

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

**Project Title:** Monitoring Bird Populations and Habitat Conditions in Riparian Areas on the Madison and Missouri Rivers

**Date:** November 4, 2020

### **Applicability to Project 2188 License Article(s):**

This project implements a vegetation and wildlife monitoring plan for the Madison and Missouri as required under Project 2188 License Article 423. This monitoring plan is specifically referenced in the Five Year (2018-2022) Project 2188 Wildlife Plan, and meets the purpose and intent of Article 423 by measuring bird community change over time as an indicator species for other wildlife, measuring changes in riparian habitat conditions, identifying important habitat areas for wildlife, providing feedback on techniques employed to enhance native plants and wildlife populations, and actively monitoring vegetation and wildlife response at restoration sites funded through the Missouri-Madison Wildlife Technical Advisory Committee (Wildlife TAC).

### **Priority Classification:**

Proposed monitoring located within the 2188 license area on the main stem of the Madison and Missouri Rivers meets the criteria for a **Priority 1** 2188 license project. Monitoring in the Beaver Creek Restoration Project area, a primary tributary that enters the Missouri River between Hauser Dam and Upper Holter Lake, classifies as a **Priority 2** 2188 license project.

**Project Sponsor (submitted by):** University of Montana

### **Location of Proposed Project:**

Madison and Missouri River main stem monitoring is located in floodplain habitat on public and private lands from Hebgen Reservoir to Fort Peck Reservoir. Beaver Creek Restoration Project monitoring is located 0.6 miles upstream from the confluence of Beaver Creek and the Missouri River on approximately 1.8 miles of planned stream channel restoration in the Helena National Forest, 14 miles northeast of Helena, MT.

**Geocode:** Lat: 46.797

Lon:-111.877

**Total Project Cost:** \$67,692

**TAC Funds (Cost-Share) Requested for Project:** \$38,521

## **I. Introduction**

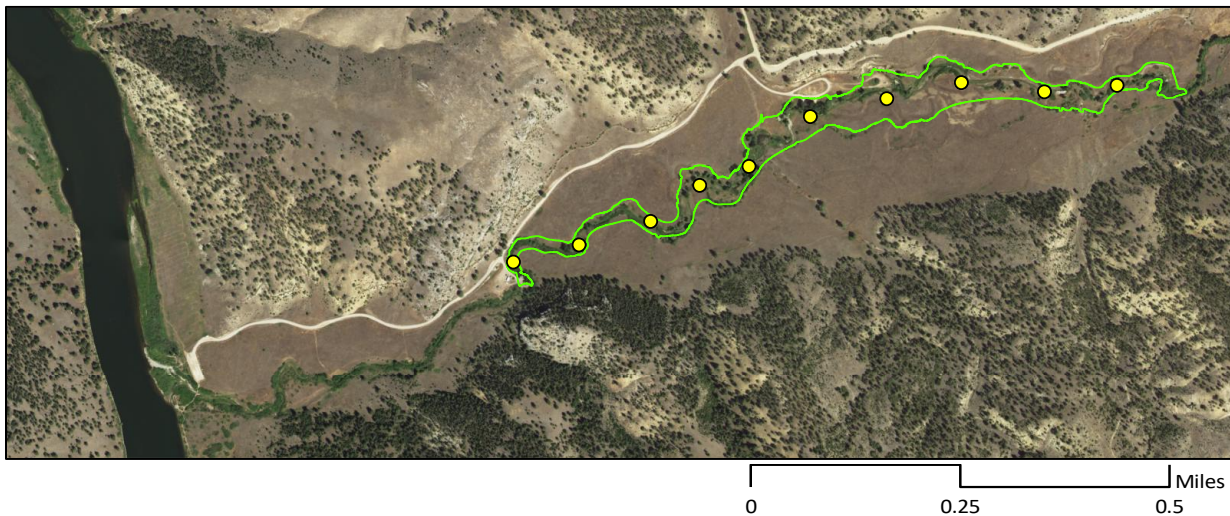
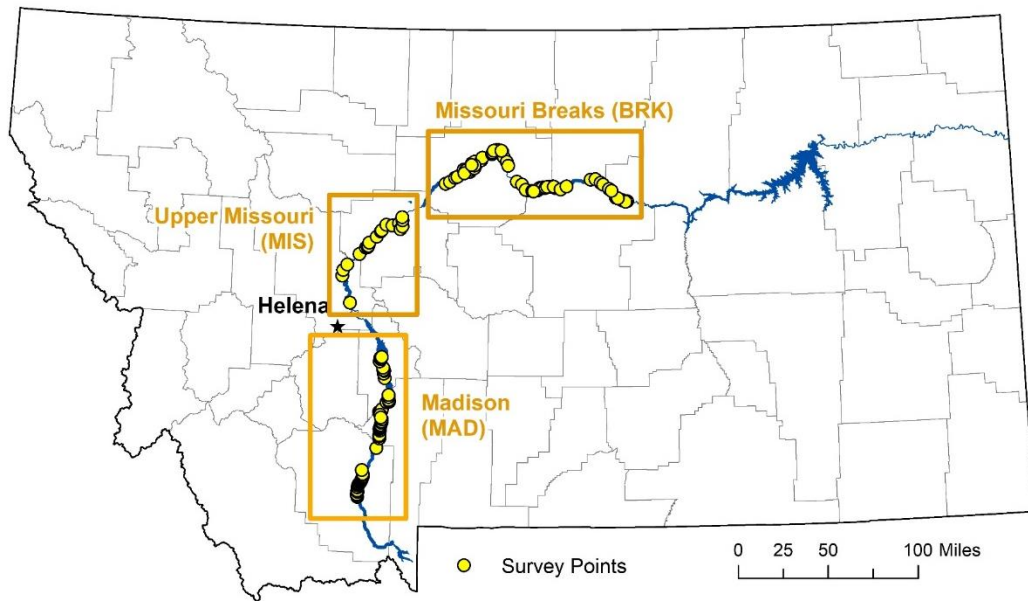
Since 2004, the University of Montana (UM), with funding from Northwestern Energy and the Bureau of Land Management (BLM), has monitored bird populations and riparian vegetation conditions on over 500 miles of the Madison and Missouri Rivers. Birds are ideal indicators of natural resource conditions because they have diverse habitat requirements, are relatively abundant within a small area, are easily surveyed, and provide feedback from an entire community rather than a single species<sup>1,2</sup>. In addition, birds are a priority for monitoring in riparian areas, because riparian and wetland habitats support a large number of bird species during breeding, dispersal, and migration, including at least 134 (55%) of Montana's 245 bird species and 30 of the 66 Montana Species of Concern. As the largest river system in the state, the Madison and Missouri rivers are critical to the future of Montana's bird populations.

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<sup>1</sup> Carigan, V., and M.A. Villard. 2002. Selecting indicator species to monitor ecological integrity: a review. *Environmental Monitoring and Assessment* 78:45–61.

<sup>2</sup> Hutto, R.L. 1998. Using landbirds as an indicator species group. Pp. 75-92 in Marzluff, J.M. and R. Sallabanks (eds.), *Avian conservation: research and management*. Island Press, Covelo, CA.

In 2021, we propose to continue monitoring bird populations and vegetation conditions within the license area and conduct the second year of monitoring within the Wildlife TAC-funded Beaver Creek project area (Fig. 1). We also propose to continue partner-supported monitoring within the Upper Missouri River Breaks area designed to address the information needs of the BLM and other members of the Missouri Breaks Riparian Group, a public and private partnership aimed at restoring cottonwood forest and improving wildlife habitat along the Upper Missouri River. Monitoring should target priority species for conservation, such as the Black-billed and Yellow-billed Cuckoo. We will continue to work with agencies (including BLM, Montana Fish, Wildlife, & Parks, Montana Natural Heritage Program, and U.S. Forest Service) to capitalize on opportunities to fill data gaps on rare and priority bird species, while completing long-term monitoring objectives.



**Figure 1. Bird and habitat monitoring locations (yellow points) within the license area stratified by Madison River, Upper Missouri River, and Missouri Breaks section (top), and within the Beaver Creek project area (bottom).**

To date we have recorded 32,091 individual birds and 159 species, including seven BLM Sensitive species, 25 Montana Species of Concern, and 29 U.S. Fish and Wildlife Birds of Management Concern. Data gathered from 2004-2019 show measurable declines for many riparian obligate and dependent bird species, with increasing trends restricted to a few common species. Habitat conditions have also changed significantly within the license area since 2004, including aging cottonwood forests, limited recruitment of young cottonwood, and declining shrub cover.

This proposal merits a high priority for funding because it builds on 16 years of monitoring investment by Northwestern Energy and partners that spans hundreds of miles of public and private lands, including the Upper Missouri Breaks National Monument, and contributes scientifically robust measures of wildlife response to habitat enhancement and protection projects supported by the Wildlife TAC as required by 2188 license 423 and described in the updated 2188 Five Year Wildlife Plan. Continued monitoring will capitalize on this long-term dataset, providing a valuable tool for managers to evaluate the status and trends of migratory bird species and habitat conditions by administrative boundary and relative to specific management priorities along the river system, providing critical feedback on best practices for land managers working to restore wildlife habitats along Montana's large rivers.

## II. Objectives

1. Monitor and evaluate status and trends in bird community and habitat conditions within main stem riparian habitats and habitat enhancement projects on the Madison and Missouri Rivers in Montana.
  - a. Conduct multi-species monitoring of the bird community, including targeted monitoring for priority bird species;
  - b. Measure vegetation composition and structure to evaluate habitat conditions;
  - c. Analyze annual changes in bird community and habitat conditions.

## III. Methods

The methods used for field sampling and analyses are described briefly below. Refer to our 2005 report<sup>3</sup> summarizing monitoring protocols for more detailed information.

*Sampling Design.* We will re-visit 239 long-term monitoring points established in randomly selected riparian habitat patches that extend from Varney Bridge, just south of Ennis, on the Madison River to Fred Robinson Bridge on the Missouri (Figure 1). We will also survey sample points established in the Beaver Creek Restoration Project.

*Habitat Measures.* At each sampling location, we will measure vegetation composition and structure, including the total number of trees (by species and size class), shrub cover (by species), canopy cover, tree and shrub height, ground cover, invasive and noxious weed species cover, and grazing intensity.

*Bird Surveys.* We will conduct point count surveys of breeding land birds following standard point count procedures. Observers will record all birds seen or heard during a 10-minute period, and distances to birds will be measured using a rangefinder. We will also assist and conduct targeted surveys for priority bird species based on input from agencies and partners, including Montana Fish, Wildlife, and Parks, and Montana Natural Heritage.

*Data Analyses.* Bird species densities (birds/ha) will be estimated using the program DISTANCE, with distance sampling analyses following Buckland et al<sup>4</sup>. The estimated density, population size, and variance for each bird species will be

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<sup>3</sup> Fletcher, R., T. Smucker, and R. Hutto. 2005. Distribution of birds in relation to vegetation structure and land use along the Missouri and Madison River corridors. Final report submitted to PPL-Montana.

<sup>4</sup> Buckland, S.T., D.R. Anerson, K.P. Burnham, J.L. Laake, D.L. Borchers, and L. Thomas. 2001. Advanced Distance Sampling. Oxford University Press, New York. 416 pp.

computed at three scales: site, river section, and across the study area. In 2013, we partially automated these analyses by developing code using Program R, which streamlined population estimates, and thereby reduced costs associated with providing population estimates for large numbers of species. To assess the presence, magnitude, and direction of trends in vegetation and populations over time, we will use a linear mixed-effects model (LMEM) to assess whether trends varied temporally as well as spatially among river sections.

We will evaluate wildlife outcomes of restoration project areas by comparing baseline data collected prior to project start to changes over time using a Before-After-Control-Impact (BACI) study design<sup>5</sup>. BACI sampling designs are particularly useful tools for evaluating bird assemblage responses to riparian restoration because they address the problem of high natural variability and year-to-year changes in river systems by effectively separating the absolute year-to-year change from treatment effects. Given the annual variability in these systems, at least at least 3 years of field data is necessary to adequately sample baseline conditions in riparian habitats.

#### IV. Schedule

This project will begin 1 May 2021 and will run until 30 April 2022 (see table below).

<b>2021</b>	
May	Field planning, coordination with local partners and private landowners, hire and train field technicians
June-Aug	Collect field data on birds and vegetation
Sep-Oct	Data entry and data management
Nov-Dec	Summarize field effort and present to TAC
<b>2022</b>	
Jan-Feb	Complete data analyses
April	Submit final report to Wild TAC

#### V. Personnel

Erick Greene (Faculty, University of Montana Wildlife Program) and Anna Noson (Program Director, University of Montana Bird Ecology Lab) will serve as co-Principal Investigators of the project. Erick Greene will administer the project within UM. Anna Noson will supervise field data collection, conduct analyses, and complete reporting and dissemination of findings. Dr. Aaron Flesch (University of Arizona) will be contracted to complete population trends analysis. We will hire two temporary technicians from May-August 2021 to complete field data collection and data entry. The Division of Biological Sciences will provide facilities and equipment at the University of Montana.

<sup>5</sup> Schwarz C.J. 1998. Studies of Uncontrolled Events. In: Statistical Methods for Adaptive Management Studies. Res. Br, B.C. Min. For., Res. Br., Victoria, BC, Land Manage. Handb. No 42.

## VI. Project budget

	<b>TAC Funds Requested</b>	<b>Total Project Cost</b>
Direct Labor	\$24,055	\$40,873
Travel and Living	\$1,200	\$8,600
Materials and supplies	\$200	\$700
Other Direct Expenses:		
Population Analysis	\$8,042	\$8,042
Direct Overhead	\$5,024 (15%)	\$9,473
<b>Total</b>	<b>\$38,521</b>	<b>\$67,692</b>

### Cost-share funding sources and amounts for this project:

\$29,171 requested from USDA Bureau of Land Management (5-year agreement in place through 2021).

## VII. Deliverables

Monitoring results will be summarized in a Final Report that will include:

1. Breeding bird population status and trends for riparian areas within the main stem Madison and Missouri Rivers;
2. Riparian vegetation condition status and trends for riparian areas within the main stem Madison and Missouri Rivers;
3. Distribution and critical habitat information for priority riparian bird species;
4. Bird population and habitat condition status within identified restoration project areas.

## VIII. Cultural Resources.

N/A- no land-disturbing activity or building modification will occur as a result of this project.

## IX. Water Rights.

N/A- no development, restoration, or enhancement of wetlands will occur as a result of this project.