

2019

Lake Vermilion

AIS Prevention Plan



Revision Date

12-9-2018

AIS Prevention Priorities at Lake Vermilion

Assessing Lake Vermilion’s Risks to Prioritize Our Activities

The resources to completely defend Lake Vermilion’s fishery and business community will never be available. We’re committed to deploying the resources we can muster on our highest priority risks as efficiently as we can.

Hybrid watermilfoil has moved up the list to our top spot. Little is known about crosses between invasive Eurasian watermilfoil and our native northern watermilfoil, but anecdotal reports suggest some genotypes have increased invasiveness and evidence of herbicide resistance. Ray Newman (MAISRC), in an ongoing study of the distribution of watermilfoil in Minnesota, has found 27 hybrid genotypes in 19 lakes. Some of those lakes had hybrid but neither parent, suggesting hybrid watermilfoil can be moved between lakes with suitable habitat.

In Lake Vermilion, native northern watermilfoil co-exists with other native vegetation. We have no known Eurasian watermilfoil – an indication our habitat may not be suitable. However, at this point, no one knows whether a specific hybrid genotype may find our water chemistry to its liking and overwhelm our native vegetation in specific bays.

Starry stonewort – a relative newcomer to Minnesota’s AIS roster – has been found in 13 lakes, including top-ten walleye lakes Upper Red, Cass and Winnibigoshish, five years after its discovery in Lake Koronis. This grass-like macro algae can produce dense mats, can interfere with recreation, and can alter habitat for young fish. It’s understandable that property values would decrease at lakes and along shorelines with starry.

Early research suggests our water chemistry may be generally low risk for starry. However, we’re early in the game and certain shallow, soft bottom bays may be suitable.

Zebra mussels, on the other hand, have been extensively studied. Zebras need sufficient dissolved calcium – about 20 milligrams per liter – to grow and reproduce. Most of Lake Vermilion is below 13 mg/l – well in the safe zone. An exception is East Two River, which flows into Vermilion’s east basin, with calcium above 20 mg/l at certain times of the year. However, its <7.0 pH prevents zebra mussels from becoming established. To be safe, we will continue to monitor east-basin water chemistry for a few years.

Our current risk assessment – including what we don’t know – is summarized below:

Species	Introduction Risk	Habitat Suitability	Impact if Population Established	
			Fishery & Ecosystem	Recreational Boating
Hybrid and Eurasian watermilfoil	Eurasian high. Hybrid increasing as more lakes become infested.	Generally low. May be suitable in specific bays.	Serious stressor. Unknown impact on each fishery.	Severe in bays with suitable habitat.
Starry stonewort	Increasing as more lakes become infested.	Generally low. May be suitable in specific bays.	Serious stressor. Unknown impact on each fishery.	Severe in bays with suitable habitat.
Zebra mussels	Very high.	Low. Limited to calcium hotspots with suitable pH?	Serious stressor. Filters zooplankton, limiting growth of fry.	Generally negative but water clarity appeals to some.
Spiny waterfleas	Present in many bays. Discovered in 2015.	High in deep basins.	Varies by fish species. Consume zooplankton, limiting growth of fry.	Low. Gets tangled in fishing or recreational gear.
Curly-leaf pondweed	Present in 4 small areas.	Moderate/high in specific bays.	Stress on native plant diversity. Unknown impact on each fishery.	May become severe in bays with suitable habitat.
Rusty crayfish	Present in east basin and west to Niles Bay.	High for sandy, rocky, rubble bottoms.	Weed bed destruction impacting several fish species.	Low to moderate.

In addition to the priority threats in the table above, we continually monitor other potential AIS threats with the assistance of RMB Environmental Labs. Examples include Brazilian waterweed, water soldier, brittle naiad, hydrilla, and water hyacinth.

Our Resulting Priorities in 2019

#1. Prevent new AIS infestations, especially hybrid watermilfoil and starry stonewort.

- **Habitat Evaluation and Risk Assessment.** *To prioritize and focus resources, update our understanding of Lake Vermilion's risk level for all new and existing threats.*
- **Inspections at Public and Private Accesses.** *Expand our inspection and education activities at all launch sites, both public accesses and private resort, campground and marina accesses.*
- **Boat Decontamination.** *Provide decontamination services at both ends of the lake to support inspectors at public and private accesses. Locate the decon units at high-traffic public accesses for L1/L2 staffing efficiency. In future years, develop low-cost solutions for cleaning and draining boats and equipment at remote resorts, marinas and campgrounds.*
- **Traffic Analysis.** *Using data from access sensors and existing inspection surveys, develop a model to predict launch traffic by hour at each public access throughout the season. Deploy L1/L2 inspectors based on traffic predictions to increase efficiency. Update traffic projections and adjust model as actual traffic data become available.*
- **Public Awareness and Education.** *Expand our public awareness and education activities, with special focus on boaters who may launch watercraft at Lake Vermilion.*
- **Regional and Statewide Partnership Development and Sharing.** *Exchange information with AIS prevention leaders statewide. Build partnerships to share resources among COLAs, lake associations and local Lake Vermilion stakeholders, including local government units, tribal governments, businesses and civic organizations.*

#2. Detect any new infestations early, when AIS control options are most effective.

- **Monitor Existing Invasive Vegetation.** *Biennially evaluate known infestations of curly-leaf pondweed. Monitor native vegetation known to frequently co-exist with serious invasives, especially those stands near invasive entry points.*
- **Early Detection at High-Risk Accesses.** *Expand sentry early detection to cover all public and private accesses. Support the access sentries using AIS Detectors as coaches and identification experts.*

Our Commitment to Process Improvement

Each year, the Lake Vermilion AIS Prevention Plan incorporates process improvements based on tested ideas we've borrowed from other counties and lake associations and on knowledge we've gained from our past projects. We are committed to continually improving the quality and efficiency of our AIS work.

2019 AIS Prevention Plan Project and Activity List

☑ = 2019 Priority Activity

↑ = New or Expanded in 2019

1. Watercraft Inspection and Decontamination Project

- 1.1 Public Access Inspections and Boater Education ☑
- 1.2 Resort, Marina & Campground Inspections and Boater Education ☑↑
- 1.3 Resort & Campground AIS Educational Materials for Guests ☑
- 1.4 Fishing Tournament Inspection and Education ☑↑
- 1.5 Enhanced Inspector Training ☑
- 1.6 Watercraft Decontamination Stations ☑
- 1.7 Watercraft Traffic Analysis and Staffing Optimization ☑↑

2. Public Awareness and Education Project

- 2.1 Newspapers and Newsletters ☑
- 2.2 Events and Shows
- 2.3 Restaurants and Local Business ☑↑
- 2.4 Website and Social Media ☑
- 2.5 Stewardship Outreach to Resort and Lake Business Owners ☑↑

3. Early Detection, Habitat Evaluation, and Population Management Project

- 3.1 Habitat Evaluation and Risk Assessment ☑↑
- 3.2 Annual Evaluation of Existing Vegetation ☑
- 3.3 Curly-Leaf Pondweed Control ☑
- 3.4 Early Detection of Invasive Vegetation at Public and Private Accesses ☑↑
- 3.5 Pilot Project to Evaluate Methods for L1 & L2 Inspectors to Assist Early Detection ↑

4. Regional and Statewide Partnership Development Project

- 4.1 Lake Vermilion Stakeholder Info Sharing and Involvement ☑
- 4.2 Statewide Information Sharing and Involvement

2019 AIS Prevention Plan Project Descriptions

1. Watercraft Inspection and Decontamination Project

Today, prevention of AIS infestations via boat inspection, boat decontamination, and boater education remains our best bet. Population control is very expensive. Eradication is generally not possible.

In 2018, the Vermilion Lake Association partnered with North St Louis SWCD to inspect over 18,000 boats, including over 10,000 (60%) of the estimated 16,000 which launch annually at Vermilion.

While 60% coverage is a significant achievement, even more is needed. And that additional coverage needs to be achieved in a very cost-conscious manner.

Two important pioneering activities, jointly funded by St Louis County and Initiative Foundation grants, will continue into 2019 and focus on coverage and efficiency:

- **Boat Access Traffic Analysis.** We've been working on inspection efficiency since the beginning. This project will develop a model to predict traffic at each public access, each hour of the day, for the entire boating season. Traffic data from inspection surveys, access cameras, and parking lot cameras will drive the traffic projections, allowing North St Louis SWCD to deploy inspectors for maximum efficiency. We are targeting a 15% efficiency increase in 2019 and continuing annual efficiency improvements thereafter.
- **Expanding Boat Inspections at Private Resorts, Campgrounds and Marinas.** About 20% of boats entering Lake Vermilion do so at private accesses while staying at resorts and campgrounds. Others enter at private marinas. Supported by the VLA, North St Louis SWCD's team inspected over 6000 watercraft at private accesses in 2018. The 2019 goal is 8000 inspections with more participating businesses.

In 2019, the two watercraft decontamination units will be deployed at public accesses, one on each end of Vermilion. It is likely this will result in more decontaminations and increased efficiency, since L2 inspectors can often play a dual role at the access and at the decon unit when traffic is not projected to be high.

Several additional projects provide essential support to the boat inspection and decontamination station efforts. Expanded educational materials for resort guests, fishing tournament inspection coverage, and enhanced inspector training are key to success.

All Watercraft Inspection and Decontamination Project activities are summarized below:

1.1 Public Access Inspections and Boater Education.

Summary: Partner with North St Louis SWCD which will provide 7,100 hours of L1/L2 inspectors at selected public accesses. Educate boat operators to self-inspect and to clean, drain and dry their equipment. Goal 15,000 total inspections and 50% coverage of boats entering Vermilion at public accesses. Monitor and track progress. Assist SWCD as needed to solve problems.

1.2 Resort, Marina & Campground Inspections and Boater Education.

Summary: Partner with North St Louis SWCD to improve the online private-access inspector certification process and the methods for training and mentoring dock attendants during the season. Recognizing that each business is unique, work with owners to solve their individual inspection problems. About 24 business partners with private accesses expected in 2019. Goal 8,000 total inspections and >50% coverage of boats entering Vermilion at private accesses (80% coverage for boats entering at participating resorts).

1.3 Resort & Campground AIS Educational Materials for Guests.

Summary: Support resort and campground partners by supplying AIS information and educational materials for their guests. Provide AIS identification materials tailored to the resort environment. Cover native and invasive vegetation and invertebrates. Provide front-desk reference materials and signage for their guests. Provide owners with AIS content for their website, email and print communications with their guests. Pre-visit informational materials and mailings, including explanation of inspection and cleaning process upon arrival.

1.4 Fishing Tournament Inspection and Education.

Summary: Partner with North St Louis SWCD, 1854 Treaty Authority, and Fortune Bay Marina to inspect boats during pre-fishing and tournament days. Use Level 1 inspectors from North St Louis SWCD, private-access inspectors at Fortune Bay and resorts, plus 1854 Treaty Authority inspectors and Landa decontamination unit. Provide tournament participants with proof-of-inspection certificate or electronic equivalent. Pilot electronic methods by bypass “lost” certificate paperwork and streamline data gathering. Educate boat operators to self-inspect and to clean, drain and dry their equipment. Target: 95% coverage for all tournament participants entering Vermilion.

1.5 Enhanced Inspector Training.

Summary: Partner with Burntside Lake Association and North St Louis SWCD to provide enhanced training for Level 1 and Level 2 inspectors. Built on successful 2017 & 2018 one-day training. In 2019, will increase emphasis on communication with supervisors and customer service. AIS identification and biology will focus on local species and threats. Classroom sessions and hands-on advanced inspection training at Vermilion Community College for public access Level 1s and Level 2s. Develop an alternative training method for resort employees who are unable to attend live session.

1.6 Watercraft Decontamination Stations.

Summary: Partner with North St Louis SWCD which will provide 2,200 hours of Level 2 inspectors at Vermilion’s public accesses. Offer courtesy cleaning, corrective decontamination for boats denied entry, and decontamination for boats exiting. Based on traffic-driven staffing and physical proximity of decon equipment to access, estimate L2s will also provide access inspection coverage for 1100 hours (50%) of the L2 hours – a significant efficiency improvement. Educate boat operators to self-inspect and to clean, drain and dry their equipment. Select hours of operation based on traffic patterns.

1.7 Watercraft Traffic Analysis and Staffing Optimization.

Summary: Analyze all available ramp traffic data collected at public and private accesses by both the inspector surveys and unstaffed monitors (e.g., TRAFx sensors, cameras). Develop a usage model to fill in the time and spatial gaps where data is weak. Combine with risk-of-establishment data to optimize equipment and inspector deployment. Test promising ideas to reduce cost-per-boat and increase percentage of boats inspected before launch. In time, provide increased focus on high-risk boats (i.e., last lake, dry time, style of boat). Actively seek proven ideas from other lakes or counties and adapt to Lake Vermilion situation. Involves concept and tool development, analyst support.

2. Public Awareness and Education Project

Launch-site education activities (Project 1) are tailored to a specific audience and focused on Lake Vermilion's most significant AIS risks. We propose to complement that work with an awareness and education package – still focused on Lake Vermilion's risks – but aimed at the general public in their daily life.

The campaign will be local, emphasizing the region within 50 miles of Lake Vermilion.

- Display ads and feature articles in the *Cook News-Herald*, the *Tower News*, and the *Timberjay* (Tower edition) complementing the county-wide ads by Wildlife Forever.
- AIS content in the VLA quarterly newsletter, which is offered free to resort guests and in local businesses.
- AIS information booth at local fairs, carnivals, parades, and similar events.

The campaign will seek out tourists when they visit local businesses.

- Lake service providers, such as resorts, campgrounds, marinas, boat dealers.
- Grocery stores, cafes and restaurants catering to lake visitors.

The campaign will seek out the tech-savvy younger generation, a group hard to reach with traditional media.

- A significant increase in the AIS content of the VLA website and Facebook page.
- Focus: AIS news and practical videos on boat cleaning and AIS identification.

All Public Awareness and Education activities are summarized below:

2.1 Newspapers and Newsletters.

Summary: Informational articles in local newspapers and VLA newsletter to increase public awareness of AIS threats and prevention activities at Lake Vermilion. Complement AIS info and display ads from Wildlife Forever. News releases to *Cook News-Herald*, *Tower News*, the *Timberjay*, and, at times, the *Mesabi News* and *Hometown Focus*. Feature articles for same. Display ads, especially for AIS milestone announcements and “thank you” to partners and donors. Regular AIS presence in VLA newsletter, which is offered free to resort guests and in local business establishments catering to lake visitors.

2.2 Events and Shows.

Summary: Staff AIS information tables at a small number of local fairs, carnivals, parades, and similar events. Examples: Cook Timber Days, Tower Harbor Days. Coordinate with info tables by Sea Grant et al. Develop AIS pamphlets and other handouts. Utilize 10x10 EZ-Up canopy when outdoors. Organize event staffing.

2.3 Restaurants and Local Businesses.

Summary: Provide AIS educational materials and assistance to local businesses. Emphasis on those catering to lake visitors. Reutilize materials created for local fairs. Create special-purpose materials (e.g., placemats, bar coasters) unique to a business segment. Provide display racks.

2.4 Website and Social Media.

Summary: Maintain up-to-date AIS information on the VLA website and Facebook page to increase public awareness of AIS threats and prevention activities. Focus on reaching the tech-savvy younger generation. Provide dedicated landing pages where appropriate. Focus on outreach to potential AIS volunteers. Utilize Google Analytics and other tools to understand what's working. Content development, hosting and analysis by WA Fisher (Virginia).

2.5 Stewardship Outreach to Resort and Lake Business Owners.

Summary: Work with lake business owners whose customers launch boats on Vermilion to explain the significant risks posed by AIS. Teach best management practices for boat inspections, client discussions, bait disposal, water removal, and boat cleaning tailored to specific threats at Lake Vermilion. Develop a recognition program to publicly recognize business owners who have been trained and have implemented key AIS practices.

3. Early Detection, Habitat Evaluation, and Population Management Project

If a new invasive were to evade our inspection and boat-cleaning firewall, we rely on early detection to give us the best chance of eradication or control.

With starry stonewort and hybrid watermilfoil in the headlines in 2017, we chose to complete a vegetation survey of all remaining littoral waters to locate undetected vegetation infestations. This effort began as a multi-year project in 2016 with an initial emphasis on locating any curly-leaf pondweed which might have escaped from our small Everett and Stuntz Bay infestations. No starry stonewort or Eurasian or hybrid watermilfoil was discovered.

To stay on top of the existing curly-leaf and continually monitor high-risk areas for hybrid watermilfoil and starry, RMB Environmental Labs (Detroit Lakes) will begin short, focused biennial vegetation surveys. Timing and locations will be adjusted based on what's found.

Vermilion's current top threats are both both vegetation: hybrid watermilfoil and starry stonewort. Vegetation almost always is first apparent at the access where it was introduced. In 2019, we will extend our "sentry" early detection project at all 17 public accessess and 20+ private accesses. We'll support our access sentries using AIS Detectors as coaches and identification experts.

Habitat evaluation is important to assess risk of establishment. We need to know what to look for and where in Vermilion to look. RMB will help us update our risk assessment by species annually. We will also continue water sample collection along Vermilion's eastern shore for a third year to look for possible high-calcium inflows, a zebra mussel habitat concern.

All Early Detection, Habitat Evaluation, and Population Management activities are summarized below:

3.1 Habitat Evaluation and Risk Assessment.

Summary: For all AIS threats, understand our "risk of establishment" once introduced. Compare Vermilion's habitat (e.g., water chemistry, bottom structure, water temperature, nutrient content, etc) with that of infested lakes and with the preferred and minimum requirements for each species. Evaluate each bay's risk where micro-habitats exist. Check calcium levels along east Vermilion shorelines where high-calcium inflows may allow zebra mussel establishment. Include upstream habitats where appropriate. Provide recommendations on resource priorities.

3.2 Annual Evaluation of Existing Invasive Vegetation.

Summary: Annually evaluate known infestations of curly-leaf pondweed. Monitor native vegetation known to frequently co-exist with serious invasives (e.g., northern watermilfoil with hybrid watermilfoil), especially those stands of native vegetation near invasive entry points.

3.3 Curly-Leaf Pondweed Control.

Summary: Develop a management plan to control the expansion and potentially reduce the infestation area of curly-leaf pondweed on Lake Vermilion. Work with Rich Rezanka et al to stay on top of new control and eradication options. Consider divers for small infestations. Work with contractor as needed to implement large-area controls.

3.4 Early Detection of Invasive Vegetation at Public and Private Accesses.

Summary: Monitor all 17 public accesses and about 20 private resort, campground and marina accesses for new invasive vegetation infestations. Three total visits at each site in mid-June, mid-July, and mid-August by trained "Sentries" who each will become familiar with their assigned site. August visit likely a part of the statewide "Starry Trek" program. Focus on vegetation matched to our water chemistry and habitat at access. Sentry training, coaching and supervision by six MAISRC-trained "AIS Detectors". AIS Detectors follow up when suspicious vegetation found.

3.5 Pilot Project to Evaluate Methods for L1 & L2 Inspectors to Assist Early Detection.

Summary: Develop and evaluate methods and tools so L1/L2 inspectors at public accesses and inspectors at private accesses can provide early-detection info to Vermilion's AIS Detectors. Examples: Examination/collection of suspicious vegetation samples as boats exit Vermilion; providing AIS picture ID card (Vermilion specific) to boaters upon entry and using the card for AIS discussion upon exit. Dedicated email and phone "hot-line" forwarded to Vermilion's AIS Detectors.

4. Regional and Statewide Partnership Development Project

The Vermilion Lake Association will work statewide to share information and exchange ideas among AIS prevention leaders. We will attend conferences and meetings as a participant and as a presenter, building contacts and partnerships at the county level and statewide.

We will also work closely with nearby lake associations, SWCDs, local government units, lake resorts and businesses, service clubs, the Lake Vermilion Resort Assn, and the Lake Vermilion Guides League to share ideas, cement partnerships, and encourage community organizations to spread the AIS story through their internal communication channels.

All Regional and Statewide Partnership Development activities are summarized below:

4.1 Lake Vermilion Stakeholder Info Sharing & Involvement.

Summary: Share AIS information and exchange ideas among nearby lake associations, schools, townships, cities, SWCD, service clubs, LVRA, Guides League, chambers of commerce, etc. Build partnerships to share resources. PowerPoint prep and customization. Estimate 6 collaborative meetings and presentations annually.

4.2 Statewide Information Sharing and Involvement.

Summary: Share information and exchange ideas among AIS prevention leaders statewide. Attend statewide conferences and meetings as a participant and as a presenter. Build partnerships to share resources at the regional and statewide levels. MAISRC Advisory Board, Aquatic Invaders Summit, etc. Estimate 3 collaborative meetings and presentations annually. Estimate 1 major conference annually. Some overnight travel.