



# Environment and Natural Resources Trust Fund (ENRTF)

## M.L. 2020 ENRTF Work Plan (Main Document)

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**Today's Date:** 8/22/2019

**Date of Next Status Update Report:** February 1, 2021

**Date of Work Plan Approval:**

**Project Completion Date:** June 30, 2023

**Does this submission include an amendment request?**

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**PROJECT TITLE:** Applying New Tools and Techniques Against Invasive Carp

**Project Manager:** Brian Nerbonne

**Organization:** Minnesota Department of Natural Resources

**College, Department, or Division:** Fisheries

**Mailing Address:** 1200 Warner Road

**City, State, Zip Code:** St. Paul, MN 55106

**Project Manager Direct Telephone Number:** (651) 259-5789

**Email Address:** Brian.Nerbonne@state.mn.us

**Web Address:** <http://www.dnr.state.mn.us/invasive-carp/index.html>

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**Location:** Mississippi, St. Croix, and Minnesota Rivers and their tributaries, other bodies of water if a risk of invasive carp infestation is identified

**Total Project Budget:** \$478,000

**Amount Spent:** \$0

**Balance:** \$478,000

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**Legal Citation:** M.L. 2020, Chp. xx, Sec. xx, Subd. xx

**Appropriation Language:**

## **PROJECT STATEMENT:**

Early detection and response efforts are important for protecting MN resources from the negative environmental and economic impacts of invasive carp. When abundant, invasive carp can harm native fish populations and make water recreation dangerous due to leaping fish. With the capture in Minnesota of three bighead carp in 2018 and one silver carp so far in 2019, it is apparent that invasive carp are at our doorstep but that control efforts are showing success. The Minnesota Department of Natural Resources (DNR) began its grant-funded invasive carp program in 2012, and expanded the program using 2013 and 2017 LCCMR grants. DNR is seeking additional funding to continue our invasive carp work, and implement promising new techniques.

DNR regularly communicates with researchers and similar programs in other states to improve our effectiveness. Several new advancements show promise to increase our effectiveness to disrupt invasive carp before they become established in Minnesota. This proposal builds on the previous successes from LCCMR-funded work, expanding effective techniques while adding others. Improving fish tracking capability, investment in specialized nets, incorporating new technologies, and implementing new capture methods outlined in the proposal will increase our ability to disrupt invasive carp before they become established. We have chosen to focus our efforts on the St. Croix, Minnesota, and Mississippi Rivers near the Twin Cities to detect invasive carp and remove early invaders. These are locations where our other effective detection and removal tool, commercial angling, is not as common as further south on the Mississippi. Our program targets the leading edge of the invasion, and protects waters further upstream.

The public knows relatively little about invasive carp in MN, creating an opportunity to increase credible sightings by “citizen scientists” through enhanced outreach included in this grant. Credible sightings can increase our understanding of when and where invasive carp can be effectively be targeted for removal.

## **II. OVERALL PROJECT STATUS UPDATES:**

**First Update February 1, 2021**

**Second Update August 1, 2021**

**Third Update February 1, 2022**

**Fourth Update August 1, 2022**

**Fifth Update February 1, 2023**

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

## **III. PROJECT ACTIVITIES AND OUTCOMES:**

**ACTIVITY 1 Title:** Integrate New Techniques and Outreach into Detection and Removal of Invasive Carp

**Description:**

New techniques are proposed to be added to our current netting and electrofishing to detect and remove invasive carp. One new technique we will implement is the use of food attractants. USGS and the University of Minnesota (U of MN) have found attractants can concentrate invasive carp, but have only tested them in high-density locations. We plan to test the effectiveness of attractants in low-density waters of Minnesota in conjunction with our detection and removal netting to see if they can be effective here. In addition to main stem and backwater habitats of the Minnesota, Mississippi, and St. Croix Rivers sampled in previous years, we plan to begin targeting Mississippi tributary streams that are similar to locations frequented by invasive carp in other states. By disrupting pre-spawn activities through our detection and removal efforts, the DNR may be able to reduce the potential for invasive carp to spawn successfully.

In addition, standard fisheries gears, including electrofishing, trap nets, gill nets, trammel nets, trawls, drift nets, and hoop nets will also be used to capture invasive carp in habitats not accessible to commercial gears. Intensive capture methods in which fish are driven and herded into nets with boats will be conducted in suitable locations. This directed effort would be above and beyond MN DNR normal fisheries management efforts. Normal efforts by DNR staff are effective in monitoring population trends of our native sportfish and panfish species. However, detection of invasive carp requires specialized, targeted sampling gears deployed in different manners at intense levels in all habitat types. Annual reports will be prepared summarizing sites sampled, effort expended with various gears, and biological data on fish captured.

An added component is public outreach. The public has limited knowledge of invasive carp. Using printed and online material, we will encourage public participation in detection of these species. DNR social media accounts on Twitter and Facebook will post invasive carp-related information to better inform the public of the threats of invasive carp, and aid in identification and reporting. DNR will also share successful control and detection techniques with other states as well as look to present control methods at a national meeting for invasive carp.

This activity will also including funding one full-time specialist and two student interns, standard fisheries monitoring, and fleet/travel costs. Outcomes will include increased numbers of invasive carp removed from Minnesota waters as well as the testing and implementing of new capture methods.

#### **ACTIVITY 1 ENRTF BUDGET: \$376,000**

<b>Outcome</b>	<b>Completion Date</b>
1. Detect and remove carp via 25 netting days and 25 days of electrofishing per year as well as one intensive capture method in which fish are driven and herded into nets with boats.	June 30, 2023
2. Work with USGS to build and deploy a mechanism to deliver food attractant over a 3-week period, twice yearly, in conjunction with targeted netting efforts.	June 30, 2023
3. Work with creative services to print and distribute 1,000 flyers/brochures, update the DNR's web page, and post 10 or more social media messages to increase public awareness. Incorporate public sightings into our dataset. Present control methods at a national meeting attended by control programs from other states.	June 30, 2023

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#### **ACTIVITY 2 Title: Invasive Carp Tracking**

##### **Description:**

The DNR, in partnership with the US Fish and Wildlife Service (USFWS) and other upper Mississippi River states, built a receiver network in the Mississippi River to track tagged fish including invasive carp. Minnesota law was changed in 2017 to allow DNR to tag and track invasive carp; DNR tagged and began tracking a captured bighead carp in July 2017. Tracking has provided DNR staff with previously unknown information about preferred habitats and seasonal movements in Minnesota waters. Netting in a location frequented by this fish led to the capture and removal of two additional bighead carp in the spring of 2018. These captures would not have occurred without the ability to track a tagged carp. Funding will be used to tag additional carp, track them, target removal in habitats being

used by tagged carp, and analyze tagging data to identify seasons and locations where invasive carp congregate, allowing planning for future removal efforts.

In addition, funding will supplement an existing VEMCO fish telemetry project, adding a three-dimensional component to better understand how tagged fish occupy important locations in the Mississippi River and tributaries. MN DNR currently maintains a network of 70 acoustic receivers, tracking a total of 200+ tagged fish representing eleven species. Numerous fish have been observed passing locks and dams in the Mississippi River. Upgrading the acoustic receiver network to provide 2D and 3D location data will greatly enhance our knowledge of fish passage at locks and dams, how fish respond to commercial fishing, movement between the Mississippi and St. Croix rivers (a popular commercial fishing site where several Bighead Carp have been captured), and how the warm water discharge attracts fish at the Allen S. King Plant in Bayport, MN (a location where six Bighead Carp were captured in 2015, one in 2017, and another in 2019). Data will be sent to VEMCO for processing, as they are the only company able to analyze these complex results. Silver Carp and Bighead Carp are already being implanted with transmitters outside of the state of Minnesota by other agencies and universities. Should a tagged invasive carp travel into Minnesota waters, it will be tracked and targeted to remove larger numbers of individuals.

This Activity will expand an existing acoustic receiver array to determine how tagged fish approach and occupy critical locations in three-dimensions. Outcomes will include a better understanding of how fish occupy key locations and interact with locks and dams and the movement patterns of native riverine species. Results will be provided in high-resolution locations of tagged fish and movement patterns that will be detailed in an annual MN DNR report.

#### **ACTIVITY 2 ENRTF BUDGET: \$17,000**

<b>Outcome</b>	<b>Completion Date</b>
1. Year round tracking and annual analysis of data over 3 years to monitor for overwintering locations, potential spawning habitat/behavior and environmental cues.	June 30, 2023
2. Used tagged carp as “traitor” (aka “Judas fish”) fish to identify opportunistic locations and attempt 4 full-scale netting efforts in such locations.	June 30, 2023
3. Maintain 70+ tracking receivers and annually contract for professional data analysis.	June 30, 2023

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**Fourth Update August 1, 2022**

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#### **ACTIVITY 3 Title: Contracted Commercial Fishing and Incorporating Deep Water Sampling Description:**

Funding to contract with commercial anglers is vital to MN DNR detection and removal efforts because of their ability to deploy large-scale and specialized gears, as evidenced by past success of commercial anglers in capturing >70% of invasive carp found to date in Minnesota. Commercial anglers possess the necessary gear and have the local knowledge to deploy it in an effective manner. Contracting with commercial anglers is a cost effective method of collecting adult invasive carp if they are present. An existing commercial fishing operation will be selected through a competitive bid process to provide approximately 32 days of gill net fishing and 14 days of seine fishing over a 3-year period. Seining is only feasible in certain locations within the rivers that are free of obstruction, while gill nets

can be deployed in other locations. Additionally, the personnel in this project will accompany and monitor the catch of other, non-contracted commercial fishing operations to detect fishing patterns and trends in fish caught which will greatly inform future Invasive Carp directed sampling efforts. Without new funding, there is currently no alternative funding to contract for commercial fishing in the waters targeted by our program.

Tracking data indicates that invasive carp spend a large portion of time in the deeper waters of Lake St. Croix. To improve capture probability in deep areas, the DNR purchased a large seine that is more commonly used in deep reservoir and marine habitats. The 2,000-foot purse seine requires specialized boats and equipment to deploy and retrieve. The MN DNR does not own this equipment but contracts with a commercial angler who has this capability.

### **ACTIVITY 3 ENRTF BUDGET: \$85,000**

<b>Outcome</b>	<b>Completion Date</b>
1. Contract commercial fishermen to deploy 14 seine days and 32 gill nets days in probable invasive carp habitats to remove invasive carp.	June 30, 2023
2. Employ deep water sampling gears 3 times per year to sample habitats used by carp but where standard gear is ineffective.	June 30, 2023

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## **IV. DISSEMINATION:**

### **Description:**

Information regarding sites sampled, effort expended, Invasive Carp caught, and native species associated with sampling sites will be compiled. This information will also be shared with other state and federal agencies including the University of Minnesota, U.S. Fish and Wildlife Service, National Park Service, U.S. Geological Survey, U.S. Army Corps of Engineers, Upper Mississippi River Conservation Committee, and others. Results will be presented at appropriate conferences, and, if appropriate, compiled and written for publication in peer reviewed journals. In addition, MN DNR annual reports will be written synthesizing the years sampling activities and results and updates will be provided on the MN DNR website's invasive carp webpage.

Invasive carp collected will be processed by MN DNR staff and information will be relayed to the U.S. Geological Survey's Nonindigenous Aquatic Species online database (<http://nas.er.usgs.gov/>) and representatives from other state and federal agencies. Samples from Invasive Carp will be sent to collaborating agencies for age validation, determination of sex and reproductive maturity, microchemistry, genetics, and other purposes as they arise following established protocols.

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 February 1, 2021**

**Second Update August 1, 2021**

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**Fourth Update August 1, 2022**

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## **V. ADDITIONAL BUDGET INFORMATION:**

### **A. Personnel and Capital Expenditures**

#### **Explanation of Capital Expenditures Greater Than \$5,000:**

The Attractant Station is budgeted at \$30,000. In that cost, \$10,000 is for services provided by USGS. No single piece of equipment will exceed \$5,000 for the attractant station. The parts needed for assembly of the attractant station are under \$5,000 and the additional \$15,000 in the budget is for the bait attractant for the duration of the grant.

**Explanation of Use of Classified Staff:** N/A

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

Enter Total Estimated Personnel Hours for entire duration of project: 8,320 hours	Divide total personnel hours by 2,080 hours in 1 yr = TOTAL FTE: 4 FTE
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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  
N/A
- B. Partners outside of project manager's organization NOT receiving ENRTF funding  
USGS, USFWS, University of Minnesota, and National Park Service (NPS)

## **VII. LONG-TERM- IMPLEMENTATION AND FUNDING:**

The DNR invasive carp field program is grant supported. It has been and is funded by a variety of sources that include: Minnesota Environment and Natural Resource Trust Fund, DNR Fisheries operation funds, Minnesota Outdoor Heritage Fund, and USFWS grants. NPS and USFWS field crews have provided additional field support. DNR will continue seeking additional grants and partnerships.

Additional funding to supplement ENRTF funding; years, agency and grant: FY 13/FY 15 Lessard Sams Outdoor Heritage Council \$109K, FY 16 USFWS Invasive Carp Grant \$60K, FY 17 USFWS Invasive Carp Grant \$142.2K, FY 18 USFWS Invasive Carp Grant \$72K, FY 19 USFWS Invasive Carp Grant \$85K, FY 18 USFWS/Interstate ANS Grant \$20K, FY 19 USFWS/Interstate ANS Grant \$20K

## **VIII. REPORTING REQUIREMENTS:**

- Project status update reports will be submitted February 1 and August 1 each year of the project
- A final report and associated products will be submitted between June 30 and August 15, 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**

Attachment A: Project Budget Spreadsheet  
 Environment and Natural Resources Trust Fund  
 M.L. 2020 Budget Spreadsheet

Legal Citation:

Project Manager: Brian A Nerbonne

Project Title: Applying New Tools and Techniques Against Invasive Carp

Organization: Minnesota Department of Natural Resources

Project Budget: \$578,000

Project Length and Completion Date: 3 years (July 1, 2020 - June 30, 2023)

Today's Date: 8/20/2019



ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET		Activity 1 Budget	Amount Spent	Activity 1 Balance	
BUDGET ITEM					
<b>Personnel (Wages and Benefits)</b>		\$ 235,000	\$ -	\$ 235,000	
Activity 1: NR Monitoring Fisheries Specialist (1 Unclassified position)- to conduct at least 200 field sampling days annually, oversee commercial fishing operations, and compile, analyze, and report findings (70% salary 30% benefits); 100% FTE for 3 years. ~(\$200,000)					
Activity 1: Student Interns (2 positions)- field data collection activities in support of project objectives (100% salary) 25% FTE for 3 years. ~(\$35,000)					
<b>Professional/Technical/Service Contracts</b>					
Activity 3: Commercial Fishing including deep water sampling: Contracted directed commercial seines and large mesh gill nets. Licensed commercial fisherman will be hired to set 11 gill net days and 5 seine days per year or 32 gill net days total and 14 seine days total over 3 years. Contractor selected through competitive bid process.		\$ 85,000	\$ -	\$ 85,000	
Activity 1: Outreach using Creative Services to create 1,000 fliers/brochures to be distributed to the public. Single-source contract through Creative Services		\$ 15,000	\$ -	\$ 15,000	
Activity 2: Increase invasive carp tracking: VEMCO data processing fee for 2 locations for 3 years as well as receiver maintenance. VEMCO is the only company able to analyze this data due to VEMCO acoustic array already in place. Single-source contract- no other company is able to analyze this data.		\$ 17,000	\$ -	\$ 17,000	
<b>Equipment/Tools/Supplies</b>					
Activity 1: Monitoring- replacement nets, specialized nets including large mesh gill nets (4 @ \$300 = \$1,200), trammel nets (4 @ \$400 = \$1,600), and mini-fyke nets (6 @ \$600 = \$3,600), necessary to capture invasive carp at various life stages and in various havitats; associated supplies to deploy nets such as rope, anchors, floats (\$2,500); miscellaneous supplies such as personal protective equipment, repairs, replacements, etc. (\$21,000)(No single piece of equipment will exceed \$5,000). Costs are based on expected bids and may vary. Attractant station (\$30,000) Note: \$10,000 of Attractant Station is services provided by USGS.		\$ 63,668	\$ -	\$ 63,668	
<b>Travel expenses in Minnesota</b>					
Fleet transportation expense for 3 years; base of operation will be Warner Road, St. Paul Fisheries office		\$ 25,000	\$ -	\$ 25,000	
In-state Travel Expenses: Meals (\$3,100) and lodging (\$4,500) for distant and overnight status up to 25 nights per year for 3 years.		\$ 8,000	\$ -	\$ 8,000	
<b>Other</b>					
<b>DNR's direct and necessary costs</b> (~29,332) pay for activities that are directly related to and necessary for accomplishing appropriated programs/projects. Direct and necessary costs cover HR Support (\$6,130), Safety Support (\$1,110), Financial Support (\$4,985), Communication Support (\$1,388), IT Support (\$14,582), Planning Support (\$1,138).		\$ 29,332	\$ -	\$ 29,332	
<b>COLUMN TOTAL</b>		\$ 478,000	\$ -	\$ 478,000	
SOURCE AND USE OF OTHER FUNDS CONTRIBUTED TO THE PROJECT		Status (secured or pending)	Budget	Spent	Balance
<b>Non-State:</b> FY 2021 USFWS Invasive Carp Grant- Funding to support and maintain fieldwork for detection and monitoring of invasive carp populations		Tentatively Approved	\$ 103,000	\$ -	\$ 103,000
<b>Non-State:</b> FY 2021- FY 2024 USFWS Invasive Carp Grant- Funding to supplement existing invasive carp program for fieldwork monitoring and detection of invasive carp. (Total grant varies)		Pending	\$ 70,000	\$ -	\$ 70,000
<b>Non-State:</b> FY 2021- FY 2024 USFWS State/Interstate ANS Grant- Funding to supplement existing invasive carp program for fieldwork monitoring and detection of invasive carp. (Total grant varies)		Pending	\$ 20,000	\$ -	\$ 20,000
<b>State:</b> Opportunities will be explored for supplemental funding (unknown at this time)			\$ -	\$ -	\$ -
<b>In kind:</b> DNR office facilities, supervisor-manager time and other support will be provided (contributions are unknown and vary)			\$ -	\$ -	\$ -
Other ENRTF APPROPRIATIONS AWARDED IN THE LAST SIX YEARS		Amount legally obligated but not yet spent	Budget	Spent	Balance
M.L. 2013, Chp. 52, Sec. 2, Subd. 06b Detection and Monitoring of Asian Carp Populations			\$ 540,000	\$ 540,000	\$ -
M.L. 2017, Chp. 96, Sec. 2, Subd. 06c Invasive Bighead Carp and Silver Carp and Native Fish Evaluation - Phase II		\$ 201,680	\$ 500,000	\$ 298,320	\$ 201,680



# Applying new tools and techniques against invasive carp

Invasive carp pose a major threat to Minnesota's rivers and lakes, and to the multimillion dollar recreational economies our waters support in communities across the state. The Minnesota DNR is applying cutting edge techniques to keep these aquatic pests at bay. Without further funding, though, much of the field work necessary to keep invasive carp out of our waters will grind to a halt.

## Find & remove

DNR is using new methods for surveillance, early detection and removal of invasive carp, including:

- Applying a new intensive capture method to herd fish into areas where they can be caught and removed.
- Using fish attractants to increase capture probability.
- Deploying new, specialized equipment to sample in deep water where invasive carp sometimes shelter.

## Knowing where to look for invasives

DNR has built a network of in-river receivers to track tagged fish so we know where to look for invasives. Our ability to follow tagged carp provides valuable data on the species' behavior and has led to the capture and removal of other invasive carp. Expanding our tracking capacity will:

- Provide more useful data to follow fish and capture invasives.
- Let us track fish in real time facilitating quicker response and removal.
- Help us know where to set nets to find and capture invasive carp.

## Engaging citizens in our efforts

Public awareness and engagement is critical to keeping invasive carp under control. We need anglers and boaters to report sightings. Our outreach and educational efforts will include:

- Creation of 1,000 fliers, brochures and online materials.
- Distribution of invasive carp educational materials to at least 50 bait shops, outdoors retailers and other venues related to water sports.
- A social media campaign to enhance public awareness of invasive carp and the threats they pose.

## Leveraging funds from collaborators

The Minnesota DNR works with numerous partners, and its invasive carp field program is funded from a variety of sources including, the Minnesota Environment and Natural Resource Trust Fund, DNR base funding, the Minnesota Outdoor Heritage Fund, and USFWS grants totalling more than \$314,000. DNR continues to explore additional partnerships and funding opportunities on an ongoing basis. Without LCCMR funding, we would lack capacity to make use of these other funding sources.



**Have you seen an invasive carp?**

The Minnesota Department of Natural Resources is on the lookout for invasive carp. Imported from China in the 1970s to control plankton, algae and snails in southern fish farms, these four carp species escaped into the Mississippi River and have been working their way upstream ever since. Some of these invasive carp grow as large as 100 pounds and they can cause serious problems for native fish and healthy waters. While some native fish jump out of the water, silver carp are known for causing hazards for boaters because they jump as high as 10 feet.

Here's how to distinguish invasive carp from common carp and native species found in Minnesota.

**If you see one of these invasive carp, contact the DNR**

**Silver carp**  
Eyes set below downward slanting mouth, no teeth, long keel from throat to tail, small scales, small dorsal fin, no barbels by mouth, silver in color, average size 33 inches. Known for jumping high out of the water.

**Bighead carp**  
Eyes set below mouth, no teeth, large head, short keel between pectoral fins, protruding lower jaw, small scales, no barbels by mouth, solid grey body with dark blotches, average size 40 inches.

**Grass carp**  
Eyes set even with mouth, no teeth, large scales with prominent dark edges, no keel, no barbels by mouth, silver to olive in color, average size 33 inches.

**Black carp**  
Eyes set even with mouth, teeth like human molars, large scales with prominent dark edges, no keel, no barbels by mouth, dark in color, average size in other states 36 inches.

If you see or catch an invasive carp, please take pictures (or keep the fish), and note the location. Then email or call the Minnesota DNR's invasive carp coordinator at: [invasive.carp@state.mn.us](mailto:invasive.carp@state.mn.us); 651-587-2781

**mn DEPARTMENT OF NATURAL RESOURCES**

