

2025 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 13, 2024

Applicability to Project 2188 License Article(s):

This project meets Project 2188 License Article 423 requirements by continuing long-term monitoring of bird communities and vegetation in riparian habitats of the Missouri and Madison Rivers, and is specifically referenced in the most recent Five Year Project 2188 Wildlife Plan under article 423. The project meets the purpose and intent of Article 423 by measuring bird community change over time as an indicator of riparian conditions for wildlife, identifying habitat and environmental factors critical for maintaining bird populations, providing feedback on techniques employed to enhance native plants and wildlife populations, and monitoring wildlife response at enhancement project sites funded by the Missouri-Madison Wildlife Technical Advisory Committee (WildTAC).

Priority Classification:

This project meets the criteria for a Priority 1 2188 license project because monitoring is located within riparian habitats of the main stem of the Missouri and Madison River and floodplain wetland complexes, as well as Priority 2 because locations also include habitat enhancement and protection project areas within 1 mile of the main stem at Giant Springs State Park and Beaver Creek, a primary tributary of the Missouri River.

Project Sponsor (submitted by): University of Montana

Location of Proposed Project:

Madison and Missouri River monitoring will be located at 244 long-term monitoring points and 16 habitat enhancement and protection project areas within riparian habitats on public and private lands from Hebgen Reservoir to Fort Peck Reservoir (Fig.1, Table1).

Geocode: Lat: 45.23691 to 48.03065 Long:-108.63146 to -111.877
(see Table 1 for a list of project locations)

Total Project Cost: \$76,522

TAC Funds (Cost-Share) Requested for Project: \$66,522

I. Introduction

Since 2004, the University of Montana (UM) has monitored bird populations and riparian vegetation on over 500 miles of the Madison and Missouri Rivers on behalf of the Northwestern Energy Missouri-Madison Wildlife Technical Advisory Committee (WildTAC) with cost-share funding from the Bureau of Land Management Montana/Dakotas State Office. This monitoring program was designed to meet the wildlife monitoring requirements of the Project license agreement by measuring bird community change over time as an indicator of riparian conditions for wildlife, identifying habitat and environmental factors critical for maintaining bird populations, providing feedback on techniques employed to enhance native plants and wildlife populations, and monitoring wildlife response at enhancement project sites funded by the WildTAC.

In 2025, we propose to continue monitoring bird populations and vegetation conditions within the license area at 244 established long-term monitoring locations (Fig. 1). Locations for long-term monitoring include private, Montana State, BLM, US Fish and Wildlife Service, US Bureau of Reclamation, US Forest Service (USFS), and local public ownership (Fig. 2). We also propose to continue monitoring WildTAC-funded habitat projects in the Missouri River corridor at Beaver Creek, Giant Springs State Park, Evans Bend, and Wood Bottom, as well as 13 livestock exclosures funded by WildTAC and BLM within the Upper Missouri River Breaks National Monument. (Table 1, Fig. 3). We will continue to capitalize on opportunities to fill data gaps on rare and priority bird species, while completing long-term monitoring objectives. Specifically, we will collect presence data for two Montana Species of Concern: Black-billed and Yellow-billed Cuckoos as part of a collaborative inventory effort with BLM and Montana Fish Wildlife and Parks (MTFWP).

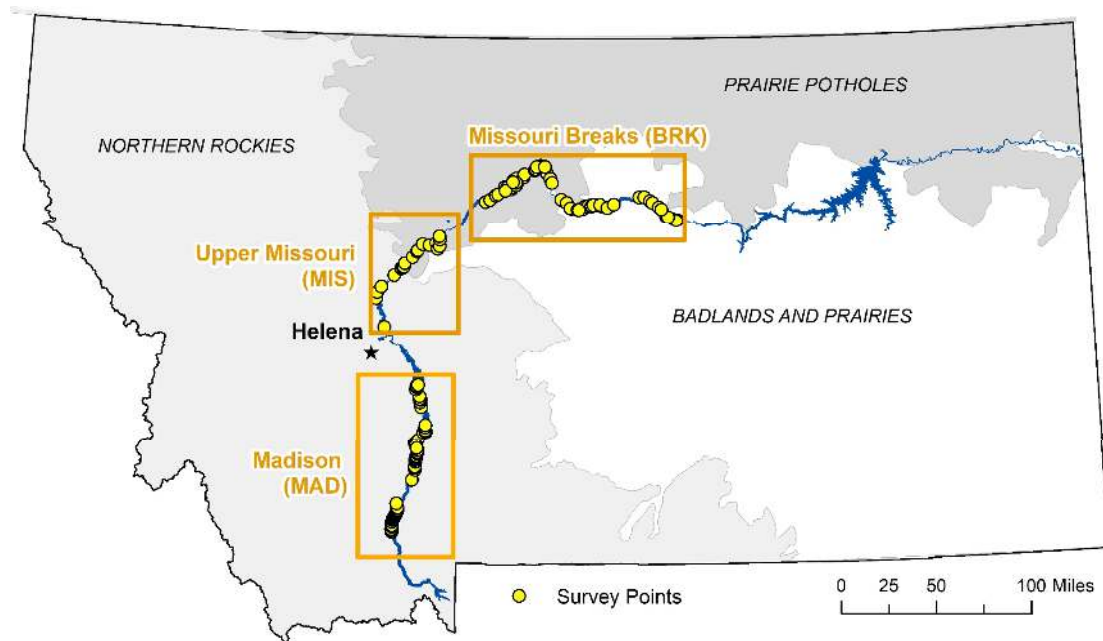


Figure 1. Location of long-term bird monitoring along the Madison and Missouri Rivers across three geographical strata (Madison River, Upper Missouri River, and Missouri River Breaks), relative to ecological regions in Montana.

Birds are ideal indicators of natural resource conditions because they have diverse habitat requirements, are easily surveyed, and provide feedback from an entire community rather than a single species^{1,2}. 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.

The program generates precise estimates of bird populations that are scalable and aggregated by ownership and river section, so managers can determine if management plans and practices are achieving wildlife habitat objectives for riparian habitats in specific management units and regions. Results also include spatially explicit information on the distribution of breeding birds

(including occurrences of sensitive species) across the river system, providing information needed by managers to identify priority locations for targeted on the ground conservation measures. To date we have recorded 41,677 individual birds and 140 species during standardized surveys, including 10 BLM Sensitive species, 25 Montana Species of Concern, and 29 U.S. Fish and Wildlife Birds of Management Concern. Most species observed were associated with riparian or wetland environments, including 33 species that are riparian obligates (>90% of breeding restricted to riparian areas), 16 species that are riparian-dependent (60-90% of breeding restricted to riparian areas), and 20 species associated with open water or wetlands including waterfowl and other water birds. Data gathered from 2004-2023 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 20 years of monitoring investment by Northwestern Energy and partners that spans hundreds of miles of public and private lands and contributes scientifically robust measures of wildlife response to habitat enhancement and protection projects supported by the WildTAC 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.

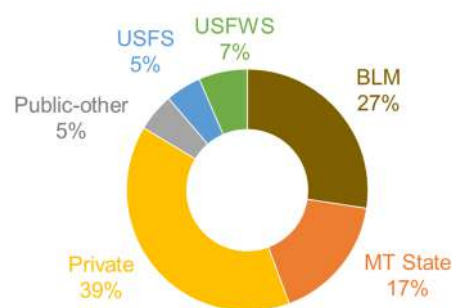


Figure 2. Ownership of long-term monitoring locations sampled for birds and habitat in riparian areas on the Madison and Missouri Rivers.

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

² 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.

Table 1. Location and ownership of habitat enhancement and protection projects proposed for monitoring in the Missouri River corridor.

Project Area Name	Ownership	Lat	Long
Anderson	Private/BLM	48.03065	-110.23188
Beaver Creek	USFS	46.78760	-111.89327
Cow Island	BLM	47.76592	-108.93939
DeMars	BLM	47.70730	-108.82186
Evan's Bend	BLM	47.84620	-110.57995
Hagadone	BLM	47.73437	-109.49371
Iron City	BLM	47.74221	-109.51003
Little Sandy	BLM	48.03045	-110.13908
Monroe	BLM	47.94152	-110.07506
Pablo	BLM	47.76167	-109.88866
Rowe Coulee	Private/BLM	47.90689	-110.45248
Sturgeon	BLM	47.79926	-109.06820
Giant Springs State Park	State	47.53390	-111.22313
Wagonbed	State	47.70758	-109.76571
The Wall	BLM	47.70434	-109.75418
Wood Bottom	Private/BLM/State	47.90334	-110.46169
Woodhawk	BLM	47.75753	-108.92258

II. Objectives

1. Evaluate the status and trends of bird populations and habitat conditions within main-stem riparian habitats of the 2188 license area.
2. Monitor bird community response to habitat enhancement and protection projects funded by Wild TAC, BLM, and other project partners.

III. Methods

The methods used for field sampling and analyses are described briefly below. Refer to the Wildlife TAC 2005 report³ summarizing monitoring protocols for more detailed information.

Bird Surveys-- We will conduct point count surveys of birds during the breeding season (May- July) within 5 hours of sunrise on days with minimal precipitation and wind. 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 conduct targeted surveys for Black-billed and Yellow-billed Cuckoos at locations with suitable habitat in consultation with BLM and MTFWP.

Habitat Measures- At each sampling location, we will measure vegetation composition and structure, including tree density (by species and size class), percent shrub cover (by species), tree and shrub height, invasive and noxious weed species cover, and an ocular estimate of grazing intensity.

³ 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.

Data Analyses-- Bird species densities (birds/ha) will be estimated using the program DISTANCE, with distance sampling analyses following Buckland et al⁴. The estimated density, population size, and variance for each bird species will be computed at three scales: site, river section (Madison, Missouri, Breaks), and across the license 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 and will 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, with long-term monitoring sites serving as untreated controls⁵. 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. To evaluate differences in bird densities, we developed mixed effects models with *p*-values computed based on Satterthwaite's method. To estimate project area differences, we computed pairwise linear contrasts and used Sidak corrections for multiple comparisons to reduce the chance of Type I error.

In addition to evaluating individual species, we will combine estimates into species groups for analyses, including all species combined, riparian-dependent species, riparian-obligate species, separately and generalists. We categorized riparian-dependent as 60-90% of breeding restricted to riparian areas and riparian-obligate as >90% of breeding restricted to riparian areas in western North America (Rich 2002). These classifications are specific to geographic regions in western North America—some species may not be classified as obligates or dependent in other regions. We classified all species not restricted to riparian habitats for breeding as generalists.

IV. Schedule

This project will begin 1 Jan 2025 and will run until 31 Dec 2025 (see table below).

2025	
Jan-April	Hire 2025 field technicians, coordinate with project partners on field season plan
May	Field planning, contact private landowners, 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

V. Personnel

Anna Noson (Research Director, UMBEL) will serve as Principal Investigator of the project. Anna Noson will supervise and assist with field data collection and complete reporting and dissemination of findings. Dr. Aaron Flesch (University of Arizona) will be contracted to complete population trends analyses. We will hire two temporary technicians from May-August to collect field data and enter data. All data will be queried, proofed for

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

⁵ 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.

quality control, and submitted to the Montana Natural Heritage Program by UM staff. The Division of Biological Sciences will provide facilities and equipment at the University of Montana.

VI. Project budget

Proposed Budget	
Direct Labor	\$50,965
Travel and Living	\$10,814
Materials and supplies	\$650
Other Direct Expenses:	
Population Trend Analysis	\$3,880
Direct Overhead	\$10,211
Total Project Cost	\$76,522
BLM cost share funding	-\$10,000
TAC Funds Requested	\$66,522

Cost-share funding sources and amounts for this project:

\$10,000 from USDA Bureau of Land Management (5-year agreement in place through 2027).

VII. Deliverables

Results will be summarized in a Final Report submitted by May 2026 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. Bird population and habitat condition status within identified restoration project areas.
4. Distribution information for priority riparian bird species, including Black-billed and Yellow-billed Cuckoo species

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.