



Environment and Natural Resources Trust Fund (ENRTF)

M.L. 2018 ENRTF Work Plan (Main Document)

Today's Date: February 22, 2017

Date of Next Status Update Report: January 1, 2019

Date of Work Plan Approval:

Project Completion Date: June 30, 2021

Does this submission include an amendment request? No

PROJECT TITLE: Conserving Minnesota's Forest Birds of Management Concern

Project Manager: Alexis Grinde

Organization: Natural Resources Research Institute, University of Minnesota Duluth

College/Department/Division: Forest and Land Initiative

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Location: Northern Minnesota

Total Project Budget: \$500,000

Amount Spent: \$0

Balance: \$500,000

Legal Citation: M.L. 2018, Chp. xx, Sec. xx, Subd. xx

Appropriation Language:

I. PROJECT STATEMENT:

Minnesota's managed forests provide critical breeding habitat for hundreds of resident and migrating bird species. Therefore, forest management provides an important opportunity to conserve and cultivate critical habitat for species of conservation concern. On-going and future changes to Minnesota's forests are likely to have substantial consequences on forest bird communities. Indeed, several species that breed in Minnesota's forests have been identified as Species in Greatest Conservation Need (SGCN) by MN DNR and as Stewardship Birds of Minnesota by Audubon Minnesota. Golden-winged Warbler, Veery, and American Woodcock are species of conservation concern in Minnesota that have had significant population declines throughout their breeding ranges and all have a large portion of their breeding populations in Minnesota's young forests.

- Golden-winged Warbler is one of the most critically threatened birds in North America with a global population estimated at only 400,000 individuals, and approximately 50% of the global population nesting in Minnesota.
- Veery populations have experienced a global decline of over 40% from 1970 to 2014; approximately 6% of its global breeding population occurs in Minnesota's forests.
- American Woodcock populations have declined by over 30% in North America in the past 50 years; approximately 10% of the global population breeds in Minnesota.

Densities of Golden-winged Warbler, Veery, and American Woodcock are highest in young, wet forests of Minnesota; this forest type is increasingly threatened due to urbanization, agricultural development, and maturation of early successional forests across the state. Historically, periodic natural disturbances would create habitat for these species—wildfires or flooding from beaver dams created a patchwork of shrubby openings amid a largely forested landscape. Currently, the major mechanism of disturbance is harvest, providing an important opportunity for habitat management of these species.

For breeding birds, conservation efforts are most effective when management plans include recommendations to maximize breeding season (nesting to post-fledgling) productivity. However, the period of time directly after young birds leave the nest and before they disperse and/or migrate (i.e., the post-fledgling period) remains an understudied life stage. To address this knowledge gap, we will use radio telemetry to study movements, cover-type selection, and survival of fledglings to determine how they use forests during the critical post-fledgling period. Our project will identify characteristics of young forests and forest management actions that maximize breeding season productivity for these species of conservation concern. Our specific objectives are to:

1. Quantify nesting habitat, nest success, and juvenile survival for Golden-winged Warbler, Veery, and American Woodcock in managed forests.
2. Quantify habitat use of Golden-winged Warbler, Veery, and American Woodcock juveniles during the post-fledgling period within managed forest plots in Minnesota
3. Provide breeding cycle habitat management recommendations for managing landscapes to maximize Golden-winged Warbler, Veery, and American Woodcock productivity and conservation.

II. OVERALL PROJECT STATUS UPDATES:

First Update January 1, 2019

Second Update July 1, 2019

Third Update January 1, 2020

Final Update June 30, 2021

III. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Assess nesting habitat requirements for Golden-winged Warbler, Veery, and American Woodcock

Description:

We will utilize data collected from our long-term study areas in managed forests of northern Minnesota to identify study sites in young forest stands that have high densities of our focal species. We will search for nests using a combination of standard nest searching methods and by radio-monitoring females to find nests. Upon finding nests, we will record and monitor their progress using nest cameras and field observer nest checks at regular intervals. We will record observations of nestling behavior such as begging or sitting quietly and adult activities such as feeding nestlings, chipping, singing, or not present. We will document sources of mortality and nest failure (if possible); nests that fledge at least one young will be considered successful. 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.

ENRTF BUDGET: \$ 167,468

Outcome	Completion Date
1. Locate and monitor Golden-winged Warbler, Veery, and American Woodcock nests in the 2019 and 2020 breeding seasons.	August 2020
2. Evaluate factors associated with nest success and hatchling survival.	December 2020

ACTIVITY 2: Assess habitat use of juvenile Golden-winged Warbler, Veery, and American Woodcock

Description:

As nestlings approach the fledging stage (~7-8 days post-hatch), we will tag juveniles with radio-transmitters. Juveniles will be tracked daily using a combination of ground telemetry methods, unmanned aerial vehicles (UAVs), and automated telemetry stations to identify movements for approximately 20 days post-fledging. Using these cutting-edge technologies we will be able to obtain space-use data of fledglings at multiple spatial and temporal scales. We will use standard telemetry techniques to obtain GPS locations of tagged birds, however because accuracy of these points is often limited in dense, regenerating forests we will also attach VHF radio receivers and antenna to UAVs to perform broad sweeps of the study areas. This technique will allow us to obtain multiple locations of tagged birds in a study area daily, further the accuracy of location data may be improved by tracking birds above the canopy. Finally, we will deploy automated telemetry stations in a grid across the study area; strength of the signals of tagged individuals detected at each station will provide information about direction and rate of movements over time.

Juveniles will be tracked 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) the 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”. Therefore on each day, every juvenile will have a “used” and paired “available” survey location. These data points will allow for analyses that show the extent to which fledglings select for specific cover types and habitat features that are associated with forest management. 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.

ENRTF BUDGET: \$ 249,969

Outcome	Completion Date
1. Tag juveniles with radio-transmitters as they approach the fledgling stage of development in the 2019 and 2020 breeding seasons.	August 2020
2. Track juveniles daily and record habitat use for 14-21 days during the 2019 and 2020 post-breeding season.	August 2020
3. Document and evaluate juveniles space use and movement in relation to available cover type and forest structure.	December 2020

First Update January 1, 2019
Second Update July 1, 2019
Third Update January 1, 2020
Final Update June 30, 2021

ACTIVITY 3: Activity 3: Develop forest management strategies to maximize Golden-winged Warbler, Veery, and American Woodcock productivity

Description:

Findings from Activities 1 and 2 will be integrated to establish habitat management guidelines that account for the interrelationships among nesting and juvenile habitat use and survival. Habitat guidelines will identify cost effective forest management strategies that improve, protect, and enhance young forest habitats to maximize breeding season productivity of focal species.

ENRTF BUDGET: \$ 82,563

Outcome	Completion Date
1. Compilation and integration of nesting and juvenile habitat use.	February 2021
2. Development of habitat management guidelines to be used by land managers to maximize breeding season productivity of focal species.	June 2021

First Update March 30, 2019
Second Update March 30, 2020
Third Update September 30, 2020
Final Update June 30, 2021

IV. DISSEMINATION:

Scientific publications: We expect that this project will produce at least 3 peer reviewed journal articles focusing on post-breeding habitat use for these species.

Presentations: Results will be disseminated through local, regional, and national conferences.

Data: Publically available data will be hosted through the Natural Resources Research Institute website.

Project partners will use the results of this study to identify and improve forestry practices to benefit Minnesota’s birds. Recommendations will be provided to public and private land managers to facilitate land use planning that maximizes Golden-winged Warbler, Veery, and American Woodcock breeding season productivity to help conserve these species of concern in Minnesota.

Description:

First Update January 1, 2019
Second Update July 1, 2019
Third Update January 1, 2020
Final Update June 30, 2021

V. PROJECT BUDGET SUMMARY:

A. Preliminary ENRTF Budget Overview: See attached budget spreadsheet

Explanation of Capital Expenditures Greater Than \$5,000: n/a

Explanation of Use of Classified Staff: n/a

Total Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: 4.95 FTE

Enter Total Estimated Personnel Hours: 10,300	Divide by 2,080 = TOTAL FTE: 4.95
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Total Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation:

Enter Total Estimated Personnel Hours: 0	Divide by 2,080 = TOTAL FTE: 0
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B. Other Funds:

SOURCE OF AND USE OF OTHER FUNDS	Amount Proposed	Amount Spent	Status and Timeframe
Other Non-State \$ To Be Applied To Project During Project Period:			
	\$ n/a	\$ n/a	
Other State \$ To Be Applied To Project During Project Period:			
	\$ n/a	\$ n/a	
Past and Current ENRTF Appropriation:			
	\$ n/a	\$ n/a	
Other Funding History:			

This project is building on 5 years of monitoring of breeding birds in large managed forest plots.	\$ n/a	\$ 125,000	Project began in 2012 and was completed in 2017.
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VI. PROJECT PARTNERS:

A. Partners receiving ENRTF funding

Name	Title	Affiliation	Role

B. Partners NOT receiving ENRTF funding

Name	Title	Affiliation	Role
Sawyer Scherer	Forest Ecologist	UPM Blandin Company	Coordinating with study site selection

VII. LONG-TERM- IMPLEMENTATION AND FUNDING: The project is an extension of a long-term study (20 year) that has documented the impacts of forest management on Minnesota’s breeding birds. This project will provide the data to assess habitat use of three species of conservation concern to better understand habitat associations across their entire breeding cycle. The results from this study will determine how forest harvests should be designed to maximize benefits for these species and identify habitat attributes that optimize nesting and brood-rearing success for these species. Identification and implementation of science-based best management practices that create or maintain Golden-winged Warbler, Veery, and American Woodcock breeding habitat is an important step towards sustaining and enhancing populations of these species in the state, plus reversing the widespread population declines observed throughout their breeding ranges. Findings and data generated from this project will also serve as a foundational resource to prioritize and assess future threats to Minnesota’s birds.

VIII. REPORTING REQUIREMENTS:

- The project is for 3 years, will begin on July 1, 2018 and end on June 30, 2021.
- Periodic project status update reports will be submitted January 1 and June 1 of each year.
- A final report and associated products will be submitted between June 30 and August 15, 2021.

IX. SEE ADDITIONAL WORK PLAN COMPONENTS:

- A. Budget Spreadsheet
- B. Visual Component or Map
- C. Parcel List Spreadsheet
- D. Acquisition, Easements, and Restoration Requirements
- E. Research Addendum

Attachment A:
Environment and Natural Resources Trust Fund
M.L. 2018 Budget Spreadsheet



Project Title: Conserving Minnesota's Forest Birds of Management Concern
Legal Citation:
Project Manager: Alexis Grinde
Organization: Natural Resources Research Institute, University of Minnesota Duluth
College/Department/Division: Forest and Land Initiative
M.L. 2018 ENRTF Appropriation: \$500,000
Project Length and Completion Date: 3 years, June 30, 2021
Date of Report: 2-22-2018

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	TOTAL BUDGET	AMOUNT SPENT	TOTAL BALANCE
BUDGET ITEM			
Personnel (Wages and Benefits)	\$386,910		\$386,910
Alexis Grinde, Principal Investigator (66.5% salary, 33.5% benefits); 21% effort each year for 3 years. \$67,340			
Research Scientists, (2), Fieldwork, Data Collection and Analysis (66.5% salary, 33.5% benefits); 43% effort each year for 3 years. \$192,880			
Field technicians (4), Nest searches, Telemetry and Vegetation Sampling (92.3% salary, 7.7% benefits); 90% cumulative effort 3 months per year for 3 years. \$77,565			
Bird banders (2) (92.3% salary, 7.7% benefits); 100% cumulative effort each year in Y1 and Y2. \$15,125			
Undergraduate Research Assistant, Assist field technicians and data entry (100% salary); 45% effort each year in Y1 and Y2. \$34,000			
Equipment/Tools/Supplies: \$103,090			
3 VHF Radio Receivers telemetry receivers (incl. antennas) @ \$5000 ea used to track birds. \$15,000	\$15,000		\$15,000
3 unmanned aerial vehicles (UAVs) will be used to mount the receivers and track fledglings over large distances @ \$6000 ea. \$18,000	\$18,000		\$18,000
30 nest cameras to track nestling survival, hatch date, and predation events @ \$150. \$4,500	\$4,500		\$4,500
240 transmitters (\$150 ea.) to attach to birds to track their movements . \$36,000	\$36,000		\$36,000
4 GPS units to map precise locations of fledglings (\$197 ea.). \$790.	\$790		\$790
6 automated telemetry stations to track long-range movements in remote locations (\$4800 ea.). \$28,800	\$28,800		\$28,800
Travel expenses in Minnesota	\$10,000		\$10,000
Travel for fieldwork, including mileage (75%) and lodging (25%) for researchers and banders. Mileage will be reimbursed at \$0.535/mile (University of MN rate). Travel is largely associated with large-scale (state-wide) deployment and maintenance of the Motus receivers during the spring and fall migration. Lodging is estimated between (\$90-\$130 per night). \$10,000			
COLUMN TOTAL	\$500,000		\$500,000

Breeding habitat for Golden-winged Warbler, Veery, and American Woodcock



Which forest management actions maximize breeding season productivity?



Golden-winged Warbler



Veery



American Woodcock

