



Project Summary to St. Louis County Aquatic Invasive Species Prevention Program

January 2022

A. Successes

The North St. Louis Soil and Water Conservation District received St. Louis County Aquatic Invasive Species (AIS) Prevention funds to operate an AIS watercraft inspection and decontamination program at 12 lakes: Bear Island, Birch, Burntside, Crane, Ely, Gilbert Pit, Johnson, Kabetogama¹, One Pine, Pelican, Shagawa and Vermilion Lakes. Measurable results from the 2021 program include:

- Between May 7th and October 24th, a total of 22,045 inspections plus 195 decontaminations occurred on 22 public accesses and 14 private accesses on 10² different lakes.
 - Public Access Inspections: completed 19,962 watercraft inspections out of the goal of 23,085 or 86%
 - Private Access Inspections: completed 2,083 watercraft inspections out of the goal of 2,500 or 83%
 - Decontaminations: completed 195 decontaminations out of the goal of 645 or 30%
 - Two Interns worked as Inspector Supervisors for 1,097.75 hours out of goal of 1,000 or 109%. Supervisors handled day-to-day issues that arose with inspectors, equipment and decontamination units, as well as monitored lakes for new AIS infestations and attended outreach events held throughout 2021.
 - 29 Level 1 Inspectors worked 6,431.5 hours out of the goal of 7,372 or 87%
 - 12 Level 2 Inspectors worked 2,873.75 hours out of the goal of 3,890 or 74%
 - Inspector staffing averaged 3.10 inspections per hour, exceeding the goal of >2.41 inspections per hour!
- Continued COVID-19 Restrictions- With the continuation of COVID-19, social distancing, and relative safety protocols the District has continued to make adjustments to the watercraft inspection program and Aquatic Invasive Species (AIS) prevention efforts throughout the 2021 boating season.

Inspectors were outfitted with COVID-19 related personal protective equipment including hand sanitizer, face masks, disposable gloves and were instructed to keep a 6ft social distance when interacting with the public. There have been zero (0) COVID-19 positive cases reported in our watercraft inspection program.

- Trainings and meetings- Normally a one-day in-person training, the Minnesota Department of Natural Resources (DNR) again put together a Level 1 inspector training on an online platform, consisting of videos and an online exam in order to become a certified Level 1 inspector. With the online training the District was able to train 29 new and returning inspectors and schedule them at public water accesses starting May 7th, the Friday before Fishing Opener weekend. New inspectors were stationed with returning inspectors during their first shift in lieu of an in-person training. This allowed new inspectors to speak with experienced inspectors, ask questions, and receive feedback on their performance before working a shift on their own during Fishing Opener weekend.

Level 2 training for decontamination operators was also modified due to COVID-19 restrictions. The DNR put together an online refresher training for returning Level 2 inspectors who had been trained previously in 2020. This consisted of the Level 1 training plus several more videos and an exam that was required to be passed before becoming re-certified. There was also an online *new* Level 2 inspector training followed by an in-person training. This training included an online portion with videos and quiz, and an outdoor, in-person training with

¹ The District has an Agreement for Service with Koochiching SWCD to complete inspections on Kabetogama. International Falls, where their office is based, is much closer to the lake than Virginia, where the District's office is based. This makes recruiting inspectors much easier. Koochiching SWCD's work completed on Kabetogama is included in this report.

² Due to limited staff availability and known low traffic, Inspectors weren't scheduled at Johnson or One Pine lakes. Open shifts were offered, but none were filled.

a limit of ten (10) people present. After the in-person training the inspectors had to pass a final exam before becoming certified. Between the returning Level 2 refresher course, and new Level 2 training we were able to train 12 Level 2 inspectors.

The District AIS Program Coordinator put together an online, program specific, training which included a recorded video introduction to the District's specific protocols, chain of command, as well as gear and tablet information. This online training helped streamline communication, and clarified how to respond to boater violations.

Together with Burntside Lake Association and Vermilion Community College, the District was able to send inspectors to an online Enhanced Training hosted on Zoom. Those who could not attend live were given access to the recorded meeting. Inspectors reported appreciating this training as it provided more in-depth information about aquatic invasive species, customer relations, handling conflict, and encouraging behavior changes.

Due to COVID-19 restrictions the District was not able to provide additional in-person training or meetings throughout most of the inspection season, as we had in the past. However, the interns who supervised the watercraft inspectors did well in communicating with the inspectors with regular visits to the accesses. The District utilized an online work chat and email to communicate with all inspectors to ensure they knew about decontamination unit schedules, upcoming tournaments, weekly updates, and answers to common boater questions.

On August 16th and September 20th, the District decided to host the first in-person inspector meeting, outdoors, since 2019. This was the first time most inspectors were able to meet one another. These meetings were very well received and social distancing was practiced. The AIS Program Coordinator, interns, and inspectors were able to: discuss the season, re-iterate the importance of thorough inspections, demonstrate a thorough inspection, encourage more decontaminations, provide behavior change incentives among inspectors, and discuss common questions and issues.

Despite the continued changes and adjustments, the inspectors were consistent and busy throughout the inspection season. Inspection numbers showed the lakes were less busy than 2020, more comparable to 2019. The reduction is believed to be because the public could participate in boating and angling while safely distancing, but with the hot summer, drought, low water levels, and the opening of restrictions, people were able to spend time elsewhere.

- Tracking Hours Worked at Accesses- Analysis from 2019 showed there were over 1,500 hours lost between inspector hours targeted at the beginning of the year, and hours that were actually worked at the accesses by the end of the year. It was found that over 940 of the lost hours were due to under-scheduling, while over 580 of the lost hours were due to inspectors not working their scheduled hours. This was an area we wanted to improve upon year over year.

The AIS Program Coordinator has made an effort throughout 2020 and 2021 to close the gap between Target Hours and Hours Worked by tracking inspectors' hours weekly. In 2021 there were necessary adjustments to inspector schedules as there were two factors that were out of the Districts control.

1. The Burntside- Van Vac landing was under construction July-October. Usually, the District places both Level 1 and Level 2 inspectors at that location, however that was not possible with the construction closure. Alternatively, the Decontamination unit and a Level 2 Inspector were moved to Birch- South for the time being.

- Voyageurs National Park had planned on providing two Decontamination units to be placed at Kabetogama public accesses throughout 2021. However, due to supply chain issues the units did not arrive until late August. Therefore, Level 2 target hours at Kabetogama were not fulfilled.

The largest difference between Target Hours and Hours Worked in 2021, was between Hours Targeted and Hours Scheduled at 1,200 Hours. However, if we exclude the two factors that were out of the District control, there was only a 73 hour difference between Hours Targeted and Hours Scheduled throughout 2021. There was an additional loss of 756 hours between Hour Scheduled and Hours Worked. This happens when people do not show up for their shift, or when inspectors work less than their scheduled hours (leave early/start late). This validates the work of the intern supervisors. Most hours lost were on Vermilion, at 279 hours (compared to 423 hours in 2020). This makes sense as it's the largest lake with the most inspectors dedicated to its accesses. There was also a loss of hours at Gilbert-Pit due to two inspectors regularly leaving their scheduled shifts early, which ultimately lead to their dismissal. Because this was tracked weekly over the season, the AIS Program Coordinator was able to add shifts, scheduling 10 hours over the target Level 1 hours for Vermilion, and 62 hours over the target at Gilbert-Pit. This tactic was used across the program, overscheduling at multiple locations to best fulfill hours that could not be worked at Burntside- Van Vac and Kabetogama.

Altogether, the 1,200 hours difference between Hours Scheduled and Target Hours, plus 756 hours difference between Hours Scheduled and Hours Worked resulted in a total of 1,957 hours difference between Target Hours and Hours Worked. Table 1 details this information, and you can see the majority of hours lost were at Burntside (with the landing closure) and Kabetogama Level 2 shifts (as the Decon units were delayed in their arrival).

TABLE 1

Region	Sum of Hours Worked	Sum of Hours Scheduled	Target Hours	Difference Hours Worked-Scheduled	Difference Hours Scheduled-Target Hours	Difference Hours Worked-Target Hours
Burntside/Shagawa Level 1	316	340	812	-24.00	-472	-496
Burntside/Shagawa Level 2	781	839	1,360	-58.00	-521	-579
Burntside/Shagawa Total	1,097.00	1,179	2,172	-82.00	-993	-1,075
Ely/ Gilbert- Pit Level 1	469.5	614	456	-144.50	158	14
Ely/ Gilbert-Pit Level 2	259	360	456	-101.00	-96	-197
Fayal Township Total	728.5	974	912	-245.50	62	-184
Pelican Level 1	306	304	112	2.00	192	194
Pelican Level 2	370.5	386	424	-15.50	-38	-54
Pelican Total	676.5	690	536	-13.50	154	141
Vermilion Level 1	4,667.25	4,898	4,888	-230.75	10	-221
Vermilion Level 2	1,174.25	1,223	1,330	-48.75	-107	-156
Vermilion Total	5,841.50	6,121	6,218	-279.50	-97	-377
Kabetogama/ Crane Level 1	541.75	588	680	-46.25	-92	-138
Kabetogama/ Crane Level 2	40.75	40	320	0.75	-280	-279
Kabetogama/ Crane Total	582.5	628	1,000	-45.50	-372	-418
WICOLA Level 1	131	150	424	-19.00	-274	-293
WICOLA Level 2	248.25	320	0	-71.75	320	248
WICOLA Total	379.25	470	424	-90.75	46	-45
Total:	9,305.25	10,062	11,262	-756.75	-1,200	-1,957

Table 1: The differences between hours that were targeted at the beginning of 2021 (Target Hours) vs. the hours that were scheduled throughout 2021 (Hours Scheduled) vs. the hours that were actually worked throughout 2021 (Hours Worked) at each location. Red indicates a negative difference. Green indicates a positive difference.

- Increased Inspections per Hour Rate- Vermilion Lake Association (VLA) created a traffic forecast from the data gathered in prior years that was used to suggest inspector schedules on Vermilion in 2021. The predictions

allowed staffing more inspectors when the accesses were likely to be busy. Traffic forecasts resulted in high efficiency of the number of inspections per inspector hour worked on Vermilion public accesses. The goal was more than 2.5 inspections per hour. We exceeded the goal with an average rate of 2.51 inspections per hour on Vermilion throughout 2021 (See Table 2).

The traffic forecast on Vermilion aided in predicting traffic on other lakes as well. The predictions were used to schedule inspectors at lakes during peak traffic hours which lead to an average rate of 3.1 inspections per hour throughout the entire program, exceeding the goal of more than 2.41 inspections per hour (Table 2).

TABLE 2

Lake	2021 Target		2021 Actual	
	Inspection Target	Efficiency Target per Hour	Inspection Actual	Efficiency Actual per Hour
Bear Island			2	0.33
Birch	975	>2.3	897	*2.40
Burntside	1460	>2	401	1.86
Crane	460	>2.3	369	*1.94
Ely Lake	475	>2.2	516	*1.42
Gilbert Pit	240	>1	272	*0.74
Kabetogama	1580	>3.3	1,035	2.64
Pelican	910	>1.7	1,198	*1.83
Shagawa	1,440	>1.9	997	*1.37
Vermilion	15,545	>2.5	14,275	*2.51
TOTAL	23,085	>2.41	19,962	3.10

Table 2: The number of inspections and efficiency completed at each access (2021 Actual), compared to the number of inspections and efficiency targeted (2021 Target). *Accesses with both Level 1 and Level 2 Inspectors, and often just a Level 2 Inspector, complete Level 1 surveys, therefore it is necessary to consider Level 2 Hours when looking at efficacy.

Below, in Table 3, is a list of all the lakes and accesses staffed by inspectors in 2021, listed in descending order based on Inspection per Hour rates.

TABLE 3

Lake	Landing	Level 1 Inspections	Hours Worked (L1)	Inspections/ L 1 Hours	Inspections/ L 1&2 Hours
Vermilion	Hoodoo	5292	439.5	12.04	3.28
Shagawa	Sandy Pt	997	100	9.97	1.38
Birch	South	897	125	7.18	2.40
Pelican	Orr Bay	1125	242	4.65	1.84
Kabetogama	Ash River	552	200	2.76	
Vermilion	Moccasin Pt	3220	1211.5	2.66	
Kabetogama	Visitor Center	483	192	2.52	
Crane	East	369	149.75	2.46	1.94
Vermilion	Petersons/Wakemup Bay	1003	424.25	2.36	
Vermilion	Timbaktu	1589	696.5	2.28	
Ely	Ely	516	232	2.22	1.42
Vermilion	Black Duck	836	393	2.13	
Vermilion	Dam Lodge	253	120	2.11	
Burntside	Van Vac	369	176	2.10	1.22

Vermilion	Frazer	758	393.5	1.93	
Vermilion	Everett	1019	531	1.92	
Vermilion	Head of Lakes	558	330	1.69	
Vermilion	Pehrson Lodge	94	60	1.57	
Burntside	Lodge	29	24	1.21	
Gilbert-Pit	Ore Be Gone	272	237.5	1.15	0.74
Pelican	Saunders Bay	73	64	1.14	
Vermilion	White Eagle Resort	12	12	1.00	
Vermilion	Muskego Pt Resort	53	56	0.95	
Bear Island	South	2	6	0.33	
Burntside	South/Wolf Rd	3	16	0.19	
Chamber	of Commerce	0	30	0.00	0.00

Table 3: The rate of inspections per inspector hour worked at each of the lakes and accesses, in descending order. Accesses with both Level 1 and Level 2 Inspectors, and often just a Level 2 Inspector, complete Level 1 surveys, therefore it is necessary to consider Level 2 Hours when looking at efficacy.

- Decontamination Units- Five (5) decontamination units were placed at public accesses beginning in May. In July the Burntside- Van Vac unit was moved to the Chamber of Commerce, a public location in Ely, MN. However, the unit was not used and therefore was moved to Birch- South for the remainder of the season.

In August two (2) new decontamination units purchased by Voyageurs National Park were ready for use. In mid-September the District was able to utilize one of the new decontamination units at Crane- Waters Edge. The first weekend the decontamination unit was placed at the Crane Lake access a boat arrived covered in zebra mussels. The inspector stopped the boater, took proper documentation, called the local conservation officer who ticketed the boater, and completed a full decontamination on the infested boat.

TABLE 4

Lake	Landing	Decons	Sum of Hours Worked	Decons/ Level 2 Hours
Chamber	of Commerce	0	30	0.00
Shagawa	Sandy Pt	44	625	0.07
Burntside	Van Vac	3	126	0.02
Ely	Ely	6	131	0.05
Gilbert-Pit	Ore Be Gone	2	128	0.02
Pelican	Orr Bay	31	370.5	0.08
Vermilion	Hoodoo	100	1174.25	0.09
Crane	Waters Edge	1	40.75	0.02
Birch	South	8	248.25	0.03
	Total:	195	2,873.75	0.068
	2020 reference	130	1,749.50	0.074
	2019 reference	241	3,720.50	0.065

Table 4: The number of decontaminations completed at each lake and access, and decon/ hour efficiency. Compare to 2020 and 2019 accomplishments.

In an effort to increase decontaminations and change boater behavior, new sandwich-board styled signs were displayed at the decontamination units which stated “Reach Our Goal! 150 Decontaminations” and displayed boxes to be filled in with a marker for every decontamination completed. Each decontamination unit had a different goal, based on risk estimates calculated from 2019 surveys. These signs helped both boaters and inspectors visualize the number of decontaminations completed compared to the goal, encouraged action, and suggested a social norm. The District worked with Wildlife Forever to design and obtain the signs.

Further, Level 2 Inspectors were encouraged to use statement verbiage rather than questions when suggesting a decontamination to a boater. Statement suggestions do not ask the boater if they would like a decontamination,

and does not allow the opportunity to deny. Alternatively, it’s a friendly suggestion that a decontamination is going to happen and boaters are less likely to suggest otherwise. An example is: “Your boat was in another lake recently so we’ll complete a decontamination for you. Please drive over to the yellow mat.”

Although 11 Level 2 inspectors were trained at the beginning of the boating season, only 5 inspectors regularly completed decontaminations (more on this on the next section). Each inspector was encouraged to complete 1-2 Decontaminations per work shift. This lower goal seemed to be more reachable than saying our District goal was 500 Decontaminations, or a location goal was 150 Decontaminations.

The interns were trained on basic decontamination unit maintenance. Their help replacing worn and broken parts, cleaning the units, and reporting repairs was integral in the efficiency of the units’ operational ability and preventative maintenance. The AIS Program Coordinator became more familiar with replacing worn motors and was able to streamline repairing the decontamination units so they were in working order throughout the season. Ultimately all minor repairs were able to be handled internally, and larger issues were mitigated until a local mechanic could work on a unit.

- Private Access Partnerships- In 2021, 10 resorts, campgrounds and marinas engaged in watercraft inspections at their private accesses. Eight (8) partners at Lake Vermilion and two (2) partners at Pelican Lake completed 1,671 inspections (Table 5) at their private accesses.

TABLE 5

Lake	Resort Name	Number of Inspections
Vermilion	Fortune Bay Resort Casino	693
Vermilion	Glenmore Resort	84
Vermilion	Head-O-Lake Resort	321
Vermilion	Life of Riley Resort	44
Vermilion	Retreat Lodge	199
Vermilion	Vermilion Houseboats	70
Vermilion	Whispering Winds Resort	105
Vermilion	White Eagle Resort	31
Pelican	Birch Forest Lodge	89
Pelican	Richardson's Shangri-La Resort	35
	Total	1,671

Table 5: Number of inspections completed at private accesses by resorts, campgrounds, and marinas.

In order to inspect, each person must complete an online training that directly resembled the inspector training District inspectors go through. Once certified, resorts receive inspection equipment and a tablet to collect survey data. In previous years, it was expressed the tablets were too bulky to carry around while completing resort obligations, then to stop and inspect a boat. This prompted the District to set up personal smart phones with the online survey. This accessibility was well received. The Resort Inspection Survey is a copy of the DNR Inspection Survey, with its own separate database managed by the District. Private access partners have varying abilities to provide staff for inspections. Resorts utilizing a survey to record inspections have an option to be paid \$7 per inspection uploaded. Most partners take this incentive in order to cover the cost of having a staff person conduct inspections.

Additionally, the District has partnered with 4 resorts with higher traffic to place a District inspector at their accesses. Vermilion Dam Lodge, Muskego Pt Resort, White Eagle Resort, and Pehrson Lodge all hosted inspectors throughout the boating season. Vermilion Dam Lodge hosts fishing tournaments and league days out of their access, therefore are of particular priority for hosting an inspector.

Fortune Bay Marina has offered unofficial decontaminations at their locations with a heated power washer unit. Decontamination protocols and training have been provided by 1854 Treaty Authority. This unit can provide a hot water cleaning on the spot rather than asking their guests to turn around and find a decontamination unit. This would not constitute an official decontamination, since those can only be conducted by Level 2 inspectors. The District was asked to train seasonal employees at the YMCA Camp Northern Lights on Bear Island Lake. The AIS Program Coordinator and Community Conservationist presented on both AIS and terrestrial invasive species. 20 participants attended; however, we have not seen any inspections come through on the private access inspection survey.

Private access owners have varying ability to participate in inspections, and provide AIS prevention information to their guests. The additional resorts listed in Table 6 are visited by the AIS Program Coordinator and VLA Resort Ambassadors regularly with AIS updates, and informational pamphlets to give their guests. Some of these partners do indeed inspect their guest’s watercraft, however don’t record their inspections on the survey and therefore are not represented above.

TABLE 6

Lake	Resort Name
Vermilion	Gruben's Marina
Vermilion	Muskego Point Resort
Vermilion	Pehrson Lodge
Vermilion	Timbuktu Marina
Vermilion	Vermilion Dam Lodge
Vermilion	Voyageur Cover Resort
Vermilion	Forest Lane Resort
Vermilion	Ludlow's Island Resort
Vermilion	Pike Bay Lodge
Vermilion	Spring Bay Resort
Vermilion	Your Boat Club
Pelican	Aspen Resort
Pelican	Cabin O' Pines Resort
Pelican	Grey Wolf Lodge
Bear Island	YMCA Camp Northern Lights

Table 6: Resorts who participate in AIS Prevention efforts without completing inspection surveys.

- Partnership with Fishing Tournament Directors- The District collaborated with the VLA to work with fishing tournament directors to strive for a 100% inspection rate of all tournament boats prior to their launch in Lake Vermilion. For each tournament, we provided a list of planned inspection and decontamination hours and locations for pre-fishing days and tournament day.

This season, all DNR-permitted tournaments on Lake Vermilion required participants’ boats obtain an inspection proven by an AIS Rules and Compliance Certification Form. The tournament directors were cooperative, we do get the sense that participants are complying and are onboard with AIS prevention. However, more work is to be done on other lakes as tournament coordinators and attendees on Pelican and Shagawa gave inspectors a hard time on a number of occasions. After discussion, some attendees came around to inspections and voluntary decontaminations, but misconceptions needed first to be corrected.

- Early Detection for new AIS infestations- Interns completed early detection on 34 lakes, looking for new AIS infestations (lakes detailed in Table 7). This effort has greatly increased from 2020 where 9 lakes were regularly monitored. Each location was visited at least once, and at most four times throughout the early detection season. Interns threw a double-headed rake, attached to a rope, into the lake in three different directions while standing

on a dock. The rake is pulled back to shore after each throw. All vegetation attached to the rake was identified. Any vegetation that looked like an invasive species or could not be identified was collected and brought back to the AIS Program Coordinator for further investigation. Despite rake throws on Ely Lake, our early detection efforts did not pick up any zebra mussels. Zebra mussels were found on Ely Lake after a landowner discussed the possibility with an inspector, and a conservation officer was called on site to identify and confirm the invasion.

Table 7

Water Body Name	Access/ Location Name	Water Body Name	Access/ Location Name
Aurora Pit	Public Access	Kinney Pit	Kinney
Bear Head	Campground	Long Lake	Public Access
Bear Island	Public Access	Longyear	Chisolm
Birch	Kramer Bay	Mine Lake	Mine Lake Rd.
Birch	South Access	Miners Pit	Public Access
Black Duck	Public Access	One Pine	Public Access
Colby Lake	Public Access	Ore Be Gone	Public Access
Colby Lake	Birch Cove	Pelican	Orr Bay
Crane	East Access	Sabin Lake	Giants Ridge Rd
Crane	Bayside	Shagawa	Sandy Pt.
Eagles Nest #3	Public Access	Side Lake	Public Access
Elephant	Elephant River	Silver	Public Access
Ely	Public Access	Stubler Pit	Buhl
Embarrass Lake	Wayside Rest	Sturgeon Lake	Campground
Embarrass River	HWY 135	West Two Rivers Reservoir	Campground
Johnson	Public Access	Whiteface Reservoir	Campground
Kabetogama	Visitors Center	Whitewater	Fishermans Pt.

- Contributed to Signage Inventory- The District continued to collaborate with Lake SWCD, Lake of the Woods SWCD, and Minnesota Sea Grant to gather information and pictures of AIS signage present at public and private water accesses. AIS interns, while en route to supervise watercraft inspectors, stopped at accesses, recorded location, recorded signs present, and took pictures. Most information has now been compiled on where signs need to be replaced or installed, and the various access managers are now being encouraged to update and install signs as necessary. Accurate signage at accesses will help keep the public informed of AIS regulations and how they can help prevent their spread. Further discussion continues on how to incorporate messaging regarding proper bait disposal and transport, self-inspections, and watershed connectivity
- Outreach and Education- The AIS Program Coordinator focused heavily on outreach events in 2021 by participating in 12 events via online platforms, classroom engagement, and by staffing booths at fairs and grand openings. These various events have proven successful as we’ve reached over 700 individuals. Most of those who were reached at these events don’t visit the busy accesses with inspectors, and therefore were a new population of people to discuss AIS policies and protocols. These outreach events ranged from Zoom workshops, booths at fishing pier and mountain bike trail grand openings, AIS Landing Blitz (a regional effort coordinated by MN Sea Grant), and classroom presentations. The District partnered with White Iron Chain of Lakes Association to co-host an AIS outreach booth at both the Blueberry Festival and Harvest Moon Festival. Additionally, the District has increased social media posts on AIS related topics, as well as writing and co-writing articles for local newsletters.

At several fair booths, visitors were asked to sign a commitment stating they would Clean Drain Dry their watercraft and equipment, and properly Dispose of live bait. In return, they’d receive a towel designed to remove spiny waterflea (designed by Minnesota AIS Research Center). Through this effort we’ve received 27 signed commitments.

B. Limitations

- Adapting to COVID-19 Restrictions- The District was not able to provide regular monthly in-person inspector meetings until August. Both District staff and inspectors benefitted from these meetings as it was a chance to share information, stories, updates, and meet other inspectors. The District communicated via an email and work chat forum, and interns communicated necessary information to inspectors as needed. However, the rapport of gathering in a space was not accomplished until the end of the season.
- Decontamination Numbers- We saw a slight increase in decontaminations in 2021, after seeing a decrease since 2017. We believe the new training on verbiage and new goal signs displayed have helped encourage decontaminations throughout 2021. We also experimented with employee incentives and created competition between Level 2 Inspectors in 2021.

Analysis and goals will be shared with 2022 inspectors as well as sales tactics and verbiage suggestions in an attempt to raise decontamination numbers.

Voyageurs National Park was able to obtain two new decontamination units. It was planned to staff these two units throughout the boating season. However, due to some supply chain and logistical issues the units weren't delivered until late July and early August. By that time, Koochiching SWCD (who's contracted to work on Kabetogama through the District) didn't have enough Level 2 inspectors to staff the units. The District was able to utilize one unit at Crane Lake for two weekends. However, the second unit was not used by the District or Koochiching SWCD due to the staffing shortage. This change will distort our accomplishments vs. the goals we'd set out at the beginning of the year.

Voyageurs National Park was able to use the second decontamination unit on the Rainy Lake portage at Kettle Falls to Namakan Lake, and completed decontaminations on all crossing boats. Rainy Lake was found to have zebra mussel veligers in 2021. The land portage, though going upstream, allows motorized boats to move from Rainy Lake to Namakan Lake. The District and Voyageurs National Park will work together in 2022 to place a decontamination unit and regular Level 2 Inspectors at the portage to decontaminate each boat crossing the land portage.

- Private Access Recruitment- There is a desire for more private access businesses to conduct inspections at their access as they pose the largest risk for AIS contamination, based on data showing the boater's last lake entered.

According to VLA's volunteer Resort Ambassadors, many businesses with private accesses are aware and interested in AIS inspections and prevention. However, they don't have the staff to conduct inspections, despite the \$7/ inspection incentive. Therefore, in some cases, inspections are being done on watercraft, but not recorded on the survey and uploaded to the District's database – which means they are not being counted. We are pleased they are inspecting boats prior to launching, and providing information to their guests, we would also like to have the count.

Recruitment of new private access partners was difficult in 2021. Plans were in the works to coordinate with resorts, campgrounds and marinas on Kabetogama, Crane and Birch lakes. However, with the continuation of COVID-19, in- person meetings were moved to online platforms. Voyageurs Conservancy helped coordinate and host a Zoom Workshop for private access owners, to encourage new participants. Unfortunately, despite repetitive outreach and emails, there was little turn out, with 1 participant. The District and its partners will continue to reach out and coordinate with resorts, campgrounds, and marinas to ensure private accesses see AIS prevention efforts.

- Education- Ongoing education is needed to reach watercraft users/lakeshore owners/tournament directors/resort owners/lake service providers/bait dealers, and classrooms. While there is increased awareness of AIS, there are still many gaps, misperceptions and opinions to overcome.

The District would like to continue the education component of AIS by working with its Community Conservationist, Becca Reiss to:

- Host AIS related workshops/seminars
 - Write outreach articles
 - Visit schools and provide AIS-related programing
 - Host booths at local events and fairs
- Continued demand for AIS Prevention resources- Three new infestations in northern St. Louis County (St. James Min Pit and Ely Lake were found with adult zebra mussels, and Rainy Lake was found with zebra mussel veligers) have spurred many conversations about AIS prevention, water quality trends, and early detection efforts. The District would like to deploy zebra mussel settlement plates, purchase a canoe, and possibly purchase a veliger tow net to help expand early detection efforts in 2022.
 - Inspector recruitment and retention- Despite raised inspector wages, the unemployment benefits offered throughout 2021 were higher than what the District had to offer. Employee shortages are a trend across the nation, and this was felt in the inspection program. In 2020 the District staffed 42 inspectors, in 2021 we staffed 27 inspectors. 29 individuals were recruited for the position and sent through training; 27 individuals worked throughout the season; however, 8 inspectors were either let go, or left the position throughout the season. In 2022 we plan on posting position advertisements to local community facebook pages, with the hopes that advertising on a local level may be the best route in increasing recruitment.

C. Analysis

- Inspections, Hours and Efficiency- Comparing accomplishments of 2021 to those of previous years begins to paint a picture of trends over the years (Table 8). Since 2018, the number of inspections completed by the District has continued to rise. This is due to both the expansion to new lakes, and staffing efficiently by placing inspectors where traffic is shown to be the highest. The number of inspector hours worked dipped in 2019, rose again in 2020, and then dipped in 2021 possibly due to both expanding to new lakes and tracking inspector hours weekly to adjust the staffing schedules where necessary. Overall, the efficiency of Inspections per Hour has greatly increased from 1.9 in 2018 to 3.10 in 2021. This could be due to traffic analysis suggesting where to place inspectors, increased boater traffic in 2020 compared to previous years, and staffing new lake accesses that are exceptionally busy (such as Kabetogama). Overall, the District accomplished just under the target for Level 1 Inspections and Hours set at the beginning of the year, but surpassed the efficiency rate of inspections per hour.

TABLE 8

Watercraft Inspection at Public Accesses															
Location	2021 Target			2021 Actual			2020 Actual			2019 Reference			2018 Reference		
	Inspector Hours	Inspection Target	Efficiency Target per Hour	Inspector Hours	Inspection Actual	Efficiency Actual per Hour	Inspector Hours	Inspection Actual	Efficiency Actual per Hour	Inspector Hours	Inspection Actual	Efficiency Actual per Hour	Inspector Hours	Inspection Actual	Efficiency Actual per Hour
Bear Island				6	2	0.33	183.75	100	0.54						
Birch	424	975	>2.3	125	897	*2.40	343.75	726	2.11						
Burntside	732	1460	>2	216	401	1.86	764.75	1,703	2.23	1,013.25	1,714	1.7	1,287	2,402	1.9
Crane	200	460	>2.3	149.75	369	*1.94	130.00	301	2.32						
Ely Lake	216	475	>2.2	232	516	*1.42	256.50	563	2.19	415.5	750	1.8	495	941	1.9
Gilbert Pit	240	240	>1	237.5	272	*0.74	322.50	244	0.76	118	223	1.9	442	344	0.8
Johnson							40.50	24	0.59						
Kabetogama	480	1580	>3.3	392	1,035	2.64	792.00	2,633	3.32						
One Pine							32.25	19	0.59						
Pelican	112	910	>1.7	306	1,198	*1.83	756.50	1,277	1.69	781.5	1,136	1.5	792	977	1.2
Shagawa	80	1,440	>1.9	100	997	*1.37	377.00	1,088	2.89	80	1,405	1.7*	494	778	1.6
Vermilion	4,888	15,545	>2.5	4,667	14,275	*2.51	5,169.25	14,983	2.90	5,418.65	13,248	2.4	5,814	12,313	2.1
TOTAL	7,372	23,085	>2.41	6,431.50	19,962	3.10	9,169	23,661	2.58	7,826.90	18,574	2.2	9,324	17,755	1.9

Table 8: The inspector hours worked, number of inspections, and inspection per hour worked that were targeted in 2021, compared to what was accomplished in 2018-2021.

- **Decontaminations-** The number of decontaminations in 2021 increased to 195 from 130 in 2020, but is still below the 546 completed in 2018 (Table 9). The reasons for this decline are unclear despite analysis that looked at inspector surveys, traffic patterns, and inspector schedules. However, similar declines in decontaminations are being seen by different agencies all across Minnesota. The increase in decontaminations in the last year suggests the training provided, verbiage suggestions, and goal signs were helpful in accomplishing the decontaminations that were completed throughout 2021. We look forward to seeing if that continues into 2022.

TABLE 9

Watercraft Decontaminations															
Location	2021 Target			2021 Actual			2020 Actual			2019 Reference			2018 Reference		
	Inspector Hours	Decon Target	Efficiency Target per Hour	Inspector Hours	Decon Actual	Efficiency Actual per Hour	Inspector Hours	Decon Actual	Efficiency Actual per Hour	Inspector Hours	Decon Actual	Efficiency Actual per Hour	Inspector Hours	Decon Actual	Efficiency Actual per Hour
Birch				248.25	8	0.03									
Burntside	680	95	0.14	156	3	0.02	303.00	48	0.16	766	41	0.05	814	127	0.16
Crane				40.75	1	0.02									
Ely Lake	240	40	0.17	131	6	0.05	62.00	8	0.13						
Gilbert Pit	216	20	0.09	128	2	0.02	208.50	1	0.00	373.5	7	0.20	418	15	0.09
Kabetogama	320	45	0.14												
Pelican	424	100	0.24	370.5	31	0.08	0.00	0	0.00						
Shagawa	680	145	0.22	625	44	0.07	194.00	24	0.12	739	93	0.13	494	121	0.24
Vermilion	1,330	200	0.15	1174.25	100	0.09	982.00	49	0.05	1,842	100	0.05	1,163	283	0.24
TOTAL	3,890	645	0.17	2,873.75	195	0.07	1,749.50	130	0.07	3,720.5	241	0.06	2,889	546	0.19

Table 9: The inspector hours worked, number of decontaminations, and decontaminations per hour worked that was targeted in 2021, compared to what was accomplished in 2018-2021.

The majority of decontaminations conducted in 2021 were of exiting boats (Table 10). However, there has been an increase in Entering and Courtesy decontaminations in 2021 in comparison to 2020. Behavior change initiatives, Decon Goal signs, and verbatim trainings planned for 2022 should continue to increase the number of decontaminations, specifically entering decontaminations.

TABLE 10

Lake	Landing	Total Number of Decontaminations	Entering Decons	Exiting Decons	Courtesy Decons
Chamber	of Commerce	0	0	0	0
Shagawa	Sandy Pt- Decon	44	1	1	42
Burntside	Van Vac- Decon	3	2	1	0
Ely	Ely-Decon	6	0	5	1
Gilbert-Pit	Ore Be Gone- Decon	2	0	1	1
Pelican	Orr Bay- Decon	31	5	12	14
Vermilion	Hoodoo-Decon	100	10	68	22
Crane	East- Decon	1	1	0	0
Birch	South- Decon	8	0	5	3
Total:		195	19	93	83
Total 2020 Reference:		130	7	104	19

Table 10: The number of entering, exiting, courtesy and total decontaminations at each lake and access in 2021. Compared to total completed in 2020.

- Private Access Inspections- 2,083 inspections were completed in 2021 at private accesses (Table 11). This is up from 1,640 in 2020, but down from 6,566 in 2018 which was largely due to dropping McKinley Campground based on its low-risk status. The difference in private access inspection between 2019 and 2020 may be due to Fortune Bay Marina. In 2019 they inspected every boat entering and exiting the marina, even if a single guest launched several times in one weekend. In 2020 the inspectors decided to reduce the number of repeat inspections in order to save their guests, and staff time. The increase in inspections in 2021 is likely because the District placed inspectors at three, busy, private access on Vermilion. Therefore inspections were consistently completed at those locations throughout the boating season.

Despite several outreach attempts by Burntside Lake Association to campgrounds, resorts and marinas on Burntside and Shagawa lakes, no private access partners have joined the AIS prevention effort.

Efforts to reach resorts, campgrounds and marinas on Kabetogama, Crane and Birch Lakes continued in 2021 with little response. However outreach will continue. It's worth noting 15 additional resorts on Vermilion, Pelican and Bear Island participated in AIS prevention by providing materials to their guests. However they are not represented below as they did not complete and record inspections.

TABLE 11

Watercraft Inspections at Private Accesses										
Location	2021 Target		2021 Actual		2020 Actual		2019 Reference		2018 Reference	
	Participating Resorts	Inspection Target	Participating Resort	Inspection Actual	Participating Resort	Inspection Actual	Participating Resort	Inspection Actual	Participating Resort	Inspection Actual
Burntside	1	50								
Kabetogama	2	150								
Pelican	4	200	2	124	2	128	2	96	3	123
Shagawa	2	100								
Vermilion	13	2,000	8	1,959	9	1,512	10	2,177	13	6,433
TOTAL	22	2500	10	2,083	11	1,640	12	2,273	16	6,556

Table 11: The number of participating resorts, and inspections that were targeted in 2021 compared to what was accomplished in 2018-2021.

- Risk Assessment- A risk assessment was conducted based on collected survey data at public accesses. It shows the risk of watercraft at various accesses (See Table 12 on the next page). We have categorized them as low-risk, moderate-risk, and high-risk factors.

Burntside and Shagawa include many boaters who have recently spoken to an inspector, a lower risk factor. Predictably, there are fewer violations found at those accesses. Shagawa and Burntside have more risk for boats entering the lake after having been in another waterbody within 24 hours, which is well below the DNR recommended time for a watercraft to dry completely, a higher risk factor.

Ely and Gilbert-Pit have median percentage values for both lower risk and higher risk values. Ely ranks higher in boats repetitively visiting Ely Lake. However, Gilbert-Pit already has Zebra mussels and Eurasian watermilfoil, and Ely Lake has a new found infestation of Zebra mussels. Therefore it's crucial inspectors continue to be stationed at the Gilbert-Pit and Ely Lake as they pose risk of new AIS infestations to nearby lakes due to proximity.

Pelican Lake continues to have higher percentages in higher risk categories. There are a high amount of boaters that enter from other water bodies, but have had 5 days of dry time, which is moderately risky. There are also high risk values in species found attached to entering watercraft, the highest percentage of boater licenses from out of state, as well as high percent of boaters entering Pelican Lake within 24 hours of visiting another waterbody. This risk analysis as well as inspection per hour rates strongly encourage continued inspections as well as a decontamination unit dedicated to the lake.

Vermilion Lake has higher percentages in moderate and nearly all of the higher risk categories. This information, along with known high traffic shows Vermilion should continue having inspectors at busy accesses, and a decontamination unit dedicated to the lake.

Kabetogama lakes have high values for boaters who have recently spoken to an inspector. This is would not have been predicted as both Crane and Kabetogama are newer lakes to the District's AIS prevention program. However, Kabetogama Lake has a higher drain plug violation rate, as well as a higher rate of visitors with out of state license plates, and visitors who have been in other water bodies within 5 days, and after 5 days dry time. Crane Lake has median values across low and high risk factors. This information, as well as the inspection per hour rates, suggest both Crane and Kabetogama should continue to be staffed with inspectors and decontamination units in 2022.

Bear Island Lake was staffed for one weekend due to staff availability, however the inspection numbers were too small to evaluate risk accurately.

Birch has a few higher values in low risk categories which is interesting considering Birch is a newer lake to the District's AIS Prevention Program in 2020. Although it is reassuring that so many boaters are return visitors to Birch Lake, inspector per hour rates were considerably high on Birch and the District will continue to staff the lake with inspectors in 2022.

TABLE 12

Lake	Total Number of Inspections	Surveyed 5x or more ³	Spoke to Inspector within last month ⁴	Same Last Lake ⁵	Same Next Lake ⁶	Entering from other water after 5 days or more ⁷	Species Found ⁸	Drain Plug Violation ⁹	License from Out of State ¹⁰	Entering from other water within 24 hours ¹¹	Entering from other water from within 5 days or Unknown ¹²
Burntside	401	2.85%	86.21%	55.89%	62.15%	5.33%	0.22%	0.22%	11.91%	4.46%	4.90%
Shagawa	997	19.46%	68.73%	40.64%	50.59%	8.30%	0.00%	1.94%	15.95%	3.89%	2.65%
Ely	516	6.59%	67.35%	49.41%	40.23%	5.88%	0.00%	0.29%	4.65%	0.59%	2.94%
Gilbert-Pit	272	2.21%	65.80%	18.65%	24.05%	7.77%	0.00%	0.00%	4.41%	0.52%	1.04%
Pelican	1322	2.87%	44.08%	27.18%	23.68%	50.46%	1.84%	0.16%	41.94%	4.78%	8.35%
Vermilion	16233	14.39%	57.64%	36.08%	27.77%	37.59%	0.55%	2.37%	29.20%	1.99%	5.93%
Crane	369	0.00%	53.30%	39.65%	36.62%	25.11%	1.76%	0.00%	15.99%	2.64%	2.64%
Kabetogama	1060	0.00%	86.17%	32.83%	30.56%	41.17%	0.28%	0.62%	18.40%	2.48%	8.50%
Bear Island	2	Data set too small									
Birch	897	17.73%	85.25%	70.32%	62.35%	8.45%	0.18%	0.18%	7.58%	1.44%	2.70%

Table 12: The total number of inspection at each lake. The percentage of each risk factor was calculated based on entering and/or exiting boater’s answers to survey questions. Columns labels in green are factors that would pose a lesser risk to a lake. Columns label in yellow pose a potential, but lower risk to a lake. Column labels in orange are factors that would pose a great risk to a lake. The top percentage is highlighted in dark yellow, the following two highest percentages are then highlighted in yellow.

Overall, the North St. Louis 2021 AIS Prevention Program was a success. Although COVID-19 offered many hurdles, inspectors were still able to reach visiting boaters, resorts were able to speak to their visitors about AIS, District Interns monitored more lakes for AIS infestations, and the decontamination units remained in working order throughout the season. The District looks forward to using the information detailed in this summary and applying it to 2022 planning as St. Louis County sees fit.

³ **Surveyed 5x or More-** The percent of time an inspector surveyed the same boater. Information is tracked by vehicle license plate. In some cases, it may be the same vehicle but a different person.

⁴**Spoke to Inspector Within Last Month-** The percent of time a surveyed boater said they spoke with an inspector within the last month.

⁵**Same Last Lake-** The percent of time a surveyed boater said the last lake they were on is the same lake they are entering (last lake they exited was Vermilion, they are getting ready to enter Vermilion)

⁶**Same Next Lake-** The percent of time a surveyed boater said the next lake they are going to enter in is the same lake they are exiting (current lake they are exiting is Vermilion, the next lake they plan to enter in is Vermilion).

⁷**Entering from other water after 5 days or more-** The percent of time an entering boaters stated their watercraft had been in another waterbody than that they are currently entering, but the boat has been out of the water for the DNR recommended 5 days to dry (current lake they are entering in is Pelican, and they were in Vermilion 6 days before).

⁸**Species Found Entering-** The percent of time species were found during an entering inspection (plants, animals, water, mud etc.)

⁹**Drain Plug Violation-** The percent of time an entering watercraft arrived at the access with the drain plug in place.

¹⁰**License From Out of State-** The percent of time an inspector surveyed a boater with a towing vehicle license plate from out of state. In some cases, it may be the same vehicle but a different person.

¹¹**Entering from other water within 24 hours-** The percent of time an entering boater stated their watercraft had been in another waterbody than that they are currently entering, within the last 24 hours (current lake they are entering in is Pelican, and they were in Vermilion the day before).

¹²**Entering from other water within 5 days or Unknown-** The percent of time an entering boater stated their watercraft had been in another waterbody than that they are currently entering, within the last 5 days or it’s unknown when the watercraft was in a waterbody last (current lake they are entering in is Pelican, and they were in Vermilion 3 days ago).