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Project Summary to St. Louis County
Aquatic Invasive Species Prevention Program
2023 Watercraft Inspection Season

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 16 lakes: Bear Island, Birch, Burntside, Crane, Ely, Gilbert Pit, Johnson, Kabetogama[1], Little Sturgeon, Middle Sturgeon, One Pine, Pelican, Perch, Shagawa, Sturgeon and Vermilion Lakes. Measurable results from the 2023 program include:

- Between May 12th and October 22nd, a total of **23,246** inspections plus **323** decontaminations occurred on 28 public accesses and 13 private accesses.
- Public Access Inspections[2]: completed 22,439 watercraft inspections out of the goal of 25,250 or 89%
- Private Access Inspections: completed 807 watercraft inspections out of the goal of 2,450 or 33%
- Decontaminations: completed 323 decontaminations out of the goal of 932 or 35%
- One intern worked as an Inspector Supervisor. The intern worked with inspectors, was the first to address any issues that arose with equipment, decontamination units, or inspector performance. He also monitored lakes for new AIS infestations and contributed to new public access signage installations.
- 33 Level 1 Inspectors worked 8,108 hours out of the goal of 11,260 or 72%
- 13 Level 2 Inspectors (decontamination trained) worked 3,038.5 hours out of the goal of 4,760 or 64%
- Inspector staffing averaged **2.01** inspections per hour, just shy of the **>2.2** inspections per hour season goal.

- <u>Trainings and meetings</u>

  A hybrid training process by the Minnesota Department of Natural Resources (MNDNR) in an effort to train inspectors effectively following the COVID-19 pandemic continued. This hybrid system allowed returning inspectors with multiple years of experience to complete only online training. Both online and in-person training was required for inspectors who had been authorized in 2022 and not years prior, have skipped year(s), or were new to the watercraft inspection program.

  The District utilized 33 new and returning inspectors (28 thru NSLSWCD and 5 thru Koochiching County) and scheduled them at public water accesses starting May 12th, the Friday before the MN Fishing Opener weekend. Three inspectors left the program before the end of the summer to make 30 available inspectors for most of the 2022 inspection season. Every attempt was made to staff new inspectors with returning inspectors during their first shift to allow them to observe experienced inspectors, ask questions, and receive feedback on their performance before working a shift on their own. If this was not possible, the inspector supervisor or AIS Program Coordinator stayed with the new employee during the first few inspections to make sure they felt comfortable with the inspection process.

  Level 2 training for decontamination operators was also a hybrid training process by the MNDNR. Similar to the Level 1 training requirements, the extent of online and in-person training depended on previous authorization status, if any. The District was able to utilize ten level 2 inspectors for most of the inspection season.

[1] The District has an Agreement for Service with Koochiching County Environmental Services to complete inspections on Lake Kabetogama via Koochiching SWCD. 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. Inspections completed on Kabetogama are included in this report.

[2] This included four private accesses (Muskego Pt. Resort, Pehrson's Lodge, Vermilion Dam Lodge, White Eagle Lodge) on Lake Vermilion that were staffed by NSL SWCD watercraft inspectors.

AIS training continued with 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.

The District utilized an online work chat and email to communicate with all inspectors to provide updates and answer any questions that came up throughout the season. The inspector supervisor also checked-in with the inspectors throughout the season to answer any questions, up-channel any concerns, provide resources, and ensure the inspectors had properly functioning equipment and sufficient supplies for them to complete their duties.

In addition, monthly inspector "enhanced training" sessions were held online and in-person at the Greenwood Township Hall (Lake Vermilion). These trainings provided inspectors with increased knowledge of topics within the AIS program. This year inspectors got to speak with a local MNDNR Conservation Officer, learned about the effectiveness of watercraft inspections/decontaminations from a UofM graduate student, and were informed as to how the information they collect is used to prioritize inspection locations.

On September 26th, the District hosted an in-person inspector meeting to discuss the success of the 2023 inspection season and to gain valuable insight from the inspectors. The inspectors continued to laud the public's perspective of the AIS program and had very few issues throughout the season. This meeting was a great way to get the inspectors' perspectives of what is working well and how to improve the program. An emphasis was placed on thanking the inspectors for their contributions to the AIS prevention program. We wanted them to know their work is appreciated and invite them to return.

- Tracking Hours Worked at Accesses

  The AIS Program Coordinator has continued to monitor inspector time to close the gap between Target Hours Scheduled and Hours Worked by tracking hours weekly. In 2023, there were very few adjustments made to the inspector schedules. The inspectors were mostly reliable and showed up for their scheduled work hours.

  Scheduling flexibility and adjustments throughout the inspection season is an important part of the success of the watercraft inspection program. Having a reliable inspector group is also critical to the program. Occasional check-ins by the inspector supervisor and the AIS Program Coordinator ensured inspectors were working their scheduled shifts. Reviewing the difference between hours worked vs hours scheduled on weekly inspector timesheets also showed how frequently shifts were missed. Most shifts were missed due to sickness, car issues, family emergencies, or other personal issues. These unforeseen situations usually did not allow enough time to find replacements to cover the inspectors' scheduled shift, but efforts were made to try and cover all the shifts when possible.

  The largest variations in the hours worked throughout the season versus the targeted hours available for 2023 were seen in the Ely area, Lake Vermilion, and the Voyageurs National Park (VNP) area (Table 1). These variations are due to the lack of staff available to fill all the available shifts. Although most sites were staffed on the weekends, other weekdays around the weekends were left open. Other areas did not see as big of difference, but again the lack of staffing available to fill all the shifts impacted the difference of hours worked versus the season's targeted hours totals.

  Decontamination units continued to be strategically placed around the District to offer services to as many boaters as possible. This year we had staffed level 2 inspectors with level 1 inspectors at the busier and more necessary stations during historically busier days in hopes of boosting decontamination numbers. This tactic appeared to have worked as the decontamination numbers were nearly triple that of the year prior. The only

downfall is that double-staffing a site takes away from the inspector availability at other locations. Some decontamination areas simply did not have staff willing to work in those areas or we could not find suitable locations/permissions to place the units. This was seen at Pelican Lake where we simply did not have anyone willing to consistently travel to that location to operate the unit. In the Sturgeon Lake area, the landings that were thought to be viable were simply too small for the units and permissions were not available at private or state park areas. These factors all impacted the total difference in the hours worked versus the targeted hours identified prior to the beginning of the 2023 inspection season.

As the program continues to grow, we hope to hire and retain more inspectors to help minimize the gap between seasonal goals and actual hours worked. We will continue to monitor the hours logged by the inspectors to ensure scheduled staff are working the shifts assigned.

TABLE 1

Region	Sum of Hours Worked	Sum of Hours Scheduled	Target Hours (2023)	Difference Hours Worked vs. Hours Scheduled	Difference Hours Scheduled vs. Target Hours	Difference Hours Worked vs. Target Hours
Ely (area) Level 1	509	528	1,440	-19	-912	-931
Ely (area) Level 2	943	960	1,100	-17	-140	-157
Burntside/Shagawa Total	1,452	1,488	2,540	-36	-1,052	-1,088
Babbitt (area) Level 1	542	584	700	-42	-116	-158
Bear Island, Birch, Johnson, One Pine, White Iron	542	584	700	-42	-116	-158
Fayal Township Level 1	586	658	720	-72	-62	-134
Fayal Township Level 2	336	336	370	0	-34	-34
Ely Lake/Gilbert Pit Total	922	994	1,090	-72	-96	-168
Pelican Level 1	257	280	550	-23	-270	-293
Pelican Level 2	8	16	400	-8	-384	-392
Pelican Total	265	296	950	-31	-654	-685
Vermilion Level 1	4,621	4,872	5,600	-250	-729	-979
Vermilion Level 2	1,161	1,221	1,400	-60	-180	-239
Vermilion Total	5,782	6,092	7,000	-310	-908	-1,218
VNP Level 1	758	757	1,830	1	-1,074	-1,073
VNP Level 2	591	583	730	9	-148	-139
Kabetogama/Crane Total	1,349	1,339	2,560	10	-1,221	-1,212
Sturgeon Level 1	428	504	420	-76	84	8
Sturgeon Level 2	0	0	200	0	-200	-200
Sturgeon Total	428	504	620	-76	-116	-192
Trainings/Extra Meetings	344	361	480	-17	-119	-136
Total Hours:	11,083	11,658	15,940	-575	-4,282	-4,857

Table 1: The differences between hours that were targeted at the beginning of 2023 (Target Hours) vs. the hours that were scheduled throughout 2023 (Hours Scheduled) vs. the hours that were actually worked throughout 2023 (Hours Worked) at each location. The District contracted with Koochiching County/SWCD to provide services/hours at Kabetogama Lake .

- Inspections per Hour Rate

The efficiency of the watercraft inspectors continues to be a key metric of the District's watercraft inspection program. Aside from conducting boat access traffic analysis like the one conducted by the Vermilion Lake Association in 2021, the efficiency of the watercraft inspectors is the only way we can gage the level of activity at an access. The goal is to target lakes/accesses and times throughout the day for the watercraft inspectors to interact with as many people and inspect as many boats as possible. There is also value in providing inspectors at lakes with lower traffic to ensure we are capturing a variety of watercraft users in various locations. Efficiency targets are set prior to the beginning of the watercraft inspection season based on historical data and anticipated goals for each location.

During the 2023 season, many of the returning inspectors had noted lower access use throughout the season. Compared to 2022, inspections were down by over 3,000 inspections validating the inspector's insight. Lower traffic resulted in missing the target inspections for 8 of the 13 lakes (62%). This directly impacted the efficiency rates, resulting in three lakes to exceed their target goals, and a total efficiency just below the annual target (Table 2). There continues to be certain accesses that are very busy and others with low boat traffic (Table 3). Ideally, we would like to see an efficiency rate of 1.5 inspections per hour or above and 14 of the 36 accesses achieve this rate.

TABLE 2

	2023 Target		2023 Actual	
Lake	**Inspection Target**	**Efficiency Target per Hour**	**Inspection Actual**	**Efficiency Actual per Hour**
Bear Island	40	>1	3	0.19
Birch	1,400	>2.5	1,338	3.37
Burntside	1,500	>2.1	1,163	*1.23
Crane	900	>2.2	1,336	*1.94
Ely Lake	800	>1.5	995	*1.43
Gilbert Pit	190	>1	265	*1.16
Johnson	20	>1	10	0.63
Kabetogama	3,400	>2.4	2,015	*3.05
One Pine	20	>1	21	0.88
Pelican	1,100	>2.0	341	*1.29
Shagawa	1,320	>1.8	1,247	*1.27
Sturgeon Chain	500	>1.2	504	1.18
Vermilion	14,000	>2.5	13,201	*2.28
TOTAL	**25,190**	**>2.2**	**22,439**	**2.01**

Table 2: The number of inspections and efficiency completed at each access (2023 Actual), compared to the number of inspections and efficiency targeted (2023 Target). Efficiencies with a "*" are sites with both Level 1 and Level 2 inspectors work, sometime simultaneously. All hours and inspections are combined at these sites. Shaded boxes are actual efficiency rates that did not meet the 2023 targets.

TABLE 3

Region/Lake	Lake (Landing)	Hours Worked	Total Inspections	Efficiency (Inspections/Hour)
WICOLA	Birch (South)	389	1324	3.40
Lake Co.	Fall Lake (campground)	407.75	1360	3.34
VNP	* Kabetogama	660.5	2015	3.05
Vermilion	Moccasin Pt.	807	2360	2.92
Vermilion	* Hoodoo Pt. N.	1639.25	4669	2.85
Vermilion	Timbuktu	723	1838	2.54
VNP	* Crane (Waters Edge)	624	1301	2.08
Vermilion	Petersons/Wakemup Bay	256.75	534	2.08
Sturgeon Lake Assoc.	Little Sturgeon (Rudstrom)	184	360	1.96
Vermilion	Black Duck	706.25	1317	1.86
Vermilion	Everett	640.5	1133	1.77
Vermilion	Frazer Bay	320.5	549	1.71
Lake Co.	Moose Lake	104.5	178	1.70
WICOLA	Birch (West)	8.5	14	1.65
Vermilion (private)	Vermilion Dam Lodge	104.25	150	1.44
Fayal Township	* Ely Lake	693.5	995	1.43
Pelican	Orr Bay	208.75	286	1.37
Lake Co.	Farm Lake	32	42	1.31
Ely	* Shagawa (Sandy Pt.)	980.25	1247	1.27
Ely	* Burntside (Van Vac)	923	1150	1.25
Fayal Township	* Gilbert Pit (Ore-Be-Gone)	228.5	265	1.16
Vermilion	Head of Lakes	517.25	595	1.15
Lake Co.	Snowbank Lake	89.25	89	1.00
Pelican	Saunders Bay	56	55	0.98
Sturgeon Lake Assoc.	Perch Lake	37	35	0.95
Vermilion (private)	Pehrson Lodge	35.25	32	0.91
WICOLA	One Pine	24	21	0.88
Vermilion (private)	Muskego Pt Resort	32	24	0.75
Lake Co.	Tofte Lake	32	22	0.69
WICOLA	Johnson Lake	16	10	0.63
Sturgeon Lake Assoc.	Middle Sturgeon (Sixberry's)	129	80	0.62
VNP	Crane (East)	64	35	0.55
Ely	Burntside (Passi Road)	24.5	13	0.53
Sturgeon Lake Assoc.	Sturgeon (McCarthy State Park)	78	29	0.37
WICOLA	Bear Island (Northeast)	16	3	0.19
Lake Co.	White Iron (North)	88.75	15	0.17

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 are combined for that site and annotated with a "*" before to the lake landing name. Watercraft inspections in Lake Co. were a result of an agreement by Lake SWCD. The District also contracted out Kabetogama inspection services to the Koochiching SWCD.

- Decontamination Units

The northern St. Louis region had a total of eight decontamination units to operate. The plan at the beginning of 2023 was to operate one of the Districts units at the Hoodoo Point North landing on Lake Vermilion, another would split time between Pelican and Sturgeon lakes, and the third would split time between Ely and Ore-be-Gone lakes. The two units owned by the City of Ely would remain at the Burntside (Van Vac) landing and Shagawa's Sandy Point landing. Voyageurs National Park also owns three units, with one operated by National Park staff at the Kettle Falls portage between Rainy and Namakan lakes. Another unit would be operated by Koochiching inspectors on Kabetogama Lake, and the third unit would operate at the Crane-Waters Edge landing. The Kettle Falls and Vermilion units are operated seven days a week while the others would be available on weekends and holidays.

Staffing limitations, access permissions and access size limitations resulted in units not being operational on Pelican, Sturgeon, and Kabetogama lakes. This resulted in one unit being permanently positioned at Ely and Ore-be-Gone lakes with hours limited due to staffing availability. Staffing issues also resulted in no decontamination services being performed at the Kabetogama access.

Since the discovery of zebra mussel veligers in the Black Bay of Rainy lake the VNP have operated a decontamination unit on the Kettle Falls portage in efforts to prevent the spread to any other lakes. Every boat that passes through this portage is decontaminated by NPS staff. We do not track how many decontaminations are conducted on the portage, but we are able to track services performed at the other locations (Table 4).

TABLE 4

Lake	Landing	Decons	Sum of Hours Worked	Decons/ Level 2 Hours	Entering Totals	Exiting Totals	Courtesy Totals
Shagawa	Sandy Point	93	496.75	0.187	16	72	5
Burntside	Van Vac	130	446	0.291	49	76	5
Ely	Ely	39	256	0.152	0	35	0
Gilbert Pit	Ore-Be-Gone	0	80	0.000	0	0	0
Vermilion	Hoodoo Pt. N.	41	1,160.75	0.035	9	21	11
Crane	Water's Edge	20	591	0.034	3	17	0
	Total:	**323**	**3,030.50**	**0.107**	**77**	**221**	**21**
	2022 reference	**102**	**3,593.25**	**0.028**			
	2021 reference	**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 the last four years. Only stations where level 2 inspector hours were recorded are shown. The decontaminations conducted at the Kettle Falls portage by NPS staff is not displayed in this table.

During the 2023 season, the District was able to utilize thirteen level 2 inspectors to perform decontamination services at the six units around North St. Louis County. A few inspectors left or found the position to be too physically demanding before the end of the season. The program performed a 5-year high number of decontaminations, but there is still a large number of watercrafts that could benefit from the service who are still not participating in the program.

The inspectors continue to observe the owner's pride and very clean watercraft showing up at the accesses. With the high level of exiting decontaminations, it is apparent that boaters are becoming more apt to keep their boats clean before heading to another lake or home. Most of the decontamination units are placed on lakes with known AIS infestations. To prevent the spread of AIS from these bodies of water all watercraft leaving these lakes should be decontaminated to kill any potential hitchhikers. If we decontaminated every exiting boat where a decontamination unit was present at infested waters the program would have recorded just over 4,000 decontaminations. The program still has a lot of work to convince all boaters to get a decontamination after leaving a lake, but with higher decontamination numbers in 2023 we are trending in the right direction.

Seasonal staff are trained in performing weekly maintenance to each unit and are able to identify/report any issues with the machines to the AIS Program Coordinator. Typically, minor issues can be resolved by the District staff, but one unit did obtain a significant fuel issue that needed to be resolved by the manufacturing company (American Pressure). This issue placed the unit out of service during the last few weeks of the season. Keeping the units operational is integral to the program's success and the District will continue to service and maintain the units so they are operational throughout the open water seasons.

- Private Access Partnerships

  In 2023, nine resorts, campgrounds and marinas engaged in watercraft inspections at their private accesses. Seven partners on Lake Vermilion and two partners on Pelican Lake. The total number of inspections conducted at each resort can be found below in Table 5.

TABLE 5

Lake	Resort Name	Number of Inspections
Vermilion	Fortune Bay Resort Casino	14
Vermilion	Glenmore Resort	9
Vermilion	Head-O-Lake Resort	268
Vermilion	Life of Riley Resort	27
Vermilion	Retreat Lodge	191
Vermilion	Vermilion Houseboats	22
Vermilion	Whispering Winds Resort	174
Pelican	Birch Forest Lodge	85
Pelican	Richardson's Shangri-La Resort	17
	Total	**807**

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

In order to perform inspections, each resort employee performing the inspections must complete an online training that directly resembled the inspector training District inspectors go through. Once completed the resorts receive a tablet, or the inspection survey is loaded to their cellphones to collect survey data. 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 four 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.

In addition to offering the inspection program to the resorts, we also provide a number of educational materials to the resorts to hand out to their guests. Even if the resorts choose not to participate in the inspection program, most are willing to make the educational materials available for their guests. Supporting the resorts will continue to be a priority for the Districts AIS program as they are an important contact point for those visiting our region. The more we can do to help them reduce the risk of spreading AIS will help in preserving the lakes they make a living on and will boost our AIS prevention efforts.

- Partnership with Fishing Tournament Directors

  The District continues to collaborate 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, we continued to utilize the DNR-permitted AIS Rules and Compliance Certification Form that was enacted in 2021. The tournament directors were cooperative. We get the sense that participants are onboard with AIS prevention.

  In addition to tournaments on Lake Vermilion, we also collaborated with the organizers of the Walleye Whamma tournament on Birch Lake. We provided inspectors and a decontamination unit was available on site the morning of the tournament. All the watercraft launching at the Birch South access (launch point for the tournament) were inspected prior to entering the lake. One boat was even directed to get decontaminated prior to launching. AIS prevention trinkets were also provided to the tournament organizers to add to the participants swag bag. This was a great addition to the Districts AIS prevention program and plan on continuing this collaboration into the future.

- Early Detection for new AIS infestations

  Seasonal and District staff completed early detection on 16 lakes, looking for new AIS infestations (lakes detailed in Table 6). Visual shoreline investigations were conducted at the lakes public water accesses. In addition to the visual observations, the staff threw a double-headed rake, attached to a rope, into the lake in three different directions while standing on a dock, pier, or by shore (when possible). 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.

  In conjunction with shoreline observations, zebra mussel monitoring plates were deployed in nine lakes around the region. These lakes included: Whiteface Reservoir, Wynne Lake, Little Sturgeon, Buhl Pit, Bear Island, Shagawa, Pelican, and Crane Lake. A plate was also placed in a known zebra mussel infested waters (Gilbert Pit) as proof of concept. All but two plates (Shagawa & Pelican Lakes) were recovered after 1-2 months of soaking. No new infestations were observed and the plate in the Gilbert Pit was completely inundated with mussels in all stages of life. These plates will continue to be a valuable resource in our early detection efforts and will be rotated throughout the lakes in the region, starting with and continually prioritizing the lakes with highest risk of contracting a zebra mussel infestation.

Eight new infestations were detected in 2023 from the early detection sampling initiative. This included the observation of Chinese Mystery Snails (*Cipangopaludina chinensis*) in seven lakes (Sturgeon, Little Sturgeon, Side, Carey, Ely, North Twin, Whitewater) and Rusty Crayfish (*Faxonius rusticus*) on one lake (West Two Rivers Reservoir). These new detections are likely not new to local residents but were previously not identified in the tracking database (EDDMaps).

Early detection efforts will continue to play a big role in the AIS prevention program. The ultimate goal is to visit all lakes with public access in the District to identify any previously unidentified AIS infestations. This information is valuable for informing the public and tailoring future program initiatives.

Table 6

Visual Observation / Rake Throws			
Water Body Name	**Access/ Location Name**	**Water Body Name**	**Access/ Location Name**
Sturgeon Lake	State Park PWA	North Twin Lake	Public Access
Little Sturgeon Lake	Rudstrom PWA	South Twin Lake	Public Access
Side Lake	State Park PWA	Embarrass Lake	Public Access
Perch Lake	Public Access	Sabin (Embarrass Pit)	Public Access
Carey Lake	Park Public Access	St. James Mine Pit	Public Access
West Two Rivers Reservoir	Park Public Access	Wynne Lake	Public Access
Gilbert Pit	Public Access	Colby Lake	Public Access
Ely Lake	Public Access	Whitewater Lake	Public Access
Zebra Mussel Settling Plates			
Water Body Name	**Access/ Location Name**	**Water Body Name**	**Access/ Location Name**
Gilbert Pit	Public Access	Bear Island	Bear Island (NE)
Whiteface Reservoir	USFS Campground (N)	Shagawa	Sandy Point Public Access
Wynne Lake	Wynne Lake (S)	Pelican	Orr Public Access
Little Sturgeon	Rudstrom Public Access	Crane	Waters Edge Public Access
Buhl Pit	Grant Pit Public Access		

Table 6: Lakes and access locations sampled during the 2023 early detection surveys.

- AIS Boundary Waters Collaborative (ABC) Sign Enhancement

  The District continues to collaborate with AIS Boundary Waters Collaborative (ABC), formerly the BWCAW Coalition. Finishing the project started in 2021, the District completed the installment of signs at access points around the Boundary Waters watershed in northern St. Louis County. The signs remind water users to clean, drain, dispose, and dry to prevent the spread of invasive species to the Boundary Waters watershed. Signs were added to a total of 41 water access points.

- Outreach and Education

  The District continued to promote AIS initiatives in 2023 by partnering with White Iron Chain of Lakes Association to assist with an AIS outreach booth at both the Blueberry Festival and Harvest Moon Festival. Additionally, the District has continued with social media posts on AIS related topics, as well as writing and co-writing articles for local newsletters.

  New to 2023, we started teaching the public how to conduct proper watercraft inspections with a booth that had a boat spiked with AIS and boating issues. Participants who performed an inspection received an aqua weed stick or a Clean, Drain, Dry water bottle and towel. This booth was deployed at parking lots, events, and public water access around the region. We plan on continuing this effort to teach as many people as possible on the importance of a proper watercraft inspection.

B. Limitations & Future Goals

- Inspector recruitment and retention (staffing)

  Fully staffing the watercraft inspection program continues to be a struggle. Of the 45 positions available, only 33 were able to be filled. With the incentive gift social marketing experiment utilized at the end of the 2022 season we were able to bump our return rate up to 76%. This was an increase of 24% from the 2022 inspector return rate. These cash gifts were tiered based on the number of years of inspecting. The goal is to get previous, experienced, inspectors to return year after year while adding to the team with new recruits. The District and staffing service will continue to explore advertising avenues in 2024 to hire a full team of watercraft inspectors.

- Decontamination Numbers

  The number of decontaminations recorded in 2023 were highest since 2018. We were able to staff ten Level 2 inspectors for most of the season to perform decontamination with the six units directly managed by the District. Most units operated primarily during the busy weekends except for one unit on Lake Vermilion (Hoodoo Pt. N.) which operated seven days a week. Koochiching SWCD was able to recruit a couple of inspectors to operate the Kabetogama decontamination unit, and Voyagers National Park staffed the unit at the Kettle Falls portage (numbers are not included). The Kettle Falls portage unit was also operated seven days a week. This provided users with multiple decontamination opportunities during the weekends and a few options throughout the week.

  The marginal number of decontaminations recorded in 2023 is suspect and lower than what was actually performed. The AIS Coordinator tracked the usage of the units at each station along with service needed at each station (water/gas fill and filter cleanings). It was noticed in the beginning of the year that a couple of the units were being serviced but no decontamination records were recorded. This was ultimately the result of some new staff members performing the service without recording them on tablets. Luckily this error was observed early in the season and additional training corrected the issue for the remainder of the season. Even while missing our decontamination goals, the inspectors did observe a large amount of boat ownership pride that translated into very clean boats.

  Voyageurs National Park added a third decontamination unit in 2023. One unit is stationed on the Rainy Lake portage at Kettle Falls to Namakan Lake, and completed decontaminations on all crossing boats is conducted by the park staff. 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. Another unit is managed by the District and contracted out to Koochiching SWCD to staff and operate the unit on Kabetogama Lake. The lack of staffing did not allow for any decontaminations by the Koochiching inspection staff. The third unit was stationed at the Crane Lake Waters Edge landing and was operated by the District staff. This ultimately cut the availability for any staff to operate a unit at the Pelican Lake access but increased the opportunities for those visiting the Crane Lake area. The District plans on continuing its partnership with Voyageurs National Park and Koochiching SWCD as part of its AIS prevention plan.

  Constant reminders throughout the season on the importance of decontaminations to the inspectors and tracking the use of each unit helped boost the programs overall numbers. In order to continue the upward trend into the future similar tactics used in 2023 will be employed in 2024. In addition, a greater emphasis on decontaminating "clean" boats will be highlighted in the 2023 level 2 training as AIS may be hard to observed with the naked eye and decontaminations provide a higher level of security in preventing the spread of AIS. An increase in educational materials will also be provided guiding boaters to MNDNR decontamination units. Decontamination units are a great tool to prevent the spread of AIS, and with proper education and tracking we hope to continue to see an increase in numbers for 2024.

- Private Access Recruitment

  There is a desire for more private access businesses to conduct inspections at their access as the boat traffic at those accesses pose a significant risk of spreading AIS. Visitors from around Minnesota and other states utilize these locations as a "one-stop shop" to enjoy the high-quality lakes of St. Louis County. Without proper watercraft inspections, the risk of spreading AIS found in other locations to our lakes is increased.

  Many businesses and private resorts understand the importance of AIS prevention but run into several roadblocks when it comes to performing and documenting watercraft inspections. Even with a $7/inspection incentive many resorts do not have the staff to keep up with the necessary inspections. The staffing shortage also plays a factor in recording inspections, as some resorts conduct inspections but do not record them. Although it is most important that the watercraft are being inspected, recording the inspections is important to track the number of inspections being conducted to help target and optimize future AIS prevention activities.

  In 2024, the District and its partners will continue to reach out and coordinate with resorts, campgrounds, and marinas to ensure private access owners understand the importance of these AIS prevention efforts. Additionally, we also plan on expanding the resort watercraft inspection program by providing interested parties with the tools and resources to conduct and track essential watercraft inspections. Finally, we hope to increase the incentive pay to help subsidize the increasing staffing rates of the resorts.

- 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 and outreach component of AIS by working with local partners, businesses, resorts, and area professionals to provide the public with information vital to preventing the spread of AIS. A focus on providing the public with necessary tools and information to conduct self-inspections will be a priority for the 2024 season. We will also continue to work on providing our watercraft inspectors with information beyond the MNDNR requirements to ensure they are knowledgeable about AIS related topics.

  Additionally, we plan on continuing the watercraft inspection booth at various events and locations to find areas of optimal public engagement and increase users understanding and importance of AIS prevention efforts. New educational materials will also be developed to target and provide information and tools to lake users. Informational materials on resources available to watercraft users will also be developed with hopes of boosting the program resources available to the public.

- AIS Early Detection & Research

  Identifying the locations of new AIS infestations can help develop plans to educate and allocate resources in efforts to prevent AIS from spreading. Detecting early infestations in lakes allows us to get the word out to the public and could possibly contain the AIS to that lake. This information is also valuable to research and could help provide information to identify lakes that are at most risk from new AIS infestations.

  In 2024 the District plans on continuing to expand its early detection efforts to all lakes with public water accesses around northern St. Louis County. While continuing to conduct early detections on the highest risk lakes, we will expand the reach to ensure all lakes are investigated over the next few years. We will continue with this cycle to identify new infestations as early as possible. The District also plans on continuing to deploy zebra mussel settling plates at high and moderate risk locations. Finally, we will look to expand and recruit new observers for the lake sentry program. This will get lake property owners involved in early detection efforts and will provide us with more eyes on each lake's early AIS detection.

C. Program Analysis

- Watercraft Inspections & Overall Inspector Efficiency

  Since the programs conception in 2016, watercraft inspectors continue to check for AIS and make contact with thousands of people who utilize the pristine waters of northern St. Louis County. During the programs first few years inspection rates rose year after year while the efficiency of the inspectors remained around 1.5 inspections per hour. As the program became more established a continuous trend of inspecting 20-25,000 watercraft throughout a season with 2 inspections per hour is becoming the norm.

  The efficiency of the inspectors was fairly constant over the first few seasons, but as the District got better at selecting high traffic sites and hours of the day the efficiency of the inspectors continued to rise. In 2021, the inspectors reached a max program efficiency of just over 3 inspections per hour. Ideally an efficiency rate of 2 inspections per hour at busy accesses and 1.5 inspections per hour at the slower access is the program goals. Every year there is a mix of busy and slower accesses included in the program so as we can maintain an efficiency above 1.5 inspections per hour the season is considered a success.

  In 2023, there was a nice mix of entering and exiting inspections. It is important to inspect the watercraft before entering to protect the lakes in our region, while it is equally important to check exiting boats to ensure we are not spreading AIS to other bodies of water. Exiting inspections also play an important role in early detection and make sure any new infestations are not being overlooked.

  Being a fishing destination, it is not surprising to see that three quarters of the inspections are conducted on fishing boats. Fishing boats, runabouts and pontoons make up over 90% of the inspections. A healthy fish population in the region will be important to maintain the high percentage of fishing boats. A significant number of people travel to great lengths to fish our pristine waters. Keeping the lake AIS free will help to sustain the lake's ecosystem and preserve great fishing opportunities into the future.

Figure 1

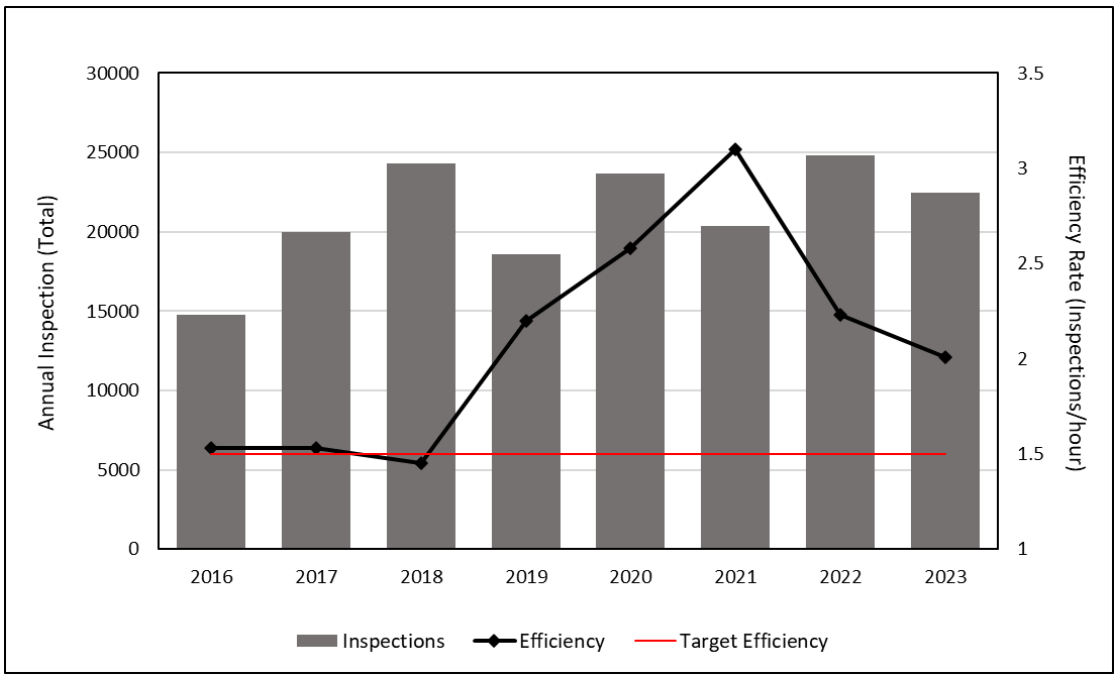

Figure 1: Historical watercraft inspection trends for AIS program. Along with efficiency trends throughout the program. The annual target efficiency goal is 1.5 inspections/hour.

Figure 2

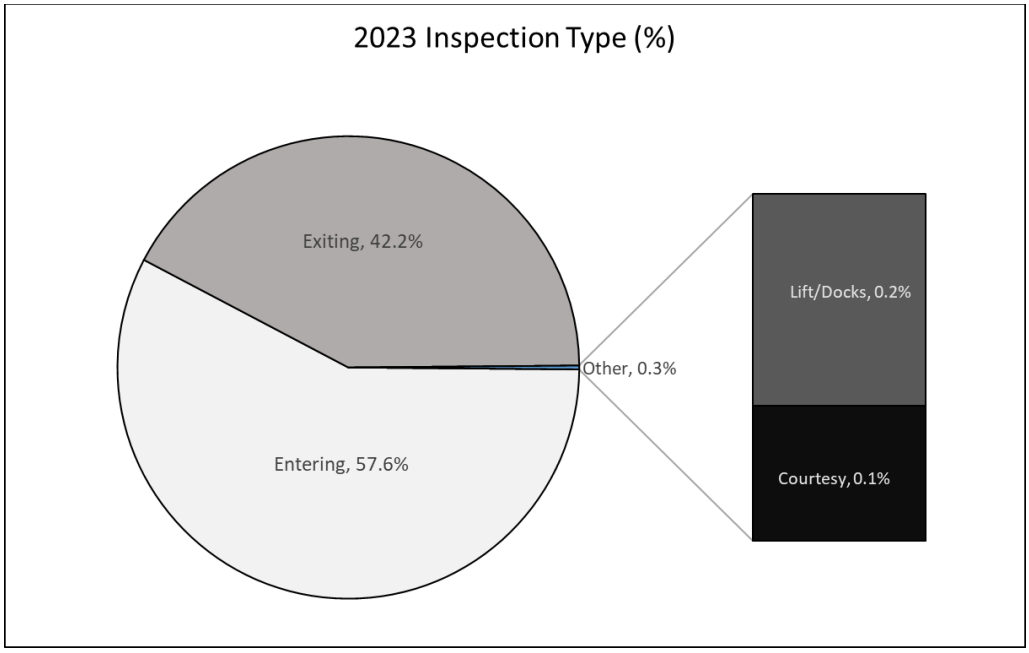

Figure 2: Graph showing the distribution of inspection types throughout the 2023 watercraft inspection season.

Figure 3

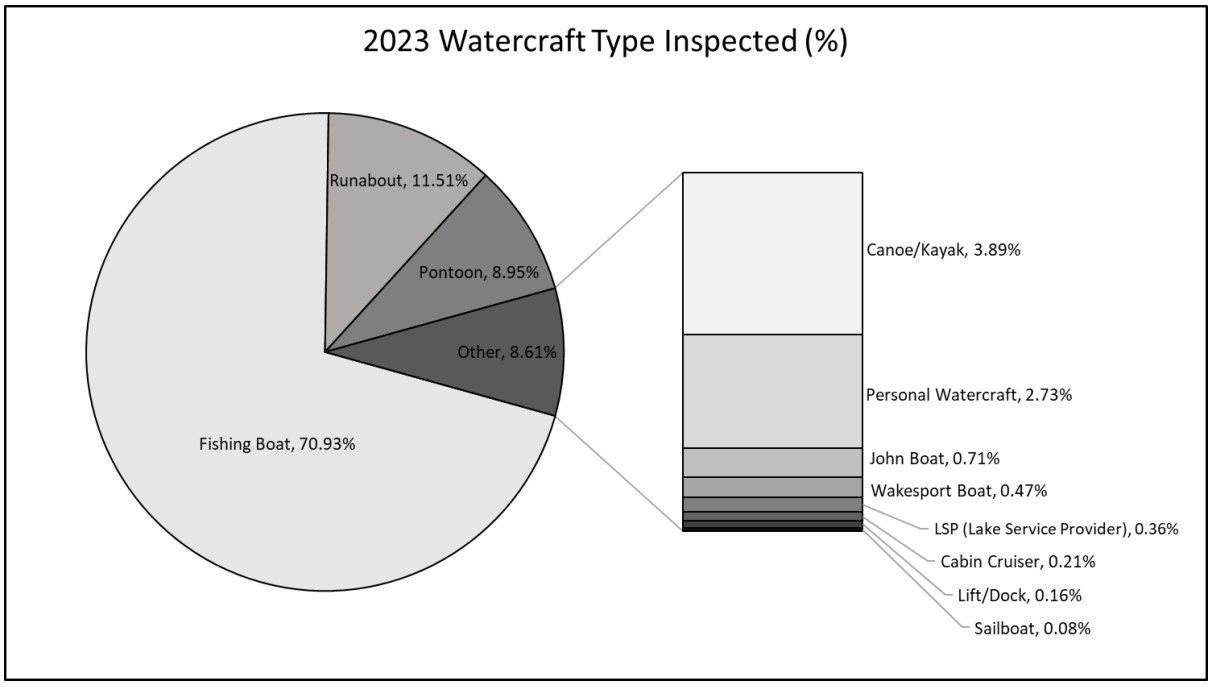

Figure 3: Distribution of watercraft types inspected during the 2023 watercraft inspection season.

- Decontaminations

An uptick in decontaminations performed was observed in 2023. Although we did not reach our goal of 932 decontaminations a 5-year high was recorded. Not included in the season totals found in Figure 4 are the decontaminations performed at the Kettle Falls portage. The Forest Service staff working the portage wash every boat utilizing the portage and do not keep track of how many boats go through each year. Even though we saw an uptick in 2023, this is just a portion that would benefit from a decontamination. New this year, we made a concerted effort to double up inspectors at locations with decontamination units in hopes to free up time for the level 2 inspectors to perform more decontaminations. This appears to have worked well, and we plan on continuing to tweak this concept to optimize inspector time and decontamination opportunities.

Voyagers National Park purchased another unit in 2023 making eight total units available in the northern St. Louis County District. Even with the addition of another decontamination unit there was a rise in decontaminations per unit in 2023. Logistic and staffing issues limited the placements of some of the units resulting in low to no services performed. Although some units fell well below their season goals, a couple (Shagawa & Burntside) exceeded their decontamination goals. We hope to continue to increase the number of decontaminations performed throughout the years and hope to meet/exceed program highs seen in 2017.

Figure 4

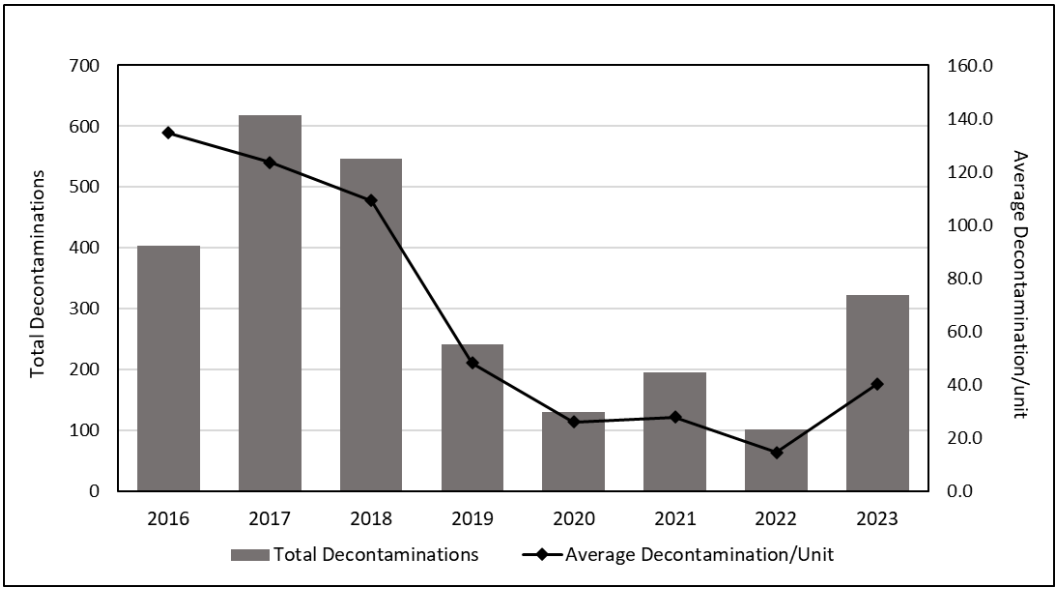

Figure 4: Historical decontamination trends for the Districts AIS program. Average decontaminations per unit is the total decontamination performed that year by the total number of units operated.

TABLE 7

Lake	2023	2022	2021	2020	2019
Shagawa	93 (80)	26	44	24	93
Burntside	130 (75)	42	3	48	41
Ely	39 (50)	2	6	8	NA
Gilbert-Pit	0 (20)	1	2	1	7
Pelican	0 (80)	1	31	NA	NA
Vermilion	41 (280)	22	100	49	100
Crane	20 (50)	8	1	NA	NA
Kabetogama	0 (67)	0	0	NA	NA
Total:	**323**	**102**	**187**	**130**	**241**

Table 7: Total decontaminations conducted at each lake over the last 5 years. Numbers in parentheses are season goals for the 2023 season.

- Private Access Inspections

807 inspections were completed in 2023 at private accesses (Table 8). This continues to be much lower than previous years. The District continues to offer watercraft inspection services to a few of the busiest and remote locations on Lake Vermilion. Other resorts on the lake along with other lakes rely on their employees to perform and record the inspections. The introduction of survey program being available on personal cellular phones enhanced the success of the program starting in 2021. This continues to help boost the inspection numbers but not all resorts are utilizing the inspection surveys. The resort inspection program relies on resort employees performing the inspection and uploading the results. In 2023, there were several resorts that did not record any inspections or drastically lower amount as they did in previous years. The goals of the 2024 season are to reconnect with those resorts who had previously contributed to the program and to reach out to other potential resorts to participate in the program. We also hope to increase the incentive rate from $7 to $9 per inspection to further compensate for staff time needed to perform the inspections.

Figure 5

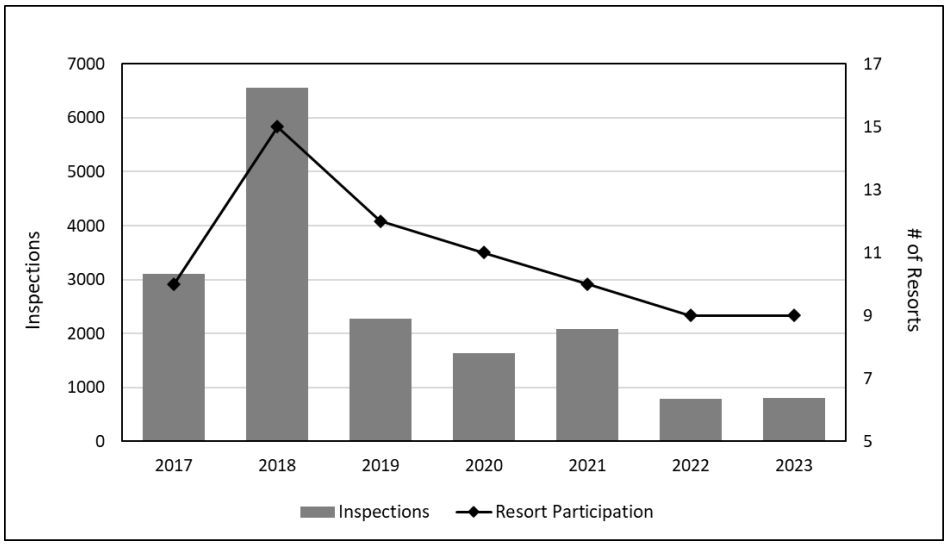

Figure 5: Historical trends of resort inspection program. Total inspections and number of resort participation for each year.

TABLE 8

Lake	2023	2022	2021	2020	2019
Vermilion	705	733	1959	1512	2177
Pelican	102	52	124	128	96
Birch	NA	1	NA	NA	NA
Total:	**807**	**786**	**2083**	**1640**	**2273**

Table 8: Total resort inspections completed at each lake over the last 5 years.

- Risk Assessment

A risk assessment was conducted based on collected survey data at public accesses. It shows the risk of watercraft at various accesses (Table 9). A total of ten survey results categorizes the lakes and highlight the categories and lakes with the greatest AIS risk. Additionally, highlights from the 2022 analysis are also shown for comparison and to show if there are any significant changes.

For the lower risk categories (green shaded categories), the lakes with most watercraft users who had recent interactions with inspectors were found at Birch, Burntside, and Shagawa. It is promising to see that only two lakes showed inspector interaction less than 70% of users surveyed. It is a little more concerning that only 64% of entering and 56% of exiting boaters had spoken with an inspector before August. The highest percentage of "same last lake" and "same next lake" was shared with Birch and Vermilion. It is likely that users are locals, or they are visiting the area and visiting these lakes multiple times during their trip. The other lakes ranged from 38-68% of same lake use making them more of an infrequent or one day adventures. Birch Lake continues to have high percentages in all three lower risk categories which is likely due to a significant amount of local use at this popular lake or visitors staying in the area are utilizing the lake multiple times.

The moderate risk category is in-between the lower and high-risk categories as they are out of the water past the five day recommendation to adequately dry the watercraft and reduce AIS spread potential, but the watercraft are still traveling from other lakes which heightens the risk. All the surveys identify an average of 26.07% of watercraft users falling within this category, an increase of 6.23% from 2022. Crane and Gilbert Pit continue to rank amongst the highest in this category. Kabetogama is also in the top three percentages in this category. Crane and Kabetogama are locations with high visitor rates, and it is encouraging that people are allowing time for their watercraft to dry before launching into these systems. Gilbert Pit also has visitor numbers with its adjacent campground, but the highest use of the lake is observed on the weekends. This gives local users time for their watercraft to dry between weekend use.

Every lake, except for Burntside, the Side Lake Chain, and Vermilion were on the top end of risk at least once in the highest "increases" risk section. Pelican Lake was the top end of all the high-risk categories and was the highest percentage in three of the five categories. The most species found occurred on popular lakes in the northwest section of the District and a popular lake near Virginia. Luckily all these values were below 10% and no invasives were observed. There also continues to be a slight issue with drain plug law violations. Although it is a very small population of violators, it is surprising to note that over 80% of the 111 violators are Minnesota residents who should be aware of the drain plug laws. The larger, more popular, lakes have the highest number of "out of state" watercraft users with Burntside, Crane, Kabetogama, Pelican, Shagawa, and Vermilion all recording over 10% of users with plates other than Minnesota. Finally, lakes near Babbitt, Orr, Virginia, and Crane Lake all had high percentages of watercraft entering from other lakes within 5 days of the last lake used. These are all popular lakes that people are likely lake hopping to or visiting as a tourist destination. With nearly all the lakes identified in Table 9 having at least one high risk in the highest "increase" risk section highlights the importance of continuing to conduct frequent watercraft inspections at all of these lakes.

Overall, the North St. Louis 2023 AIS Prevention Program was successful. Although the District continues to struggle with staffing and decontamination logistical issues, we were able to provide valuable AIS prevention actions to protect our many pristine lakes. The District looks forward to using the information detailed in this summary and applying it to 2024 planning as St. Louis County sees fit.

TABLE 9

2023 Public Access Inspections		Lowers Risk			Moderate Risk	Increases Risk				
Lake	Number of Inspections	Spoke to Inspectors[3]	Same Last Lake[4]	Same Next Lake[5]	Entering from other water after 5 days more[6]	Species Found[7]	Drain Plug Violations[8]	License from Out of State[9]	Entering from other water within 24 hours[10]	Entering from other water from within 5 days[11]
Bear Island	3	*Data set too small*								
Birch	1338	83.22%	74.31%	74.42%	16.95%	0.25%	1.37%	7.92%	5.99%	8.35%
Burntside	1163	94.50%	66.10%	60.27%	18.71%	0.00%	0.14%	10.58%	3.38%	13.08%
Crane	1336	73.05%	42.24%	38.37%	37.03%	1.36%	0.11%	10.78%	4.87%	41.90%
Ely	995	74.57%	64.46%	53.22%	23.64%	1.02%	2.04%	6.73%	5.61%	11.22%
Gilbert Pit	265	66.04%	44.44%	45.88%	36.11%	0.56%	1.67%	4.53%	15.00%	17.78%
Johnson	10	*Data set too small*								
Kabetogama	2015	71.51%	49.36%	52.44%	38.64%	0.00%	0.00%	17.72%	3.49%	11.83%
One Pine	21	*Data set too small*								
Pelican	341	74.78%	56.38%	49.66%	26.06%	9.57%	4.79%	21.41%	10.64%	14.36%
Perch	35	*Data set too small*								
Shagawa	1247	85.42%	62.11%	70.63%	24.80%	0.29%	0.57%	12.67%	5.88%	12.63%
Sturgeon Chain	469	64.82%	75.07%	68.94%	19.29%	0.00%	0.00%	4.05%	2.37%	5.04%
Vermilion	13201	83.21%	74.64%	72.59%	19.44%	0.26%	0.94%	10.38%	2.11%	5.61%
White Iron	15	*Data set too small*								
	2022 (top %)	95.14%	70.55%	78.21%	32.00%	3.77%	2.00%	18.33%	6.99%	11.00%
For Reference (2022 Results)	**1st**	Burntside	Birch	Vermilion	Gilbert Pit	Pelican	Gilbert Pit	Kabetogama	Ely	Burntside
	2nd	Birch	Vermilion	Birch	Ely	Crane	Shagawa	Shagawa	Burntside	Ely
	3rd	Kabetogama	Shagawa	Shagawa	Crane	Gilbert Pit	Vermilion	Pelican	Birch	Gilbert Pit

Table 9: The total number of inspections 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 result is the lowest AIS spread risk to a lake. The yellow column poses a moderate AIS risk to the lake. Column labels in orange are factors that would pose the greatest AIS risk to a lake. The top three (3) highest percentages for each column are highlighted.

[3]**Spoke to Inspector-** The percent of time a surveyed boater said they spoke with an inspector during the season.
[4]**Same Last Lake-** The percent of time a surveyed boater said the last lake they were on is the same lake they are entering or last was storage (ex. last lake they exited was Vermilion, they are getting ready to enter Vermilion)
[5]**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 or to storage (ex. current lake they are exiting is Vermilion, the next lake they plan to enter in is Vermilion).
[6]**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, and 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).
[7]**Species Found Entering-** The percent of time species were found during an entering inspection (plants, animals, water, mud etc.)
[8]**Drain Plug Violation-** The percent of time an entering watercraft arrived at the access with the drain plug in place.
[9]**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.
[10]**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 (ex. current lake they are entering in is Pelican, and they were in Vermilion the day before).
[11]**Entering from other water within 5 days-** 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 (ex. current lake they are entering in is Pelican, and they were in Vermilion 3 days ago).