Houghton Lake – 2025 Fisheries Survey Report

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March 2026

## Introduction

Houghton Lake is a natural lake of glacial origin located in west-central Roscommon County. The unincorporated communities of Houghton Lake, Houghton Lake Heights, and Prudenville are located along the southern shore of the lake. Houghton Lake has a surface area of 20,075 acres, making it Michigan's largest inland lake. The maximum depth of Houghton Lake is 22 feet, and the average depth is 8.4 feet (Clark et al. 2004). Houghton Lake lies in the Muskegon River Watershed, and its outflow essentially forms the Muskegon River. Houghton Lake is fed by several small tributaries, the most significant of which include the Cut River and Denton Creek. Houghton Lake water levels are controlled by a dam near the outlet of the lake. Roscommon County is responsible for operation and maintenance of the structure, as well as meeting the summer and winter lake levels set by a 1982 circuit court order.

There are multiple public boat launches on Houghton Lake. Houghton Lake receives extremely heavy fishing pressure in both the open-water and ice fishing seasons. A creel census study conducted in 2001/2002 resulted in angler effort of approximately 500,000 angler-hours, making it the most heavily fished inland lake in Michigan, with more angler effort than Michigan waters of Lake Erie or Lake Superior (Clark et al. 2004).

Houghton Lake has a long fisheries management history, dating back to at least the early 1900s. Popular species on Houghton Lake include Walleye, Northern Pike, Bluegill, Black Crappie, Yellow Perch, Largemouth Bass, and Smallmouth Bass. After the extensive creel census study of 2001/2002, Clark et al. (2004) stated that "It also seems clear that the fishery of Houghton Lake in 1957-61 was very similar to its fishery today".

Much of the historical stocking and management activity on Houghton Lake has revolved around Walleye, which were first stocked into Houghton Lake in 1908 (O'Neal 2017). Houghton Lake was stocked with Walleye fry from 1933-1944, and then not stocked from 1945-1978. From 1979-1994 it was stocked regularly with spring fingerling Walleye in most years. Between 1995 and 2011, stockings were more sporadic, with low numbers of Walleye stocked in only five of those years. All of these stocking efforts were very low on a per-acre basis for a 20,000-acre lake. Schrouder (1993) recommended further investigation into the extent of Walleye natural reproduction in Houghton Lake, specifically by fall electrofishing surveys targeting juvenile Walleye. She stated that "if catches of Walleyes on non-stocking years equal or exceed stocked year catches a decision will be made to cease Walleye rearing and stocking by the Houghton Lake Association and the MDNR". Despite this statement and the presence of naturally reproduced Walleye in fall electrofishing surveys that met this threshold, stocking continued sporadically until 2011.

An extensive netting effort in the spring of 2001 combined with creel census in 2001 and 2002 led to a Walleye population estimate of 58,854 (Clark et al. 2004). Other, much less intensive netting surveys were conducted in 2007 and 2011. According to O'Neal (2012), "most of the walleye catch in 2011 was composed of age-2 to age-5 walleye (Table 3). These fish represent the 2006 through 2009 year-classes when walleye were not stocked into Houghton Lake". In addition to the netting surveys, many fall electrofishing surveys targeting juvenile Walleye in the fashion of a Serns Index (1982, 1983) and Ziegler and Schneider (2000) have been conducted on Houghton Lake, starting in 1990 (O'Neal 2017; Tonello 2021). The results of these surveys conducted since 2000 can be seen in Table 1. As a result of this extensive sampling of Houghton Lake, Walleye stocking was discontinued after 2011. In 2022 however, 1.1 million surplus Walleye fry were stocked into the Cut River (Tonello 2023).

A netting survey of Houghton Lake in the summer of 2022 showed healthy populations of both Bluegill and Walleye (Tonello 2023). In particular, the survey showed good Walleye catch rates and nine different year classes of Walleye represented, none of which were stocked years. This led to the conclusion that the Walleye population of Houghton Lake is healthy and well-supported by natural reproduction.

## Materials and Methods

On 9/22/2025, an electrofishing survey to evaluate walleye natural reproduction in Houghton Lake was conducted. The survey was a one-night electrofishing effort aimed at assessing Walleye year class strength. Two sections of Houghton Lake shoreline were surveyed, with each being two miles in length. The surveys were conducted according to protocols outlined by Ziegler and Schneider (2000), and by Serns (1982 and 1983), and were similar in nature to prior surveys of Houghton Lake (Table 1). An 18-foot electroshocking boat with two electrodes was utilized for the survey.

## Results

In the 2025 survey, a total of 135 Walleye were captured during the September 22 effort, ranging from 5.3 to 19.2 inches in length. Of those, 55 were age-0 Walleye from 5.3 to 8.3 inches in length, and 74 were age-1 Walleye from 7.5 to 10.4 inches (Table 2). The catch rate for the age-0 Walleye was 12.5 per mile of shoreline sampled, or 16.2 Walleye per hour of sampling, and the catch rate for age-1 Walleye was 16.8 per mile and 35.2 per hour. The remaining 6 Walleye caught in the 2025 survey were older Walleye from age-2 to age-6, ranging from 12.5 to 19.2 inches in length. The age-0-year class was growing -0.9 inches below the state average (a minimum of five fish per age group is required to make statistical inferences about growth rates), while the age-1 year class was growing -1.0 inches below the state average.

## Discussion

The MDNR protocol for fall indexing of age-0 and age-1 Walleye calls for sampling at least six miles of shoreline for lakes larger than 1,000 acres (Ziegler and Schneider 2000). Since Houghton Lake is over 20,000 acres, it should receive far more effort even than that. However, in recent years, staffing levels have only allowed for the sampling of approximately 4 miles of shoreline per year. This is no doubt inadequate to accurately gauge the abundance of young Walleye in the lake. That said, the recent surveys are not without value. While they may not accurately show the

abundance of young Walleye, they do continue to show annual natural reproduction of Walleye in Houghton Lake and survival and recruitment of older year classes.

At 12.5 age-0 Walleye per mile of electrofishing, the 2025 fall survey catch ranked as slightly above average (Table 1). The catch of 16.8 age-1 Walleye per mile was by far the highest ever recorded in similar surveys of Houghton Lake. The previous high was 7.3 age-1 Walleye per mile in 2011. The high catch of age-1 Walleye was not unexpected, since the 2024 survey showed the highest age-0 catch ever recorded in a Houghton Lake fall Walleye survey (Tonello 2025). This confirms that Houghton Lake continues to produce excellent numbers of Walleye without supplemental stocking. In addition, the presence of six different age classes of Walleye in the 2025 survey is further confirmation that Houghton Lake continues to produce natural year-classes of Walleye.

**Management Direction:**

All recent surveys of Houghton Lake have shown strong natural reproduction of Walleye. Therefore, Houghton Lake should continue to be managed as a self-sustaining Walleye fishery, with no need for stocking. As the most heavily fished inland lake in Michigan, the Houghton Lake fishery contributes dramatically to the local economy of the area. Annual fall Walleye surveys should continue to be conducted to monitor year-class strength and the fishery. A creel survey of Houghton Lake to measure angler effort and harvest in the fishery should be conducted as soon as possible. Another netting survey replicating that conducted in 2022 should be repeated no later than 2027. Conducting a population estimate for Walleye would be extremely helpful in setting the course for future management on Houghton Lake. Creel census and population estimate data could be compared with the data from the 2001 survey efforts. In addition, MDNR Fisheries personnel should work to maintain communication with Houghton Lake anglers and stakeholders to monitor all aspects of the Houghton Lake fishery, including Walleye.

An issue of particular importance to the Houghton Lake Walleye fishery is the protection of the Cut River. The Cut River is the most significant tributary used by Walleye from Houghton Lake for spawning and rearing purposes and is critical to successful Walleye natural reproduction in Houghton Lake. The Cut River flows out of Higgins Lake, and there is a lake-level control structure at the outlet of Higgins Lake. Wiley and Layman (2016) recommended maintaining flows of at least 50 cubic feet per second (cfs) through the control structure to protect fish populations in the Cut River. They also recommended that during the critical spring Walleye spawning time, flows of 100-150 cfs should be maintained to ensure that walleye spawning and hatching can be successfully completed. Some Higgins Lake residents have strongly advocated against maintaining minimum flows exiting Higgins Lake and have even advocated for shutting off the flow into the Cut River at times. This should not be allowed, and a minimum flow rate of at least 50 cfs should always be maintained, with potentially higher flow rates in the spring to promote successful Walleye natural reproduction.

Other issues worthy of discussion on Houghton Lake include aquatic plant management, shoreline management, and lake level control. Houghton Lake has an extensive treatment history with a myriad of chemicals being used for controlling both native and non-native aquatic plants. Due to

its shallow nature, aquatic plants are a critical component to the Houghton Lake ecosystem and fishery. Therefore, we recommend only treating invasive plant species when recreational use is disrupted or threatened. Native plants should not be treated. In addition, Fisheries Division will continue to support ongoing efforts by stakeholder groups to restore native wild rice beds and other native plants important to the Houghton Lake ecology.

All remaining riparian wetlands adjacent to Houghton Lake should be protected and considered critical to the continued health of the lake's aquatic community. The Houghton Lake shoreline is already more developed than most other lakes in Michigan. Future unwise riparian development and wetland loss may result in further deterioration of the water quality and aquatic habitat. Healthy biological communities in inland lakes require suitable natural habitat. Human development within the watershed, along the shoreline, and in the lake basin tends to change and diminish natural habitat. Attempts should be made to reclaim Houghton Lake natural shoreline by removing seawalls and riprap and restoring natural shoreline characteristics. The Michigan Natural Shoreline Partnership, an organization dedicated to promoting natural shoreline landscaping to protect Michigan's inland lakes (http://www.mishorelinepartnership.org/), can provide guidance and training on how best to manage the land/water interface for the benefit of Houghton Lake.

Houghton Lake levels are artificially controlled by a control structure (dam) on the outlet. Due to the sheer size of Houghton Lake, it can be difficult at times for Roscommon County to meet the summer and winter legal lake levels. This can be exacerbated by extended droughts or periods of heavy rainfall that can cause extensive flooding on the highly developed, low-lying shoreline of Houghton Lake. In recent years, lower rainfall totals have led to some landowners calling for raising the summer legal lake level. Fisheries Division does not recommend pursuing short-term solutions. It is important to understand that inland lakes without water level control structures experience the same natural high and low water cycles. Without human intervention low water levels can rejuvenate aquatic vegetation and reverse the effects of erosion. Cycles of high water can increase spawning habitat and create estuaries for juvenile fish and other aquatic organisms. Both cycles are part of the natural function of inland lakes and provide benefit for the fish community and aquatic ecosystem of Houghton Lake.

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Table 1. Results of fall electrofishing surveys conducted on Houghton Lake targeting juvenile Walleye. The surveys were conducted according to protocols described by Ziegler and Schneider (2000).

| Year survey was conducted | Age 0 Walleye #/mile of electrofishing | Age 1 Walleye #/mile of electrofishing |
|---|---|---|
| 2000 | 0 | 2.2 |
| 2001* | 7.8 | 0.4 |
| 2002 | 0.1 | 1.6 |
| 2003 | 3.5 | 0.2 |
| 2004* | 29.7 | 1.0 |
| 2005* | No survey conducted | No survey conducted |
| 2006 | 5.1 | 6.6 |
| 2007 | 22.0 | 1.0 |
| 2008 | 10.3 | 2.3 |
| 2009 | 16.5 | 1.3 |
| 2010 | 13.8 | 3.8 |
| 2011* | 25.8 | 7.3 |
| 2012 | No survey conducted | No survey conducted |
| 2013 | 8.2 | 4.3 |
| 2014 | 4.0 | 4.0 |
| 2015 | 6.4 | 2.6 |
| 2016 | 10.6 | 1.3 |
| 2017 | 13.3 | 2.6 |
| 2018 | 21.0 | 0.0 |
| 2019 | 4.1 | 6.4 |
| 2020 | 7.7 | 0.9 |
| 2021 | 0 | 2.6 |
| 2022* | 2.1 | 3.2 |
| 2023 | 16.6 | 0.6 |
| 2024 | 54.3 | 1.3 |
| 2025 | 12.5 | 16.8 |
| Average: | 12.3 | 3.1 |

*Indicates Walleye were stocked

Table 2. Results of a fall electrofishing effort targeting Walleye on Houghton Lake on September 22, 2025, Roscommon County, Michigan. During the survey, 4.0 miles of shoreline were sampled in 2.1 hours of electrofishing. The surface water temperature was 71.0°F.

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| Houghton Lake acreage | 20,075 |
| Miles of shoreline sampled: | 4.4 |
| Hours of electrofishing: | 2.1 |
| Water temperature: | 71.0F |

| Year Class | Age | # Walleye captured | Catch Rate (# Walleye/mile of shoreline sampled) | Catch Rate (# Walleye/hour of electrofishing) |
|---|---|---|---|---|
| 2025 | 0 | 55 | 12.5 | 26.2 |
| 2024 | 1 | 74 | 16.8 | 35.2 |