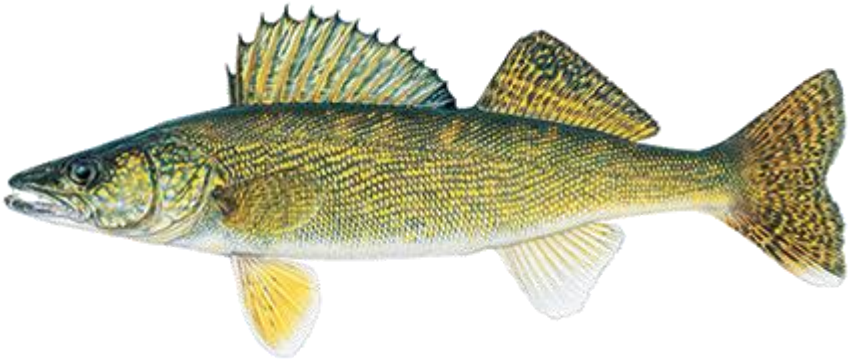
Michigan DNR Fisheries– Southern Lake Huron Management Unit

Loon Lake – 2021 Fall Walleye Survey

2021 Discretionary Survey Report



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On the cover: *Walleye. Credit: Joe Tomelleri ©*

Introduction

Loon Lake has a history of Walleye intermittent stocking by the Michigan DNR since 1992 (Table 1). Loon Lake is classified as a stocked lake within the Michigan DNR Inland Walleye Management Plan (MDNR IWMP). The MDNR IWMP classifies stocked lakes based on natural reproduction, Walleye suitability, and lake class (Table 2). Loon Lake with a lake class level of 1, natural reproduction ranking of 4, and suitability index of 0.67 (scale 0-1). The natural reproduction ranking of 4 is defined as having variable natural reproduction and needs stocking to maintain a sustainable fishery.

Loon Lake receives substantial stocking of Walleye by the MDNR and additionally by the lake association (under permit). Stocking events have not occurred since 2018; scheduled Walleye plants in 2020 were cancelled due to COVID-19 restrictions that limited Walleye rearing. Anecdotal reports from anglers indicate that Loon Lake provides an inland Walleye fishery for anglers during peak times. At an angler meeting held by a residential angler and an MDNR biologist, anglers reported catches of Walleye smaller than 10 inches and rated their satisfaction with the current fishery as an eight out of ten. A comprehensive Status and Trends Lake Survey was last completed in 2011. Results from that survey netted 23 Walleye that ranged in total length (TL) from 9.0 to 25.0 inches representing 9 age classes. At least 5-year classes did not correspond to the stocking history suggesting that natural reproduction of Walleye was occurring. A discretionary survey was conducted in September 2020 to further evaluate the potential natural reproduction of Walleye. The 2020 survey found age-0, 1, and 3 fish that did not correspond to stocking years providing clear evidence of natural reproduction of Walleye in Loon Lake.

We surveyed Loon Lake on 14 October 2021 for Walleye to further document natural reproduction and evaluate our current stocking regime of 75 spring fingerlings/acre biennially. Our objectives were to 1) document relative abundance, 2) document size structure, and 3) determine age and growth of Walleye.

Table 1. Fish stocked in Loon Lake, Iosco County, 1990-2021.

Year	Species	Age	Average Length (inches)	Number	Operation
1992	Walleye	Spring fingerling	1.26	34,540	State
1993	Walleye	Spring fingerling	1.77	18,620	State
1995	Walleye	Spring fingerling	3.50	10,500	State
1999	Walleye	Spring fingerling	2.01	40,050	State
2001	Walleye	Spring fingerling	1.50	44,983	State
2004	Walleye	Spring fingerling	1.85	24,640	State
2006	Walleye	Spring fingerling	2.00	21,968	State
2009	Walleye	Spring fingerling	1.58	24,367	State
2012	Walleye	Spring fingerling	2.27	26,117	State
2014	Walleye	Spring fingerling	1.81	41,552	State
2014	Walleye	Fall fingerling	5.5	520	Private
2015	Walleye	Fall fingerling	2.36	1,600	Private
2016	Walleye	Spring fingerling	1.73	34,983	State
2018	Walleye	Spring fingerling	1.86	52,133	State

Table 2. Habitat description of the lake classifications prioritized for Walleye management actions described within MDNR IWMP. Degree days were calculated (from a base of 32F) as the product of the duration of the ice-free period and mean water temperature during the ice-free period. This table was amended from Wehrly et al. (2012).

Class	Description
1	High degree-days (4,415), high mean temperature (61.2 °F), small surface area (163 acres), and intermediate depth (16.6 ft); these lakes are predominately located in the Lower Peninsula. These lakes are considered a low priority for Walleye management efforts because of their low habitat suitability and high vulnerability to climate change.
2	High degree-days (4,315), intermediate mean temperature (59.9 °F), large surface area (1,572 acres), and deep (22.7 ft); these lakes are found primarily in the Lower Peninsula. Expected to be resilient to climate change because of their large surface area and relatively deep depths.
3	Low degree-days (3,293), low mean temperature (57.7 °F), large surface area (2,363 acres), and deep (24.7 ft); these lakes are concentrated in the western Upper Peninsula, with limited distribution in the northern Lower Peninsula. Currently most suitable for Walleye and expected to be resilient to climate change because of their large surface area and relatively deep depths.
4	Low degree-days (3,441), intermediate mean temperature (59.9 °F), small surface area (94 acres), and intermediate depth (14.7 ft); these lakes are very common in the Upper Peninsula and northern Lower Peninsula. Expected to be the most vulnerable to climate change because of their relatively small surface area, shallow depths, and predicted temperature increases in northern regions where these lakes are located.
5	Intermediate degree-days (3,719), intermediate mean temperature (60.1 °F), intermediate surface area (616 acres), and intermediate depth (14.4 ft); these lakes are found in the Upper Peninsula and northern Lower Peninsula. Expected to have variable response to climate change, which will primarily be determined by surface area, depth, and latitude with lakes within this classification being more resilient in northern latitudes.
6	Low degree-days (3,304), intermediate mean temperature (59.7 °F), intermediate surface area (1,258 acres), and shallow (10.3 ft); these lakes are found primarily in the Upper Peninsula. Expected to have variable response to climate change, which will primarily be determined by surface area and depth with larger and deeper lakes within this classification being more resilient.

Study Area

Loon Lake is a 417-acre natural lake in Iosco County approximately two miles north of the Village of Hale in north-central Michigan (Figure 1). Loon Lake is classified as a deep, warmwater lake, of medium size that stratifies in the summer. The lake has a narrow littoral zone with only 17% of the lake 15 feet in depth or less. Loon Lake has a maximum depth of 128 feet and the drop-offs are steep. Maggie Creek, a small intermittent coldwater tributary is an inlet to Loon Lake and Smith Creek is the outlet—a trout-stream that forms the East Branch Au Gres River. Loon Lake is an oligotrophic lake—a classification which typically has low levels of nutrients and, therefore, have high water clarity and can support less productive aquatic communities. Loon Lake has several rocky shoals where Walleye can reproduce, but there are

several parts of the lake that are too deep to support a high density of Walleye. Anglers can expect a marginal Walleye fishery that can be enjoyed throughout the year.

Public access to Loon Lake can be gained through the Plainfield Township boat access site. The site has a boat ramp, parking, an outhouse, and a boardwalk with trails to a nearby lake and wetland complex.

Methods

Boat electrofishing was used to collect Walleye on 14 October 2021. One complete shoreline electrofishing pass was conducted after dusk and the surface water temperature was 65 F. Electrofisher settings were generally tuned to 8 amps, a pulse rate of 60, and a duty cycle of 40. All Walleye were netted, measured to total length (TL in inches), and a dorsal fin ray was removed for later age estimation using standard techniques. In the laboratory, a cross section of the fin ray was removed using a Dremel tool. Then the cross section was observed under a microscope to count the number of annuli—representing the age of the fish. Catch per unit effort (CPUE) was expressed as the number of fish/species per hour of electrofishing. Lake surface water temperature was measured with a handheld temperature probe.

Figure 1. Loon Lake in Iosco County, Michigan.

Results

Eighteen Walleye (CPUE= 9/hr) were collected over the total shock time of 1.65 hours. Walleye TL ranged from 9.4 to 21.5 inches and age estimates revealed 5 age classes (Table 3). Walleye in Loon Lake grew at a faster rate (0.7 inches) when compared to statewide average. Walleye in Loon Lake appeared to originate from natural reproduction and stocking events. Fish that were age-1 and 2 do not correspond with years in which Walleye were stocked and were therefore likely naturally produced in the lake. Without definitive marking of stocked fish (e.g., oxytetracycline marking) it is difficult to differentiate stocked and naturally produced fish. However, this supports the results of the fall 2020 survey that also provided evidence of natural reproduction.

Table 3. Estimated age, number, and total length (TL) range of Walleye captured in Loon Lake on 14 October 2021.

Age	Number	TL range (in)	Statewide average TL (in)
1	1	9.4	10.4
2	3	12.6-14.0	13.9
3	7	14.4-18.8	15.8
5	4	18.7-22.2	19.2
6	3	18.2-21.5	20.6

Conclusions

Despite being ranked as a class 1 lake, this survey provided a snapshot of the Walleye population and provides evidence that natural reproduction of Walleye is occurring in Loon Lake. Stocking did not occur in 2021 and no age-0 fish were collected during this survey. Walleye fishing in Loon Lake is very popular, but natural reproduction is likely not high enough to produce adult Walleye density adequate for a good fishery. Therefore, stocking events are still necessary to supplement natural reproduction and maintain the fishery. However, DNR stocking of spring fingerling Walleye should be reduced to encourage natural reproduction of Walleye. The current MDNR stocking rate of 75 spring fingerling Walleye per acre in addition to private stocking events in Loon Lake could be too high given the amount of natural reproduction present in the lake. The stocking rate should be decreased to 50 spring fingerlings per acre when the stocking prescription expires in 2025. Fish should be OTC marked for further evaluation of stocked vs. natural fish.

References

Wehrly, K.E., J.E. Breck, L. Wang, and L. Szabo-Kraft. 2012. Landscape-based classification of fish assemblages in sampled and unsampled lakes. Transactions of the American Fisheries Society 141:414-425.

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