Environment and Natural Resources Trust Fund

M.L. 2020 Approved Work Plan

General Information

ID Number: 2020-007

Staff Lead: Corrie Layfield

Date this document submitted to LCCMR: August 13, 2021

Project Title: Conserving Black Terns And Forster's Terns In Minnesota

Project Budget: $198,000

Project Manager Information

Name: Annie Bracey

Organization: U of MN - Duluth - NRRI

Office Telephone: (218) 788-2649

Email: brace005@d.umn.edu

Web Address: https://www.nrri.umn.edu/

Project Reporting

Date Work Plan Approved by LCCMR: August 13, 2021

Reporting Schedule: April 1 / October 1 of each year.

Project Completion: June 30, 2024

Final Report Due Date: August 14, 2024

Legal Information

Legal Citation: M.L. 2021, First Special Session, Chp. 6, Art. 5, Sec. 2, Subd. 03o

Appropriation Language: $198,000 the second year is from the trust fund to the Board of Regents of the University of Minnesota for the Natural Resources Research Institute in Duluth to assess the distribution and breeding status of black tern and Forster's tern and to make conservation and restoration recommendations to improve the suitability of habitat for these two bird species in Minnesota.

Appropriation End Date: June 30, 2024

Narrative

Project Summary: Black and Forster's tern populations have declined. Comprehensive assessment of distribution and breeding status will identify population limiting factors to inform best management practices and prioritize conservation and restoration.

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

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 Department of Natural Resources 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.

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.

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.
1) We will conduct a comprehensive assessment of the current and historical distribution and abundance of the Black Tern and Forster's Tern in Minnesota based on best available data.
2) We will classify habitat suitability and identify key habitat features associated with colony persistence, which will allow us to provide recommendations for best management practices and to prioritize conservation and restoration efforts.
3) We will develop systematic protocols for long-term monitoring of these species in the state.

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?

This project will develop long-term monitoring and conservation management plans for Black and Forster's Terns in Minnesota. It will identify management actions for land managers at both site-specific and landscape-level scales. Our results will help inform managers and land-owners about best practices for restoring nesting habitat for these species of conservation concern and will help identify where restoration efforts are most likely to be effective. We will share outcomes with land managers, state and federal government agencies, and non-profit organizations working to conserve these species.

Project Location

What is the best scale for describing where your work will take place?

Statewide

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

Statewide

When will the work impact occur?

In the Future

Activities and Milestones

Activity 1: Data integration of historical and current breeding sites and wetland monitoring prioritization

Activity Budget: $36,740

Activity Description:
To develop a comprehensive assessment of potential priority wetland complexes, we will communicate with project partners to obtain historical and current breeding records for Black and Forster's terns in Minnesota. We will contact wildlife partners from MNDNR, MNBBA, Minnesota Ornithologists' Union, and Audubon Minnesota to obtain all relevant data and compile it into one geospatial database. We will then use the Global Surface Water dataset (https://global-surface-water.appspot.com/) to characterize changes in water occurrence; the US Geological Survey (USGS) National Land Cover Database (NLCD; https://www.mrlc.gov/data/nlcd-land-cover-change-index-conus) to characterize land cover at multiple spatial scales (e.g., 500m,1km, 50km) and to quantify changes in land use (e.g., % agriculture and development); and the USGS Nonindigenous Aquatic Species (NAS) Database (https://nas.er.usgs.gov/default.aspx) and/or the Early Detection & Distribution Mapping System (EDDMapS) Database (https://www.eddmaps.org/) to identify the presence of invasive plant species at wetlands that have historically been used and/or are currently being used as breeding sites for one or both species (Fig. 2). We will use these data to model landscape-level wetland characteristics of successful colonies and identify priority wetlands for detailed monitoring efforts.

Activity Milestones:

Description	Completion Date
Obtain and merge data sources and integrate into the breeding colony geospatial database.	October 31, 2021
Characterize wetlands used for breeding and analyze impacts of landscape changes on colony persistence	April 30, 2022
Identify priority wetlands to use as focal study sites.	May 31, 2022

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

Activity Budget: $131,860

Activity 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, in areas that allow drone flights and where use of drones is logistically feasible. 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 features, collect water quality data, and develop an index of food availability to assess site-specific conditions. We will also characterize habitat associated with breeding colony locations in the wetlands along with features of individual nest locations. Specifically, we will assess habitat 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.

Activity Milestones:

Description	Completion Date
Conduct tern monitoring at priority wetlands for two breeding seasons using in-person surveys and drones	August 31, 2023
Collect data to characterize site quality and habitat features at a subset of priority wetlands	August 31, 2023

Determine characteristics of productive colonies and identify limiting factors for breeding colonies across the state	December 31, 2023

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

Activity Budget: $29,400

Activity 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 restoration and long-term monitoring of breeding Black and Forster's tern colonies in Minnesota.

Activity Milestones:

Description	Completion Date
Identify priority sites for restoration and develop site specific restoration plans.	June 30, 2024
Determine viability of using drones for monitoring and develop protocol for long-term monitoring	June 30, 2024

Dissemination

Describe your plans for dissemination, presentation, documentation, or sharing of data, results, samples, physical collections, and other products and how they will follow ENRTF Acknowledgement Requirements and Guidelines.
This project will provide foundational information necessary to assess the habitat characteristics that are important for breeding colonies of Black Terns and Forster's Terns in Minnesota. We will use the data collected to identify population limiting factors associated with habitat suitability, provide guidance on best management practices that will help to prioritize conservation and restoration efforts. We will distribute our findings to the Minnesota Department of Natural Resources and Audubon Minnesota as well as suggested protocols we develop for long-term monitoring of these species. The findings will be distributed to stakeholders and will be made available via the Natural Resources Research Institute website. In addition, we expect at least one manuscript to be written and submitted for publication in peer-reviewed journals. Results will also be disseminated through webinars and through local, regional, and national conferences. We will acknowledge the ENTRF funding in publications, signage, and other public communications and outreach related to work associated with the project using the trust fund logo or inclusion of language attributing support from the trust fund as appropriate.

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 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.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
Principal Investigator		Project management and coordination.			26%	0.54		$48,932
Co-Investigators		Provide advice and guidance on project implementation, analyses, and interpretation.			26%	0.03		$5,646
Research Scientists		Assist with project design, data collection and analysis.			24%	0.3		$21,975
Research Assistant/Field Technician		Assist with data collection.			8%	0.3		$10,311
Graduate Student (MS)		Lead field data collection and analysis.			46%	1		$83,478
							Sub Total	**$170,342**
Contracts and Services								
							Sub Total	-
Equipment, Tools, and Supplies								
	Equipment	Unmanned Aerial Vehicle (UAV) (qty= 2; $2,025 ea.; estimates are associated with DJI Phantom 4 model)	Required to collect UAV aerial imagery for documenting colony characteristics and breeding activity.					$4,050
	Tools and Supplies	Wildlife monitoring and hydrology equipment	Includes remote cameras (e.g., trail cameras) to monitor colony status, pressure transducers for monitoring water levels, misc. supplies for data collection (e.g., batteries, waders, SD cards)					$10,188
	Equipment	Rechargeable batteries for drones	Additional set of batteries and charger for the drones to extend flight times.					$1,100
	Equipment	Drone camera with attachment (qty =2; $940 ea.)	Camera to capture drone footage and document colony characteristics and breeding activity.					$1,880

							Sub Total	**$17,218**
Capital Expenditures								
							Sub Total	**-**
Acquisitions and Stewardship								
							Sub Total	**-**
Travel In Minnesota								
	Miles/ Meals/ Lodging	Miles (~8,000 x $0.58 per mile), Meals ($45/day x 40 days x 2 people), Lodging ($100/night x 40 nights) x 2 years	Funds required to travel to field sites and conduct fieldwork					$10,440
							Sub Total	**$10,440**
Travel Outside Minnesota								
							Sub Total	**-**
Printing and Publication								
							Sub Total	**-**
Other Expenses								
							Sub Total	**-**
							Grand Total	**$198,000**

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	$86,965
			Non State Sub Total	**$86,965**
			Funds Total	**$86,965**

Attachments

Required Attachments

Visual Component

File: 911edc31-a68.docx

Alternate Text for Visual Component

Black Tern and Forster's Tern are pictured in flight. Maps of the distribution of the species in the state, typical wetland habitats and a shallow nest with three eggs on a floating mat of vegetation are also pictured. Text reads: 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 priorit...

Optional Attachments

Support Letter or Other

Title	File
ENRTF Background Check Certification Form	ceb20c13-c63.pdf

Difference between Proposal and Work Plan

Describe changes from Proposal to Work Plan Stage

We updated the years and altered the budget to reflect changes in salaries and supply costs which align with the recommended funding amount. This adjustment resulted in $1,000 less than the amount in the proposal.

In regards to the LCCMR comments:

For comment 1152 'Budget': We itemized the drone set-up into drones, camera, and rechargeable batteries as individual pieces of equipment and added more details about each item and the costs to clarify the expected equipment needs.

For comment 1153 'Dissemination': We added the ENTRF acknowledgements in the dissemination section.

Additional Acknowledgements and Conditions:

The following are acknowledgements and conditions beyond those already included in the above workplan:

Do you understand and acknowledge the ENRTF repayment requirements if the use of capital equipment changes?

N/A

Do you agree travel expenses must follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?

Yes, I agree to the UMN Policy.

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?

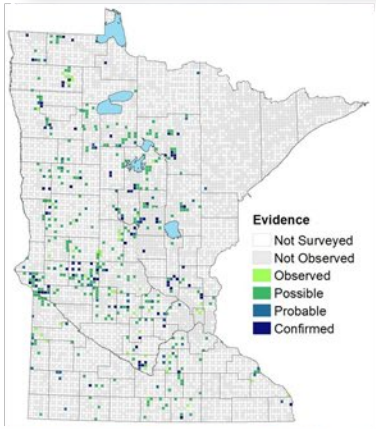
N/A

Does your project include original, hypothesis-driven research?

Yes

Does the organization have a fiscal agent for this project?

Yes, Sponsored Projects Administration



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.