Lake Vermilion AIS Prevention Program Status Report

Submitted to St Louis County
September 30, 2020

Introduction

The Vermilion Lake Association (VLA) is pleased with our progress on the **Lake Vermilion AIS Program** during 2020. Now in our fifth year, we have built on everything we've learned to protect Lake Vermilion and those lakes next visited by our boaters.

The three goals of our long-term AIS program are:

Prevention.	Prevent all new aquatic invasives from being introduced at Lake Vermilion, with emphasis on those which would be game changers for our fishery, recreational lake use, and business community.
Early Detection.	Detect all new AIS infestations quickly, before they have become established, when eradication options are most viable. Emphasis on those which would be game changers.
Containment.	Prevent the expansion of all existing infestations, with emphasis on those which are game changers.

The benefits of the **Lake Vermilion AIS Program** extend far beyond Lake Vermilion. Those who visit our lake take their AIS knowledge and good habits with them, protecting the next lake they visit. A clean Lake Vermilion also helps keep the Vermilion River and the entire downstream watershed healthy.

Property owners, fishermen and recreational boaters who use Lake Vermilion play a strong role in our AIS prevention program. Building their understanding of AIS, their self-inspection skills, and their stewardship at Lake Vermilion is vital.

We understand well that the resources – funding, trained volunteers, and proven contractors – to fully defend Lake Vermilion from all AIS threats will never be completely available. We are committed to deploying the resources we can muster efficiently on our highest priorities.

We thank you for helping us reach our AIS goals. The primary funding for our 2020 Lake Vermilion AIS Program comes from the 2019 and 2020 St Louis County AIS Prevention grants. Supplemental funding was received from the Initiative Foundation during 1Q2020 for work with our resort partners and for public access traffic analysis.

This status report is organized into six sections:

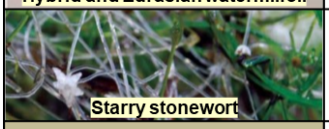
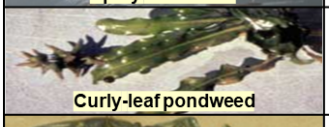
1. Habitat Evaluation and Risk Assessment
2. Watercraft Inspection and Decontamination
3. Public Education
4. Early Detection of New Infestations
5. Management of Existing Infestations
6. Growing Capacity to Handle AIS Threat

Habitat Evaluation and Threat Assessment

Vermilion's water chemistry sets us apart from most Minnesota lakes. Our low calcium and low pH make us low risk for zebra mussels. Our risk for Eurasian and hybrid watermilfoil and starry stonewort also appears to be low. However, until those risks are fully evaluated by researchers, both stay at the top of our Vermilion threat table.

While our soft water protects us from many game-changing invasives that plague central Minnesota and much of Wisconsin and Michigan, it can also expose us to other invaders no one is talking about. We are looking toward the Canadian Shield lakes to our north for information about AIS that prefer a soft water habitat. We don't know what bad guys are lurking up there.

Our threat table – unchanged in the last year – looks like this:

Species	Introduction Risk	Habitat Suitability	Impact if Population Established	
			Fishery & Ecosystem	Recreational Boating
 Hybrid and Eurasian watermilfoil	Hybrid increasing as more lakes become infested.	Hybrid unknown. May be suitable in specific bays.	Serious stressor. Unknown impact on each fishery.	Severe in bays with suitable habitat.
 Starry stonewort	Increasing as more Minnesota lakes become infested	Unknown. Limited to specific bays?	Serious stressor. Unknown impact on each fishery.	Severe in bays with suitable habitat.
? Unknown Soft-Water Specialist	Likely low. Connectivity to soft water lakes limited.	Presumed moderate/high.	Unknown	Unknown
 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.

Research is underway on hybrids between invasive Eurasian watermilfoil and our native northern watermilfoil. Anecdotal reports suggest increased invasiveness and evidence of herbicide resistance. In Lake Vermilion, native watermilfoil co-exists with other native vegetation. Invasive Eurasian watermilfoil has been in Lake Minnetonka for over 30 years, yet we know of none in Lake Vermilion despite considerable boat traffic between these two popular lakes – an indication our habitat and water chemistry may not be suitable. However, at this point, no one knows whether a specific hybrid genotype may find our habitat suitable and overwhelm our native vegetation.

The DNR's 2019 discovery of zebra mussel veligers (larvae) at Lake of the Woods has important implications for Lake Vermilion. Both lakes have generally low calcium levels, well below the levels thought suitable for zebra mussel reproduction.

However, the Lake of the Woods discovery re-opens the question on whether zebras might conceivably get a foothold along East Two River before it enters Pike Bay. East Two River has relatively high calcium levels at certain times of the year when rainfall is low. As a precaution, volunteers resumed a comprehensive adult and veliger early detection plan on East Two River during 2020.

Watercraft Inspection and Decontamination

Watercraft inspection and decontamination continue as our most important tools to prevent new infestations at Lake Vermilion. Our partner North St Louis SWCD handles all operational aspects of boat inspections and decon at Vermilion's public and private accesses. Please refer to their reports for details.

The Vermilion Lake Association and North St Louis SWCD, however, work together to improve the inspection process and extend it to new areas. Several of these initiatives are discussed below:

Enhanced Training for Inspectors. One-day enhanced training for L1 and L2 inspectors has been held for three consecutive years at Vermilion Community College soon after Memorial Day. This important training was suspended in 2020, but is likely to be resumed in 2021.

Fishing Tournaments. Boat inspections at fishing tournaments are a special challenge. The key is inspecting participants boats when they first arrive for "pre-fishing" the week prior to the tournament. This year, participants were encouraged to utilize Hoodoo Point N public access for their inspection, since it would be naturally staffed 7 days a week. Due to COVID, only two tournaments were held this year, compared to 8-10 normally. Cooperation by tournament directors was excellent, achieving near 100% inspection rates.

Traffic Analysis. The key to an efficient inspection program is deploying inspectors at the busiest accesses at the busiest times of the day for the entire season. Early assessments suggest improved productivity (boats per hour), likely buoyed by higher COVID-driven traffic and by improved traffic forecasting. Off-season analysis will give better insight on productivity improvements and on what additional changes would make sense for 2021.

Risk Analysis of Trailered Boats Entering Vermilion. As we deploy inspectors based on traffic, we want to also emphasize boats coming from lakes with known Eurasian watermilfoil, hybrid watermilfoil or starry stonewort infestations – potential gamechangers for Vermilion's fisheries and recreational boaters. Survey data indicated certain public accesses were low risk – Stuntz Bay, for example, where 85% of the boats were returning to Lake Vermilion having just been in Vermilion. Others were much higher risk – Everett Bay, for example, where almost 40% of the incoming boats came from a lake with potentially game-changing AIS or from an unknown out-of-state lake. Risk-adjusted traffic forecasts were used for staffing decisions.

Eric Hanson (l) and Tyler Kiehm discuss boat inspection methods at Pehrson Lodge Resort on Lake Vermilion. Photo credit: Initiative Foundation.

Inspections at Private Resorts, Campgrounds and Marinas. This trail blazing extension of traditional AIS inspections to private accesses debuted in 2018 and was expanded in 2019 and 2020. The DNR and North St Louis SWCD developed an online certification process, making training for resort dock attendants practical. Analysis of inspection survey data confirmed what we suspected: Boats arriving at resorts are about 2-3 times more likely to have come from Minnesota lakes with major AIS infestations or an unknown out-of-state lake. Together, the VLA, North St Louis SWCD and our resort partners have set a long-term goal to inspect 100% of the boats launching at resorts. Great progress was made in 2020, with inspection estimates at participating resorts ranging from 50-90%. In 2021, we plan to work with more resorts and to help them remove barriers to higher inspection rates.

Public Education

All who use Lake Vermilion play an important role in protecting Vermilion from invasive species. Building their understanding of AIS, their self-inspection skills, and their stewardship at Lake Vermilion is vital. We reach out to them in many ways:

Business Partners. In recent years, we have expanded our work with local businesses and organizations to help them explain AIS issues to their customers and members. Currently we have partnerships with over 50 business and restaurants to share VLA newsletters and AIS literature with their customers. Almost all 30+ Vermilion resorts provide AIS info to their guests. In 2020, COVID slowed expansion of this public education activity. We expect growth to resume in 2021.

You can't miss this new reminder on Hwy 53 near Cook that a clean boat protects all lakes from AIS.
Photo credit: Wildlife Forever.

Public Events. VLA volunteers did not staff info tables at events in 2020. This work will resume in 2021.

Newsletter. In 2020, the VLA continued to provide its 20-page to its members quarterly. In addition, free distribution at local businesses and resorts has increased. A typical issue includes AIS covering 4-5 pages.

Website/Facebook. Twenty-nine articles were posted on our website and then on Facebook during the Jan-Sept period. Over 50% relate to AIS. Others help build lake stewardship. A growing number of lake stewards – now about 300 persons – subscribe to our Wednesday morning email on lake issues.

Presentations to Organizations. Due to COVID, this activity has been suspended in 2020. It will resume in 2021.

Signage for Resorts. Invasive species prevention signs, banners and materials – some custom – were provided to 20+ resorts to help them explain their AIS commitment to their customers.

Ramp signage, like this one at Gruben's Marina, are very popular.

Early Detection of New Infestations

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

The VLA attacks the early-detection challenge through several means. In each case, a score of hardworking volunteers labors behind the scenes inspecting the riskiest areas of the lake for AIS invasions.

AIS Detector Bob McNamara using sampling rake

In 2018, a loosely assembled group of volunteers established themselves as Sentries to inspect Vermilion's 17 public boat landings three times a season. Since then, led by Mary McNellis, the Sentries have become highly organized team, supported by four certified AIS Detectors – Jim Graham, Mary McNellis, Wayne Suoja and Bob McNamara – trained to identify AIS by the Minnesota Aquatic Invasive Species Research Center (MAISRC) at the University of Minnesota.

Our 14 Sentries and their 4 AIS Detector partners have just successfully completed their third year by policing all 17 public accesses, the Fortune Bay marina, and Your Boat Club. These boat launches were inspected three times this summer in June, July, and August. The August inspections placed special emphasis on starry stonewort, which is most identifiable at that time of year. No invasive vegetation was found at any public access in 2020.

In 2020, the VLA expanded its successful public access program to include many private ramps at resorts and marinas. This early detection effort was organized by Bob McNamara. Four resorts chose to do the job themselves, checking their waterfront 3-6 times during the season. An additional 14 resorts and marinas accepted assistance from our AIS Detectors, who performed checks in June, July, and August. No invasive vegetation was found at any private access in 2020.

Craig Beveroth takes a water sample at East Two River

The 2019 Lake of the Woods veliger discovery re-opens the question on whether zebras might conceivably get a foothold along East Two River before it enters Pike Bay. As a precaution, volunteers resumed zebra mussel early detection on East Two River during 2020:

- VLA volunteers Wayne Suoja and Maria & Dale Robertson deployed a zebra sampling plate near the mouth of East Two River at the Robertson dock. The sampling plate, when checked this fall, had come apart, but no zebra mussels were found on the components.

- VLA volunteers Renee and Bob Pearson conducted two plankton net tows during July near the mouth of East Two River. The water samples were tested by RMB Environmental Labs, which reported no evidence of veligers in the samples taken.

Bob and Renee' Pearson searched for zebra mussel veligers near the mouth of East Two River

Management of Existing Infestations

The VLA continues to monitor existing infestations of curly-leaf pondweed in Everett Bay and spiny waterfleas throughout the lake. Vegetation in Everett Bay, a soft-bottom bay which has proven to be very weed-friendly, will receive special focus for both existing and potentially new infestations.

In prior years, RMB Environmental Labs (Detroit Lakes) returns to Lake Vermilion in late July to check for undiscovered Eurasian/hybrid watermilfoil and for starry stonewort. They typically spent 2 days on the water at weed-friendly bays and high-traffic accesses. However, their visit was suspended in 2020. Visits will resume in 2021.

Also, in prior years, Rich Rezanka (DNR AIS Specialist) checks our known curly-leaf pondweed infestation at Everett Bay in June. While the two-acre infestation changes shape a bit each year, it is not expanding geographically and not overwhelming native vegetation. However, his visit was suspended in 2020. His visit will resume in 2021.

Growing Capacity to Handle AIS Threat

The Vermilion Lake Association feels strong AIS partnerships are critical at all levels.

Beyond our vital local partnerships, we have been working statewide to influence AIS research direction and to share AIS prevention ideas among AIS prevention leaders. St Louis County and Lake Vermilion both benefit from the accelerated learning. VLA leaders serve on the MAISRC Advisory Board (Jeff Lovgren) and the DNR Walleye Advisory Committee (Terry Grosshauser).

Statewide, a VLA AIS volunteer attended the DNR Roundtable in January and many participated in the MAISRC Research and Management Showcase (via Zoom) in September. VLA AIS Coordinator Jeff Lovgren participated in three MAISRC Advisory Board meetings – in-person or by Zoom. In addition, four VLA volunteers have taken MAISRC training to become AIS Detectors.

Regionally, the VLA continued to work with Cass SWCD and Itasca County SWCD to pilot innovative concepts to extend traditional AIS work at public accesses to resorts, campgrounds and marinas. That very productive 2-year project wrapped up on March 31.

References

Recent reports:

2019 RMB Vegetation Survey Report – Vermilion [pdf]

Upcoming reports and plans:

2020 Lake Vermilion AIS Program Final Report
2021 Lake Vermilion AIS Program