The Vermilion

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To Protect and Improve Lake Vermilion

IN THIS ISSUE

PRESIDENT'S MESSAGE

Our new newsletter format has been well received by our membership based upon comments during the last couple of months. We hope you enjoy the increased number of pictures and the always interesting articles. Our thanks to the *Timberjay* for the layout and printing of our newsletter.

Terry Grosshauser
VLA President

We are always looking to add more lake residents and frequent visitors to our membership. Please share our newsletter with your neighbors and let them know our small membership dues are a great investment in our lake.

As I write this article in late March, I'm still a bit sore from plowing six inches of new snow yesterday. There are at least 12 inches of snow and slush on top of the lake ice and a forecast of below zero temperatures next week. It seems like a very long winter this year. Hopefully there will be a quick warm-up in April. I cannot wait to see open water again.

On the AIS front, we are already busy meeting with resorts, marinas, campgrounds, local businesses, Bois Forte, fishing tournament directors, and local governments. Our AIS partnership expects to increase its boat inspection efforts significantly again this year at the private accesses. We are reviewing boat inspection data from our first two years at public launch sites to optimize the use of our inspectors. One hole in our coverage is trailered boats which launch at private cabins. If you can, please ask guests from areas with a lot of AIS (e.g., the Twin Cities or Lake Superior) to launch their boat at a public access where their boat can be checked.

Every year we print the results from the fall DNR test netting in our Spring newsletter. The results this year indicate we will have a strong year for walleyes with good year classes reaching keeper size. If you have not already tried for some crappies, there are some exceptional year classes on the west end of the lake, and they were hitting well into July last year. Try areas from the Black Bay entrance all the way east into Niles and Wolf Bays on the north shore. There are some very nice-size fish (11 to 15 inches) in 4- to 15-foot depths. They make a great meal.

Please remember that the northern pike special regulation on Vermilion remains the same as last year. The walleye 20-26 inch slot also will be the same, with four in possession with only one over 26 inches.

We have had a very strong response to the photo contest, but we can always use more photos. There were a lot of fabulous sunsets. Don't forget the pictures of dogs and kids enjoying the lake … and, my favorite, some fish pictures.

It should be a great summer this year with lots of activities. July 18 is Take a Kid Fishing day. There's always a need for volunteers for this large event. Our 50th anniversary celebration culminates with a picnic on August 11 at Camp Vermilion outside Cook. And please mark your calendar now to visit the hatchery in mid-April 2019 to watch the DNR take spawn from walleyes (see the article in this newsletter).

We always welcome articles or stories for our newsletter. Please send them to any board member or to me at terrygrosshauser@gmail.com.

If you'd like to play a larger role with our newsletter, consider volunteering to be our Newsletter Coordinator. This volunteer will work with our authors to be sure all info gets to the *Timberjay* on a timely basis, and will proof early drafts. We're also looking for a new board member to coordinate our overall communication efforts, including our website, Facebook, news releases, newspaper display advertising, and our quarterly newsletter to members. Interested in either? Send me a note at terrygrosshauser@gmail.com or a call me at 218-666-0580.

Vermilion Lake Association plans 50th Anniversary Celebration Picnic on Saturday, August 11

All Lake Vermilion Association members are invited to the 50th Anniversary Celebration Picnic hosted by the VLA on Saturday, Aug. 11. The picnic will be held at Camp Vermilion, 2555 Vermilion Camp Rd. in Cook.

The event is part of a year-long celebration for the lake association, which was founded back in 1968.

"The Vermilion Lake Association is not just for lakeshore property owners," said VLA president Terry Grosshauser. "It is for everyone who has an interest in a healthy lake."

The anniversary picnic will include activities for the whole family. There will also be raffles and giveaways throughout the afternoon, with the chance to win some amazing prizes.

There will be educational booths with information from the DNR and St. Louis County, educational exhibits, and plenty of VLA members on hand to answer questions about the lake, fishery, and dangers from aquatic invasive species.

"The goal of this picnic is to celebrate our first 50 years and to increase awareness of the challenges ahead," said celebration committee chair Jeff Stebbins. "It will also be a time to highlight initiatives being taken by the association to preserve the lake environment in the future."

Attendees will be able to see all the VLA has to offer, and how members have helped improve and preserve lake quality over the past 50 years.

With the outdoor location at Camp Vermilion, which sits on the shores of the lake, the organization is hoping to attract many families, young and old, for an afternoon celebrating the lake they all love.

It's Never Too Late to Protect Lake Vermilion from AIS

Is it too late? Will the depressing news about fishery issues at other major walleye lakes inevitably reach our shore?

Absolutely not!

Jeff Lovgren
VLA Board Member

Yes, spiny waterfleas were discovered in Vermilion's east basin in 2015. They have noticeably reduced our small zooplankton, especially in late summer, but it's unclear what effect spinys have had on our fisheries so far. For more details, see the fisheries article in this newsletter by Matt Hennen, DNR Large Lake Biologist.

Fortunately, through your hard work and a little luck, we do not have infestations of the major game changers – zebra mussels, Eurasian watermilfoil, or starry stonewort – which can seriously degrade our fisheries and recreation. There's no reason we can't keep it that way while our scientists work on solutions for eradication.

Major Minnesota Walleye Lakes	Current AIS per DNR Infested Waters List (Game Changers in **RED BOLD**)
Vermilion	Spiny Waterfleas
Lake of the Woods	Spiny Waterfleas
Rainy	Spiny Waterfleas
Kabetogama	Spiny Waterfleas
Upper Red	**Starry Stonewort**
Winnibigoshish	**Zebra Mussels, Starry Stonewort**
Cass	**Zebra Mussels, Starry Stonewort**
Leech	**Zebra Mussels, Eurasian Watermilfoil**
Mille Lacs	**Zebra Mussels, Eurasian Watermilfoil,** Spiny Waterfleas

The Luck: Zebras can't reproduce in our low calcium, low pH water chemistry. Our native vegetation has kept our small curly-leaf pondweed infestations small – which is not the case in many central Minnesota lakes. Vermilion has no known infestations of Eurasian watermilfoil, despite its presence in Minnesota for 30 years and significant trailered boat traffic to our shores. Perhaps our water chemistry is helping here, also.

The Hard Work: Boater education, your continuing vigilance, boat inspections at our accesses, and early detection of new infestations are all important in this battle. Together, we will prevail, and Lake Vermilion will continue to have the fewest AIS problems of Minnesota's "Top 9" walleye lakes.

Vermilion Lake Association Caps Now Available

They're here! Wear your new caps proudly to show your support for your lake association. The price is right: $15, plus $3 shipping for any number of caps to one address. Free local pickup. Check out the three style choices at our website VermilionLakeAssociation.org/caps.

For more info, contact Sheri Sawatzky 218-666-5512, or email sherisawatzky@gmail.com.

Lake Vermilion Trail Update

Five years of hard work by the Lake Vermilion Trail steering committee have recently produced several important results.

The proposed Lake Vermilion Trail (LVT) is now under management by a local Joint Powers Board with representatives from the cities of Cook and Tower; from Beatty, Greenwood, Kugler, Owens, and Vermilion Lake townships; and from the Bois Forte Band. The Joint Powers Board began meeting this spring to strategize development priorities and to begin a major fundraising campaign.

The first draft of a Master Plan for the LVT was available for public review in mid-April 2018.

Completion of the Master Plan is a critical first step in the grant application process. Assistance in grant writing will be provided by staff from the Arrowhead Regional Development Commission (ARDC). ARDC's participation has been made possible by special funds recently received from the Iron Range Resources and Rehabilitation Board (IRRRB).

Continued success in the grant writing process could lead to actual trail construction as early as the fall of 2019.

The LVT will follow a route through the beautiful natural landscape south of Lake Vermilion between Cook and Tower/Soudan. It will be a premier, paved, and scenic trail providing healthy, safe, non-motorized, and year-round transportation and recreation for residents and visitors.

Past and current information about the proposed trail can be found on the LVT website at https://lakevermiliontrail.org or the LVT Facebook page (@lakevermiliontrail).

Status of the Lake Vermilion Fishery

2018 Angling Prospects

The Lake Vermilion fishery is healthy and should provide both catch and harvest opportunities for multiple species. The walleye population is abundant and consists of a wide range of sizes and age classes. Harvest opportunity is above average for walleyes from 14 to 18 inches, and fish over 20 inches continue to be abundant, providing opportunity for a memorable or trophy fish. Although historically low in abundance, northern pike provide an opportunity to catch fish up to 40 inches. Additionally, black crappie, bluegill, largemouth bass, smallmouth bass, and yellow perch all will provide additional angling opportunities. Trophy opportunities exist for muskie anglers as fish over 50 inches are present in the population. Whitefish and cisco (tullibee) offer harvest opportunities primarily during the fall sport gill-netting season.

Matt Hennen
DNR Fisheries

Fisheries Management

Lake Vermilion is comprised of two major basins, East Vermilion (area east of Oak Narrows) and West Vermilion (area west of Oak Narrows), that are significantly different in terms of habitat and fish communities. The lake is part of the Minnesota Department of Natural Resources (DNR) Large Lake Monitoring Program which includes annual fisheries population assessments, water quality monitoring, zooplankton monitoring, aquatic invasive species surveillance, and regularly scheduled creel surveys on the 10 largest lakes in Minnesota. Since 1984, annual standardized fish population assessments have included a variety of sampling gear to collect various fish species at different life stages. The gear includes gill nets, trap nets, shoreline seines, and electrofishing boats. Fisheries assessments are standardized so that the sampling gear is used at the same locations during the same time of year in order to track population trends. Length, weight, age, and other data are collected for fish of management concern.

A new management plan for Lake Vermilion was finalized in 2018 to guide fisheries management for a six-year period from 2017 to 2022 following input from the Lake Vermilion Fisheries Input Group and the general public. The new plan increases the use of defined fisheries goals, objectives, and management activities for individual fish species. In addition to the updated management plan, a new special regulation for walleye came into effect in May 2017. The new regulation is a 20- to 26-inch protected slot limit, with one fish over 26 inches allowed in a four-fish possession limit.

Lakes with special northern pike regulations, like Lake Vermilion, will not be included in the state's new northern pike management zone regulations. Therefore, the current special regulation is in effect in 2018: all northern pike from 24- to 36-inches must be immediately released with one fish allowed over 36 inches in a three-fish possession limit. However, the DNR is considering dropping the special regulation which would mean the new northeast zone regulation could apply to Vermilion in the future. This process will follow standard rulemaking procedures with the opportunity for general public input in 2018. The public accesses will be posted

prior to the 2018 fishing opener and the DNR will hold a public input meeting in August. The earliest implementation of the northeast zone regulation for Lake Vermilion would be in May 2019, if there is public support. The northeast northern pike zone regulation is all fish from 30- to 40-inches will require release and only one over 40 inches is allowed in a possession limit of two fish. Spearers will also be able to take two pike but only one may be larger than 26 inches.

Walleye

The DNR's 2017 annual fall gill-net survey had a walleye catch rate of 16 fish/net, exceeding the historic average for Lake Vermilion. Annual gill-net catch rates have normally been higher in East Vermilion than West Vermilion. The 2017 catch rates were well above the historic average in East Vermilion and slightly above average in West Vermilion. The average length of walleyes was 14.4 inches which was above the historic average. Average length has increased since the implementation of the protected slot in 2006. The increase has been less pronounced in East Vermilion compared to West Vermilion. Above average numbers of 14- to 18-inch walleyes were sampled in 2017. Overall, fish of preferred harvest sizes are available, especially 14- to 18-inch fish in East Vermilion and 14- to 20-inch fish in West Vermilion. Additionally, the numbers of fish 20 inches and larger continue to be above historic averages.

Walleyes captured in gill nets in 2017 ranged in age from 1 to 15 years. Catch rates of age-1, age-4, age-5, age-6, and age-8 and older fish were above historical averages. As observed in the 2015 and 2016 surveys, age-5 fish from the 2012 year class continue to persist at numbers well-above the historic median. Fish as young as age-2 were available to harvest at about 13 inches long and fish as old as age-10 were still under the protected slot (<20 inches). Walleyes ages-8 and older continue to be well represented in the gill net sample, however they were only 6% of the catch in 2017 compared to 11% in 2016.

The most recent strong walleye year class was produced in 2012. Preliminary estimates of the 2015 and 2016 year classes indicate moderate to exceptionally strong year classes present in the lake. Also, a notable strong year class for West Vermilion was produced in 2014 and these fish should provide harvest opportunity in that basin. Fall electrofishing provides general information on the abundance and growth of young-of-the-year (YOY) walleyes near the end of their first growing season. Both the catch rate of YOY walleyes and length of fish captured help predict future year class strength, however length appears to be a better indicator for Lake Vermilion. In 2017, the catch rate of YOY walleyes was 90.3 fish/hour which was slightly above the historic 25th percentile. The average length of fish captured was 5.7 inches which was slightly above the historic average. Based on catch rates and average length of fish observed, preliminary data suggest the 2017 year class could be weak to moderate. The last weak year class occurred in 2009.

The DNR continues to operate the walleye spawn take and hatchery at the Pike River. A portion of the walleye fry produced at the Pike River hatchery will be put back into Lake Vermilion. In the past 10 years, between 5.7 and 15 million fry have been stocked into Lake Vermilion annually. We will stock approx-

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DNR Fisheries staff Andy Levar and Matt Hennen taking data from a walleye captured in a gill net. photos courtesy of MN DNR Fisheries

imately 5 million walleye fry into Lake Vermilion in 2018.

Yellow Perch

Yellow perch are a primary forage species in Lake Vermilion that also provide some angler harvest. The 2017 gill-net catch rate of 15 fish/net was slightly greater than the catch rate observed in 2016, but fell below the management plan objective. Catch rates have been extremely variable and somewhat cyclic. Both the lowest and highest catch rates observed historically occurred within the last 5 years. The mean length of yellow perch captured in 2017 was 7.8 inches, slightly above the historic average. Fish captured in gill nets ranged from 1 to 8 years of age. Age-2 and age-5 fish made up the largest portions of aged fish. The high proportion of age-2 fish captured bodes well for the future.

Northern Pike

Northern pike have historically been present in relatively low abundance in Lake Vermilion but are an important gamefish for anglers. An ice-out trap-net assessment was conducted in 2017 to obtain size structure information on adult pike. A total of 397 pike ranging in length from 10.8 to 39.8 inches (average = 23.4 inches) were captured. During the annual fall gill-net assessment in 2017, eleven northern pike (0.55 fish/net) ranging in length from 17.8 to 39.2 inches were captured. The gill-net catch rate fell below the historical 1st quartile. Analysis of the effects of the 24- to 36-inch protected slot length

limit indicated that the abundance of northern pike has declined but the size structure has shifted towards larger fish. The regulation has been in place since 2003.

Smallmouth Bass

Smallmouth bass are found throughout Lake Vermilion and they provide an important fishery. Typically higher catch rates are observed in West Vermilion but the average size tends to be larger in East Vermilion. Spring electrofishing targeting bass did not occur in 2017 and has been reduced to once every three years in the new management plan.

Bluegill and Black Crappie

Bluegills provide significant catch and harvest opportunity in Lake Vermilion and black crappies are generally a minor component of the fishery. Trap-net catches indicate greater abundance of both species in West Vermilion. Summer trap-netting targeting panfish did not occur in 2017 and has been reduced to once every three years in the new management plan.

A large rock found in the stomach of a 15-inch walleye caught in a gill net.

Aquatic Invasive Species

Aquatic invasive species are nonnative animals and plants that do not naturally occur in Minnesota waters and cause varying levels of ecological and economic harm. Lake users should follow Minnesota's Clean, Drain, Dispose laws to help prevent the spread of aquatic invasive species. Several invasive species are present in Lake Vermilion including Chinese mystery snails, curly-leaf pondweed, *Heterosporis sutherlandae*, purple loosestrife, rusty crayfish, and spiny waterfleas.

Spiny waterfleas are an invasive zooplankton first discovered in East Vermilion in 2015. They have yet to be sampled in West Vermilion. In 2017, overall zooplankton densities, biomass, and species diversity were lower in East Vermilion compared to West Vermilion and this trend became more evident as the year progressed. The observed trend is likely due to the increasing abundance of spiny waterfleas in East Vermilion. Similar results were observed in Rainy and Kabetogama lakes following the establishment of the invasive zooplankton.

Double-crested Cormorants

The double-crested cormorant (DCCO) is a native, fish-eating colonial water bird that has historically used Lake Vermilion for nesting, foraging, and loafing in relatively low numbers. A population resurgence has occurred throughout North America since the 1970s when populations began rebounding from decades of human persecution and environmental contamination. However, this resurgence has led to natural resource and societal conflicts of varying degrees. Within the last 15 years, the DCCO population using Lake Vermilion for nesting has increased ten-fold and the relatively rapid growth of the colony generated concern within the local angling and business community that higher DCCO numbers would negatively impact sportfish populations, specifically yellow perch and walleye.

Cormorants are protected by the Migratory Bird Treaty Act in the United States. However, following increasing resource conflicts in the early 1990s, the U.S. Fish and Wildlife Service (USFWS) and the U.S. Department of Agriculture Animal and Plant Health Inspection Services (USDA) issued an Aquaculture Depredation Order and a Public Resource Depredation Order (PRDO) allowing lethal control. The Depredation Orders allowed aquaculture facilities and state, federal, and tribal management agencies to deal

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Double-crested cormorants on Lake Vermilion. photo courtesy of VLA

with cormorant issues locally under USFWS review. However, in 2016 a U.S. District Court decision ended all cormorant control efforts under the PRDO. In 2018, DNR will not conduct DCCO control on Lake Vermilion due to the court decision. The cormorant colony will continue to be monitored.

Displaying the direct impacts of DCCO on wild, "free-swimming" fish, which is required for lethal control to take place, is extremely complex. However, cormorant control measures were taken from 2013 to 2015 to reduce the DCCO population present on Potato Island and limit foraging in Lake Vermilion prior to the court decision. Cormorant nest counts from 2013 to 2017 stabilized around 340 nests following the peak of 434 in 2012 and no new nesting colonies have been established outside of Potato Island. The response of walleye and yellow perch populations to cormorant control efforts remains unclear. Following three consecutive years of DCCO control, the East Vermilion perch gill-net catch rates from 2015 to 2017 were similar to the unusually low catches observed in pre-control years from 2007 to 2012. It is important to recognize that yellow perch are a primary prey source for the walleye population in Lake Vermilion and that these populations are closely linked. Walleye gill-net catches have been at normal to high levels and the size structure has shifted towards larger fish needing more forage at the same time as the DCCO colony expansion and control.

Fishing Tournaments

Historically, there have been relatively few permitted fishing tournaments on Lake Vermilion. Generally, between two to six tournaments occur each year. The DNR is responsible for regulating fishing tournaments and manages them in a manner that will protect fish populations and minimize conflict with other lake users. DNR permits are required for fishing tournaments that meet certain conditions and permits have been issued for the following tournaments in 2018:

May 19: City Auto Glass Walleye Classic

May 20: Minnesota Bass Federation Spring Fest

July 14: Carpenters North Star Walleye Classic

July 29: Minnesota B.A.S.S. Nation Bassmaster Team Championship Trail

September 14-16: Professional Musky Tournament Trail 20th Anniversary Mega Tournament

For more information on aquatic invasive species and other DNR programs, please visit http://www.dnr.state.mn.us. For more information about Lake Vermilion, please visit https://www.dnr.state.mn.us/lakevermilion/index.html or contact Tower Area Fisheries by phone at 218-300-7802 or email at tower.fisheries@state.mn.us.

Loon Nesting Platforms…Year Two

Mel Hintz
VLA Board Member

Last year marked our first attempt to lure a pair of loons into adopting one of our two nesting platforms as their home base for 2017. Though we did have some interest in our west platform, it was not used for nesting purposes. And, there were no sightings of loons sizing up our east platform. So, simply put, our platforms were rejected last year. This, despite our best efforts deploying the platforms right after ice out and offering them a "homey and safe" place to raise their young; soft dry grasses for nesting, overhead guards to protect the loon chicks from attacks by eagles, and anchoring the platforms far enough from shore to discourage land-based predators. With no activity, we removed the platforms from the lake in early August.

For Year Two, the platforms have been modified with the addition of some live vegetation which will green up as the season progresses. Soon after ice out, they will be re-deployed in the same location as last year. Loons tend to return to the same breeding territory so we are hopeful that when they return this spring the platforms will be a familiar site and therefore, more likely to be used by the birds. If one of our platforms is occupied by a loon pair, our goal is to equip it with a mini-camera linked to our Vermilion Lake Association website.

2018 Northern Pike regulation unchanged at Vermilion

Terry Grosshauser
VLA President

Even though there are new northern pike regulations being implemented this spring around the state, the regulation for Lake Vermilion will not change from last year.

The regulation for Lake Vermilion in 2018 has a slot between 24 and 36 inches where all fish must be immediately released.

An individual can have three fish in possession, but only one can exceed 36 inches.

See the fishery article in this newsletter for additional information on the new statewide regulations and what they may mean for Lake Vermilion in 2019.

Please Share Your Lake Vermilion Stories

Are you willing to share some stories or photos about Lake Vermilion with other VLA members? It's simple to do. Just send them to us.

Our members enjoy reading newsletter stories about your fishing adventures, family fun at the lake, what brought you to Vermilion, shoreland restoration efforts, your family's history at this great lake, adventures with grandkids, introducing them to the outdoors, etc. Articles, poems, photos, maps … you name it.

Please send your items to our acting newsletter coordinator Terry Grosshauser at terrygrosshauser@gmail.com.

Moose Mortality Study Wrapping Up

Just over five years ago, the Minnesota Department of Natural Resources launched a cutting-edge study to determine exactly why moose in northeast Minnesota are dying. The two-million dollar project was largely supported by funding from Minnesota's Environment and Natural Resources Trust Fund through the Legislative-Citizen Commission on Minnesota's Resources, with hopes that information gained through this research could help change the current trajectory of the moose population.

Michelle Carstensen
DNR Wildlife

The recent moose survey estimated 3,700 moose in northeast Minnesota, which is down 58% from the highest population estimate of 8,800 animals in 2006. This steep decline comes on the heels of the population collapse of moose from northwest Minnesota, where over 4,000 animals existed in the 1980's and fewer than 100 moose remain now. The disappearance of moose in the northwest was sudden and dramatic, and high parasite loads and poor body condition were documented in many moose deaths, but the true driver of the decline was largely unknown. With the declining trend of moose in the northeast occurring now, it is unknown if the population will stabilize at a lower level or if a continued decline will lead to the end of moose in Minnesota.

To understand what may kill a moose, we first must be able to monitor the animal and know when it dies. To accomplish this, we deployed satellite-linked global positioning system (GPS) collars on adult moose that could send a message to biologists when the animal died. Our goal was to respond to a moose's death within 24 hours to determine the cause of death and conduct extensive field necropsies. From February 2013 to December 2018, we responded to 60 moose deaths. As we examined these animals and the circumstances of their deaths, it became very clear that there was not just one cause that would explain what is killing Minnesota's moose; instead, there were many causes intertwined in a complex system. The majority of moose deaths can be grouped into three primary categories: predation by wolves (30%), parasites (30%), and bacterial infections (20%). The remaining 20% of deaths included accidents (vehicle collision and falling through the ice), legal harvest by tribal hunters, complications of calving, and undetermined health issues.

People can be quick to point the finger at wolves as the primary driver in the moose decline. It appears to be the simplest and most obvious choice; wolves eat moose and we have a healthy wolf population in northern Minnesota. Yes, it is a fact that wolves do kill moose. But before you crack the gavel and read the verdict, you must first look at which moose wolves are indeed killing. In this study, wolves killed 18 adult moose but nearly half of these cases involve moose that had other major health issues that likely predisposed them to predation, including brainworm, pneumonia, and encephalitis. This may be an underestimate because not all wolf-killed moose had enough remains left for diagnostic evaluation of diseases or parasites. Further, we found that wolves were also selecting for younger (<3 years of age) and older (>9 years of age) moose, which is consistent with other predator-prey systems where the most

Left: Michelle Carstensen with a adult moose. photo courtesy of the MN DNR. At right: David R. Johnson caught a photo of a moose with three calves and shared the photo with the DNR.

vulnerable members of the prey group are targeted. The one age group where wolves are having a significant impact is the calves. In a companion study, calves from our collared adult female moose were monitored for survival for their first year of life, and between 2013 and 2015 survival rates were low (29, 40, and 33%, respectively) and mortality was primarily predation by wolves (65%) and bears (15%). While the impact of wolves on the adult segment of the moose population is not atypical or even above normal for a predator-prey system, they are having a significant effect on calf recruitment.

Parasites were directly responsible for 18 adult moose deaths, and the main culprits were brainworm, liver flukes, and winter ticks. Brainworm is caused by *Parelaphostrongylus tenuis*, a tiny worm whose life stages circulate naturally between snails or slugs and white-tailed deer. They will leave the deer unharmed but are fatal to moose, elk, and caribou. A moose inadvertently eats infected snails or slugs while browsing and the worm migrates from the stomach to the brain or spinal column, leading to neurologic symptoms (circling, tremors, staggering, head tilts) and eventual death. Liver flukes (*Fascioloides magna*) are also naturally circulated between snails and deer, but in moose can lead to massive liver damage and death from hepatitis. Winter tick (*Dermacentor ablipictus*) infestations are largely weather dependent; harsh and prolonged winters tend to lead to a lessened winter tick burden the following year. Mild winters increase winter tick survival and this translates into tens of thousands of ticks living on just one moose, which leads to immense blood loss and missing hair due to constant itching. In our study, the winter of 2013 was a bad winter tick year with many moose showing signs of hair loss and three moose directly dying of tick-associated anemia.

The last major category for causes of mortality was bacterial infections. These are typically caused by some type of injury that created a route for bacteria to invade the body. The moose's immune system failed to overcome the foreign invader and succumbed to system-wide failure. These injuries ranged from an open-fracture on a foreleg, puncture wounds from bulls fighting during the rut, bites from predators, and other wounds without explanation for how they may have occurred.

A real eye-opener in this study was observing moose that suffered from numerous health issues all at the same time. Case in point is Moose 192, a 12-year old female collared in winter 2015 and found dead on May 11, 2016, in a water-filled ditch along a road in Lake County. When we pulled her from the ditch, we noticed a massive injury to her hind end that appeared to be caused by a wolf attack. When we traced back to her most recent locations, about 400 yards from her death site, we found an attack site where she encountered wolves yet managed to escape. We also learned that she had a full-term male fetus in her birth canal, meaning she was in the process of calving when the wolves found her. Further, she was anemic with a heavy winter tick

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A moose and calf caught on a trail cam. Another photo shared with DNR moose researchers. All photos courtesy of MN DNR.

infestation and had massive hair loss, her liver was over 90% destroyed by liver flukes, and she had evidence of a brainworm infection. Her actual cause of death was shock and drowning in the water ditch where she collapsed. However, she represents the complexity of this system where each individual animal may be facing a multitude of challenges simultaneously.

As the field portion of our study is now over, we have remotely released the remaining collars on moose this past winter and we used radio telemetry equipment to recover these collars from beneath the snow. There is a multitude of data stored on each moose collar that can tell us about their lives, including the habitats they lived in, the times of day they were active or rested, and in some cases even their body temperatures. Over the next year or so, will we be analyzing these data to help us understand the important aspects in how each moose lived, as well as how they died. Stay tuned.

Vermilion Lake Association
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Can Existing Vegetation Help Us Find Starry Stonewort?

Jeff Lovgren, Lake Vermilion AIS Program Leader

Photo courtesy of the Minnesota AIS Research Center.

Starry stonewort is one of the top two AIS threats at Lake Vermilion. By fall 2017, this newcomer to Minnesota's AIS roster had already been found in six counties and 11 lakes, including Upper Red, Cass and Winnibigoshish. This grass-like macro algae can produce dense mats, can interfere with recreation, and can alter habitat for young fish. It would be an overnight game changer at Vermilion … or any lake.

Our AIS partnership's boat inspection team is working hard at both public and private accesses to prevent starry from being introduced to our lake. But that still could happen sometime. It only takes a small fragment, and we don't have the resources to guard all our accesses 24/7.

Our second line of defense is our Sentry Program. Volunteer sentries monitor the shallow waters off public and private accesses every couple of weeks for new vegetation. But, again, resources are limited. We need to focus on the highest risk habitats.

Can existing vegetation be a clue of where to look? Can certain existing species be indicators or counter-indicators that starry would find the water chemistry, bottom conditions, water depth, etc, to its liking? We know we have some *Nitella sp.* and *Chara sp.*, which are algae in the same family as starry (*Nitellopsis obtusa*). Are they useful indicators?

We asked Dan Larkin, a key starry scientist at the Minnesota AIS Research Center, for his insight and for suggestions on which published papers could give us the best clues. We then asked Max Helmberger, who had a few months available between the completion of his MS at Cornell and his upcoming PhD program at Michigan State, to search worldwide for information on the co-existence of starry and any of its cousins.

That work is still underway. But it's clear already that there will be no perfect answers and no perfect indicator species. As Helmberger points out, co-occurrence of two species – even closely related species – does not mean that all lakes containing one will be suitable for the other. One species may be a generalist, which can live under a broad set of conditions, and the other a specialist, which might be quite picky about habitat, or one may better compete with native vegetation.

Helmberger's research results and recommendations for our AIS program are posted on our website at www.VermilionLakeAssociation.org/ais-prevention/planning-reports/. Additional reports on habitat suitability of all AIS threats will be posted when available.

Minnow Trapping...a Rite of Spring

Mel Hintz, VLA Board Member

Spring is an exciting time of the year as we watch the ice leave Lake Vermilion, the return of the loons and other water birds, trees budding out, spring flowers blossoming, all heralding the soon-to-be-here fishing opener. It is also the time to begin minnow trapping with the hopes of catching a fresh batch of minnows for the upcoming walleye fishing season.

I started trapping minnows ten years ago and have not missed a season since. My neighbor and trapping partner, Tom Forconi, has been at it much longer. He picked it up from his dad and even today the trap he uses still bears a tag with his father's name... a visual reminder of the long-standing tradition. Most years, we trap between 30-40 dozen minnows, enough for our needs plus providing a supply for a few friends.

We use standard funnel traps baited with either a cracker or cookie, and toss in a few small pieces of crumpled up tin foil which serve as attractors for the minnows. Other trappers prefer to use dry dog food as bait claiming it takes longer to dissolve underwater. Because we place our traps in moving water, we add a railroad spike or short piece of half-inch pipe to keep our traps in place. The traps must bear a waterproof tag with the owner's name and address to comply with MNDNR regulations.

Minnow trappers are a bit like stream trout fishermen and blueberry pickers in that they rarely share the location of their "favorite spots". Suffice it to say that Tom and I have success trapping in beaver ponds and streams within 15 miles of Tower.

We check our traps every two to three days and sort our catch in the field to avoid bringing any unwanted species back to Vermilion. Besides rainbows and shiners, our traps often contain trash minnows (i.e., sticklebacks, mud minnows, and an occasional pollywog or bullhead). Sometimes we catch some strange things such as bull frogs and once a field mouse that apparently swam underwater lured by the cookie used as bait. On yet another occasion, half of our trap was missing…. probably the work of a river otter.

We transport our freshly trapped minnows in an

aerated minnow bucket containing fresh well water. On warm days, ice is added to the water as minnows survive much better in cold water. We also count our minnows because DNR regulations limit the number that may be transported to 12 dozen unless you possess a commercial minnow license.

The DNR rules for minnow trapping are spelled out in the bait section of the 2018 Fishing Regulations (pages 31-33). Among other things, minnow trappers must have a current fishing license. Minnows must be transported in tap or bottled water (i.e., you can't use water from the stream or lake where you are collecting to transport bait). Also, you cannot collect your bait within state parks, designated trout waters, and aquatic invasive species infested waters. Since Vermilion is a designated aquatic invasive species infested water (spiny waterflea), you cannot legally take minnows and leeches from the lake to use as bait. There are also limits on trap size and design as well as trap tagging requirements. All unused bait must be disposed of in the garbage.

Minnow trapping is a very enjoyable springtime pursuit. My neighbor and I are out in the woods enjoying all the invigorating sights, sounds, and smells of the spring season when tending our traps. We get to experience a bit of a rush when the water literally "begins to boil" when lifting a trap containing several dozen minnows from the stream. And, it all culminates with an added measure of satisfaction when catching Vermilion walleyes with minnows we personally captured from a nearby stream or pond. It is truly a rite of spring.

Importance of Aquatic Vegetation

Wayne Suoja
VLA Board Member

Note the photos of the aquatic vegetation on my shoreline. Reputable science, and common sense, tells us that what we do on the land-especially in shorelands-affects our lake's water quality and the aquatic vegetation. This shoreland and vegetation provides a nesting area and a spawning area for fish as well as critical habitat for our most prized wildlife: loons, eagles, herons, kingfishers, otters, ducks, turtles, frogs, and others.

From the Minnesota DNR

Often dismissed as "weeds" by many lakeshore property owners, aquatic plants provide essential fish and wildlife habitat and help keep lakes clean and healthy. Through photosynthesis, aquatic vegetation produces oxygen for the lake. These plants also filter nutrients that can fuel midsummer algae blooms. And they provide food, shelter, and nesting areas for fish, invertebrates, and wildlife.

Removing aquatic vegetation to improve boating or swimming eliminates fish habitat and damages the root network that holds bottom sediments in place. For example, bulrushes keep silt carried by waves from covering bottom gravel used by bass and panfish for spawning. When bulrush beds are removed, waves also begin to eat away at banks.

Wave action and boat wakes also stir up sediment, causing the lake water to become murky. If sunlight cannot penetrate the cloudy water, many healthy and vibrant lakes can eventually turn into a green soup, devoid of most desirable fish and wildlife species.

What can you do?

➤ Call the DNR before removing aquatic plants.

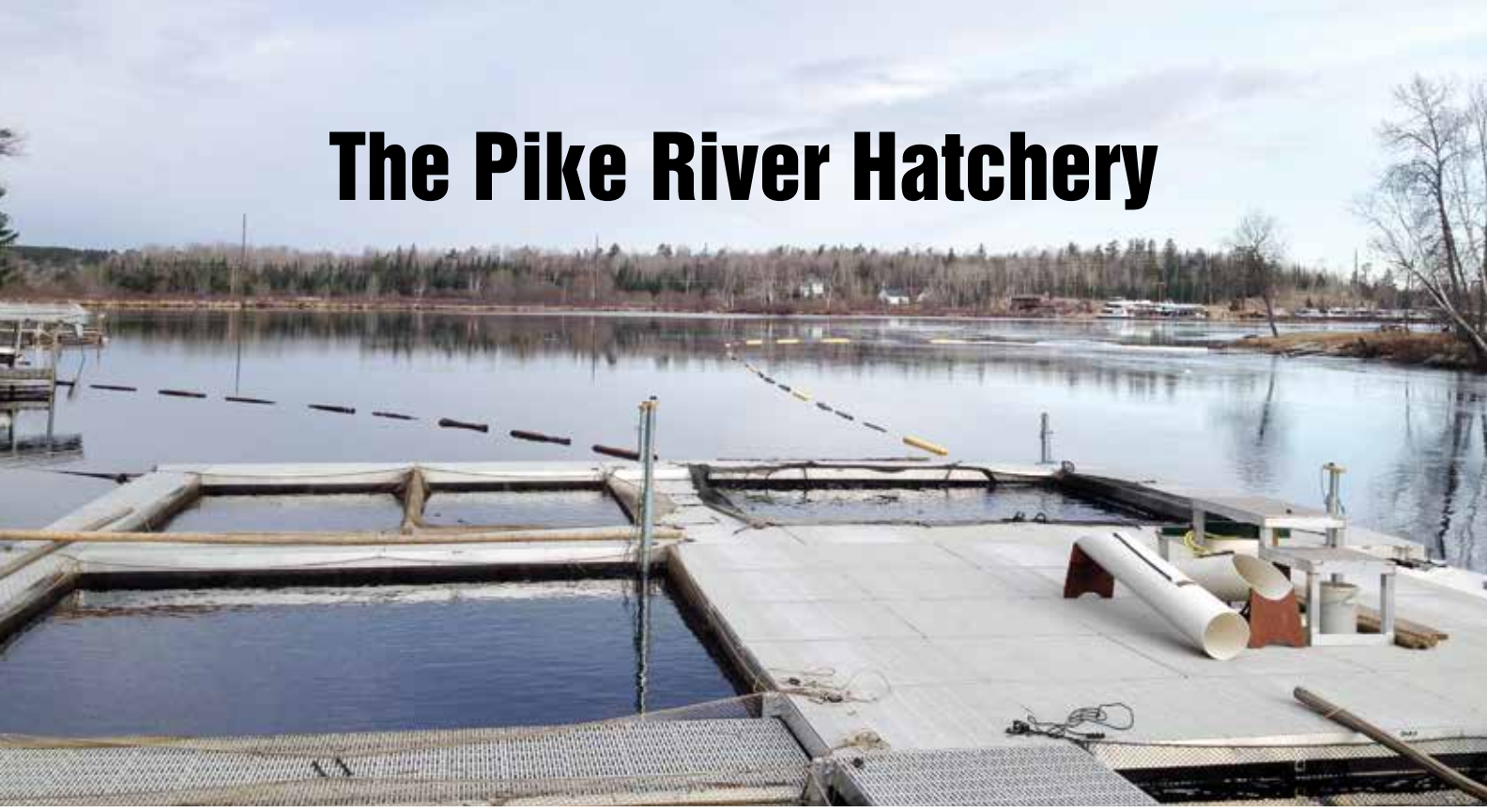
➤ Consider re-establishing aquatic plants along the lakeshore. To learn how, contact the DNR for advice:

DNR Ecological and Water Resources website and a listing of Area Hydrologists: Mndnr.gov/contact/ewr.html.

DNR Ecological and Water Resources: 651-259-5100

DNR Shoreland Habitat Coordinator: 651-259-5212.

The Pike River Hatchery



Early newspaper articles and State Fish and Game Commission reports indicate that the Pike River walleye spawn take first began in 1893. The first hatchery building was built in 1912 and was located at the foot of Pike River Falls where the dam (1918) now sits. This hatchery only operated until 1918. In 1918, a second hatchery building was erected on the site of the present building. This building had a 30' x 38' main room with three hatching batteries holding 400 jars total. This building was operated as a walleye hatchery until 1946.

Jeff Eibler
DNR Fisheries

In 1946, many egg takes were closed around the state including Pike River. At that time, the Fisheries Research Unit had determined that 1) stocking of walleye in large, natural walleye lakes was not necessary, 2) where stocking was warranted, fingerlings were more successful and 3) the use of only a few large spawn takes was sufficient to supply the state's needs. Egg takes continued at Cut Foot Sioux and Waskish. From 1946 to 1958, the Pike River Hatchery was used to hatch or ship sucker eggs collected at the outlet of Eagles Nest 4. The sucker fry were used as forage in rearing ponds and by minnow dealers.

In 1971, the Pike River spawn take resumed. The old hatchery was torn down and the present hatchery was built. Pike River was chosen over an alternate site at Rainy Lake because it was centrally located, it had been a consistent producer, and the land and some facilities were already in place. The current hatchery has a 35' x 60' main room. There are four batteries with a capacity of 528 jars. River water is pumped to a 9,000-gallon tank located on a hill adjacent to the hatchery. The water supply for hatching relies on gravity. Several upgrades have occurred since 1971, including the addition of two chillers (2001) to better control water temperatures. Also, a new floating dock was acquired (2015) to facilitate the spawn take. Finally, a filtration system was installed (2016) to ensure that invasive species, such as spiny waterflea, do not enter the water supply.

Each spring, the walleye trap is set as the ice in the river goes out. The historic average set date is April 14. The earliest set date was March 26, 2012, and the latest was May 3, 2013. Typically, the spawn take lasts 7-10 days, however the longest was 29 days recorded in 2000. The DNR's egg quota is based on individual lake management plans that prescribe walleye stocking. On average, our quota is around 100 million eggs.

Because of their genetic similarity, walleye fry hatched at Pike River are used to stock lakes in the

Rainy River watershed. Of the total eggs collected, roughly 50% are shipped to other hatcheries in the state. The fry from those hatcheries may be stocked in lakes where genetic strain is not important (e.g. land-locked prairie lakes with little or no natural walleye reproduction) or in fertile rearing ponds in southern Minnesota where they grow to fingerling size by fall. Most of these fingerlings are shipped back to the northeast and used to stock lakes where natural reproduction is low and fry survival is poor.

Each year the DNR also returns a portion of the fry from the Pike River Hatchery to Lake Vermilion. The number stocked in Vermilion was established during the recent Lake Vermilion Management Planning process and is based on mature female walleye biomass estimates. Because hatch rates are significantly higher in the controlled environment (70-80% in the hatchery and 1-5% in nature), often the net result is to stock more fry than would have hatched naturally from the eggs taken. Since the days of the first spawn take, Lake Vermilion has remained a popular walleye fishery and a destination for anglers throughout the Midwest.

Each year, thousands of visitors come to see the spawn take and the hatchery. The large, egg-laden female walleye draw the most attention. The largest measured in recent years was a 34.1-inch female estimated at 14 pounds. Many tours are given to elementary, high school and college groups. Once the trap is set, the facility is staffed continuously until the last fry are shipped approximately six weeks later. The hatchery is then thoroughly cleaned, drained and winterized in preparation for the next year's spawn take.

Photos courtesy of MN DNR Fisheries

Teach a Kid to Fish This Year

Antique Angler here again. It is difficult to believe that open water is near this year with 12 inches of snow on the lake. I have been a guide/boat operator for the past six years at the Take A Kid Fishing day. Every year I get to take a different couple of kids of different ages out for four hours in the afternoon. They are old enough to fish and most are ten to fourteen years old.

The Antique Angler

I always start the day off by discussing what kind of fishing they are interested in or what kind of fishing they like to do. Generally, I get comments about wishing they could catch a walleye or something large. I am not a guide, and I am not on the water every day. So I have figured out catching something or anything at this age will keep them interested, and generate quite a bit of enthusiasm. I know some of the experienced guides have them troll and reel in the fish when they hit while trolling. Others try casting lures which can be somewhat difficult.

Every year I rig up a couple of spin cast rods and reels with bobbers and leeches. I usually take them to my "go to" spot where it is relatively shallow, but there always seems to be panfish and bass in the area. The previous year all they caught were some perch with a guide. We pulled up to my spot and a bass surfaced nearby. I told one of the boys to cast over in that direction and within seconds he had a smallmouth bass of a couple of pounds flying out of the water and the drag screaming out. His face lit up and that was only the beginning as bass after bass hit and each put up a great fight. They had several bass over 3 lbs. and on spin cast reels and light rods, the fish seemed like monsters. The action was fast. I had them netting each other's fish and the time was flying by.

To change things up, I asked them if they wanted to try another spot and do some casting with spinning equipment. The casting only lasted a few minutes and they wanted to go back to the original spot. It was still hot and they caught some panfish along with the bass and the action was almost continuous. I had trouble getting them to take a few minutes to have something to drink and some cookies. They did not want to go back for the fish fry.

What I have learned is that they have the most fun when they are getting a lot of action and they must cast the bobber and fight the fish on a rod that has some flexibility. They wanted to keep some fish to have a fish fry for the family, and we were able to do that. The smiles in the picture say it all and I enjoyed their fun even though I was not fishing. Take some kids fishing this summer. To make it fun for them, a bobber and a leech work great on Vermilion. You just may enjoy it as much as they do.

Wolf Island: History, Current Status

Wolf Island is located on the northern part of Lake Vermilion near the head of the Vermilion Dam/ Vermilion River. It is also known as Knotts Island and is often identified that way on USGS maps. The 58-acre island shows significant evidence of native Ojibwe use.

Dwight Warkentin
VLA Board Member

Wolf Island as described by Jim Brown to John Jager in the early 1900s:

"I know it well, it's an Indian recluse where they are making birch utensils (on the eastern knoll), the only island in the upper Vermilion, before and since much deforested by lumbering thieves."

While a detailed history of the island is lacking, and leaves room for speculation, its location near the Vermilion River would suggest it would have been a stopping point for both native peoples and early fur traders. It is possible Verendrye, a French Canadian fur trader who set out from Montreal to explore this area, used this island as a navigation point. There is evidence of pottery and reports of birch bark canoe building on the island.

In 1907, John Jager visited the island with his brother and an Ojibwe guide named Jim Brown. They explored the island and John Jager decided to file a claim to the property, which he did in 1908.

Mr. Jager was an architect and self-proclaimed conservationist who designed his home near Minnehaha Falls as well as some of the buildings in downtown Minneapolis.

Mr. Jager decided to build his dream cabin on Wolf Island in the late 1920s. Using the natural materials found in the area, he drew upon the Adirondack style of architecture of New York. During the building of this cabin and subsequently, Mr. Jager found time to document his scholarly interests. This included his 'archaeological finds', artifacts, journals of nature, geology, wildlife, and the natural surroundings. He mapped the entire island and built paths, some of which exist to this day. In his later life he was somewhat reclusive, spending many of his summers alone on the island, documenting it in his journals. After his death in 1959, his wife had most of his journals burned, so much of this history is lost.

The island and cabin were handed down to family friends who cared for it until recently. After years of private ownership, The Trust for Public Land purchased the island to preserve its unique history and for future conservation. The island was subsequently designated for transfer to the U.S. Forest Service in September 2013. I had the pleasure of attending the official ceremony for its transfer. It included a dedication of the land by a member of the Bois Forte Band of Ojibwe, walks and tours of the island and cabin, and a discussion on future plans for the island. I felt a sense of history walking the paths built by Mr. Jager, observing anthropology, evidence of native use, as well as ample current signs of nature.

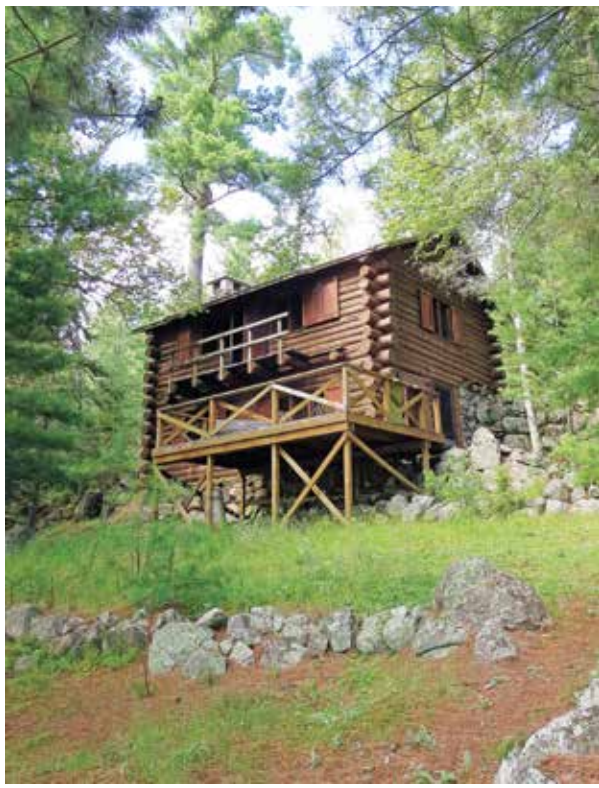


Photo courtesy of the McPeak family

The transfer of the island to the U.S. Forest Service was completed in 2016. At this time options are being considered for future use of the island. Since there is cultural significance, the goal is to maintain this history while allowing the public to enjoy access to this wonderful island.

Acknowledgment: History was sourced from "Wolf Island on Lake Vermilion: A History of Land and People", The Trust for Public Land, 2013.

AIS Prevention at Lake Vermilion in the Early Days

I joined the board of the Sportsmen's Club of Lake Vermilion in 2003. I was recruited by President Ray Harris and Paula Bloczynski. Barb Shook, club treasurer, had recently passed away, and they were looking for a replacement. I was a church treasurer at the time, so a little extra effort, I thought, was manageable. I was reasonably good with a computer, so I was able to rather quickly convert a part of Barb's ledger into data my Quicken program could read. The club treasurer job to this day remains very important and busier than ever.

Bob Wilson
Former AIS Leader

But I could also see some dark clouds on the horizon that were not related to dollars and cents. Duane Williams and Jack Sparks had discovered rusty crayfish in Armstrong Bay in the mid-1980s. Interesting, but the significance of rusty crayfish multiplying at a rather rapid rate was not clear at the time. They especially liked weedy bays. Back in those days, they were called "exotics" or "exotic species" and didn't get much attention.

The attention had grown a bit by 1992, when three SCLV representatives attended a scientific conference in Brainerd entitled "Exotics in Minnesota: The Inland Invasion." The message was now clear.

After the conference, we published an article in our May 1992 newsletter called "Exotic Plants and Animals – Do they Threaten Lake Vermilion?" Member education was our first step. See excerpts from that early newsletter article on the next page.

In addition to education, our organization got our members involved. Willis Irons worked with property owners to hang zebra mussel samplers made from PVC pipe off the end of their docks. Fortunately, no zebras were detected.

By the early 2000s, the term "exotics" was replaced by "invasives" and soon "aquatic invasive species." I began organizing volunteer boat inspections on holiday weekends at our busiest public accesses – Hoodoo Point and Moccasin Point in particular. We were plowing new ground and were pleased with the cooperation we received from boaters.

Soon, we were inspecting boats at a dozen accesses across Vermilion with over 50 volunteers. Within a few years, we had inspected our 1,000th boat. Pretty good for a great bunch of volunteers! Most of them were very willing to help with boat checks on busy weekends. We had a few training sessions run by the DNR, with a good box lunch prepared by Nancy Yapel. Our attendance, not surprisingly, was quite good.

By 2010, we had added other education efforts. Judy Moline designed an AIS placemat for restaurants after Frank Siskar found an example at a different lake, I believe, in North Dakota. Other efforts were having AIS signs on billboards. That was a challenge in that the location of the billboard was seldom optimal. With the DNR's help, we had fish rulers made. AIS ID cards were distributed. The Ron Gardenhire PSA was especially popular during Twins Games. About once a year, my counterpart in Ely and I would be interviewed on the air at an Ely radio station. Perhaps we were able to reach people who knew little about AIS.

In 2015, we witnessed the fishery problems at Lake Mille Lacs. As an SCLV board, we vowed to do

everything possible to prevent the same type of devastation at Vermilion. About that time, St. Louis County made AIS prevention funding available to organizations like ours. Our AIS prevention program took another leap forward.

Today, after my retirement, board member Jeff Lovgren leads our AIS work. With serious AIS threats all around us, the scope of today's program dwarfs that from 20 years ago. The program includes partners North St. Louis Soil and Water Conservation District, the Burntside Lake Association, Pelican Lake, and Fayal Township. It's a model for other lakes and counties to copy. Boat checks are still a very important component of AIS prevention and have grown into quite a sophisticated effort.

"Exotic" Advice from 1992 Still Valid

[Excerpts from May 1992 newsletter article "Exotic Plants and Animals – Do They Threaten Lake Vermilion?" by Dale Lundblad]

A scientific conference titled "EXOTICS IN MINNESOTA: The Inland Invasion" was recently attended by Dale Lundblad and Jack Sparks, board members of the Sportsmen's Club of Lake Vermilion, and Mark Ludlow, owner of Ludlow's Island Lodge.

The theme of the [conference] was "Why Exotics are a threat to Minnesota's waters and what actions can be taken to minimize their impact." An "Exotic" is an organism that is not native to a certain area but is foreign or imported.

The Exotics that present a potential threat to the Lake Vermilion Ecosystem are: Eurasian watermilfoil, zebra mussel, ruffe, spiny waterflea, and rusty crayfish.

The experts [at the conference] are unable to predict if any of these Exotics will become established or cause damage to Lake Vermilion. If we, as members of the Sportsmen's Club, can be successful in keeping Lake Vermilion healthy and unpolluted, we will maintain an effective deterrent to them.

Our first line of defense, however, must be education of the boating and fishing public. If we can observe and promote the following precautions, perhaps we can keep these invaders from entering Lake Vermilion in the first place.

➤ Clean your boat. Clean all mud and plant matter from your boat, trailer, propeller, live well and anchors before leaving the landing. Even canoes should be checked inside and out.

➤ Dry or wash your boat and fishing equipment. Drain live wells, bait buckets, and bilge areas. Let your boat and trailer dry in the sun for at least three days before you use it again in another lake or river. Or wash your boat and equipment with very hot water (at least 105 degrees F). Make sure tackle and fishing lines are free of [spiny waterflea] eggs. Do not transport bait from one waterway to another. Purchase it in the area where you intend to fish.

It takes only one mistake to spread a pest and ruin a waterway. Don't be the one!

Your Board of Directors is now formulating a plan of action to keep Exotics out of Lake Vermilion. Some of the ideas under consideration include:

➤ Volunteer inspection of arriving boats at Public Landings.

➤ Informational billboards on main roads leading to Lake Vermilion.

➤ A citizen "Exotics Watch" to quickly identify and monitor Exotics that do reach our lake.

➤ Informational news releases in the print media and radio.

Since public involvement is essential, we encourage your input and participation in the Club's efforts.

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Volunteers Make the Difference

The Vermilion Lake Association has been fortunate over the years to have a dedicated group of leaders and volunteers to staff our important activities. We are grateful for their help.

Please consider joining this team. We have needs for both workers and leaders, for those with only a few hours to spare, and for those who can make a larger time commitment.

If you think you may be interested, please contact Pat Michaelson, VLA Volunteer Program Leader, at 612-306-7702 (cell) or plmichaelson@gmail.com .

Vermilion Lake Association

Sheri Sawatzky, Member Records • P.O. Box 696 • Tower MN 55790
sherisawatzky@gmail.com • (218) 666-5512

Membership year runs from Jan 1st through Dec 31st

☐ 2018 New Member ☐ 2018 Renewal

Membership level

☐ $15.00 Individual ☐ $20.00 Couple
☐ $25.00 Family ☐ $50.00 Business or Organization

Member Name _____

Spouse Name _____

Street _____

City _____ State _____ Zip _____

Email (requested) _____

Phone (requested) _____

Please clip or copy this form and send to the address above.

Become a Member

Join those who love Lake Vermilion as much as you do. Help us continue the many activities you've just read about.

Not sure? Check us out at our website VermilionLakeAssociation.org. We're pretty sure you'll like our vision for the future and the work we have underway now to make Lake Vermilion even better.

Please mail a check with the form on this page or join at our website using PayPal or a credit card.

The Vermilion Lake Association is a 501(c)(3) non-profit organization.

Renew Membership for 2018

If you have not yet renewed your lake association membership, there's still time. You can renew at the VermilionLakeAssociation.org website or use the form on this page.