



## MEMORANDUM

Comfort Lake-Forest Lake Watershed District

Date: January 16, 2024  
To: CLFLWD Board of Managers  
From: Mike Kinney, District Administrator  
Subject: 2023 AIS Yearend Reports



District Wide

### Background/Discussion:

The purpose of this agenda item is for the Board to consider approval of two reports: 1) the 2023 Aquatic Invasive Species (AIS) Program Yearend Summary; and 2) the 2023 Watercraft Inspection Program Yearend Report. Both documents were originally presented at the December 20<sup>th</sup> regular board meeting.

### Recommended Action:

Manager \_\_\_\_\_ moves to approve the 2023 Aquatic Invasive Species Program Yearend Summary and the Watercraft Inspection Program Yearend Report. Seconded by Manager \_\_\_\_\_.

**Attached:** (distributed at the December 20<sup>th</sup>, 2023, regular board meeting and included on the January 25<sup>th</sup> board packet webpage):

- 2023 Aquatic Invasive Species Program Yearend Summary
- 2023 Watercraft Inspection Program Yearend Report



# 2023 Aquatic Invasive Species Program Yearend Summary

Moody Lake  
Bone Lake

Little Comfort Lake  
Shields Lake

Lake Keewahtin  
Forest Lake

Comfort Lake



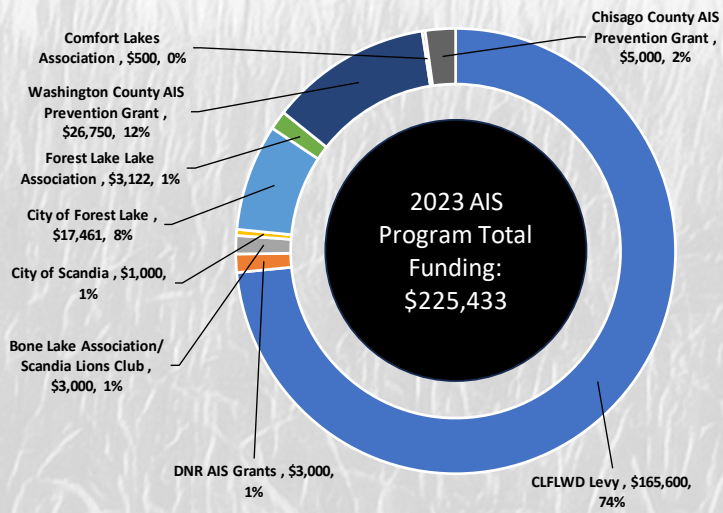
**CLFLWD**  
WATERSHED DISTRICT



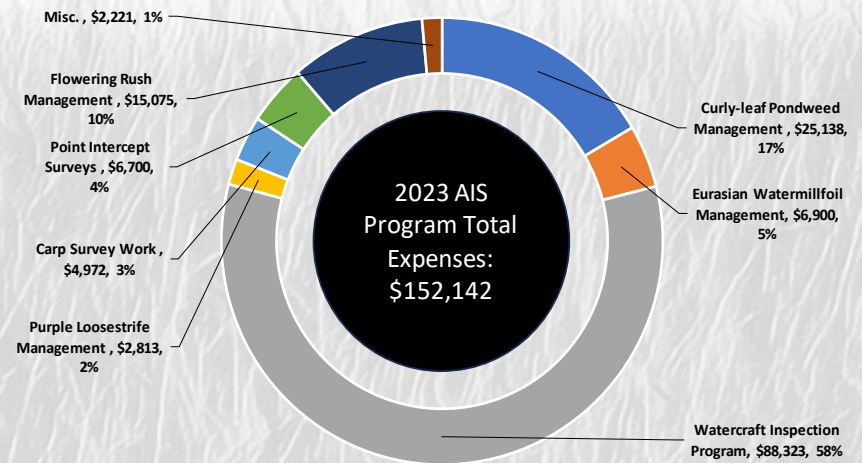
# District-Wide AIS Budget Summary



**CLFLWD's 2023 District-Wide AIS Program Funding**



**CLFLWD's 2023 District-Wide AIS Program Expenses**





# Moody Lake

## 2023 Yearend Summary

### Aeration System

- **Operation:** The District continued operation of the aeration system in winter months (1/5/23–4/3/23) to increase dissolved oxygen, reduce winter fish-kills, and support a healthy fishery that suppresses invasive fish populations. This was the 8th winter the District ran the aerator.
- **Monitoring:** Oxygen levels were monitored throughout the winter and were found to be at healthy levels for the whole season.
- **2024:** District staff will reactivate the aeration system once ice conditions are safe, typically in early January.

### Curly-leaf Pondweed (CLP)

- On April 25th, Blue Water Science (BWS) conducted a delineation point intercept survey to assess the CLP population. Growth was primarily light, and no treatment was recommended again this year. For reference, no CLP was treated on Moody Lake in 2022 or 2021, 3.11 acres in 2020, and 7.81 acres in 2019.

### Native Aquatic Plant Transplanting Project

- On August 1st, District staff and a researcher from the University of Minnesota implemented a native aquatic plant transplanting project on Moody Lake. A variety of native species were collected from Keewahtin Lake and planted in Moody Lake. In total, more than 700 clay balls with attached aquatic plants were planted in the lake. Next year, staff will survey the lake for signs of new species establishing themselves after the project. Results will aid the researchers in their much broader study on the effectiveness of this new type of aquatic plant management practice.



#### Transplanting Project

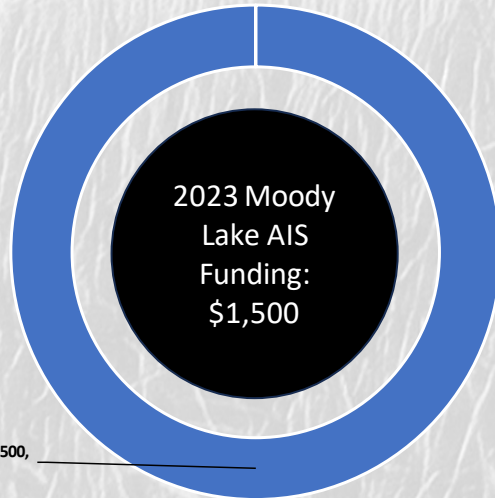
Cooler filled with native plants for transplanting project. Clay was packed around the roots to help the plants sink.



# Moody Lake AIS Budget Summary

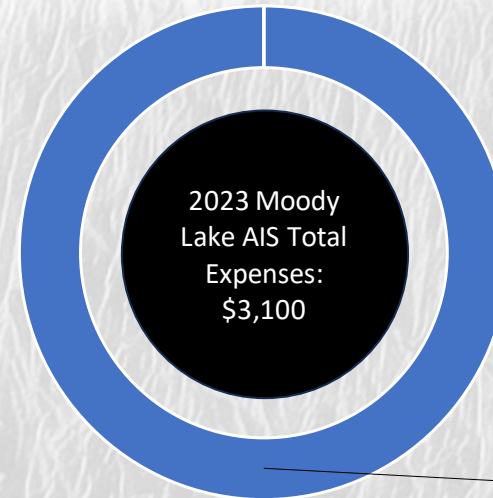


### CLFLWD's 2023 Moody Lake AIS Funding



CLFLWD Levy, \$1,500,  
100%

### CLFLWD's 2023 Moody Lake AIS Program Expenses



Curly-leaf Pondweed  
Management, \$3,100,  
100%

# Bone Lake

## 2023 Yearend Summary

### Curly-leaf Pondweed (CLP)

- **Delineation:** Performed on May 1st and found only several areas of light CLP growth in the entire lake. Treatment was not recommended based on this survey.
- **Treatment:** No treatment was performed in 2023.
- **Assessment:** Performed on June 2nd and found only a few more locations of light CLP growth since the May 1st survey.
- **History:** For reference, past years' CLP treatments are as follows – 2022: No treatment, 2021: 4.38 acres, 2020: 5.14 acres, 2019: 3.88 acres, 2018: hand pulling only, 2017: treated 3.89 acres, 2016: no treatment, 2015: treated 2.45 acres.

### Eurasian Watermilfoil (EWM)

- **Delineation:** Performed on June 2nd and found only several locations of light EWM growth.
- **Treatment:** No treatment was performed in 2023.
- **Assessment:** Performed on July 20th and found only four locations of light EWM growth.

### Zebra Mussels

- **Brief Background:** On May 28, 2019, six juvenile zebra mussels were discovered near the Bone Lake public access dock. Following this discovery, an eradication attempt was conducted by the District and partners. Since the initial zebra mussel discovery in 2019, no zebra mussels have been in Bone Lake. However, on July 20, 2023, Blue Water Science found 3 juvenile zebra mussels while performing a point intercept survey. The discovery was communicated to the DNR and long-term population monitoring resumed.
- **Sampler Plates:** In 2023, several Bone Lake residents volunteered to host a sampler plate on their property, while others were asked to inspect their docks at the end of the season. No zebra mussels were found on sampler plates or water related equipment.



#### Zebra Mussel Diving Survey

Steve and Connor McComas dressed for their chilly late-September diving survey on Bone Lake



- **Veliger Tow:** The District, with help from the WCD, performed two veliger tows on June 21st and August 11th. The DNR's analysis found veligers in the submitted samples, suggesting there is a reproductive population somewhere in the lake.
- **Blue Water Science Diving Survey:** A diving survey was performed on October 12th searching for zebra mussels and starry stonewort. Neither was found during this survey.

## Rough Fish Management

- **Fish Barrier:** Maintained and managed stop logs in the two fish barriers located at the inlet and outlet of Bone Lake.
- **Surveys:** The DNR typically performs fish surveys on a 5–6 year rotation (except for Forest Lake which is on a 2-year rotation). The upcoming survey schedule for Bone Lake is as follows: June 2024 – standard survey, June 2027 – gill net only survey. Surveys are performed more frequently on Bone Lake than many other District lakes since the DNR stocks Bone Lake with walleye.

## Watercraft Inspections (brief overview; see full report for more details)

- **Hours:** 714.25 hours were worked at Bone Lake
- **Surveys:** 866 inspection survey were performed at Bone Lake
- **Reports:**
  - Chisago County: 2023 AIS Prevention Report (Expected in early 2024)
  - CLFLWD: 2023 Watercraft Inspection Program Report

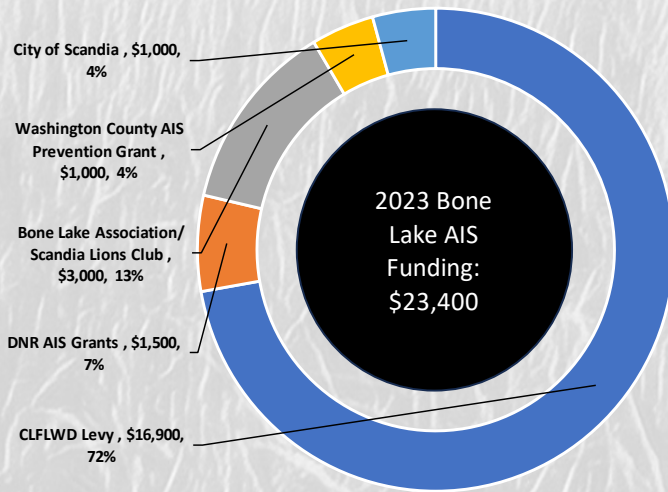
### White Water Lily

The Bone Lake outlet is home to a healthy population of white water lilies that typically bloom from June to September

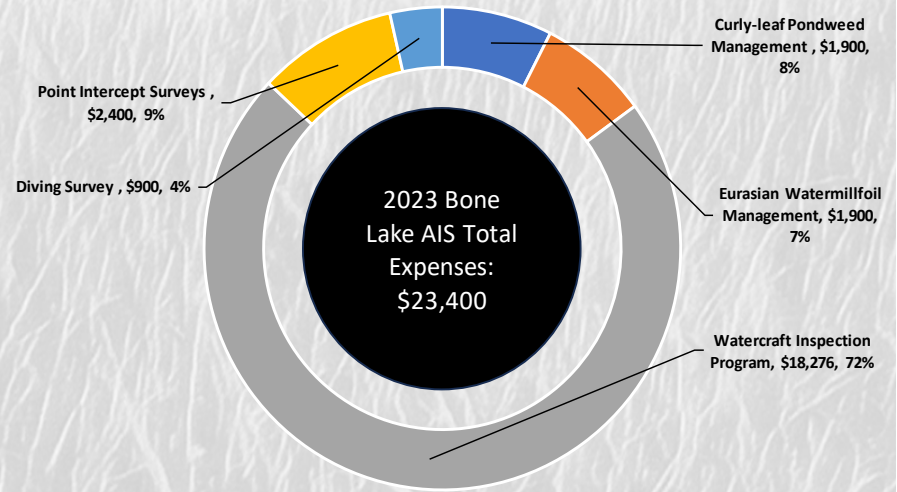
# Bone Lake AIS Budget Summary



### CLFLWD's 2023 Bone Lake AIS Funding



### CLFLWD's 2023 Bone Lake AIS Program Expenses





# Little Comfort Lake

## 2023 Yearend Summary

### Curly-leaf Pondweed (CLP)

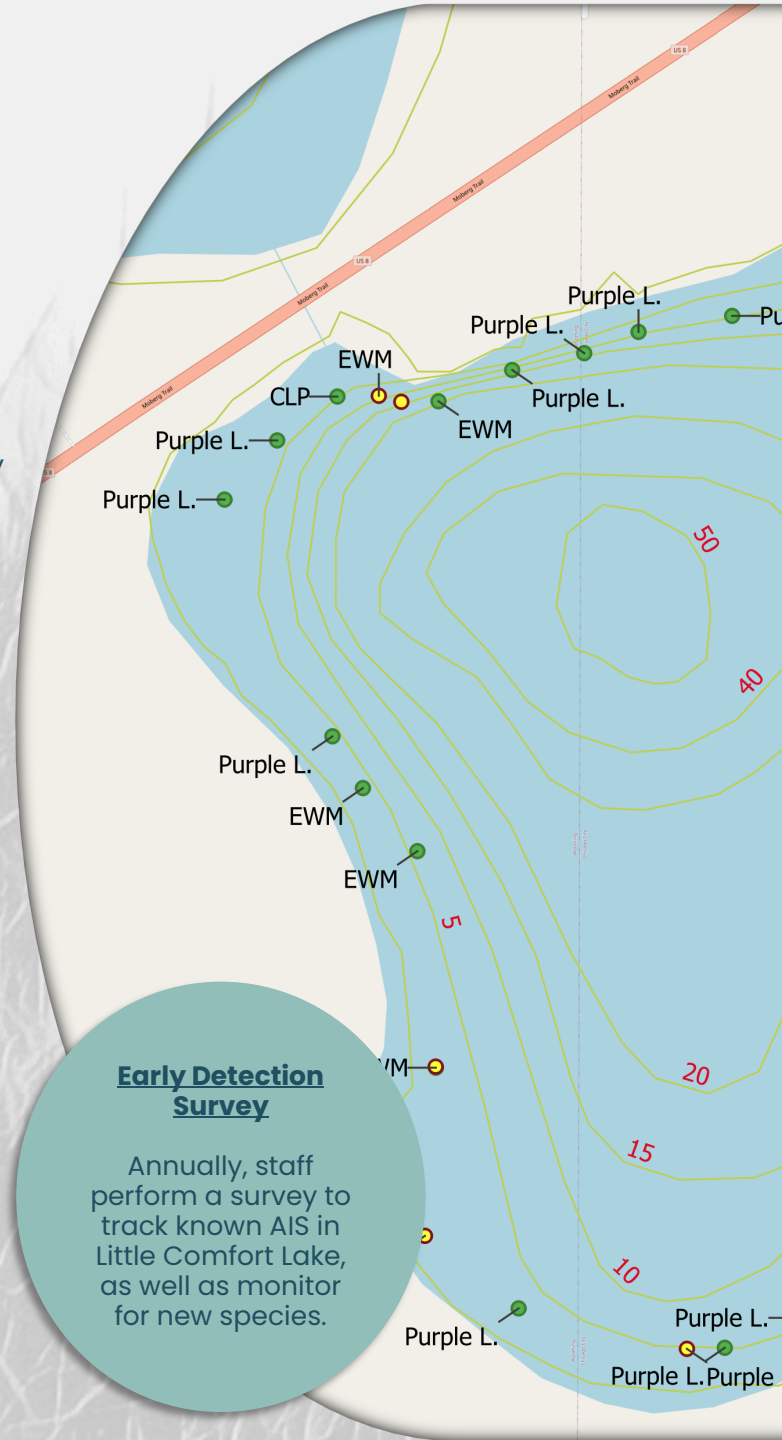
- **Overview:** The 2023 budget did not contain funding for curly-leaf management in Little Comfort Lake. On July 18th, District staff conducted a meandering survey for CLP and only found a few locations with light growth. Given the sparse growth in the lake, no removal was deemed necessary for 2023.

### Eurasian Watermilfoil (EWM)

- **Discovery:** EWM was first discovered in Little Comfort Lake in 2021 by the MN Department of Natural Resources Invasive Species Program.
- **2023 Survey:** During the July 18th survey, only a few location of EWM were identified. Growth densities were often light.
- **Management:** Given the sparse growth in the lake, no removal was deemed necessary in 2023.

### AIS Tracking and Early Detection Survey

- **Overview:** On July 18th, District staff conducted a meandering survey to monitor the distribution and abundance of existing AIS and to search for species not known to be in the lake. Know species such as curly-leaf pondweed, Eurasian watermilfoil, and purple loosestrife were found again, though mostly in light densities. Fortunately, no new invasive species were found during the survey. Overall, Little Comfort Lake has a healthy and abundant native plant community that seems to be limiting the spread of the AIS.



# Little Comfort Lake AIS Budget Summary



## CLFLWD's 2023 Little Comfort Lake AIS Funding

2023 Little  
Comfort Lake  
AIS Funding:  
\$0

## CLFLWD's 2023 Little Comfort Lake AIS Program Expenses

2023 Little Comfort  
Lake AIS Expenses:  
\$0  
Early Detection  
Survey Performed  
In-House



# Shields Lake

## 2023 Yearend Summary

### Aeration System

- **Operation:** The District continued operation of the aeration system in winter months (1/5/23–4/3/23) to increase dissolved oxygen, reduce winter fish-kills, and support a healthy fishery that suppresses invasive fish populations.
- **Monitoring:** Oxygen levels were monitored throughout the winter and were found to be at healthy levels for the whole season.
- **2024:** District staff have started the 2024 DNR permit renewal process and anticipate reactivating the aeration system once ice conditions are safe, typically in early January.

### Curly-leaf pondweed (CLP)

- **Delineation:** Performed on April 25th and identified two treatment areas totaling 3.07 acres.
- **Treatment:** Treatment performed on May 22nd by LMI on the marked 3.07 acres.
- **Assessment:** Performed on June 1st and found treatment had excellent control.
- **Report:** Blue Water Science Delineation and Assessment Report (Summary distributed in December, full report in January 2024).

### Rough Fish Management

- **Fish Barriers:** The mechanical fish barrier was installed in August 2019. District staff will continue to operate the electric fish barrier as is.
- **2022 Carp Survey Results:** Data from the three electrofishing attempts in 2022 were used to calculate an updated CPUE population estimate, which now suggests there are between  $39.9 \pm 26.3$  kg/ha of carp biomass remaining in the lake. This estimate puts Shields Lake below the District's adopted management threshold of 100 kg/ha, which is accepted by scientists as the level where carp biomass has minimal impact on water quality. Conservatively, WSB has recommended future management activities be decided with the upper limits of this estimate in-mind.

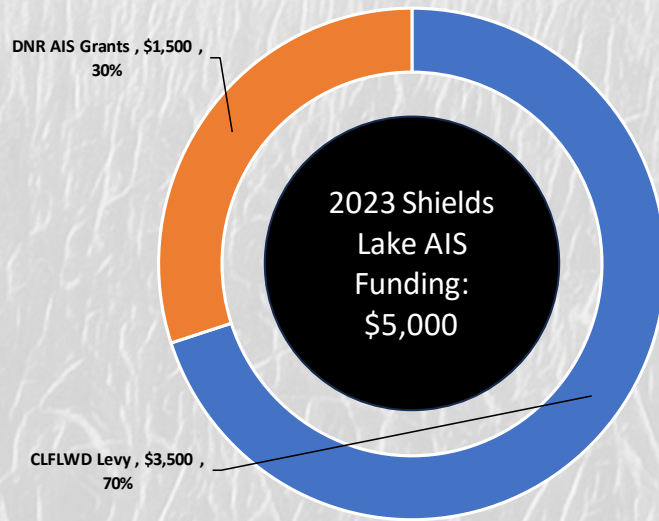
### Aeration System

The District updated the Shields Lake aeration system in 2022 to help protect the health of the native fishery.

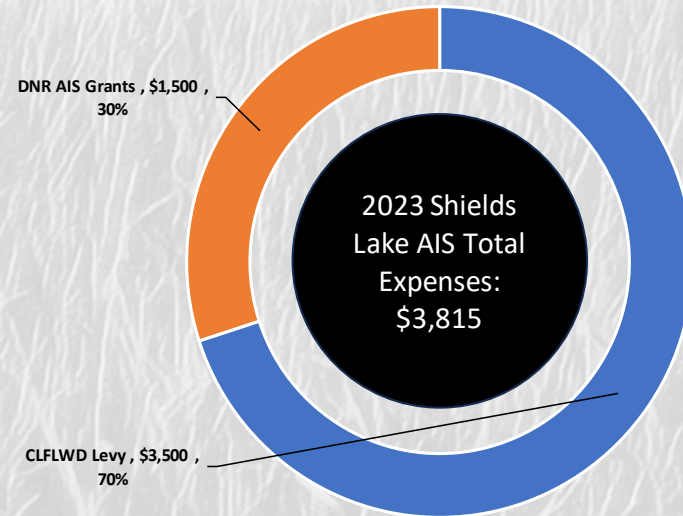
# Shields Lake AIS Budget Summary



### CLFLWD's 2023 Shields Lake AIS Funding



### CLFLWD's 2023 Shields Lake AIS Program Expenses





# Lake Keewahtin

## 2023 Yearend Summary

### AIS Tracking and Early Detection Survey

- **Overview:** District staff performed an AIS tracking and early detection survey on July 18th. During this survey, staff looked for new invasive species such as Eurasian watermilfoil, flowering rush, or starry stonewort and monitored the distribution of existing invasive species, purple loosestrife and curly-leaf pondweed.

### Curly-leaf pondweed (CLP)

- **Survey Results:** During the July 18th survey, District staff did not observe any CLP in the lake. Historically, CLP has only been present in the lake at low densities.

### Purple Loosestrife

- **Delineation:** On July 18th, District staff documented all locations of purple loosestrife around the perimeter of Lake Keewahtin and identified 2.6 acres for treatment
- **Treatment:** A treatment was conducted by PLM on August 22nd
- **Assessment:** District staff performed a treatment assessment survey on September 18th and found it had excellent control. Most areas had complete control of purple loosestrife, while some denser areas had a few plants remaining.

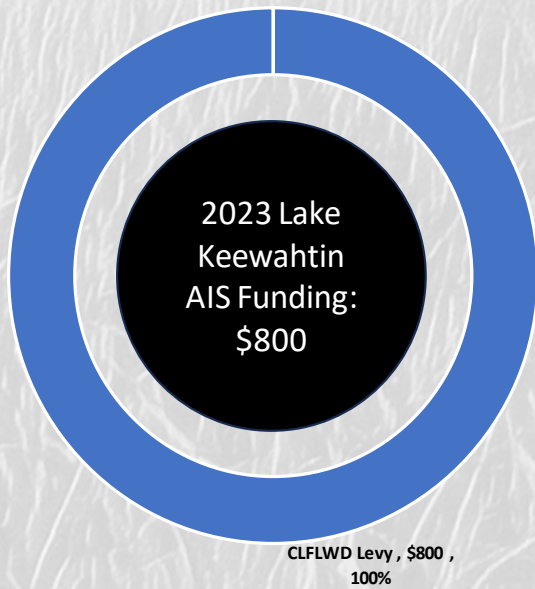
### Wild Rice

District staff noted a patch of wild rice growing in Lake Keewahtin during a AIS tracking and early detection survey

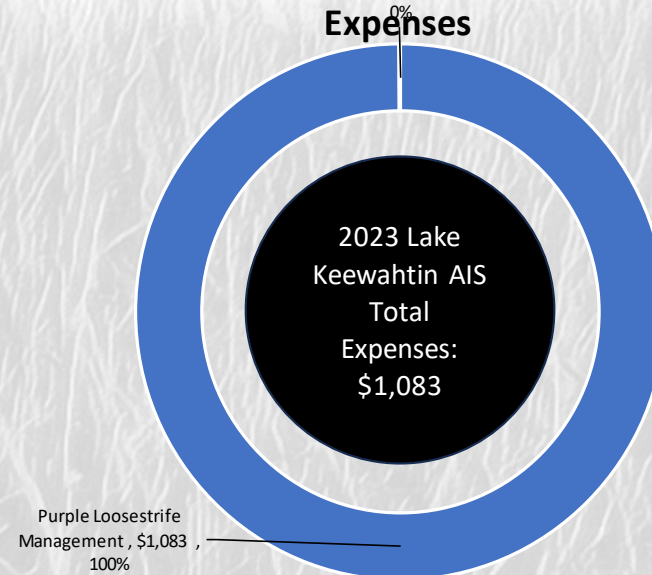
# Lake Keewahtin AIS Budget Summary



### CLFLWD's 2023 Lake Keewahtin AIS Funding



### CLFLWD's 2023 Lake Keewahtin AIS Program Expenses





# Forest Lake

## 2023 Yearend Summary

### Curly-leaf Pondweed (CLP)

- **Delineation:** Performed on May 9th. Eight treatment locations totaling 61.55 acres were identified for treatment.
- **Treatment:** Treatment performed on May 22nd on all 61.55 acres.
- **Assessment:** Performed on June 13th and found it had excellent control.
- **History:** For reference, past years' CLP treatments are as follows – 2022: 103.96 acres, 2021: 120.34 acres, 2020: 58.29 acres, 2019: 99.12 acres, 2018: 16.6 acres, 2017: 169 acres, 2016: 114 acres, 2015: 88 acres.

### Eurasian Watermilfoil (EWM)

- **Delineation:** Performed on June 13th and July 11th. Both survey found no treatable EWM.
- **Assessment:** Performed on August 8th and found 8.41 acres of EWM.
- **Treatment:** The Forest Lake Lake Association decided to coordinate a treatment for all 8.41 acres of EWM in the west basin of Forest Lake.

### Flowering Rush

- **Delineation #1:** Blue Water Science (BWS) performed the first delineation survey on July 11th and identified 84 flowering rush sites totaling 0.24 acres.
- **Treatment # 1:** On July 26th, PLM conducted treatments on four larger areas, totaling 2.92 acres.
- **Treatment #2:** On August 15th, PLM conducted spot treatments on locations identified in the July 11th delineation.
- **Delineation #2:** BWS performed the second delineation survey on September 20th and identified 155 flowering rush growth sites totaling 0.93 acres.
- **Treatment #3:** To test its feasibility, PLM walked the entire shoreline of Forest Lake's west basin with backpack sprayers on August 29th.



#### **Flowering Rush Backpack Spraying**

Backpack sprayers help applicators treat flowering rush that is growing in shallow water or on shore



- **Treatment #4:** Adopting the approach, PLM walked the entire shoreline of Forest Lake with backpack sprayers on September 29th. PLM revisited the lake on October 10th to treat areas that were offshore and couldn't be reached during the walking treatment.
- **Seed Head Collection:** In 2023, District staff and partners clipped and disposed of more than 4,000 flowering rush seed heads.
- **2024 Plans:** After eight years of management, Forest Lake has fewer large beds of flowering rush and more smaller patches. Shoreline walking with backpack sprayers has been identified as an effective strategy to stay on top of these scattered patches. In addition, new herbicide formulations and shoreline owner engagement are planned to be introduced into 2024's flowering rush management plan.

### Common Carp Population Assessment

- **Overview:** To calculate the common carp population in Forest Lake, the District contracted WSB to perform the survey. With help from staff, WSB visited the lake three times this fall to electro-fish for carp. In total, only 5 carp were captured during more than 3 hours of active surveying, which covered a large portion of Forest Lake's shoreline. According to WSB's calculations, there is an estimated  $50.9 \pm 6.5$  lbs/acre of common carp biomass in the lake. This falls below the 89.9 lbs/acre threshold value that scientists have determined to be the population size that is damaging to a waterbody's water quality and ecosystem.

### Purple Loosestrife

- **Delineation:** On July 18th, District staff identified ten large purple loosestrife treatment areas, totaling 2.8 acres when combined.
- **Treatment:** A treatment was conducted by PLM on August 29th
- **Assessment:** District staff performed a treatment assessment survey on September 18th and found it had excellent control.

### Zebra Mussels

- **Overview:** Five zebra mussel sampling plates were deployed on Forest Lake this year. Zebra mussels were discovered in Forest Lake in 2015. It is expected that densities will continue to rise over the upcoming years, then potentially crash after reaching a peak.



#### **Common Carp Population Survey**

Beth Carreno  
 (CLFLWD Senior Program Manager)  
 holding a carp captured during the  
 2023 population survey



## Point-Intercept Macrophyte Survey (PI Survey)

- **Overview:** The last PI survey was performed on Forest Lake in 2018. Following the District's 5-year rotation for PI surveys, Forest Lake was due for another in 2023. On August 8th, Blue Water Science performed a point intercept survey to document the plant community in Forest Lake.

## Plant Harvester

- **Overview:** The Forest Lake native aquatic plant harvester is operated solely by the City of Forest Lake, and the District only helps to create a harvesting map that avoids locations of AIS. This year, the City operated the harvester from June 12th to early-September. During that time, more than 2,208 cubic yards of native aquatic plants were removed from the lake. This required 182 dump truck loads to haul and dispose of the removed material.

## Watercraft Inspections (brief overview; see full report for more details)

- **Hours:** 2,570 hours were worked at Forest Lake accesses
- **Surveys:** 6,056 inspection survey were performed at Forest Lake accesses
- **Reports:**
  - Chisago County: 2023 AIS Prevention Report (Expected in early 2024)
  - CLFLWD: 2023 Watercraft Inspection Program Report



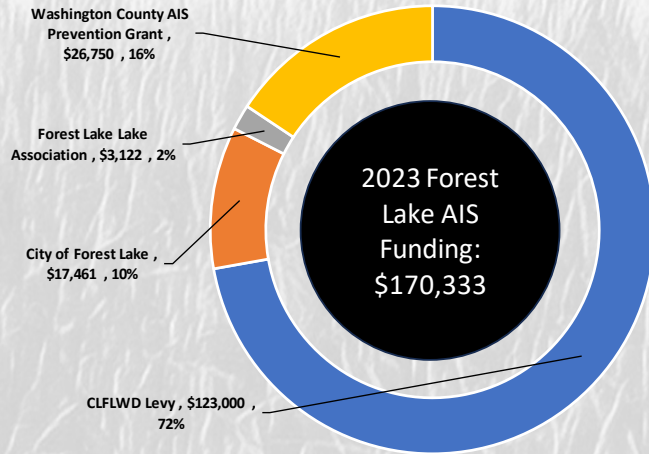
### Flowering Rush Flowers

While pretty, these flowers are capable of producing thousands of viable seeds that help spread the plant

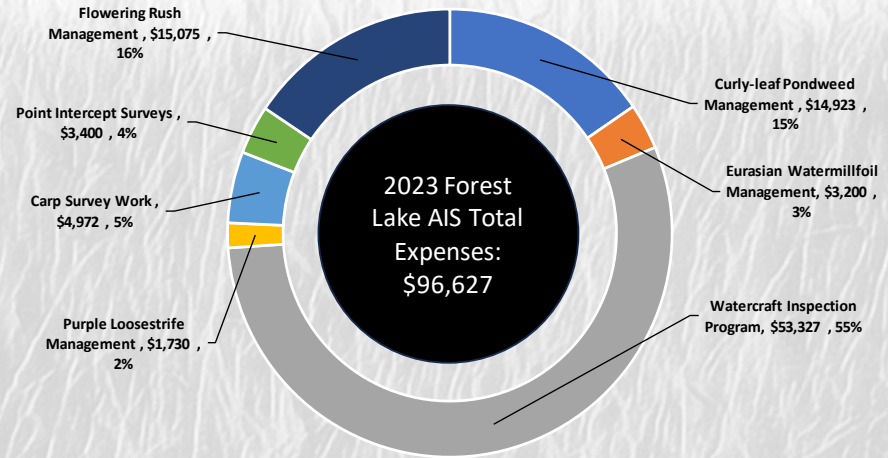
# Forest Lake AIS Budget Summary



### CLFLWD's 2023 Forest Lake AIS Funding

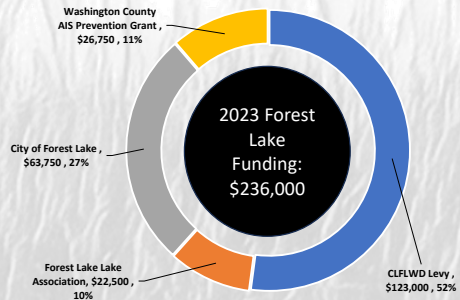


### CLFLWD's 2023 Forest Lake AIS Program Expenses

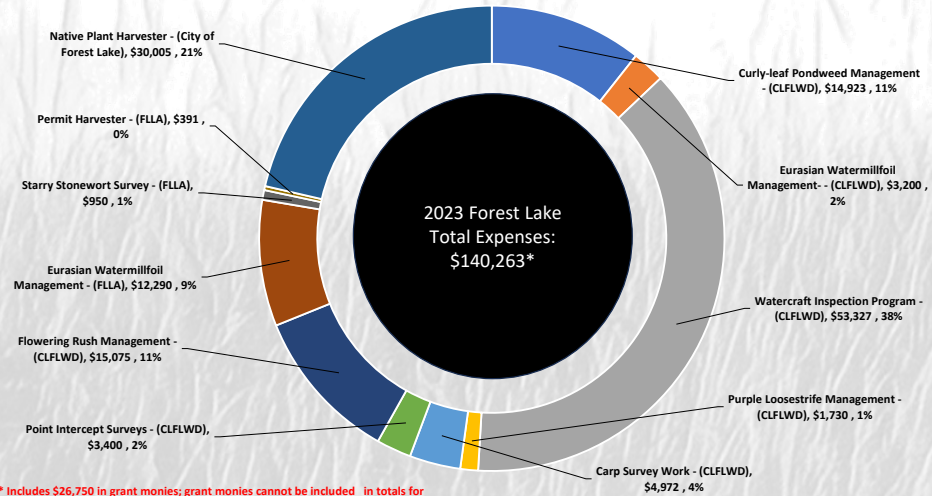




### 2023 Forest Lake AIS and Lake Management Funding



### 2023 Forest Lake AIS with Partner Lake Management Expenses Tri-Party Funding Support Agreement : City of Forest Lake, Forest Lake Lake Association, Comfort Lake Forest Lake Watershed District



\* Includes \$26,750 in grant monies; grant monies cannot be included in totals for reconciliation as per the tri-party agreement

AIS and Lake Management Expense Totals			
City of Forest Lake	Forest Lake Lake Association	CLFLWD	Total
\$47,446	\$16,753	\$76,064	\$140,263

# Comfort Lake

## 2023 Yearend Summary

### Curly-leaf Pondweed (CLP)

- **Delineation:** Performed on April 24th and found only four areas of light CLP growth in the entire lake. Treatment was not recommended based on this survey.
- **Treatment:** No treatment was performed in 2023.
- **Assessment:** Performed on June 2nd and found CLP growth had expanded slightly, but most was at light densities

### Eurasian Watermilfoil (EWM)

- **Point Intercept (PI) Survey:** Per the DNR's reporting requirements for the Comfort Lakes Association's 2022 whole lake Fluridone treatment, Blue Water Science was contracted to perform a PI survey on June 2nd. Their survey found four locations of light EWM growth.
- **Follow-Up Delineation:** On August 8th, Blue Water Science's survey found a slight increase in EWM growth since the June 2nd survey.
- **Treatment:** The Comfort Lakes Association coordinated a treatment on 2.77 acres of EWM on September 19th. The herbicide ProcellaCOR was used by Lake Management Inc.

### Zebra Mussels

- **Overview:** In 2023, the Comfort Lakes Association participated in a zebra mussel monitoring program being piloted by the University of Minnesota. Instead of hand counting zebra mussels at the end of the season, researchers hope to develop technology to count them from a photograph of the sampler plate.

### Watercraft Inspections (brief overview; see full report for more details)

- **Hours :** 718.25 hours were worked at Comfort Lake
- **Surveys :** 981 inspection surveys were performed at Comfort Lake
- **Reports :** Chisago County: 2023 AIS Prevention Report (Expected in early 2024)  
CLFLWD: 2023 Watercraft Inspection Program Report



### Great Blue Heron

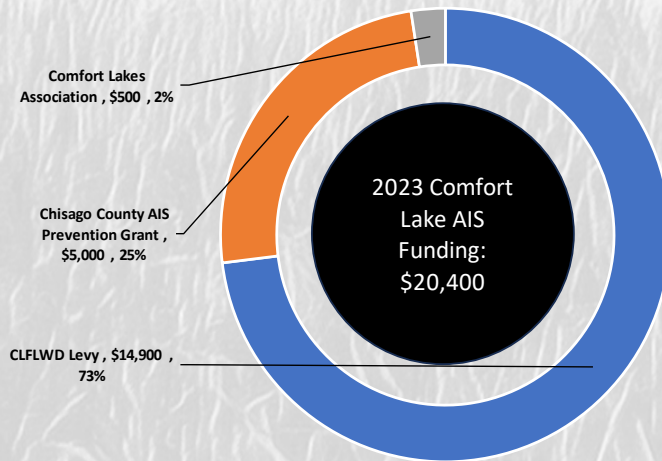
Perched on a swimming platform in Comfort Lake



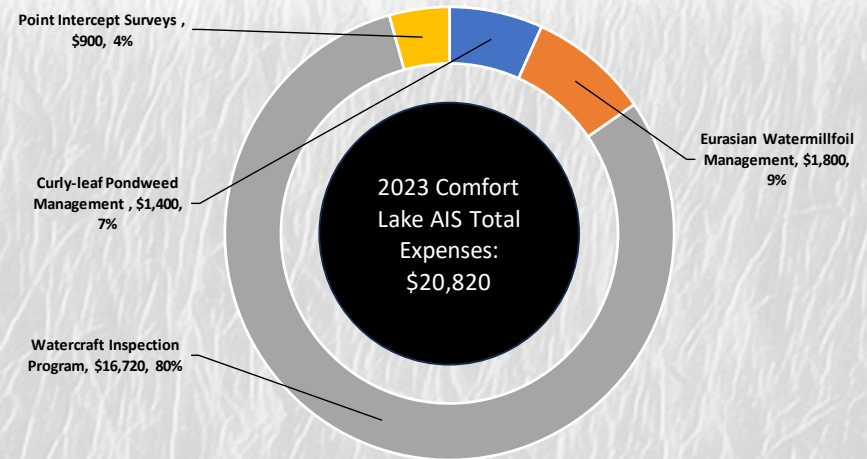
# Comfort Lake AIS Budget Summary



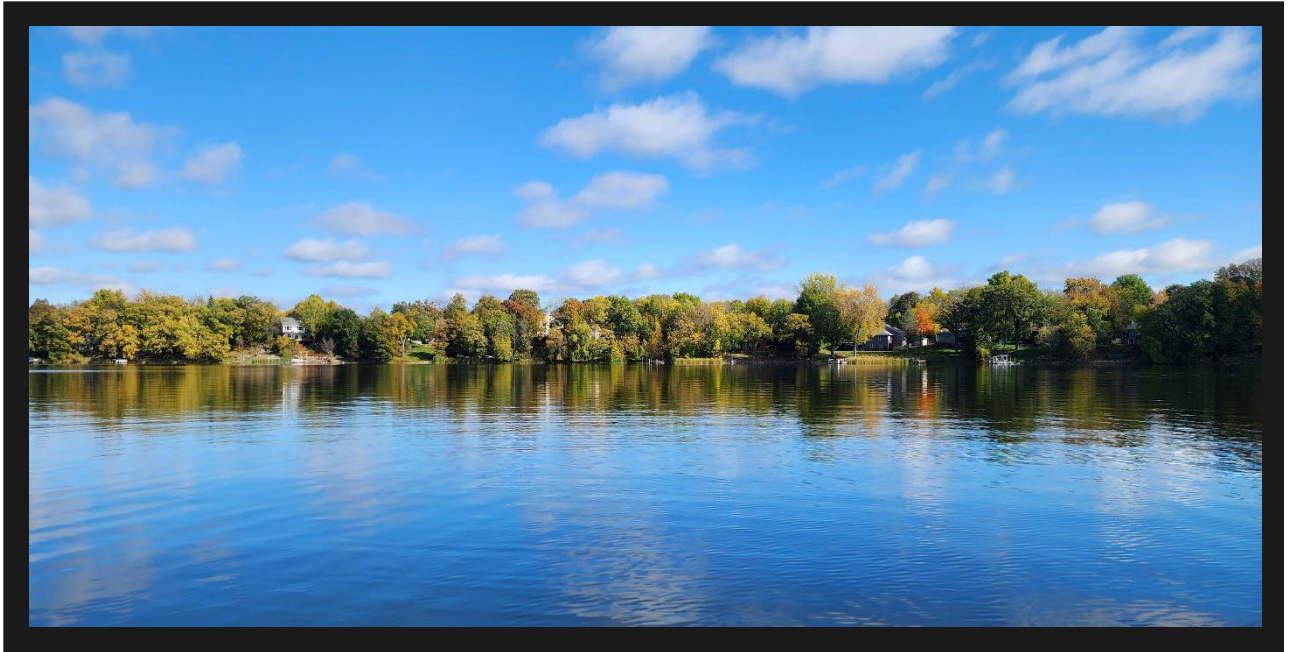
### CLFLWD's 2023 Comfort Lake AIS Funding



### CLFLWD's 2023 Comfort Lake AIS Program Expenses



# Comfort Lake-Forest Lake Watershed District



## 2023 Watercraft Inspection Program Yearend Report



**CLFLWD**  
WATERSHED DISTRICT

**Updated January 17, 2024**

**Drafted By: Garrett Miller – AIS Program Coordinator**

**Cover Image:** Sunny Fall Day on Comfort Lake – October 2023



## Table of Contents

Introduction.....	3
Funding and Goals.....	4
Results.....	6
District-Wide.....	6
Bone Lake.....	14
Forest Lake.....	17
Comfort Lake.....	22
Discussion and Conclusion.....	25

## List of Figures

Figure 1. Financial contributions for 2023 watercraft inspection program.....	5
Figure 2. Funded inspection hours for 2023 watercraft inspection program.....	5
Figure 3. District-wide inspections and hours per season.....	6
Figure 4. District-wide inspections, hours, rates, and goals.....	7
Figure 5. District-wide inspections and hours per day for the 2023 season.....	8
Figure 6. District-wide watercraft contaminants and drain plug violations.....	10
Figure 7. Spiny water flea (left) and starry stonewort (right). Source: MNDNR.....	12
Figure 8. Summary of inspection hours, surveys, and inspection rates for Bone Lake. .....	14
Figure 9. Bone Lake watercraft contaminants and drain plug violations.....	16
Figure 10. Summary of inspections hours, surveys, and inspection rates for Forest Lake. .....	17
Figure 11. Forest Lake watercraft contaminants and drain plug violations.....	20
Figure 12. Summary of inspection hours, surveys, and inspection rates for Comfort Lake.....	22
Figure 13. Comfort Lake watercraft contaminants and drain plug violations.....	24

## List of Tables

Table 1. Top 10 lakes boaters intended to visit after leaving a District lake in 2023.....	11
Table 2. Number of watercrafts entering District lakes last in an AIS infested lake.....	13
Table 3. Forest Lake inspection hours.....	18
Table 4. Forest Lake number of inspections.....	18
Table 5. Forest Lake inspection rate (inspections/hour).....	18

## Appendix

2023 Watercraft Inspection Summary Infographic

## Introduction

The Minnesota Department of Natural Resource's (DNR) Watercraft Inspection Program is a state-wide program that was first created in 1992. From the beginning, the DNR's goal for the program was "To prevent the spread of invasive species within Minnesota through boater education, watercraft inspections and watercraft decontaminations at public water accesses". In 2011, legislation was signed into law that allowed watercraft inspectors to visually and tactilely inspect water related equipment, decontaminate water-related equipment, prohibit access to boaters that refuse inspection or fail to remove contaminants and require watercrafts be decontaminated prior to launching into Minnesota waters. Contaminates are anything that could harbor invasive species or be invasive itself such as plants, animals, mud, and water. While the DNR hires its own watercraft inspectors for the program, most inspectors in the state are hired and paid for by watershed districts, conservation districts, lake associations, lake improvement districts, and many other organizations. In total, organizations across the state performed over 466,000 watercraft inspections in 2023.

To implement the watercraft inspection program in 2023, 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 public lake 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 their presence at boat launches on weekends and holidays.

There are five public lake 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). Hours worked by inspectors at each access are largely dependent upon funding and boater traffic. The Forest Lake 1 access has the highest boater traffic and is therefore assigned the most watercraft inspector shifts within the District.

Watercraft at the District's 5 public accesses 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-pressure, high-heat spraying machine to remove plants, animals such as mussels, and other potential contaminants from watercraft. Chisago County operates a decontamination unit which rotates between 14 high-traffic 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.

## Funding and Goals

Funding for the CLFLWD’s watercraft inspection 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 the Lions Club. Figure 1 illustrates the yearend financial contributions to the 2023 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).

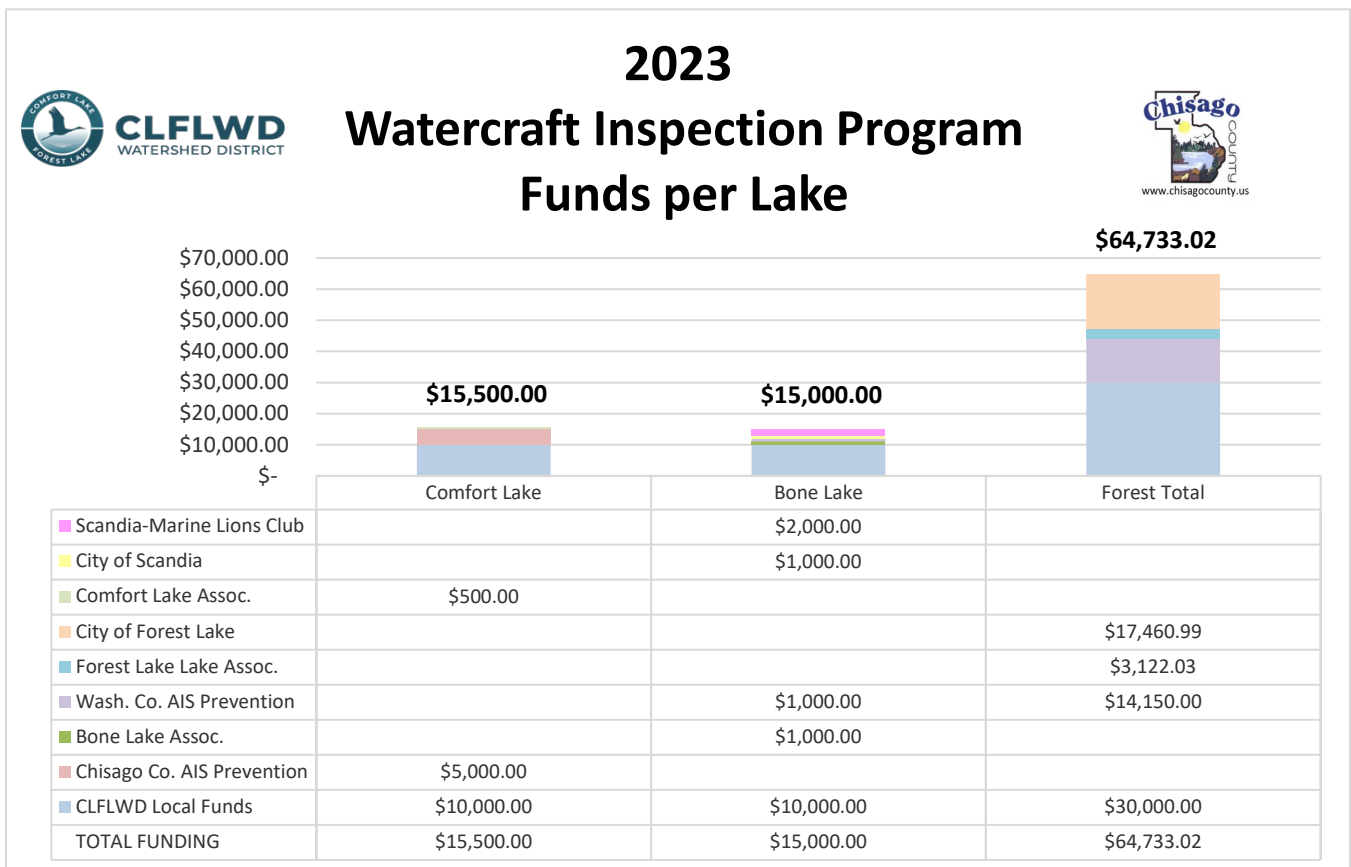


Figure 1. Financial contributions for 2023 watercraft inspection program

To set goals and determine hiring needs before the season starts, estimated financial contributions were converted to inspection hours using an average hourly billing rate. For level 1 and 2 inspectors, the billing rate was \$23/hour. The 2023 pre-season funding estimate for the entire program was \$84,100 which could have funded up to 3,657 hours. Towards the end of the season, actual contribution amounts get finalized. In 2023, the yearend watercraft inspection program contributions totaled \$95,233. Figure 2 illustrates the number of hours each yearend financial contribution would cover.

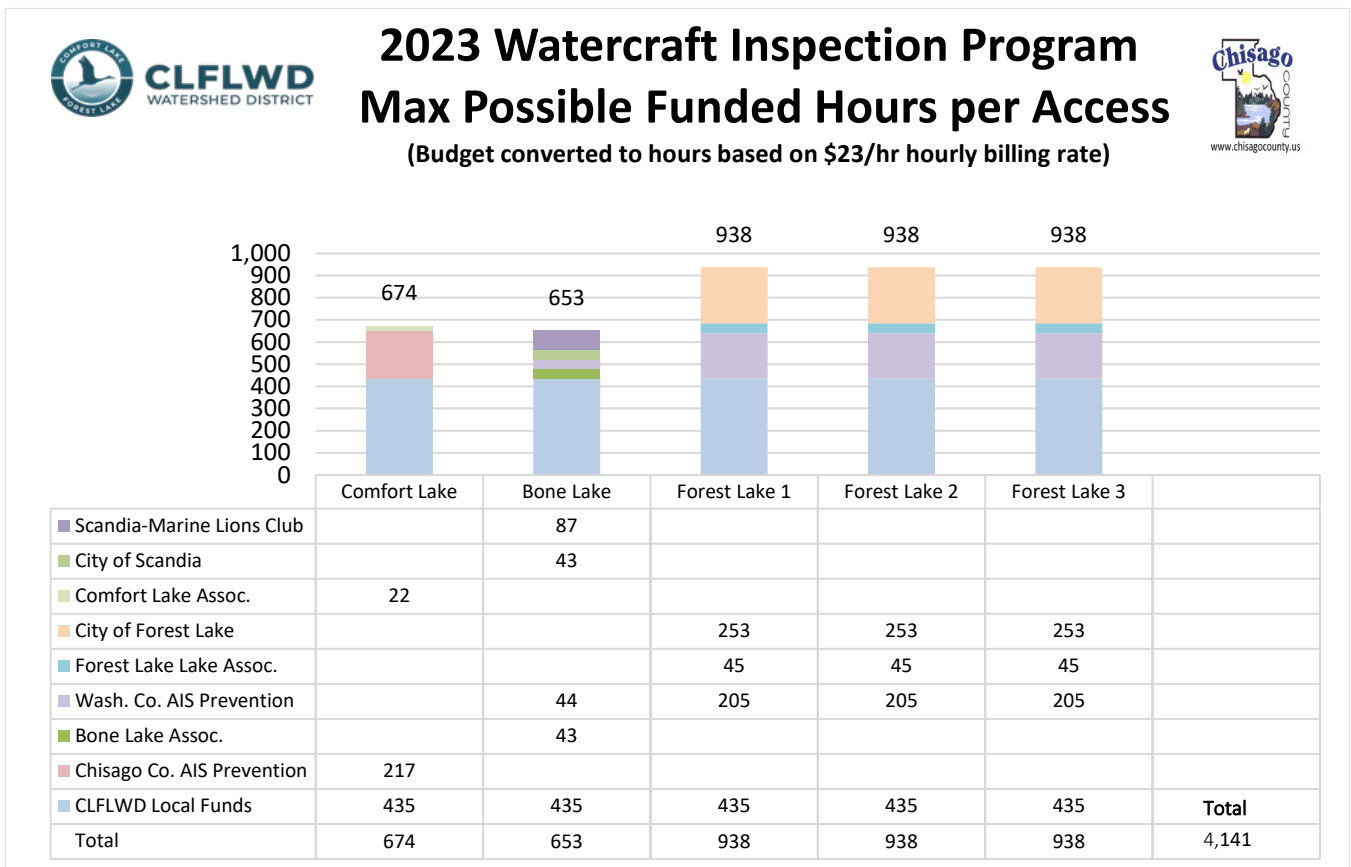


Figure 2. Funded inspection hours for 2023 watercraft inspection program

With the available funding, this year the District was able to hire a total of 13 inspectors to perform watercraft inspections at District accesses. Some inspectors were hired through the Chisago County joint program (4 staff), and others were hired directly by CLFLWD (9 staff).



# Results

## District-Wide

### Inspection Hours and Scheduling

District-wide, watercraft inspectors performed **7,903 inspections and worked 3,934.25 hours** in 2023. Inspectors averaged a rate of **2.01 inspections per hour**. Figure 3 summarizes the total number of inspection hours and inspections completed District-wide over the last ten seasons.

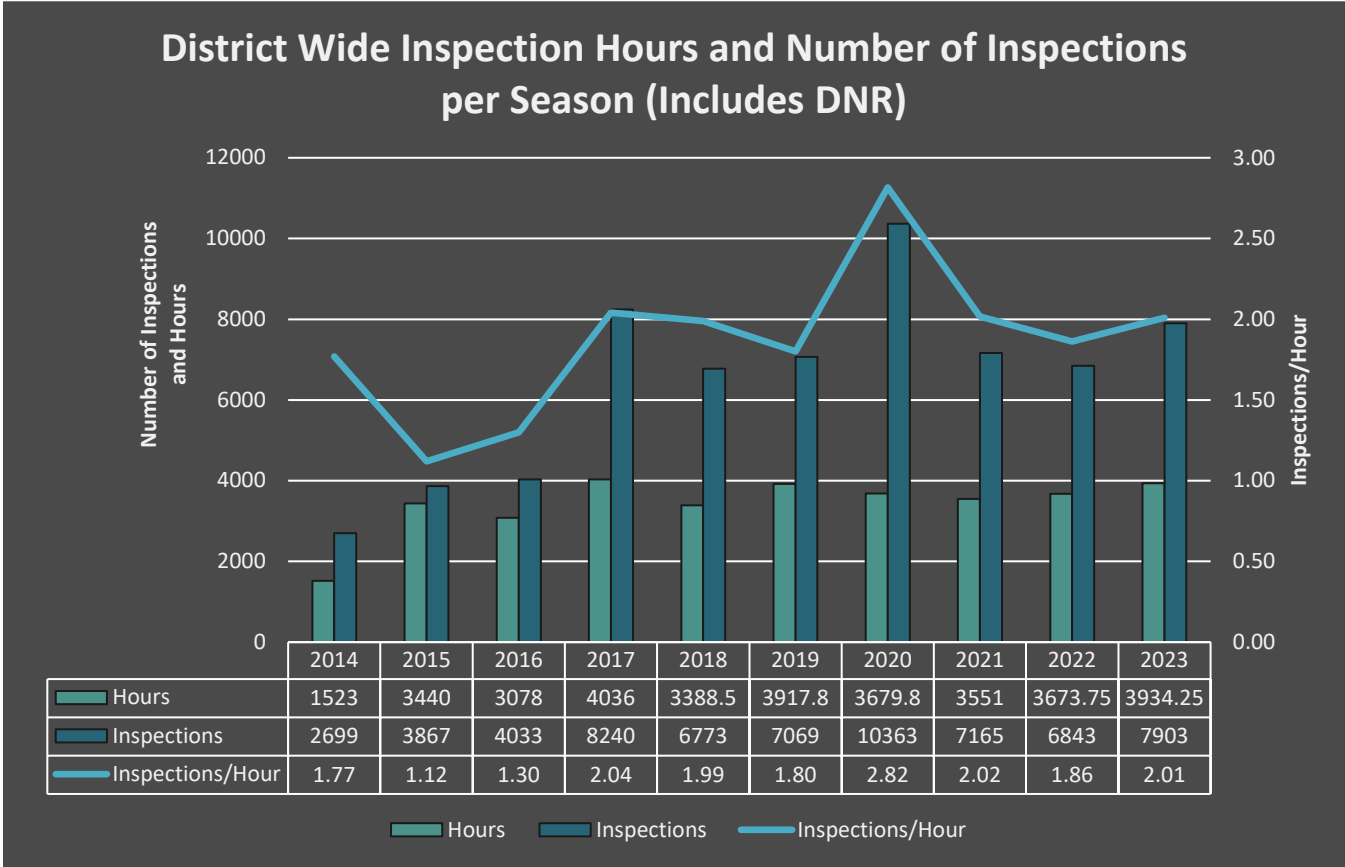


Figure 3. District-wide inspections and hours per season

As a planning tool to meet inspection hour goals, District staff take the number of funded inspections hours and divide it by the number of weeks in the watercraft inspection season. This calculation generates an average number of hours to work per week to use all funded hours by the end of the season. The goal number of hours per week of 145 was met by week 2 and was sustained until week 19 towards the end of the season. 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 can be found in Figure 4 . The spikes in inspections/hours that can be seen in the graph are generally attributed to holidays or seasonal changes (e.g. week five includes Memorial Day and week ten includes the Fourth of July).

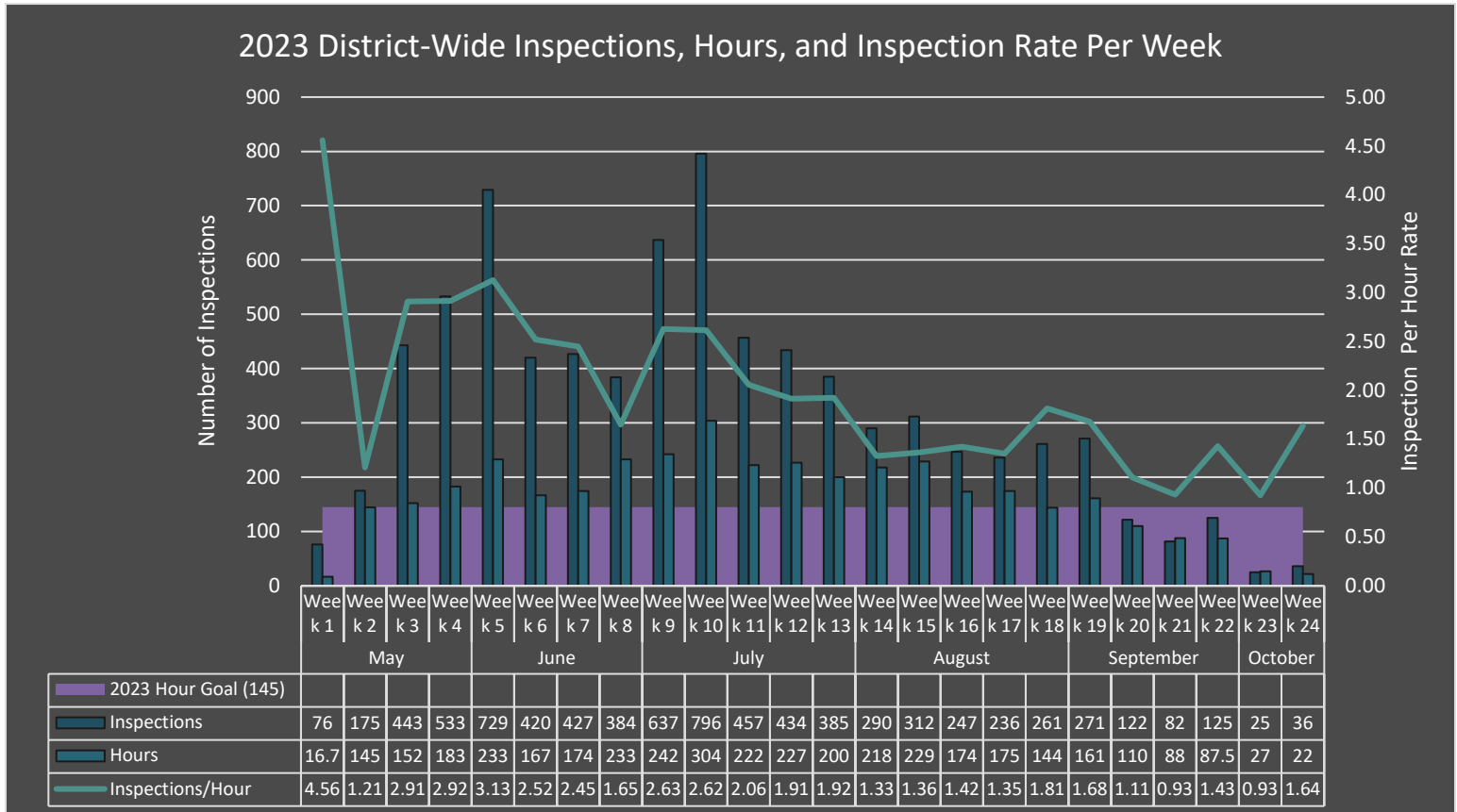


Figure 4. District-wide inspections, hours, rates, and goals

To maximize cost effectiveness and inspection numbers, weekend hours are prioritized for conducting watercraft inspections due to the general higher level of activity. As a result, 65% of hours and 78% of inspections occurred Friday through Sunday. Inspection hours worked during the week (Monday – Thursday) are typically performed by Chisago’s and the DNR’s inspectors. Figure 5 shows the number of inspections and hours per day of the week for the 2023 season.



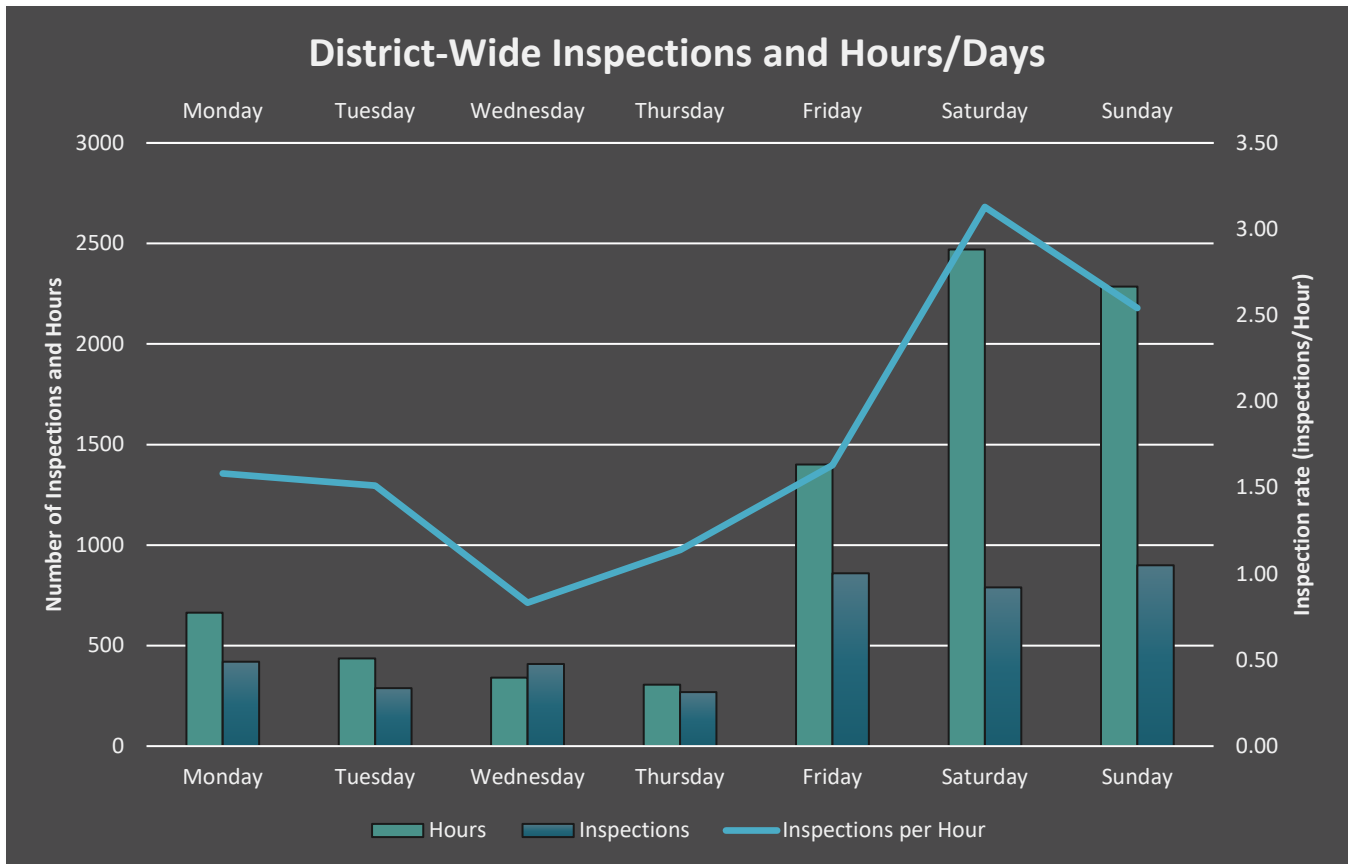


Figure 5. District-wide inspections and hours per day of the week for the 2023 season

### Survey Results

In addition to a watercraft inspector’s responsibility to thoroughly inspect watercrafts for aquatic invasive species (AIS) and other contaminants, they are also required to complete an inspection survey for each boat that enters or exits a lake. Completed surveys are uploaded to the DNR’s state-wide inspection survey database where program coordinators across the state can view the data. Important information such as number of boats entering and exiting a lake, incoming boat AIS violations, and new AIS infestation risk assessment can be calculated. In 2023, a total of 7,903 watercraft inspection surveys were performed on District lakes. Below are some findings from the inspection survey data. A summary of this information can be found in Figure 6.

- 67 watercrafts arrived at District lakes with contaminants such as plants, animals, mud, or water on their equipment.** This number was 50 in 2022, 65 in 2021, 148 in 2020, 122 in 2019, 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.

- **68 watercraft required removal of the bilge drainage plug** upon arriving at District lakes. This number was 29 in 2022, 33 in 2021, 83 in 2020, 85 in 2019, 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.
- **1,275 watercraft exited District lakes with contaminants such as plants, animals, mud, or water present.** This number was 850 in 2022, 786 in 2021, 1462 in 2020, 867 in 2019, 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.



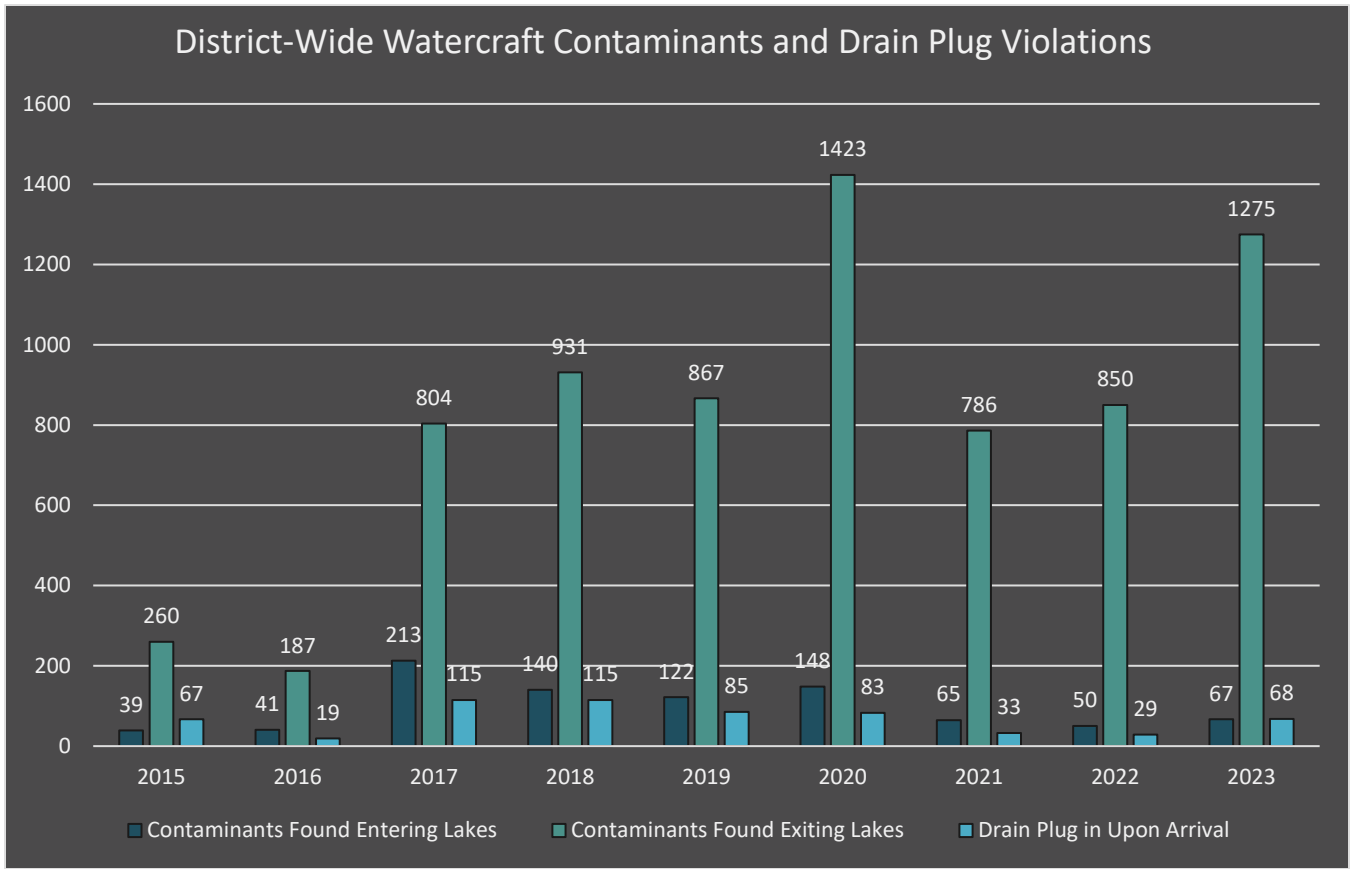


Figure 6. District-wide watercraft contaminants and drain plug violations as reported over the last nine seasons. Contaminants include plants, animals, mud, and water.

Included in the inspection survey are questions regarding the waterbody most likely to be visited next by the boater. Many of the lakes that boaters intend to visit after leaving a District lake do not have all the same AIS present in them. This information stresses the importance of not just preventing AIS from entering District lakes but also preventing AIS from leaving them. Results of this aspect of the survey can be found in Table 1.

<b>Next Lake Boaters Intend to Visit after Leaving a District Lake</b>				
<b>Lakes</b>	<b>Eurasian Watermilfoil</b>	<b>Zebra Mussels</b>	<b>Flowering Rush</b>	<b>Spiny Waterflea</b>
<b>Big Marine, Washington Co.</b>	EWM	X	X	X
<b>St. Croix River, Multiple Co.</b>	EWM	ZM	X	X
<b>White Bear, Ramsey Co.</b>	EWM	ZM	X	X
<b>Coon, Anoka Co.</b>	EWM	X	X	X
<b>Minnetonka, Hennepin Co.</b>	EWM	ZM	FR	X
<b>Chisago, Chisago Co.</b>	EWM	X	X	X
<b>Mille Lacs, Mille Lac Co.</b>	EWM	ZM	X	SW
<b>Bald Eagle, Ramsey Co.</b>	EWM	ZM	FR	X
<b>Clear, Washington Co.</b>	EWM	X	X	X
<b>Green, Chisago Co.</b>	X	X	X	X

Table 1. Top 10 lakes boaters intended to visit after leaving a District lake in 2023

### Risk of New Invasive Species

Unfortunately, many CLFLWD lakes are home to a number of aquatic invasive species such as curly-leaf pondweed, Eurasian watermilfoil, flowering rush, zebra mussels, and several others. Species such as these are a concern to the District as they have the ability to cause ecological, recreational, economic, and physical harm. While the District manages many of the aquatic invasive species present in its lakes, it is still widely known that the most effective management strategy is prevention. There are still many species that are not yet in District lakes and one of the main goals of the CLFLWD watercraft inspection program is to prevent their introduction.

Starry stonewort and the spiny water flea are two examples of aquatic invasive species found in Minnesota that are not yet found in District lakes. Starry stonewort is an invasive macro-algae that forms dense mats in lakes that can 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 21 additional lakes across the state. In 2023, five new lakes were added to the DNR’s infested waters list for starry stonewort, Clearwater Lake in Wright County, Long Lake in Kandiyohi County, Long Lake in Hubbard County, and Blackduck and North Twin Lakes 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 68 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 7. contains photos of spiny water flea and starry stonewort.



Figure 7. Spiny water flea (left) and starry stonewort (right). Source: MNDNR

Part of the watercraft 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. District watercraft inspectors required that these watercrafts be cleaned off, decontaminated and/or drained prior to launching into the lake.

- **151 boats launching into District lakes came from lakes infested with spiny water flea.** This number was 95 in 2022, 96 in 2021, 158 in 2020, 111 in 2019, 104 in 2018, 171 in 2017, and 231 in 2016.
- **35 boats launching into District lakes came from lakes infested with starry stonewort.** This number was 48 in 2022, 48 in 2021, 30 in 2020, 22 in 2019, 61 in 2018, 14 in 2017, and 83 in 2016.
- **In 2023, 85 boats came from a waterbody infested with New Zealand mudsnail, 121 from a faucet snail infested lake, and 85 from a lake with the VHS virus.**

<b>Number of Entering Watercrafts Last in an AIS Infested Waterbody</b>						
	<b>Bone</b>	<b>Comfort</b>	<b>Forest 1</b>	<b>Forest 2</b>	<b>Forest 3</b>	<b>Grand Total - All Lakes</b>
<b>Starry Stonewort</b>	3	3	16	4	9	35
<b>Spiny Waterflea</b>	18	14	57	17	45	151
<b>Zebra Mussels</b>	50	30	173	46	110	409
<b>Flowering Rush</b>	21	8	57	19	32	137
<b>Grass Carp</b>	14	10	39	14	30	107
<b>Silver Carp</b>	14	10	39	14	30	107
<b>Big Head Carp</b>	14	10	39	14	30	107
<b>New Zealand Mudsnail</b>	11	8	29	10	27	85
<b>Round Goby</b>	11	8	29	10	27	85
<b>White Perch</b>	11	8	29	10	27	85
<b>VHS</b>	11	8	29	10	27	85
<b>Ruffe</b>	11	8	29	10	27	85
<b>Faucet Snail</b>	14	10	46	17	34	121
<b>EWM</b>	141	118	366	79	212	916

Table 2. The number of watercrafts entering District lakes that reported last being in an AIS infested lake. These figures could be a slight underestimation as a substantial number of inspections did not include enough information to determine which waterbodies boaters were last in.



## Bone Lake

### Inspection Hours and Scheduling

This season, watercraft inspectors performed **714.25 hours of inspections** on Bone Lake which resulted in **866 inspections and associated surveys**. Inspectors averaged **1.21 inspections per hour**. Figure 8. below summarizes the total number of inspection hours and inspections conducted on Bone Lake over the last ten seasons.

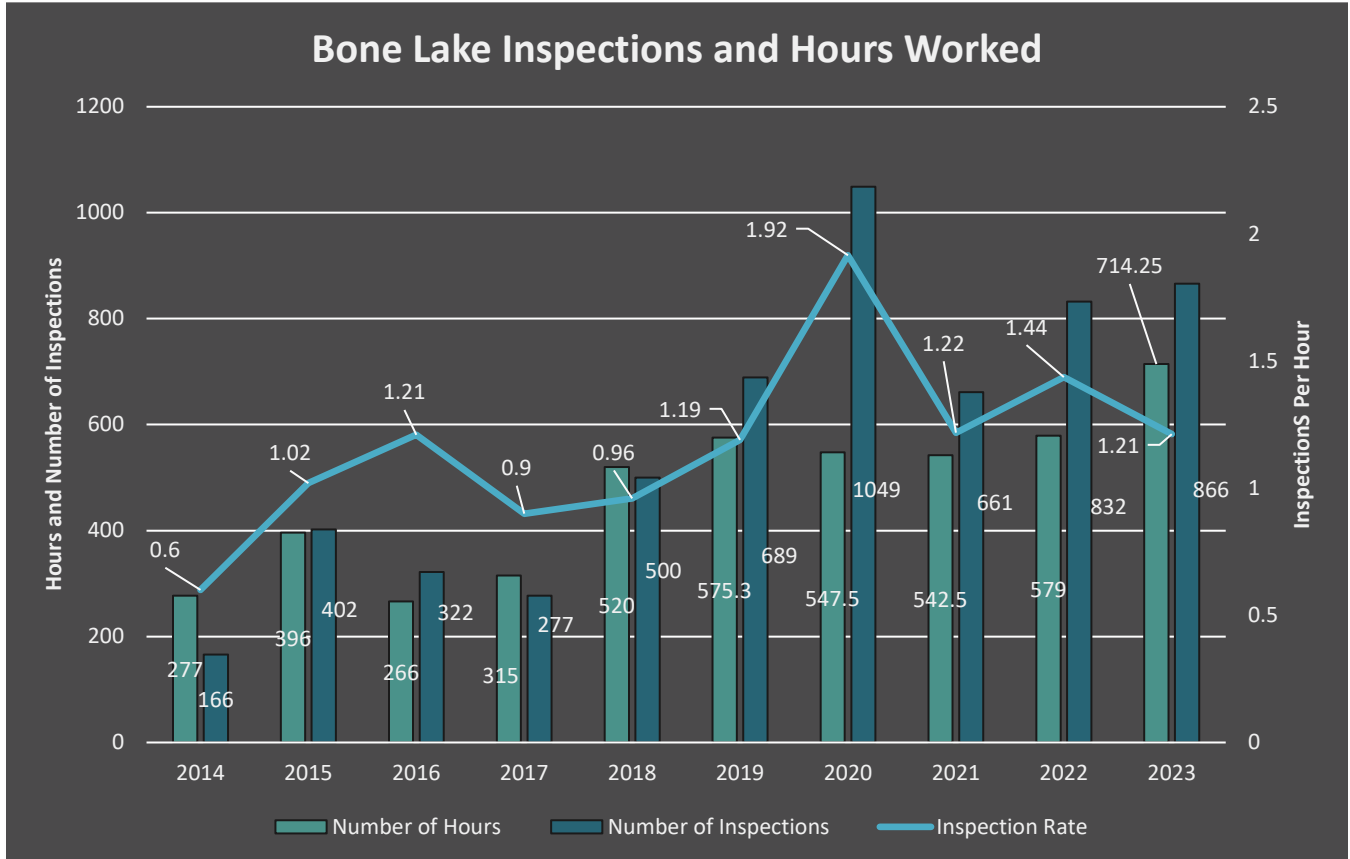


Figure 8. Summary of the total number of inspection hours, number of surveys, and inspection rates for Bone Lake over the last ten seasons.

## Survey Results

A total of 866 surveys were performed on Bone Lake this season. Findings and a summary of the results from the compiled inspection survey data for Bone Lake can be found below and in Figure 9.:

- **4 watercraft arrived at Bone Lake with plants, animals, mud, or water on their watercraft.** This number was 1 in 2022, 1 in 2021, 3 in 2020, 7 in 2019, 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 watercrafts were cleaned off and/or drained prior to launching into Bone Lake.
- **8 watercraft required removal of the bilge drainage plug upon arriving at Bone Lake.** This number was 1 in 2022, 13 in 2021, 12 in 2020, 12 in 2019, 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.
- **38 watercraft exited Bone Lake with plants, animals, mud, or water present.** This number was 79 in 2022, 35 in 2021, 47 in 2020, 50 in 2019, 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.

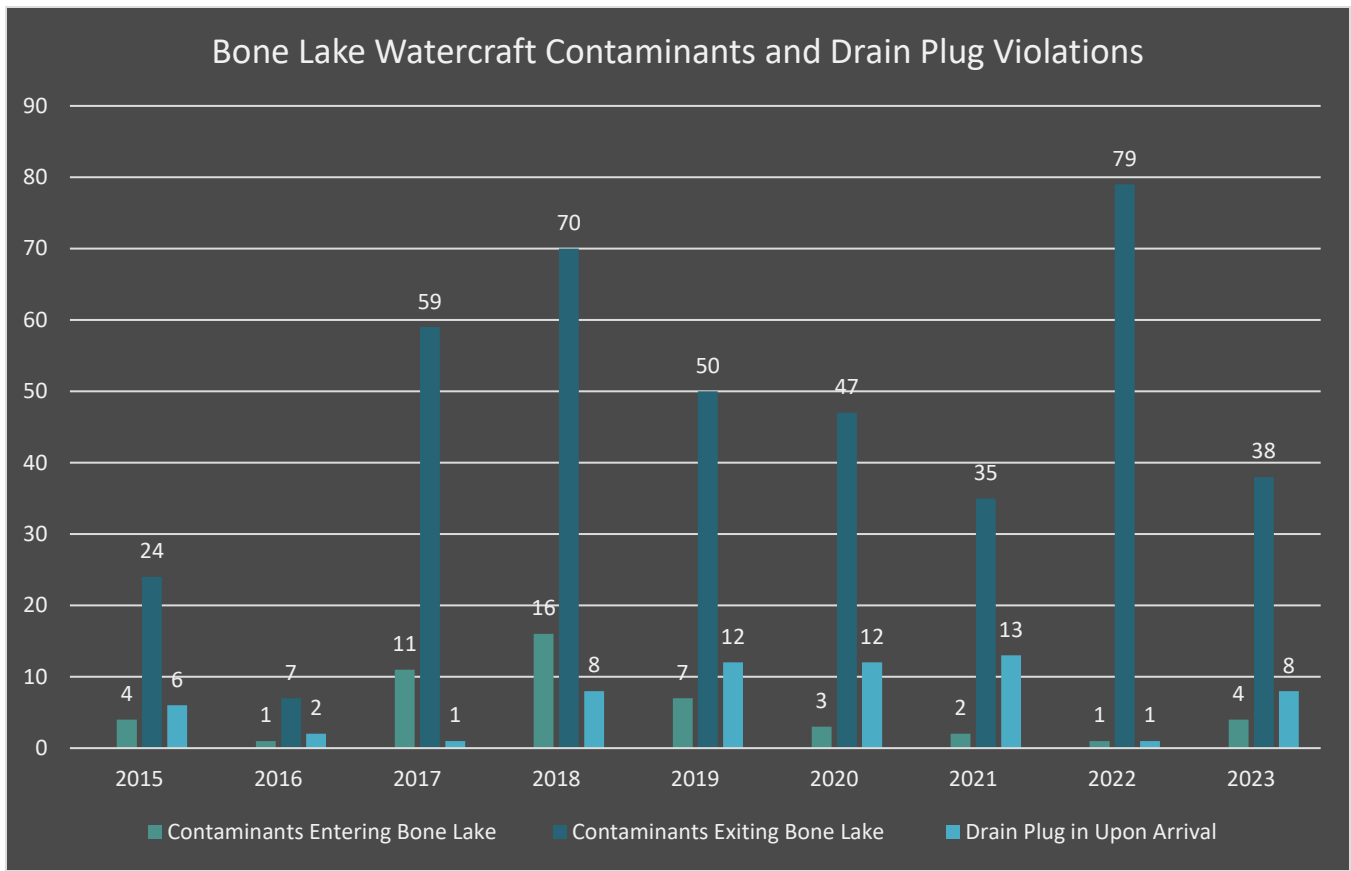


Figure 9. Bone Lake watercraft contaminants (ex. plants, animals, mud, and water) and drain plug violations reported over the last nine seasons.

### Risk of New Invasive Species

A portion of the inspection survey process involves asking 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 with contaminants such as plants or standing water are required to be decontaminated prior to launch.

- 18 boats launching into Bone Lake came from lakes infested with spiny water flea.** For comparison, this number was 10 in 2022, 5 in 2021, 14 in 2020, 7 in 2019, 2 in 2018, 5 in 2017, and 25 in 2016.
- 3 boats launching into Bone Lake came from lakes infested with starry stonewort.** This number was 4 in 2022, 5 in 2021, 2 in 2020, 3 in 2019, 3 in 2018, 0 in 2017, and 2 in 2016.



## Forest Lake

### Inspection Hours and Scheduling

This season, CLFLWD watercraft inspectors performed 2,200 hours of inspections, and DNR inspectors performed 301.75 hours, totaling **2,501.75 total hours of inspections on the three Forest Lake public accesses**. During this time, CLFLWD inspected 5,279 watercraft and the DNR inspected 777 watercrafts, totaling **6,056 inspections and associated surveys**. Together, CLFLWD and DNR inspectors averaged **2.42 inspections per hour**. A summary of this information is presented in Figure 10. and Tables 3 - 5.

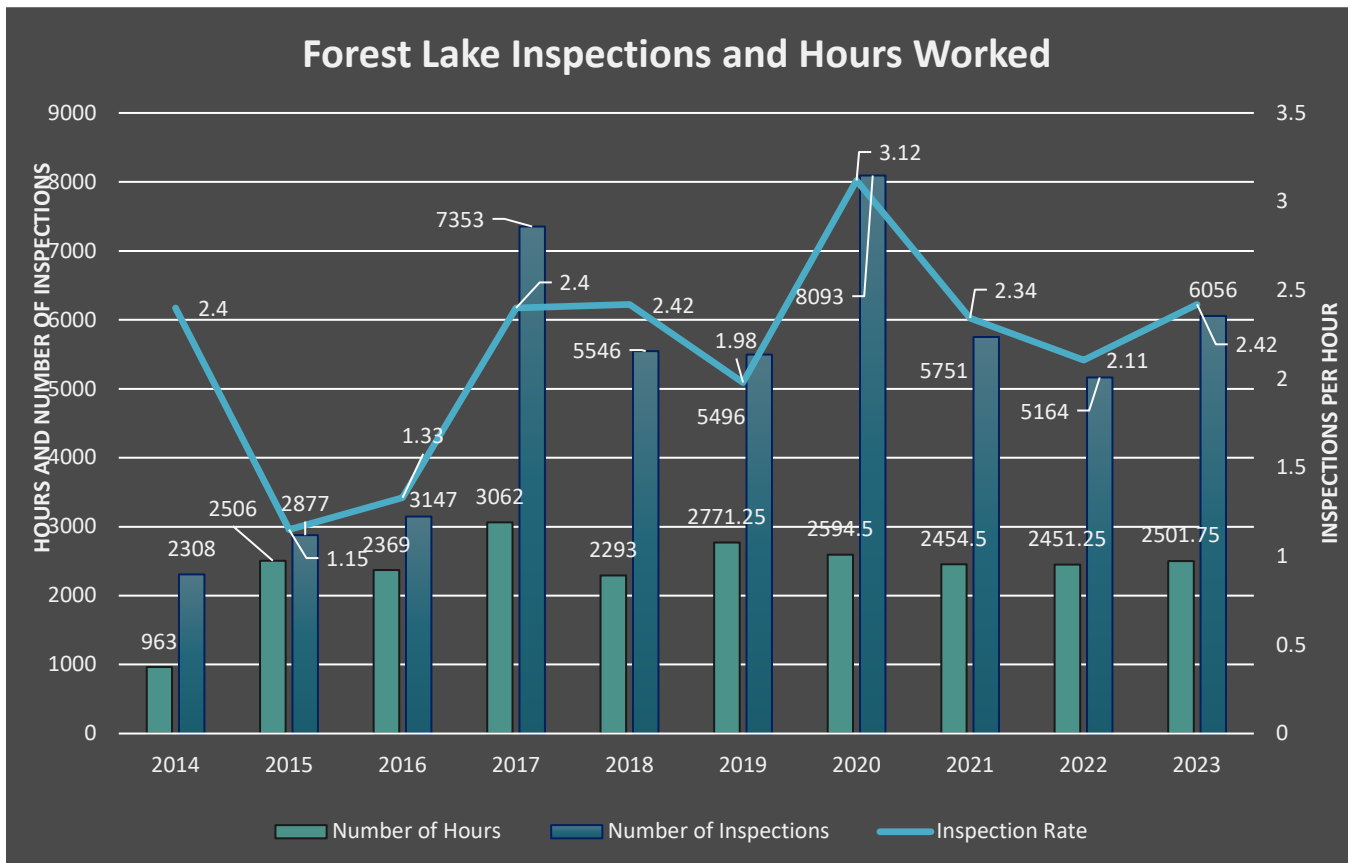


Figure 10. summary of inspections hours, number of surveys, and inspection rates over the last ten seasons at all three Forest Lake public boat launches.

Table 3. Forest Lake inspection hours

	Forest 1 (West or Lakeside Park)	Forest 2 (Middle or Willow Point)	Forest 3 (East or Hagberg)	Total
CLFLWD Inspection Hours	819.5	585.25	795.25	2,200
DNR Inspection Hours	301.75	-	-	370
<b>Total Inspection Hours</b>	<b>1,121.25</b>	<b>585.25</b>	<b>795.25</b>	<b>2,501.75</b>

Table 4. Forest Lake number of inspections

	Forest 1 (West or Lakeside Park)	Forest 2 (Middle or Willow Point)	Forest 3 (East or Hagberg)	Total
CLFLWD Inspections	2,464	920	1,817	5,279
DNR Inspections	777	0	0	846
<b>Total Inspections</b>	<b>3,319</b>	<b>920</b>	<b>1,817</b>	<b>6,056</b>

Table 5. Forest Lake inspection rate (inspections/hour)

	Forest 1 (West or Lakeside Park)	Forest 2 (Middle or Willow Point)	Forest 3 (East or Hagberg)	Average
CLFLWD Inspection Rate	3.01	1.57	2.28	2.29
DNR Inspection Rate	2.57	-	-	2.57
<b>Average Inspection Rate</b>	<b>2.79</b>	<b>1.57</b>	<b>2.28</b>	<b>2.21</b>

## Survey Results

A total of 6,056 surveys were performed on Forest Lake this season. Findings and a summary of the results from the compiled inspection survey data for Forest Lake can be found below and in Figure 11. Below are some findings from the inspection survey data:

- **59 watercraft arrived at Forest Lake with plants, animals, mud, or water on their watercraft.** This number was 44 in 2022, 61 in 2021, 132 in 2020, 87 in 2019, 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. It is against state law to launch a contaminated watercraft at a MN lake, regardless of known current infestations of that lake.
- **55 watercraft required removal of the bilge drainage plug upon arriving at Forest Lake.** This number was 20 in 2022, 131 in 2021, 62 in 2020, 65 in 2019, 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.
- **1,207 watercraft exited Forest Lake with plants, animals, mud, or water present.** This number was 755 in 2022, 727 in 2021, 1191 in 2020, 762 in 2019, 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.



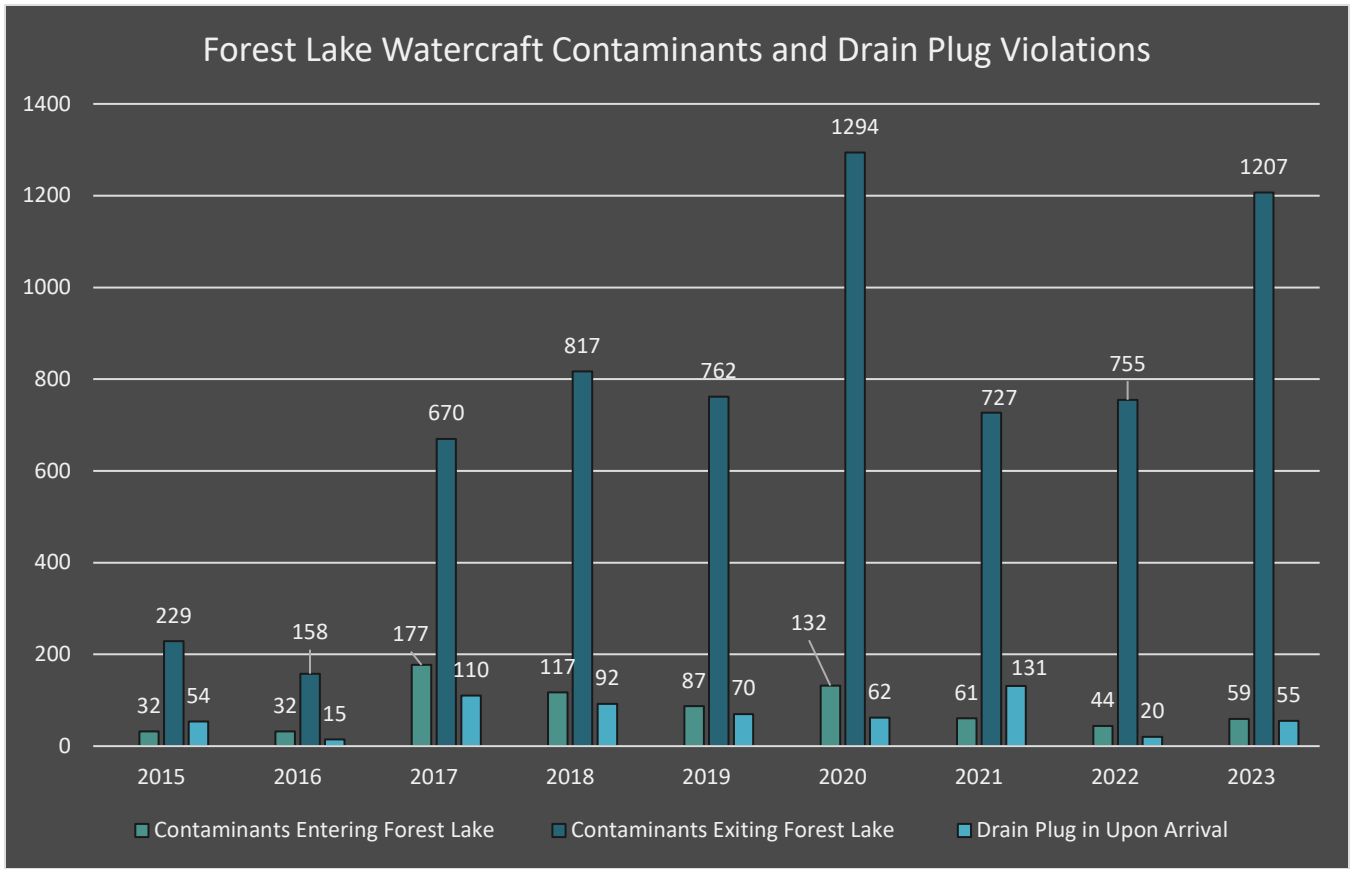


Figure 11. Forest Lake watercraft contaminants and drain plug violations as reported at Forest Lake accesses over the last nine seasons

## 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.

- **119 boats launching into Forest Lake came from lakes infested with spiny water flea.** This number was 74 in 2022, 82 in 2021, 131 in 2020, 92 in 2019, 101 in 2018, 153 in 2017, and 183 in 2016.
- **29 boats launching into Forest Lake came from lakes infested with starry stonewort.** This number was 38 in 2022, 42 in 2021, 27 in 2020, 18 in 2019, 53 in 2018, 12 in 2017 and 74 in 2016.

# Comfort Lake

## Inspection Hours and Scheduling

This summer, watercraft inspectors performed **718.25 hours of inspections** on Comfort Lake which resulted in **981 inspections and associated surveys**. Inspectors averaged **1.37 inspections per hour**. A summary of this information is presented in Figure 12..

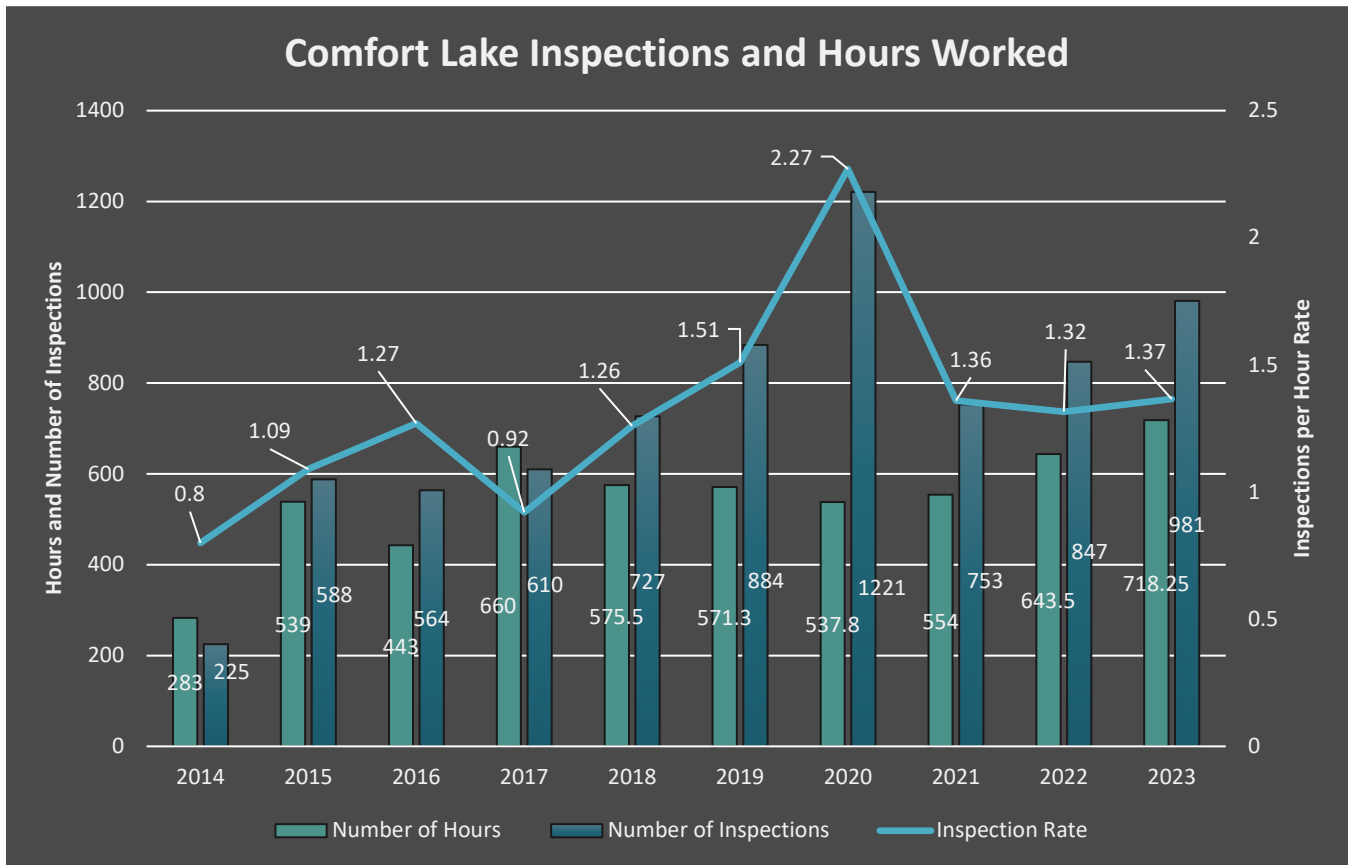


Figure 12. Summary of the inspection hours, number of surveys, and inspection rates completed on Comfort Lake over the last ten seasons.



## Survey Results

A total of 981 surveys were performed on Comfort Lake this season. Findings and a summary of the results from the compiled inspection survey data for Comfort Lake can be found below and in Figure 13.

- **4 watercraft arrived at Comfort Lake with plants, animals, mud, or water on their watercraft.** This number was 5 in 2022, 5 in 2021, 13 in 2020, 28 in 2019, 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 watercraft were cleaned off and/or drained prior to launching into Comfort Lake.
- **5 watercraft required removal of the bilge drainage plug upon arriving at Comfort Lake.** This number was 8 in 2022, 10 in 2021, 9 in 2020, 8 in 2019, 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 prior to the watercraft launching in an area that would not flow into the lake.
- **30 watercraft exited Comfort Lake with plants, animals, mud, or water present.** This number was 16 in 2022, 24 in 2021, 82 in 2020, 55 in 2019, 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.

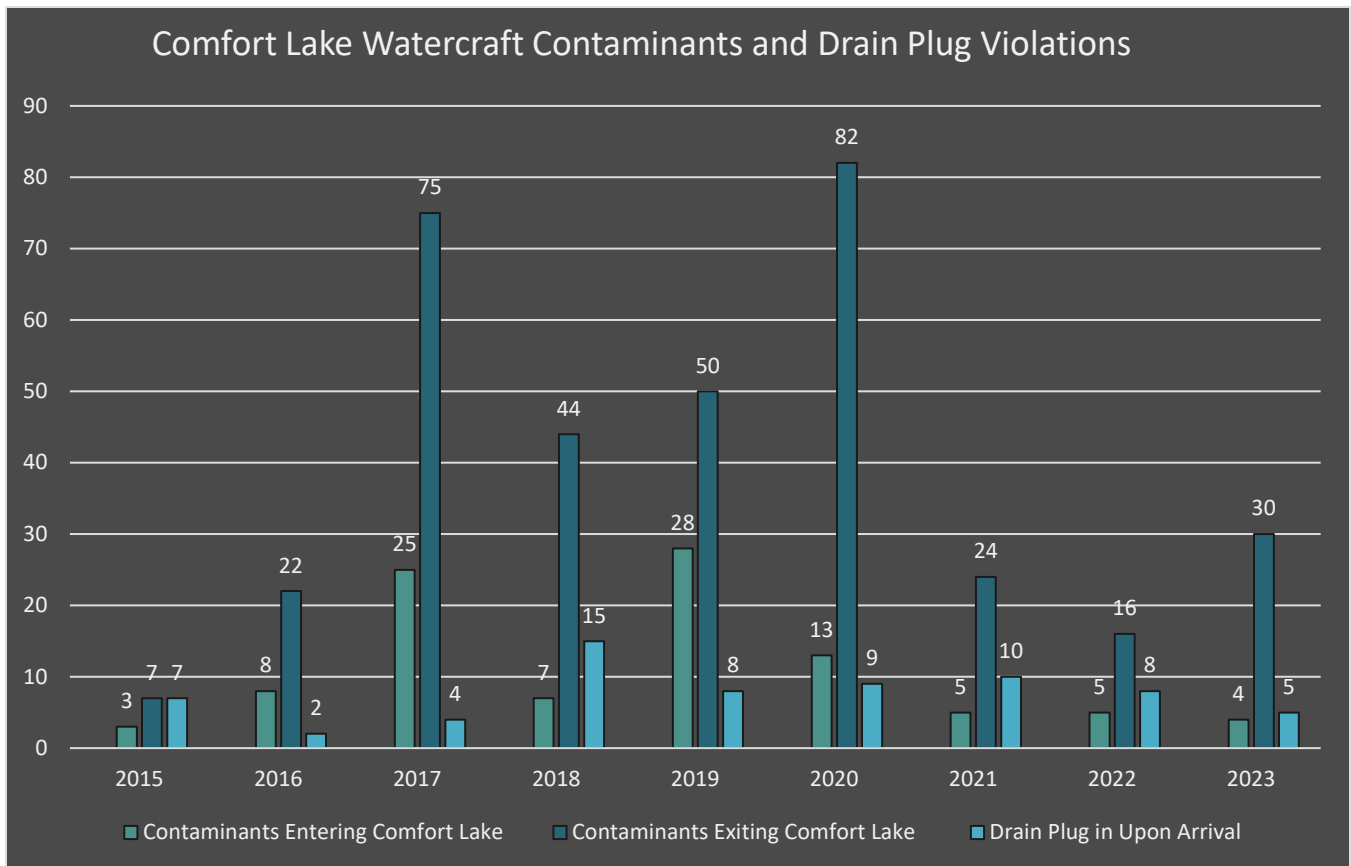


Figure 13. Comfort Lake watercraft contaminants and drain plug violations as reported at Comfort Lake over the last eight seasons

### 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.

**14 boats launching into Comfort Lake** came from lakes infested with **spiny water flea**. For comparison, this number was 11 in 2022, 9 in 2021, 13 in 2020, 12 in 2019, 7 in 2018, 13 in 2017, and 24 in 2016.

- **3 boat launching into Comfort Lake** came from lakes infested with **starry stonewort**. This number was 6 in 2022, 1 in 2021, 1 in 2020, 1 in 2019, 5 in 2018, 2 in 2017 and 7 in 2016.

## Discussion and Conclusion

The 2023 watercraft inspection season was a success in terms of reaching hour goals set pre-season (District-wide goal = 3,600 hours). In total, 3,934.25 hours were worked by watercraft inspectors across the District's five public accesses, which resulted in 7,903 related inspections surveys. While 2020 remains the year's busiest for inspection surveys (10,363 surveys), 2023 ranked third in the District history with the program, barely beat out for second by 2017 (8,240 surveys). One area in which the 2023 program excelled was providing excellent boat launch coverage during the peak of the season (June – August). This coverage is mostly due to fewer hiring difficulties early-season, which allowed the program to start off strong beginning in early-May.

As mentioned, a major component of this year's success was due to fewer hiring difficulties. In total, the District hired 9 in-house inspectors, 6 of which were returning individuals. Not only do returning inspectors reduce onboarding and administrative work, but they also bring seasoned experience and expertise specific to the District's program. The District greatly values its returning inspectors and has made efforts to retain them through yearly pay raises, among the other compensation offerings available to all, which include competitive starting wages, holiday pay, and performance bonuses. Through Program Coordinator and Lead Watercraft Inspector support and flexible scheduling, the District continues to foster a fun, fair, and enjoyable working environment that will hopefully keep valuable inspectors returning.

In addition to the 9 inspectors hired in-house, Chisago County provided an additional four inspectors through the joint power agreement. These inspectors rotated through the District's five accesses and focused their hours Monday-Thursday, whereas the District primarily focuses its hours Friday-Sunday. In total, Chisago County Inspectors worked 978 hours (24% of all hours) and performed 897 inspections (11% of all inspections). Additionally, the DNR also provided inspector coverage at the Forest Lake West public access. In total, the DNR worked 370 hours (9% of all hours) and conducted 777 inspection surveys (10% of all inspections). The partnership and collaboration with both parties helps provide great coverage across the District.

Beyond inspections, District inspectors continued to emphasize the importance of education and engagement. Included in the inspector's equipment kits were lake brochures and other educational AIS handouts. Inspectors were encouraged to offer these items to interested visitors, especially those that were new to the area or were unfamiliar with AIS. For each of the season's three holidays (Memorial Day, Independence Day, and Labor Day), inspectors were given other fun District branded handouts which included key floats, can koozies, sunglasses, buttons, stickers, and pens. The



District wants each interaction with the WCI Program to be a positive one, and this effort has been well received and popular for the last couple of years. Next season, District staff will consider other educational handouts and public access amenities to maintain a positive, helpful, and educational public image.

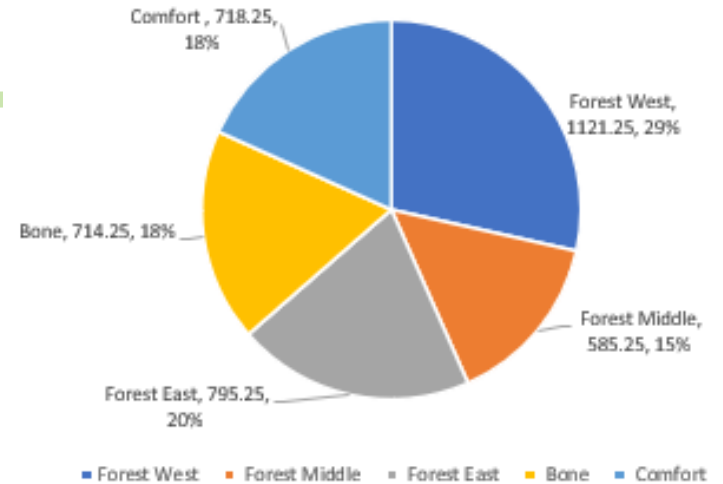
Overall, the CLFLWD's 2023 watercraft inspection season was very successful in reaching its hour and inspection goals. These achievements would not have been possible without the support of the community, local lake associations, and the District's partners. Their generous financial contributions and feedback are greatly appreciated and go a long way to support the program. In 2024, the District will again seek out passionate water stewards for the watercraft inspector positions that will best represent the District and serve the community to preserve the ecological health and recreational quality of the area's waterbodies.

# Comfort Lake—Forest Lake Watershed District

## 2023 Watercraft Inspections

In 2023, CLFLWD and Minnesota DNR inspectors spent a total of **3,934.25 hours** at landings in the CLFLWD inspecting watercraft and educating boaters. **7,903 inspections** were completed this year.

Inspection Hours at Each Access And % Of Total Hours (DNR Hours Included)



District Wide Inspection Hours and Number of Inspections per Season (Includes DNR)



- **1.48 %** of boaters **entering** the water had **plants, animals, water, mud**, etc. on their boat at the time of inspection. This can be compared to 1.23% in 2022, 1.06% in 2021, 0.03% in 2020, 1.7% in 2019, 3.8% in 2018, 5.4% in 2017 and 2.4% in 2016.
- **1.50%** of boaters **arriving** at the launch had their **drain plug in** at the time of inspection. This can be compared to 0.72% in 2022, 0.54% in 2021, 0.01% in 2020, 1.2% in 2019, 3.1% in 2018, 3.8% in 2017 and 3.1% in 2016.
- Inspectors averaged **2.01 inspections per hour**. This can be compared to 1.86 in 2022, 2.02 in 2021, 2.83 in 2020, 1.8 in 2019, 2.0 in 2018, 2.04 inspections per hour in 2017 and 1.31 inspections per hour in 2016.

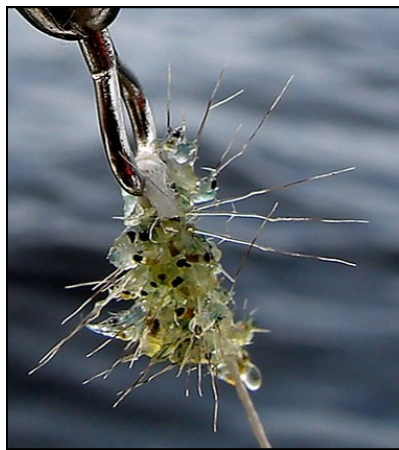
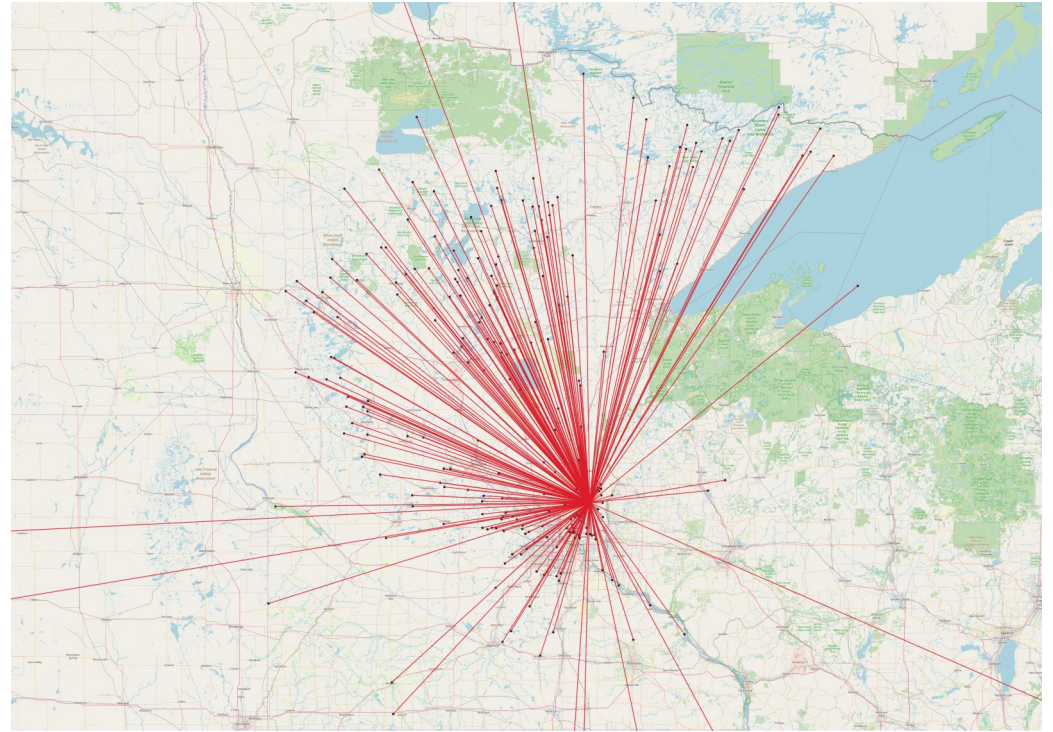


**CLFLWD**  
WATERSHED DISTRICT

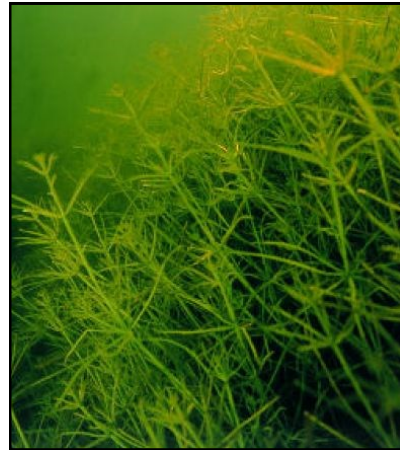


## Inspections were performed on:

- **151 watercraft that had previously been in spiny water flea-infested lakes.** This number was 95 in 2022, 96 in 2021, 158 in 2020, 111 in 2019, 104 in 2018, 171 in 2017, and 231 watercraft in 2016.
- **35 watercraft that had previously been in starry stonewort-infested lakes.** This can be compared to 48 in 2022, 48 in 2021, 30 in 2020, 22 in 2019, 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.**