As part of a long-term Walleye monitoring project, Michigan DNR’s Tribal Coordination Unit placed temperature loggers and took temperature and dissolved oxygen profiles in East and West Twin Lakes between May and October 2023. A fall walleye index survey was also conducted in September 2023 in both lakes to evaluate stocking success and natural Walleye recruitment. These efforts will continue for the next 10-20 years in addition to periodic walleye population estimates and fish community surveys. East and West Twin Lakes are currently scheduled for these comprehensive fisheries surveys in spring and early summer 2026.

The water temperatures in East and West Twin Lakes from May to late October 2023 were very similar, which was expected for lakes so close together. The daily average temperature in West Twin Lake was slightly cooler by 1-2OF at several points over the open water season, but the overall trends were nearly identical and were comparable to the five other long-term monitoring lakes. The range of water temperatures across the season was 47.4oF to 80.5oF for both lakes.

Similarly, temperature and dissolved oxygen profiles taken at the deepest point in each lake in spring (May), summer (August), and fall (October) indicated similar trends in dissolved oxygen levels and temperature during spring and summer, with steady declines in temperature with depth in the spring profiles and rapid declines in dissolved oxygen beginning just above 20 ft in the summer profiles (Figures 2 and 3). A decrease in dissolved oxygen is expected in summer when lakes are most likely to be stratified, but neither lake was stratified by temperature in August. The lack of temperature stratification in August is likely because East and West Twin Lakes are relatively shallow. The fall profiles also had the same trend in both East and West Twin Lakes, which is expected after the lake mixes in fall and water temperature and dissolved oxygen are typically uniform throughout the water column (Figures 2 and 3).

Secchi depth measurements were recorded on each lake when temperature and dissolved oxygen profiles were taken, except for the May 2023 profiles (Table 1). The depths observed in 2023 by Michigan DNR were very similar to those reported by volunteers from the Cooperative Lakes Monitoring Program in the same month and year. Secchi depth measurements in West Twin Lake were similar between 2022 and 2023, but in East Twin Lake Secchi depth was lower in 2022 for the August and September measurements.

Fall Walleye index survey results were compared to previous survey results for East and West Twin Lakes. These surveys are conducted at night using an electrofishing boat to survey the entire shoreline and are intended to target Age-0 Walleye, but adult Walleye are sometimes captured. All Walleye caught are measured and a dorsal fin clip is taken for aging before the fish are released. In East Twin Lake, 150 Age-0 Walleye were captured, which was an average catch rate compared to surveys conducted in previous years with stocking (Table 2). A higher catch rate in stocked years compared to non-stocked years would be expected in both East and West Twin Lakes because they are known to be reliant on stocking to produce a fishery. In West Twin Lake, no Age-0 Walleye were captured which is identical to the only previous survey conducted in a year with no Walleye stocking (Table 3)

Walleye stocked into East Twin Lake in spring 2023 were marked with oxytetracycline (OTC) which allows a sample of Age-0 Walleye to be kept and examined in the lab to determine if the fish is of stocked or natural origin. Twenty Age-0 Walleye were kept for analysis and 75% were of stocked origin based on OTC marks. While this indicates good survival of stocked Walleye, it also shows that there is some successful natural reproduction of Walleye occurring in East Twin Lake. Since no stocking occurred in 2023 in West Twin Lake, results evaluating the proportion of stocked and natural Age-0 Walleye will be conducted in the next stocking year (2024).

Table 1. Secchi depth measurements taken by Michigan DNR (2023) and by the Cooperative Lakes Monitoring Program (2022-2023) in East and West Twin Lakes, Montmorency County.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Secchi Depth (ft) | |
| Organization | Month and Year | East Twin Lake | West Twin Lake | |
| Michigan DNR | August 2023 | 10 | 12.5 | |
| October 2023 | 14 | 23 | |
| CLMP | May 2023 | 11.5 | 16 | |
| Sept. 2023 | 11 | 11 | |
| August 2023 | 10.5 | 12 | |
| May 2022 | 11.5 | 13 | |
| August 2022 | 8 | 13 | |
| September 2022 | 9 | 13 | |

Table 2. Summary of fall walleye index survey results for East Twin Lake, Montmorency County. An asterisk (\*) indicates years in which stocking occurred.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Miles Shocked** | **Hours Shocked** | **No. Age-0 Walleye** | **Catch per Mile** | **Catch per Hour** |
| 2003\* | 3.00 | 2.00 | 178 | 59.3 | 89.0 |
| 2011\* | 1.00 | 1.00 | 74 | 74.0 | 74.0 |
| 2015\* | 5.51 | 3.08 | 265 | 48.1 | 86.0 |
| 2017\* | 2.00 | 0.80 | 94 | 47.0 | 117.5 |
| 2019\* | 4.00 | 2.05 | 219 | 54.8 | 106.8 |
| 2023\* | 5.23 | 2.08 | 150 | 28.7 | 72.1 |

Table 3. Summary of fall walleye index survey results for West Twin Lake, Montmorency County. An asterisk (\*) indicates years in which stocking occurred.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **Miles Shocked** | **Hours Shocked** | **No. Age-0 Walleye** | **Catch per Mile** | **Catch per Hour** |
| 1998\* | -- | 1.50 | 5 | -- | 3.3 |
| 1999\* | -- | 2.00 | 16 | -- | 8.0 |
| 2000\* | -- | 1.50 | 12 | -- | 8.0 |
| 2001 (Aug) | -- | 2.25 | 0 | 0 | 0.0 |
| 2004\* (Aug) | 3.8 | 2.07 | 43 | 11.2 | 20.7 |
| 2011\* | 1.5 | 1.50 | 60 | 40.0 | 40.0 |
| 2022\* | 4.0 | 2.50 | 42 | 10.5 | 16.8 |
| 2023 | 6.25 | 2.03 | 0 | 0 | 0 |

Figure 1. Average daily water temperatures from May 2023 to October 2023 in East and West Twin Lakes, Montmorency County.

**May**

Figure 2. Temperature and dissolved oxygen profiles from May (top), August (center), and October (bottom) in East Twin Lake, Montmorency County.

Figure 3. Temperature and dissolved oxygen profiles from May (top), August (center), and October (bottom) in West Twin Lake, Montmorency County.