation and annually after construction to evaluate percent cover of woody riparian vegetation, density of natural recruitment, species diversity, and structure integrity. Information gathered from monitoring these bank treatments will be used to understand the effectiveness of the treatment to expand woody riparian vegetation along the banks of the Madison River and an annual monitoring report will be developed.

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:

The cultural resources management application and site review by BLM archaeologist will take place in late winter 2019/early spring 2020.

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:

The following permits will be submitted to comply with Montana water rights laws, policies, and guidelines:

- SPA 124 Permit, submitted to Montana Fish, Wildlife and Parks
- Section 404 Permit, submitted to Army Corps of Engineers
- 318 Authorization and 401 Certification
- Floodplain Permit, submitted to County Floodplain Administer

BLM Programmatic EA will cover all NEPA compliance.



Figure 1. Example of a wildlife exclosure fence installed at restoration site near Lincoln, Montana.

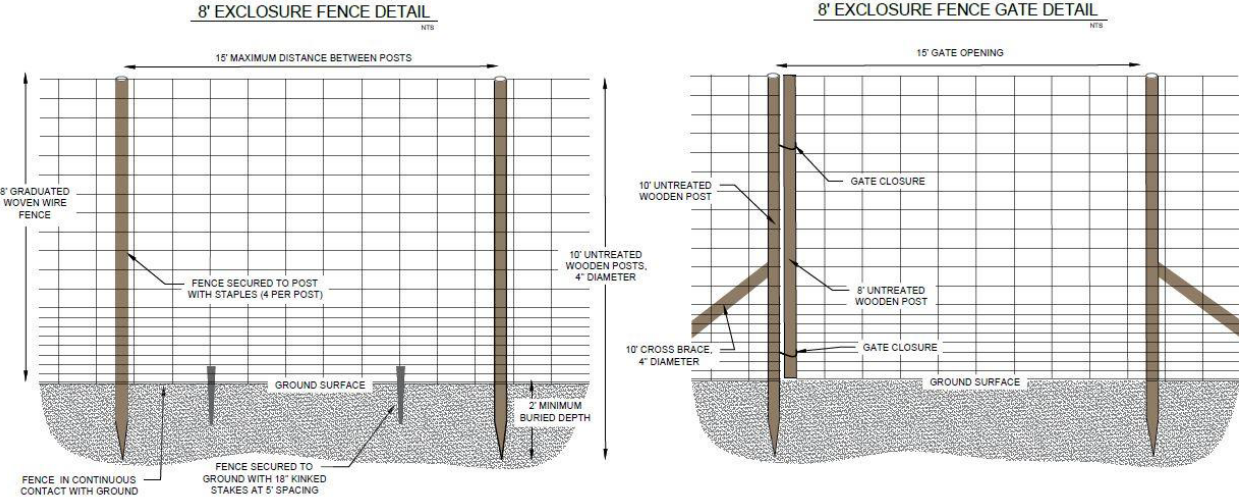


Figure 2. Wildlife exclosure fence detail drawings to support implementation.

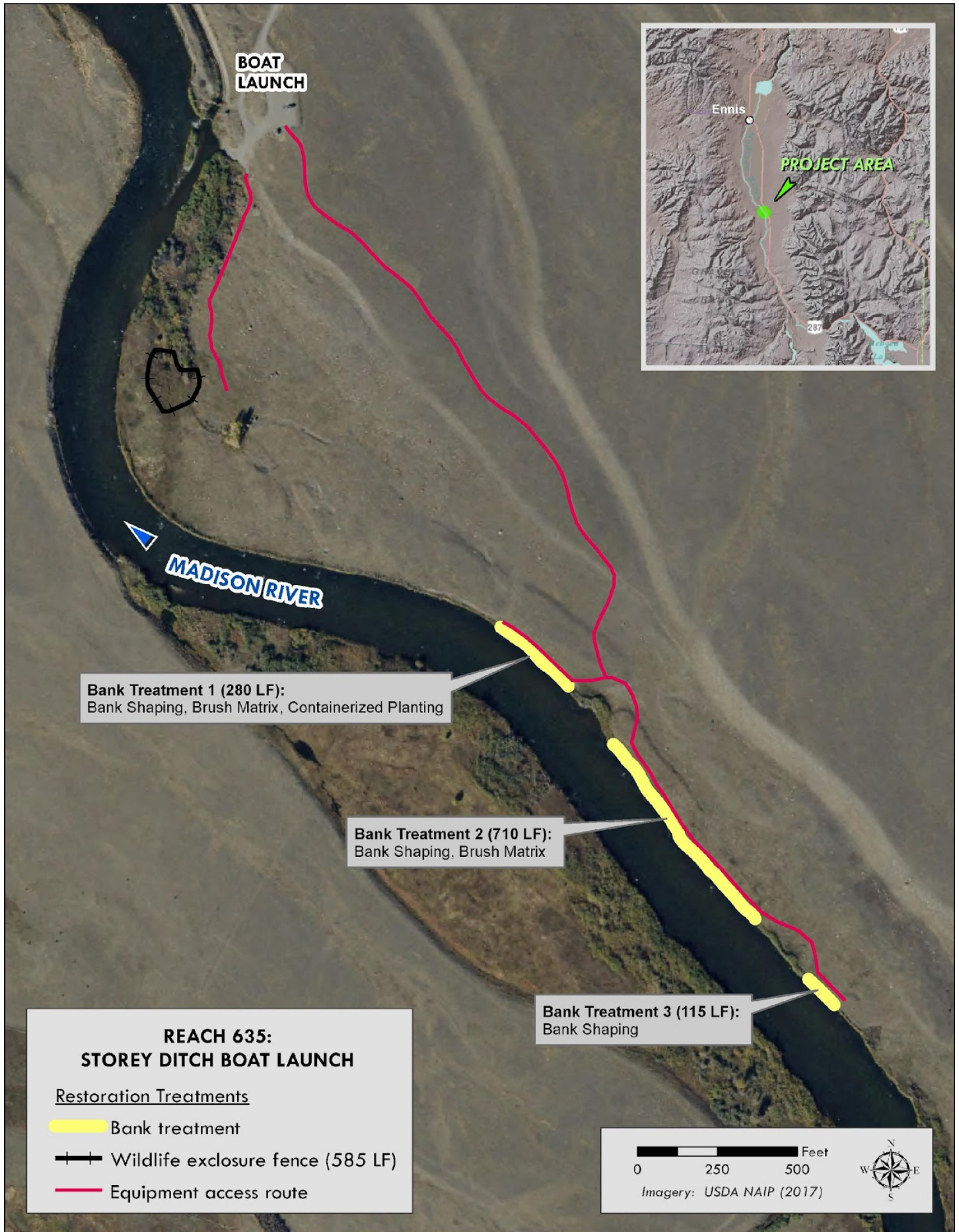


Figure 3. Overview of restoration treatments within the Project Area.

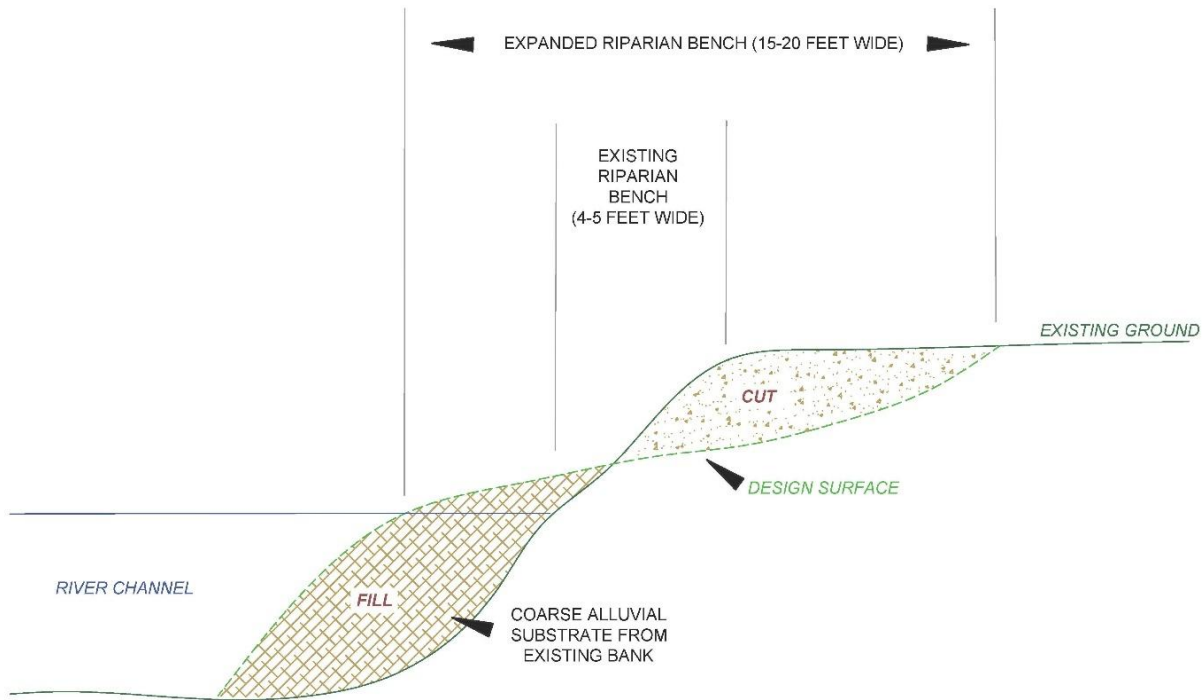


Figure 4. Cross section of river bank displaying movement of material from the crest of bank (cut) to the toe of bank (fill) to create an expanded riparian bench with the bank shaping.

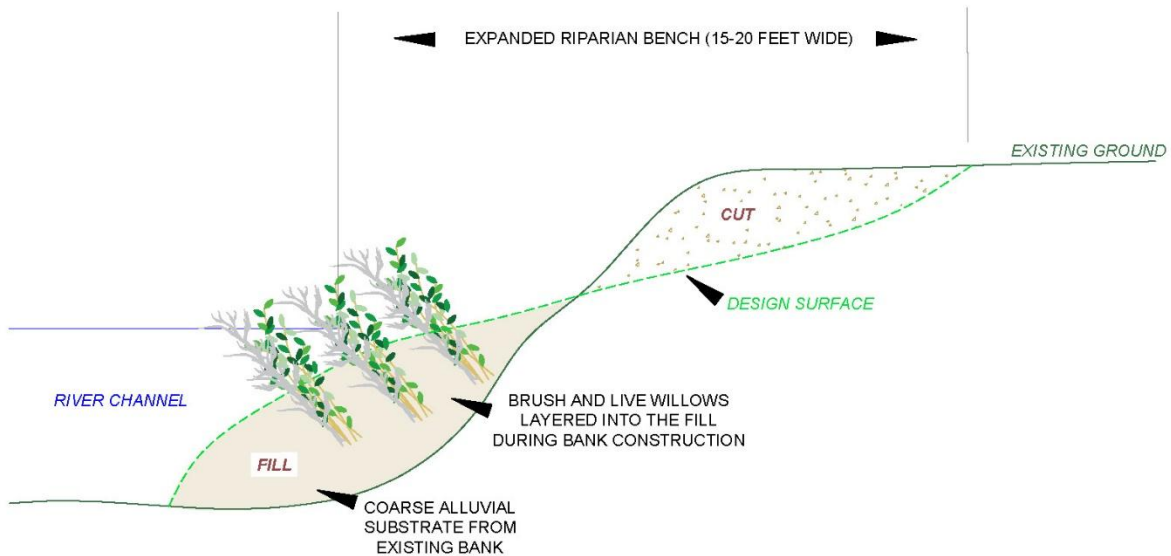


Figure 5. Cross section of river bank displaying installation of brush and willow cuttings to create a brush matrix near the toe of the bank treatment.

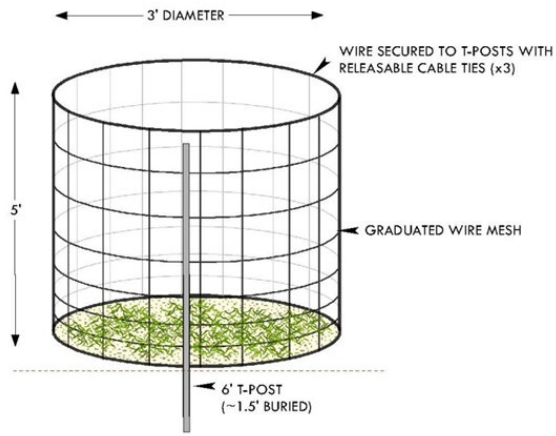


Figure 6. Diagram of individual browse protector cage and an example of installed cages.