

Information on Walleye in Long Lake
Based on sessions with local DNR Park Rapids area fisheries staff 2022-24

1. Based on DNR size and aging analysis, it is thought that only about 5-6 % of the walleye in Long Lake are from natural reproduction; 94-95% of the walleye in the lake are from stocking. For walleye, Long is truly a “put and take” lake. Meaning you have to put in walleye in order to take out walleye.
2. Mud Lake is not a viable spawning option for walleye, even if some walleyes go there. Mud Lake does not have habitat that is conducive for Walleye spawning. Optimal habitat that is best suited for Walleye spawning would be clean gravel that is kept clean with wind action or under water current. The culvert to the inlet of Long Lake does occasionally see Walleye spawning activity, and the DNR had historically cleaned the rocks in the area and roped it off to people fishing in the fill in the spring. However, because almost no successful natural reproduction could be attributed to this, the department ceased doing this in the mid 2010’s.
3. Walleye stocking rates are based on the number of littoral acres in a lake. Littoral acres in a lake are the area that is 15 feet deep or less. This is the most fertile area of the lake – the “nursery” for young fish. Long has about 468 littoral acres. Long is currently stocked for walleye in the fall of the year at about 1 pound per littoral acre every other year. Since 2016 this has been 485 pounds stocked in the fall in even numbered years. From 2006 to 2014 the walleye stocking rate was about 2 pounds per littoral acre or about 935 pounds every other year.
4. Stocking fingerlings is more effective than stocking fry in Long Lake. The DNR stocked fry in the 1980’s, and those stockings did not result in strong year classes.
5. Stocking every other year helps the DNR better assess stocked vs non-stocked years.
6. Fingerlings are roughly 5-7 inches long and run about 15 to 25 fish per pound. Recent stockings in Long have been on the larger side at about 15 fish per pound which would be closer to fingerlings that are 7 inches long. Growth rate data on fingerlings stocked in Long Lake show a fingerling grows about 4 inches the first year in the lake and about 3 inches the second year in the lake. This means it takes about 2-3 years for “stocking” to show up as “catching\keeping” if a length of 14 inches is used as the threshold for keeping a walleye. The fish stocked in Long are bought from commercial suppliers and in 2023 cost about \$20.50 per pound (if 15/pound this is \$1.37 each).
7. The DNR conducts a survey of the fish population in Long Lake every five years. The last survey was in 2019, the next survey will be in 2024, the survey takes place during summer. A series of nets and traps are set in locations consistent with other surveys and data is collected and analyzed on all fish caught.
8. A key metric from these surveys is the CPUE – catch per unit effort. The CPUE is a standard metric that can be used for comparisons among all lakes. The higher the CPUE number the more fish that were sampled. The CPUE is a metric that can help measure trends in fish populations in a lake.
9. In 2019 the walleye CPUE for Long Lake was 4.73. Considering recent history going back to 1993, this is the lowest CPUE on record for this time frame. The CPUE has declined since a peak in 2004. The DNR plan that was last updated in 2021 calls for a CPUE goal of 6. CPUE is calculated for the lake, but for stocking evaluation purposes is more importantly attributed to the individual year classes the fish are aged to.

For 10 through 14, the LLAA Fisheries team asked the local DNR fisheries about their Long Lake surveys.

10. None of the Long Lake surveys appear to sample small walleye (0-9 inch) very well. Is that typical and does it mean the CPUE in Long Lake tends to reflect mostly larger fish?

Unfortunately, many area lakes that we survey do not sample young of year and age 1 fish very well. This can be attributed to the fish this size (0-9 inches) being too small for the gill net mesh's used in the samples, or those smaller Walleyes are not using the habitat our gill nets are set in yet. Some lakes also do not sample age 2 fish, but age 3-5 are often the sweet spot in almost all lakes.

Based on our catch rate data, it looks like the catch rates in the gill nets ramp up to age 3, then slowly decline to age 5, and then stay fairly steady from age 5 on. So, guessing we are seeing the fish be caught in the gill nets effectively at age 3, and the decline from there on is likely from angler harvest or natural mortality. But we are still sampling numbers of age 5, 6 and 7+ walleyes with very little decline. We have aged the oldest Walleyes sampled from 9 - 20 years old, with an average oldest Walleye at 14 years old.

	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7+
Average 1988 – 2019	1%	10%	21%	14%	9%	10%	36%

11. When Long Lake is surveyed how many nets\locations are used and how long are they in the lake? Does the deeper water of Long Lake make it harder to survey than other area lakes?

15 gill nets are used that target Walleye/Yellow Perch/Northern Pike. Generally, we set ~3 gill nets a day which are each set in an individual location for 24 hour or less. Every day the nets are moved to new locations. All of these locations are standardized, and GPS locations are used to set the nets in the same locations. All the gill nets have white buoys attached to each end, but otherwise the nets are at least 6' below the surface, so they should not cause any issues with boats. Deep water doesn't change how we sample the lake for Walleyes. All our standard gill nets are set the same way in all lakes. The nets in Long are set at the same depths, in the same locations, with the same orientation that have always been set at.

Additionally, we have set vertical gill nets in the lake which target Tullibee that utilize more of the deep water in the lake.

12. Does the CPUE tend to correlate with fishing success? Does the DNR have any feedback loop to receive comments on fishing success trends over time from people fishing the lake on a regular basis?

CPUE should correlate more closely with the actual population of fish in the lake. Fishing success can have many factors that influence it. Weather, Forage, Plant Growth, Water Levels, Thermocline/Oxygen Depth...all can have an impact. We can take fishing success into consideration however this information is so subjective that we would have a hard time managing based on that alone. 100 people fishing the same lake, the same day will have drastically different results.

13. What about large Walleyes? Promote catch and release?

There is no biological reason to protect larger Walleyes in Long Lake. All our data shows there is almost no recruitment from natural reproduction in Long Lake. Therefore, the only reason to release these larger fish would be for social reasons, giving another angler a chance to catch a large Walleye. Generally, you are better off keeping those Walleyes during times of warmer surface water temperatures (76*+) and coming out of deeper water (30'+). Hooking mortality estimates range from 5 – 35% depending on a number of factors.

To promote having more Walleyes, harvesting the larger fish would likely be a benefit. Like we talk about stocking rates with fingerlings, there is generally going to be a biomass of Walleyes that the lake supports. Therefore, having a large proportion of Age 6+ fish (46% of captured fish) is going to take up a large percentage of the biomass that the lake will support.

14. Would it be feasible to create a man-made gravel\rock spawning area for walleye somewhere on Long Lake? Or in Mud Lake?

No, unfortunately this has been attempted unsuccessfully in many places. MNDNR has taken the position to not allow this in lakes. Creating specific habitat that is suitable for Walleye to actively spawn in, hatch, and survive is not as easy as just having the rock, but you need all the rest of the conditions/factors to be perfect. This is especially important as the wind/wave action needs to oxygenate these areas and keep silt or sand from settling over it.