

2022 VLAWMO Carp Management Report

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Prepared For: Vadnais Lakes Area Water Management Organization & Ramsey Washington
Metro Watershed District

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Summary

Carp Solutions conducted a trap netting survey on West Vadnais Lake in the summer of 2022. Five trap nets were placed around the perimeter of the lake on August 1, 2022. The following day, the nets were pulled and the fish captured in them were counted and measured. Captured fishes included several smaller native species as well as common carp. From this data, a continuation of carp management is suggested for West Vadnais Lake.

Methods and Results

The initial plan for the 2022 season involved conducting three boat electrofishing surveys and a trap netting survey on West Vadnais Lake. However, due to the low water level for the duration of the season, VLAWMO and Carp Solutions agreed to postpone the boat electrofishing surveys but still conduct the trap net survey on the lake. On August 1, five trap nets were installed around the perimeter of West Vadnais Lake and left overnight. Locations of the nets are displayed in Figure 1. The following day, the nets were pulled and the fish captured in them were identified, counted, measured, and released. Six larger (11.5-13.3 inch) juvenile carp were fin clipped and implanted with a Passive Integrated Transponder (PIT) tag for future tracking efforts. The data for species caught per net can be observed in Table 1. Species observed include black bullhead, brown bullhead, common carp, fathead minnow, and golden shiner. Length histograms for each species are shown in Figure 2. As shown in the bottom pane of this graph, carp sizes ranged from young-of-year (YOY) carp just over an inch to large juveniles just under 14 inches, with multiple modes indicating several size classes. Carp represented 21.8% of all fishes captured in terms of numbers of each species collected.

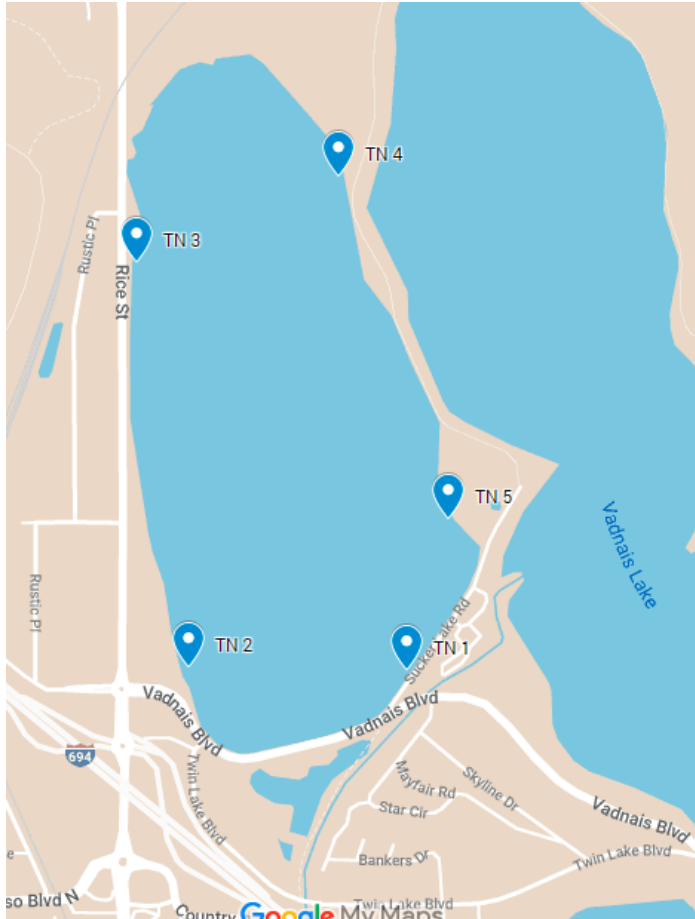


Figure 1: A map of West Vadnais and the locations of the trap nets along the lake shore.

Table 1: Distribution of species per trap net. Additionally, the totals of each species and catch-per-unit-effort (CPUE) and average length per net is also shown.

Trap Net #	Black Bullhead	Brown Bullhead	Common Carp	Fathead Minnow	Golden Shiner	Total
1	51	0	36	0	0	87
2	59	2	8	0	0	69
3	69	0	3	0	0	72
4	92	0	8	0	0	100
5	48	0	43	1	28	120
Total	319	2	98	1	28	448
CPUE(Fish per Net)	63.8	0.4	19.6	0.2	5.6	
Average Length (inches)	5.37	7.13	3.73	1.61	3.97	

2022 West Vadnais Trap Net Length Distributions by Species

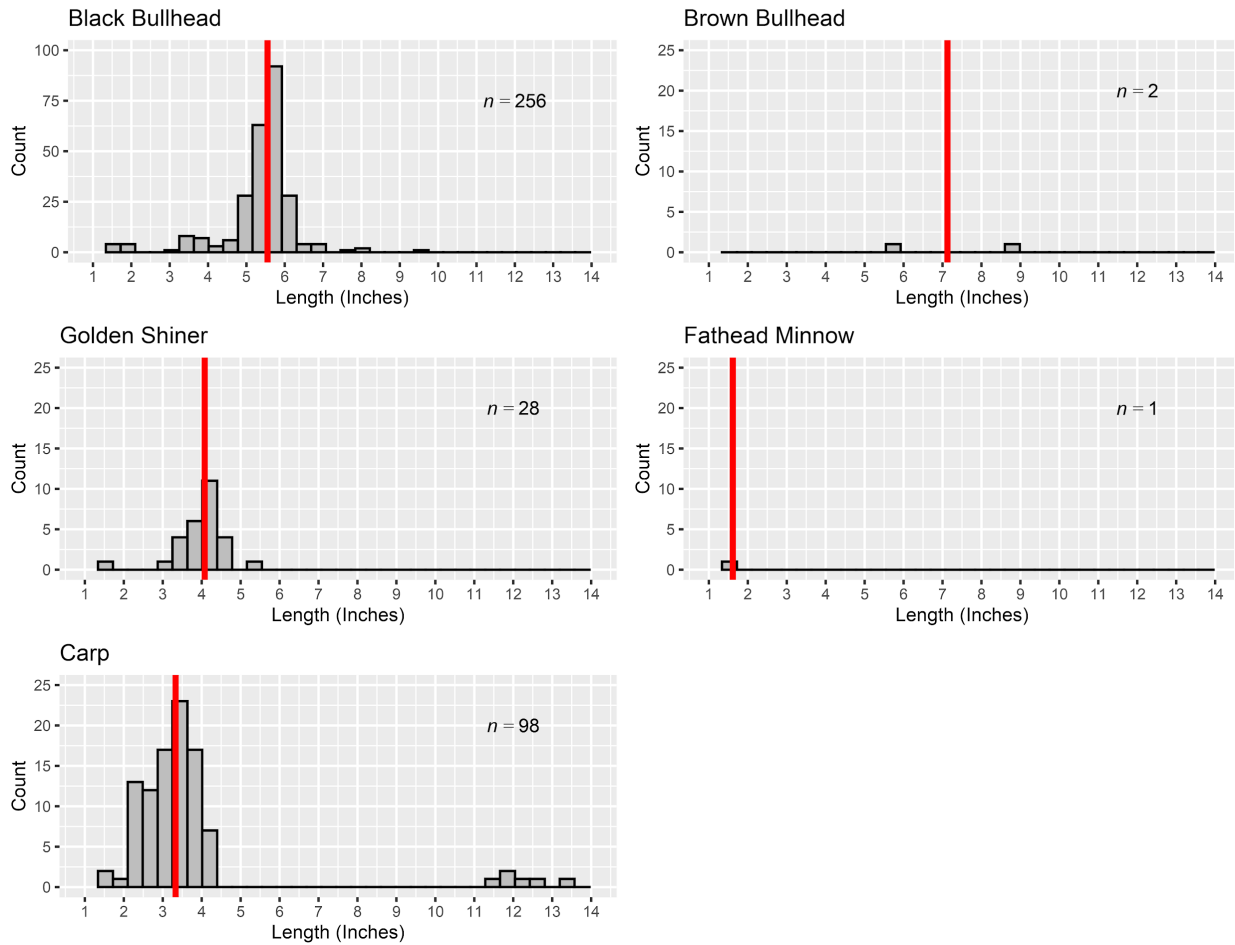


Figure 2: Size distribution of the fishes captured in trap nets on 8/2/22 divided by species. The red lines indicate the median length of that species. All graphs have the same scale and bin size except for the first graph of black bullheads..

Discussion

The multiple size classes of common carp from YOY to large juveniles indicates that carp are reproducing consistently in West Vadnais Lake. This is likely due to the lack of sunfish in the lake. Sunfish species are important because they are known to control carp reproduction through the consumption of fertilized carp eggs (Poole and Bajer 2019). A majority of fish collected (93% by count) were carp and black bullheads. High abundance of these species are typical of low water quality systems and waterbodies with regular winterkill events (Fischer et al., 2013).

Management Recommendations

Since boat electrofishing surveys could not be conducted in 2022, it is recommended to conduct them in the future when water levels allow. These surveys will provide carp population and biomass estimates after removals in 2020. During these surveys, both adult and juvenile members of the population would be sampled unlike trap netting, which is generally only effective at capturing juvenile carp. These carp should be PIT tagged to continue monitoring their movement in the system.

If water levels in West Vадnais rise, a physical barrier to the channel that connects the lake to Grass Lake should be installed. The continuation of the EGS low-voltage electric barrier and associated PIT antenna at the West Vадnais outlet is also strongly recommended to block the movement of carp in or out of the lake. These two barriers will prevent any migration of carp into or out of West Vадnais Lake.

Citations

Fischer, J. R., Krogman, R. M., & Quist, M. C. (2013). Influences of native and non-native benthivorous fishes on aquatic ecosystem degradation. *Hydrobiologia*, 711(1), 187-199.

Poole, J. R., & Bajer, P. G. (2019). A small native predator reduces reproductive success of a large invasive fish as revealed by whole-lake experiments. *PLoS one*, 14(4), e0214009.