1.0 INTRODUCTION

The Tomahawk Lake System is a drainage system in Oneida County and are designated as a Statewide AIS Source Water (Figure 1.0-1). Tomahawk Lake and Little Tomahawk Lake are designated as Outstanding Resource Waters (ORW) by the Wisconsin Department of Natural Resources (WDNR). Over 900 waterfront parcels exist on these lakes, paying taxes on around 225 million dollars of property. Further, the system is an integral part of Oneida County's tourism trade.

The primary citizen-based organization leading management activities on the Tomahawk System is the Tomahawk Lake Association (TLA). EWM was first documented in 2003, with the TLA being formed in 2005 to lead management efforts towards this species.

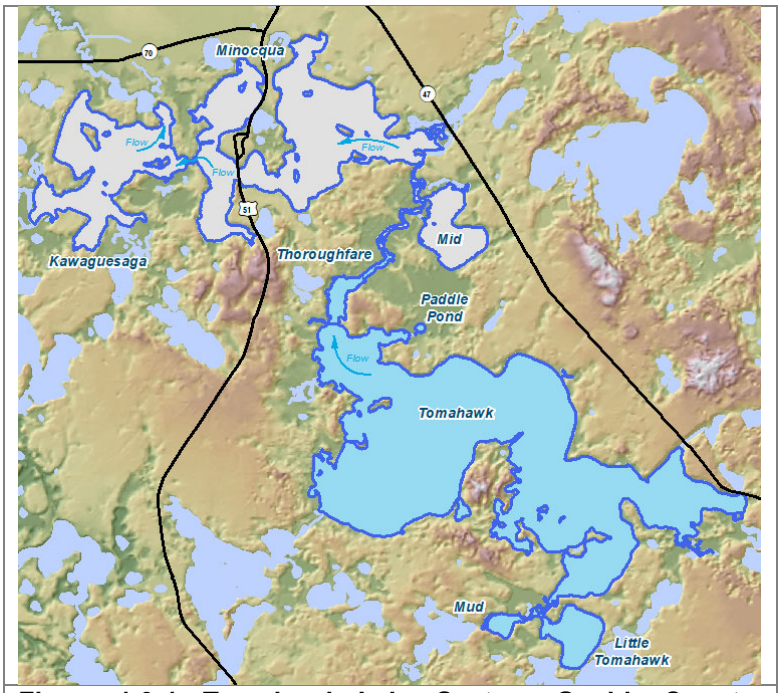


Figure 1.0-1. Tomahawk Lake System, Oneida County, Wisconsin.

1.1 Historic EWM Management & Planning

Targeted 2,4-D spot treatments occurred on the system from 2006-2016. In 2009, the TLA created a Hydraulic Conveyor System (HCS) which now falls into what is commonly called Diver Assisted Suction Harvesting (DASH). The HCS system has been operated on the Tomahawk Lake System from 2009 to 2021.

The TLA's *Comprehensive Lake Management Plan* for Tomahawk Lake was finalized and approved by the WDNR in 2016. No herbicide treatment occurred during 2017-2018, as the plan discussed that small treatment sites have not been effective with traditional spot treatments using weak acid herbicides (traditionally 2,4-D). In 2019, a trial set of treatments using Aquastrike (2,4-D & endothall) and ProcellaCOR (florpyrauxifen-benzyl) occurred with limited success.

With changes in technologies and what is considered a *Best Management Practice* (BMP) for EWM management, the TLA investigated options outside of herbicide and manual removal efforts that may have more direct benefit with fewer potential unknown risks, such as targeted mechanical harvesting. During the spring of 2019, the TLA applied for a WDNR permit to conduct a mechanical harvesting trial in select parts of the system including Thoroughfare. The 2019 season was met with mechanical failures such that the TLA opted to rerun the trial again in 2020.

During 2020, two days of mechanical harvesting were conducted on July 16-17 on roughly 19 acres. This location was revisited 52 days later on September 7 for assessment. The results indicate that EWM growth had largely returned to the surface by this time, so any improvement in navigation or recreation in this area was less than 52 days. The TLA now knows that 2 days is an insufficient amount of mechanical harvesting to sufficiently target an area of this size and with the amount of EWM biomass. The TLA also understands that 52 days of relief is unrealistic to gain from a single cutting.

During the later-summer of 2021, the TLA worked with the local WDNR biologist (Scott Van Egeren) and Onterra to develop an adaptive management strategy that may be worthy of WDNR Control Grant funding. The TLA secured the maximum WDNR grant award allowed ($150,000) to fund a trial mechanical harvesting project in 2022 and 2023. Slightly larger equipment would be used as part of the 2022-2023 effort in which over 100 acres was preliminarily estimated to be targeted and monitored. This report is the first deliverable for the 2-year grant-funded project (ACEI-293-22).

Because the science and understanding of aquatic plant management is constantly evolving, the WDNR recommends that lake organizations update these aspects of their *Plan* approximately every 5 years. During 2021-2022, the TLA created an updated *Aquatic Plant Management* (APM) Plan. While this project was focused on revisiting the TLA's aquatic plant management-related Implementation Plan to update its content based on the lessons learned since the last *Plan*, this document also incorporates aspects of shoreland condition and lake stewardship. The *APM Plan* was approved by the WDNR in December 2022.

The *APM Plan* outlined several management goals, with specific actions outlined to assist with reaching each goal. In regards to EWM management, the TLA's defined goal is to:

Actively manage EWM to keep the population from negatively impacting recreation, navigation, and aesthetics

In order to reach this objective, the TLA has developed a multi-pronged approach as part of this Integrated Pest Management (IPM) Program.

- ***Mechanical Harvesting*** will be the primary EWM management tool. Much of the EWM footprint of EWM in the Tomahawk Lake System is in offshore and exposed areas where herbicide treatment is not likely to be effective. Building off what was learned in previous attempts, a more robust trial mechanical harvesting program will occur in 2022-2023 to continue to learn how to best implement this tool and develop success expectations.
- ***Herbicide Treatment*** will be integrated into the IPM Program after trials document its effectiveness. The first trial will occur in spring 2023. Herbicide treatment is likely to be confined to protected bays of the lake where the likelihood of success is higher. These areas may also be less compatible with mechanical harvesting, as they contain shallow water and/or docks and other obstacles.
- ***Hand-Harvesting*** using HCS/DASH will be applied by requesting riparians at a local scale. The costs of the action will be the responsibility of the requesting riparian, with assistance on permitting from the TLA.

During fall of 2022, the TLA successfully applied for a WDNR AIS Control Grant to fund a one-year trial herbicide treatment in Tomahawk Lake. This grant program allowed WDNR funding up to $50,000, which will facilitate targeting two areas of the system, in the bay where the Lake Tomahawk public landing resides and an area locally known as Pickerel Bay.

1.2 2022 Mechanical Harvesting Strategy

Areas targeted for mechanical harvesting include areas within high riparian footprint and areas of local importance for recreation. During the winter prior to the 2022 field season, the TLA worked with Onterra and Aquatic Plant Management LLC to create a preliminary mechanical harvesting strategy, with attention to the development of a prioritization and efficiency strategy (Map 1). Aquatic Plant Management completed around 90 days of mechanical harvesting between June and October, removing

approximately 123,000 cubic feet of EWM from 36 predefined and prioritized locations. Aquatic Plant Management also conducted riparian-focused DASH removal at 10 properties around Tomahawk Lake Additional details of the harvesting efforts are included within the Tomahawk Lake EWM Removal Report authored by Aquatic Plant Management and included with this report as Appendix A.

2.0 2022 MONITORING RESULTS

The professional monitoring design of the project consists of pre- and post-harvesting monitoring of the aquatic plant community through a sub-sample point-intercept survey. A professional EWM mapping survey will also occur in 2023 to compare with the 2021 survey (not reported on here). Volunteer-based monitoring will aim to monitor the longevity of relief provided by mechanical harvesting by measuring the distance from the top of the EWM plants to the surface of the lake at designated intervals following the mechanical harvesting activities.

2.1 Quantitative Monitoring: Sub-Sample Point-Intercept Survey

A quantitative monitoring plan was created for this trial treatment site in which a total of 342 sub-sample point-intercept sampling locations were contained within the mechanical harvest areas and 45 were placed within an un-targeted control site (Map 2). The quantitative assessment would be completed through the comparison of the sub point-intercept survey from June 2022 (*prior to harvesting*), late-season 2022 (*after 1 harvest season*), and late-season 2023 (*after 2 harvest seasons*). This will allow an understanding of how native and non-native plant populations are impacted by the mechanical harvesting effort.

Figure 2.1-1 shows the results of the pre- and post mechanical harvesting monitoring of EWM during 2022. EWM populations increased in all sites between the June and September surveys following the typical phenological population trajectory.

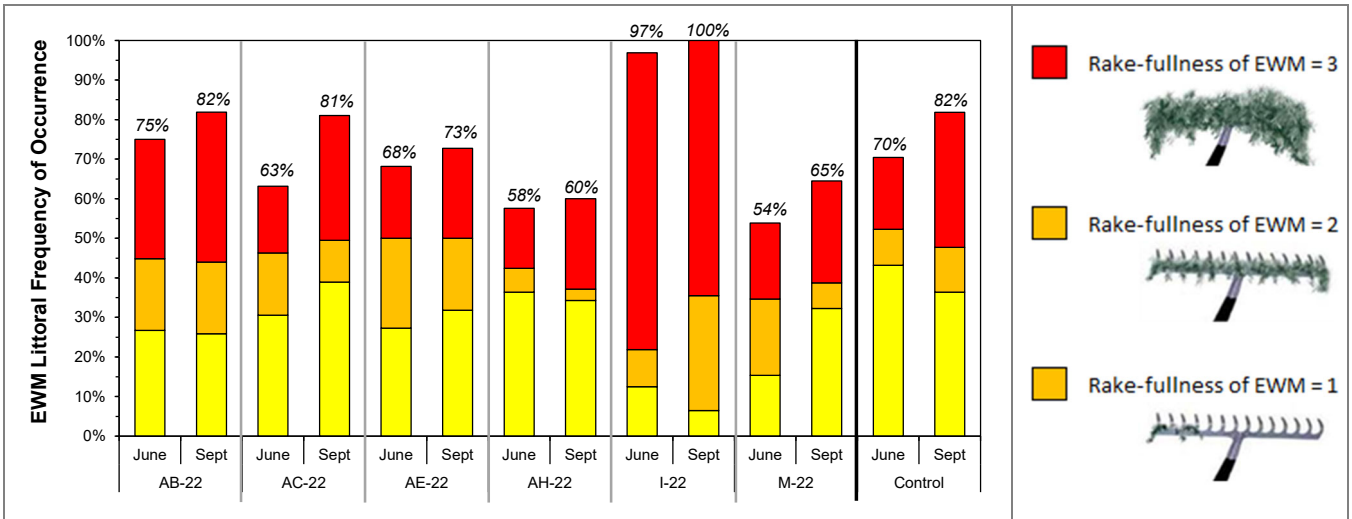


Figure 2.1-1. EWM Littoral frequency of occurrence from sub-sample point-intercept surveys in Tomahawk Lake.

The results of the entire aquatic plant populations within these same select sites is shown in the multipage Figure 2.1-2. Some aquatic plant species displayed increases over the summer growing season, but almost no species were negatively impacted by the mechanical harvesting operation.

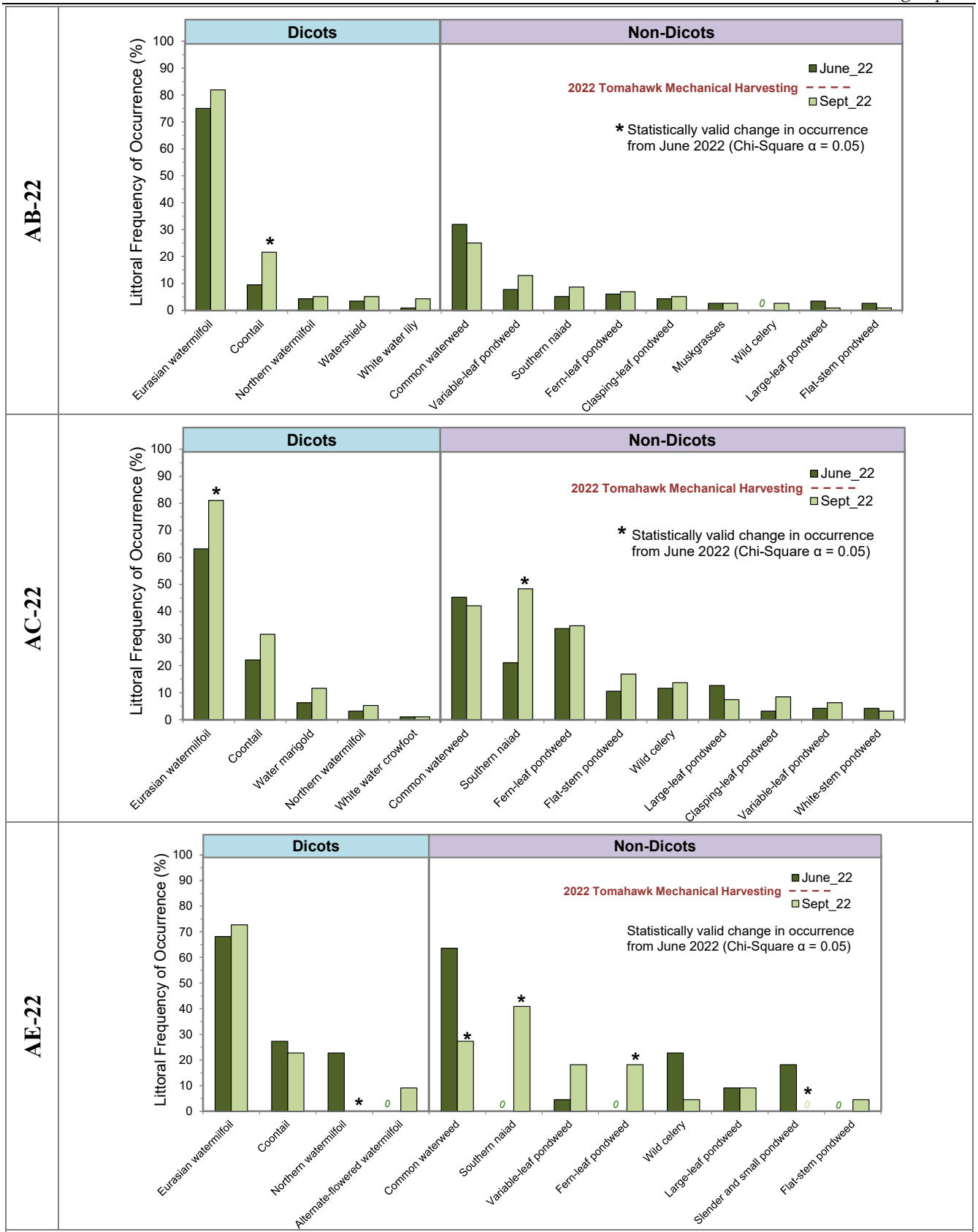


Figure 2.1-2. Littoral frequency of occurrence of aquatic plants from sub-sample point-intercept survey in Tomahawk Lake.

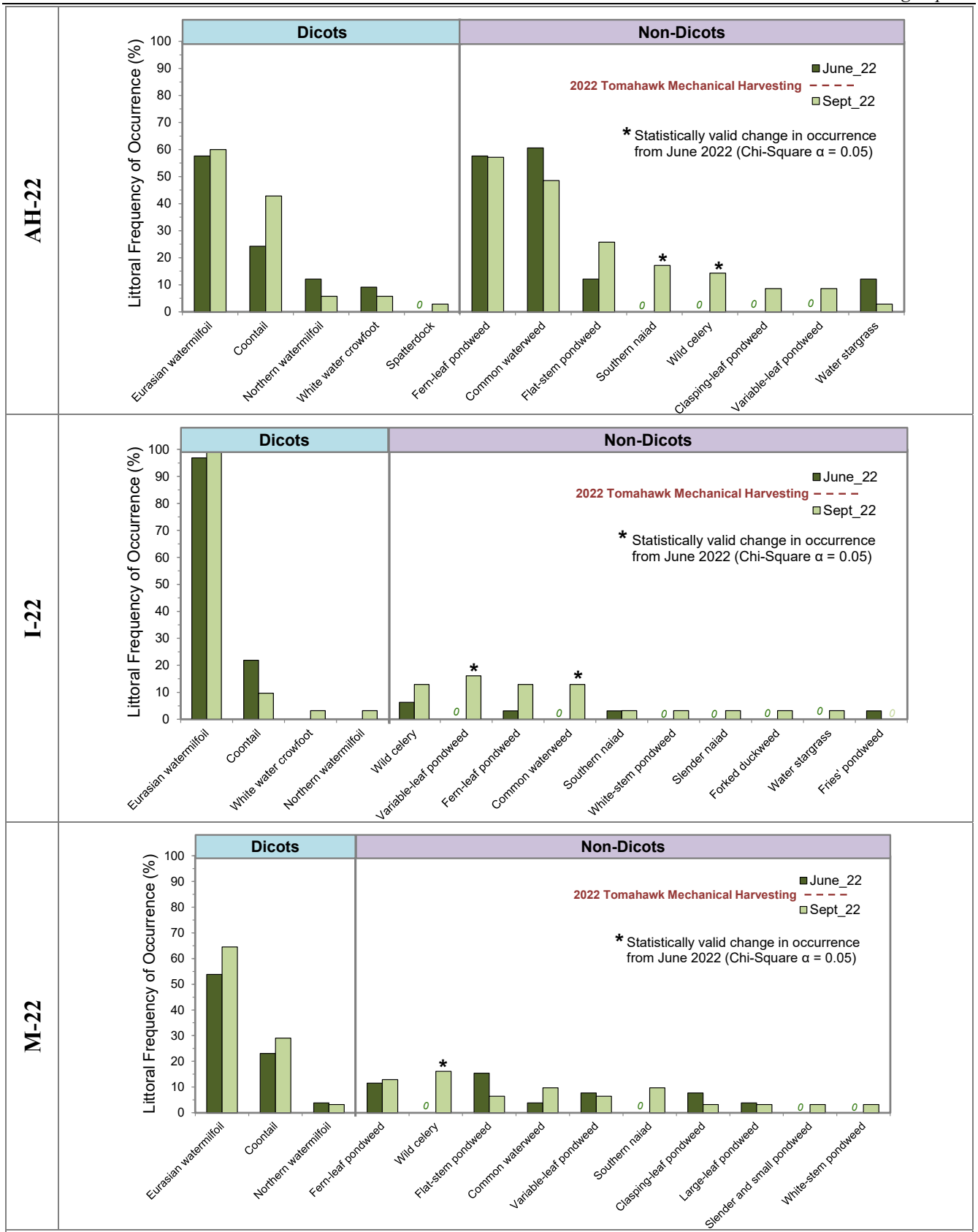


Figure 2.1-2 continued. Littoral frequency of occurrence of aquatic plants from sub-sample point-intercept survey in Tomahawk Lake.

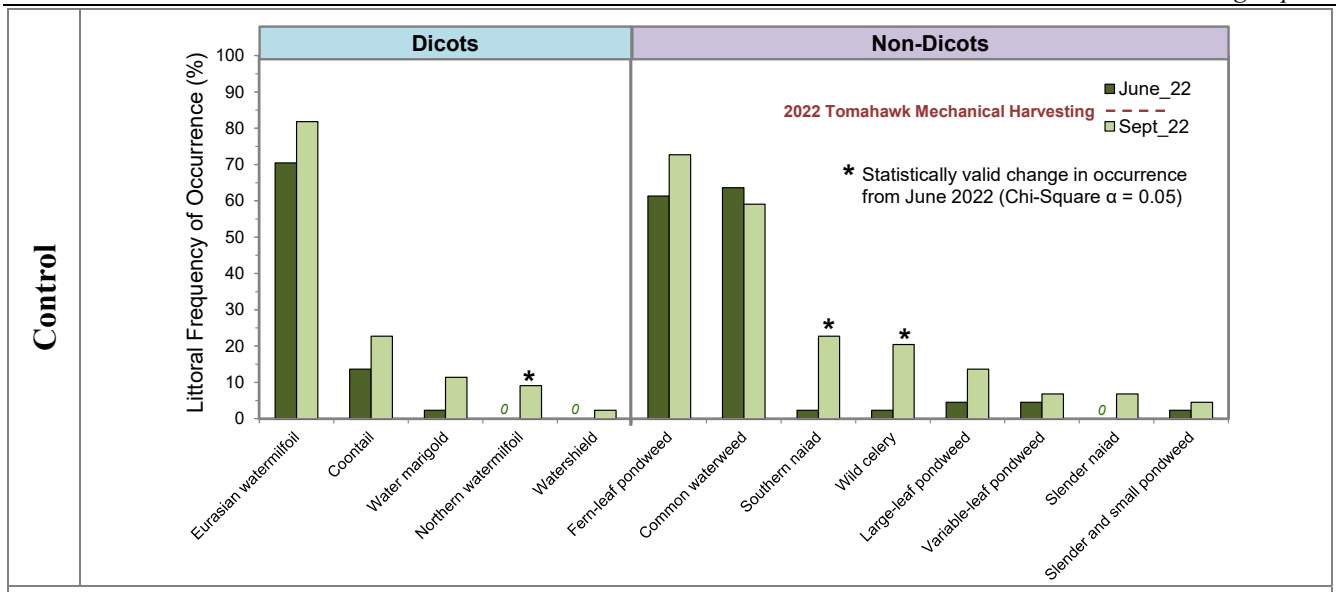


Figure 2.1-2 continued. Littoral frequency of occurrence of aquatic plants from sub-sample point-intercept survey in Tomahawk Lake.

2.2 Volunteer-Based EWM Regrowth Monitoring

A pilot program was initiated in 2021, where volunteers were provided a 6-ft graduated PVC pipe to measure the distance from the top of the EWM plants to the surface of the lake. During this project, volunteers would collect data from multiple predefined sites per harvesting plot at different time intervals.

Unfortunately, the logistics of implementing this monitoring were challenging for the TLA. Recently cut plants were difficult to measure, especially those that were cut to 6 feet deep. Therefore monitoring occurred between cuttings, with subsequent cuttings limiting the amount of data generated. Ultimately, the data that was collected in 2022 allowed an understanding of EWM re-growth over time at five locations in roughly mid-July. The data indicate that EWM grew an average of just over a foot a week. Additional efforts for 2023 will be aimed at gathering more overall data, perhaps allowing the ability to query aspects such as time of year, impacts of multiple cut events, etc.

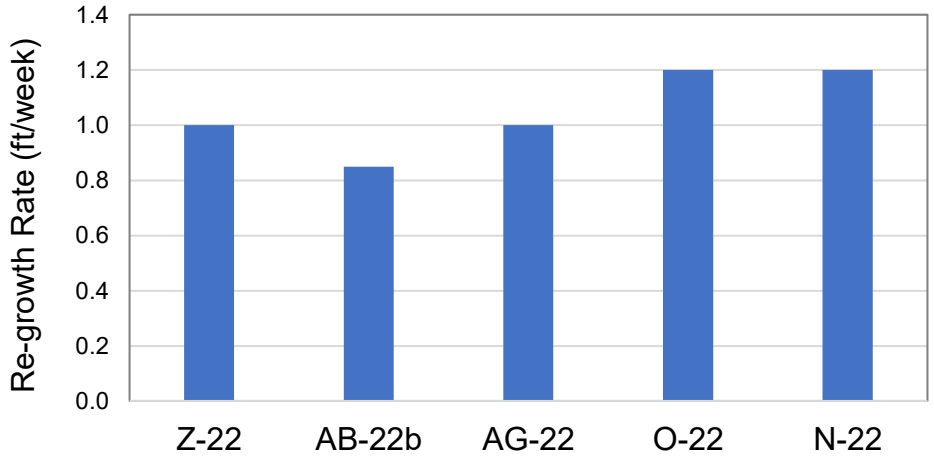


Figure 2.2-1. EWM growth rates from 5 sites prior to mechanical harvesting

3.0 CONCLUSIONS & DISCUSSION

The mechanical harvesting program implemented in 2022 allowed the greatest effort of mechanical harvesting on the Tomahawk Lake System to date. Early-season efforts allowed basic access by cutting lanes, later transitioning to targeted block areas to maximize benefits to navigation, recreation, and aesthetics. Mechanical harvesting followed a priority list, factoring in weather (particularly wind) conditions and minimizing transit time for offloading. Mechanical harvesting occurred throughout the growing season into late-September and October.

Once again, EWM fragmentation was a concern for riparians. For established EWM populations like those that exist on the Tomahawk Lake System, lake managers are not really concerned with EWM fragments caused by mechanical breakage as the role of auto-fragmentation has a much greater impact on EWM spread within a lake. Conditions change from year to year and the footprint and density of EWM will also, even if unmanaged. While EWM fragments may not be a concern from a population management perspective, fragments of any plant species can be unwelcomed by riparians when they accumulate on their shoreline. The TLA will continue to investigate options to minimize the nuisance conditions caused by EWM fragments.

The aquatic plant monitoring that occurred in 2022 indicated that native plant populations were largely unimpacted by the mechanical harvesting operations. Additional monitoring will be helpful to learn if continued mechanical harvesting efforts may cause shifts in plant population, especially those that rely on seeds for continued population regeneration. The volunteer-based monitoring indicated that EWM regrew about a one foot per week. This allows for a baseline understanding of time between harvesting depending on the depth of cutting at a particular site.

3.1 2023 EWM Herbicide Management & Monitoring Strategy

The mechanical harvesting contractor noted that the biggest obstacle to productivity was a few select colonies required a large amount of effort both for harvesting and for off-loading times. In order to make the mechanical harvesting program more productive, the TLA is investigating adding herbicide management into their Integrated Pest Management (IPM) Program.

The TLA's successfully WDNR AIS Control Grant application (ACEI-312-23), allows the TLA to target two areas of the system as part of a trial effort: in the bay where the Lake Tomahawk public landing resides and an area locally known as Pickerel Bay (Map 3). The associated monitoring plan is discussed in the next sections, where current TLA grants will assist with cost share for post treatment monitoring in 2023. The TLA aims to continue monitoring the treatment sites in 2024 and will be seeking additional grant opportunities for cost share of those efforts.

ProcellaCOR™ is currently the state's most popular spot-treatment strategy for EWM management. Onterra's experience monitoring many ProcellaCOR™ treatments within the state since 2019 indicates that EWM control has been high with almost no EWM being located during the summer post treatment surveys. Some treatments showed EWM rebound by two years after treatment while other sites have demonstrated three years and counting of EWM reductions to date. Within these treatments, native plant impacts have been largely limited to sensitive dicot species such as northern watermilfoil, coontail, and water marigold. Onterra's experience is that adjacent populations of floating-leaf species (i.e. water lilies) may initially shows signs of herbicidal stress such as leaf twisting (epinasty), but typically rebound a few weeks after treatment.

Lake managers continue to learn how to successfully implement this form of treatment after being registered for use in Wisconsin only a couple of years ago. ProcellaCOR™ has a high sediment/organic binding affinity (Koc) and relatively short persistence (half-life of < 6 days), so it is thought to stay where applied better than other chemistries. However; in many of the treatments Onterra has monitored, EWM impacts have been observed extending outside of the application area (i.e through herbicide dissipation), as this chemical has shown activity at even low concentrations and exposure times as it mixes into an area of perceived impact. For Tomahawk Lake, impacts to EWM and sensitive native plants are anticipated to occur throughout the confined bays in which these respective treatments take place.

Pretreatment Confirmation and Refinement Survey

Onterra ecologists will conduct a *Pretreatment Confirmation and Refinement Survey* prior to the early-season herbicide application to verify application area extents and inspect the condition of the EWM colonies targeted for treatment through the use of a combination of surface surveys, rake tows, and submersible video monitoring. This approximately late-May meander-based survey would investigate for EWM colonial expansion, growth stage of the EWM (and native plants), application area specifies (e.g. average depth & extents), and other aspects that could warrant a modification to the treatment plan. Water temperature and pH data would be collected during the survey to assist with projecting ideal treatment timing. During this visit, Onterra staff would provide supplies and training to volunteers for conducting herbicide concentration monitoring.

Following the *Pretreatment Confirmation & Refinement Survey*, an email-style report with map(s) of the survey results and finalized treatment plan would be provided to the TLA, WDNR, and other project partners for review prior to the treatment. Spatial data would be provided to the herbicide applicator in appropriate format. The chosen contractor, in conjunction with the TLA, will be responsible for completing appropriate permit-related documentation and deliverables to the WDNR.

Herbicide Concentration Monitoring

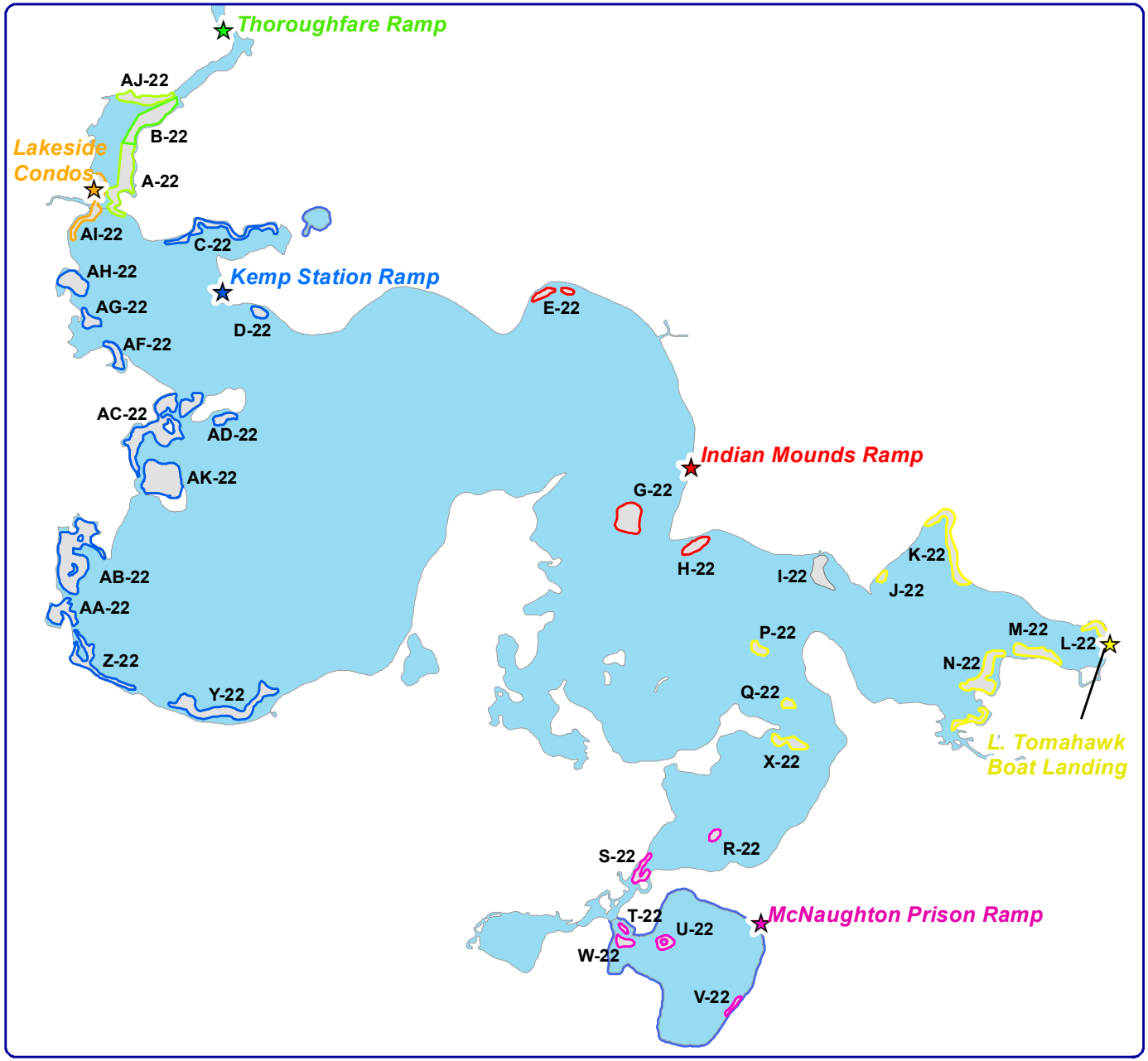
TLA volunteers would conduct herbicide concentration monitoring during the hours/days following treatment following a sampling regime that will be created through collaborative efforts of the WDNR and Onterra. Samples would be collected at specified time intervals and locations within and outside the application area. Sample collection would be focused on understanding the quantity and longevity of the herbicide active ingredient and the acid metabolite (primary degradation product). Properly preserved samples would be overnight-delivered to EPL Bio Analytical Services where the herbicide analysis is conducted.

Quantitative Aquatic Plant Monitoring

Aquatic plant monitoring is planned in 2023 and 2024 through the replication of a sub-sample point-intercept survey. These data were largely collected during the summer of 2022 as a part of the mechanical harvesting monitoring projects. The post treatment data will be compared to previous surveys to understand how native and non-native aquatic plant populations may be impacted by the 2023 management strategy.

Qualitative EWM Monitoring

A Late Season EWM Mapping Survey will be conducted in 2023 to produce the mapping data to document a census of the EWM population within the Tomahawk Lake System at the perceived peak growth stage. Comparing these data to previous surveys will help lake stakeholders understand management outcomes. The herbicide treatment would meet control expectations if little to no EWM is present in the application areas during the late-summer 2023 survey. Many treatment impacts during the *year of treatment* may be short-lived, so understanding how populations stabilize during the *year after treatment* is important within evaluations. EWM reductions would be expected to extend into 2024 for the treatment to be deemed successful.



2022 Final Mechanical Harvesting Strategy		
Site	**Acres**	**Off-load Location**
A-22	10.6	Thoroughfare ramp or Lakeside Condos
B-22	8.5	Thoroughfare ramp or Lakeside Condos
C-22	7.1	Kemp Station ramp
D-22	1.6	Kemp Station ramp
E-22	1.6	Indian Mounds ramp
F-22	0.7	Indian Mounds ramp
G-22	7.5	Indian Mounds ramp
H-22	2.9	Indian Mounds ramp
I-22	7.4	Lake Tomahawk boat landing
I1-22	0.9	Lake Tomahawk boat landing
J-22	0.9	Lake Tomahawk boat landing
K-22	8.1	Lake Tomahawk boat landing
L-22	2.4	Lake Tomahawk boat landing
M-22	4.7	Lake Tomahawk boat landing
N-22	7.8	Lake Tomahawk boat landing
O-22	2.3	Lake Tomahawk boat landing
P-22	1.7	Lake Tomahawk boat landing
Q-22	1.2	Lake Tomahawk boat landing
R-22	1.1	McNaughton Prison Landing
S-22	2.6	McNaughton Prison Landing
T-22	0.5	McNaughton Prison Landing
U-22	2.0	McNaughton Prison Landing
V-22	0.9	McNaughton Prison Landing
W-22	1.6	McNaughton Prison Landing
X-22	3.2	Lake Tomahawk boat landing
Y-22	13.3	Kemp Station ramp
Y1-22	1.3	Kemp Station ramp
Y2-22	1.2	Kemp Station ramp
Z-22	7.1	Kemp Station ramp
Z1-22	2.9	Kemp Station ramp
AA-22	2.7	Kemp Station ramp
AB-22	18.9	Kemp Station ramp
AB1-22	4.2	Kemp Station ramp
AC-22	16.1	Kemp Station ramp
AD-22	2.1	Kemp Station ramp
AE-22	3.5	Kemp Station ramp
AF-22	2.7	Kemp Station ramp
AG-22	2.5	Kemp Station ramp
AH-22	5.7	Kemp Station ramp
AI-22	5.8	Lakeside Condos or Kemp Station ramp
AJ-22	4.8	Thoroughfare ramp or Lakeside Condos
AK-22	13.8	Kemp Station ramp
Total	***198.7***	

N
W E
S

350
feet

Onterra LLC
Lake Management Planning
815 Prosper Road
De Pere, WI 54115
920.338.8860
www.onterra-eco.com

Sources:
Roads and Hydro: WDNR
Bathymetry: Onterra
Aquatic Plants: Onterra, 2021
Orthophtography: NAIP, 2020
Map Date: July 1, 2022 - EJH

Project Location in Wisconsin

Off-Load Location

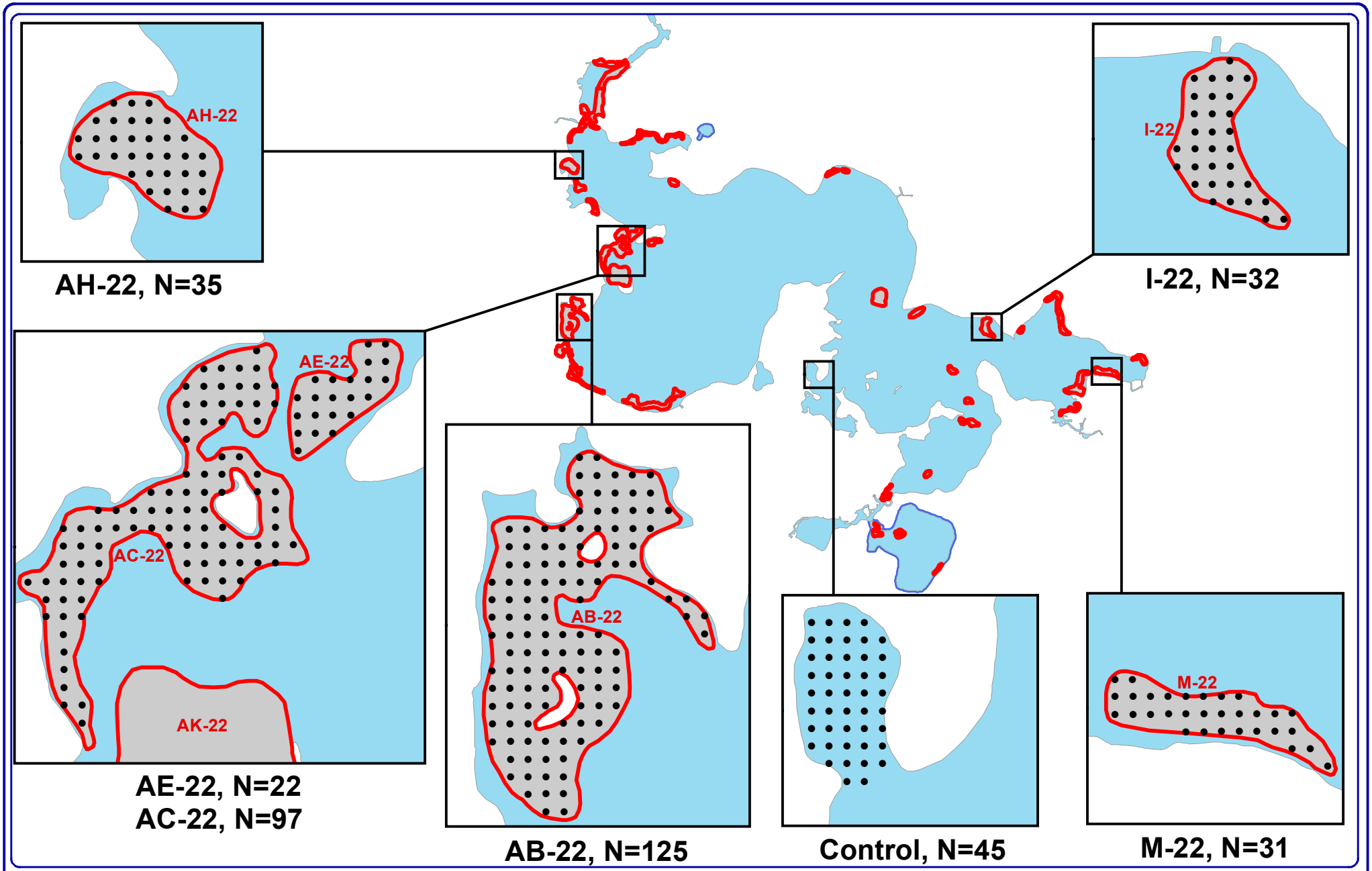
- Indian Mounds Ramp
- Kemps Station Ramp
- Lake Tomahawk Ramp
- Lakeside Condos or Kemps Station Ramp
- McNaughton Prison Ramp
- Thoroughfare Ramp or Lakeside Condos

Map 1

Tomahawk System

Oneida County, Wisconsin

2022 Mechanical Harvesting Plan



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feet

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www.onterra-eco.com

Sources:
Roads and Hydro: WDNR
MechHarvestSties: Onterra, 2021
Map Date: March 3, 2023 - EJH

Project Location in Wisconsin

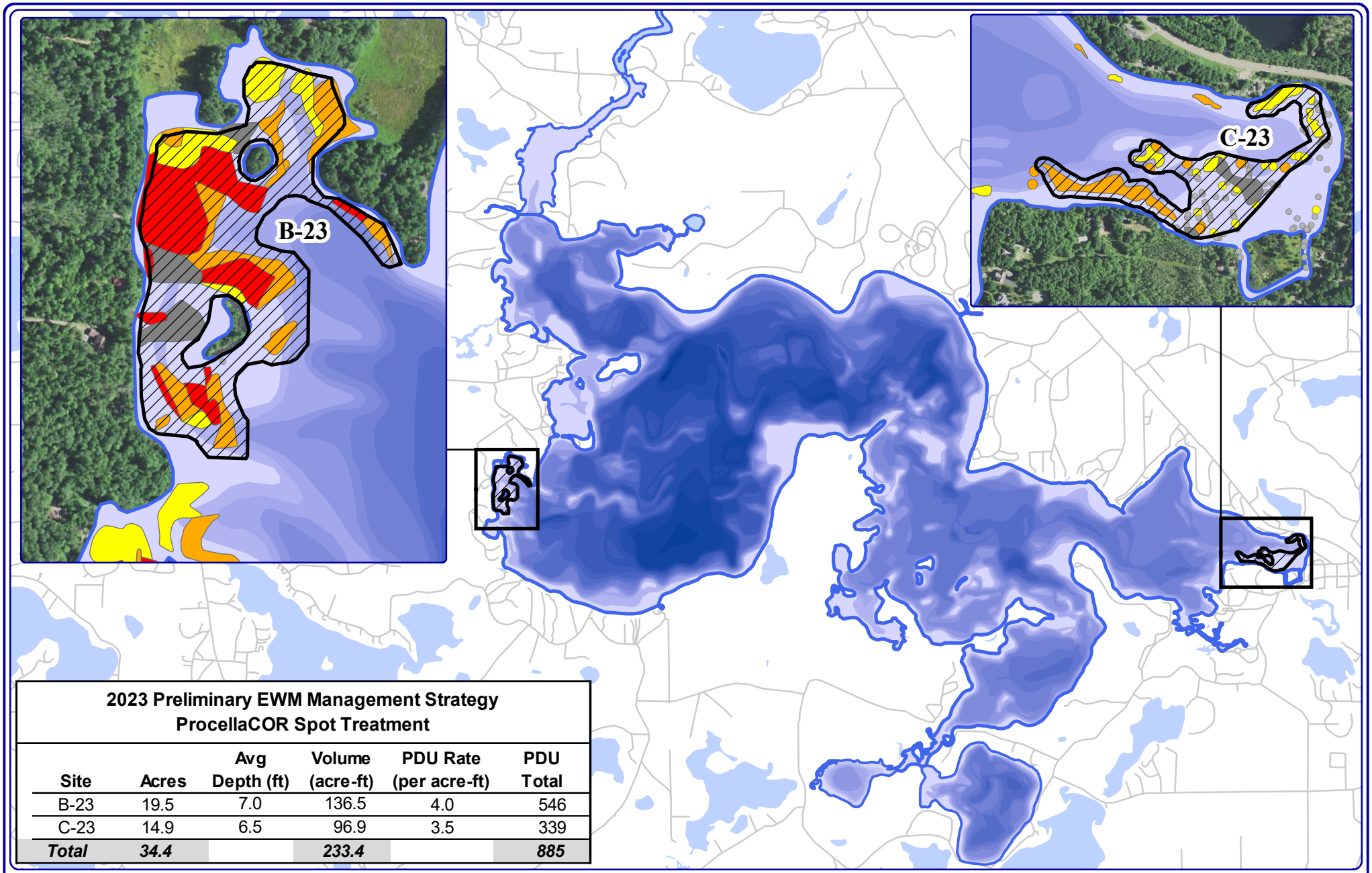
Legend

- Point-Intercept Sub-Sample Locations (25-m spacing)
- Mechanical Harvesting Area

Map 2

Tomahawk System
Oneida County, Wisconsin

Mechanical Harvest Quantitative Monitoring Plan



2023 Preliminary EWM Management Strategy
ProcellaCOR Spot Treatment

Site	Acres	Avg Depth (ft)	Volume (acre-ft)	PDU Rate (per acre-ft)	PDU Total
B-23	19.5	7.0	136.5	4.0	546
C-23	14.9	6.5	96.9	3.5	339
Total	***34.4***		***233.4***		***885***

N W E S

3,800
Feet

Onterra LLC
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815 Prosper Road
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920.338.8860
www.onterra-eco.com

Sources:
Roads and Hydro: WDNR
Bathymetry: WDNR
Aquatic Plants: Onterra, 2021
Orthophtography: NAIP, 2020
Map Date: Nov 2, 2022 TWH
Filename:Tomahawk_EWMPB_2021.mxd


Project Location in Wisconsin

Legend

Eurasian watermilfoil (August 3-5, 2021)

- Highly Scattered
- Scattered
- Dominant
- Highly Dominant
- Surface Matting *(None)*
- Single or Few Plants
- Clumps of Plants
- Small Plant Colony
- 2023 Herbicide Application Area

Map 3
Tomahawk Lake
Oneida Co, Wisconsin

Preliminary 2023 EWM Herbicide Treatment Areas

A

APPENDIX A

Tomahawk Lake EWM Harvesting Report 2022 – *Aquatic Plant Management LLC*

EST. 2013

AQUATIC PLANT MANAGEMENT

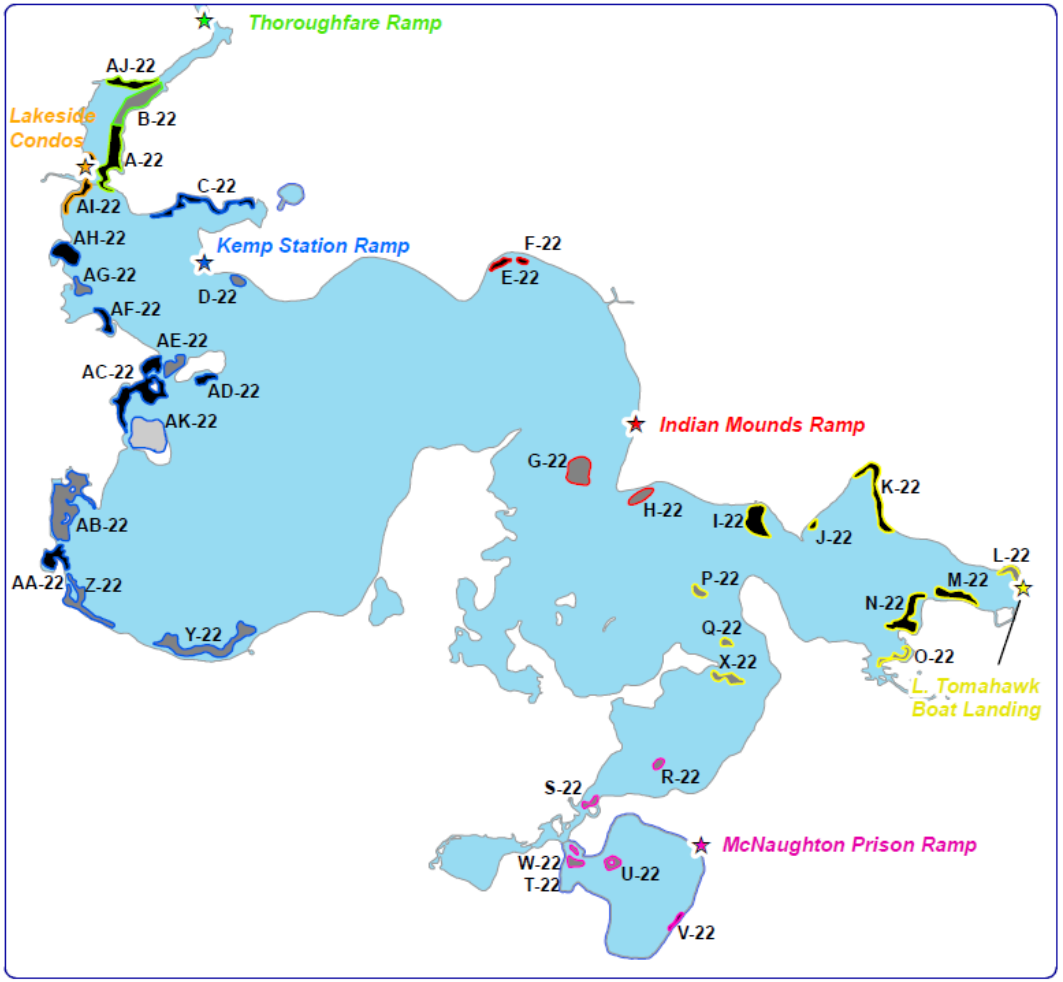
Tomahawk Lake
EWM Harvesting Report 2022

PO Box 1134 Minocqua, WI 54548

Executive Summary

- Tomahawk Lake in Oneida County, WI has an extensive population of Eurasian Watermilfoil (EWM) covering **190+ acres**
- To address the EWM population, the Tomahawk Lake Assocation (TLA) and Aquatic Plant Management (APM) partnered on a **multi-year program of mechanical harvesting and diver assisted suction harvesting (DASH)**
- In the first year of the program, APM completed **~90 days of mechanical harvesting, removing ~123K cubic feet of EWM from 36 prioritized sites** throughout the lake
- In addition, APM **completed DASH at 10 different locations, removing 810 cubic feet** for TLA members who received a discounted DASH rate through the program
- In total, APM **removed 123K cubic feet** of EWM from Tomahawk Lake in 2022

2022 Mechanical Harvesting Plan

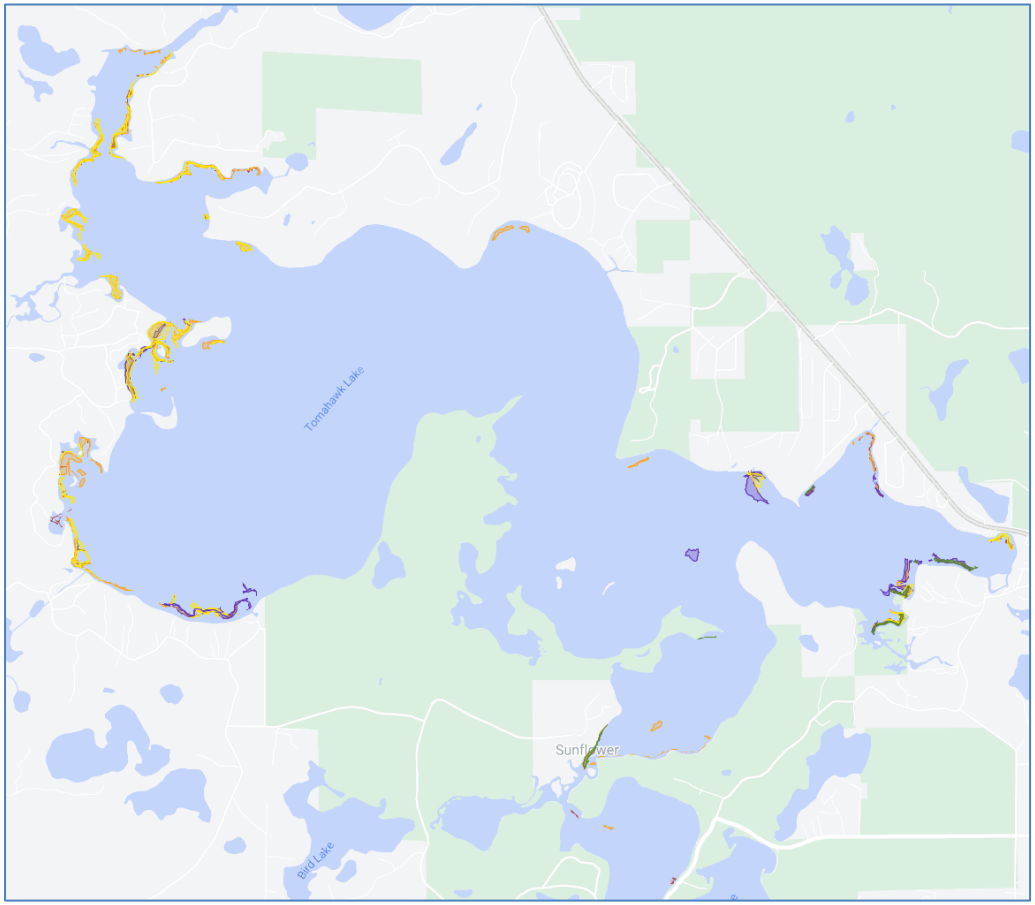


Source: 4.21.2022 EWM Survey Completed by Onterra LLC; Site Selection & Prioritization by TLA

Harvesting Approach

- **Riparian Access Lanes:** APM started the season by harvesting 'access lanes' from riparian piers/lifts to the main section of the lake
- **Total Colony Harvest:** After lanes had been harvested, the approach shifted to target full colonies prioritized by boat traffic and density
- APM worked down the priority list as **wind conditions permitted** making best efforts to **minimize transit time** between sites/offloads

2022 Mechanical Harvesting Results



Source: APM Harvest Records June – October 2022

Legend Jun Jul Aug Sep Oct

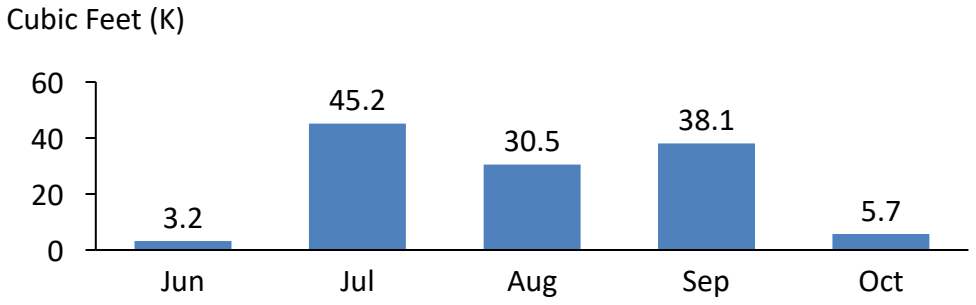
Site	Acres	Treatment Hours	CF Removed
A-22	10.6	14.8	3,954
AA-22	5.1	3.3	1,287
AB-22	18.9	27.9	10,682
AC-22	16.1	48.9	20,371
AD-22	2.1	3.3	982
AE-22	3.5	10.3	3,769
AF-22	2.7	13.4	4,441
AG-22	2.5	6.9	2,243
AH-22	5.7	14.5	5,594
AI-22	5.8	19.7	5,728
AJ-22	4.8	1.9	300
AK-22	13.8	0.4	90
B-22	8.5	2.9	956
C-22	7.1	18.3	4,925
D-22	1.6	7.5	2,584
E-22	1.6	3.6	1,220
F-22	0.7	2.0	700
G-22	7.5	-	-
H-22	2.9	1.3	820
I-22	7.4	14.9	11,676
J-22	0.9	2.3	756
K-22	8.1	6.9	1,300
L-22	2.4	6.0	3,100
M-22	4.7	9.3	3,454
N-22	7.8	19.4	8,212
O-22	2.3	13.1	4,003
P-22	1.7	5.1	2,084
Q-22	1.7	-	-
R-22	1.1	2.4	950
Schuette's Rock	-	0.8	175
S-22	1.2	6.3	1,222
T-22	0.5	0.1	39
U-22	2	0.5	367
V-22	0.9	0.4	49
W-22	1.6	0.4	64
X-22	3.2	0.5	442
Y-22	13.3	18.3	9,342
Z-22	7.1	14.3	4,753
Total	**189.6**	**321.2**	**122,634**

Summarized Harvesting Results

Mechanical Harvesting Commentary

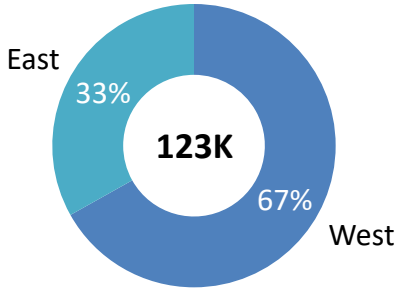
- The bulk of the EWM harvest occurred in the month of July during the peak growing season, however the TLA and APM decided to also prioritize efforts at the tail end of the season (Sep/Oct) to leave the EWM plants further from the surface over the winter
- Two thirds of the EWM was harvested from 17 sites in the western portion of the lake, which had ~129 acres to target versus 60 acres on the eastern portion of the lake
- EWM fragmentation was noted by riparians as a result of boat traffic and harvesting; APM made best efforts to remove floating fragments but prioritized the total colony harvest strategy as aligned with the TLA
- The main hinderance to productivity was the distance between some of the large, dense beds in the southwest portion of the lake, and the nearest off-load location at Kemp station

Harvest by Month



	Jun	Jul	Aug	Sep	Oct
Days[1]	7.1	32.1	20.5	25.1	4.9
# of Sites	17	26	11	19	11

Harvest by Lake Section



- **East**: Main offload location at Lake Tomahawk Landing
- **West**: Main offload location at Kemp Station

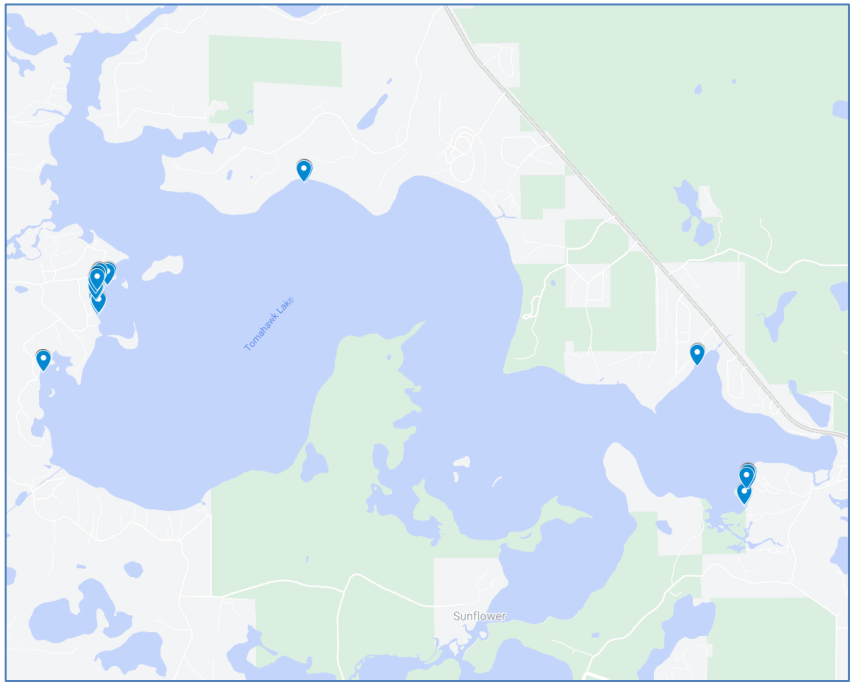
Source: APM Harvest Records June – October 2022
1) Day corresponds to 8 hours of harvesting; some dates included up to 14 hours of harvesting

Riparian DASH Harvest Results

Diver Assisted Suction Harvesting Commentary

- 10 TLA members took advantage of the discounted DASH program to remove EWM from in and around their piers, boat lifts, and swim areas
- In total, APM was able to remove 811 cubic feet with ~79 hours of underwater dive time

Lake:	Avg. Water Depth	# of Dives	Underwater Dive Time	AIS Removed (cubic feet)
Riparian 1	3.8	5	6.7	29.5
Riparian 2	5.7	3	6.0	41.0
Riparian 3	8.7	6	8.9	122.5
Riparian 4	5.2	9	11.7	135.0
Riparian 5	9.5	2	6.8	39.0
Riparian 6	5.0	2	2.8	24.5
Riparian 7	7.8	11	18.2	239.0
Riparian 8	6.5	4	6.3	66.0
Riparian 9	4.6	4	5.8	26.5
Riparian 10	6.4	4	5.8	88.0
Grand Total	**6.4**	**50**	**78.9**	**811.0**



Source: APM DASH Records June – September 2022

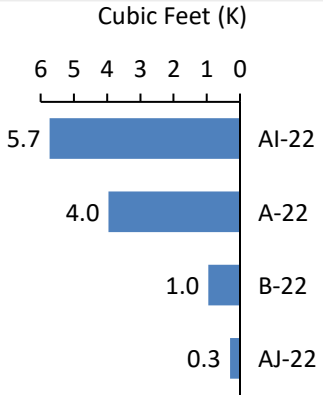
Next Steps

- TLA and APM plan to create another prioritization strategy over the winter and in the late spring once the EWM population can be observed
- A less aggressive harvesting approach (i.e., fewer days) is likely going to be a component of the strategy
- TLA and APM should discuss a strategy for fragment collection as fragmentation was common complaint from riparians
- TLA should consider other management options (e.g., herbicides) for the densest beds that have high traffic (e.g., AC-22) so the harvesting can maximize time in other areas

Mechanical Harvesting Maps

Mechanical Harvesting Results - Lakeside

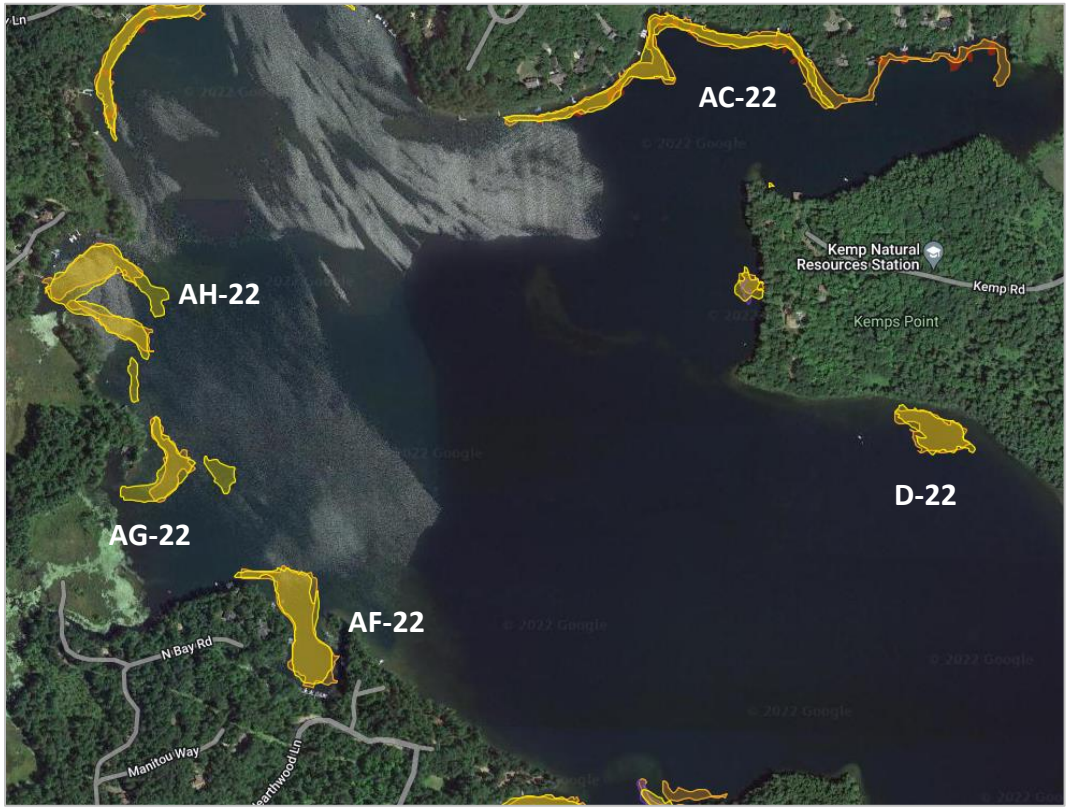
Harvest Details by Site



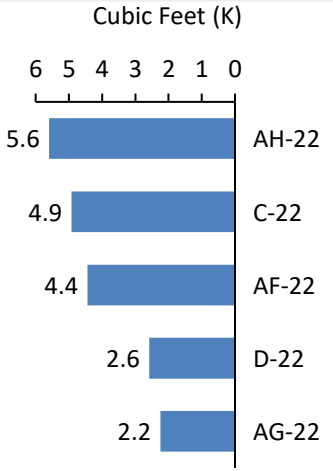
	Hours[1]	# of Treatments
AI-22	19.7	17
A-22	14.8	11
B-22	2.9	4
AJ-22	1.9	2

	Cubic Feet (K)	Hours	# of Treatments
Total	11.0	39.2	34
% of Lake	8.9%	12.2%	9.8%

Mechanical Harvesting Results - Kemp



Harvest Details by Site

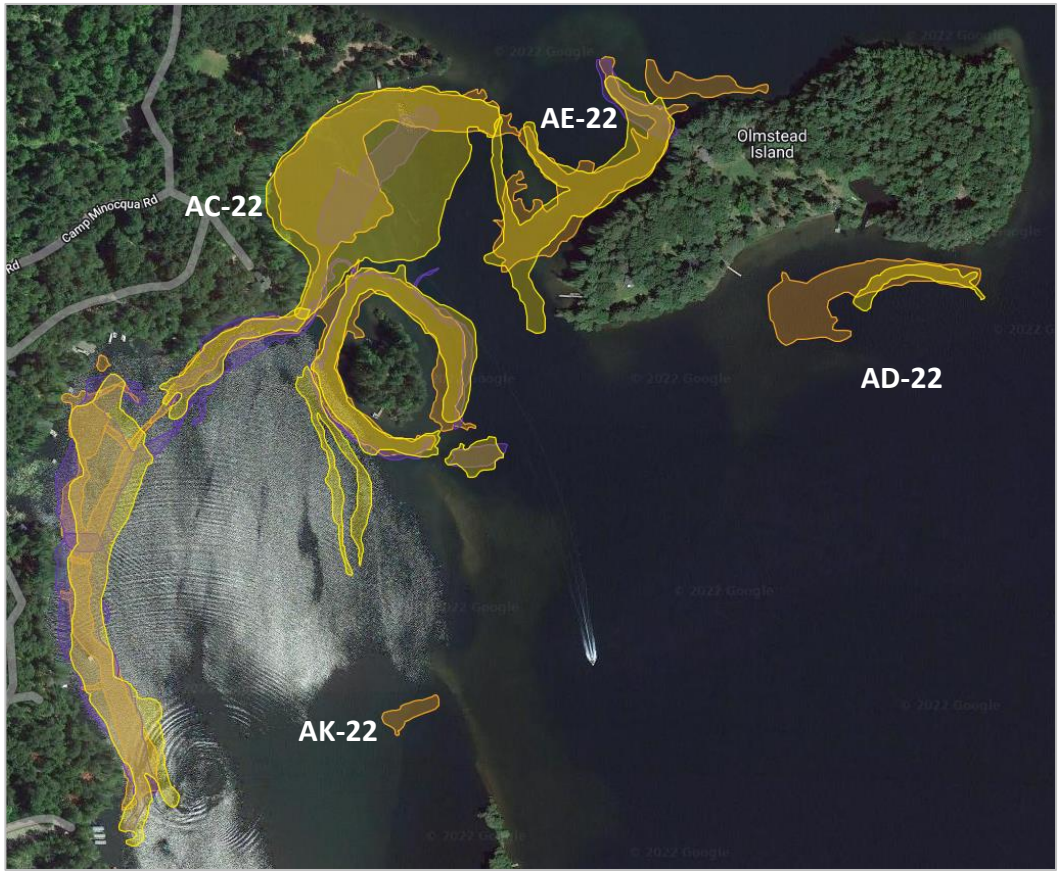


	Hours[1]	# of Treatments
AH-22	14.5	15
C-22	18.3	16
AF-22	13.4	13
D-22	7.5	8
AG-22	6.9	7

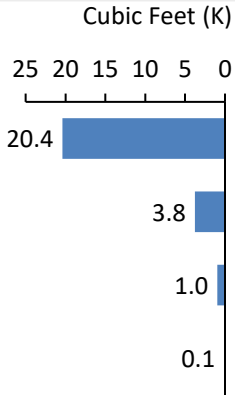
	Cubic Feet (K)	Hours	# of Treatments
Total	19.8	60.5	59
% of Lake	16.1%	18.8%	17.0%

Legend: Jun, Jul, Aug, Sep, Oct

Mechanical Harvesting Results - Olmstead



Harvest Details by Site

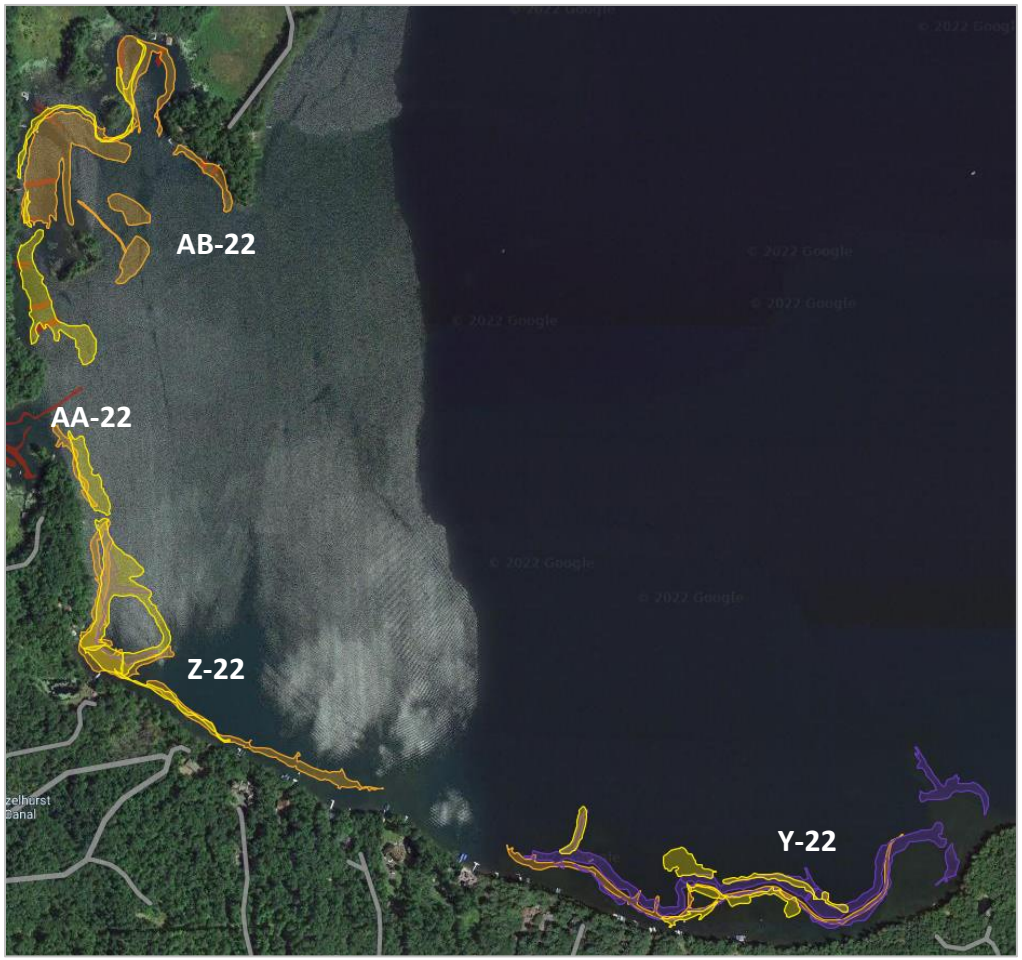


	Hours[1]	# of Treatments
AC-22	48.9	51
AE-22	10.3	11
AD-22	3.3	3
AK-22	0.4	1

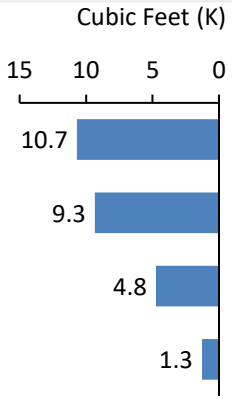
	Cubic Feet (K)	Hours	# of Treatments
Total	25.2	62.9	66
% of Lake	20.6%	19.6%	19.0%

Legend Jun Jul Aug Sep Oct

Mechanical Harvesting Results - Southwest



Harvest Details by Site



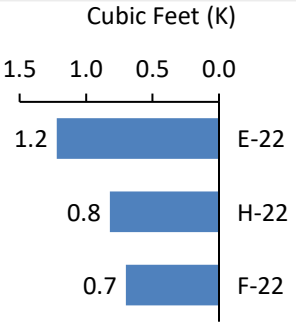
	Hours[1]	# of Treatments
AB-22	27.9	28
Y-22	18.3	24
Z-22	14.3	12
AA-22	3.3	5

	Cubic Feet (K)	Hours	# of Treatments
Total	26.1	63.7	69
% of Lake	21.3%	19.8%	19.9%

Mechanical Harvesting Results – Indian Mounds

Legend Jun Jul Aug Sep Oct

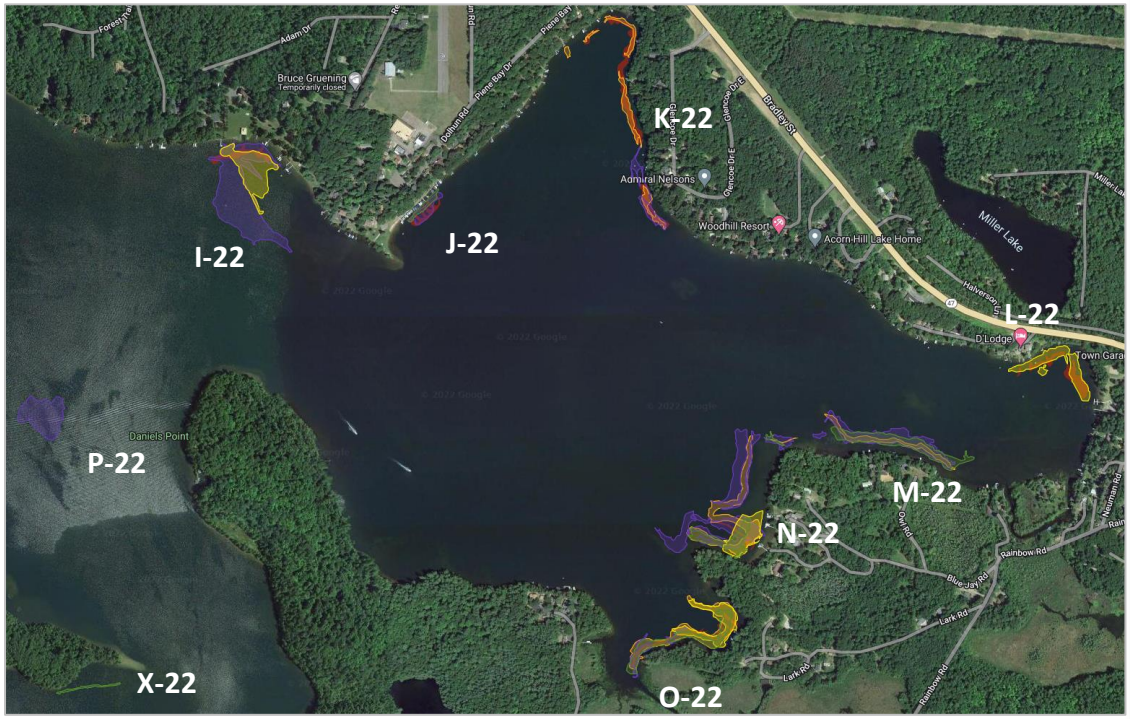
Harvest Details by Site



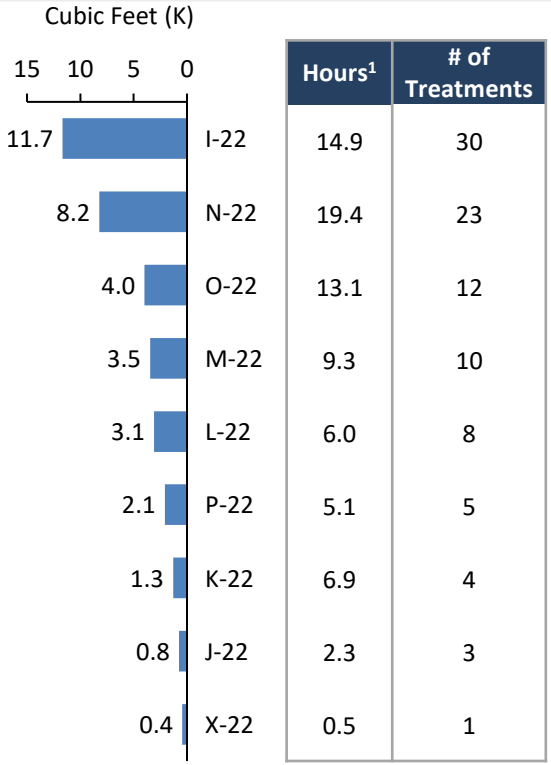
	Hours[1]	# of Treatments
E-22	3.6	4
H-22	1.3	2
F-22	2.0	3

	Cubic Feet (K)	Hours	# of Treatments
Total	2.7	6.8	9
% of Lake	2.2%	2.1%	2.6%

Mechanical Harvesting Results – Lake Tomahawk



Harvest Details by Site

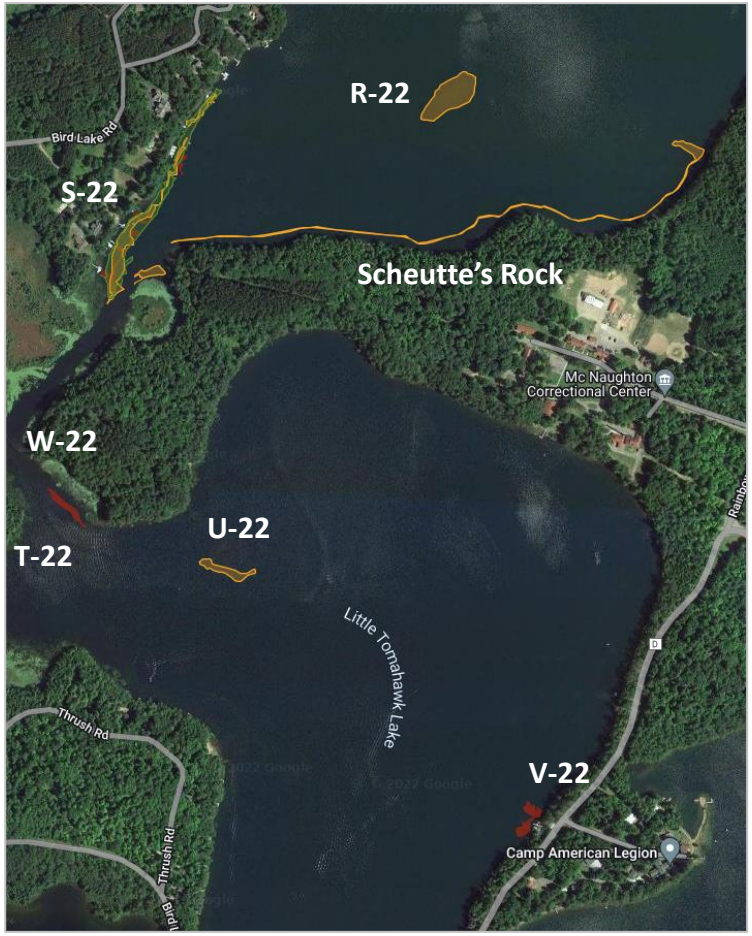


	Hours[1]	# of Treatments
I-22	14.9	30
N-22	19.4	23
O-22	13.1	12
M-22	9.3	10
L-22	6.0	8
P-22	5.1	5
K-22	6.9	4
J-22	2.3	3
X-22	0.5	1

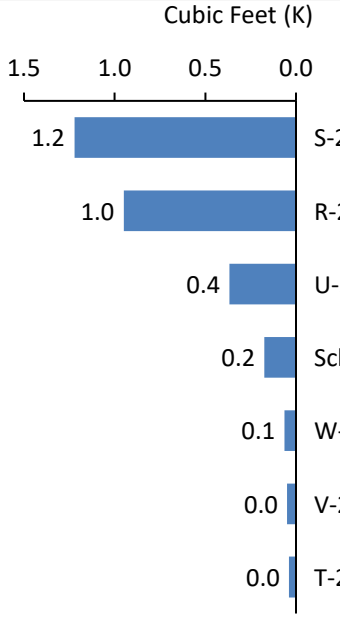
Legend: Jun, Jul, Aug, Sep, Oct

	Cubic Feet (K)	Hours	# of Treatments
Total	35.0	77.3	96
% of Lake	28.6%	24.1%	27.7%

Mechanical Harvesting Results – Southeast



Harvest Details by Site



	Hours[1]	# of Treatments
S-22	6.3	5
R-22	2.4	3
U-22	0.5	2
Schuette's Rock	0.8	1
W-22	0.4	1
V-22	0.4	1
T-22	0.1	1

	Cubic Feet (K)	Hours	# of Treatments
Total	2.9	10.8	14
% of Lake	2.0%	3.3%	4.0%