Environment and Natural Resources Trust Fund (ENRTF)

M.L. 2020 ENRTF Work Plan (Main Document)

Today's Date: 02/10/2020

Date of Next Status Update Report: 04/01/2021

Date of Work Plan Approval:

Project Completion Date: 06/30/2023

Does this submission include an amendment request? __

PROJECT TITLE: Conserving Black Terns and Forster's Terns in Minnesota

Project Manager: Annie Bracey

Organization: Natural Resources Research Institute, University of Minnesota Duluth

College, Department, or Division: Forest and Land Initiative

Mailing Address: 5013 Miller Trunk Highway

City, State, Zip Code: Duluth, MN 55811

Project Manager Direct Telephone Number: 218-788-2649

Email Address: brace005@d.umn.edu

Web Address: nrri.umn.edu

Location: Statewide

Total Project Budget: $198,000

Amount Spent: $0

Balance: $198,000

Legal Citation: M.L. 2020, Chp. xx, Sec. xx, Subd. xx

Appropriation Language:

PROJECT STATEMENT:

We will conduct a comprehensive assessment of the current and historical distribution and abundance of the Black Tern and Forster's Tern in Minnesota. We will identify population limiting factors associated with habitat suitability, allowing us to create best management practices and prioritize conservation and restoration efforts in the state.

Black and Forster's terns are waterbirds that breed in freshwater wetlands with extensive emergent vegetation and open water, preferably located within large wetland complexes. These species have similar habitat preferences and can often be found nesting in the same wetlands. Populations of both species have declined significantly throughout their range in North America over the last 50 years. In Minnesota, Black Terns have experienced a large and statistically significant decline since 1966, decreasing an average of 5.8% per year for a loss of nearly 96% of the state population over 53 years. It has been suggested that the distribution and abundance of Forster's Terns has remained relatively unchanged in the state since the 1980s, although numbers remain low, likely <1,000 nesting pairs. For these reasons, both species are designated as Species in Greatest Conservation Need by the Minnesota DNR and Target Conservation Species by Audubon Minnesota.

The main cause of population declines in Minnesota is hypothesized to be loss of suitable nesting habitat and habitat degradation due to invasive plants such as *Phragmites*, purple loosestrife, and hybrid cattail. However, based on habitat preferences, suitable nesting habitat appears to exist in the state that is not currently being used by these species. Therefore, it is important to characterize changes associated with development, hydrology, and invasive species that have occurred in wetlands that have historically been used for breeding. Given the low site fidelity of Black Terns and the apparent lack of colonization of new sites by Forster's Terns, quantifying landscape changes associated with abandoned colonies in addition to identifying important characteristics of breeding colonies that have persisted over time will allow us to prioritize and develop recommendations for habitat restoration.

II. OVERALL PROJECT STATUS UPDATES:

First Update April 1, 2021

Second Update October 1, 2021

Third Update April 1, 2022

Fourth Update October 1, 2022

Fifth Update April 1, 2023

Final Report between project end (June 30) and August 15, 2023

III. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1 Title: Data integration of historical and current breeding sites and wetland monitoring prioritization.

Description:

To develop a comprehensive assessment of potential priority wetland complexes we will reach out to project partners to obtain historical and current breeding records for Black and Forster's terns. We will contact wildlife partners from MNDNR, MNBBA, MOU, and Audubon Minnesota to obtain all relevant data. We will use the global surface water dataset (https://global-surface-water.appspot.com/) to characterize wetlands used for breeding and assess changes in landscape characteristics such as

development, changes in hydrology, and introduction of invasive species that have occurred over time. We will use these data to model wetland characteristics of successful colonies and identify priority wetlands for monitoring.

ACTIVITY 1 ENRTF BUDGET: $ 36,740

Outcome	Completion Date
1. *Obtain and merge data sources and integrate into the breeding colony geospatial database.*	*October 2020*
2. *Characterize wetlands used for breeding over time and analyze impacts of landscape changes on breeding colony persistence.*	*April 2021*
3. *Identify priority wetlands to use as focal study sites.*	*May 2021*

Activity 2 Title: Determine site quality and habitat characteristics of priority wetlands

Description:

We will locate and inventory potential nesting areas to monitor the status of breeding colonies in priority wetlands. Monitoring will be conducted using a combination of in-person visits and drones. This activity will allow us to assess the feasibility of using drones as part of a long-term monitoring program for tern colonies across the state. We will measure hydrological changes, water quality, and food availability to assess site-specific conditions. We will also quantify habitat characteristics of breeding colony locations in the wetlands along with features of individual nest locations. Specifically, we will characterize features associated with presence of both species relative to breeding status including interspersion of hemi-marsh, water level control mechanisms, presence of invasive species, and land use around the wetlands. These data will allow us to determine characteristics of productive colonies, identify features that impact colony success, develop best practices for public land managers, and provide metrics for restoration and conservation initiatives.

ENRTF BUDGET: $ 132,860

Outcome	Completion Date
1. Conduct tern monitoring surveys at priority wetlands for two breeding seasons using a combination of field visits and drones to estimate site abundance and nest density.	*August 2022*
2. Collect data to characterize site quality (water quality, hydrology, and food availability) and habitat features (% open water / vegetation, size of complex, density of invasives) of priority wetlands, breeding locations within wetlands, and individual nest site locations.	*August 2022*
3. Determine characteristics of productive colonies and identify limiting factors for breeding colonies across the landscape.	*Dec 2022*

Activity 3 Title: Identify priority wetland sites for restoration and develop long-term monitoring protocol for breeding tern colonies.

Description:

To increase the availability of suitable breeding habitat for Black and Forster's terns in the state we will use the landscape model developed in Activity 1 to identify wetland sites that are most likely to sustain breeding tern colonies. We will use the information from Activity 2 to develop site specific

restoration plans for these wetlands to ensure the restored sites meet the site quality and habitat characteristics needed for successful breeding colonies. We will use the monitoring data collected in Activity 2 to develop best practices for long-term monitoring of breeding tern colonies.

ENRTF BUDGET: $28,400

Outcome	Completion Date
1. Identify priority sites for restoration and develop site specific restoration plans.	*June 2023*
2. Determine viability of using drones for monitoring breeding colonies and develop protocol for long-term monitoring of breeding tern colonies.	*June 2023*

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Fifth Update April 1, 2023

Final Report between project end (June 30) and August 15, 2022

IV. DISSEMINATION:

Description:

Presentations: We will disseminate our results at local, regional, and national conferences as well as to agencies and NGOs interested in our results (e.g., Audubon Minnesota, The American Bird Conservancy).

Data Storage/Data Sharing: Data will be housed at the Natural Resources Research Institute and be available to the public upon request.

Samples: Any physical samples (e.g., insects collected) will be housed and processed at a laboratory at the Natural Resources Research Institute.

Results: We will inform the public of our project goals, progress, and results through a variety of media sources (e.g., online at Natural Resources Research Institute). We also anticipate at least two peer-reviewed journal articles focusing on 1) habitat use by these species and 2) landscape-scale factors influencing colony persistence. Results will be shared with organizations such as Minnesota Audubon, Minnesota Land Trust, and Minnesota Department of Natural Resources to help identify priority locations for protection and potential restoration efforts and to provide information about how to most effectively continue to monitor these species in the state.

All publicity, including media coverage, presentations given, or conferences attended will be reported to LCCMR during periodic status updates. The Minnesota Environment and Natural Resources Trust Fund (ENRTF) will be acknowledged through use of the trust fund logo or attribution language on project print and electronic media, publications, signage, and other communications per the ENRTF Acknowledgement Guidelines.

First Update April 1, 2021

Second Update October 1, 2021

Third Update April 1, 2022

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Fifth Update April 1, 2023

Final Report between project end (June 30) and August 15, 2023

V. ADDITIONAL BUDGET INFORMATION:

A. Personnel and Capital Expenditures

Explanation of Capital Expenditures Greater Than $5,000:

We will need to purchase a drone platform and camera to complete Activity 2: to determine whether drones are effective for identifying nests and for collecting site-level imagery. We estimate this cost to be $8,400. This drone will be used for the duration of the project and to support potential continuation of this project.

Explanation of Use of Classified Staff: N/A

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

Enter Total Estimated Personnel Hours for entire duration of project: **5,610**	Divide total personnel hours by 2,080 hours in 1 yr = TOTAL FTE: **2.70**

Total Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation:

Enter Total Estimated Contract Personnel Hours for entire duration of project: **0**	Divide total contract hours by 2,080 hours in 1 yr = TOTAL FTE: **0**

VI. PROJECT PARTNERS:

The project team includes Annie Bracey (PI) from the Natural Resources Research Institute (NRRI), Dr. Alexis Grinde (NRRI), and Dr. Francesca Cuthbert (UMN-TC). The project team will work closely with Minnesota Audubon, Minnesota Land Trust, and Minnesota DNR to develop monitoring protocols and restoration plans.

A. Partners outside of project manager's organization receiving ENRTF funding: **N/A**
B. Partners outside of project manager's organization NOT receiving ENRTF funding: **N/A**

VII. LONG-TERM- IMPLEMENTATION AND FUNDING:

This project builds on several current and previous LCCMR funded projects including the "Minnesota Breeding Bird Atlas" (NRRI/Audubon Minnesota), "Implementing Conservation Plans for Avian Species of Concern" (Audubon Minnesota), and "Creating a Statewide Wetland Bird Survey" (Audubon Minnesota). Our breeding colony monitoring protocol and restoration guide will be distributed to land mangers throughout the state. Additional funding will be needed to continue long-term monitoring of breeding terns; we will seek additional funds from available state and federal resources to ensure the long-term conservation of these imperiled species.

VIII. REPORTING REQUIREMENTS:

- Project status update reports will be submitted April 1 and October 1 each year of the project
- A final report and associated products will be submitted between June 30 and August 15, 2023

IX. SEE ADDITIONAL WORK PLAN COMPONENTS:

A. Budget Spreadsheet: See attached spreadsheet '2020-02-10 Bracey Draft Budget'

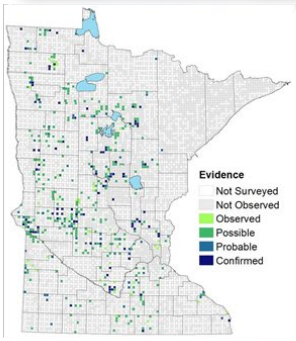
B. Visual Component or Map: See below

C. Parcel List Spreadsheet: N/A

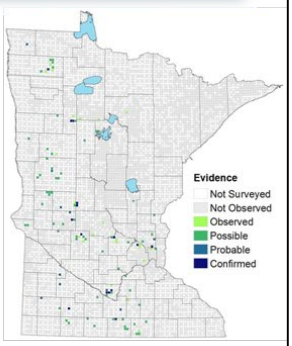
D. Acquisition, Easements, and Restoration Requirements: N/A

E. Research Addendum: Will be submitted separately per LCCMR staff instructions

B. Visual Component



We will conduct a comprehensive assessment of the current and historical status and distribution of Black Tern and Forster's Tern. Determining site quality and habitat characteristics of breeding colonies will allow us to create best management practices and prioritize conservation and restoration efforts.



Attachment A: Project Budget Spreadsheet
Environment and Natural Resources Trust Fund
M.L. 2020 Budget Spreadsheet
Legal Citation:
Project Manager: Annie Bracey
Project Title: Conserving Black Terns and Forster's Terns in Minnesota
Organization: Natural Resources Research Institute, University of Minnesota Duluth
Project Budget: $ 198,000
Project Length and Completion Date: 3 years; June 30, 2023
Today's Date: February 10, 2020

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Budget	Amount Spent	Balance
BUDGET ITEM			
Personnel (Wages and Benefits)	$ 168,840	$ -	$ 168,840
A. Bracey, Avian ecologist at Natural Resources Research Institute: $47,671 (74% salary, 26% fringe), 18% FTE for 3 years. *Note that NRRI research staff salaries are largely sponsored by external funds.			$ -
A. Grinde, Research Program Manager at Natural Resources Research Institute; Co-PI: $3,664 (74% salary, 26% fringe), 1% FTE for 3 years.			$ -
F. Cuthbert, Professor, University of Minnesota; Co-PI: $6,190 (74% salary, 26% fringe), 1% FTE for 3 years.			$ -
Graduate Research Assistant: $79,938 (86% salary, 14% fringe) and tuition reimbursement in AY; 50% FTE AY and 50% FTE SUM for 2 years.		$ -	$ -
Research assistant: $10,329 (92% salary, 8% fringe), 10% FTE for 3 years.		$ -	$ -
Research scientists: $21,068 (77% salary, 23% fringe), 10% FTE for 3 years.		$ -	$ -
Equipment/Tools/Supplies			$ -
Wildlife monitoring and hydrology equipment (Acitivity 2): drone platform and camera @ $7,760.00, remote camera system for monitoring colony status (20 @ $300.00 each = $6,000), misc field supplies (batteries, wader, etc. $1,000.00), pressure transducers for continuous water table monitoring of wetland sites (12 @ $330.00 each)	$ 18,720	$ -	$ 18,720
			$ -
Travel expenses in Minnesota			$ -
Travel to the research sites multiple times each year to collect data related for Activity 2. Two people will visit each of ~36 wetlands 1-2 times each year for 2 years. We estimate (8,000 miles x $0.58/mi = $4,640), due to long distances between sites. Travel expenses include lodging @ ~$100.00/night x 40 nights = $4,000 for 2 people) and meal allowance ($45/day x 40 days = $1,800) for graduate students, research associates, and field technicians.	$ 10,440	$ -	$ 10,440
Other			$ -
	$ -	$ -	$ -
COLUMN TOTAL	$ 198,000	$ -	$ 198,000

SOURCE AND USE OF OTHER FUNDS CONTRIBUTED TO THE PROJECT	Status (secured or pending)	Budget	Spent	Balance
Non-State:		$ -	$ -	$ -
State:		$ -	$ -	$ -
In kind: Unrecovered F&A @ 54% MTDC	Secured	$ 84,063	$ -	$ 84,063
Other ENRTF APPROPRIATIONS AWARDED IN THE LAST SIX YEARS	**Amount legally obligated but not yet spent**	**Budget**	**Spent**	**Balance**