



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

# 2015 - 2016

## FUNDED PROJECTS



For more information on AIS in St. Louis County:

[www.stlouiscountymn.gov/ais](http://www.stlouiscountymn.gov/ais)

All detailed reports and applications are available

# Contents



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### Date

1-2017  
Rev. 1.0

SOURCES: Content generated from progress reports from grant recipients.

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## About State Program Aid

Beginning in 2014, the Minnesota State Legislature authorized funding to all Minnesota counties to implement plans to prevent, slow and minimize impacts of aquatic invasive species (AIS). In 2014, \$4.5 million was appropriated for 2014 and \$10 million in 2015 annually thereafter.

St. Louis County is the recipient of County Program Aid grant funds for AIS prevention as a result of 2014 Session Law Chapter 308. The purpose of these funds is to “prevent the introduction or limit the spread of aquatic invasive species at all access sites within the county” (MN Statutes 477A.19).

## What are AIS?

Aquatic invasive species 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

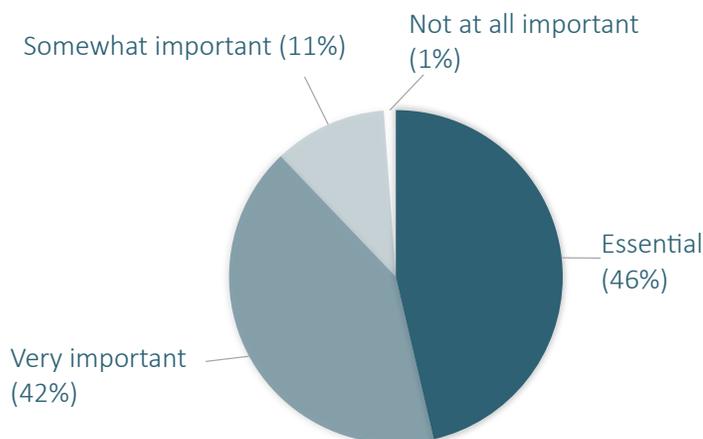
St. Louis County, with assistance from Minnesota Sea Grant, developed an Aquatic Invasive Species Prevention Plan. St. Louis County has 1,068 lakes and AIS poses a great threat to our pristine waters. Actions that the county may support to prevent the spread of AIS are identified in the plan. The plan cross references the MN Department of Natural Resources Local AIS Plan framework and actions and elements from a Minnesota State Management Plan for 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 Aquatic Invasive Species Prevention response.

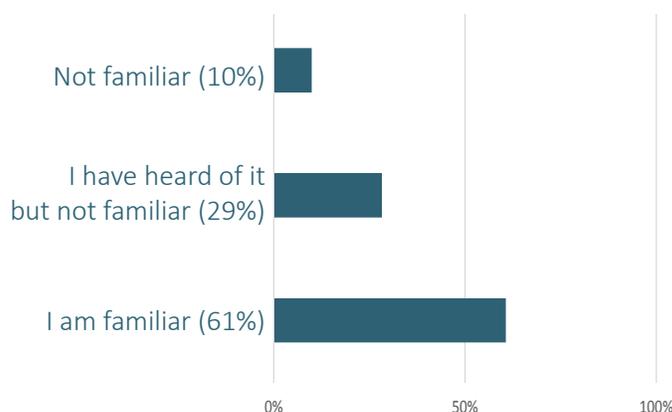
## Awareness of AIS in St. Louis County

St. Louis County included two AIS questions in the 2016 community survey. Based on the results, a majority of residents are familiar with AIS and believe action should be taken to prevent the spread. This data affirms that the residents of St. Louis County believe it is important to prevent the spread of AIS.

**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 Grant Recipients

2015-2016

**1 Sportmen's Club of Lake Vermilion**  
Comprehensive Lake Vermilion Prevention Program

**2 North St. Louis Soil and Water Conservation District**  
Watercraft Decontamination

**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 Izaak Walton League of America**  
Rapid Response Mobile Ballast Water Treatment for Lake Superior Harbors

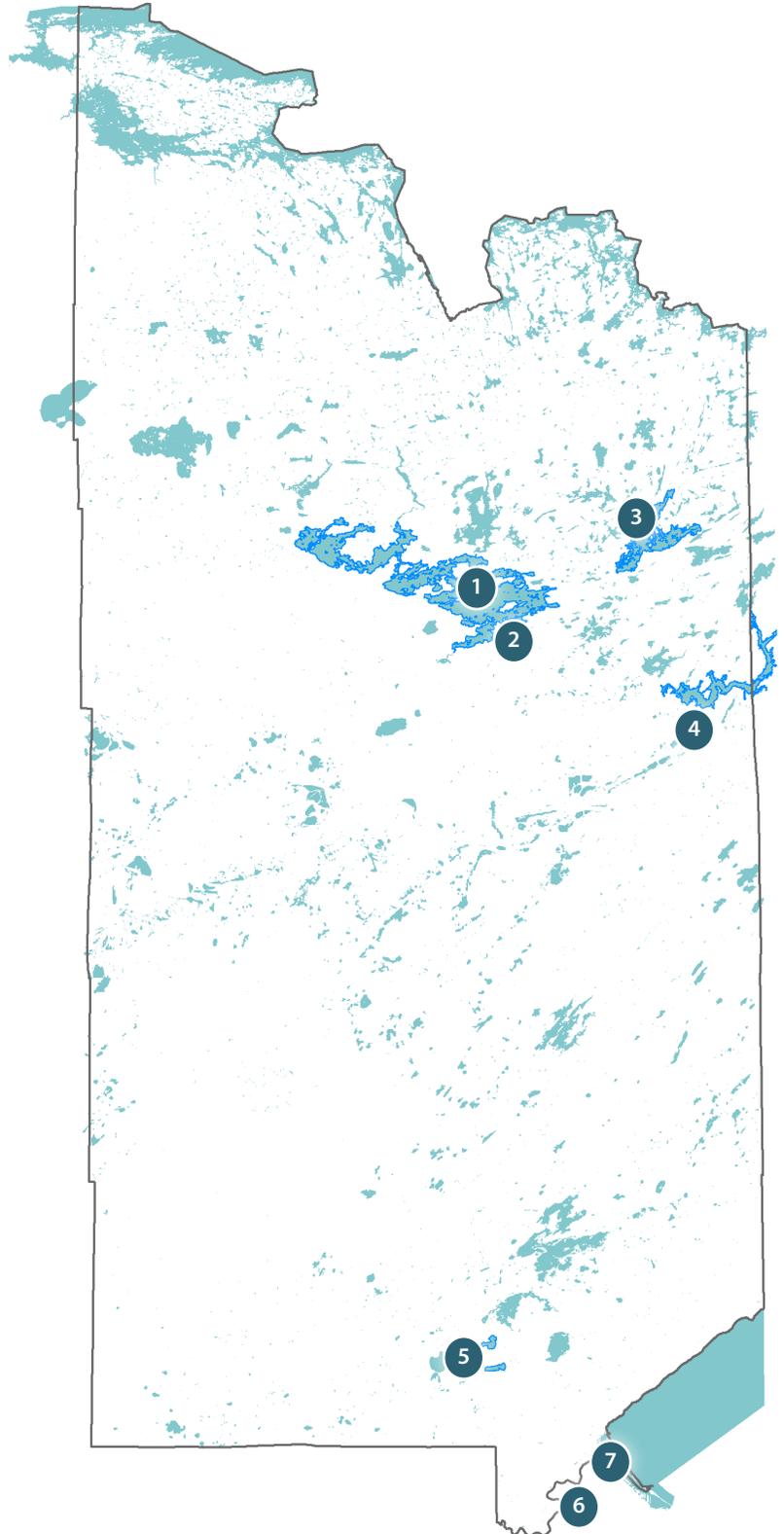
## County Wide Projects

### Natural Resources Research Institute (NRRI)

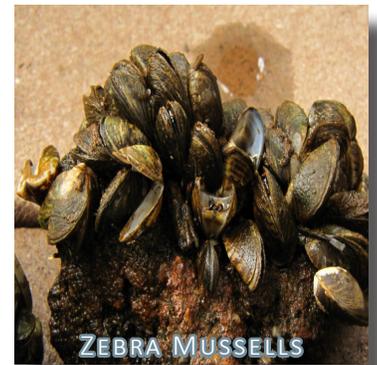
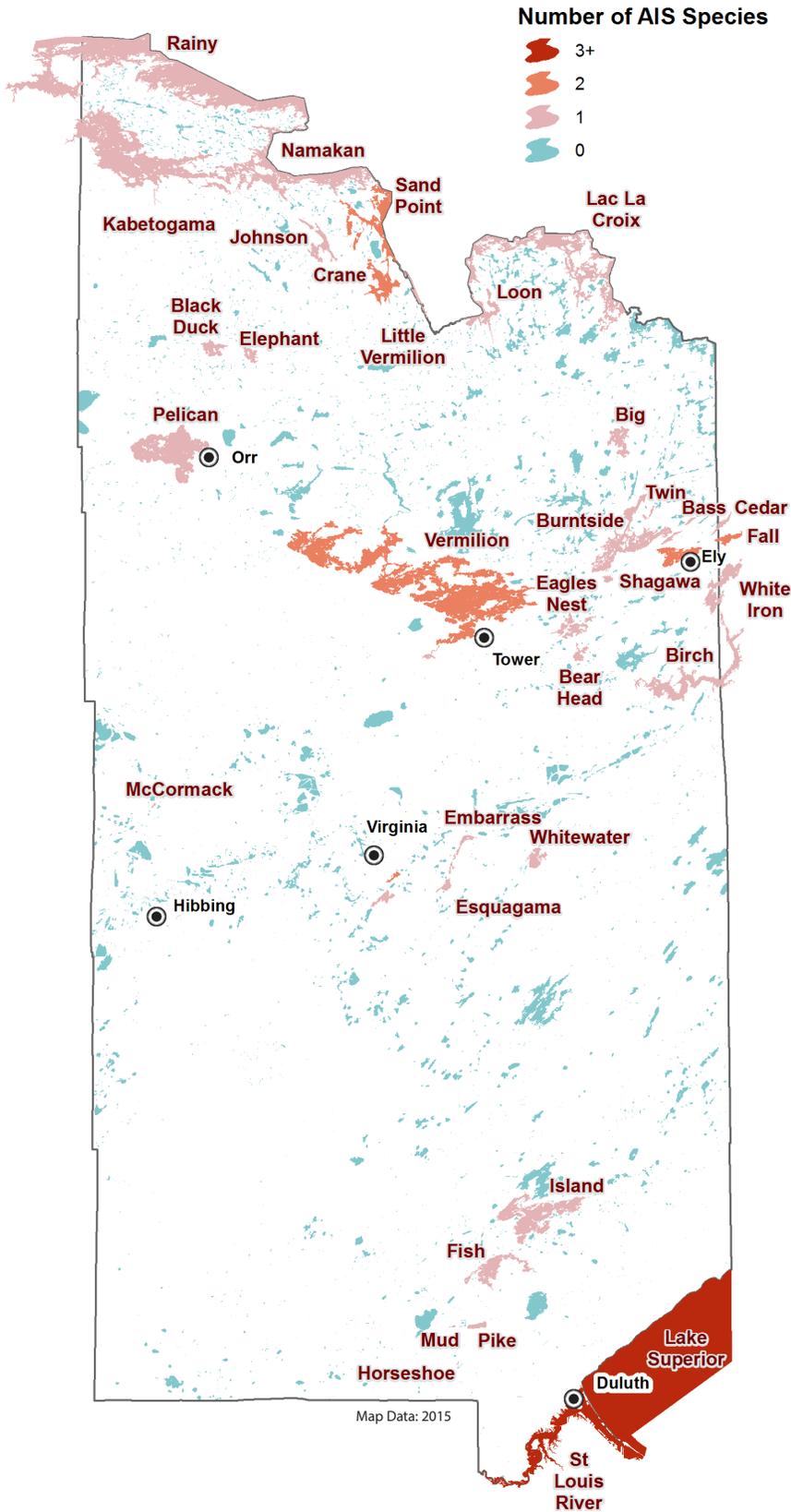
1. George Host  
Baseline surveys and geospatial modeling of AIS in SLC
2. Josh Dumke  
AIS Introduction Risk Assessment

### Wildlife Forever

County Coordinated Public Awareness



# 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.

## Investments in Prevention

| Award Year | Total Award Allocated



**2016:** \$23,441  
**2015:** \$285,885



**2015:** \$60,000



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



**2016:** \$189,857



**2015:** \$118,380



**2016:** \$16,000

**Natural Resources Research Institute**

UNIVERSITY OF MINNESOTA DULUTH  
Driven to Discover

**2015:** \$126,281



**2016:** \$102,500  
**2015:** \$107,000



**2016:** \$24,817  
**2015:** \$11,754



**2015:** \$50,000

# Building Partnerships



BABBITT BOAT LAUNCH ON BIRCH LAKE

Photo credit: Ely Echo

## Research

**The City of Babbitt**, as a part of the development of an upgraded boat launch on Birch Lake, incorporated AIS prevention in the design and construction of the stormwater, signage, and operational layout. In partnership between St. Louis County, the City of Babbitt was able to construct a boat launch that incorporated AIS prevention features including a boat, trailer and vehicle cleaning area.

**The Sportsmen's Club of Lake Vermilion, North St. Louis SWCD, and Burntside Lake Association** joined the formation of the Ely Area Invasives Team. The mission of the group is to prevent the spread of invasive species into and among all Ely-area lakes. The group includes representatives from the White Iron Chain of Lakes, Eagles Nest Township Lake Association, Shagawa Lake, Lake Vermilion Lake Association, Lake County Soil and Water, North St. Louis Soil and Water Conservation District, Ely Field Naturalists, ECO Club in Ely, and 1854 Treaty Authority. This group actively looks at ways to implement AIS prevention plans for their own lakes through lessons learned from the experiences of others in the group and also at ways we can cooperate to use resources more effectively.

**MN Sea Grant**, led a county-wide community outreach effort in 2015 and 2016. Sea Grant led the outreach effort for 27 events and co-lead or supported nine additional events. Sea Grant, along with community partners, dedicated approximately 664 hours to AIS education and outreach in 2015 and 2016 in St. Louis County. 12,976 people were reached with AIS spread prevention messaging, and 15,210 pieces of educational material were distributed. Partners included:

1. 1854 Treaty Authority
2. American Fisheries Society
3. Animal Allies Humane Society
4. Cook County Invasive Team
5. Lake County Soil and Water Conservation District
6. Lake Superior Zoo
7. Minnesota Department of Natural Resources
8. Natural Resources Research Institute
9. North St. Louis County Soil and Water Conservation District
10. St. Louis River Alliance
11. The Snake Pit
12. World of Fish

# Species Removal



PHRAGMITES REMOVAL IN THE ST. LOUIS ESTUARY

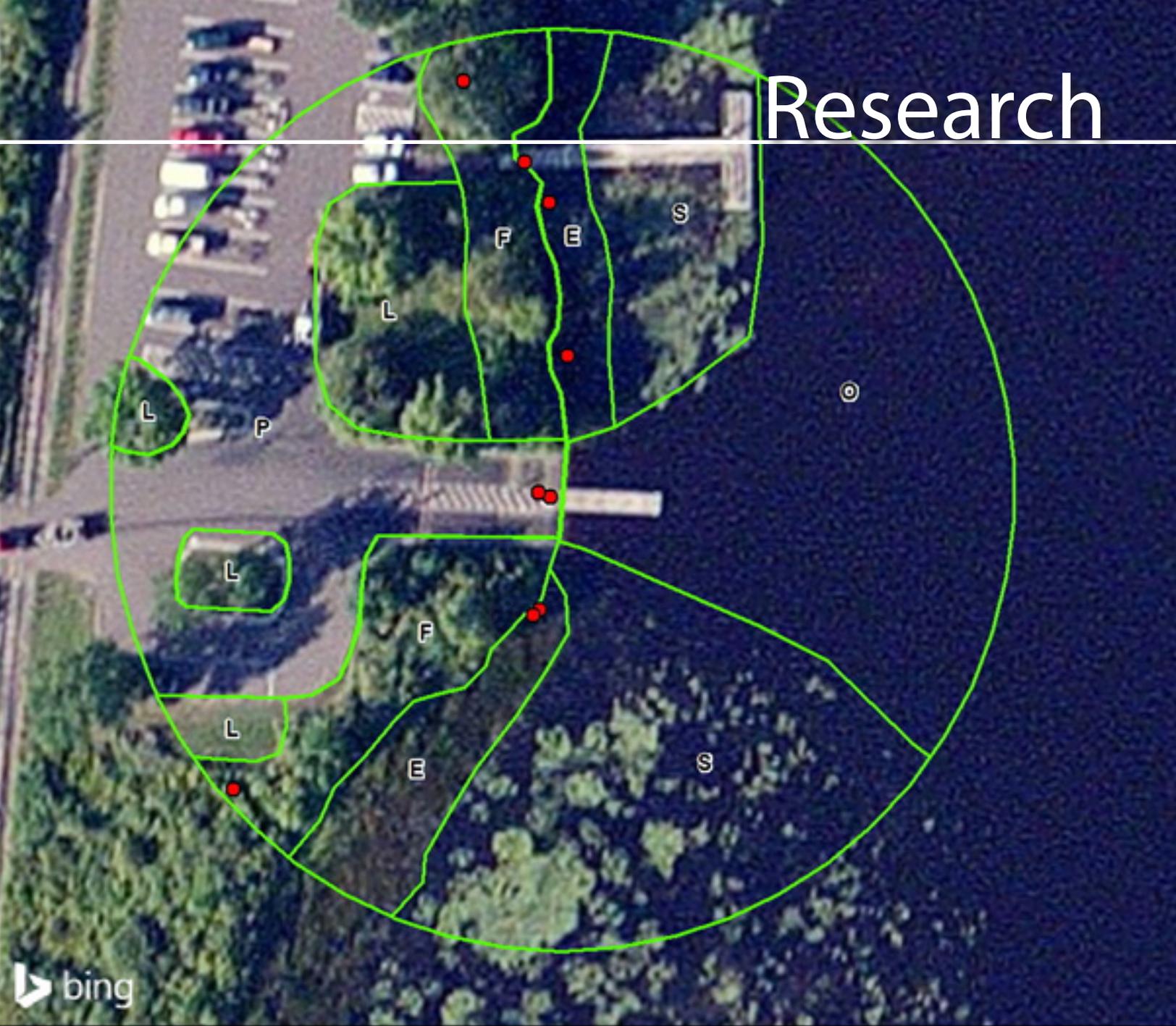
Photo credit: St. Louis River Alliance

## Species Removal

No plan for phragmites management existed on the Minnesota side of the St. Louis River estuary prior to the development of this grant. Extensive technical team building and communications were needed to initiate the project. **St. Louis River Alliance (SLRA)**, through meetings with the technical committee and communication with the Wisconsin Department of Natural Resources (who had already started treatment on the Wisconsin side of the estuary), identified and targeted critical locations for treatment that are scheduled to be modified or managed in accordance with the St. Louis River Area of Concern Remedial Action Plan.

Each landowner was contacted and provided with the information on the location and estimated acreage of the location covered by non-native Phragmites. The one-page education handout was also provided along with a specific description on how the plant was to be managed and eradicated in the land owner agreement. SLRA treated two locations equaling approximately 3 acres of non-native Phragmites in the estuary during the 2016 season, the large patch of Phragmites located behind the Tate & Lyle plant as well as a patch located next to the Spirit Lake Marina were treated, bringing the treated acreage total for 2016 to approximately 3 acres.

# Research



**St. Louis River, Spirit/Clyde Ave.  
State Water Access Site**

● Invasive species locations  
□ Cover type

0 5 10 Meters



## Research

Research by Researcher **George Host and NRRI** in July and August 2017, has generated baseline data on invasive plant species observed at 39 public water access points in St. Louis County; researchers sampled 16 landings in southern, 16 landings in central, and 13 landings in the northern part of the county. The purpose is to help understand pathways of introduction of invasive species to local waters, and will help update MNDNR's list of water bodies that are

designated as infested, with a focus on boat launch areas. The researchers have started digitizing the habitat maps at each landing, and overlaying the locations of invasive species. The species data, AIS plant species within a 100 meter diameter from each landing, will be used to populate attribute tables for the habitat polygons and invasive species points in ArcGIS maps.

# Research



GLOSTEN TEAM TESTING INRESPONSE

Photo credit: Glosten

## Research

Grant funding contributed to research projects in the county. The results and collaboration will help to track, analyze, and build partnerships for AIS prevention. Natural Resources Research Institute, Izaak Walton Foundation, St. Louis River Alliance, Sportsmen's Club of Lake Vermilion, and Burntside Lake Association all contributed to expanding AIS research.

The research conducted by a partnership between the **Izaak Walton Foundations, National Park Service, and Glosten** used the inResponse™ ballast water treatment system (BWTS), designed for marine vessels that are otherwise unable to manage their ballast water, to minimize the spread of AIS. The August 2016 trials demonstrated practical deployment of the inResponse™ BWTS on the articulated tug-barge John J. Carrick. This mobile system is deployed to a marine vessel that arrives in port already laden with potentially high-risk ballast water. Once aboard, the equipment treats the ballast water in-tank with chemicals, establishes efficacy by achieving a minimum concentration time (CT), and then neutralizes the chemical so that the tank is ready for discharge.

The inResponse™ system uses bulk sodium hypochlorite to raise the oxidant level in the ballast water to levels that are toxic to marine organisms and pathogens in a marine vessels ballast water. The mixing system promotes mixing of the chemical throughout the ballast water tank that is being treated. Prior to adding the treatment chemical, a tracer dye is administered and measured to determine the length of mixing required.

The inResponse™ system nearly met the standards for zooplankton in compliance with International Maritime Organization, US Environmental Protection Agency, and US Coast Guard standards. The structural divisions of the aft peak tanks (three level separations with small access ways in between) inhibited tank mixing throughout the entire volume. The inResponse™ mixing pump could only directly mix the top third of the aft peak tanks due to each tank's structural bulkheads. The dosing chemical could not penetrate to the more remote locations of each tank within the allotted test period. This arrangement indicated the limits of inResponse™ performance in a nonoptimized tank geometry, characteristic of an authentic emergency treatment response.

Researcher **Josh Dumke and NRRI** is developing an AIS information portal via interactive online map layers which display where AIS have been surveyed but none found (non-detection), and which waterbodies have not been surveyed (data gaps; i.e. potentially undetected AIS already present). The data gaps this project identifies are going to be valuable for future planning and limiting the spread of AIS in St. Louis County. The final products (interactive online map layers) are effective at conveying information to users and will be measured in two workshops in 2017.



# Research

## Research

**Burnside Lake Association** completed a survey of aquatic plants in Burnside Lake (conducted by RMB Environmental). No invasive plants were found during the survey. The lake association now has a baseline for measuring any changes that may occur over time. The association also had a group participate in the St. Louis River Alliance (SLRA) Sentry Program to help participants learn how to identify AIS and how to monitor their area of the lake.

**Sportsmen's Club of Lake Vermilion Volunteers** collected samplings for two projects: Eagles Nest Township Lake and River Calcium Sampling Project and the East Two River Calcium Source Identification project.

The first collected water samples from key lakes and interconnecting streams throughout Eagles Nest Township to identify those which could support a zebra mussel population. Between March 29, 2016 and May 23, 2016, 22 water samples were collected from nine different locations. The highest risk lakes are expected to be the southern 2/3rds of the township and spring-fed from a shared high calcium aquifer. Lakes determined to be at-risk will be more closely sampled to understand seasonal variations and to identify localized "hot spots" near flowing wetlands or small stream inflows and to determine seasonal variations. Sources will be investigated to determine if they are natural or man-made (e.g., abandoned mines, quarries, roadbeds).

The timing of samples taken at Eagles Nest Lake #2 (the primary headwaters of East Two River) was coordinated with the synoptic and load monitoring samples along East Two River described in the next section. Sampling takes place from ice-out (late March) through ice-up (November). Data analysis extends through March 17, 2017.

The East Two River calcium source identification project, beginning at ice-out 2016 and running to ice-up, collected calcium samples and other measurements were taken at 10 locations along East Two River for 11 triggering events. These locations and events are designed to isolate the calcium sources and quantify the contribution from each source along the river.

During each of these 11 events, synoptic samples and measurements taken at 10 locations included calcium, magnesium, hardness, water temp, pH, Secchi tube clarity, conductivity, and mine and wastewater discharge flow rates. A solar powered data-logging station was established shortly after ice out at the Pine St. Bridge (S000- 967). It has been outfitted with a pressure transducer (depth of water) and conductivity/temperature sensor (concentration of salts). It is logging data every 15 minutes from each of the sensors, greater than 20,000 data points from each of the sensors to date.

# Inspections



WATERCRAFT INSPECTIONS

Photo credit: North St. Louis County Soil and Water

## Inspections

Inspections on Burntside, Pike, Caribou, and Vermilion Lakes were completed from Saturday, May 14, 2016 (fishing opener) through Sunday, September 18, 2016. Inspection schedules varied based on the needs of lake's users. Hours varied 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 MN Department of Natural Resources. A local staffing agency was used to aid in the hiring and human resource management of inspectors. Level 1 inspectors can conduct MN DNR approved watercraft inspections while level 2 inspectors can operate the decontamination station to kill AIS that may be on the watercraft. This uses a combination of high temperature and high pressure water.

## Pike and Caribou Lakes

Inspections and education on Pike and Caribou Lakes were managed by **Canosia Township**. Pike was designated as a zebra mussel infested water in 2009. Pike Lake'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.

Location	Inspectors Hired	Hours of Inspection	Inspections
Canosia Township Pike and Caribou Lakes	5- Level 1 inspectors	840	1,000
Burntside Lake Van Vac Road	Averaged 10 FTE Level 1 and 2 inspectors	1,375	2,193
Lake Vermilion 11 public and 4 private boat launches	Averaged 21 FTE Level 1 and 2 inspectors	5,688	12,562
St. Louis County Sheriff Courtesy outreach at launches and on water	Sheriff Deputies	662	1577 (observed) 244 (checked)

# Decontamination



DECONTAMINATION IN PROCESS



DECONTAMINATION EDUCATION

Photo credit: North St. Louis County Soil and Water

## Lake Vermilion - 240 Decontaminations

The **North St. Louis Soil and Water Conservation District** purchased two watercraft decontamination units for use in conjunction with the **Sportsmen's Club of Lake Vermilion's** AIS watercraft inspection program.

The decontamination units were used to decontaminate watercraft before entering and/or after exiting area lakes. The units were strategically located at convenience stores, Y-Store in Tower (135 cleanings) and Country Store in Cook (105 cleanings). These locations allowed any watercraft

owner passing along the Highway 169 and 53 corridors to have their unit decontaminated.

The boat cleaning stations at the Y Store and the Country Store together reached 240 decontaminations, more than twice the anticipated number. Initial analysis suggests the key reasons for the success were ideal locations, the incentive coupon offering, word-of-mouth publicity later in the season, and resort informational letters to their guests.

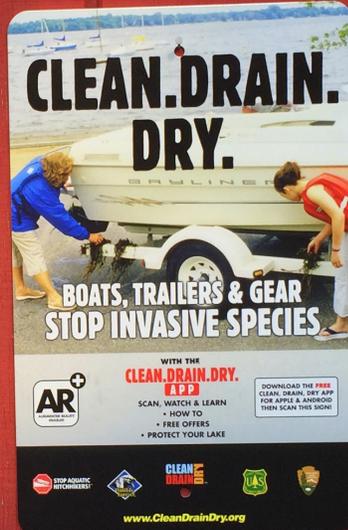
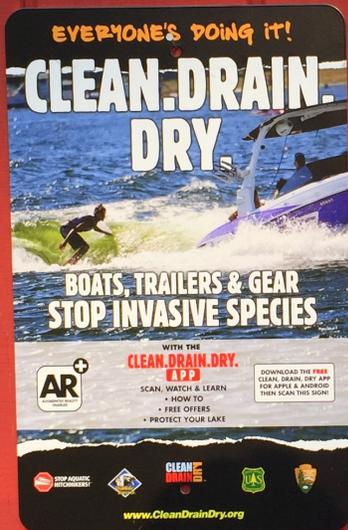
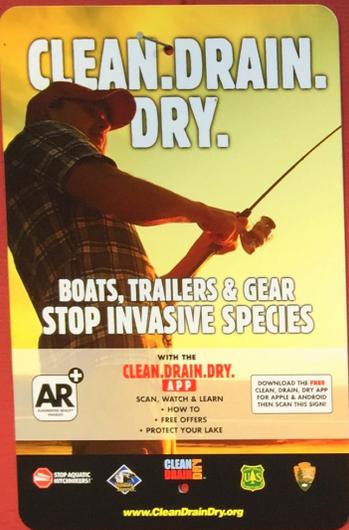
## Burntside Lake - 132 Decontaminations

This station was staffed Friday to Sunday only as traffic did not justify having it staffed the rest of the week. Signs were posted on both sides of the Chamber, on Route 1 and on Route 169 (Sheridan Street) to promote the boat cleaning site. In addition, there was a weekly ad in the Ely Angler advertising the location and hours of our boat cleaning stations.

The **Burntside Lake Association** also partnered with **Wildlife Forever** on WELY radio station advertising the location and hours of the boat cleaning stations. The lake association completed 132 boat cleanings with the 2 decontamination stations located at the Van Vac landing (100 cleanings) and at the Ely Chamber of Commerce (32 cleanings) parking lot.

The lake association's goal was to inspect between 800-1,000 boats based on the original estimate of 1,000-1,200 boats being launched into Burntside Lake each season. The lake association recorded 2,193 inspections with the DNR between May 14, 2016 and September 18, 2016. 1,204 inspections were of boats entering the lake and 989 were exiting boats.

# Outreach



WILDLIFE FOREVER CLEAN.DRAIN.DRY MESSAGING

Photo credit: Wildlife Forever

## Media

1. **Radio:** local broadcast stations aired 1,700 commercials
2. **TV:** placed 160, 30-second ads
3. **Newspaper:** 5 local newspapers and publications displayed 47 ads from April to September
4. **Billboards:** 8 billboards displayed from April to September
5. **Deliverables:** 35 vinyl banners and 30,000 Clean.Drain.Dry brochures, bar coasters, bobbers, floating keychains, decals, laminated posters, AIS books.
6. **Gas Stations:**  
3 designs at 10 different gas stations  
17 locations 17" and 22" posters in restrooms
7. **Events:** 10 Events by the St. Louis River Alliance Sentry Program

## Impressions

- 1.8 Million
- 1.9 Million
- 250 Thousand
- 4 Million
- 5.5 Million
- 2,043

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

# Education



## Education

**Burntside Lake Association** had a successful program with Ely Community Resource's ECO Club. Two programs were developed for high school students: trapping rusty crayfish in the Burntside River and measuring spiny waterflea populations in Burntside Lake. For the younger kids, AIS prevention was introduced as part of their summer programs and included a demonstration of a boat cleaning.

**MN Sea Grant**, in partnership with St. Louis County, Minnesota Department of Health, Minnesota Pollution Control Agency, St. Louis River Alliance, US Environmental Protection Agency, and the Western Lake Superior Sanitation District, hosted a Workshop on the Water, St. Louis River's Ecosystem Services – how a healthy watershed supports our communities. This 4 hour workshop offered

government officials, staff, and business people an opportunity to learn about AIS while sailing aboard the Vista Star. They also learned about ecosystem services provided by the St. Louis River Estuary and some of the natural resource issues affecting the estuary.

**St. Louis River Alliance** has developed a training package including a manual, lesson plans and activities for field and classroom for the Sentry program. Sentries are volunteers that look for AIS while involved in field activities. In 2016, St. Louis River Alliance staff conducted four classroom sessions and four field sessions and trained 29 people, 16 in Duluth and 13 in Ely.

**MN Sea Grant, St. Louis River Alliance, Burntside Lake Association, Sportsmen's Club of Lake Vermilion,** all participated, presented, and contributed to AIS related events including:

- St. Louis River Summit
- Head of Lakes Chapter of Master Naturalists
- St. Louis River Annual Meeting
- Northland Paddlers Alliance
- University of Wisconsin- Superior
- Minnesota Whitewater Rafting
- Lake Superior Days
- Tall Ships Festival
- Duluth Boat, Sport, Travel, and RV Show
- Children's Museum Youth Event
- St. Louis River Quest
- Lake Superior Zoo Earth Tracks
- Park Point Garage Sale
- Blueberry Festival
- North St. Louis County Fair
- Habitattitude Surrender Event
- Walleye Classic Fishing Tournament
- Traditional Media Outlets including:
  - KUMD
  - Duluth News Tribune
  - Ely Echo
  - Fox Morning Show
  - WDIO

# Current and Future Investments

## AIS Funding as Workforce Development

AIS funding has provided opportunities for employment for residents of St. Louis County. The positions generated by the funding include inspectors, environmental scientists, researchers, interns, operations staff, outreach, construction trades, and education specialists. Seasonal and year long positions benefit from the prevention work, research, education and outreach distributed in the northern and southern waterbodies.

The grant contributes to the mission and effectiveness of organization in the county to develop staff and organization capacity aimed to prevent the spread of AIS.

## Addressing New Concerns

A relative newcomer to AIS is starry stonewort. It is a grass-like macro algae that produces dense mats, interferes with recreation and alters habitat of young fish. In 2016, starry stonewort was found in 7 new lakes in 4 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. Because the dense mats interfere with and severely limit boat traffic, property values for affected areas of Lake Koronis appear to be significantly depressed according to anecdotal reports, with no buyers stepping forward. AIS infestations, such as these, that reduce the desirability of the lake as a place to live and recreate will have a negative impact on property tax values.



## Identifying Potential Introductions

The table identifies the documented number of opportunities for the potential introduction of new invasive species into Lake Vermilion in 2016. Of the 6,755 entering inspections in 2016, there were 1,342 opportunities for the potential introduction of a new invasive species into Lake Vermilion. Nearly 20% (percent) of watercraft posed a risk for spreading AIS. This excludes spiny water flea, as Lake Vermilion is currently designated as spiny water flea infested waters.

Watercraft Coming from Infested Waters		
Species	Burntside Lake	Lake Vermilion
<b>Eurasian Water Milfoil</b>	38	329
<b>Zebra Mussels</b>	43	319
<b>Faucet Snail</b>	12	124
<b>Flowering Rush</b>	8	70
<b>Big Head Carp</b>	9	69
<b>Silver Carp</b>	9	69
<b>Grass Carp</b>	9	62
<b>New Zealand Mud Snail</b>	8	56
<b>White Perch</b>	8	56
<b>Round Goby</b>	8	56
<b>Ruffe</b>	8	56
<b>Viral Hemorrhagic Septicemia</b>	8	56
<b>Starry Stonewort</b>	4	20
<b>Total</b>	<b>172</b>	<b>1,342</b>



## AIS Funding Supports Economic Health

There are nearly three dozen AIS currently considered high-risk for Minnesota - nearly equally divided between plants, fishes, invertebrates, and microbes.

With 1,068 lakes in St. Louis County, AIS poses a great threat to our pristine waters. Though a study has been undertaken by NRRI, there is no data available to suggest which lakes might be at higher risk and what risk factors are greatest. The 2015 and 2016 grants were awarded to applicants and lakes that currently are infested. These lakes contribute to the tax base of the county.

**Burntside Lake** is the largest open recreational lake in the Ely area at 7,314 acres. It is located seven miles northwest of Ely and is a gateway to the Boundary Waters Canoe Area Wilderness. There are 572 parcels on Burntside Lake with an estimated market value of \$206 million<sup>1</sup>. Based on Burntside Lake market valuation and tax class rates, its taxpayers contribute about \$2.0 million<sup>1</sup> in property taxes to the local government, the local school district, and St. Louis County. Burntside Lake is the principal water source for the city of Ely.

**Lake Vermilion** is the largest lake in St. Louis County at 39,721 acres. It has 341 miles of shoreline and 365 islands. Lake Vermilion has 17 public accesses and 23 resort/campground/private accesses. With over 20,000 guests annually, its tourism impact likely exceeds \$20 million<sup>2</sup>. Its lakeshore property has an estimated market value of \$902 million<sup>1</sup>. Property tax owners from the lake contribute \$10.5 million<sup>1</sup> net tax to St. Louis County, school districts and local governments.

Prevention of additional species to these and all lakes is important to maintaining property tax values of lakeshore properties in the Minnesota's pristine lakes and streams.

**Source:**  
<sup>1</sup>North SWCD Project Suitability Application 2016. Project suitability data from St Louis County Assessor's and Auditor's data.  
<sup>2</sup>Based on multiplier from 2015 Tourism and the Economy Fact Sheet from Explore Minnesota Tourism and on LVRA pattern of past receipts and expected 2015 receipts from 3% lodging tax.



# Annual Report Aquatic Invasive Species (AIS)

St. Louis County, Minnesota

**PROTECT THIS LAKE FROM  
AQUATIC INVASIVE SPECIES**

LYLE SIGNS INC. 08-10-04748407

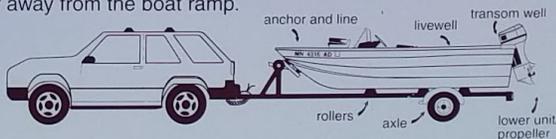


## HELP STOP AQUATIC HITCHHIKERS!

**It's the law: BEFORE launching ... BEFORE leaving you must**

- **Remove** aquatic plants, zebra mussels, and other prohibited invasive species.
- **Drain** lake or river water away from the boat ramp.

inspect the  
locations  
shown



### It is unlawful to:

- Transport aquatic plants, zebra mussels, or other prohibited species on public roads
- Launch a boat or place a trailer in the water if it has aquatic plants, zebra mussels, or other prohibited or regulated species attached
- Transport watercraft without draining water, removing the drain plug, and opening water-draining devices
- Dispose of unwanted live bait in the water or on the ground.

**Penalties up to \$1,000 - Call a Conservation Officer to report violations**

Minnesota Department of Natural Resources

LYLE SIGNS INC. 08-10-04748407