# Environment and Natural Resources Trust Fund

2023 Request for Proposal

## General Information

**Proposal ID:** 2023-072

**Proposal Title:** Mapping Migratory Pitstops in Minnesota

## Project Manager Information

**Name:** Dale Gentry

**Organization:** Audubon Minnesota

**Office Telephone:** (651) 888-2994

**Email:** dale.gentry@audubon.org

## Project Basic Information

**Project Summary:** Identifying Avian Migratory Stopover Sites to provide foundational information necessary for the conservation of migratory birds.

**Funds Requested:** $341,000

**Proposed Project Completion:** July 31, 2026

**LCCMR Funding Category:** Foundational Natural Resource Data and Information (A)

## Project Location

**What is the best scale for describing where your work will take place?**

Statewide

**What is the best scale to describe the area impacted by your work?**

Statewide

**When will the work impact occur?**

In the Future

## Narrative

**Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.**

A landmark 2019 study showed North American bird populations have declined by nearly one-third; a loss of three billion birds since 1970. A review of the declining species reveals one unifying trait, migration. Migratory birds face unique challenges each spring and fall as they complete a series of long flights separated by periods of resting and refueling at migratory stopover sites. Reversing the declines of migratory birds requires conserving these migratory stopover sites in addition to suitable habitat for breeding and overwintering. However, in part because an analysis of the use of different habitat patches by migrant birds has never been done, most avian conservation work in Minnesota focuses on breeding habitats. At the northern terminus of the Mississippi River migratory corridor and containing the boreal forest breeding grounds of so many long-distance migrants, Minnesota is an important region for migratory birds. Regional landbird conservation plans from Partners in Flight, the U.S. Fish and Wildlife Service, and Audubon all highlight the importance of mapping stopover sites as a critical missing component for full life cycle conservation. This project begins to fill that gap and provide data necessary to support the conservation of the migratory birds Minnesotans cherish.

**What is your proposed solution to the problem or opportunity discussed above? Introduce us to the work you are seeking funding to do. You will be asked to expand on this proposed solution in Activities & Milestones.**

Using three cutting-edge technologies – Doppler weather radar (capable of detecting birds in flight), observation data from eBird (a widely used community science bird observation program), and nano-tagging (i.e. very small radio transmitters) four focal species of conservation concern, we will collect data to map and classify the use of migratory stopover sites and prioritize high use sites for conservation in Minnesota. There is a clear need to both understand migration patterns and to communicate those understandings to our partners and the public. We will achieve both by developing a web-based interactive decision support tool and an adaptive management plan to share with partners and the public to guide the conservation of stopover sites and migratory birds in Minnesota.

Funding from the ENRTF will support the collection and analysis of the data on migration patterns, the development of a sharable web-based decision support tool, and the written adaptive management action plan. We applied for funds from the U.S. Fish and Wildlife Service to support the Doppler radar analysis with Dr. Jeffry Buler of the University of Delaware, an internationally recognized expert on the analysis of Doppler radar for the study of migratory birds.

**What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?**

Audubon Minnesota will produce a publicly available interactive web-mapping tool to give land managers access to our spatial prioritization analysis and guide the conservation prioritize of state, federal and private conservation groups.

We will also write a publicly available Blueprint for Conservation of Minnesota's Migratory Birds to guide the conservation work of Audubon, federal and state agencies, and other partners working to conserve birds in Minnesota. These resources will allow Minnesota to expand our conservation work beyond critical breeding habitats to include critical migratory stopover sites as well.

## Activities and Milestones

### Activity 1: Develop baseline understanding of avian use of stopover sites in Minnesota.

**Activity Budget:** $61,000

**Activity Description:**
We will collect and analyze data from three sources that will all be used to develop our decision support tool and adaptive management plan. We will work with partners to apply nano-tags to the MN endangered Henslow's Sparrow and three Minnesota Species of Greatest Conservation Need; Bobolink, Chimney Swift, and Golden-winged Warbler, we will collect the publicly available data depicting weekly abundance of more than 800 bird species from eBird, and we will collect and analyze data from doppler weather radar (supported through funding from USFWS).

Analysis of these three forms of auxiliary data in Minnesota will produce five deliverables:

Radar observed stopover patterns in spring and fall over five years (2017-2022)

Statistical analysis of predicted bird stopover use outside of radar-sampled areas

Bimonthly maps of predicted bird species composition and mean population decline in spring and fall from eBird models

Integrated maps of stopover conservation priority ranking

Maps of the migratory patterns of four nano-tagged focal species

**Activity Milestones:**

| Description | Completion Date |
|---|---|
| Complete nano-tagging four focal species | October 31, 2024 |
| Integration of three forms of auxiliary data to produce maps and ranking | July 31, 2025 |
| Map the migratory patterns of the four focal species | July 31, 2025 |

### Activity 2: Development of the web-based migration mapping resource and decision support tool.

**Activity Budget:** $140,000

**Activity Description:**
The Conservation Manager will work with the Audubon Spatial Data Analyst to integrate our new data with existing relevant data from within Audubon and other stakeholders to inform a scoring system that will rank stopover sites based on importance for birds and conservation opportunities.

The Conservation Manager will also support the GIS Analyst, who will lead the development of an interactive web map tool which will be used to communicate the results of the data compilation to land managers. The Conservation Manager will seek feedback from land managers and stakeholders throughout this process to identify stopover habitat conservation projects which will be integrated into the final products.

Once the web resources are complete, Audubon Minnesota's Conservation Manager and Engagement Manager will convene meetings to share the conservation decision support tool with state and regional conservation stakeholders and with the public.

**Activity Milestones:**

| Description | Completion Date |
|---|---|
| Complete data collection | July 31, 2025 |
| Data integration and analysis to produce ranking of stopover sites | January 31, 2026 |
| Design and production of the web resources and decision support tool | January 31, 2026 |

## Activity 3: Developing and publish a blueprint for conservation of migratory birds in Minnesota

**Activity Budget:** $140,000

**Activity Description:**
The Conservation Manager will oversee a literature search and data gathering and analysis process to support the development of a Blueprint for Conservation of Migratory Birds in Minnesota. They will work with Audubon's Engagement Manager to develop a stopover habitat survey for land managers and then work with an advisory team to identify land managers and stakeholders who will be recipients of the survey. The survey will be used to identify threats and conservation opportunities at a wide variety of stopover sites throughout Minnesota.

The results of this survey and the outputs of the spatial prioritization will be used to develop a Blueprint for the Conservation of Minnesota's Migratory Birds. The blueprint will identify priority regions and species where conservation action is most critical, suggest conservation goals, and suggest activities that will help us achieve our conservation goals. The Conservation Manager will seek feedback from land managers and other stakeholders throughout this process to ensure the final products meet their needs.

**Activity Milestones:**

| Description | Completion Date |
|---|---|
| Design and share stopover habitat survey | January 31, 2025 |
| Publish the Blueprint for Conservation of Minnesota's Migratory Birds | January 31, 2026 |

## Long-Term Implementation and Funding

**Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this work be funded?**

This project will inform migratory bird habitat conservation efforts across Minnesota. It will produce a finished product that will not require future funding to complete. The conservation plan and the decision support tool will be available to our partners and the public on Audubon's website. We will host information-sharing meetings with our partners in the region to discuss new conservation opportunities that will arise from our work. This project will increase the impact that Outdoor Heritage, and other funds, have already had in restoring and enhancing Minnesota's most critical habitats.

## Other ENRTF Appropriations Awarded in the Last Six Years

| Name | Appropriation | Amount Awarded |
|---|---|---|
| Minnesota Breeding Bird Atlas - Final Phase | M.L. 2014, Chp. 226, Sec. 2, Subd. 05f | $300,000 |
| Creating a Statewide Wetland Bird Survey | M.L. 2015, Chp. 76, Sec. 2, Subd. 03f | $146,000 |
| Local Planning and Implementation Efforts for Bird Habitat | M.L. 2017, Chp. 96, Sec. 2, Subd. 05e | $280,000 |
| Implementing Conservation Plans for Avian Species of Concern | M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 03k | $124,000 |

## Project Manager and Organization Qualifications

**Project Manager Name:** Dale Gentry

**Job Title:** Conservation Manager

**Provide description of the project manager's qualifications to manage the proposed project.**

Dale joined Audubon Minnesota as Conservation Manager in 2021. Before joining Audubon Dale was a professor at the University of Northwestern –Saint Paul where he studied the reuse of natural and woodpecker cavities and the role of woodpeckers as biological control for the invasive emerald ash borer. He also chaired the department of biology and taught courses in ecology, conservation, and ornithology. Before moving to Minnesota Dale was field science faculty at the graduate program of the Teton Science Schools in Grand Teton National Park. He supervised research, taught graduate courses in conservation, community, and winter ecology, and partnered with the National Park Service and National Forest service on land management in Jackson Hole. Dale has a B.S. in Zoology from Idaho State University, an M.S. in Biology from the University of South Dakota, and a Ph.D. in Atmosphere, Environment, and Water Resources from the South Dakota School of Mines and Technology. His graduate work compared the breeding biology of cup nesting songbirds in natural river corridors and anthropogenic woodlots (M.S.) and the keystone species concept in cavity-nesting communities in old burns in the Black Hills in South Dakota (Ph.D.).

**Organization:** Audubon Minnesota

**Organization Description:**

Audubon Minnesota was established in 1979 and is the state office of the National Audubon Society, one of the oldest conservation organizations in the world. For the last 40 years, Audubon Minnesota has been at the forefront of critical conservation issues that will impact us for generations to come.

While we are one of 23 Audubon state offices, we establish our own statewide conservation projects, generate our own funding, and have an 11-member state Board of Directors who meet quarterly. Our state office mission is, "To conserve and restore natural ecosystems in Minnesota, focusing on birds and their habitats for the benefit of humanity and the

earth's biological diversity." Today there are 24,000 Audubon members in Minnesota and 13 geographically-based chapters from the Mississippi Headwaters Audubon Chapter in Bemidji to Zumbro Valley Audubon Chapter in Rochester.

## Budget Summary

| Category / Name | Subcategory or Type | Description | Purpose | Gen. Ineligible | % Benefits | # FTE | Classified Staff? | $ Amount |
|---|---|---|---|---|---|---|---|---|
| **Personnel** | | | | | | | | |
| Conservation Manager | | Project manager | | | 30% | 1.2 | | $101,500 |
| Spatial data analyst | | Integrate and interpret auxiliary forms of data | | | 30% | 34.5 | | $31,000 |
| GIS analyst | | Develop decision support tool | | | 30% | 0.63 | | $62,000 |
| MN Outreach Coordinator | | Coordinate partner meetings and communicate findings with public | | | 30% | 0.3 | | $26,000 |
| Conservation Science Associate | | Support data integration and collection | | | 30% | 0.3 | | $24,000 |
| | | | | | | | **Sub Total** | **$244,500** |
| **Contracts and Services** | | | | | | | | |
| TBD | Professional or Technical Service Contract | Catching an nanotagging birds | | | | 0.4 | | $30,000 |
| | | | | | | | **Sub Total** | **$30,000** |
| **Equipment, Tools, and Supplies** | | | | | | | | |
| | Equipment | Nano-tags | The nano-tags will track the location of migratory birds with the Motus tower network | | | | | $10,000 |
| | | | | | | | **Sub Total** | **$10,000** |
| **Capital Expenditures** | | | | | | | | |
| | | | | | | | **Sub Total** | - |
| **Acquisitions and Stewardship** | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | **Sub Total** | **-** |
| **Travel In Minnesota** | | | | | | | | |
| | Miles/ Meals/ Lodging | 8 trips, 125 miles each (on average), 8 days of meals | trips to meetings with partners to discuss design of decision support tool | | | | | $2,500 |
| | | | | | | | **Sub Total** | **$2,500** |
| **Travel Outside Minnesota** | | | | | | | | |
| | | | | | | | **Sub Total** | **-** |
| **Printing and Publication** | | | | | | | | |
| | | | | | | | **Sub Total** | **-** |
| **Other Expenses** | | | | | | | | |
| | | Direct Support Services | Overhead | | | | | $54,000 |
| | | | | | | | **Sub Total** | **$54,000** |
| | | | | | | | **Grand Total** | **$341,000** |

## Classified Staff or Generally Ineligible Expenses

| Category/Name | Subcategory or Type | Description | Justification Ineligible Expense or Classified Staff Request |
|---|---|---|---|

## Non ENRTF Funds

| Category | Specific Source | Use | Status | Amount |
|---|---|---|---|---|
| **State** | | | | |
| | | | **State Sub Total** | **-** |
| **Non-State** | | | | |
| In-Kind | Audubon | Indirect (14.66% on modified base) | Secured | $6,175 |
| In-Kind | Audubon | GIS analyst | Secured | $30,937 |
| In-Kind | Upper Mississippi/Great Lakes Joint Venture | Radar analysis | Potential | $100,000 |
| | | | **Non State Sub Total** | **$137,112** |
| | | | **Funds Total** | **$137,112** |

## Attachments

### Required Attachments

*Visual Component*

File: 7814a3ea-2a3.docx

*Alternate Text for Visual Component*

The visuals highlight the need to map migratory pitstops and show the locations of the NEXRAD radar sites....

*Financial Capacity*

File: 2bcdcca7-ed3.pdf

*Board Resolution or Letter*

| Title | File |
|---|---|
| Audubon MN Board Letter of Support | 74a0bc23-643.docx |

## Administrative Use

**Does your project include restoration or acquisition of land rights?**

No

**Does your project have potential for royalties, copyrights, patents, or sale of products and assets?**

No

**Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?**

N/A

**Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?**

N/A

**Does your project include original, hypothesis-driven research?**

Yes

**Does the organization have a fiscal agent for this project?**

No

# Mapping Migratory Pitstops in Minnesota

*Snow Geese and Sandhill Cranes.*
*Photo: Steve Torna/Audubon Photography Awards*

## Identifying the most critical landscapes for refueling with innovative technology

At the northern end of the Mississippi River migratory corridor and containing the boreal forest breeding grounds of so many long-distance migrants, Minnesota is an important region for migratory birds. Regional landbird conservation plans from Partners in Flight, the U.S. Fish and Wildlife Service, and Audubon all highlight the importance of mapping stopover sites as a critical missing component for full life cycle conservation. This project fills that critical gap and provides data necessary to support the conservation of the migratory birds Minnesotans cherish.

Using three cutting-edge technologies –Doppler weather radar (capable of detecting birds in flight), observation data from eBird (a widely used community science bird observation program), and nano-tagging (i.e. very small radio transmitters) four focal species of conservation concern, we will collect data to map and classify the use of migratory stopover sites and prioritize high use sites for conservation in Minnesota. There is a clear need to both understand migration patterns and to communicate those understandings to our partners and the public. We will achieve both by developing a web-based interactive decision support tool and an adaptive management plan to share with partners and the public to guide the conservation of stopover sites and migratory birds in Minnesota.

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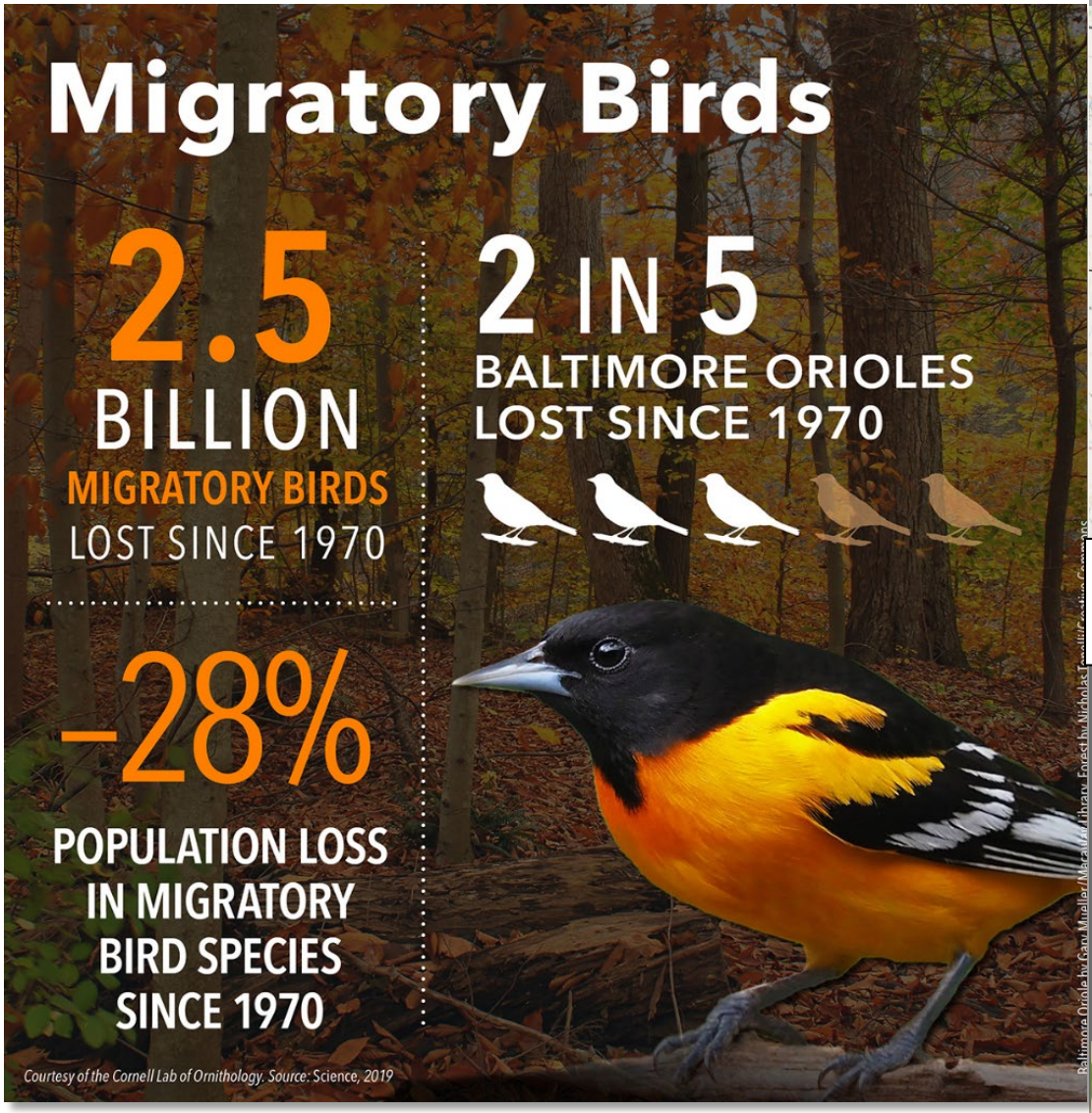


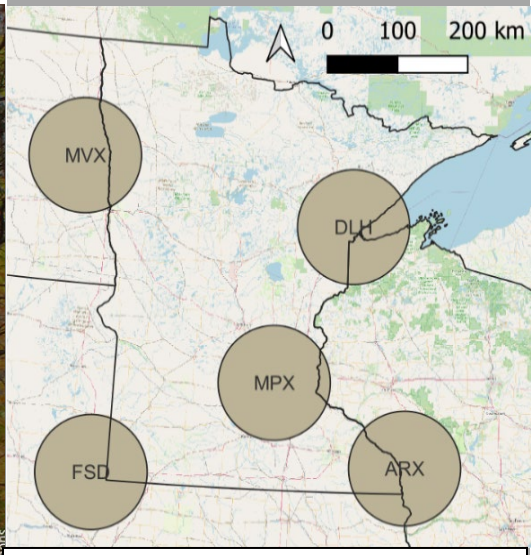


Doppler radar coverage (80 km radius) of five NEXRAD sties providing coverage within Minnesota

A landmark 2019 study shows North American bird populations have declined by nearly one-third; a loss of three billion birds since 1970. A review of the declining species reveals one unifying trait, migration. Migratory birds face unique challenges each spring and fall as they complete a series of long flights separated by periods of resting and refueling at migratory stopover sites.

## Project Activities

1. Map baseline understanding of avian use of stopover sites in Minnesota.
2. Develop web-based migration mapping resource and decision support tool.
3. Publish a blueprint for conservation of migratory birds in Minnesota

Henslow's Sparrow (credit: Kenneth Cole Schneider) depicted above, is one of four endangered and species of greatest conservation concern in Minnesota that will be fitted with nano-tags and tracked through this project.

## Project Outputs

Audubon Minnesota will produce a publicly available interactive web-mapping tool to give land managers access to our spatial prioritization analysis and guide the conservation priorities of state, federal and private conservation groups. We will also write a publicly available Blueprint for Conservation of Minnesota's Migratory Birds to guide the conservation work of Audubon, federal and state agencies, and other partners working to conserve birds in Minnesota. These resources will allow Minnesota to expand our conservation work beyond critical breeding habitats to include critical migratory stopover sites as well.