

**Environment and Natural Resources Trust Fund**

# 2022 Request for Proposal

## **General Information**

**Proposal ID:** 2022-043

**Proposal Title:** Improving Golden-winged Warbler conservation and habitat restoration

## **Project Manager Information**

**Name:** Alexis Grinde

**Organization:** U of MN - Duluth - NRRI

**Office Telephone:** (218) 788-2747

**Email:** agrinde@d.umn.edu

## **Project Basic Information**

**Project Summary:** Assess Golden-winged Warbler productivity throughout the breeding season and inform habitat restoration to conserve Minnesota’s biodiversity.

**Funds Requested:** $197,000

**Proposed Project Completion:** June 30 2025

**LCCMR Funding Category:** Small Projects (H) **Secondary Category:** Foundational Natural Resource Data and Information (A)

## **Project Location**

**What is the best scale for describing where your work will take place?** Region(s): Central, NW, NE,

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

**When will the work impact occur?** During the Project and In the Future

## **Narrative**

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

Golden-winged Warbler is one of the most critically threatened birds in North America with a global population estimated at only 400,000 individuals of which 50% nest in Minnesota. Densities of Golden-winged Warbler are highest in young, wet forests of Minnesota; this forest type is increasingly threatened due to maturation of early successional forests across the state.
American Bird Conservancy has completed over 10,000 acres of restoration and management action to create breeding habitat in upland forest and shrubby wetlands for the Golden-winged Warbler in Minnesota. Additional information is necessary to assess the effectiveness of these activities. Our project will assess habitat use of breeding females and fledglings to determine habitat characteristics associated with high quality habitats and restoration management actions that maximize breeding season productivity for this imperiled species.
Our specific objectives are to:
1. Compare nest success and juvenile survival for Golden-winged Warbler in young forest and shrubby wetlands.
2. Compare habitat use by Golden-winged Warbler during the breeding and post-fledging period in young forest and shrubby wetlands.
3. Provide metrics to guide restoration and habitat management at the landscape scale to maximize Golden-winged Warbler productivity and conservation.

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

Minnesota is a critical stronghold for the global Golden-winged Warbler population; developing breeding season management plans that address and incorporate fledgling survival and habitat use are necessary to continuously inform and improve habitat restoration efforts on the ground. American Bird Conservancy’s restoration activities have focused on emulating natural disturbance by cutting dense alder, willow, and other forest or brushland species to create nesting habitat while retaining scattered, mature trees to create the structural diversity used by breeding males to sing and attract females.
To maximize the impact of these restoration efforts, additional information is needed to assess the habitat needs of nesting females and young birds after they leave the nest and before they disperse and/or migrate (i.e., the post-fledging period). To address this critical knowledge gap, we will use radio telemetry to study movements, cover-type selection, and survival of fledglings to determine how they use forest habitats during the critical post-fledging period.
We will provide foundational information regarding the extent to which differences in breeding habitats impact bird productivity during the breeding season. Results will provide valuable insight into the landscape needs of Golden-winged Warblers which in turn will inform and improve management guidelines and conservation.

**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?**

Minnesota is a key state in the international Golden-winged Warbler full life-cycle conservation initiative. American Bird Conservancy collaborates with international partners in Central and South America to conserve Golden-winged Warbler wintering and stopover habitat, while implementing a regional program engaging public and private partners to restore and enhance breeding habitat throughout the Great Lakes and Appalachia. Understanding additional site-level characteristics that improve nest success and fledgling survival to help guide and prioritize site selection for habitat restoration and enhancement treatments is essential to creating the highest quality habitat to help prevent further population decline for this imperiled species.

## **Activities and Milestones**

### **Activity 1: Assess differences in Golden-winged Warbler nest success between young forest and shrubby wetland habitats.**

**Activity Budget:** $66,000

**Activity Description:**We will identify and select eight managed sites (four in young forest; four in shrubby wetlands). We will search for nests using a combination of standard nest searching methods and by radio-tagging females to find nests. Females will be tracked regularly to assess home range use during the nesting season, we will use an automated telemetry station near a subset of nests to document differences in time on and off nests in the different habitats. Nests will be monitored in-person during twice-weekly visits during the breeding season and camera traps will be deployed to document feeding activity, food items, and potential causes for nest failure and juvenile mortality (e.g., predation events). We will measure growth of nestlings and collect fecal samples for dietary analysis. We will use carbon and nitrogen stable isotopes to estimate lipid content and identify types of prey items eaten.
We will use high resolution imagery to characterize forest structure and composition at multiple spatial scales around nest locations. These data will allow us to evaluate habitat and landscape factors associated with nest success and hatchling survival.
Outcome: Determine differences in nestling survival and insect food provided by parents between breeding habitat types.

**Activity Milestones:**

|  |  |
| --- | --- |
| **Description** | **Completion Date** |
| Identify eight study sites (four in young forest, four in shrubby wetlands). | November 30 2022 |
| Locate and monitor Golden-winged Warbler nests and track females. | August 31 2024 |
| Assess nestling growth and diets. | October 31 2024 |
| Evaluate factors associated with nest success and hatchling survival. | June 30 2025 |

### **Activity 2: Compare habitat use by Golden-winged Warbler during the post-fledging period in young forest and shrub-dominated wetlands.**

**Activity Budget:** $104,000

**Activity Description:**As nestlings approach the fledgling stage (~7-8 days post-hatch), we will tag juveniles with radio-transmitters. Juveniles will be tracked daily using ground telemetry methods to identify movements for approximately 20 days post-fledging to monitor survival and record habitat use. We will record habitat variables at two scales: 1) macro scale; forest cover type the juvenile is using, and 2) micro scale; within-stand features (e.g. sapling height, vegetation density) around juvenile locations. In addition to recording habitat information where birds are located, we will also record habitat variables at paired random locations that were “available” for use by juveniles. These data points will allow for analyses that will help us understand the functional interrelationships between habitat structure, landscape and juvenile survival and habitat use. We will use high resolution imagery to characterize forest structure and composition at multiple spatial scales around “used” and “available” locations. This portion of the study will allow us to assess post-fledging survival across space and time. This information is imperative to maximize the productivity of breeding birds and to provide management recommendations for species of conservation concern.
Outcome: Determine habitat use characteristics important during the post-fledging period.

**Activity Milestones:**

|  |  |
| --- | --- |
| **Description** | **Completion Date** |
| Tag juveniles with radio-transmitters as they approach the fledgling stage of development. | September 30 2024 |
| Track juveniles and record habitat use for 14-21 days during the post-breeding season. | September 30 2024 |
| Evaluate juvenile habitat use. | June 30 2025 |

### **Activity 3: Identify conservation priorities and strategies to promote habitat quality.**

**Activity Budget:** $27,000

**Activity Description:**Findings from Activities 1 and 2 will be integrated to determine if there are differences in habitat quality and landscape context for the breeding season productivity of Golden-winged Warblers. We will develop comprehensive guidelines and next-steps for long-term conservation of Minnesota’s biodiversity.
Outcome: Identify and communicate conservation priorities.

**Activity Milestones:**

|  |  |
| --- | --- |
| **Description** | **Completion Date** |
| Development of conservation guidelines and priority actions. | June 30 2025 |
| Compilation and integration of breeding season habitat use. | June 30 2025 |

## **Project Partners and Collaborators**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Organization** | **Role** | **Receiving Funds** |
| Peter Dieser | American Bird Conservancy | Project coordination and design. | No |

## **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 be funded?**This project will provide data to assess habitat use of Golden-winged Warbler and better understand habitat associations across their breeding cycle. Results will provide insight into targeting restoration monies for young forest and shrubland habitat management. Identification and implementation of science-based best management practices that create or maintain Golden-winged Warbler breeding habitat is an important step towards sustaining and enhancing populations of these species and helping to reverse widespread population declines observed throughout their breeding range. Findings and data generated from this project will also serve as a foundational resource to prioritize and assess future threats to Minnesota’s birds.

## **Other ENRTF Appropriations Awarded in the Last Six Years**

|  |  |  |
| --- | --- | --- |
| **Name** | **Appropriation** | **Amount Awarded** |
| Conserving Minnesota’s Forest Birds of Management Concern | M.L. 2018, Chp. 214, Art. 4, Sec. 2, Subd. 03g | $500,000 |
| Mapping Avian Movement in Minnesota | M.L. 2018, Chp. 214, Art. 4, Sec. 2, Subd. 03h | $200,000 |

## **Project Manager and Organization Qualifications**

**Project Manager Name:** Alexis Grinde

**Job Title:** Wildlife Ecologist

**Provide description of the project manager’s qualifications to manage the proposed project.**Key Qualifications
Dr. Grinde is a Wildlife Ecologist and Research Lab Manager at the Natural Resources Research Institute, University of Minnesota Duluth. She has over 15 years of research experience focusing on conservation ecology.
EDUCATION
Ph.D. Integrated Biological Sciences. University of Minnesota, Duluth. Thesis: Spatio-temporal Ecology of Forest Birds. Adviser: Dr. Gerald Niemi.
M.S. Biology. University of North Dakota. Thesis: Ecological effects of wild pigs in California’s oak woodlands. Adviser: Dr. Rick Swietzer.
B.S. Biology. Bemidji State University. Thesis: The Effects of Rainfall on Number of Nest Initiation Attempts by Nene in Hawaii Volcanoes National Park. Adviser: Dr. Elizabeth Rave.
RELEVANT RESEARCH EXPERIENCE
Research Program Manager and Wildlife Ecologist. Natural Resources Research Institute, University of Minnesota Duluth. Dr. Grinde manages five full-time research scientists and multiple research projects and contracts focusing on the development of management strategies for habitats and wildlife. Her research focuses on conservation ecology including studying the large-scale impacts of environmental change on wildlife, biodiversity, and ecosystem functions. Applications of her research include informing forest management decisions in relation to changing land use patterns and providing recommendations for conservation plans for species of conservation concern.

**Organization:** U of MN - Duluth - NRRI

**Organization Description:**The Natural Resources Research Institute (NRRI) is an applied research and economic development engine for the University of Minnesota research enterprise. NRRI employs over 130 scientists, engineers and technicians to deliver on its mission to deliver integrated research solutions that value our resources, environment and economy for a sustainable and resilient future. NRRI collaborates broadly across the University system, the state and the region to address the challenges of a natural resource based economy.
NRRI researchers have extensive experience in managing large, interdisciplinary projects. NRRI’s role is as an impartial, science-based resource that develops and translates knowledge. Projects include characterizing and defining resource opportunities, minimizing waste and environmental impact, maximizing value from natural resources and maintaining/restoring ecosystem function.

The NRRI Avian Ecology Lab is led by Dr. Alexis Grinde (over 15 years of wildlife and education experience) and consists of five full-time research scientists. Our research focuses on the development of economically sustainable conservation strategies and land management guidelines to preserve and enhance the species diversity of Minnesota bird populations and to protect species of conservation concern.

## **Budget Summary**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Category / Name** | **Subcategory or Type** | **Description** | **Purpose** | **Gen. Ineli gible** | **% Bene fits** | **# FTE** | **Class ified Staff?** | **$ Amount** |
| **Personnel** |  |  |  |  |  |  |  |  |
| Research technicians |  | Bird monitoring, tracking and data analysis (CS) |  |  | 24.1% | 0.75 |  | $55,665 |
| Graduate Research Assistants |  | Two Summer GRA appointments to assist with data collection and analysis. |  |  | 16.6% | 0.5 |  | $25,312 |
| Field technicians |  | Data collection and data entry |  |  | 7.4% | 0.46 |  | $17,937 |
| Alexis Grinde, Wildlife Ecologist |  | Principal investigator; Project management and coordination. |  |  | 26.7% | 0.15 |  | $18,754 |
| Graduate Research Assistant (academic year) |  | Graduate student (50% GRA 1 semester, academic year, tuition benefits) |  |  | 50% | 0.19 |  | $20,481 |
| Field Technician |  | Data collection and data entry |  |  | 0% | 0.02 |  | $1,620 |
|  |  |  |  |  |  |  | **Sub Total** | **$139,769** |
| **Contracts and Services** |  |  |  |  |  |  |  |  |
| University of Minnesota | Internal services or fees (uncommon) | eDNA Processing will be used to identify insects consumed by birds and insects available in the environment. (estimate ~200 samples @ $15/ sample) |  |  |  | 0 |  | $3,000 |
| TBD | Professional or Technical Service Contract | Isotope analysis will be used to assess quality of insects consumed by birds and compared to insects available in the environment (estimate ~200 samples @ $14.40/ sample). |  |  |  | 0 |  | $2,880 |
|  |  |  |  |  |  |  | **Sub Total** | **$5,880** |
| **Equipment, Tools, and Supplies** |  |  |  |  |  |  |  |  |
|  | Tools and Supplies | Diet analysis | DNA Kits for extraction DNA extraction from fecal and insect samples. |  |  |  |  | $700 |
|  | Tools and Supplies | Telemetry equipment | Estimate 24 successful nests per year; we will tag all females (n=24 females / year) and two juveniles from each successful nest; 48 juveniles / year. Total of 144 transmitters (@$160 / transmitter) = $23,000 for transmitters. Yagi antennae, batteries, and replacement cables ($2100). Note: Receivers purchased from previous studies will be used. |  |  |  |  | $25,100 |
|  | Tools and Supplies | Insect sampling equipment | Flight intercept traps, nets for vegetation sampling, coolers for field storage, and collection analysis vials. |  |  |  |  | $8,651 |
|  |  |  |  |  |  |  | **Sub Total** | **$34,451** |
| **Capital Expenditures** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Acquisitions and Stewardship** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Travel In Minnesota** |  |  |  |  |  |  |  |  |
|  | Miles/ Meals/ Lodging | Travel associated with fieldwork | Travel for fieldwork, including mileage, lodging, and per diem for field technicians and researchers. Travel is largely associated with nest box monitoring and insect collection and lodging during the 2022 and 2023 field seasons. |  |  |  |  | $16,900 |
|  |  |  |  |  |  |  | **Sub Total** | **$16,900** |
| **Travel Outside Minnesota** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Printing and Publication** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Other Expenses** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
|  |  |  |  |  |  |  | **Grand Total** | **$197,000** |

### **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 | UMN unrecovered indirect costs are calculated at the UMN negotiated rate for research of 55% modified total direct costs. | Indirect costs are those costs incurred for common or joint objectives that cannot be readily identified with a specific sponsored program or institutional activity. Examples include utilities, building maintenance, clerical salaries, and general supplies. (https://research.umn.edu/units/oca/fa-costs/direct-indirect-costs) | Secured | $103,832 |
|  |  |  | **Non State Sub Total** | **$103,832** |
|  |  |  | **Funds Total** | **$103,832** |

## **Attachments**

### **Required Attachments**

#### ***Visual Component***

File: [11e959b4-039.pdf](https://lccmrprojectmgmt.leg.mn/media/map/11e959b4-039.pdf)

#### ***Alternate Text for Visual Component***

Title reads "Improving Golden-winged Warbler Conservation and Habitat Restoration".
Text reads "Problem: Golden-winged Warbler is one of the most critically threatened birds in North America. Approximately 50% of the global population nests in Minnesota."
Below is a picture of a bird and map of the US and Canada showing the highest population density of Golden-winged Warblers in Minnesota.
Text box reads "American Bird Conservancy has completed over 10,000 acres of restoration and managemen...

### **Optional Attachments**

#### ***Support Letter or Other***

|  |  |
| --- | --- |
| **Title** | **File** |
| UMD Sponsored Projects Transmittal Letter | [ba0aac8e-f07.pdf](https://lccmrprojectmgmt.leg.mn/media/attachments/ba0aac8e-f07.pdf) |
| Letter of Support from ABC | [2493f5fa-8d4.pdf](https://lccmrprojectmgmt.leg.mn/media/attachments/2493f5fa-8d4.pdf) |

## **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?**
 Yes, Sponsored Projects Administration