**PROJECT TITLE: Conserving Black Terns and Forster’s Terns in Minnesota**

**I. 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. PROJECT ACTIVITIES AND OUTCOMES**

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| **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. |  |

**ENRTF BUDGET: $ 36,740**

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| **Outcome** | **Completion Date** |
| *1. Obtain and merge data sources and integrate into the breeding colony geospatial database.* | *Oct. 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* |

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| **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: $ 133,500** | |  | |
| **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* | |

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| **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* | |

**III. PROJECT PARTNERS AND COLLABORATORS:** 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.

**IV. 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.