



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 - NRRRI

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 - NRRRI

Organization Description:

The Natural Resources Research Institute (NRRRI) is an applied research and economic development engine for the University of Minnesota research enterprise. NRRRI 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. NRRRI collaborates broadly across the University system, the state and the region to address the challenges of a natural resource based economy.

NRRRI researchers have extensive experience in managing large, interdisciplinary projects. NRRRI'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 NRRRI 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. Ineligible	% Benefits	# FTE	Classified 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](#)

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
Letter of Support from ABC	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?

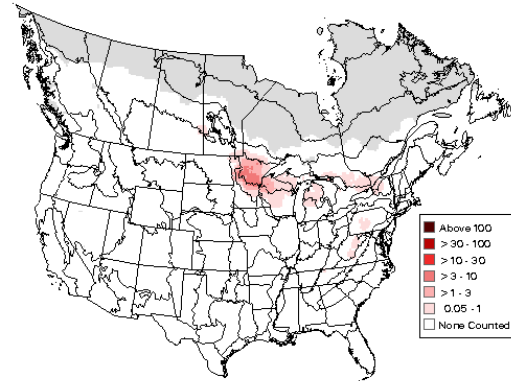
Yes, Sponsored Projects Administration

PROJECT TITLE: Improving Golden-winged Warbler Conservation and Habitat Restoration

Problem: Golden-winged Warbler is one of the most critically threatened birds in North America. Approximately 50% of the global population nests in Minnesota.



Golden-winged Warbler in Minnesota.
Photo credit: John Jonas Photography



mnbirdatlas.org



American Bird Conservancy has completed over 10,000 acres of restoration and management actions to create breeding habitat in upland forest and shrubby wetlands. Additional information is necessary to assess and improve the effectiveness of these activities.

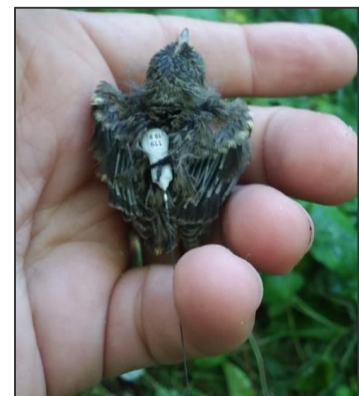
Solution: Assess habitat use of breeding females and young birds to determine habitat characteristics that maximize breeding season productivity.



Female Golden-winged Warbler.
Photo credit: Ted Keyel



Golden-winged warbler managed habitat. Photo credit: Peter Dieser



Young bird with radio transmitter.
Photo credit: Ryan Steiner

Project Outcomes: Understanding habitat characteristics that improve nest success and fledgling survival to help guide and prioritize sites for habitat restoration and enhancement treatments is essential to prevent further population decline for this imperiled species.

