Environment and Natural Resources Trust Fund (ENRTF)
M.L. 2018 ENRTF Work Plan (Main Document)

Today's Date: February 16, 2018

Date of Next Status Update Report: January 31, 2019

Date of Work Plan Approval:

Project Completion Date: June 30, 2021

Does this submission include an amendment request? NO

PROJECT TITLE: **Evaluate Control Methods for Invasive Hybrid Cattails**

Project Manager: Steve Windels

Organization: Voyageurs National Park

College/Department/Division:

Mailing Address: 360 Hwy 11 E

City/State/Zip Code: International Falls, MN 56649

Telephone Number: 218-283-6692

Email Address: steve_windels@nps.gov

Web Address: www.nps.gov/voya

Location: Rainy Lake, Voyageurs National Park, Koochiching and St. Louis counties

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Total Project Budget: $131,000

Amount Spent: $0

Balance: $131,000

Legal Citation: M.L. 2018, Chp. xx, Sec. xx, Subd. xx

Appropriation Language:

I. PROJECT STATEMENT:

An invasive hybrid cattail species is rapidly expanding and negatively affecting native species in wetlands across Minnesota. Voyageurs National Park (VNP) has already secured $1,175,000 in grants ($790,000 state and $385,000 federal) to begin critical on-the-ground wetland restoration efforts in Rainy and Kabetogama Lakes to deal with this growing problem. VNP will start work on this project in June 2017 that will affect >500 acres of sensitive wetlands over the next 10 years. However, resources from these grants are restricted from scientific monitoring efforts, and the true effectiveness of our work cannot be known without additional support.

Chemical herbicide treatments are prohibited in these waters by state law. As an alternative, we are using mechanical harvesting machines to remove large floating mats of hybrid cattail. We are also stocking muskrats, native herbivores that have the ability to control and reduce cattails and other wetland vegetation, as a native control of hybrid cattails. To better inform future restoration and management of cattail invaded wetlands in MN, we need a clearer understanding of the effectiveness of various control methods.

Goal 1: Evaluate how mechanical control of hybrid cattails impacts native wildlife and plants in wetlands. Because hybrid cattail grows in dense stands that crowd out other species, expanding cattail populations negatively affect wildlife and plant communities in MN. Mechanical removal techniques reduce cattail density but we don't know how this translates to improved habitat for native wildlife and plants. Using funding already secured from state and federal sources, mechanical treatment methods will begin in 2017 and continue through 2019. Some pre-treatment data has been collected for wetlands in 2016 and 2017. We will use LCCMR funds to monitor the response of native wildlife and plants 1-3 years after completion of mechanical treatments to reduce hybrid cattail abundance and restore wetland diversity and function (Fig 1).

Goal 2: Evaluate the effectiveness of muskrats as bio-restoration tool for hybrid cattail invaded wetlands. While chemical and mechanical treatments are generally effective, they are expensive, disruptive, and require periodic retreatment. Muskrats are a native species in MN that feed on hybrid cattail and other wetland plants. Muskrat populations have the documented ability to reduce and control densities of wetland vegetation, and may be a viable management alternative for expanding hybrid cattails. The usefulness of muskrats as a bio-restoration tool has not yet been evaluated. Our project will experimentally assess the effectiveness of reintroducing and enhancing muskrat populations to serve as a natural control for expanding hybrid cattails in MN (Fig 2).

Voyageurs National Park is a 218,000 acre protected area that presents an excellent laboratory to test different methods of invasive plant control. We anticipate that project results will be of interest to government agencies and lake associations and other non-governmental organizations interested in restoring fish and wildlife habitat in degraded wetlands. We also believe that project results will be broadly applicable to cattail-invaded wetlands throughout the state, especially those in lake habitats.

II. OVERALL PROJECT STATUS UPDATES:

First Update January 31, 2019
Second January 31, 2020
Third Update January 31, 2021
Final Update June 30, 2021

III. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Evaluate how mechanical control of hybrid cattails impacts native wildlife and plants in wetlands

Description:
Selected wetlands in Rainy Lake (VNP) will be mechanically treated to remove/reduce hybrid cattail abundance in 2017 and 2018 (using non-LCCMR funds). Wildlife and plant surveys will be conducted 1 and 2 years after treatment to evaluate the effects on native wildlife and plant species of interest. Species or groups of species selected to survey are good general indicators of the effects of treatments of native species and are expected to show short-term effects within the 2018-2021 LCCMR project timeframe.

ENRTF BUDGET: $55,000

Outcome	Completion Date
1. Establish sampling sites in mechanically-treated and control wetlands.	*9/31/2018*
2. Conduct surveys of native wildlife (crayfish, aquatic furbearers, marshbirds/ waterfowl) in wetlands for 1-2 yrs after treatment.	*9/31/2020*
3. Conduct surveys of native plants (wild rice, bulrushes, pond lilies) in wetlands for 1-2 yrs after treatment.	*9/31/2020*
4. Provide wetland management recommendations to MN land managers based on effectiveness of mechanical cattail removal to improve wildlife and plant species.	*6/30/2021*

First Update January 31, 2019
Second January 31, 2020
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ACTIVITY 2: Determine the effectiveness of muskrats as a native biocontrol for cattails

Description:
We will identify selected wetlands in VNP in which to stock muskrats (trapped elsewhere in MN) at various densities (Fig.2). This approach will let us test how many muskrats are required to sufficiently reduce hybrid cattail abundance or, alternatively, create open water spaces that muskrats and other wildlife species need. We will also study survival and movements of stocked muskrats to understand how sustainable such stocking methods are. We will also conduct feeding trials with wild muskrats to understand how they prefer hybrid cattail relative other native plants such as wild rice, bulrush, and pond lilies. Stocking and radio implantation efforts will begin in 2018 and continue in 2019, allowing 1-2 yrs of study of short-term effects of muskrat stocking on hybrid cattails.

ENRTF BUDGET: $76,000

Outcome	Completion Date
1. Identify wetland sites within VNP that are heavily invaded with hybrid cattail.	*7/31/2018*
2. Stock muskrats into selected wetlands at 1, 2, and 3x of natural densities and monitor effects to hybrid cattail and other native plants.	*9/31/2020*
3. Fit 60 muskrats with implanted radio-transmitters to monitor survival and movements after stocking.	*9/31/2020*
4. Investigate food preferences of native muskrats on invasive hybrid cattail vs. other native plant species.	*9/31/2020*
5. Report summarizing the effectiveness of muskrats as natural control of hybrid cattail	*6/30/2021*

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IV. DISSEMINATION:

Description: Project progress and results will be shared with the public in a number of ways. While field work is ongoing, outreach will include newsletter articles; articles in local, regional, and state newspapers; posts on Voyageurs National Park's Facebook page; presentations to interested stakeholder groups (e.g., Voyageurs National Park Association or Rainy Lake Property Owners Association); presentations at scientific conferences; and peer-reviewed literature in quality journals.

First Update January 31, 2019
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V. PROJECT BUDGET SUMMARY:

A. Preliminary ENRTF Budget Overview: See attached budget sheet

Explanation of Capital Expenditures Greater Than $5,000:

Explanation of Use of Classified Staff: NA

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

Enter Total Estimated Personnel Hours: 2040	Divide by 2,080 = TOTAL FTE: 1.0

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

Enter Total Estimated Personnel Hours: 2040	Divide by 2,080 = TOTAL FTE: 1.0

B. Other Funds:

SOURCE OF AND USE OF OTHER FUNDS	Amount Proposed	Amount Spent	Status and Timeframe
Other Non-State $ To Be Applied To Project During Project Period:			
Voyageurs National Park	$ 80,000	$0	Secured; July 1, 2018-June 30, 2019
Other State $ To Be Applied To Project During Project Period:			
Initiative Foundation	$430,000	$0	Secured; July 1, 2018-June 30, 2019
In-Kind Services To Be Applied To Project During Project Period:			
Voyageurs National Park	$ 64,400	$0	Pending; July 1, 2018-June 30, 2021
Kansas State University	$ 7,780	$0	Secured; July 1, 2018-June 30, 2021
Kansas State University	$ 32,365	$0	Pending; July 1, 2018-June 30, 2021

Minnesota Dept. of Natural Resources	$ 4,500	$0	Pending; July 1, 2018-June 30, 2021
Past and Current ENRTF Appropriation:			
N/A	$	$	
Other Funding History:			
Voyageurs National Park	$765,000	$765,000	Secured
US Geological Survey	$70,000	$70,000	Secured
Kansas State University	$56,420	$56,420	Secured

VI. PROJECT PARTNERS:

A. Partners receiving ENRTF funding

Name	Title	Affiliation	Role
Adam Ahlers	Asst. Professor	Kansas State University	Will provide advice on all aspects of the project, particularly on aspects related to research, translocation, and monitoring of muskrats, and will mentor one graduate student.

B. Partners NOT receiving ENRTF funding

Name	Title	Affiliation	Role
John Erb	Furbearer Biologist	MN DNR	Will provide advice on all aspects of the project, particularly on aspects related to research, translocation, and monitoring of muskrats.

VII. LONG-TERM- IMPLEMENTATION AND FUNDING:

Our study will evaluate the cost-effectiveness of two control methods of invasive hybrid cattails expansions. Land managers from VNP, MN Department of Natural Resources, and other agencies will use this information to move forward with immediate removal of invasive hybrid cattails and subsequent long-term restoration efforts. As with other invasive plants, control efforts will need to be reapplied over time. The timing of future management is unknown, but we expect this project to provide information that will inform the long-term effectiveness of mechanical removal and bio-restoration tools like muskats for treatment of hybrid cattail.

VIII. REPORTING REQUIREMENTS:

- **The project is for 3 years, will begin on July 1, 2018, and end on June 30, 2021.**
- **Periodic project status update reports will be submitted January 31 of each year.**
- **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
D. Acquisition, Easements, and Restoration Requirements
E. Research Addendum

Attachment A:
Environment and Natural Resources Trust Fund
M.L. 2018 Budget Spreadsheet

Project Title: Evaluate Control Methods for Invasive Hybrid Cattails
Legal Citation:
Project Manager: Steve Windels
Organization: Voyageurs National Park
College/Department/Division:
M.L. 2018 ENRTF Appropriation: $131,000
Project Length and Completion Date: 3 years, June 30, 2021
Date of Report: February 16, 2018

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Budget	Amount Spent	Balance
BUDGET ITEM			
Personnel (Wages and Benefits) - Overall	$88,940	$0	$88,940
1 Wildlife Technician (93% salary, 7% benefits), NPS; 50% FTE for 2 years; field assistant for data collection, muskrat telemetry, etc.(Total estimated amount $31,000)			
1 Grad Research Asst for data collection, analysis, writing; 50% fte, 94.5% salary/5.5% fringe ($46,460), KSU; Grad Research Asst tuition and fees for 2 years ($11,480), KSU.(Total estimated amount $57,940)			
Equipment/Tools/Supplies - Overall	$20,060	$0	$20,060
60 VHF transmitters @$200 ea for tracking muskrat survival and movements (Total estimated amount $12,000)			
60 surgical transmitter implant kits/drugs @$110 ea(Total estimated amount $6,600)			
Misc. field supplies, GPS receivers, KSU (Total estimated amount $1,460)			
Travel expenses in Minnesota	$12,000	$0	$12,000
Vehicle rental for local travel, lodging for technician, NPS (Total estimated amount $6,000)			
Summer lodging, local mileage for grad student, KSU (Total estimated amount $6,000)			
Other	$10,000	$0	$10,000
Flight time for fall aerial muskrat and vegetation surveys, monthly flights to track radio transmitters ($100/hr for 80 hours; aircraft + fuel cost) (Total estimated amount 8,000)			
Publication fees/page charges for peer-reviewed publications, KSU (Total estimated amount $2,000)			
COLUMN TOTAL	$131,000	$0	$131,000

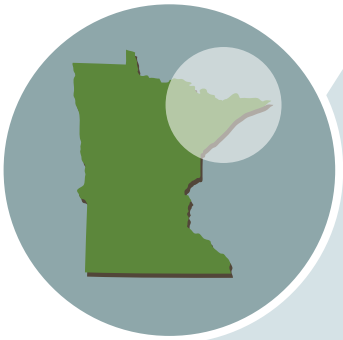
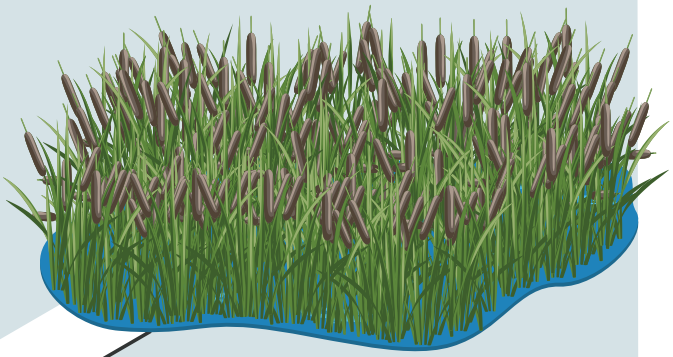
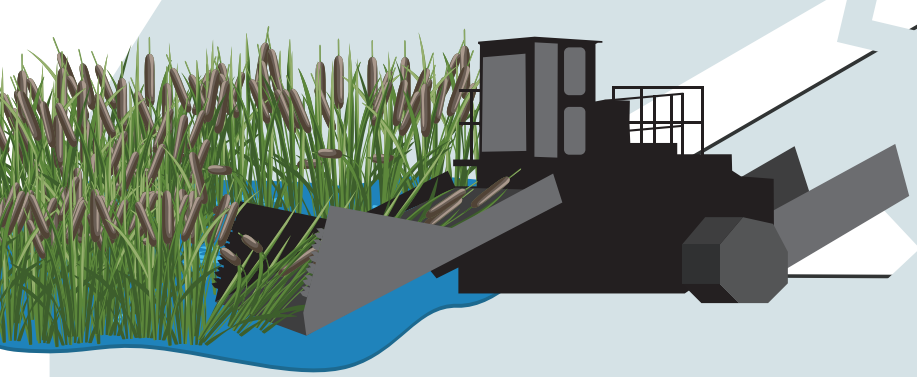
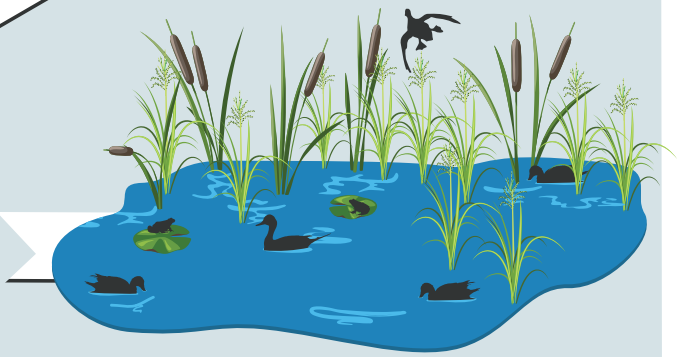


FIGURE 1: GOAL 1

We will evaluate how **MECHANICAL CONTROL OF HYBRID CATTAILS** impacts native wildlife and plants in Minnesota wetlands.







We will use translocated muskrats to investigate the effectiveness of **MUSKRATS AS A NATIVE BIOCONTROL OF HYBRID CATTAILS** in Minnesota wetlands.

FIGURE 2: GOAL 2