



Environment and Natural Resources Trust Fund (ENRTF)

M.L. 2019 ENRTF Work Plan (Main Document)

Today's Date: August 23, 2018

Date of Next Status Update Report: December 1, 2019

Date of Work Plan Approval: June 5, 2019

Project Completion Date: June 30, 2021

Does this submission include an amendment request? ___

PROJECT TITLE: Restoring Native Mussels in Streams and Lakes – Continuation

Project Manager: Mike Davis

Organization: MN DNR

College/Department/Division: EWR

Mailing Address: 2109 North Lakeshore Drive

City/State/Zip Code: Lake City / MN / 55041

Telephone Number: 651.314.6302

Email Address: mike.davis@state.mn.us

Web Address:

Location: Statewide

Total Project Budget: \$500,000

Amount Spent: \$0

Balance: \$500,000

Legal Citation: M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 03b

Appropriation Language: \$500,000 the first year is from the trust fund to the commissioner of natural resources to restore native freshwater mussel assemblages, and the ecosystem services they provide, in the Mississippi, Cedar, and Cannon Rivers and to inform the public on mussels and mussel conservation. This appropriation is available until June 30, 2021, by which time the project must be completed and final products delivered.

I. PROJECT STATEMENT:

Minnesota’s native mussels are a diverse and critically important component of aquatic ecosystems. Mussels function as ecosystem engineers by filtering and cleaning vast volumes of water, cycling nutrients, and forming a basis for aquatic food webs by capturing and depositing organic matter on which other organisms depend. As sentinels of ecosystem health, mussel populations have declined dramatically in North America including Minnesota, where 80% of our species are affected. Improvements from Clean Water Act implementation and watershed and stream restoration work are creating opportunities to reverse this trend. However, the complex life cycle of native mussels prevents some populations from recovering naturally. Captive culture and reintroduction provides an established alternative to restore native mussel populations that have been lost. Reestablishing mussel assemblages will improve habitat and water quality, and will help to restore biotic communities to their natural state. Furthermore, increasing populations of threatened and endangered mussels will help delist species in conservation need. This proposal will continue and build upon previous mussel conservation efforts by restoring historical native mussel assemblages and their ecosystem services.

II. OVERALL PROJECT STATUS UPDATES:

First Update December 1, 2019

Second Update June 1, 2020

Third Update December 1, 2020

Final Report between project end (June 30) and August 15, 2021

III. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1 Title: Restore historic mussel populations of threatened and endangered species in select streams to improve stream health through restoration of their unique provisioning of ecosystem services.

Description: Use established field and laboratory methods to propagate and reintroduce up to six threatened or endangered (T&E) mussel species in the Cedar River, up to three T&E species in the Cannon River, and up to six T&E species in the Upper Pool 2 of the Mississippi River in St. Paul.

ACTIVITY 1 ENRTF BUDGET: \$375,000

Outcome	Completion Date
1. Yearly field collection of female broodstock and host fishes for each mussel species. 2-10 mussels per species; 10-200 host fish per mussel species.	June 30, 2021
2. Propagate and rear juvenile mussels to releasable size for each species and river system. 10-1000 juvenile mussels to releasable size per species.	June 30, 2021
3. Reintroduce cultured juvenile mussels to selected restoration sites. Release mussels at 1-3 sites in each river system.	June 30, 2021

First Update December 1, 2019

Second Update June 1, 2020

Third Update December 1, 2020

Final Report between project end (June 30) and August 15, 2021

Activity 2: Support research into contaminants of emerging concern

Provide glochidia, propagated juvenile mussels, and adult mussels to supply research projects at University of St. Thomas, University of MN St. Anthony Falls Lab, and the MN Zoo.

ACTIVITY 2 ENRTF BUDGET: \$50,000

Outcome	Completion Date
1. Collect or produce the necessary number of glochidia, juvenile mussels, and adult mussels for research projects. 5-20 gravid females; 1000-5000 newly metamorphosed; 50-500 juveniles 2-10mm; 5-100 adults (>30mm).	June 30, 2021

First Update December 1, 2019

Second Update June 1, 2020

Third Update December 1, 2020

Final Report between project end (June 30) and August 15, 2021

Activity 3: Engage and inform the public about freshwater mussels

Develop and produce interpretive displays in high traffic areas to illustrate the importance of mussels to aquatic ecosystems and their benefits to people.

ENRTF BUDGET: \$75,000

Outcome	Completion Date
1. Interpretive video for MNDNR website and YouTube	June 30, 2021
2. Create and publish mussel ID app for phones	June 30, 2020
3. Added content for the Minnesota DNR and MN Zoo's website on mussel importance and ongoing conservation activities within the state.	Ongoing
4. Create public displays at Minnesota State Parks and boat launches that serve rivers and lakes with native mussel populations.	June 30, 2021

IV. DISSEMINATION:

Description:

Progress updates will be disseminated via additions to the DNR website, our quarterly mussel newsletter, DNR Facebook, MN Conservation Volunteer, at scientific conferences, symposia and during interagency meetings. A finished video will be published to YouTube.

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 December 1, 2019

Second Update June 1, 2020

Third Update December 1, 2020

Final Report between project end (June 30) and August 15, 2021

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:

Classified staff salaries will be backfilled from funds received from Federal grants matched with ENRTF funds and from contract work with federal and state agencies.

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

Enter Total Estimated Personnel Hours for entire duration of project: 13,520	Divide total personnel hours by 2,080 hours in 1 yr = TOTAL FTE: 6.5
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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: N/A	Divide total contract hours by 2,080 hours in 1 yr = TOTAL FTE: N/A
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VI. PROJECT PARTNERS:

A. Partners outside of project manager’s organization receiving ENRTF funding

Name	Title	Affiliation	Role
Ben Minerich	Mussel Conservation Specialist	MN Zoo	Fish culture support, mussel rearing and contaminants
Dalma Martinovic	Associate Professor	St. Thomas University	Contaminant research

B. Partners outside of project manager’s organization NOT receiving ENRTF funding

Name	Title	Affiliation	Role
Dan Kelner	Fish Biologist	U.S. Army Corps of Engineers	Support monitoring of federally endangered mussels
Tamara Smith	Endangered Spp. Biologist	USFWS	Planning and permitting
Nathan Eckert	Mussel Biologist	USFWS	Mussel propagation support
Byron Karns	Ecologist	National Park Service	Permitting support in NPS areas
Jessica Kozarek	Research Associate	University of Minnesota St. Anthony Falls Lab	Contaminant research

VII. LONG-TERM- IMPLEMENTATION AND FUNDING:

Native mussel restoration in Minnesota is a long-term strategy to rebuild our aquatic ecosystem infrastructure and a natural progression of efforts that build on prior public investments that have made this feasible. Successful restoration can take a decade or more of effort. Indications of success can be demonstrated within 3-6 years of ENRTF expenditures. Demonstrating success is intended to lead to permanent non-ENRTF funding of this work. This project is a natural progression from 1999 when a LCCMR grant began mussel surveys of the state’s rivers. Surveys continued with other funds resulting in data from nearly 4,000 sites covering all 81 major

watersheds in the state. This information is used to identify streams for mussel reintroductions. Our research identified host fish relationships needed to propagate most of Minnesota's mussel species. This proposal builds on these investments. Expertise in accomplishing mussel restoration began in 2000 with the USFWS Jeopardy Decision for the Higgin's eye pearly mussel. The first propagated Higgin's eye were produced by the MNDNR in Lake Pepin in 2001. Funding from the USACE expanded that effort for 10 years resulting in the release of over 40,000 propagated Higgins' eye in the Mississippi River. New recruits from this population were found in 2012, a first ever milestone for a reintroduced federally endangered mussel. This project expands those efforts to other species and other river systems.

This is a long-term project, mussels that are released need one to five years to become sexually mature and begin reproducing. Their offspring will take two to five years to grow to an easily detectable size. It is evidence for self-perpetuating populations that ultimately defines the success of these reintroduction efforts.

VIII. REPORTING REQUIREMENTS:

- Project status update reports will be submitted March 1 and December 1 each year of the project
- 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 N/A

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

E. Research Addendum N/A

Attachment A:
 Environment and Natural Resources Trust Fund
 M.L. 2019 Budget Spreadsheet
 Legal Citation: M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 03b
 Project Manager: Mike Davis
 Project Title: Restoring Native Mussels in Streams and Lakes
 Organization: MNDNR
 Project Budget: \$500,000
 Project Length and Completion Date: 2-years, July 1, 2019 - June 30, 2021
 Today's Date: December 3, 2018



ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Budget	Amount Spent	Balance
BUDGET ITEM			
Personnel (Wages and Benefits)	\$ 436,001	\$ -	\$ 436,001
Mussel Culture Biologist-1FTE (72% salary, 28% benefits) \$130,469			\$ -
Aquarist/survey diver, 1 FTE (72% salary, 28% benefits) \$105,448			\$ -
Malacologist, .5 FTE (72% salary, 28% benefits) \$86,982			\$ -
Lab/Database/survey diver, .5 FTE (72% salary, 28% benefits) \$60,071			\$ -
Project Manager, .25 FTE (72% salary, 28% benefits) \$53,031			\$ -
Professional/Technical/Service Contracts			
Mussel Phone App. - contract with Evelyn Liu, University of British Columbia	\$ 10,000		\$ 10,000
Equipment/Tools/Supplies			
Host fish purchases, mussel food.	\$ 6,469	\$ -	\$ 6,469
Capital Expenditures Over \$5,000			
	\$ -	\$ -	\$ -
Fee Title Acquisition			
	\$ -	\$ -	\$ -
Easement Acquisition			
	\$ -	\$ -	\$ -
Professional Services for Acquisition			
	\$ -	\$ -	\$ -
Printing			
	\$ -	\$ -	\$ -
Travel expenses in Minnesota			
Travel to and from donor mussel sites and reintroduction monitoring sites	\$ 5,997	\$ -	\$ 5,997
Other			
Direct and Necessary DNR charges: HR Support (~\$9,604), Safety Support (~\$1,989), Financial Support (~\$5,879), Communications Support (~\$1,251), IT Support (\$21,751), Planning Support (~\$1,059) necessary to accomplish funded project.	\$ 41,533	\$ -	\$ 41,533
COLUMN TOTAL	\$ 500,000	\$ -	\$ 63,999

OTHER FUNDS CONTRIBUTED TO THE PROJECT	Status (secured or pending)	Budget	Spent	Balance
Non-State: C-SWG federal funds	Secured	\$ 254,512	\$ -	\$ 254,512
State: Match funds from LCCMR at 35% to 65% federal funds		\$ 113,625	\$ -	\$ 113,625
In kind:		\$ -	\$ -	\$ -

PAST AND CURRENT ENRTF APPROPRIATIONS	Amount legally obligated but not yet spent	Budget	Spent	Balance
Current appropriation:		\$ -	\$ -	\$ -
Past appropriations:		\$ 600,000	\$ 600,000	\$ -