



Update Report Aquatic Invasive Species (AIS)

St. Louis County, Minnesota

2017 - 2018 FUNDED PROJECTS



For more information on AIS in St. Louis County:
www.stlouiscountymn.gov/ais
All detailed reports and applications are available

Contents



Rusty Crayfish found in
St. Louis County Lakes

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Date

1-2019
Rev. 1.0

SOURCES: Content generated from grant recipients' progress reports.

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What are AIS?



Aquatic invasive species (AIS) are non-native aquatic organisms that invade water beyond their natural and historic range that may harm economic, environmental or human health and can threaten our natural resources.

- Definition from MN Statute Chapter 84D

St. Louis County AIS Plan

St. Louis County in 2015, with assistance from Minnesota Sea Grant, developed an AIS Prevention Plan. St. Louis County has 1,068 lakes and AIS pose a great threat to our pristine waters. County supported actions to prevent the spread of AIS are identified in the plan. The plan cross references the Minnesota Department of Natural Resources (DNR) Local AIS Plan framework, actions and elements from a Minnesota State Management Plan for Aquatic Invasive Species.

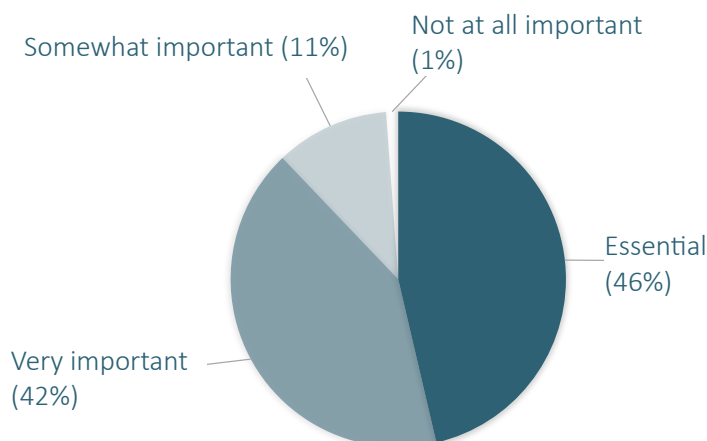
The purpose of the plan is two-fold:

1. Define actions for which the allocated funds may be used to prevent the spread of AIS.
2. Guide St. Louis County AIS Prevention response.

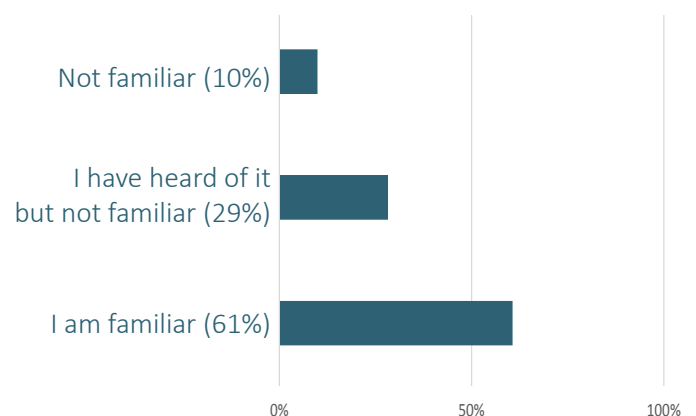
Awareness of AIS in St. Louis County

St. Louis County included two AIS questions in the 2016 community survey. Based on the results of the 2016 community survey, a majority of residents are familiar with AIS and believe action should be taken to prevent the spread. An update to the survey is going to be completed and should be available in 2019.

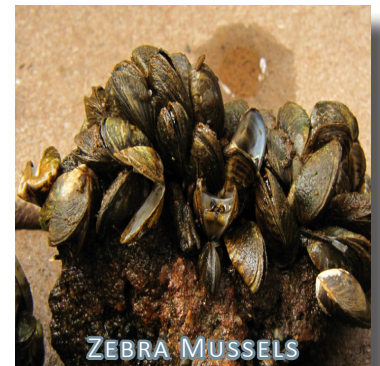
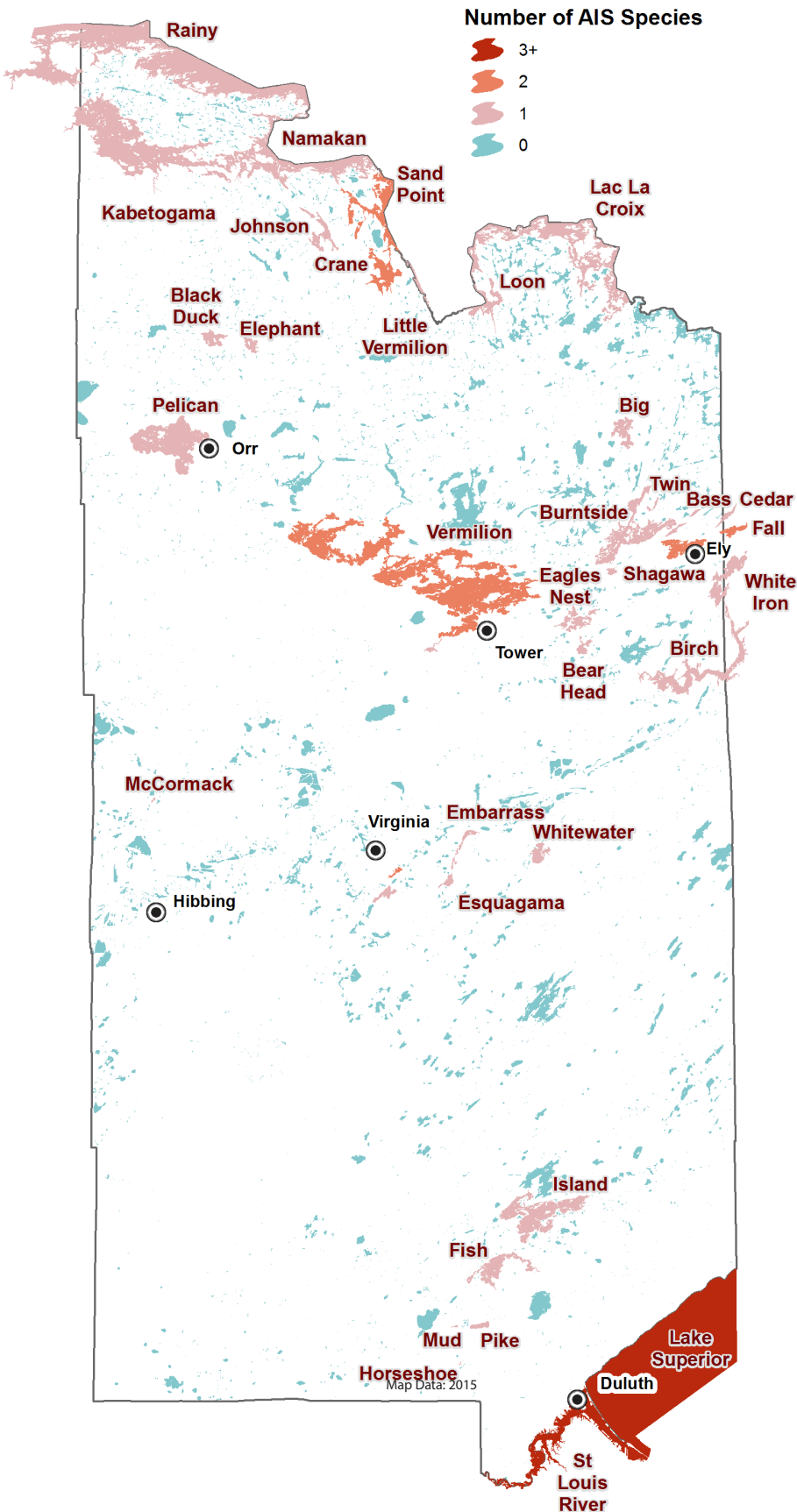
How important, if at all, do you believe it is to take action to prevent the spread of AIS?



How familiar, if at all, are you with AIS?



AIS in St. Louis County



Actions in AIS Plan

By addressing the pathways through which AIS spread, it is possible to prevent, control and minimize impacts of AIS within the county and limit their spread elsewhere. The county supported implementation of projects that address one or more of the following seven actions:

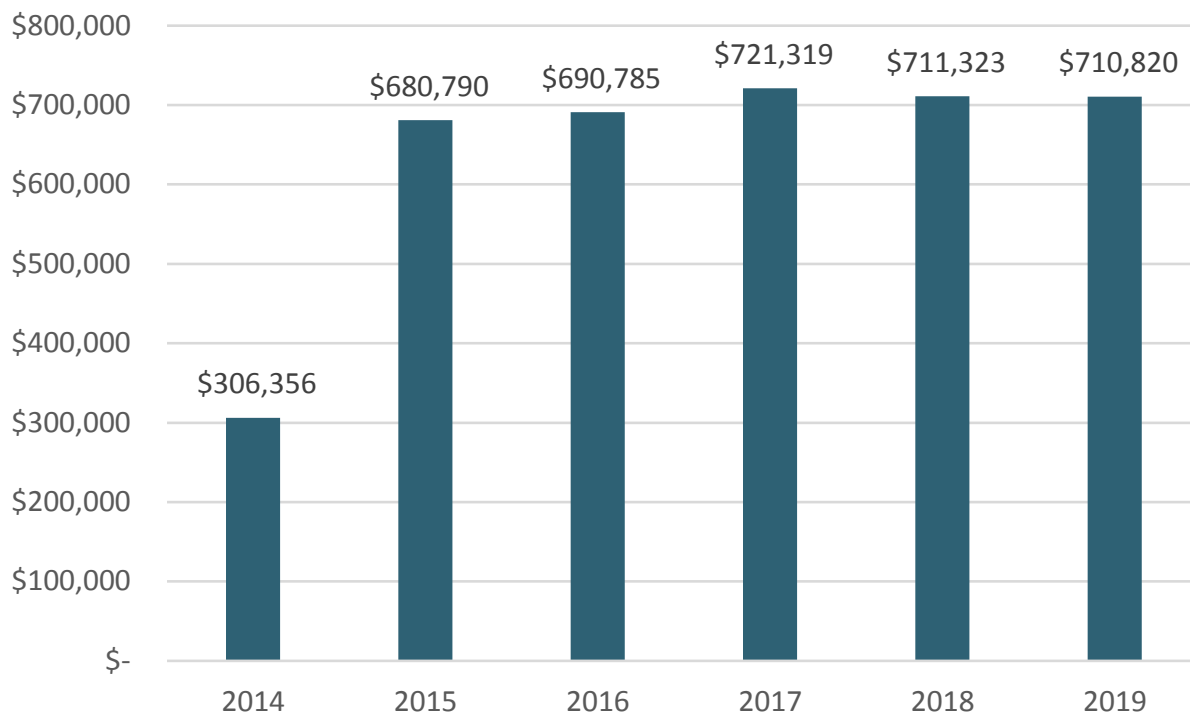
1. Assess county resources and risks for AIS introduction and spread.
2. Increase resources for county wide education and enforcement.
3. Increase public awareness and participation in prevention.
4. Raise available resources and leverage partnerships.
5. Broaden knowledge of and participation in early detection and rapid response activities.
6. Manage existing populations of AIS.
7. Address specific pathways for AIS introduction.

About State Program Aid

Beginning in 2014, the Minnesota State Legislature (Law Chapter 308) authorized funding to all Minnesota counties to implement plans to prevent, slow and minimize impacts of AIS. The purpose of these funds is to “prevent the introduction or limit the spread of AIS at all access sites within the county” (MN Statutes 477A.19). In 2014, \$4.5 million was appropriated for 2014 and \$10 million in 2015 annually thereafter.

This funding allows St. Louis County to accomplish the actions in the plan using a grant award pass through to stakeholders and fund internal capacity building. The table below identifies the amount appropriated to the county since the authorization of the funds.

AIS Funding Allocated to St. Louis County by Year



AIS Grant Recipients

2015 - 2018

- 1 Vermilion Lake Association**
Comprehensive Lake Vermilion Prevention Program
- 2 North St. Louis Soil and Water Conservation District**
Watercraft Decontamination and Inspection on Various Waterbodies
- 3 Burntside Lake Association**
Burntside Lake AIS Prevention Program
- 4 City of Babbitt**
Birch Lake AIS Prevention Project
- 5 Pike and Caribou Lakes Canosia Township**
Pike Lake AIS Educational Inspection Program
- 6 St. Louis River Alliance**
 1. Non-native phragmites control
 2. AIS Sentry Program
- 7 Community Action Duluth**
Non-native phragmites control
- 8 Izaak Walton League of America**
Rapid Response Mobile Ballast Water Treatment for Lake Superior Harbors
- 9 Grand Lake Township**
Caribou Lake 2018 AIS Inspection Program
Birch Point Access

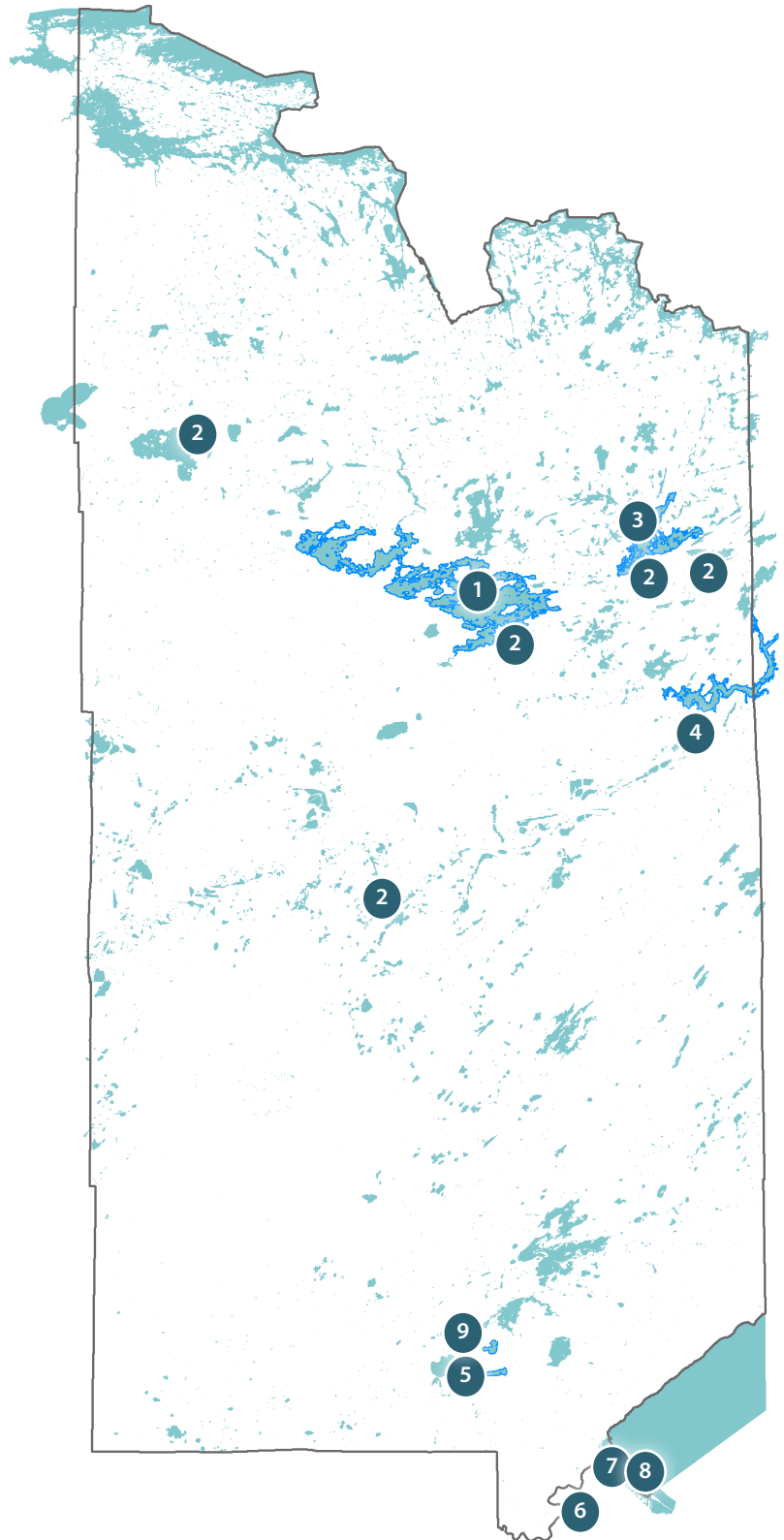
County Wide Projects

Natural Resources Research Institute (NRRI)

1. George Host
Baseline surveys and geospatial modeling
2. Josh Dumke
AIS Introduction Risk Assessment
3. Donn Branstrator
What gear on your boat is most likely to spread spiny water flea?

Wildlife Forever

County Coordinated Public Awareness



Investments in Prevention

Grant Recipients and Funding Received

| Award Year | Total Award Allocated



2018: \$59,000
2017: \$96,396
2016: \$23,441
2015: \$285,885



2018: \$391,350
2017: \$281,600
2015: \$60,000



2016: \$45,000
2015: \$50,000



2018: \$26,000
2017: \$43,075
2016: \$189,857



2017: \$46,900
2015: \$118,380



2018: \$22,500
2017: \$55,114
2016: \$16,000

**Natural Resources
 Research Institute**

UNIVERSITY OF MINNESOTA DULUTH
 Driven to Discover

2017: \$44,643
2015: \$126,281



2018: \$114,000
2016: \$102,500
2015: \$107,000



2018: \$22,248
2017: \$19,659
2016: \$24,817
2015: \$11,754



2018: \$50,000
2015: \$50,000

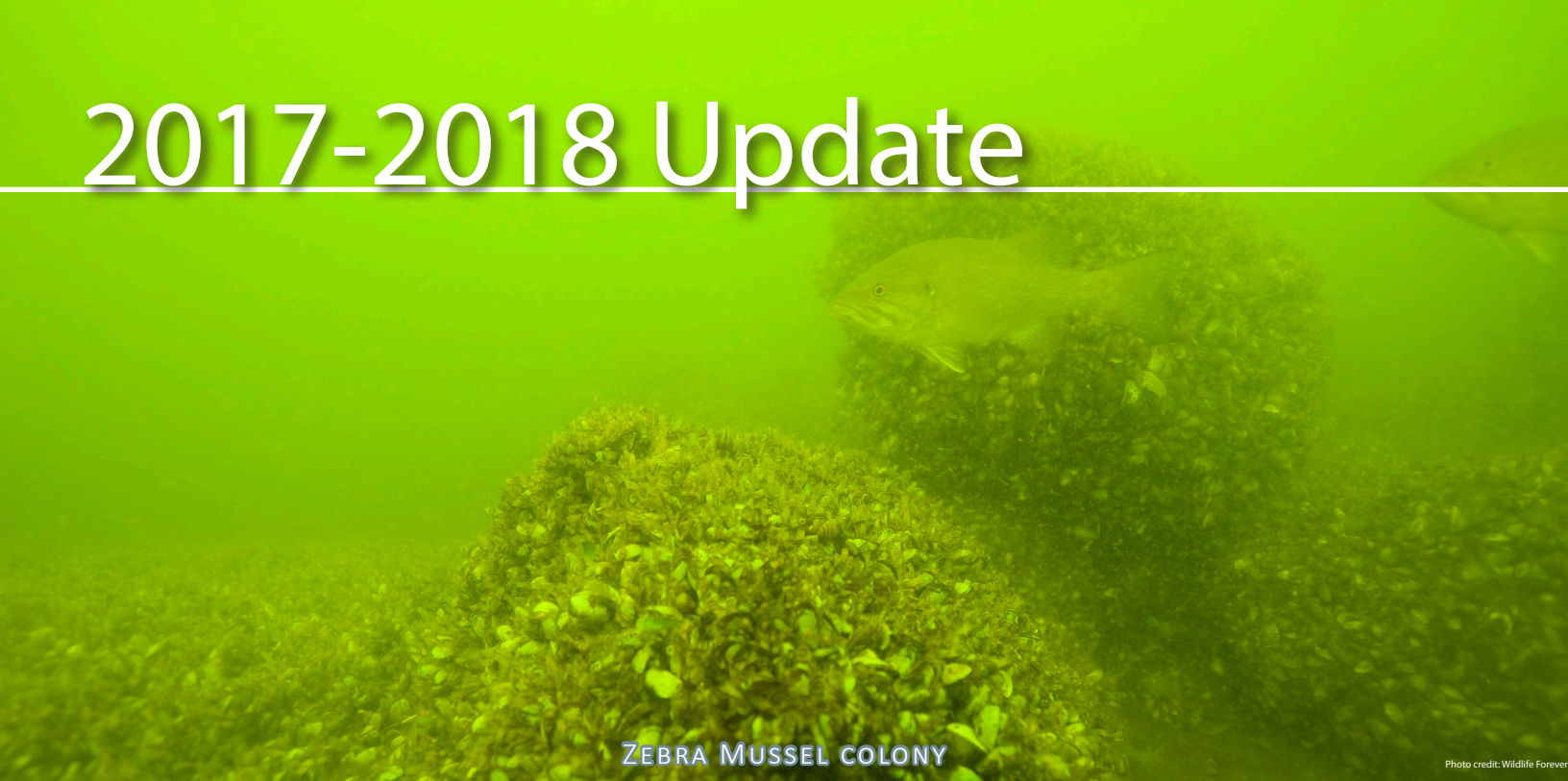


2017: \$60,000

**Grand Lake
 Township**

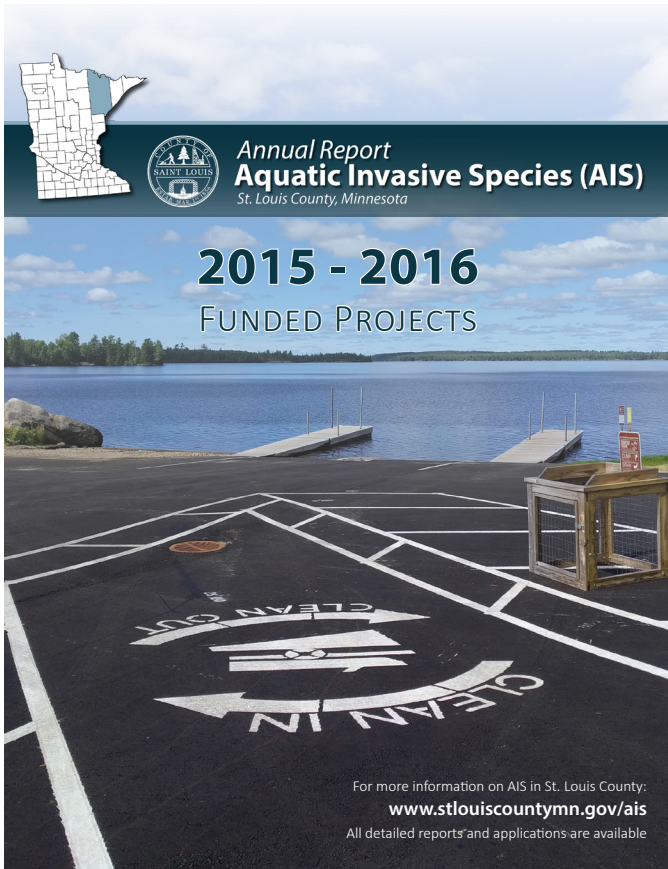
2018: \$14,900

2017-2018 Update



ZEBRA MUSSEL COLONY

Photo credit: Wildlife Forever



This current report is an update on projects funded and accomplished in 2017 and 2018. The timeline for most grants is 18-months to accommodate for seasonality of the prevention work.

The 2015-2016 report is available online on the county's AIS webpage. Work that was completed in 2015-2016 continues and this current report update includes new numbers and highlights.

All applicant specific reports are available by request.

St. Louis County AIS webpage:
www.stlouiscountymn.gov/ais.

For more information on AIS in St. Louis County:
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All detailed reports and applications are available

Building Partnerships



PARTNERSHIPS WITH PRIVATE LAUNCHES ON LAKE VERMILION

Photo credit: Ely Echo

AIS is a biological issue that crosses jurisdictions and political boundaries. Prevention relies on partnership to accomplish the goals identified in the plan. North St. Louis Soil and Water Conservation District (NSWCD) has collaborated with other grant recipients, counties, and jurisdictions to build partnerships. In 2017-2018, these include:

- Boat Traffic Analysis: Initiative Foundation grant to increase inspection efficiency at public accesses.
- Multi-Region Resort Ambassador Program: Initiative Foundation grant to expand prevention and early detection at resorts in Cass County, Itasca County and St. Louis County.
- City of Ely: City of Ely owns two decontamination units that were staffed by NSWCD watercraft inspectors at Burntside Lake and Shagawa Lake.
- Fayal Township and the City of Gilbert: Collaborated with Fayal Township and the City of Gilbert for inspections and decontaminations at Ely Lake and Gilbert Pit.
- Lake County Soil and Water Conservation District (SWCD): Established a shared services agreement with Lake County SWCD for NSWCD inspectors to inspect boats at Fall Lake, Snowbank Lake, and Moose Lake. 1,145 watercraft inspections were completed.
- Fishing Tournaments: Collaborated with DNR, 1854 Treaty Authority & Vermilion Lake Association to achieve close to a 100% inspection rate at 4 out of 5 tournaments at Fortune Bay Marina.
- The City of Duluth and Wildlife Forever partnered to bring a CD3 unit to Munger landing on the St. Louis River.

Additional Partners that participated in AIS related activities are but not limited to:

Minnesota Department of Natural Resources
Ely Area Invasives Team
Lake County SWCD
Vermilion Community College
Local law enforcement
Minnesota Lakes & Rivers

Minnesota Aquatic Invasive Species Research Center
1854 Treaty Authority
Fortune Bay Resort
Natural Resource Research Institute (NRRRI)
Local AIS business partners
Lake Superior Zoo

Species Removal



PHRAGMITES REMOVAL IN THE ST. LOUIS ESTUARY

Photo credit: Community Action Duluth

Species Removal by Duluth Community Action Duluth

Work completed in 2017 and 2018 was a continuation of efforts by the St. Louis River Alliance in 2016. Community Action Duluth (CAD) and Duluth Stream Corp became the new organization responsible for treatment, outreach and education to property owners, technical team coordination, and mapping of phragmites sites. Phragmites is a tall wetland grass that grows prolifically.

The outreach process began with contacting each land owner and providing them with the information on the location and estimated acreage of the location covered by non-native phragmites. The one-page education handout was provided along with how the plant was to be managed and eradicated in the land owner agreement. Landowner agreements for non-native phragmites services for all sites required CAD to obtain the Invasive Aquatic Plant Management Permit from the DNR and work with the City of Duluth. A combination of methods were utilized by CAD to reach an agreement to access their property for non-native phragmites management.

Outside of regularly scheduled meetings, coordinating technical, team organizations worked to develop the infrastructure for a cooperative data entry application that allowed for tracking and sharing of data. Tracking criterion include: non-native phragmites occurrences and management, land ownership information and documentation, and tech team management.

In 2018, CAD completed chemical treatment on 41 of the 67 mapped phragmites sites. They were able to secure new two year agreements to 10.96 of the 13.16 acres of phragmites growth. In the fall and winter, the crews are able to mechanically knocked down the vegetation and prepared the sites for summer treatment. Species removal requires ongoing management to continue gains to prevent the species from growing back.

Research



SPINY WATER FLEA RESEARCH ON ISLAND LAKE RESERVOIR

Photo credit: Donn Branstrator

Research on Spiny Water Flea

Spiny water flea has been identified by the DNR in 24 lakes and connected waterways in St. Louis County. Humans are the most likely spreader of spiny water flea to other lakes. In an effort to better understand how this species is transported from lake to lake, St. Louis County awarded Donn Branstrator's (NRRI) research project to find out "What gear on your boat is most likely to spread spiny water flea?" The research was conducted in 2017 on Island Lake Reservoir outside of Duluth.

Researchers are making progress toward developing best practices for cleaning recreational equipment to prevent the spread of spiny water flea. Initial analysis of data from 2017 field work shows that, during the daytime, fishing lines gather some spiny water flea. Twilight hours are when spiny water flea moved up closer to the surface of the water to feed and therefore likely captured on equipment than in daytime.

Researchers simulated the use of fishing equipment on Island Lake Reservoir. Each simulation was designed to replicate trolling. During each simulation, three stationary anchors, three towed fishing lines, a towed downrigger with steel cable and monofilament line, a towed bait bucket, and a simulated live well were used. Plankton nets were also used to determine the ambient density of spiny water fleas in the lake.

Research was expanded and continued by the Minnesota Aquatic Invasive Species Research Center on Lake Millacs in 2018. Results will be studied for correlation and available in 2019. This is an example of research funded by and in St. Louis County that benefits waterbodies in the state.

Research



Researching Ballast Water Treatment

National Parks Service (NPS) and its partners designed a skid-mounted, mobile ballast water treatment system that allows for ballast treatment on an array of vessels. Freshwater trials are needed to confirm applicability in the Great Lakes. The first of three trials was conducted in 2016 with funding from NPS, St Louis County and the DNR. Izaak Walton League, MN Division was the applicant for the St Louis County funds. Funds were also leveraged from the NPS and the Chamber of Marine Commerce.

Staff from Isle Royale National Park, marine engineers at Glosten, marine casualty responders at Global Diving & Salvage, and biologists from Moss Landing Marine Laboratories conducted two shipboard trials of the Ballast Responder system on-board a Great Lakes freighter, the Vessel Tim S. Dool, operated by Algoma Central. The trial

occurred en route from Hamilton, ON to Superior, WI from September 12th thru 18th, 2018. Final biological data was submitted by Moss Landing in January and a full report is currently under development by Glosten and the NPS.

Habitat Awareness



Researching Habitat

In 2017 on Lake Vermilion, a thorough assessment of East Two River calcium concentration was completed by the NRRI and Vermilion Lake Association (VLA) volunteers. VLA cautiously concluded zebra mussels cannot become established in Lake Vermilion. The calcium and pH in East Two, the only known calcium source at Vermilion, is too low. Therefore, zebra mussels moved down the VLA's AIS risk assessment table.

To confirm that conclusion, VLA volunteer continued during 2018 to evaluate calcium levels along east Vermilion shorelines where possible high-calcium inflows might allow zebra mussel establishment. Most samples were approximately 11 mg/l, consistent with historical east Vermilion values and indicating habitat unsuitable for zebra mussels.

Therefore, due to unique habitat, VLA identified eurasian watermilfoil, curly leaf pondweed, hybrid watermilfoil, and starry stonewort as high risk threats. RMB Environmental Labs was hired to study locations in Lake Vermilion and Gilbert Pit to evaluate and monitor early-detection of AIS.

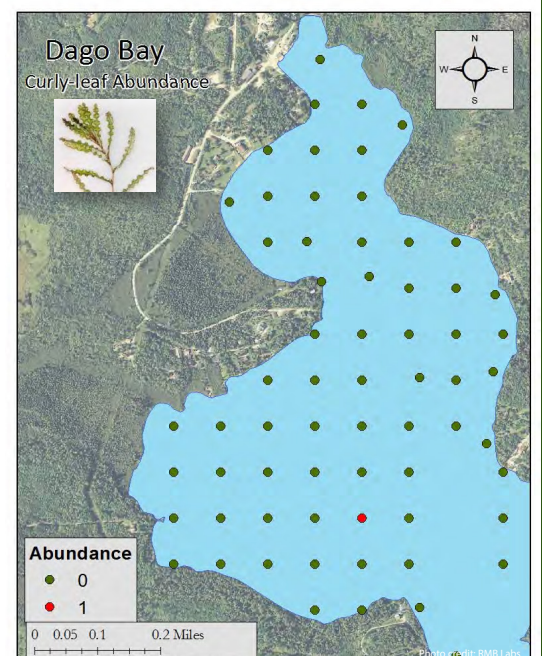


Figure 9: Curly-leaf pondweed found at Lake Vermilion, Dago Bay, sample points, St. Louis County, MN, June 27, 2018.

Inspections



Photo credit: North St. Louis County Soil and Water

Inspections

Inspections on Burntside, Pike, Caribou, Vermilion, Shawaga, Gilbert Pit, Pelican, Ely lakes were completed from fishing opener through the weeks after labor day. Inspection schedules varied based on the needs of lake’s users. Hours of each inspection season vary from 8 hours per day during May and most of June to 14 hours a day in July through Labor Day weekend.

Inspectors received training from the DNR. Level 1 inspectors can conduct DNR approved watercraft inspections while Level 2 inspectors can operate the decontamination station to kill AIS that may be on the watercraft using a combination of high temperature and high pressure water.

CD3 Stations: Tools to Self Inspect

CD3 stations are waterless cleaning systems that are user-operated equipment designed to reduce the spread of invasive species. The City of Duluth and Wildlife Forever partnered to bring a station to Munger Landing on the St. Louis River. This is the second unit in St. Louis County. The other is on Pike Lake and managed by Canosia Township.



Munger Landing
2018



Pike Lake
2017

Inspections



INSPECTIONS ON BURNTSIDE LAKE

Photo credit: Michael Scharenbroich

NSWCD Public and Private Inspections

NSWCD manages inspections and decontaminations at public launches but also has partnered with private launches at campgrounds, resorts, and marinas on Vermilion and Pelican lakes. NSWCD signed a private launch partnership to inspect entering and exiting watercraft at private accesses. These private accesses are reimbursed or provide the inspection service in-kind. This partnership

was a pilot program in 2018 and looks to continue in 2019. These accesses support a number of fishing tournaments and are an important part of the economy.

Watercraft Inspections by the NSWCD		
Year (# of Accesses)	2017	2018
Public Accesses	16,901 (14)	17,755 (18)
Private Accesses	3,107 (12)	6,566 (15)
Total Inspections	20,008	24,321

Pike and Caribou Lakes Inspections

Inspections and education on Pike and Caribou Lakes were managed by Canosia and Grand Lake Townships. Pike Lake was designated as a zebra mussel infested water in 2009. It's close proximity to St Louis Bay, a source for multiple AIS species, and the high frequency of use by recreational boats in the Duluth area poses a risk for transmission of

additional species. Caribou Lake is not currently infected and is susceptible to the similar transmission of AIS as Pike Lake. Grand Lake and Canosia Townships split the inspections on Caribou Lake. Canosia Township had 1,662 in 2017 and 2,015 inspections in 2018.

Decontaminations



Photo credit: North St. Louis County Soil and Water

Decontaminations

The NSWCD continues to operate an AIS watercraft decontamination program along with inspections on Burntside Lake, Lake Vermilion, Shagawa Lake, and Gilbert Pit. Demand for decontamination stations has varied. Therefore, NSWCD adapted the positioning of the mobile

decontamination stations to meet boat traffic flows to and from lakes and traffic counts at landings. NSWCD manages five decontamination stations in the county. Measurable results from the 2017 and 2018 program include:

Watercraft Decontaminations by NSWCD		
	2017	2018
Decontaminations	594	546
Percent of Total Inspections	3%	2%



Outreach



WILDLIFE FOREVER CLEAN.DRAIN.DRY MESSAGING

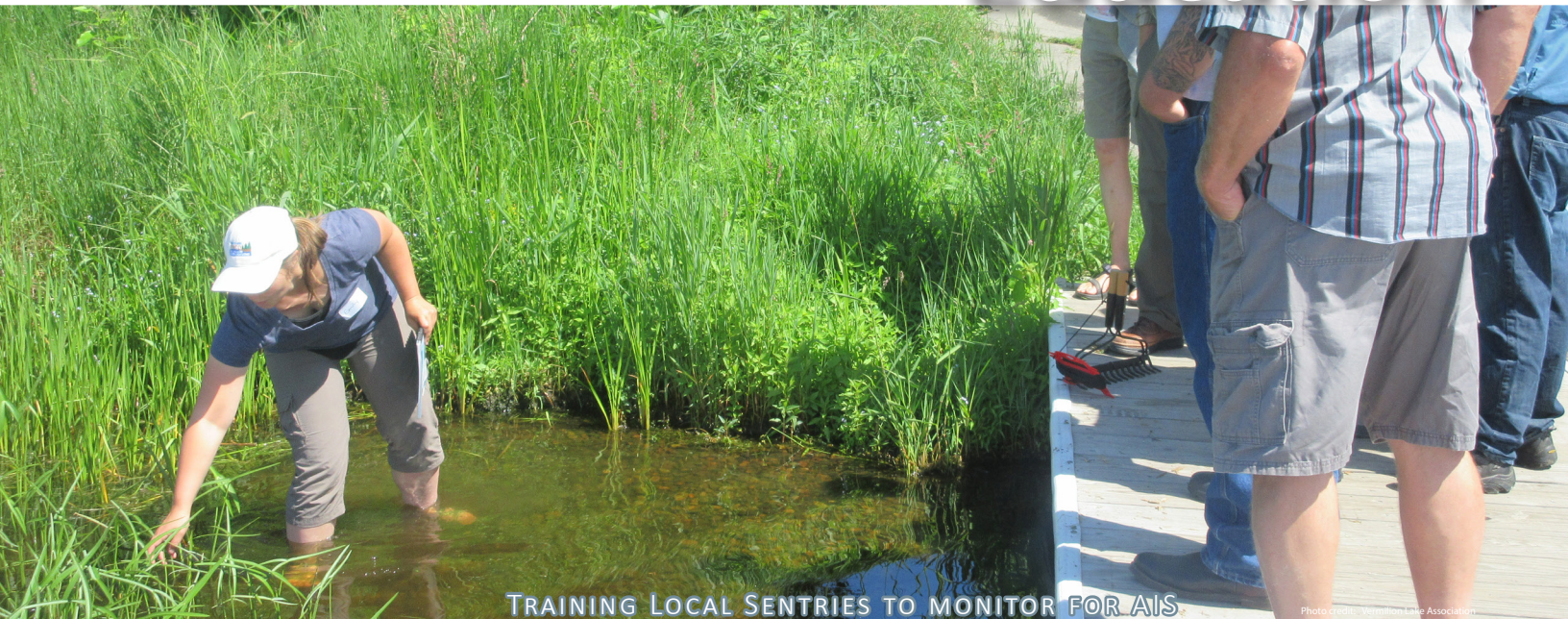
Photo credit: Wildlife Forever

Media

Impressions (2017-2018)

- 1. Radio:** 7 local broadcast stations aired 2,209 commercials 6.6 Million
- 2. TV:** 6 stations placed 850, 30-second ads 5 Million
- 3. Newspaper:** 4 local newspapers and publications displayed 44 ads from April to September 230 Thousand
- 4. Billboards:** 11 billboards displayed from April to September 6.3 Million
- 5. Deliverables:** vinyl banners, Clean.Drain.Dry brochures, bar coasters, bobbers, floating keychains, decals, laminated posters, AIS books.
- 6. Gas Stations:** 9.9 Million
At 11 different gas stations
5 post locations and 22 posters in restrooms
- 7. Events:** 5 Events by the St. Louis River Alliance Sentry Program 550

1-6: These impressions are estimated by Wildlife Forever's media impressions. Each applicant and project also generates impressions for person-to-person education, local ads, and during inspections



TRAINING LOCAL SENTRIES TO MONITOR FOR AIS

Photo credit: Vermilion Lake Association

Education to Encourage Involvement

Burntside Lake Association partnered with Vermilion Community College to hire students to act as sentries and monitor sites around the Burntside Lake for AIS.

Minnesota Sea Grant, in 2017 and 2018, participated in 39 community events in St. Louis County, reached 8,532 people, distributed 8,038 educational materials, and leveraged 117 hours of in-kind time on AIS outreach. These events included many local fairs and events. A unique event included *Habitattitude* and opportunity to surrender pet species that may pose an AIS risk.

Sea grant provided four students an intern position to research AIS topics and public outreach. These interns partnered with the 1854 Treaty Authority and the Natural Resources Research Institute.

St. Louis River Alliance (SLRA) developed a training package that included a manual, lesson plans and activities for field and classroom. Those who took the program became volunteer AIS sentries. Sentries use their time on

waterbodies to look for AIS. SLRA conducted six on the water trainings in 2018. SLRA staff trained 30 participants in an online course in addition to 10 people who completed both the online and on the water training.

The AIS Sentry Program, a citizen-science based AIS early detection program originally developed by the St. Louis River Alliance, was adapted to northern St. Louis County lakes by the Ely Area Invasives Team. Sentry training workshops were held on Burntside Lake, Lake Vermilion and Shagawa Lake in partnership with Lake County SWCD, Burntside Lake Association, and Vermilion Lake Association. Workshops consisted of 3 hours of classroom training and 3 hours of outdoor training. Participants included lakeshore homeowners and lakeshore businesses. Eight people were trained on Burntside Lake and 25 were trained on Lake Vermilion.



Photo credit: MN SeaGrant

Future Actions

Updating the Prevention Plan for 2020

The county and its partners will be meeting in 2019, to develop a 5 year update, and share experiences, best management practices and potential priority changes. St. Louis County will open the process to all AIS related stakeholders and document the process. The results will help to guide the funding priorities and prevention plan for 2020.

St. Louis County is also a part of the top ten recipients of funding and will continue to partner with counties statewide to find efficiencies and best management practices.

Identifying Potential Introductions

The table identifies the documented number of opportunities for the potential introduction of new invasive species into lakes inspected by the NSWCD. In 2018, 13,404 entering inspections revealed there were 2,791 (21%) opportunities for the potential introduction of a new invasive species into area lakes including Burntside, Ely, Gilbert Pit, Pelican, Shagawa, and Vermilion. These numbers are only for inspected lakes. A majority of lakes in the county are not inspected.

2018 Entering Inspections from Infested Waters	
Species	Inspections
VHS/New Zealand Mud Snail/Round Goby/Ruffe/White Perch	100
Starry Stonewort	35
Brittle Naiad	3
Eurasian Watermilfoil	556
Flowering Rush	137
Faucet Snail	202
Zebra Mussel	572
Spiny Waterflea	213
Bighead Carp/Grass Carp/Silver Carp	191
Total	2,791 (21%)

Continue to Monitor

The main goal of the prevention plan is to build the capacity to manage current species and prevent introduction of new species. According to the DNR Infested Water List, which monitors high priority aquatic invasive species, there have been no new known introductions of AIS in St. Louis County lakes in 2018, although there is potential for species to exist that have not been identified.

A species of concern that currently exists in lakes in nearby counties is starry stonewort. In 2016, Starry Stonewort was found in 14 new lakes in 6 counties after its discovery in Lake Koronis in Meeker County in 2015. With no known cost-effective treatment, starry stonewort has quickly become one of the most dreaded AIS. Dense mats of starry stonewort interfere with and severely limit boat traffic, recreational opportunities and potential habitat. AIS infestations, such as these, may reduce the desirability of the lake as a place to live and recreate and may have a negative impact on property tax values.





Update Report **Aquatic Invasive Species (AIS)** *St. Louis County, Minnesota*

