

**Environment and Natural Resources Trust Fund
2020 Request for Proposals (RFP)**

Project Title:

ENRTF ID: 053-AH

Archiving Unreported Band Recoveries of Minnesota Birds

Category: H. Proposals seeking \$200,000 or less in funding

Sub-Category: A. Foundational Natural Resource Data and Information

Total Project Budget: \$ 141,700

Proposed Project Time Period for the Funding Requested: June 30, 2023 (3 yrs)

Summary:

This project will ensure that >30,000 recaptures of banded non-game birds are made permanently available for analysis of population dynamics of Minnesota birds.

Name: Todd Arnold

Sponsoring Organization: U of MN

Job Title: Dr.

Department: Fisheries, Wildlife, and Conservation Biology

Address: 135 Skok Hall

St. Paul MN 55108

Telephone Number: (612) 624-2220

Email arnol065@umn.edu

Web Address: _____

Location:

Region: Statewide

County Name: Ramsey, Washington

City / Township: St. Paul

Alternate Text for Visual:

The visual provides photo-documentation of the banding and data recording process for nongame birds, and gives real-world examples of how these data can be used.

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ TOTAL	_____ %



**Environment and Natural Resources Trust Fund (ENRTF)
2020 Main Proposal Template**

PROJECT TITLE: Archiving Unreported Band Recoveries of Minnesota Birds

I. PROJECT STATEMENT

Since 1950, Minnesotans have banded more than 2 million birds, but these data are only useful if recovered bands are properly reported to the federal Bird Banding Laboratory. For non-hunted species like songbirds, hawks, and owls where most band recoveries occur from recapturing previously banded birds, the vast majority of band recovery data currently resides in dusty 3-ring binders where it is in danger of being lost forever (this is not the fault of Minnesota banders, but rather the fault of the US Fish & Wildlife Service, which only recently recognized the value of live recapture data). Working with Minnesota-based nature centers that have conducted long-term volunteer banding programs, we have identified >30,000 unreported band recoveries, which represents a more than 8-fold increase in the amount of band-recovery data currently available for nongame birds. Our project will work with Minnesota-based banding organizations to electronically archive band-recovery data and make them available for future conservationists to assess the health of Minnesota bird populations. We will also work with current banding programs to implement best-management practices for data submission to make sure that all future data are properly archived.

After completing Activity 1, we will utilize these newly archived data to conduct analyses of survival and reproductive success in Minnesota-banded birds. Banding data from late summer and early fall can be used to estimate annual reproductive success from age ratios at capture, and our analysis has identified more than 100 species that would contribute sufficient data for this analysis. Many of these species also have enough data for estimating survival rates, and this number should increase dramatically after we complete the data summary for Activity 1. From our analysis, we can identify bird species for which survival and reproductive success are deteriorating through time, and also identify potential causes of these declines to assist wildlife professionals in developing more effective management strategies.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1 Title: Electronic archival of Minnesota band-recapture data

Description: Through informal surveys, we have identified >30,000 undocumented recapture records of birds banded at three nature centers in Minnesota (Carpenter Nature Center, Hastings; Warner Nature Center, Marine on St. Croix; Lowry Nature Center, Victoria) and we would survey other organizations to identify additional unarchived banding data. We would hire data interns at each nature center to summarize and verify data records, and allocate additional staff time to supervise these activities. At completion, summarized data would be electronically archived at the U.S. Bird Banding Laboratory where they would be publically accessible to current and future analysts.

ENRTF BUDGET: \$50,908

Outcome	Completion Date
1. Survey MN organizations to identify additional undocumented recovery records.	August, 2020
2. Develop protocol for electronically recording and archiving records.	Sept, 2020
3. Work with individual organizations to complete data archival and implement data archival strategies going forward.	July, 2021



Activity 2 Title: Estimate survival and reproductive success of MN nongame birds

Description: Understanding the health of Minnesota’s bird populations requires better information on **survival**, a measure of how many birds die each year through natural and human caused mortality, and **reproductive success**, a measure of how many offspring are produced during each nesting season. We will estimate survival and reproductive success for all bird species with sufficient data (>1,000 bandings or >100 recoveries). Patterns observed within these data could help identify where Minnesota birds face problems (for example, if South American migrants are declining relative to year-round residents), specific habitat types that might be limiting (for example, if grassland birds are declining relative to forest birds), or climate and weather patterns that create hardships for birds (i.e., if early spring migrants suffer declines during years with late spring snow storms). Hence, this analysis would provide important guidance for delivery of future conservation programs to benefit Minnesota birds, and will also provide professional training to increase capacity for future projects.

ENRTF BUDGET: \$90,792

Outcome	Completion Date
1. Summarize historical banding data for analysis.	July 2021
2. Incorporate newly archived recapture data from Activity 1.	Oct 2021
3. Statistical analysis of reproductive success from banding data.	July 2022
4. Statistical analysis of survival from banding data	Jan 2023
5. Disseminate results and submit for publication.	June 2023

III. PROJECT PARTNERS AND COLLABORATORS:

Activity 1 will be implemented by Minnesota nature centers that have known banding data in need of archiving (Carpenter Nature Center, Hastings; Lowry Nature Center, Victoria; Warner Nature Center, Marine on St. Croix). Additional partners are possible based on Activity 1, Outcome 1.

Activity 2 will be implemented by a PhD student in the Conservation Sciences Graduate Program at the University of Minnesota, under the supervision of Dr. Todd Arnold.

IV. LONG-TERM IMPLEMENTATION AND FUNDING:

Participating organizations will complete Activity 1 involving data archival within one year, as outlined above. Additional organizations that begin Activity 1 after the project start date may have later completion dates. In addition to eliminating the backlog of unreported band recoveries, we will implement “best data management practices” at each banding station so that future data is electronically archived as soon as it is collected.

Activity 2 would begin near the end of year one and continue through year three, with all elements except formal publication being completed within this time frame. PhD students typically require 4 years to complete their degree. Additional funding to support the graduate student working on this project would come from competitive fellowships or teaching assistantship support through the University of Minnesota.

Attachment A: Project Budget Spreadsheet
 Environment and Natural Resources Trust Fund
 M.L. 2020 Budget Spreadsheet

Legal Citation:

Project Manager: Todd Arnold

Project Title: Archiving Unreported Band Recoveries of Minnesota Birds

Organization: University of Minnesota

Project Budget: \$141,700

Project Length and Completion Date: 3 years, June 2023

Today's Date: 8 April 2019



ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET		Budget	Amount Spent	Balance
BUDGET ITEM				
Personnel (Wages and Benefits)		\$ 90,792	\$ -	\$ 90,792
UMN Graduate Research Asst, \$90,792 (55% salary, 45% tuition & benefits). 50% FTE for 2 years				
Professional/Technical/Service Contracts				
Sub-award w/ Carpenter Nature Center: Data Entry Technician, \$40,560 (77% salary, 23% benefits). 100% FTE for 1 year. Supervisors: Carpenter Nature Center, \$5,000 (70% salary, 30% benefits). 10% FTE for 1 year. Supervisor: Warner Nature Center, \$5,000 (70% salary, 30% benefits). 10% FTE for 1		\$ 50,560	\$ -	\$ 50,560
Equipment/Tools/Supplies				
		\$ -	\$ -	\$ -
Capital Expenditures Over \$5,000				
		\$ -	\$ -	\$ -
Fee Title Acquisition				
		\$ -	\$ -	\$ -
Easement Acquisition				
		\$ -	\$ -	\$ -
Professional Services for Acquisition				
		\$ -	\$ -	\$ -
Printing				
		\$ -	\$ -	\$ -
Travel expenses in Minnesota				
Mileage to and from Duluth (Hawk Ridge), Warner, Carpenter, and UMN for 4 group meetings per year. Additional travel for Technician to visit sites and obtain data. 600 miles x \$0.58/mile		\$ 348	\$ -	\$ 348
Other				
		\$ -	\$ -	\$ -
COLUMN TOTAL		\$ 141,700	\$ -	\$ 141,700
SOURCE AND USE OF OTHER FUNDS CONTRIBUTED TO THE PROJECT				
	Status (secured or pending)	Budget	Spent	Balance
Non-State:		\$ -	\$ -	\$ -
State:		\$ -	\$ -	\$ -
In kind:		\$ -	\$ -	\$ -
Other ENRTF APPROPRIATIONS AWARDED IN THE LAST SIX YEARS				
	Amount legally obligated but not yet spent	Budget	Spent	Balance
NA		\$ -	\$ -	\$ -

Archiving Unreported Band Recoveries of Minnesota Birds



1) Minnesotans have banded 2.1 M birds since 1950, including 1.4 M nongame birds like this Nashville Warbler banded at Warner Nature Center.



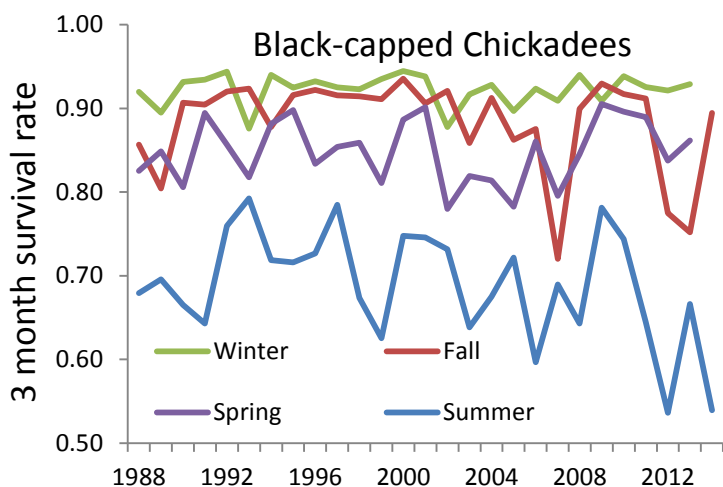
2) For game birds such as this American black duck, hunters report about 18% of banded birds, providing a wealth of data for estimating survival and harvest rates.



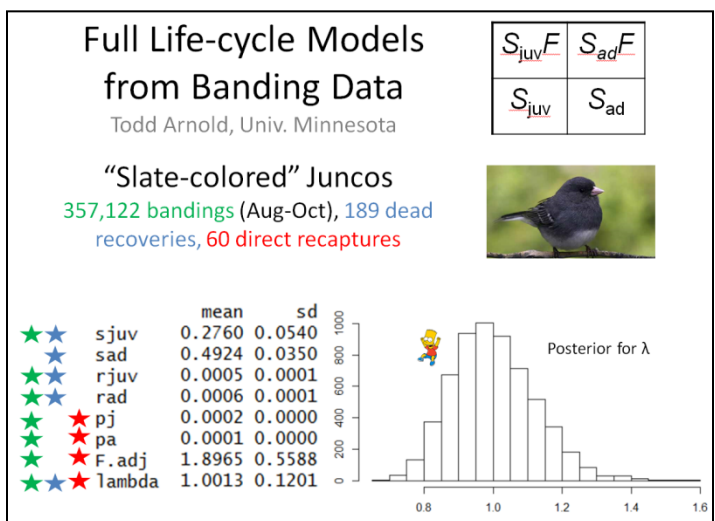
3) For nongame birds such as this yellow-rumped warbler, most recoveries come from recapturing previously banded birds.



4) These extremely valuable data exist primarily in paper format, because federal banding protocols discouraged banders from reporting these data.



5) These recapture data could be used to estimate long-term survival rates, and explore impacts of habitat loss and climate change on survival, as in this case study of black-capped chickadee survival from Springbrook Nature Center, Fridley, MN (R. Refsnider and T. Arnold, unpublished).



6) Despite sparse data, I was able to estimate survival (s_{juv} , s_{ad}) and fecundity (F_{adj}) of dark-eyed juncos throughout North America (T. Arnold, 2018, Ecology & Evolution 8: 10298-10305). Collectively, Carpenter and Warner Nature Centers have more live recapture data than exist in all



PROJECT TITLE: Archiving Unreported Band Recoveries of Minnesota Birds

F. Project Manager Qualifications and Organization Description

Todd Arnold (Ph.D., Zoology, University of Western Ontario, 1990) is a Professor in the Department of Fisheries, Wildlife & Conservation Biology at the University of Minnesota. He has published more than 100 papers in professional journals, including several recent papers on using banding data to estimate survival rates and reproductive success in birds.

Jennifer Vieth (BSch, Biology, Queen's University) is the Executive Director of Carpenter St. Croix Valley Nature Center. She is a federally permitted Master Bird Bander whose field work experience includes: seasonal tech for Queen's University at La Perouse Bay, Manitoba, banding Snow Geese goslings; assistant Director of Field Studies (World Bird Sanctuary) nest box monitoring program for AmerenUE grant, surveying wild bird populations, including banding, at multiple sites for environmental assessment studies for corporations including Holcim, and volunteer field work for MN Important Bird Area program and USGS Breeding Bird Survey.

ORGANIZATION DESCRIPTION:

The Department of Fisheries, Wildlife and Conservation Biology (FWCB) is one of 14 departments in the University of Minnesota's College of Food, Agricultural and Natural Resource Sciences. The mission of FWCB is to foster a high quality natural environment by contributing to the management, protection, and sustainable use of fisheries and wildlife resources through teaching, research, and outreach. FWCB faculty have a long and productive track record of successfully managing LCCMR projects.

Carpenter Nature Center is a 501 c 3 non-profit organization that serves 25,000-35,000 visitors per year through K-12 Environmental Education Programming and public events. The Nature Center operates two campuses, one in Minnesota and one in Wisconsin, just south of the Hudson City limits. Together the campuses protect 725 acres of wildlife habitat. Carpenter Nature Center has monitored wild birds via a weekly bird banding program for 38 years under former Executive Director, Jim Fitzpatrick and current director, Jennifer Vieth.