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 6, 2026

Explain how this Project addresses a specific Project 2188 License Article(s): This project meets Project 2188 License Article 423 requirements by continuing long-term monitoring of bird communities in riparian habitats of the Missouri and Madison Rivers as referenced in the 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).

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

Priority 1: Wildlife and vegetation monitoring is located within riparian floodplain habitats of the mainstem of the Missouri and Madison Rivers, as well as **Priority 2:** locations also include habitat enhancement and protection project areas on adjacent lands and major tributaries within 1 mile of the mainstem.

Project Sponsor (submitted by): University of Montana Bird Ecology Lab

Location of Proposed Project:

Monitoring will be located at 289 long-term monitoring points and 6 TAC-funded habitat enhancement and protection project areas on public and private lands within the Madison and Missouri River corridor between Hebgen Reservoir and Fort Peck Reservoir (Fig.1, Table1).

Geographic coordinates in decimal degrees:

Geocode: Lat: 45.23691 to 48.03065 Long:-108.63146 to -111.877

(see Table 1 for a list of all surveyed TAC-funded project locations)

Total Project Cost: $92,676

TAC Funds (Cost-Share) Requested for Project: $56,175

I. Introduction

Since 2004, the University of Montana (UM) has monitored bird populations and riparian vegetation on approximately 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. 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.

This monitoring program generates precise estimates of bird populations that are scalable and aggregated by ownership and river section, so land 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 50,853 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 2004-2025 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.

In 2027, we propose to continue monitoring bird populations and vegetation conditions at 289 established long-term monitoring locations within riparian habitats on the mainstem of the Madison and Missouri River (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 other public ownership. Monitoring includes 6 WildTAC-funded habitat enhancement and protection projects in the Missouri River and Missouri Breaks river sections, including Anderson, Beaver Creek, Evans Bend, Giant Springs, Rowe Coulee, and Woodbottom (Table 1). We will also continue to capitalize on opportunities to fill data gaps on rare and priority bird species, while completing long-term monitoring objectives. Specifically, we will continue to collaborate with BLM and Montana Fish Wildlife and Parks (MTFWP) on a regional inventory effort to collect presence data for two Montana Species of Concern: Black-billed and Yellow-billed Cuckoos.

[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.

This proposal merits a high priority for funding because it builds on over 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.

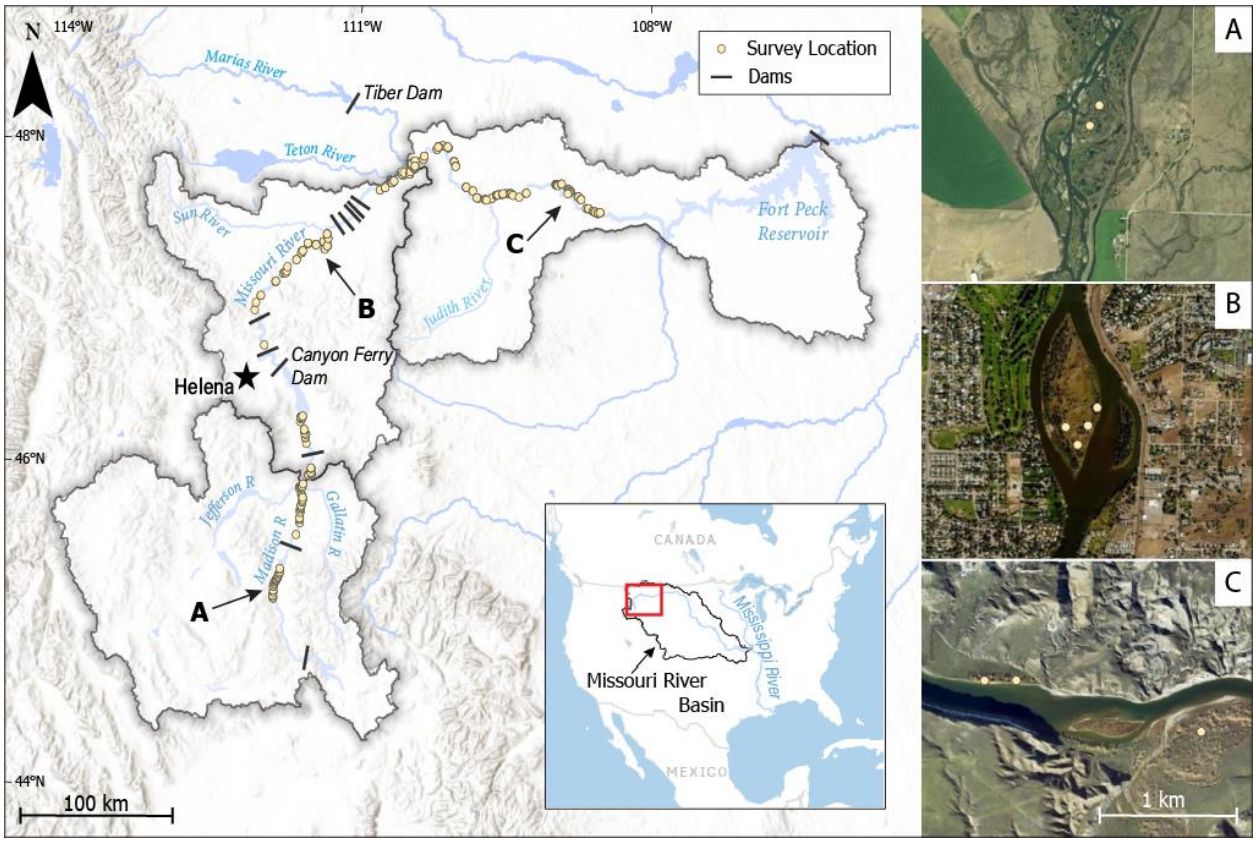


Figure 1. Locations of field monitoring sites across the riparian vegetation in the mainstem floodplain of the upper Missouri River in Montana, along with finer-scale aerial imagery depicting variation in landcover for surveyed sites in the Madison (A), Upper Missouri (B), and Missouri Breaks (C) river sections delineated by watershed boundaries. Inset map shows location of study within the Missouri River Basin.

II. Objectives

This project will fund continuation of long-term monitoring, including project implementation and annual reporting. Specific objectives for 2027 include:

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 report[3] summarizing monitoring protocols for more detailed information.

Monitoring Design

To distribute monitoring effort across the area and account for geographic differences in breeding bird distributions and riparian vegetation, the monitoring area was stratified into three geographical regions based on regional drainage boundaries defined by U.S. Geological Survey hydrologic units (100401, 100301, and 100200), referred to hereafter as Madison, Upper Missouri, and Missouri Breaks, respectively (Figure 1). On free-flowing reaches within the active floodplain of each region, sites were randomly selected from discrete patches of riparian vegetation with a minimum width of 50 m and >500 m apart, allowing inferences about bird species distributions and trends at multiple spatial scales. Bird and vegetation surveys were conducted at survey points spaced 150 m apart within each site. Habitat projects located within the FERC license area (within 1 mile of the river mainstem) were sampled by adding survey points within project boundaries following the same methodology. This design allows direct comparison of birds found in project areas with bird populations at long-term monitoring locations before and after project completion.

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.

Vegetation/Habitat Measures- At each bird survey location, we will measure vegetation composition and structure within 4 circular subplots located at the point center and 25 meters away in three cardinal directions (0°, 120°, and 240°). Measures will include tree counts (by species and size class), percent shrub cover (by species), tree and shrub height, invasive weed species cover, and relative grazing intensity (0=none, 1=minimal, 2=moderate, 3=high).

Data Analyses-- Bird species densities (birds/ha) will be estimated using the program DISTANCE, with distance sampling analyses following Buckland et al[4]. 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. 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 and spatially among river sections. 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, 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.

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[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.

[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.

We will evaluate wildlife outcomes of habitat 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 controls[5]. 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 will develop mixed effects models. To estimate project area differences, we will compute pairwise linear contrasts and use corrections for multiple comparisons to reduce the chance of Type I error.

IV. Schedule

This project will begin 1 Jan 2027 and will run until 31 Dec 2027 (see table below), but is part of long-term monitoring that follows a rotating schedule consisting of breeding bird surveys in different locations throughout the license area, followed by analysis and annual reporting in the following calendar year. For 2027, UMBEL requests funds for survey planning, technician training, data collection, analyses, and reporting on the mainstem of the Madison and Missouri Rivers and habitat projects at Beaver Creek, Giant Springs State Park, and Upper Missouri River Breaks National Monument. Analysis and final reporting of the data collected in 2026 will be completed in 2027, while analysis of data collected in 2027 will be completed in 2028.

2027	**Activities**
Jan-Apr	Planning: confirm survey sites, coordinate with project partners, obtain access permissions, private, hire field technicians
May-Aug	Field implementation: train field technicians, conduct bird and vegetation surveys
Sept-Dec	Data management and interim reporting: QA/QC, WildTAC presentation
2028	**Activities**
Jan-Apr	Synthesis: Data analyses and final report

V. Personnel

Anna Noson (Research Director, UMBEL) will serve as Principal Investigator of the project. Anna Noson will coordinate and supervise field data collection and complete reporting and dissemination of findings. UMBEL staff will assist with hiring, field training, data collection, and data management, and analyses. We will hire three temporary technicians from May-August to collect and enter field data. All data will be queried, proofed for quality control, and submitted to the Montana Natural Heritage Program by UM staff. The University of Montana Division of Biological Sciences will provide administrative staff support.

[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.

VI. Project budget

	Total Project Cost	BLM Cost-share	2027 TAC Funds Requested
Direct Labor	$62,151	$26,516	$35,095
Travel and Living	$11,410	$3,889	$7,521
Materials and supplies	$680	$200	$480
Other Direct Expenses: Population/Trend analyses	$6,900		$6,900
Direct Costs	$79,993	$30,605	$48,848
Indirect Costs (NWE: 15%, BLM: 17.5%)	$12,683	$5,356	$7,327
Total Costs	**$92,676**	**$35,961**	**$56,175**

Cost-share funding sources and amounts for this project:

$35,961 from USDA Bureau of Land Management (5-year agreement in place through 2027).

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 project will provide:

- Annual WildTAC presentation and partner briefing summarizing thej 2027 field effort.
- Final technical report documenting methods, QA/QC, updated bird population status and trends, vegetation status and trends, and management recommendations.
- Georeferenced database of bird species density estimates and vegetation conditions for all monitored sites within the mainstem floodplain of the Madison and Missouri Rivers.
- Communications, including a bird list and monitoring results, will be provided to interested private landowners participating in the project (providing access).

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.

Table 1. Location of proposed bird and vegetation monitoring within TAC-funded habitat project areas.

GPS_ID	LAT	LONG	River Section	Ownership	Habitat Project Area
201_1	47.84622	-110.57995	Missouri Breaks	BLM	Evans Bend
201_2	47.84584	-110.57788	Missouri Breaks	BLM	Evans Bend
201_3	47.84534	-110.57583	Missouri Breaks	BLM	Evans Bend
201_4	47.84493	-110.57380	Missouri Breaks	BLM	Evans Bend
205_1	48.03065	-110.23188	Missouri Breaks	BLM	Anderson
205_2	48.03066	-110.22913	Missouri Breaks	BLM	Anderson
205_3	48.03072	-110.22648	Missouri Breaks	BLM	Anderson
82_1	47.90307	-110.45000	Missouri Breaks	private	Rowe Coulee
82_2	47.90193	-110.45121	Missouri Breaks	private	Rowe Coulee
82_3	47.90097	-110.45283	Missouri Breaks	private	Rowe Coulee
82_4	47.90008	-110.45435	Missouri Breaks	private	Rowe Coulee
203_1	47.90834	-110.45432	Missouri Breaks	BLM	Rowe Coulee
203_2	47.90983	-110.45793	Missouri Breaks	BLM	Rowe Coulee
203_3	47.90981	-110.46080	Missouri Breaks	BLM	Rowe Coulee
83_1	47.90334	-110.46169	Missouri Breaks	BLM	Woodbottom
83_2	47.90150	-110.45884	Missouri Breaks	BLM	Woodbottom
83_3	47.90329	-110.45898	Missouri Breaks	BLM	Woodbottom
84_1	47.90999	-110.47762	Missouri Breaks	BLM	Woodbottom
84_2	47.90922	-110.48152	Missouri Breaks	BLM	Woodbottom
84_3	47.90793	-110.48094	Missouri Breaks	BLM	Woodbottom
400_1	46.78760	-111.89327	Upper Missouri	USFS	Beaver Ck
400_2	46.78789	-111.89168	Upper Missouri	USFS	Beaver Ck
400_3	46.78827	-111.88996	Upper Missouri	USFS	Beaver Ck
400_4	46.78887	-111.88878	Upper Missouri	USFS	Beaver Ck
400_5	46.78919	-111.88758	Upper Missouri	USFS	Beaver Ck
400_6	46.79001	-111.88611	Upper Missouri	USFS	Beaver Ck
400_7	46.79031	-111.88426	Upper Missouri	USFS	Beaver Ck
400_8	46.79057	-111.88246	Upper Missouri	USFS	Beaver Ck
400_9	46.79042	-111.88046	Upper Missouri	USFS	Beaver Ck
400_10	46.79053	-111.87871	Upper Missouri	USFS	Beaver Ck
500_1	47.53392	-111.22313	Upper Missouri	State	Giant Springs
500_2	47.53318	-111.22410	Upper Missouri	State	Giant Springs
500_3	47.53330	-111.22558	Upper Missouri	State	Giant Springs