



Environment and Natural Resources Trust Fund (ENRTF) M.L. 2019 ENRTF Work Plan (Main Document)

Today's Date: 7 February 2019

Date of Next Status Update Report: 1 April 2020

Date of Work Plan Approval:

Project Completion Date: 30 June 2023

Does this submission include an amendment request? ___

PROJECT TITLE: Minnesota Trumpeter Swan Migration Ecology and Conservation

Project Manager: David E. Andersen

Organization: U.S. Geological Survey, Minnesota Cooperative Fish and Wildlife Research Unit and University of Minnesota

College/Department/Division: University of Minnesota/Department of Fisheries, Wildlife, and Conservation Biology

Mailing Address: 200 Hodson Hall, 1980 Folwell Avenue

City/State/Zip Code: St. Paul/Minnesota/55108

Telephone Number: (612) 6226-1222

Email Address: dea@umn.edu/dea@usgs.gov

Web Address: <http://mncoopunit.cfans.umn.edu/> and <https://www.coopunits.org/Minnesota/>

Location: Statewide

Total Project Budget: \$300,000

Amount Spent: \$0

Balance: \$300,000

Legal Citation: M.L. 2019, Chp. xx, Sec. xx, Subd. xx

Appropriation Language:

I. PROJECT STATEMENT:

Trumpeter swans (*Cygnus buccinator*) have high intrinsic and economic value in Minnesota (MN) as a protected wildlife species. MN citizens enthusiastically invested in the restoration of trumpeter swans through the check off donation and other funding sources to the MN Department of Natural Resources (MNDNR) Nongame Program since the mid-1980s. The Interior Population of trumpeter swans (of which MN swans comprise ~63%) has increased dramatically since they were re-established in the 1960s and 1970s and both population size and distribution have expanded significantly in MN since the MNDNR Alaska-egg project began in 1986. The original MN reintroduction goal of 15 breeding pairs and the revised interim goal of 500 individuals by 2001 have been greatly exceeded, with a current estimate of nearly 17,000 swans (an average annual finite rate of increase of ~1.20 since 2000). Better understanding of trumpeter swan ecology will be extremely useful in developing future management strategies for this growing population.

In MN, trumpeter swans currently breed throughout most of the state, but beyond recent estimates of population size and trend and distribution, relatively little is known about their ecology, hindering conservation decision-making. To address current information needs, we propose to mark a sample of Interior Population trumpeter swans in MN with GPS-GSM transmitters. These transmitters record high-resolution, high frequency location and related data and transmit those data through cellular phone networks, and will allow us to:

1. Evaluate year-round swan movements, including determining what proportion of trumpeter swans winter outside of the state, the locations where swans spend the winter, and the timing and duration of their movements.
2. Determine whether and where trumpeter swans make molt migrations.
3. Evaluate year-round habitat use and selection patterns of trumpeter swans.
4. Estimate annual survival rates of trumpeter swans, if sample sizes are adequate and fates (i.e., mortality events) can be determined.

Results of this study will inform current and future trumpeter swan conservation in MN by providing basic information about migration, year-round movements, mortality risks, and use of agricultural landscapes. The data from the project will be archived with *movebank* (<https://www.movebank.org/>) and made available to the public via a website that summarizes trumpeter swan movements and habitat use. Thus, the project will also offer the opportunity to actively engage and inform MN citizens about how their past investment in conservation made a positive difference to MN's natural heritage today.

II. OVERALL PROJECT STATUS UPDATES:

First Update 1 April 2020

Second Update 31 December 2020

Third Update 1 April 2021

Fourth Update 31 December 2021

Fifth Update 1 April 2022

Sixth Update 31 December 2022

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

III. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1 Title: Capture and mark 36 trumpeter swans with GPS-GSM transmitters in MN, including graduate student and field technician support

Description: We propose to mark 36 trumpeter swans in MN with GPS-GSM transmitters, distributed across the state and on both breeding and non-breeding swans. In cooperation with the MNDNR, Three Rivers Parks, and the U.S. Fish and Wildlife Service, we will capture swans and monitor their movements via transmission of high-resolution location data collected at 15-minute intervals throughout the year via cellular networks. Capturing and marking swans will be conducted by a graduate student and field technicians during 2019 through 2021.

ACTIVITY 1 ENRTF BUDGET: \$230,482

Outcome	Completion Date
1. Mark 16 swans with GPS-GSM transmitters	December 2020
2. Mark an additional 20 swans with GPS-GSM transmitters	December 2021

First Update 1 April 2020

Second Update 31 December 2020

Third Update 1 April 2021

Fourth Update 31 December 2021

Fifth Update 1 April 2022

Sixth Update 31 December 2022

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

ACTIVITY 2 Title: Acquire movement and habitat data for radio-marked swans

Description: Beginning with transmitter deployment in 2019, we propose to acquire high-resolution location data for trumpeter swans marked in MN, and evaluate local and regional movements and habitat use. Transmission of high-resolution location data will commence with transmitter deployment in 2019 and continue through 2023.

ACTIVITY 2 ENRTF BUDGET: \$69,518

Outcome	Completion Date
1. Acquire high-resolution GPS-GSM data for marked swans	June 2023
2. Acquire local habitat data	June 2023
3. Assess survival and year-round habitat use and selection patterns of trumpeter swans	June 2023

First Update 1 April 2020

Second Update 31 December 2020

Third Update 1 April 2021

Fourth Update 31 December 2021

Fifth Update 1 April 2022

Sixth Update 31 December 2022

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

IV. DISSEMINATION:

Description:

Results of this project will provide information about MN trumpeter swans that will be disseminated to state and federal management agencies, published in the peer-reviewed literature, included in a Ph.D. dissertation, and made available to the general public via a website and popular articles. The public education component, with up to 36 stories of individual trumpeter swans (where they nest, winter, migrate and stop along the way, how far they travel, how much time they spend in wetlands, fields, rivers and lakes) is an excellent engagement tool to support and even increase the interest of MN citizens in its natural resources.

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 1 April 2020

Second Update 31 December 2020

Third Update 1 April 2021

Fourth Update 31 December 2021

Fifth Update 1 April 2022

Sixth Update 31 December 2022

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

V. ADDITIONAL BUDGET INFORMATION:

A. Personnel and Capital Expenditures

Explanation of Capital Expenditures Greater Than \$5,000: N/A

Explanation of Use of Classified Staff: N/A

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

1.81

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

N/A

VI. PROJECT PARTNERS:

This project will be conducted cooperatively through the MN Cooperative Fish and Wildlife Research Unit at the University of MN. Project partners include University of MN principal investigators, MNDNR biologists, U.S. Fish and Wildlife Service biologists, Three Rivers Park District, and the Trumpeter Swan Society. Funds received from this Environmental and Natural Resources Trust Fund (ENRTF) request will be through an agreement with the University of MN with Drs. Andersen and Fieberg as co-Principal Investigators.

Receiving ENTRF funding:

Associate Professor John Fieberg, University of MN, Department of Fisheries, Wildlife, and Conservation Biology

Not receiving ENTRF funding:

David E. Andersen, U.S. Geological Survey, MN Cooperative Fish and Wildlife Research Unit, University of MN

Steve Cordts, Christine Herwig, Carrol Henderson, MNDNR

Tom Cooper, U.S. Fish and Wildlife Service

John Moriarty, Three Rivers Park District

VII. LONG-TERM- IMPLEMENTATION AND FUNDING:

The proposed project period is July 2019 – June 2023. We will work with project partners (U.S. Fish and Wildlife Service, MNDNR, Three Rivers Park District, and the Trumpeter Swan Society) to acquire funding to support marking an additional 14 swans, focused on the larger Interior Population. This will increase our sample size to 50 as indicated in our original proposal (the current smaller sample size in this work plan reflects changes in response to reduced funding recommended by LCCMR). Given the timing and availability of project support (the beginning of a state fiscal year) from the ENRTF, we propose marking a small number of swans with partner funds in 2019 and the remainder of our sample in 2020 and 2021, with movement data collection through June 2023. Results of this project will provide information about MN trumpeter swans that will be disseminated to state and federal management agencies, published in the peer-reviewed literature, included in a Ph.D. dissertation, and made available to the general public via a website and popular articles. The public education component, with up to 36 (contingent upon partner funding) stories of individual Interior Population trumpeter swans (where they nest, winter, migrate and stop along the way, how far they travel, how much time they spend in wetlands, fields, rivers and lakes) is an excellent engagement tool to support and even increase the interest of MN citizens in its natural resources.

VIII. REPORTING REQUIREMENTS:

- Project status update reports will be submitted 1 April and 31 December each year of the project
- A final report and associated products will be submitted between 30 June and 15 August 2023

IX. SEE ADDITIONAL WORK PLAN COMPONENTS:

A. Budget Spreadsheet

B. Visual Component or Map

C. Parcel List Spreadsheet N/A

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

E. Research Addendum *Pending*

Attachment A:
Environment and Natural Resources Trust Fund
M.L. 2019 Budget Spreadsheet



Legal Citation:

Project Manager: David E. Andersen

Project Title: Minnesota Trumpeter Swan Migration Ecology and Conservation

Organization: U.S. Geological Survey Minnesota Cooperative Fish and Wildlife Research Unit *and* University of Minnesota

Project Budget: \$300,000

Project Length and Completion Date: 4 years, June 2023

Today's Date: 27 August 2018

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Budget	Amount Spent	Balance
BUDGET ITEM			
Personnel (Wages and Benefits)	\$ 141,930	\$ -	\$ 141,930
Ph.D. Graduate Research Assistant \$85,498 (50% Research Assistantship, 50% FTE for 2 years, 54.9% stipend, 8.2% benefits, 36.8% tuition)			
University of Minnesota Assistant Professor John Fieberg, quantitative ecologist \$34,118 (4.5 - 9% FTE for 3 years, 66.3% salary, 33.7% fringe)			
1 (2019-2020) or 2 (2020-2021) field technicians @ 11 weeks per year \$22,314 (63% FTE, 92.1% salary, 7.9% fringe)			
Professional/Technical/Service Contracts (cellular phone contracts for download of satellite transmitter data)			
Cellular data fees (\$300 per transmitter per year; 16 data contracts in 2019, 36 data contracts in 2020, 36 data contracts in 2022, and 30 data contracts in 2023; data include GPS locations at 15-minute intervals, transmitter status, temperature, and other parameters, stored onboard devices until connecting and downloading data when in range of cellular networks)	\$ 35,400	\$ -	\$ 35,400
Equipment/Tools/Supplies			
GPS-GSM transmitters (36 @ \$2,600 each; 16 deployed in 2019-2020 and 20 deployed in 2020-2021)	\$ 93,600	\$ -	\$ 93,600
Miscellaneous supplies (neck collar materials and neck collars, rocket nets, rocket-net propellant, etc.)	\$ 3,660	\$ -	\$ 3,660
Travel expenses in Minnesota			
4-wheel drive vehicle mileage [1 (2019-2020) or 2 (2020-2021) vehicles @ \$0.565/mile x 100 miles/day x 80 days/year] for swan capture activities	\$ 13,560	\$ -	\$ 13,560
Lodging for 1 (2019-2020) or 2 (2021-2020) field crews 1-2 rooms per night @ \$40 per night x 80 nights x 2 field seasons) for swan capture activities	\$ 9,600	\$ -	\$ 9,600
Field crew food and supplies [\$75 (2019-2020) or \$150 (2020-2021)/week x 10 weeks/year] for swan capture activities	\$ 2,250	\$ -	\$ 2,250
COLUMN TOTAL	\$ 300,000	\$ -	\$ 300,000

OTHER FUNDS CONTRIBUTED TO THE PROJECT	Status (secured or pending)	Budget	Spent	Balance
Non-State: U.S. Fish and Wildlife Service, Migratory Birds (\$60,000)	<i>Pending</i>	\$ 60,000	\$ -	\$ 60,000
Unit	<i>Pending</i>	\$ 15,000	\$ -	\$ 15,000
In kind: U.S. Geological Survey, David E. Andersen salary and benefits (1 month/year; \$42,000) Minnesota Department of Natural Resources, Wildlife (1 month/year; \$15,000) Minnesota Department of Natural Resources, Nongame (1 month/year: \$15,000) U.S. Fish and Wildlife Service (1 month/year: \$15,495)	<i>Pending</i>	\$ 84,495	\$ -	\$ 84,495

PAST AND CURRENT ENRTF APPROPRIATIONS	Amount legally obligated but not yet spent	Budget	Spent	Balance
Current appropriation: N/A		\$ -	\$ -	\$ -
Past appropriations: N/A		\$ -	\$ -	\$ -

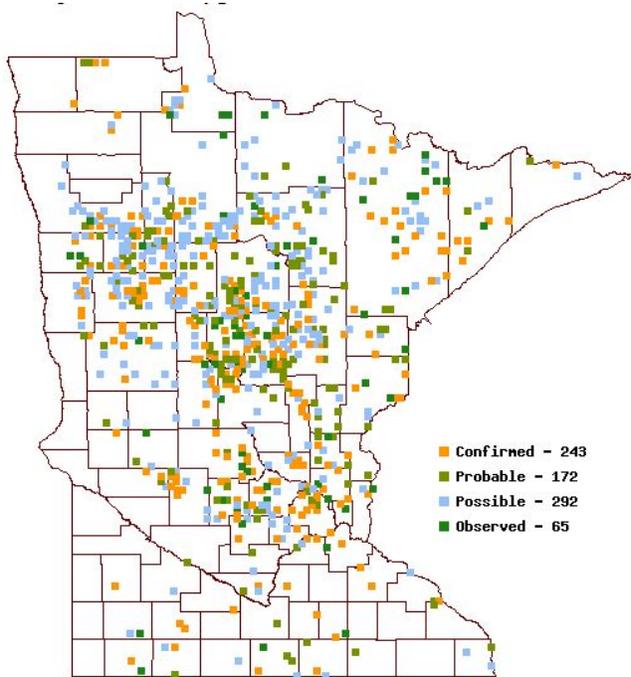


Figure 1. Current trumpeter swan distribution in Minnesota following re-establishment in the 1960s and 1970s and the Alaska-egg program initiated by the Minnesota Department of Natural Resources in 1986. (MN Breeding Bird Atlas Project)



Figure 2. Little information exists about Interior Population trumpeter swan movements, habitat use and selection, and survival. Photo courtesy of Beau Liddell.

Figure 3. Minnesota trumpeter swan population size estimated from waterfowl surveys conducted over approximately 39% of the area of the state (MN DNR, unpublished data). The trumpeter swan population in Minnesota has increased substantially, dramatically exceeds original and interim population goals, and is currently growing at an annual rate of ~1.20.

