

Comfort Lake-Forest Lake Watershed District



2019 Watercraft Inspection Program Year-End Report



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2019 Watercraft Inspection Summary Infographic

Introduction

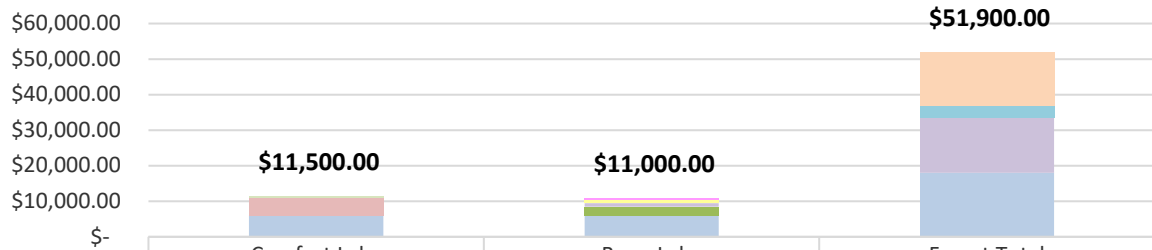
To implement the watercraft inspection program in 2019, the Comfort Lake-Forest Lake Watershed District (CLFLWD) entered into a Joint Powers Agreement with the Minnesota Department of Natural Resources (DNR) for authority to conduct boat launch inspections. The District continued its multi-year partnership with Chisago County to hire, train, and oversee inspectors. Through this partnership, Chisago County managed payroll and human resources for inspectors and received reimbursement from the CLFLWD for hours worked within the District. Chisago County inspectors were stationed at accesses within the CLFLWD (which covers portions of Washington and Chisago counties) as well as throughout the remainder of Chisago County. Additionally, the CLFLWD directly hired several of its own inspectors in order to increase presence at boat launches on weekends and holidays.

There are five public accesses within CLFLWD, and inspectors were stationed at each one throughout the summer. Public accesses include one at Bone Lake, one at Comfort Lake, and three at Forest Lake: Forest 1 (located on the west basin at Lakeside Park), Forest 2 (located on the middle basin near Willow Point), and Forest 3 (located on the east basin and in some cases referred to as Hagberg).

Funding and Goals

Funding for the program was provided by multiple sources including the Aquatic Invasive Species Prevention Aid Program for both Washington and Chisago counties, local municipalities, and local interest groups such as lake associations and Lions Club. Figure 1 illustrates financial contributions to the 2019 watercraft inspection program. Note that certain organizations opted to allocate funding to specific waterbodies (e.g. Bone Lake Association's donations allocated to Bone Lake).

2019 Watercraft Inspection Program Estimated Funds per Lake



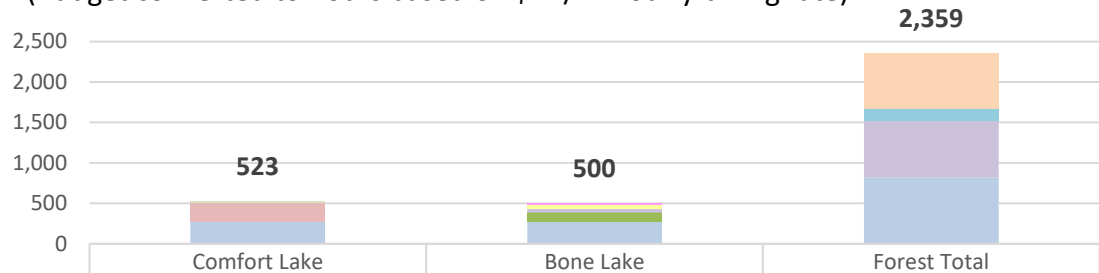
	Comfort Lake	Bone Lake	Forest Total
Scandia-Marine Lions Club		\$500.00	
City of Scandia		\$1,000.00	
Comfort Lake Assoc.	\$500.00		
City of Forest Lake			\$15,000.00
Forest Lake Lake Assoc.			\$3,400.00
Wash. Co. AIS Prevention		\$1,000.00	\$15,500.00
Bone Lake Assoc.		\$2,500.00	
Chisago Co. AIS Prevention	\$5,000.00		
CLFLWD Local Funds	\$6,000.00	\$6,000.00	\$18,000.00
TOTAL FUNDING	\$11,500.00	\$11,000.00	\$51,900.00

Figure 1. Financial contributions for 2019 watercraft inspection program

In order to set goals and determine hiring needs, estimated financial contributions were converted to inspection hours using an average hourly billing rate. For level 1 and 2 inspectors, the billing rate was \$22/hour. Figure 2 illustrates the estimated number of hours each financial contribution would cover.

2019 Watercraft Inspection Program Funded Hours

(Budget converted to hours based on \$22/hr hourly billing rate)



	Comfort Lake	Bone Lake	Forest Total
Scandia-Marine Lions Club		23	
City of Scandia		45	
Comfort Lake Assoc.	23		
City of Forest Lake			682
Forest Lake Lake Assoc.			155
Wash. Co. AIS Prevention		45	705
Bone Lake Assoc.		114	
Chisago Co. AIS Prevention	227		
CLFLWD Local Funds	273	273	818
TOTAL HOURS GOAL	523	500	2,359

Figure 2. Funded inspection hours for 2019 watercraft inspection program

With the available funding, this year the District hired a total of 19 full- and part-time inspectors to perform watercraft inspections at District accesses. Some inspectors were hired through the Chisago County joint program, and others were hired directly by CLFLWD.

Results

District-Wide

Inspection Hours and Scheduling

District-wide, watercraft inspectors performed **7,069 inspections over 3,917.8 hours**. Inspectors averaged a rate of **1.80 inspections per hour**.

Figure 3 summarizes the total number of inspection hours and inspections completed District-wide over the last six seasons.

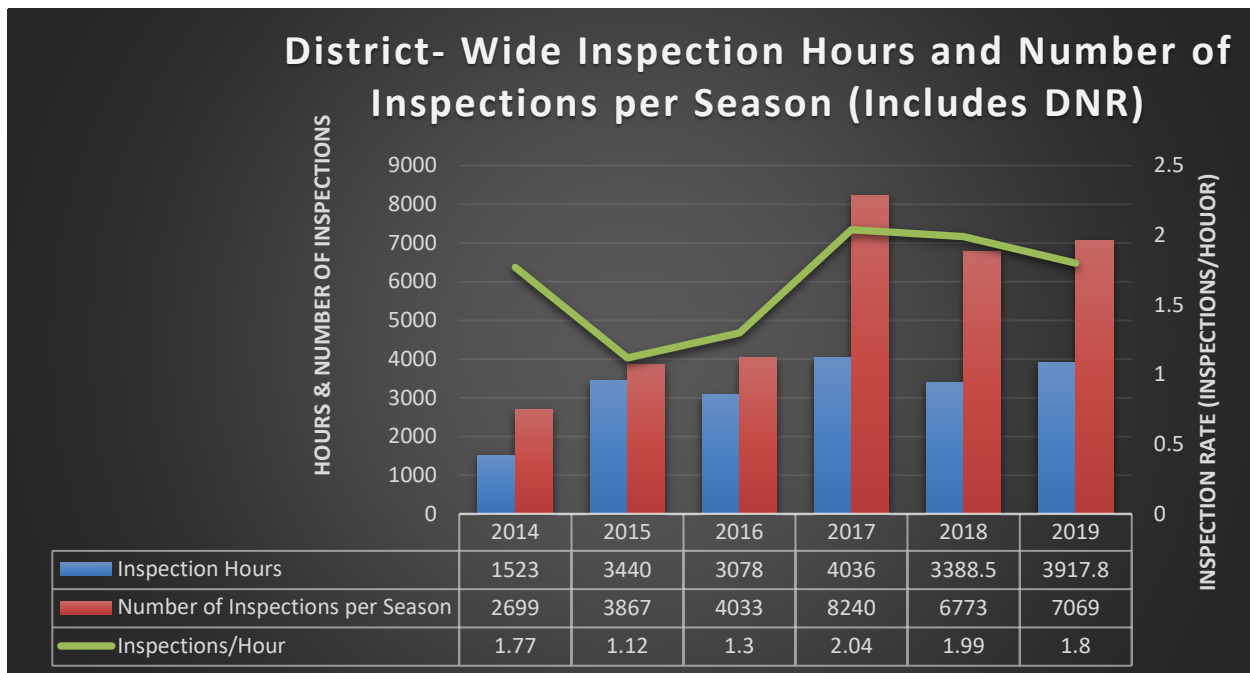


Figure 3. District-wide inspections and hours per season¹

Though more inspections were performed in 2019, the average inspection rate (inspections/hour) fell slightly in comparison to the last two years with 1.99 inspections/hour in 2018 and 2.04 inspections/hour in 2017.

Figure 4 shows the number of inspections, and inspection hours by week throughout the season, as well as the rate of inspections/hour, and the hours/week goal. The goal number of hours per week of 143.27 was met by week 4, coinciding with the start of CLFLWD’s watercraft inspection season. The spikes in inspections/hour that can be seen in the graph are generally attributed to holidays or seasonal changes (e.g. week four includes Memorial Day, week ten includes the Fourth of July, week 18 is the end of summer). Starting in week 19, inspection hours remain below the hours/week goal for the remainder of the season due to inspector retention difficulties.

¹ See Conclusion section of this report for discussion on decrease in inspection hours compared to previous years.

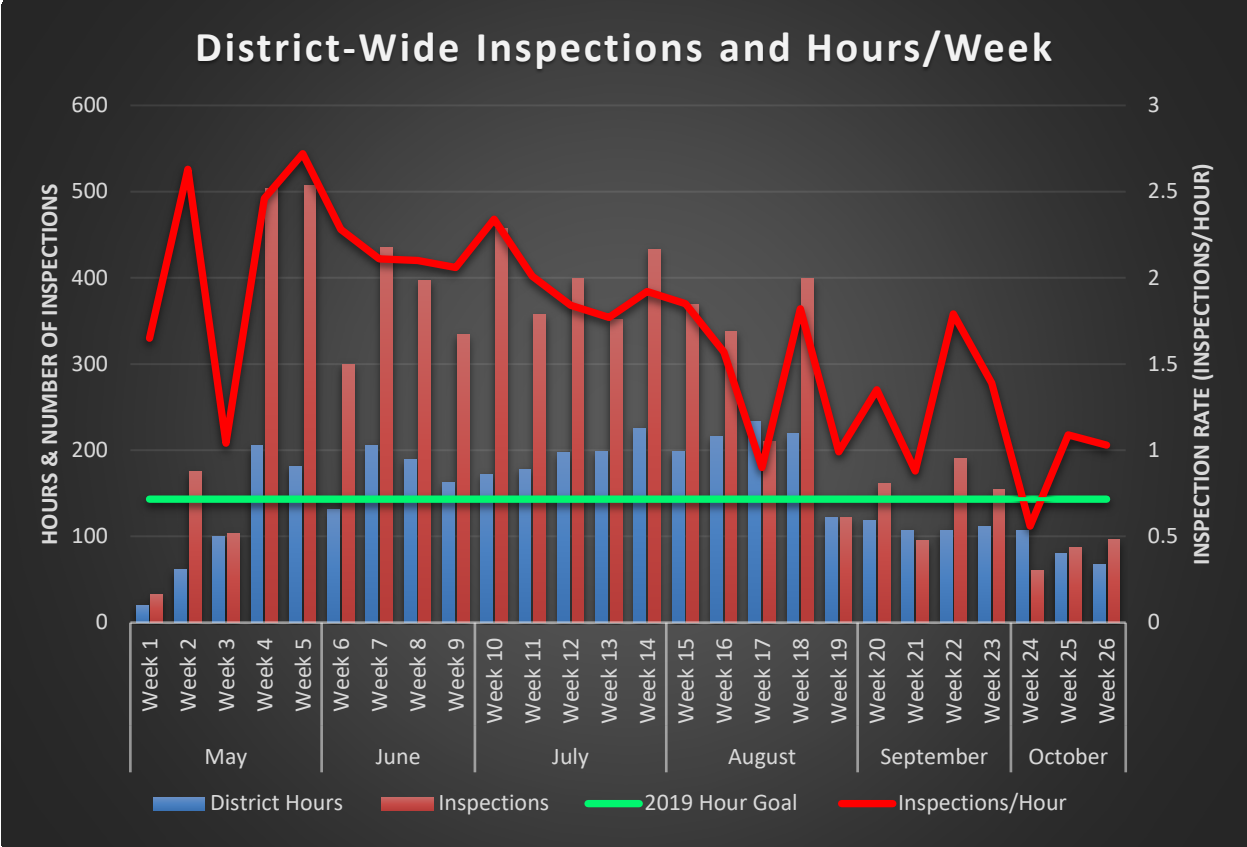


Figure 4. District-wide inspections, hours, rates, and goals

Due to the higher level of activity, weekend hours are prioritized for conducting watercraft inspections. As a result, 69% of hours and 80% of inspections occurred Friday through Sunday. Figure 5 shows the number of inspections and hours per day for the 2019 season. The slightly increased rates on Mondays and Wednesdays is most likely attributed to major holidays occurring on those days (Memorial Day, Fourth of July, Labor Day).

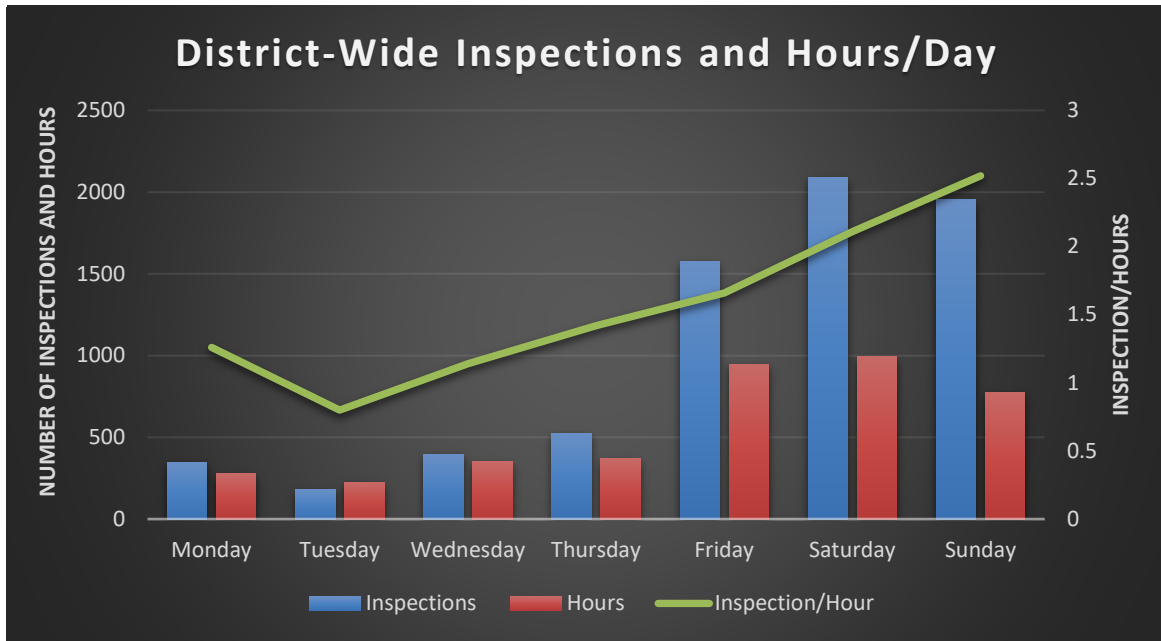


Figure 5. District-wide inspections and hours per day for the 2019 season

Survey Results

A total of 7,069 surveys were performed on District lakes this season. Below are some findings from the inspection survey data:

- **122 surveyed watercraft arrived at District lakes with plants, animals, mud, or water on their equipment.** This number was 140 in 2018, 213 in 2017, 41 in 2016 and 39 in 2015. Note that transportation of *any* plants or animals on watercraft, not just invasive species, is prohibited. These watercrafts were cleaned off and/or drained prior to launching. If vegetation or mud could not be removed by hand, watercraft were denied launch.
- **85 watercraft required removal of the bilge drainage plug** upon arriving at District lakes. This number was 115 in 2018, 115 in 2017, 19 in 2016 and 67 in 2015. After educating the watercraft user on the potential of AIS in their bilge water, bilge plugs were removed from the watercraft and all water was drained prior to the watercraft launching in an area that would not flow into the lake.
- **867 watercraft exited District lakes with plants, animals, mud, or water present.** This number was 931 in 2018, 804 in 2017, 187 in 2016 and 260 in 2015. Note that transportation of *any* plants or animals on watercraft, not just invasive species, is prohibited. All contaminants were removed from the watercraft and trailer before departing from the lake.

Figure 6 summarizes the number of watercraft contaminant sightings and drain plug violations recorded at District lakes over the last five seasons.

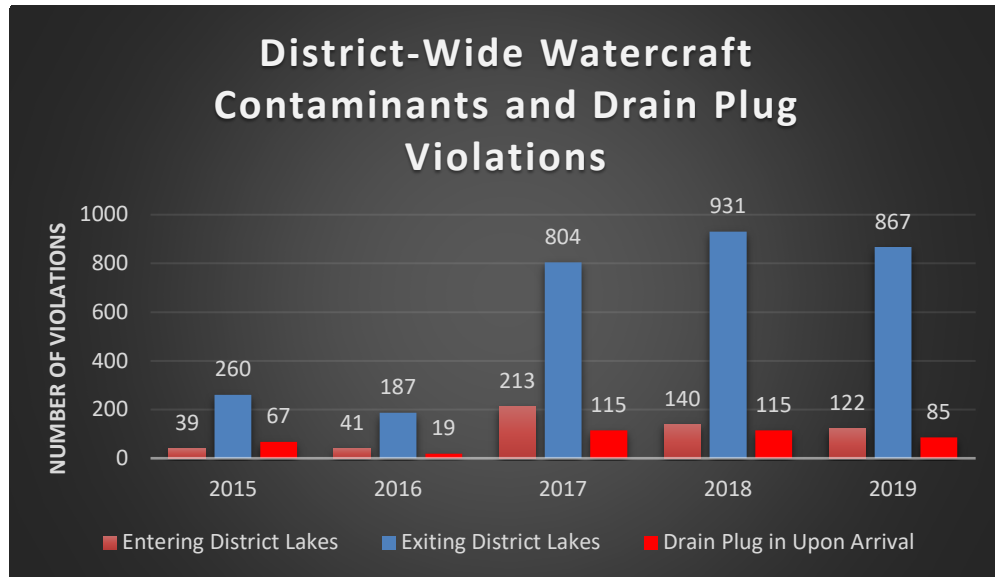


Figure 6. District-wide watercraft contaminants and drain plug violations

Figure 7 summarizes the top 10 lakes boater intend to visit after leaving a District lake in 2019.

Next Lake Boaters Intend to Visit after Leaving a District Lake				
Lakes	Eurasian Watermilfoil	Zebra Mussels	Flowering Rush	Spiny Waterflea
Big Marine	EWM	x	x	x
Coon	EWM	x	x	x
White Bear	EWM	ZM	x	x
Chisago	EWM	x	x	x
Green	EWM	x	x	x
Mille Lacs	EWM	ZM	x	SW
Bald Eagle	EWM	ZM	FR	x
Minnetonka	EWM	ZM	FR	x
Clear	EWM	x	x	x
Vermilion	x	x	x	SW

Figure 7. Intended next destination of district boaters. Note that the lakes boaters intend to visit have different varieties of AIS present. This information stresses the importance of not just preventing AIS from entering District lakes but also preventing AIS from leaving them. In 2020, the District will work to reduce the number of exiting violations from the 867 violations that were recorded in 2019.

Risk of New Invasive Species

Starry stonewort and the spiny water flea are two examples of aquatic invasive species found in Minnesota that are not yet in District lakes. Starry stonewort is an invasive algae that forms dense mats in lakes that impede boating and prevent the establishment of beneficial native plants. Starry stonewort was discovered in Lake Koronis near Paynesville, MN in 2015 and has since been discovered in 14 additional lakes across the state. In 2019, one lake was added to the DNR's infested waters list for starry stonewort, Beltrami Lake in Beltrami County.

The spiny water flea is an invasive species of zooplankton which is about the size of a grain of rice that competes with small fish for the same food resource (other zooplankton). The spiny water flea was first discovered in Lake Superior in the early-1980s and has since spread to more than 66 inland lakes in Minnesota including: Mille Lacs Lake, Lake Vermilion, Lake of the Woods, and others.

Both invasive species are thought to be transported primarily by recreational watercraft. Figure 8 contains photos of spiny water flea and starry stonewort.



Figure 8. Spiny water flea (left) and starry stonewort (right). Source: MNDNR.



Part of the inspection survey involves asking the boaters which lake they visited last. The boaters' responses can be cross referenced with records that the DNR keeps of infested waters. This is a way to estimate the risk of these species spreading to District lakes. Note that transportation of water or *any* plants or animals on watercraft, not just invasive species, is prohibited. Contaminated watercraft were cleaned off, decontaminated and/or drained prior to launching into the lake.

- **111 surveyed boats launching into District lakes came from lakes infested with spiny water flea.** This number was 104 in 2018, 171 in 2017, and 231 in 2016.
- **22 surveyed boats launching into District lakes came from lakes infested with starry stonewort.** This number was 61 in 2018, 14 in 2017, and 83 in 2016.
- **Of the boats surveyed in 2019, 1 came from a lake infested with brittle naiad, 3 came from a lake with New Zealand mudsnail, 16 from a faucet snail infested lake, and 3 from a lake with the VHS virus.**

Number of entering watercrafts that were last in an AIS infested waterbody						
	Comfort Lake	Bone Lake	Forest 1	Forest 2	Forest 3	Grand Total- All Lakes
Starry Stonewort	1	3	6	2	10	22
Spiny Waterflea	12	7	46	8	38	111
Zebra Mussels	54	42	243	52	141	532
Flowering Rush	40	21	48	8	29	146
Brittle Naiad	0	0	0	1	0	1
Grass Carp	7	5	20	7	14	53
Silver Carp	7	5	20	7	14	55
Big Head Carp	7	5	22	7	12	55
New Zealand Mudsnail	1		1		1	3
Round Goby	1		1		1	3
White Perch	1		1		1	3
VHS	1		1		1	3
Ruffe	1		1		1	3
Faucet Snail	4		7	1	4	16
EWM	146	119	444	86	255	1050

Figure 9. The number of surveyed watercraft entering District lakes that were last in an AIS infested lake. These figures are likely an underestimation as many inspections did not include information about which waterbodies boaters were last in.

Bone Lake

Inspection Hours and Scheduling

This summer, watercraft inspectors performed **575.3 hours of inspections** on Bone Lake which resulted in **689 inspections and associated surveys**. Inspectors averaged **1.19 inspections per hour**.

Figure 10. summarizes the total number of inspection hours and inspections completed on Bone Lake over the last six seasons.

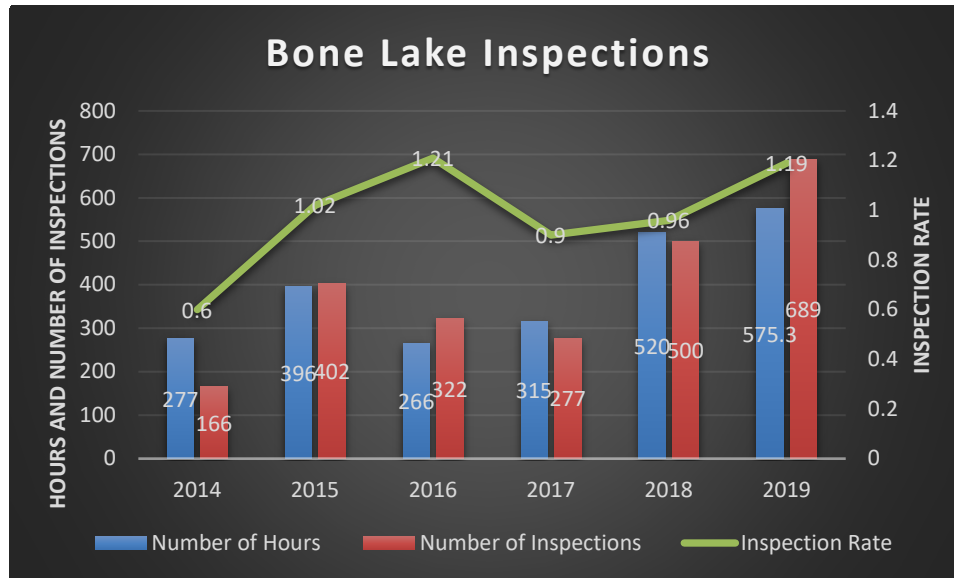


Figure 10. Bone Lake inspection hours, number of surveys, and inspection rates

Survey Results

A total of 689 surveys were performed on Bone Lake this season. Below are some findings from the compiled inspection survey data:

- **7 surveyed watercraft arrived at Bone Lake with plants, animals, mud, or water on their watercraft.** This number was 16 in 2018, 11 in 2017, 1 in 2016 and 4 in 2015. Note that transportation of *any* plants or animals on watercraft, not just invasive species, is prohibited. These watercraft were cleaned off and/or drained prior to launching into Bone Lake. During one of these surveys, a single adult zebra mussel was found on a watercraft entering Bone Lake. The mussel was dead and able to be removed by hand prior to launch, and the proper staff were notified.
- **12 surveyed watercraft required removal of the bilge drainage plug upon arriving at Bone Lake.** This number was 8 in 2018, 1 in 2017, 2 in 2016 and 6 in 2015. After educating the watercraft user on the potential of AIS in their bilge water, bilge plugs were removed from the watercraft and all water was drained prior to the watercraft launching in an area that would not flow into the lake.

- **50 surveyed watercraft exited Bone Lake with plants, animals, mud, or water present.** This number was 70 in 2018, 59 in 2017, 7 in 2016 and 24 in 2015. Note that transportation of *any* plants or animals on watercraft, not just invasive species, is prohibited. All contaminants were removed from the watercraft and trailer before departing from Bone Lake. Zebra mussels were not found on any watercraft leaving Bone Lake.

Figure 11. summarizes the number of watercraft contaminant sightings and drain plug violations as reported at Bone Lake over the last five seasons.

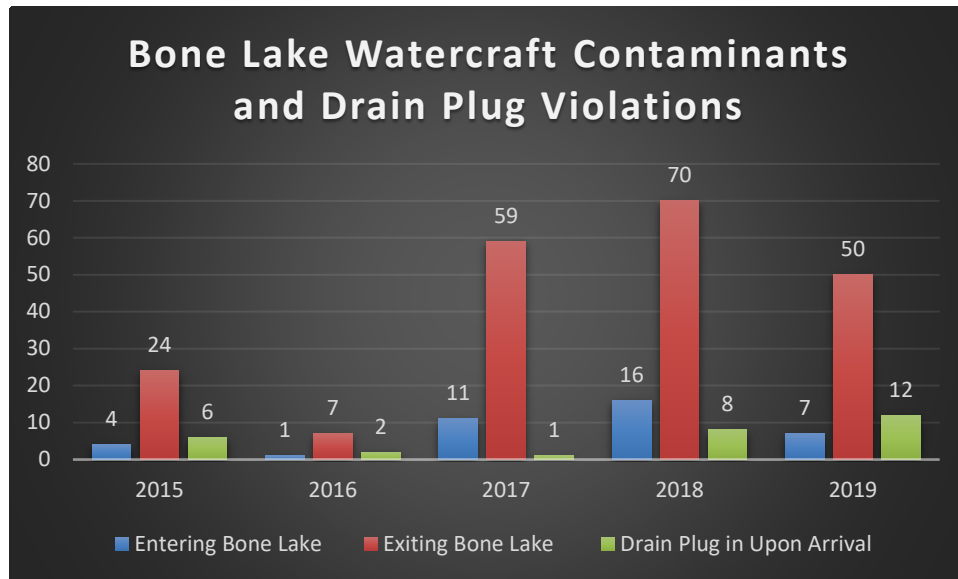


Figure 11. Bone Lake watercraft contaminants and drain plug violations

Risk of New Invasive Species

Part of the inspection survey involves asking the boaters which lake they visited last. The boaters' responses can be cross referenced with records that the DNR keeps of infested waters. This is a way to estimate the risk of these species spreading to Bone Lake. Note that any watercraft containing

- **7 surveyed boats launching into Bone Lake came from lakes infested with spiny water flea.** For comparison, this number was 2 in 2018, 5 in 2017, and 25 in 2016.
- **3 surveyed boats launching into Bone Lake came from lakes infested with starry stonewort.** This number was 3 in 2018, 0 in 2017, and 2 in 2016.

Forest Lake

Inspection Hours and Scheduling

Watercraft in Forest Lake were inspected by either a Level 1 inspector or a Level 2 inspector. Both Level 1 and Level 2 inspectors are trained by the DNR and perform visual inspections as well as verbal boater surveys. In addition, Level 2 inspectors are qualified to operate a decontamination unit. This involves using a high-heat pressure washer to remove plants, animals (such as mussels), and other potential contaminants from watercraft. Chisago County operates a decontamination unit which rotates between 14 accesses throughout CLFLWD and Chisago County including Forest 1, Forest 3, Comfort Lake, and Bone Lake. The DNR also operates a decontamination unit which rotates between Forest 1 and other accesses throughout the East Metro. Level 1 inspectors are not permitted to operate the decontamination unit, and instead solely complete the visual inspections of the watercraft and verbal boater surveys.

This summer on Forest Lake, CLFLWD watercraft inspectors performed 2,172.3 hours of inspections, and DNR inspectors performed 600 hours, totaling **2,771.3 total hours of inspections on Forest Lake**. During this time, CLFLWD inspected 4,440 watercraft and the DNR inspected 1056 watercraft, totaling **5,496 inspections and associated surveys**. Together, CLFLWD and DNR inspectors averaged **1.98 inspections per hour**.

Figure 12. summarizes inspection hours and number of inspections over the last six seasons at all three Forest Lake public boat launches.

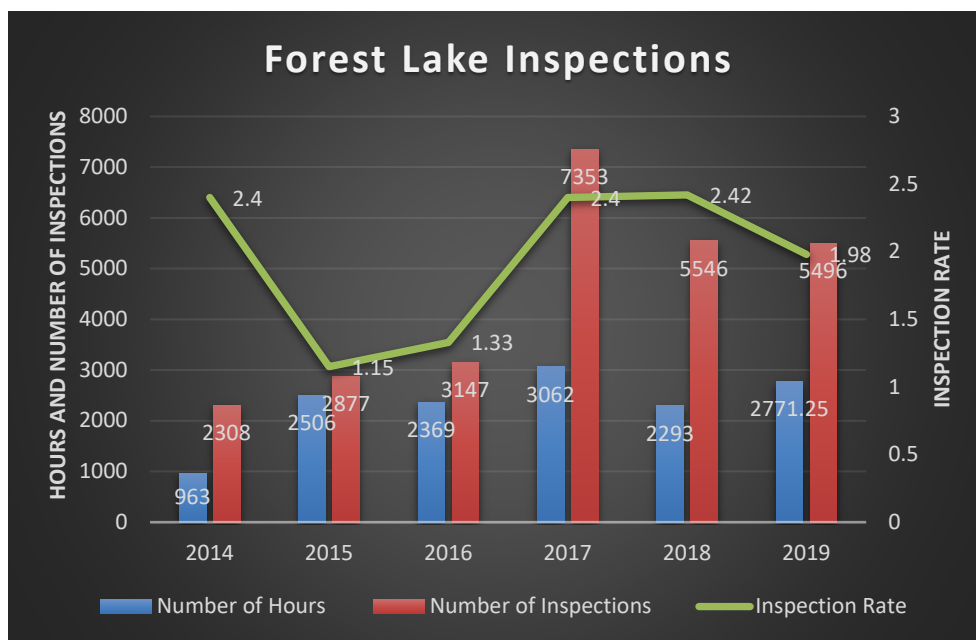


Figure 12. Forest Lake inspection hours, number of surveys, and inspection rates

Tables 1, 2 and 3 summarize the inspection hours, number of inspections, and inspection rate for each of the three public boat launches on Forest Lake.

Table 1. Forest Lake inspection hours

	Forest 1 (Lakeside Park)	Forest 2 (Willow Point)	Forest 3 (Hagberg)	Total
CLFLWD Inspection Hours	740.3	657	774	2,171.25
DNR Inspection Hours	600	-	-	600
Total Inspection Hours	1,340.3	657	774	2,771.3

Table 2. Forest Lake number of inspections

	Forest 1 (Lakeside Park)	Forest 2 (Willow Point)	Forest 3 (Hagberg)	Total
CLFLWD Inspections	2,082	729	1,628	4,439
DNR Inspections	1056	1	0	1,057
Total Inspections	3,138	730	1,628	5,496

Table 3. Forest Lake inspection rate (inspections/hour)

	Forest 1 (Lakeside Park)	Forest 2 (Willow Point)	Forest 3 (Hagberg)	Average
CLFLWD Inspection Rate	2.81	1.11	2.10	2.01
DNR Inspection Rate	1.76	-	-	1.76
Average Inspection Rate	2.29	1.11	2.10	1.89

Survey Results

A total of 5,546 surveys were performed on Forest Lake this season. Below are some findings from the inspection survey data:

- **87 surveyed watercraft arrived at Forest Lake with plants, animals, mud, or water on their watercraft.** This number was 117 in 2018, 177 in 2017, 32 in 2016, and 32 in 2015. Note that transportation of *any* plants or animals on watercraft, not just invasive species, is prohibited. These watercraft were cleaned off and/or drained prior to launching into Forest Lake. During only 1 of these surveys, zebra mussels were found that required decontamination before launching. It is against state law to launch a contaminated watercraft at a MN lake, regardless of known current infestations of that lake.
- **65 surveyed watercraft required removal of the bilge drainage plug upon arriving at Forest Lake.** This number was 92 in 2018, 110 in 2017, 15 in 2016, and 54 in 2015. After educating the watercraft user on the potential of AIS (e.g. microscopic zebra mussel larvae) in their bilge water, bilge plugs were removed from the watercraft and all water was drained prior to the watercraft launching in an area that would not flow into the lake.
- **762 surveyed watercraft exited Forest Lake with plants, animals, mud, or water present.** This number was 817 in 2018, 670 in 2017, 158 in 2016, and 229 in 2015. Note that transportation of *any* plants or animals on watercraft, not just invasive species, is prohibited. All contaminants were removed from the watercraft and trailer before departing from Forest Lake. Zebra mussels were sighted on 21 of these watercrafts. Some of these mussels were removable by hand. In cases where live zebra mussels were found, boats were either decontaminated onsite, or directed to another decontamination location.

Of the 762 violations, 723 were due to plants hanging from or being stuck to water equipment. To help reduce this number, watercraft inspectors were given rakes towards the end of the season to clear the dead floating plant debris that often accumulated around the lake accesses. In 2020, rakes will be issued at the beginning of the season to reduce the number of violations exiting the lake.

Figure 13. summarizes the number of watercraft contaminant sightings and drain plug violations as reported at Forest Lake over the last five seasons.

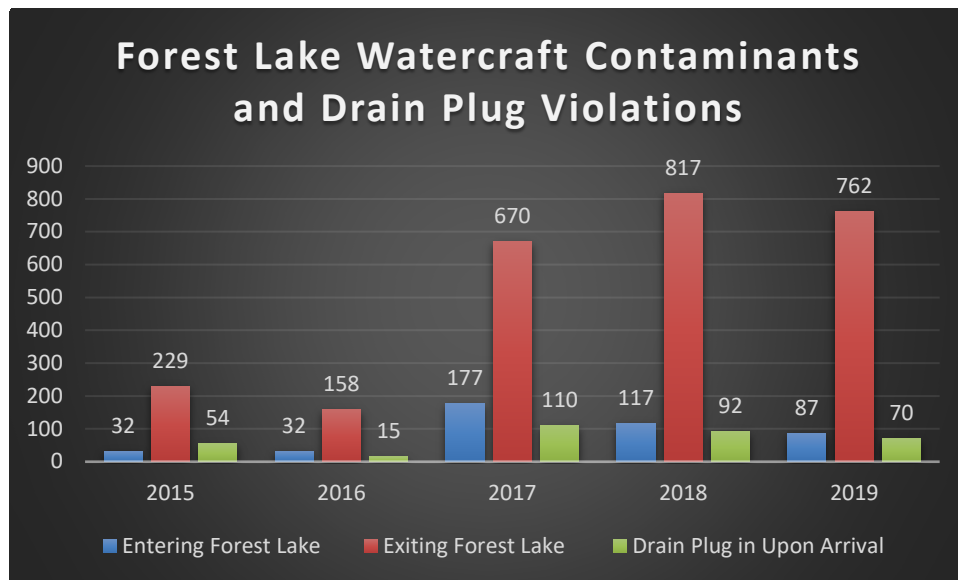


Figure 13. Forest Lake watercraft contaminants and drain plug violations

Risk of New Invasive Species

Part of the inspection survey involves asking the boaters which lake they visited last. The boaters' responses can be cross referenced with records that the DNR keeps of infested waters. This is a way to estimate the risk of these species spreading to Forest Lake. Note that any watercraft with contaminants such as plants or standing water are required to be decontaminated prior to launch.

- **92 surveyed boats launching into Forest Lake came from lakes infested with spiny water flea.** This number was 101 in 2018, 153 in 2017, and 183 in 2016.
- **18 surveyed boats launching into Forest Lake came from lakes infested with starry stonewort.** This number was 53 in 2018, 12 in 2017 and 74 in 2016.

Comfort Lake

Inspection Hours and Scheduling

This summer, watercraft inspectors performed **571.3 hours of inspections** on Comfort Lake which resulted in **884 inspections and associated surveys**. Inspectors averaged **1.55 inspections per hour**.

Figure 14. summarizes the total number of inspection hours and inspections completed on Comfort Lake over the last six seasons.

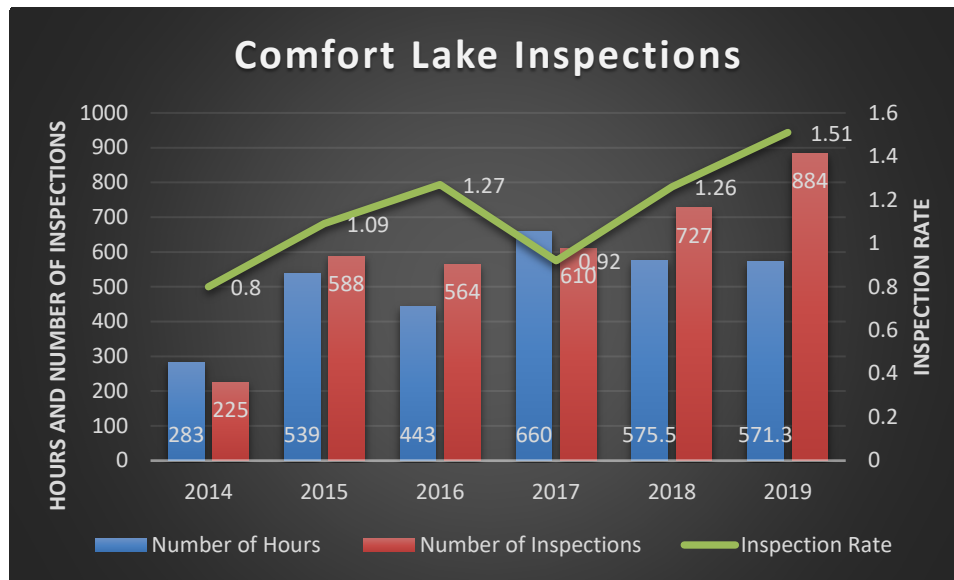


Figure 14. Comfort Lake inspection hours, number of surveys, and inspection rates

Survey Results

A total of 884 surveys were performed on Comfort Lake this season. Below are some findings from the compiled inspection survey data:

- **28 surveyed watercraft arrived at Comfort Lake with plants, animals, mud, or water on their watercraft.** This number was 7 in 2018, 25 in 2017, 8 in 2016, and 3 in 2015. Note that transportation of *any* plants or animals on watercraft, not just invasive species, is prohibited. These watercrafts were cleaned off and/or drained prior to launching into Comfort Lake. None of the contaminants found on arriving watercraft were zebra mussels.
- **8 surveyed watercraft required removal of the bilge drainage plug upon arriving at Comfort Lake.** This number was 15 in 2018, 4 in 2017, 2 in 2016 and 7 in 2015. After educating the watercraft user on the potential of AIS in their bilge water, bilge plugs were removed from the watercraft and all water was drained in an area that would not flow to the lake prior to launching.

- **55 surveyed watercraft exited Comfort Lake with plants, animals, mud, or water present.** This number was 44 in 2018, 75 in 2017, 22 in 2016 and 7 in 2015. Note that transportation of *any* plants or animals on watercraft, not just invasive species, is prohibited. All contaminants were removed from the watercraft and trailer before departing from Comfort Lake. Zebra mussels were not found on any watercraft leaving Comfort Lake.

Figure 15. summarizes the number of watercraft contaminant sightings and drain plug violations as reported at Comfort Lake over the last five seasons.

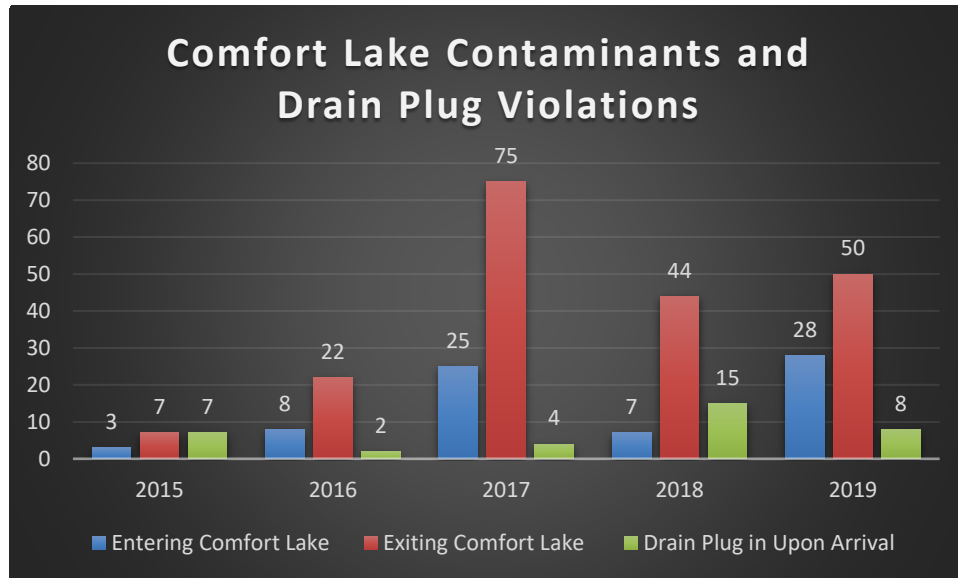


Figure 15. Comfort Lake watercraft contaminants and drain plug violations

Risk of New Invasive Species

Part of the inspection survey involves asking the boaters which lake they visited last. The boaters' responses can be cross referenced with records that the DNR keeps of infested waters. This is a way to estimate the risk of these species spreading to Comfort Lake. Note that any watercraft with contaminants such as plants or standing water are required to be decontaminated prior to launch.

- **12 surveyed boats launching into Comfort Lake** came from lakes infested with **spiny water flea**. For comparison, this number was 7 in 2018, 13 in 2017, and 24 in 2016.
- **1 surveyed boat launching into Comfort Lake** came from lakes infested with **starry stonewort**. This number was 5 in 2018, 2 in 2017 and 7 in 2016.

Conclusion

The CLFLWD’s watercraft inspection program had a later start than last year as the first scheduled shifts began on May 25th instead of May 12th. Fortunately, Chisago County inspectors helped cover some of the missed shifts starting on May 11th while the District’s inspectors completed their training and orientation. Despite the late start, CLFLWD, Chisago County, and the Minnesota DNR’s inspectors conducted over 7,069 inspections over the course of 3,917.8 hours. This was 296 more inspections than last year, meaning inspectors helped spread the message of the “Clean, Drain, Dry” campaign to that many more boaters. Additionally, inspectors worked 529.3 more hours than last year, but had a lower District-wide average inspection rate (inspections/hour) that fell from 1.99 in 2018 to 1.8 in 2019. This inspection rate decrease may be due to this year’s rainy weather and staff retention difficulties. Next year, CLFLWD will hire inspectors early and often, as well as continue to focus its efforts at high-traffic times and locations to maximize contact with boaters.

The number of watercrafts arriving at District lakes (especially Forest Lake) from lakes infested with spiny water flea, starry stonewort, faucet snail, New Zealand mudsnail, and brittle naiad demonstrates the high risk of new infestations at lakes across the District. Not only is it the goal of the CLFLWD’s watercraft inspection program to prevent AIS from entering District lakes, but it’s equally as important to stop AIS from leaving District lakes. Forest, Bone, and Comfort Lakes are enjoyed by visitors from all over Minnesota, Wisconsin, and even Montana, which increases the risk of visitors bringing AIS back to their local lakes outside of the District. To prevent the spread of AIS and protect our beloved water resources, the CLFLWD will continue to hire and train passionate water stewards who will educate visitors and ensure compliance with Minnesota’s AIS laws.



Figure 16. CLFLWD and Chisago inspectors at the 3rd check-in/training of the season

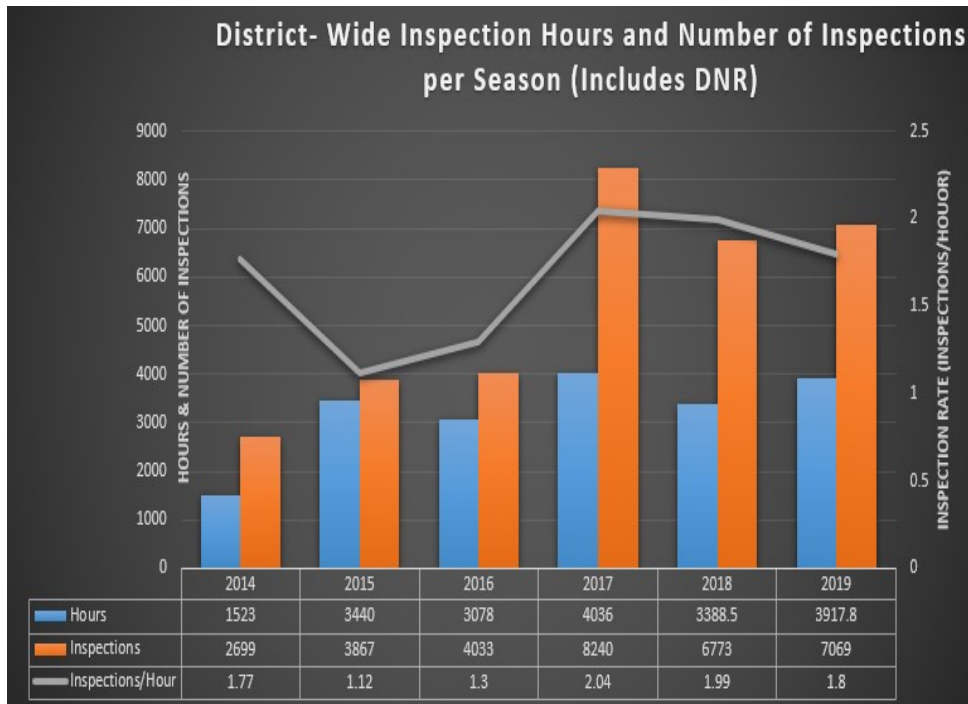
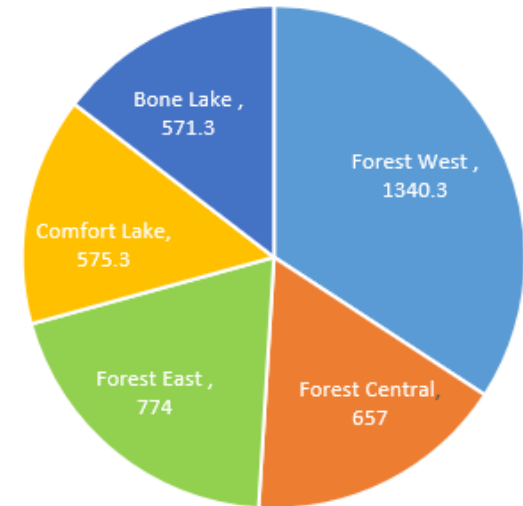
Appendix – 2019 Watercraft Inspection Summary Infographic

Comfort Lake—Forest Lake Watershed District

2019 Watercraft Inspections

In 2019, CLFLWD and Minnesota DNR inspectors spent a total of **3,917.8 hours** at landings in the CLFLWD inspecting watercraft and educating boaters. **7,069 inspections** were completed this year.

Inspection Hours per Access
(DNR hours included)



- **1.7%** of boaters **entering** the water had **plants, animals, water, mud, etc.** on their boat at the time of inspection. This can be compared to 3.8% in 2018, 5.4% in 2017 and 2.4% in 2016.
- **1.2%** of boaters **arriving** at the launch had their **drain plug in** at the time of inspection. This can be compared to 3.1% in 2018, 3.8% in 2017 and 3.1% in 2016.
- Inspectors averaged **1.80 inspections per hour**. This can be compared to 2.00 in 2018, 2.04 inspections per hour in 2017 and 1.31 inspections per hour in 2016.

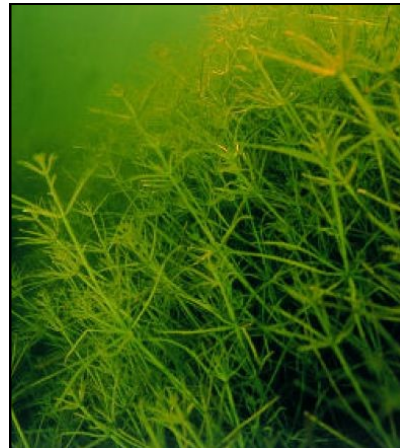


Inspections were performed on:

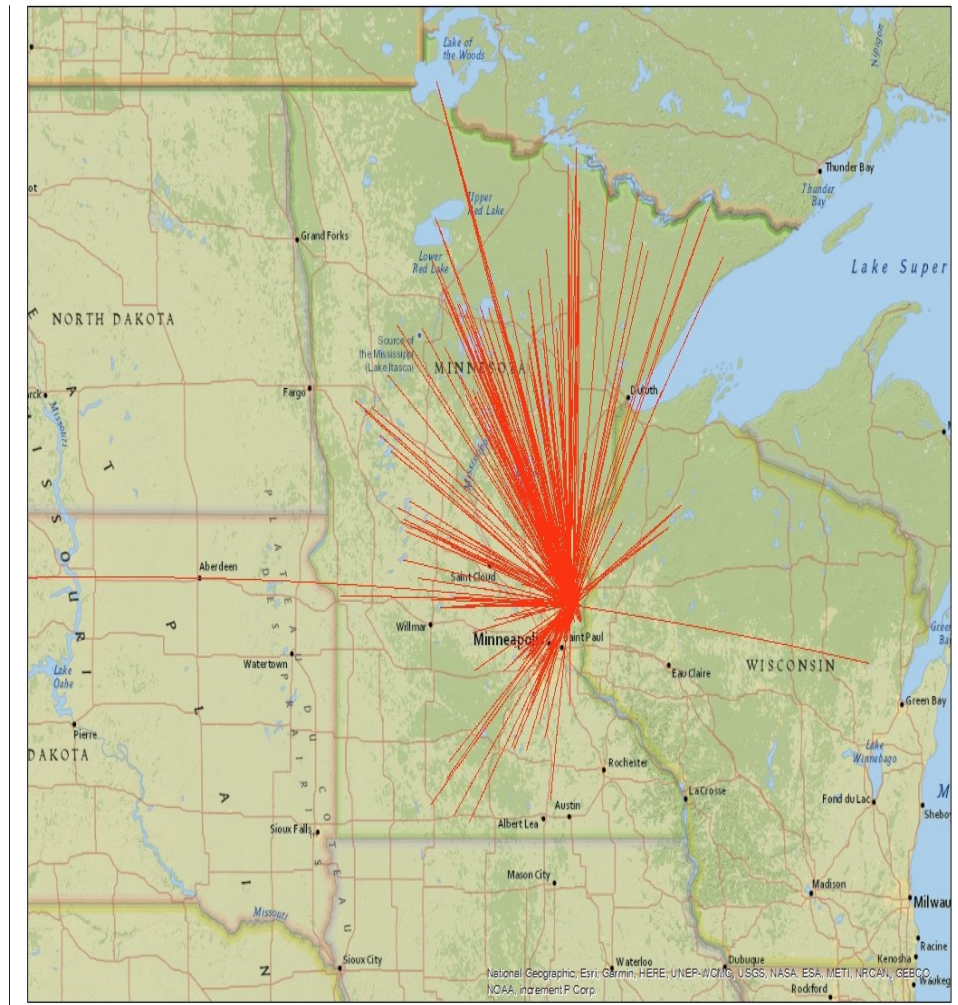
- **111 watercraft** that had previously been in **spiny water flea-infested lakes**. This number was 104 in 2018, 171 in 2017, and 231 watercraft in 2016.
- **22 watercraft** that had previously been in **starry stonewort-infested lakes**. This can be compared to 61 in 2018, 14 in 2017, and 83 watercraft in 2016.



Spiny Water Flea



Starry Stonewort



Above: Flow map showing the lakes that were visited by watercraft before coming to either Forest Lake, Comfort Lake, or Bone Lake. Each line represents at least one boater who traveled from another Minnesota lake into a CLFLWD lake.