



2024 RWMWD Carp Management Report

February 7, 2025

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Summary

In 2024, Carp Solutions continued its efforts to monitor and control the common carp population in the Ramsey-Washington Metro Watershed District. Backpack electrofishing equipment was used at the Gervais Mill Pond barrier to remove 100 migrating carp. PIT antennas were used at the barriers at the outlet of Lake Owasso to guide the removal of carp. A total of 643 carp were removed from the outlet of Lake Owasso, 28 being recaptured. Using the mark-recapture method, post removal population estimates in Lake Owasso are 1,449 with a biomass density of 34.4 kg/ha. An additional 23 carp were removed from the Lake Wabasso outlet barrier. To estimate carp population and biomass density, boat electrofishing surveys were conducted on Grass, Gervais, Kohlman, and West Vadnais Lakes. The population estimate for Gervais Lake based on catch per unit effort (CPUE) was 2,567 (90% CI: 1,239-3,894) and a biomass density estimate of 72.5 kg/ha (90% CI:8.3-136.7). The estimated population for Grass Lake was 300 (90% CI:100-500) and a biomass of 26.1 kg/ha (90% CI:8.3-43.9). The estimated population for Kohlman Lake was 301 (90% CI: 210-781) and a biomass density of 14.3 kg/ha (90% CI:-0.9-29.4). The biomass density point estimates for all of these lakes were below the 100 kg/ha management threshold. Trap netting surveys to sample the native fish populations and detect juvenile carp were conducted on Willow Lake and Wetland A. Although trapnetting in Willow Lake resulted in no young-of-year or juvenile carp, surveys in Wetland A captured 94 carp. Overall, the carp population throughout the Ramsey-Washington Watershed District appears to be under the ecologically damaging threshold of 100 kg/ha with the exception of Gervais Lake, where the upper end of the large confidence interval is slightly above that

threshold at 136.7 kg/ha. These small numbers show that carp management over the past several years have proven successful.

Methods and Results

Lake Owasso Block Net and PIT Antenna

A Passive Integrated Transponder (PIT) antenna was placed at the Lake Owasso outlet on April 5, on the lake side of the outlet pipe in order to determine when carp were aggregating (map in Figure 1). The physical carp barrier on the Lake Wabasso side of the outlet was examined and reinforced after winter. A remote access camera was also placed overlooking the barrier for 24/7 visual access of carp aggregations between the culvert and the carp barrier. The first PIT tagged carp was detected at the antenna on April 27. The first removal was conducted between the barrier on the Lake Wabasso side and culvert on May 7th, with four carp being removed. After this, the block net was installed on the Lake Owasso side of the culvert on May 14th. Throughout the spring of 2024, block net removals occurred 8 times. In total, 643 carp were captured including 28 recaptures. The 28 recaptures included 9 of the 25 (36%) carp tagged in 2023 (those 25 carp were randomly tagged in Lake Owasso using boat electrofishing thus can be used for population estimate). The average length of the carp captured was 25.6 inches (Figure 2). A breakdown of removals by date can be seen in Table 1. Based on the total tags detected and the recapture rate, the estimated spawning run for 2024 was approximately 1,650 carp. Based on the number of unique tags detected and those removed, approximately 39% of the spawning run was removed. Using the mark-recapture method from the 25 carp tagged in 2023, the pre-removal population estimate for Lake Owasso was 2,092 carp (90% CI: 1,143-3,041). Using the same analysis, the pre-removal biomass density estimate for Lake Owasso was 49.7 kg/ha (90% CI: 27-72 kg/ha). After removals, the population estimate fell to 1,449 and the biomass density to 34.4 kg/ha.

The PIT antenna was active from April 5-July 3. During this period, 98 individual PIT tagged carp were detected at this antenna, of which 35 (35.4%) were removed. These 98 tags included 75 from 2019 and 23 of the 25 (92%) tags implanted in Owasso in 2023. These detections occurred in pulses, largely dictated by weather conditions (Figure 3). As shown by Figure 4, most of the carp were detected before sunrise. As in previous years, individual carp were detected at the PIT antenna 1-37 days for an average of 11.1 days (Figure 5).

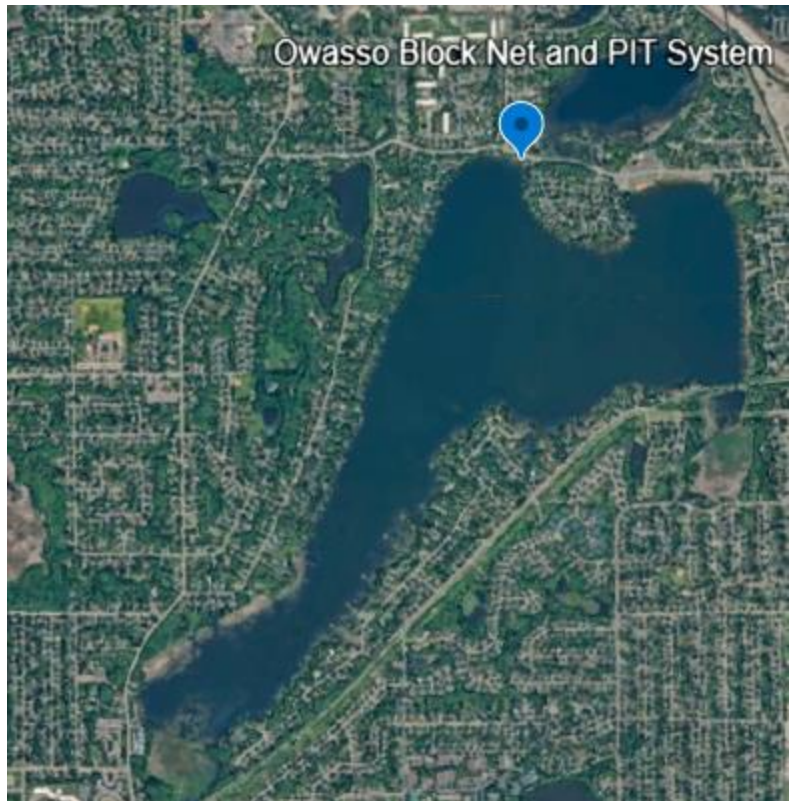


Figure 1: The location of the barrier at the Owasso outlet barrier, and the PIT antenna at the outlet.

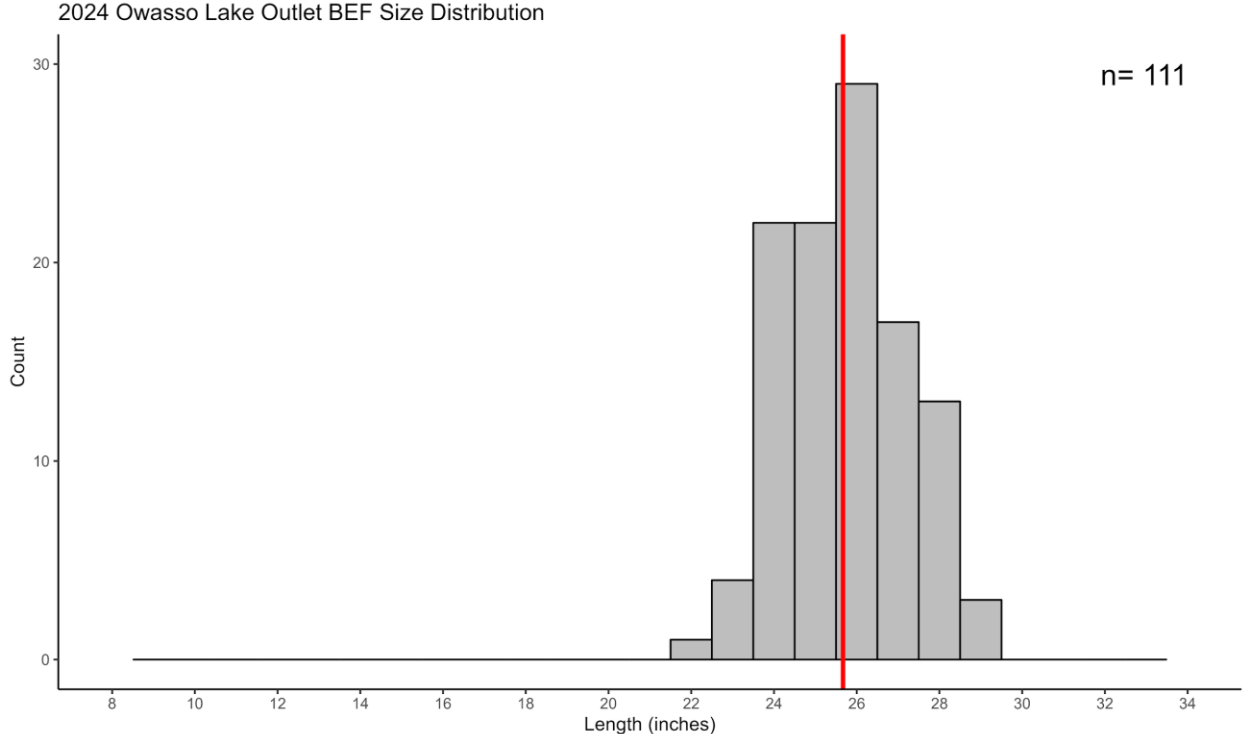


Figure 2: Overall length distribution of sampled carp (n = 111) collected from Owasso Lake. The red line indicates the mean length of 25.6 inches.

Table 1: Summary of the spring removals in Owasso by date.

Date	Catch	PIT Recaps	Average Length (in)
5/7/2024	4	0	24.8
5/14/2024	4	0	24.3
5/21/2024	218	12	25.7
5/22/2024	59	4	26.0
5/25/2024	144	9	25.7
5/30/2024	16	0	25.9
6/3/2024	167	8	25.9
6/19/2024	31	1	26.1
Total	643	34	
Average	80.4	4.3	25.7

2024 Owasso Lake Outlet PIT Antenna Count

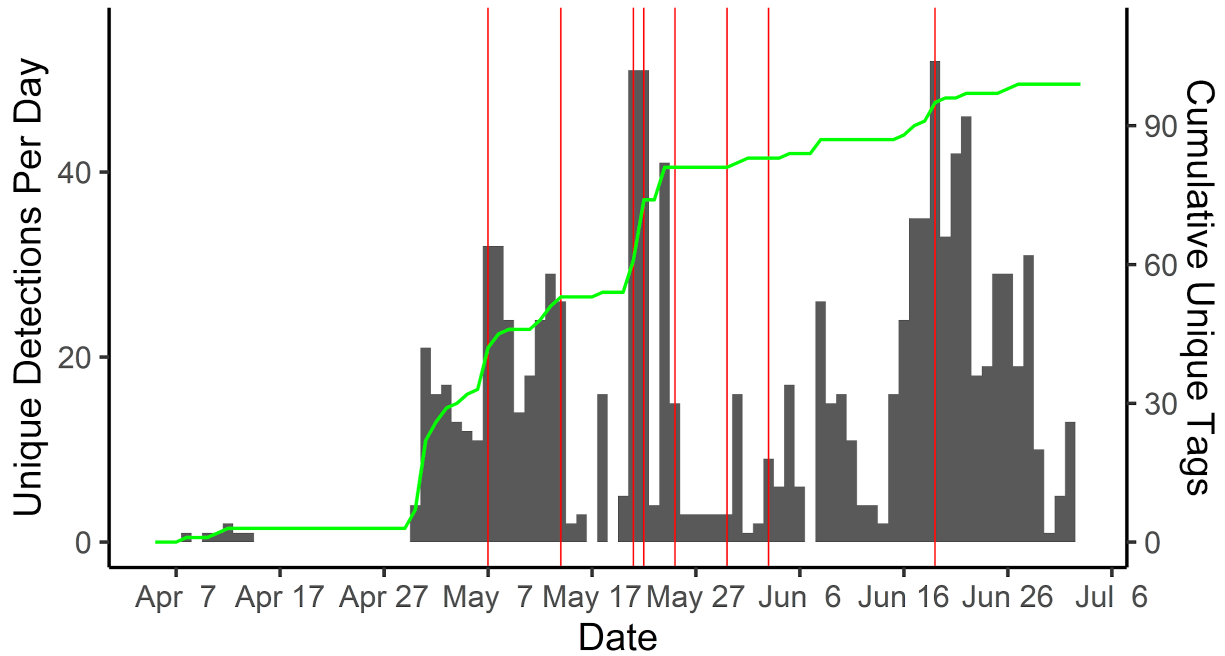


Figure 3: The number of unique PIT tags detected per day at the PIT antenna at the Lake Owasso outlet. The solid green line indicates the cumulative number of PIT tags detected.

Owasso Outlet Hourly Detections 2024

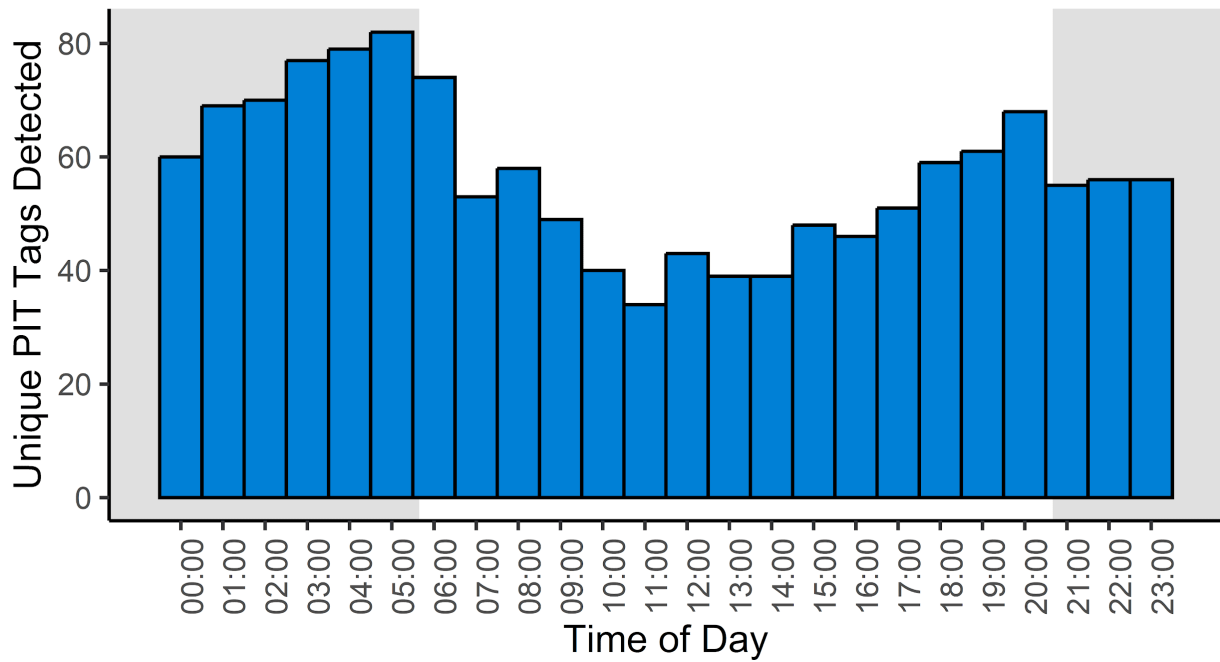


Figure 4: Aggregated hourly PIT detections at the Lake Owasso outlet. Gray portions represent night hours.

Number of Dates an Individual Tag Was Detected

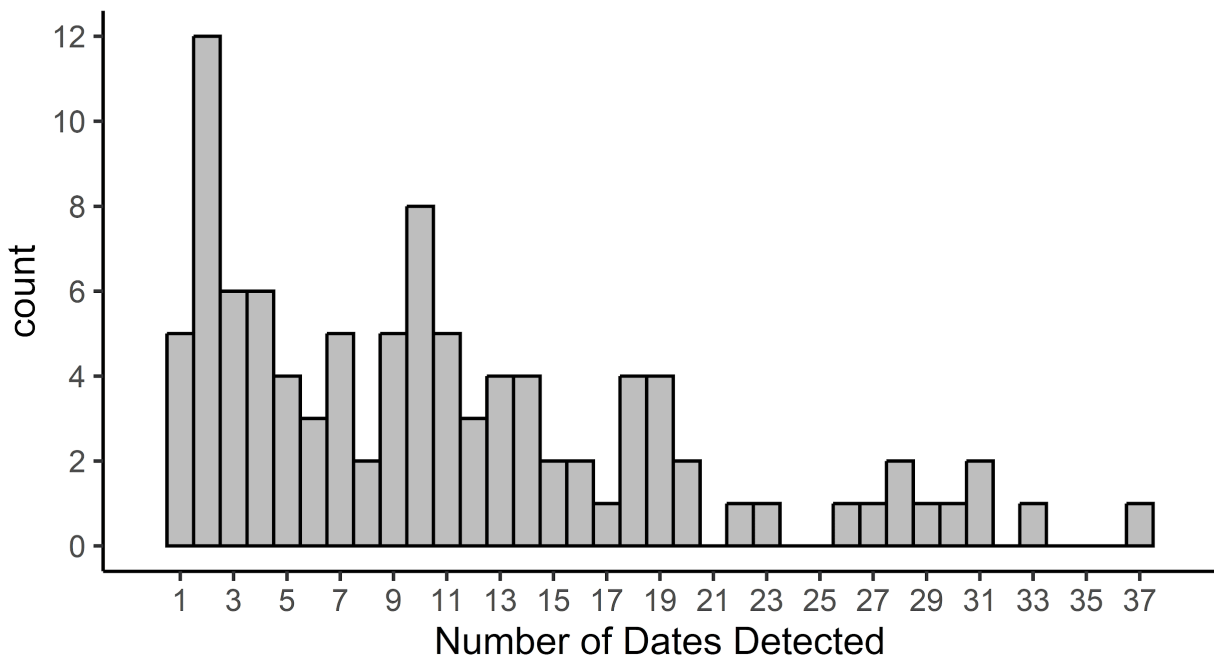


Figure 5: The number of days individual tagged carp were detected at the Owasso outlet PIT antenna.

Backpack Shocking at Barriers

In addition to the block net at Lake Owasso, backpack electrofishing was used to remove carp at barriers throughout the watershed. In 2024, this occurred at the outlet of Wabasso Lake and the outlet of Gervais Mill Pond. Normally, these removals only occur in the spring during spawning season, but they can also occur in the summer following heavy rainfall events.

Two removals were conducted at the Lake Wabasso outlet barrier on May 13 and 25. On May 13, 22 carp were captured and removed from the Lake Wabasso side of the barrier. All of these carp were measured for length (Figure 6). A single carp was removed on May 25th on the downstream side of the barrier.

Two backpack electrofishing removals occurred in Gervais Mill Pond between the barrier and the culvert in May and August of 2024. On May 22, 100 carp were captured with a backpack electrofishing unit. Carp were observed below the barrier on August 6 after a heavy rain. The barrier failed during this heavy rain event and was subsequently removed by RWMWD staff on August 12. Carp Solutions attempted a carp removal on August 7, but the carp had left by time the removal crew arrived. None of the collected carp were previously tagged with PIT tags. The lengths of a sample of 10 carp were measured. These lengths ranged from 24.4 to 31.9 inches with a median of 28.7 inches (Figure 7).

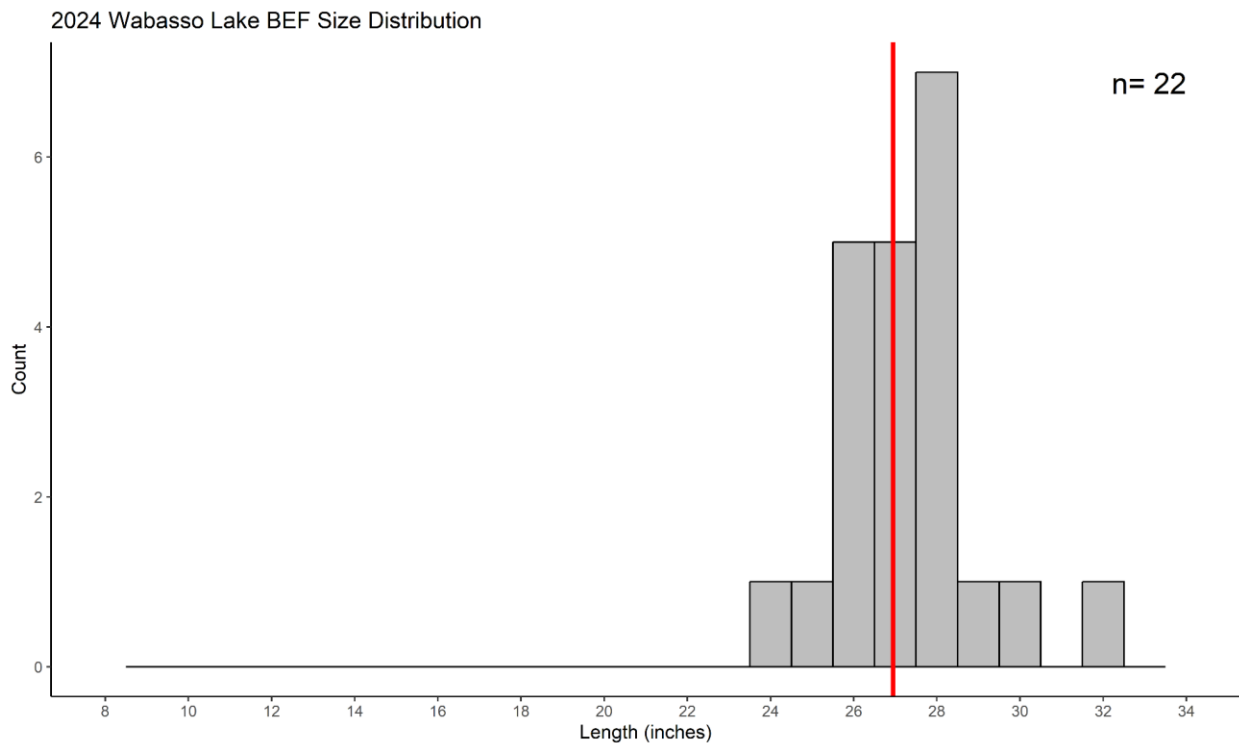


Figure 6: Overall length distribution of sampled carp (n = 22) collected from Wabasso Lake. The red line indicates the median length of 26.9 inches..

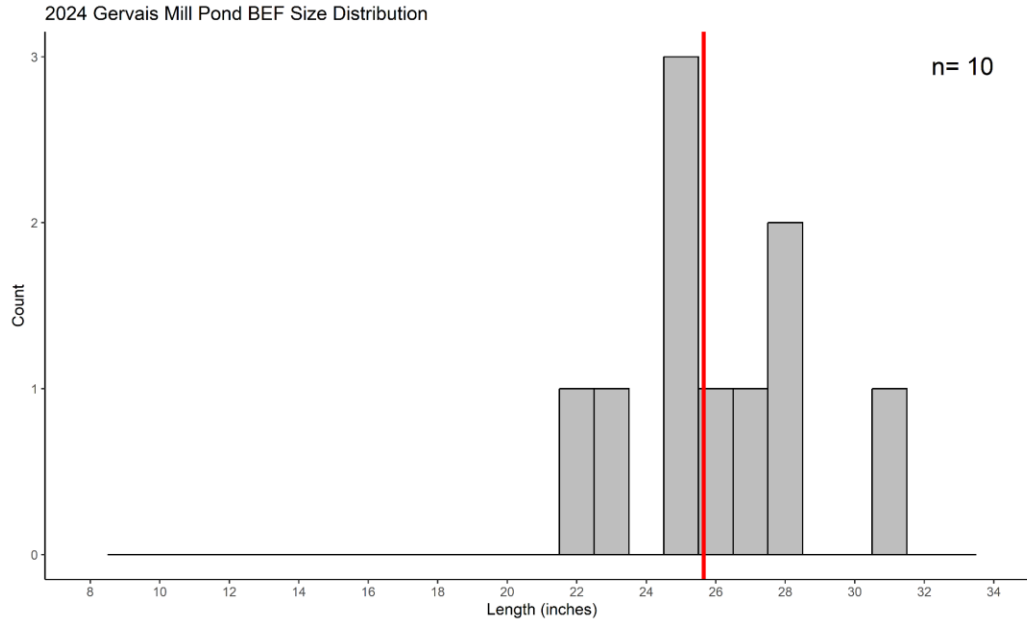


Figure 7: Overall length distribution of sampled carp (n = 10) collected from Gervais Mill Pond. The red line indicates the median length of 28.7 inches.

Electrofishing Surveys Grass Lake

During the summer and fall of 2024, three boat electrofishing surveys were conducted on Grass Lake for the purpose of gaining carp population and biomass estimates. Surveys consisted of four transects, each lasting an average of twenty minutes of effective electrofishing time. Other species were identified, but not collected during this process. Collected carp were measured for length, had their left pelvic fin clipped and a PIT tag implanted before they were released back into the water. Two carp were sampled during the surveys. The lengths of these carp were quite large for the system at 29.8 and 27.5 inches (Figure 8). The other species observed were black bullhead, golden shiner, bluegill, largemouth bass, fathead minnow, green sunfish, central mudminnow, brook stickleback, white sucker, and pumpkinseed sunfish. Carp CPUE ranged from 0 to 0.74 over the three surveys and averaged 0.49. The CPUE from these surveys were used to make population and biomass density estimates. The population estimate for carp in Grass Lake was 300 (90% CI: 100-500). The biomass density estimate was 26.1 kg/ha (90% CI: 8.3-43.9 kg/ha) (Table 2).

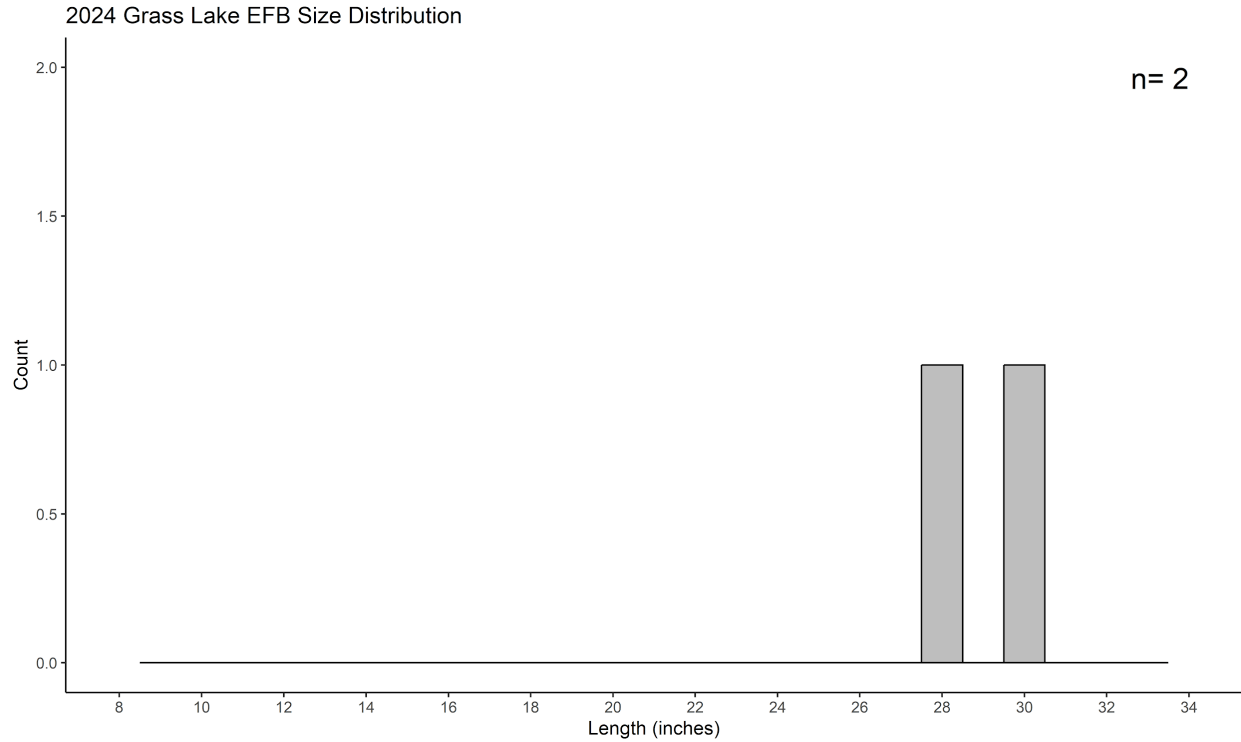


Figure 8: Length distribution of carp sampled (n=2) from the 2024 Grass Lake surveys.

Table 2: Data from boat electrofishing surveys on Grass Lake in 2024.

Date	Carp caught	CPUE	Average Length (inches)	Population Estimate	Biomass Density Estimate (kg/ha)
7/19/24	0	0.00	NA	0.0	0.0
8/21/24	1	0.74	29.8	364	35.3
9/13/24	1	0.74	27.5	365	28.3
Average	0.7	0.49	28.7	300	26.1
Total	2				
SE	0.3	0.2	1.2	121.6	10.8
Lower 90%	0.1	0.1	26.8	100.5	8.3
Upper 90%	1.2	0.9	30.6	500.4	43.9

West Vadnais Lake

A series of three electrofishing surveys were also conducted on West Vadnais Lake in 2024. No carp were observed during this survey. Other species observed during these surveys were black bullhead, bluegill, largemouth bass, fathead minnow and golden shiner.

Gervais Lake

During the summer of 2024, three boat electrofishing surveys were conducted on Gervais Lake to estimate common carp population abundance and biomass. Surveys consisted of four transects, each lasting an average of twenty minutes of electrofishing time. Other species were identified, but not collected during this process. Collected carp were measured for length, had their left pelvic fin clipped before they were released back into the water. A total of 21 carp were collected and released during the Gervais Lake surveys. These carp ranged in length from 10.0-33.4 inches (Figure 9). Notably, seven of the 21 carp were small, ranging from 10 to 16 inches. This suggests a relatively significant recruitment of young carp into the population in recent years. Other species observed included bluegill, largemouth bass, pumpkinseed, walleye, white sucker, golden shiner, northern pike, black crappie and yellow perch. Carp catch rates per hour (CPUE) ranged between 2.21 and 8.38 with a mean of 5.1. The CPUE values were used to estimate the abundance and biomass of carp using relationships developed by Bajer and Sorensen (2012). The estimated carp population was 2,567 (90% CI: 1,239-3,894). The estimated carp biomass density estimate was 72.5 kg/ha (90% CI: 8.3-136.7 kg/ha) (Table 3).

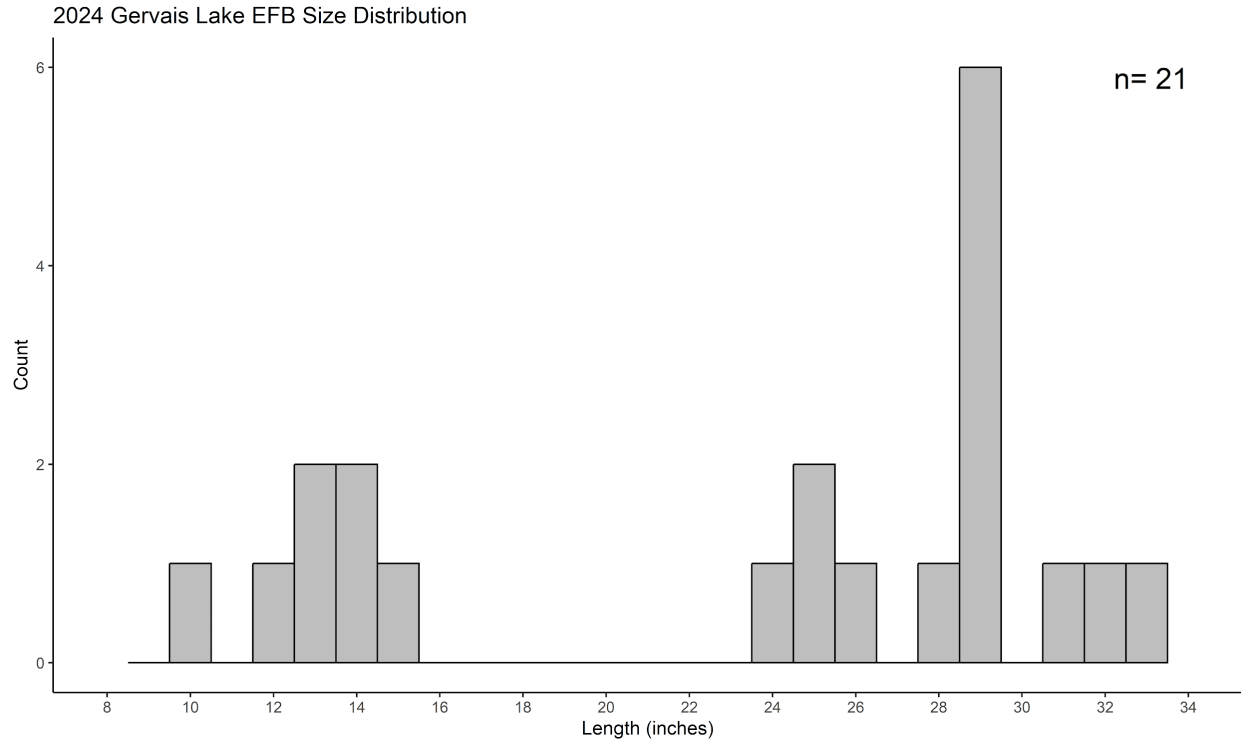


Figure 9: Size distribution of carp (n = 21) collected during Gervais Lake electrofishing surveys.

Table 3: Data from Gervais Lake electrofishing surveys.

Date	Carp caught	CPUE	Average Length (inches)	Population Estimate	Biomass Density Estimate (kg/ha)
7/10/24	12	8.38	25.4	4042	148.5
7/17/24	6	4.48	20.7	2296	47.8
7/24/24	3	2.21	18.7	1278	20.2
Average	7.0	5.09	23.1	2567	72.5
Total	21				
SE	2.6	1.8	2.0	807.0	39.0
Lower 90%	2.6	2.1	19.9	1,239.4	8.3
Upper 90%	11.4	8.0	26.4	3,894.5	136.7

Kohlman Lake

During the summer and fall of 2024, three days of electrofishing surveys were conducted on Kohlman Lake in order to assess carp populations and biomass. Surveys consisted of four transects, each lasting an average of twenty minutes of effective electrofishing time. Other species were identified, but not collected during this process. Collected carp were measured for length, had their left pelvic fin clipped before they were released back into the water. Five carp were captured during these surveys ranging in length from 12.5 to 25.7 inches (Figure 10). Other species observed were bluegill, yellow perch, largemouth bass, black bullhead, golden shiner, walleye, pumpkinseed, white sucker, black crappie, northern pike, brook stickleback, and tiger muskellunge. Carp CPUE ranged from 0 to 2.24 with an average of 1.23. The CPUE was used for estimates for carp abundance and biomass density. The carp population estimate for Kohlman Lake was 301 (90% CI: 74 -529) and the biomass density estimate was 14.3 kg/ha (90% CI: -4.1-32.6 kg/ha). A summary of the electrofishing surveys by date can be seen in Table 4.

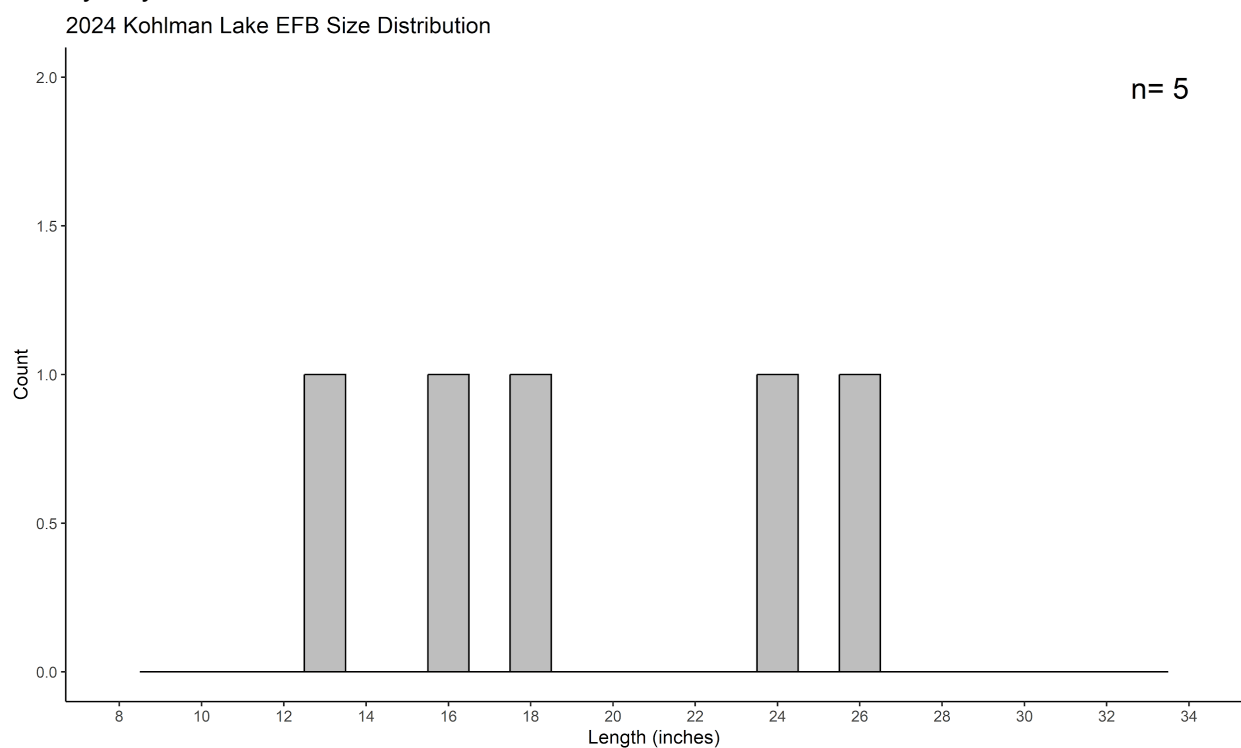


Figure 10: Length distribution of sampled carp (n=5) in Kohlman Lake from EFB surveys.

Table 4: Data from boat electrofishing surveys on Kohlman Lake by date.

Date	Carp caught	CPUE	Average Length (inches)	Population Estimate	Biomass Density Estimate (kg/ha)
7/12/2024	0	0.00	0.0	0	0.0
8/2/2024	3	2.24	21.8	462	31.0
8/30/2024	2	1.49	15.4	342	8.7
Average	1.7	1.23	19.2	301	14.3
Total	5				
SE	0.9	0.7	6.5	138	11.1
Lower 90%	0.2	0.2	8.6	74	-4.1
Upper 90%	3.1	2.3	29.9	529	32.6

Trap Net Surveys

Two trap netting surveys were conducted between August and October of 2024 in Willow Lake and Wetland A. During each trap net survey, four to five nets were randomly placed around the perimeter of the lake and left overnight. The following day, fish captured in each net were collected, analyzed, and the species within them were identified. The first 50 individuals of each species in each net were measured, counted, and released. Any individuals of a species that surpassed 50 were counted and released without measuring. The purpose of these surveys was to determine whether juvenile carp were present in potential nursery sites and to evaluate the native micropredators present in the waterbody.

Willow Lake

The Willow Lake trap netting survey took place on September 10 and 11. The trap net locations are shown in Figure 11. The species captured in these trap nets were black bullhead, brook stickleback, central mudminnow, and fathead minnow (Table 5). A distribution of lengths for each species is shown in Figure 12.

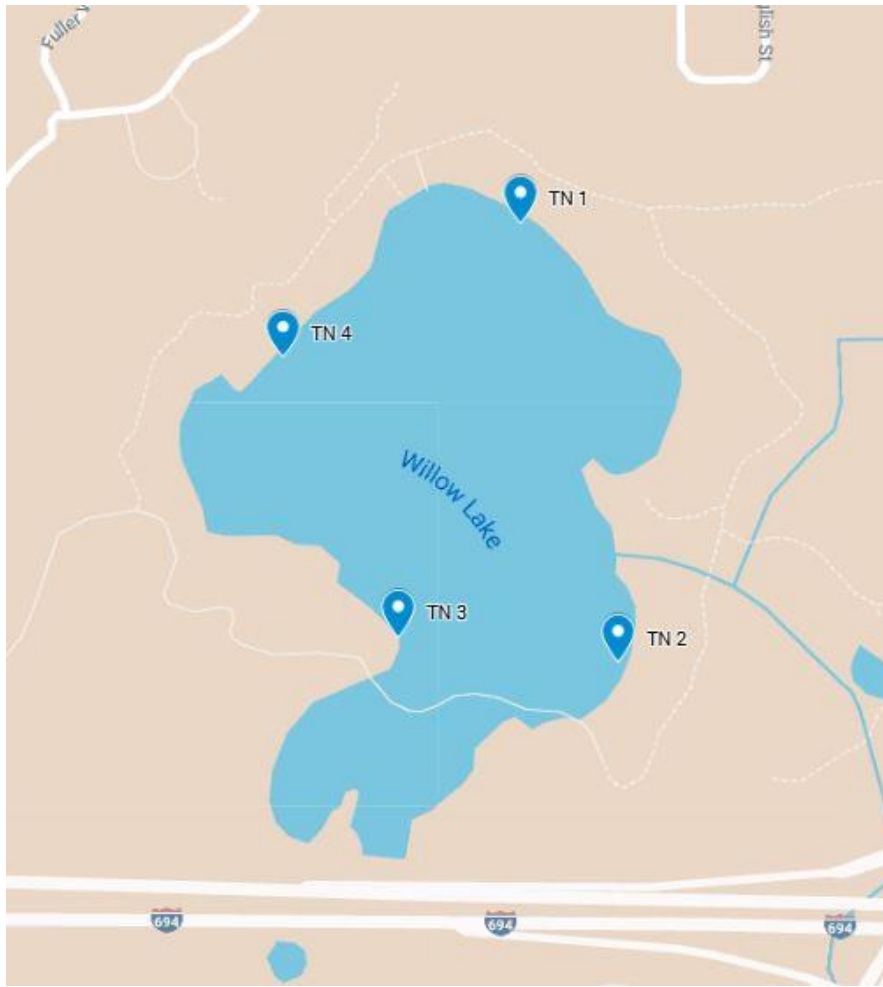


Figure 11: Map of Willow Lake. Points represent the location of trap nets.

Table 5: Species totals per net from the trap net survey on Willow Lake. CPUE stands for catch per unit effort, in units of fish captured per net.

Trap Net #	black bullhead	brook stickleback	central mudminnow	fathead minnow
1	1	0	0	1
2	37	0	1	0
3	1	1	0	0
4	0	0	0	1
	0	0	0	0
Total	39	1	1	2
CPUE(Fish per Net)	9.75	0.25	0.25	0.5
Average Length (in)	3.94	1.85	3.90	2.64

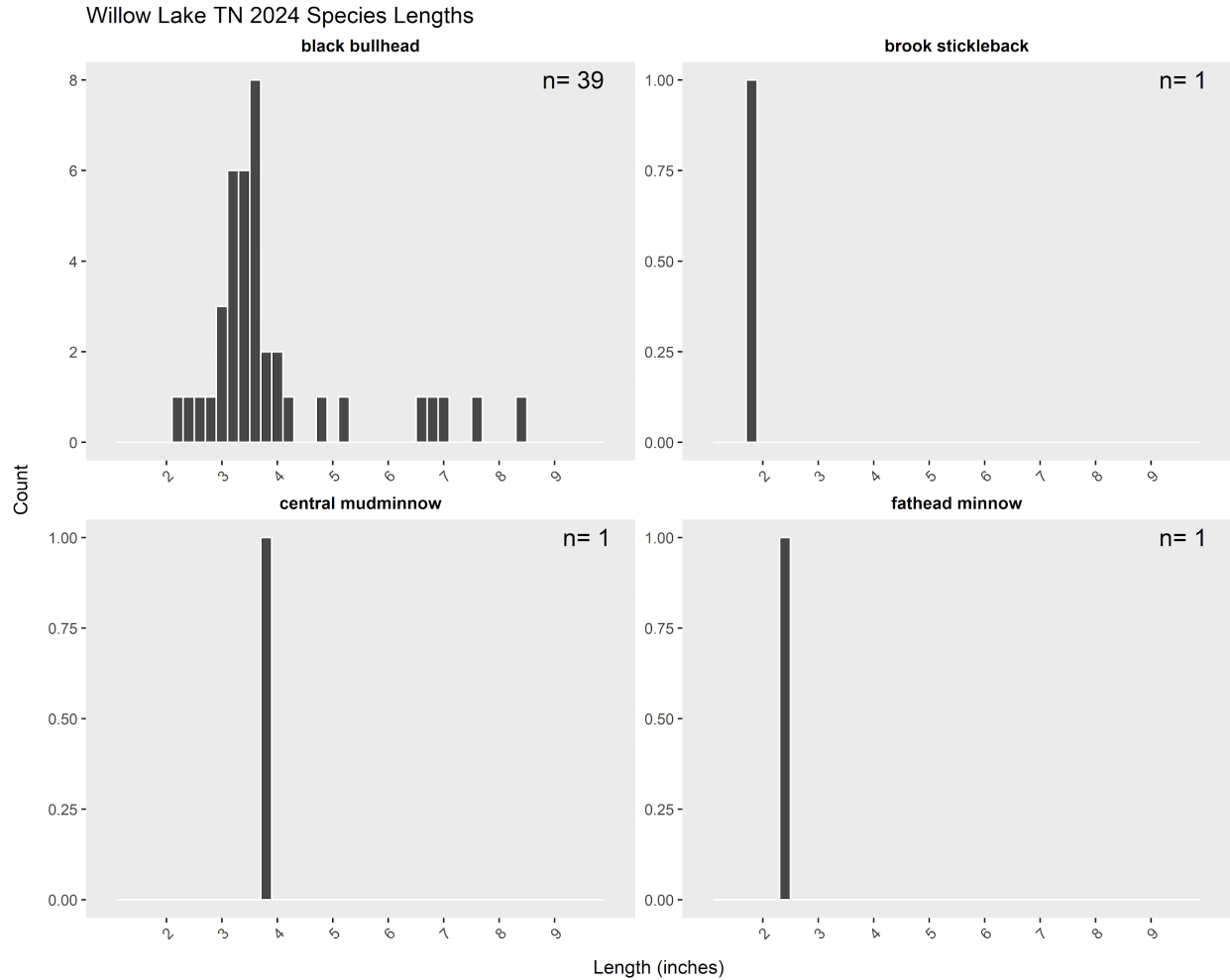


Figure 12: A comparison of the distribution of sizes of collected fish from trap net surveys in Willow Lake.

Wetland A

The Wetland A survey took place on August 26 and 27. Trap net locations are shown in Figure 13. The species observed in these trap nets included black bullhead, common carp, fathead minnow, green sunfish, hybrid sunfish, pumpkinseed, and yellow bullhead. The data from this survey is shown in detail in Table 6. Of particular note, 94 juvenile carp were captured from three distinct size classes: 2-4 inches, 6-9 inches, 13-14 inches (Figure 14). Most likely, they represent age-0, age-1 and age 2+, respectively.

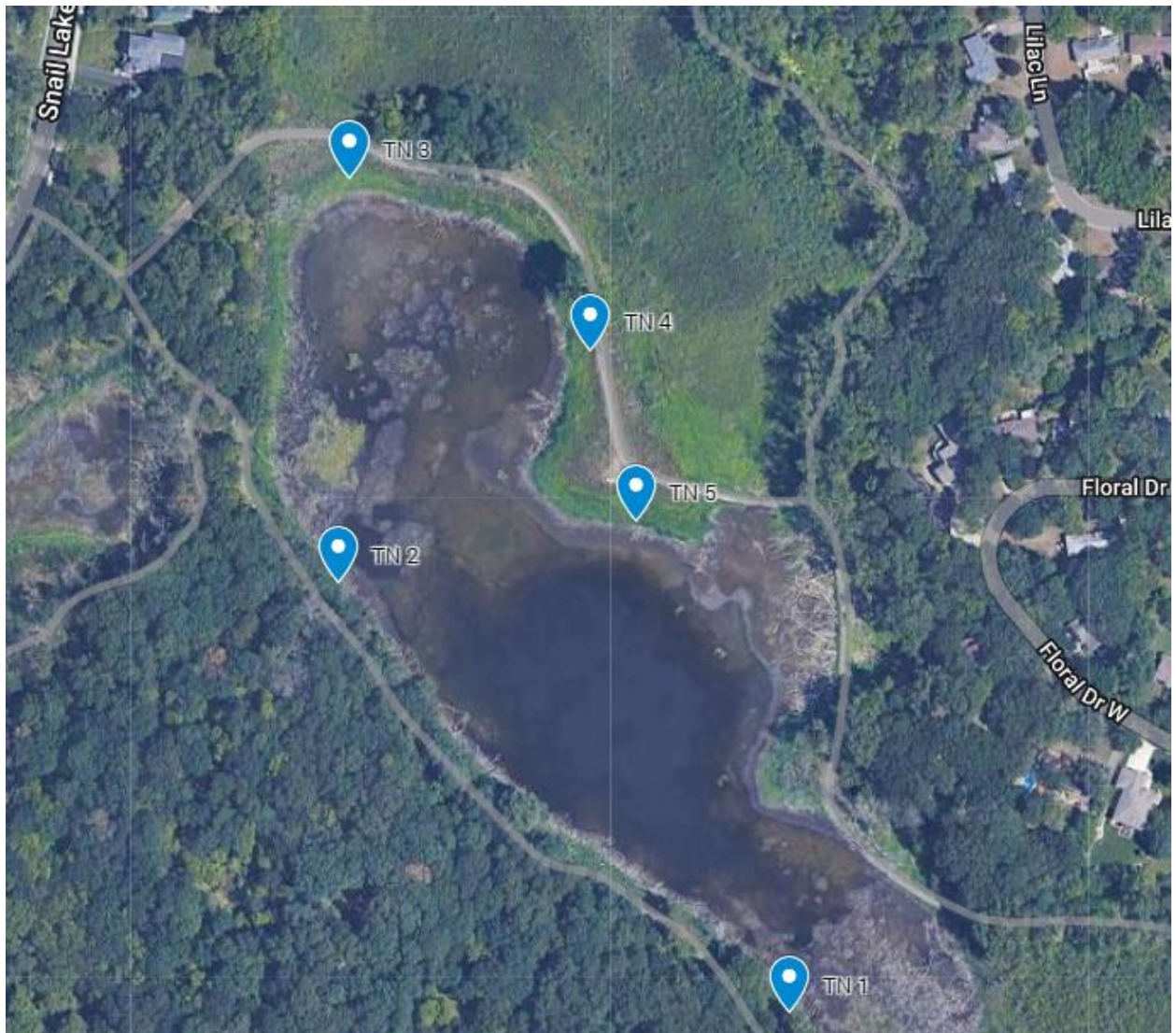


Figure 13: A map of the trap net locations for Wetland A

Table 6: Species totals per net from the trap net survey on Wetland A. CPUE stands for catch per unit effort, in units of fish captured per net.

Trap Net #	black bullhead	common carp	fathead minnow	green sunfish	hybrid sunfish	pumkin seed	yellow bullhead	Total
1	444	62	0	8	3	39	54	610
2	14	15	0	2	0	2	3	36
3	47	3	1	16	0	7	3	77
4	98	14	0	1	1	2	8	124
5	29	0	1	8	0	14	1	53
Total	632	94	2	35	4	64	69	900
CPUE(Fish per Net)	126.4	18.8	0.4	7	0.8	12.8	13.8	
Average Length (in)	4.53	7.38	2.72	4.69	3.77	3.10	7.05	

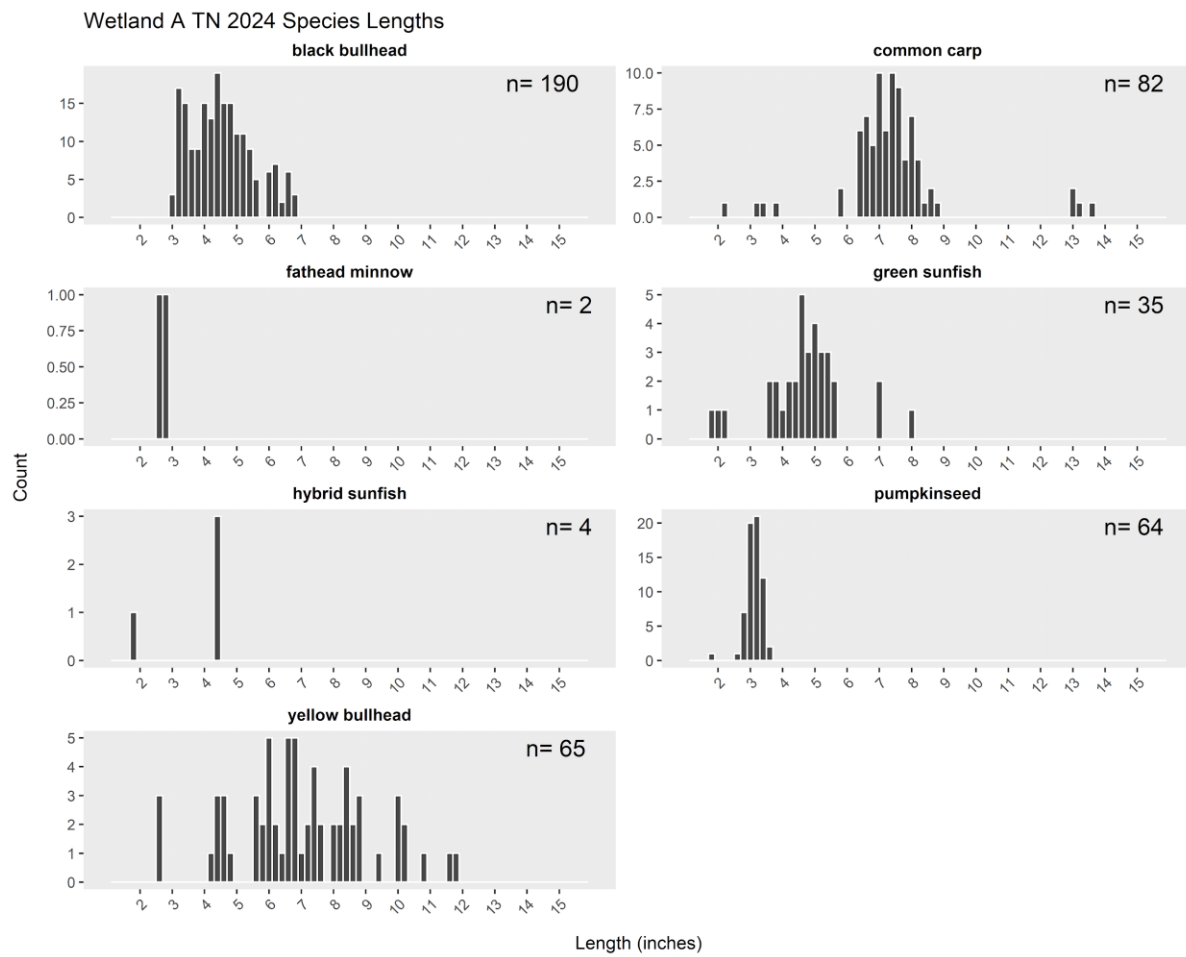


Figure 14: A comparison of the distribution of sizes of collected fish from trap net surveys in Wetland A.

Wicklender Pond

A visual inspection of Wicklender Pond in Maplewood was conducted to plan for goldfish management there. Goldfish were observed and access sites for sampling with trap nets were identified.

Discussion

Owasso Lake

As in 2022, the block net around the outlet of Owasso Lake proved to be a highly effective means to remove the carp that attempted to move out of the lake towards Wabasso Lake. The combination of a remote access camera and PIT antenna system to monitor the carp activity at the outlet pipe inside the net and guide tripping it was very important to this success. The mark-recapture based population estimate of 2,092 carp (90% CI: 1,143-3,041) was lower than the boat electrofishing CPUE based estimate of 5,214 carp (90% CI: 1,577-8,852) from 2023 although the confidence intervals overlap. Mark-recapture estimates are typically more accurate than boat electrofishing CPUE based estimates. After removals, the estimated carp abundance had fallen to 1,449 with a final biomass density of 34.4 kg/ha, below the 100 kg/ha biomass threshold below which carp have a negligible effect on aquatic macrophyte cover (Figure 15). However, it is important to block the spawning migration out of Owasso Lake down into Wabasso Lake and ultimately into Grass and West Vadnais Lakes. If these carp make it into Grass and West Vadnais Lakes after those lakes experience a winterkill, a significant recruitment event could occur. These young carp could then move upstream back into Wabasso and Owasso Lakes or downstream into the Phalen Chain of Lakes. Thus, continuing to block this migration is important for long-term carp management. Removal of these carp as they attempt to migrate continues to reduce their population and reduce the risk of significant recruitment.

Wabasso Lake

Unlike in 2022, relatively few carp were removed at the outlet of Wabasso Lake. In 2022, several of the carp that were captured at the Wabasso Lake outlet had been originally tagged in Owasso Lake in 2019, so clearly the carp had passed through the Owasso Lake outlet barrier at some point. In 2023, no carp were caught or seen in Wabasso Lake during the boat electrofishing surveys. This suggests that the majority of the carp in Wabasso Lake, at least some of which were originally from Owasso Lake, had been removed from the lake at the outlet by the summer of 2023. Thus, the barrier at the outlet of Wabasso Lake provides a backup in case the barrier between Owasso and Wabasso Lakes fails. The Wabasso outlet barrier also provides a convenient removal location for any remaining carp in Wabasso Lake and any carp from Owasso Lake that make it through the outlet barrier.

Grass Lake

During the 2024 boat electrofishing surveys two carp were observed in Grass Lake. Neither of the captured carp in these surveys were previously PIT tagged, so the origin of where they came from cannot be confirmed. These fish most likely migrated in from Owasso and Wabasso Lakes. Carp from Owasso Lake historically attempt to run into Wabasso Lake and then to Grass Lake to spawn. Presence of these carp in Grass Lake is concerning because even low numbers of adult carp can produce numerous year classes of juveniles under optimal conditions (e.g. after winterkills). In 2023, trap netting surveys revealed a healthy population of native species including bluegill sunfish, which is known for predated on carp eggs and thus could limit the carp recruitment (Poole and Bajer 2019). While trap netting was not conducted in 2024, a similar native fish community was observed during boat electrofishing. This suggests that Grass Lake did not experience a winter kill during the extremely mild winter of 2023-2024. Thus, a healthy population of bluegill and other native species should significantly limit the recruitment of the small number carp present in Grass Lake, unless it suffers from winter or summer hypoxia. Continued monitoring of carp recruitment in Grass Lake is recommended

Wetland A

The trap netting survey revealed a large number of juvenile carp in this wetland along with a mostly hypoxia-tolerant group of native fishes that are often found in nursery ponds along with juvenile carp. Since Wetland A is a closed basin under normal water levels, the carp likely migrated up from Grass Lake during extremely high water levels in 2019. Park users reported seeing carp swimming in the ephemeral channel in between Grass Lake and Wetland A during this time. Since Wetland A has been cut off from Grass Lake since approximately 2020 and young-of-year carp were captured there in 2024, there must be a small number of adult carp in the wetland that were not sampled in this survey.

West Vadnais Lake

No carp were observed in West Vadnais Lake during boat electrofishing surveys in 2024. Since box netting efforts in 2020 and a potential winterkill event in the winter of 2021-2022, there have been no observable populations of carp in the lake from sampling. With a number of barriers both upstream and downstream of the lake and the lack of an abundant carp population, it is unlikely that carp will massively repopulate West Vadnais Lake unless these barriers fail. The diverse native fish populations within West Vadnais Lake during the survey may also limit successful recruitment within the lake. However, both the sizes and population size of these fish were not tracked during these surveys, so how strongly these populations can curb recruitment is unknown. If a

significant enough population of species like bluegills exist within the lake, predation of both eggs and larval stage carp would diminish the survivorship of those carp.

Gervais Mill Pond

In 2024, two backpack electrofishing removals were conducted resulting in the capture of 100 carp attempting to run upstream towards West Vadnais Lake from Gervais Lake. Due to Gervais Lake's estimated population size from boat electrofishing surveys and the relative ease of removals at this barrier, further opportunistic removals of the carp populations in Gervais and Kohlman Lakes provide added value.

Gervais Lake

Boat electrofishing surveys in 2024 on Gervais Lake resulted in a carp population estimate of 2,567 (90% CI: 1,239-3,894) and a biomass density of 72.5 kg/ha (90% CI: 8.3-136.7 kg/ha). Compared to 2018, the last time CPUE based estimates were taken, the carp population has decreased by an estimated 325 carp (2019:2,892). Similarly, the biomass density has also decreased by 16.5 kg/ha (2019: 89 kg/ha). The average size of carp captured during surveys has decreased since 2019. The average length of carp captured in the respective surveys has dropped from 23.9 to 23.1 inches (0.8"). The average weight has dropped from 6.4 to 5.9 lbs (0.5 lbs). Concerningly, this likely suggests that recruitment has occurred somewhat recently. This also correlates with the capture of a number of juvenile carp (<5 years old) in the 2024 surveys. Barriers both in Gervais Mill Pond and Kohlman Basin should theoretically prevent carp from having successful spawning events, however it appears that one may have occurred within the previous 5 years either in the lake or in some of the interconnected systems. Overall, the point estimate of biomass density of carp in Gervais Lake is currently below the management threshold of 100 kg/ha. However, the growth of the juvenile carp will increase the biomass of carp in the lake significantly in the next several years even without any additional recruitment. Additionally, it has been seen in other lakes inhabited by relatively moderate populations (CPUE less than 15 carp/hr) of large carp that the biomass estimates derived from boat electrofishing surveys were sometimes inflated when compared to mark-recapture estimates.

Kohlman Lake

Boat electrofishing surveys on Kohlman Lake revealed a very limited carp population. The carp population was estimated to be 301 carp (90% CI: 74 -529) and the biomass density of 14.3 kg/ha (90% CI: -4.1-32.6 kg/ha). This biomass density is estimated to be substantially lower than Gervais Lake at 72.5 kg/ha. Compared to the last time boat electrofishing surveys were conducted in 2018, the population estimate has decreased somewhat (2018 estimate: 555 carp). At the same time, the biomass density has also decreased (2018 estimate: 60.4 kg/ha). However, like in Gervais Lake,

some small/ juvenile carp between 10-14 inches were detected showing that some carp recruitment occurred within the system in the last five years. Thus, although the carp biomass density is below the management threshold of 100 kg/ha, potential sites of carp recruitment should be identified.

Willow Lake

As in 2020, no carp were caught in Willow Lake and the native fish that were found there are typical of a shallow, winterkill prone waterbody like Willow Lake.

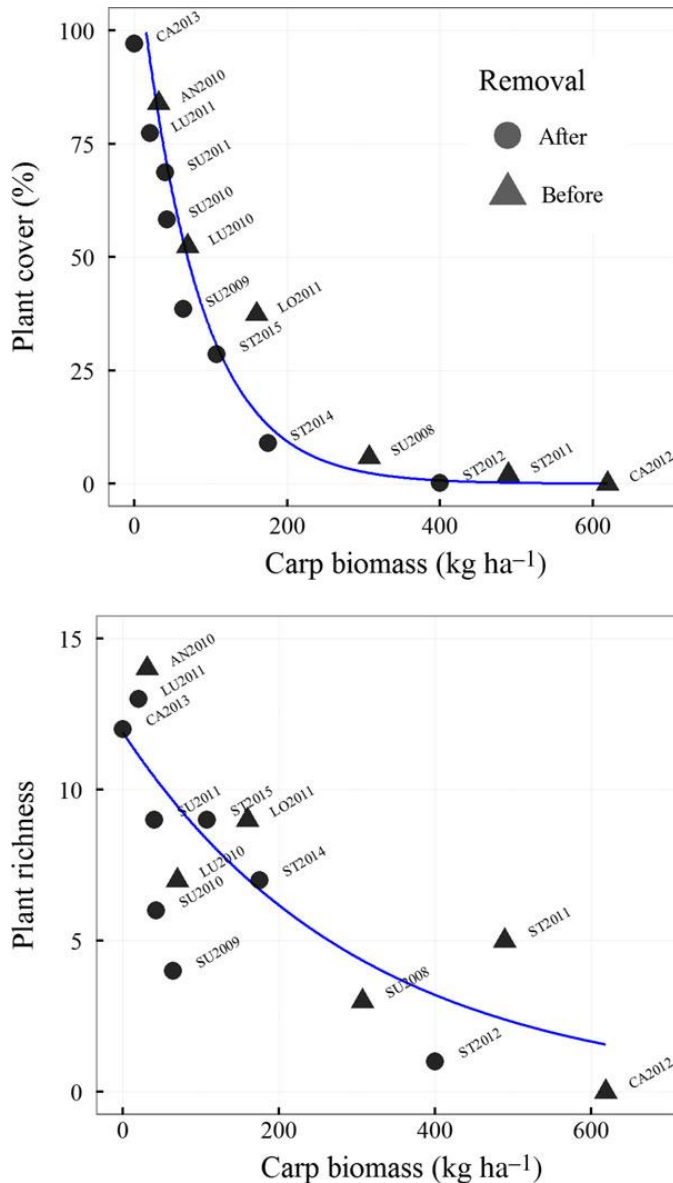


Figure 15: Relationship between common carp biomass and aquatic macrophyte cover in the littoral (top) and plant richness (bottom) in small Minnesota lakes. From Bajer et al. 2016.

Management Recommendations

Lake Owasso

A continuation of the current management plan for Lake Owasso is advised for 2025. This includes monitoring the barrier at the Lake Owasso outlet during the spring migration for potential removals. The current physical barrier at the Lake Owasso outlet should be repaired if needed in the spring of 2025. Given the success of removing a sizable portion (28.3%) of the annual spring run of carp in Lake Owasso, continuation of opportunistic spring removals using the block net and barrier at the Owasso Outlet is recommended. A boat electrofishing survey should be conducted in 2025 in continuation of biennial surveys on Owasso in order to continue monitoring of both carp population and biomass density. PIT tagging during these surveys should be done to further increase accuracy of statistical analysis of future removals and monitoring as well as aid in the timing of spring removal events.

Lake Wabasso

The existing barrier at the outlet should be maintained to prevent the migration of carp and facilitate further opportunistic removals during the spawning run. Electrofishing surveys should be done in 2025 in continuation of biennial surveys.

Grass Lake

Electrofishing surveys are recommended every year to monitor the carp population in the lake. Additionally, trap netting to monitor for juvenile carp and sample the native fish populations is advised on a biennial basis as well.

West Vadnais

Electrofishing and trap net surveys are recommended every two years to monitor the carp population in the lake. While there have been physical barriers at the outlet of this lake in 2020 and 2023, and an electric barrier in the same location from 2021-2022, no carp have been observed or detected at the accompanying PIT antenna. Since a physical barrier is currently located at the site, an electric barrier will not be needed in future years. Additionally, a PIT antenna may not be necessary in future years provided the physical barrier is maintained.

Gervais Lake

Given the current biomass density of carp in Gervais Lake intensive carp management on the lake is not needed. Biennial boat electrofishing surveys on the lake should be considered to continue monitoring the carp population. Additionally, PIT tagging during these surveys would provide the possibility of using the mark-recapture method for estimates which is considered more accurate than estimates based just on CPUE alone. This would also allow for future tracking of potential spawning runs (and

identifying the source of recruitment) at both the Gervais Mill Pond spring removal site and into Kohlman Basin. Both of these waterbodies are the most likely sources of potential newly recruited carp in the system. The most important part of managing Gervais Lake is the maintenance of barriers around it. In addition to preventing the carp from spawning in the peripheral waterbodies, these barriers also facilitate opportunistic removals of the migrating carp. At this time, such opportunistic removals are all that is required to maintain the carp population below the management threshold of 100 kg/ha.

Kohlman Lake

Similar to the connected Gervais Lake, intensive carp management is not needed on this lake. Like Gervais Lake, biennial boat electrofishing surveys and the implantation of PIT tags are recommended. As has been done in the past, maintenance of the barrier at the outlet of Kohlman Basin into Kohlman Lake to prevent spawning is critical. Like other barriers in the watershed, this barrier also provides the opportunity for removals when the carp run. Since the carp biomass density is well below the management threshold of 100 kg/ha, no removals are needed beyond the opportunistic removals at the barriers.

Gervais Mill Pond

Since the barrier at the outlet of Gervais Mill Pond was removed on August 12 after it collapsed due to high flows, it needs to be replaced in the spring of 2025. This barrier protects an important carp nursery that could allow carp populations to rapidly expand in Gervais Lake if not maintained properly. To avoid further failures of this barrier, a longer term solution should be sought out. Specifically, a low voltage electric barrier and guidance system could be installed here. This barrier would allow debris through in high flows while still preventing carp movement. Such a system could also be designed to make carp removal at the site more efficient.

Continued opportunistic removal of carp at this barrier is also recommended. This barrier provides an easy site for the removal of carp from the system and can continue to improve the state of carp populations in the downstream lakes. Since surveys have not been conducted on Gervais Mill Pond since 2021, an electrofishing survey is recommended there in 2025.

Willow Lake

Because no carp were caught during the trapnet surveys, carp management is not required. Future monitoring using trapnet surveys should be considered every 3 to 5 years.

Wetland A

It is very concerning that both young-of-year carp were observed during surveys, however, with carp not being able to leave the wetland upstream towards Snail Lake or downstream to Grass Lake under low or normal water levels it is unlikely that it poses a serious threat to the system. Further surveys and potentially small scale box netting could be conducted in the wetland in the future.

Goldfish Management

Since goldfish have been observed or sampled in Wicklander, Wakefield, and Markham Ponds, we recommend summer-fall trap netting surveys to sample the goldfish. Although trap netting cannot be used as a removal method due to MN DNR permitting requirements, it will set baselines for future management in these ponds.

Citations

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