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We evaluate the strength of a walleye year class in Black Lake based on nearshore nighttime electrofishing sessions. Many historic stations were surveyed in the past with this gear, but the standard route has been approximately 7 ½ miles from Five Mile Point south and then east to the Rainy River mouth. This method is more useful for assessing juvenile walleye (age 0 and 1) than adults. It also can help determine stocking success, or wild walleye production in a year.

Age 0 walleye sampling results by year in Black Lake:

1997 – wild fish present, low but acceptable numbers
1998 – wild fish present, low but acceptable numbers
1999 – no sampling
2000 - wild fish present, low but acceptable numbers
2001 – no sampling
2002 – no sampling
2003 – no sampling
2005 – minimal wild fish present
2006 – minimal wild fish present
2007 – minimal wild fish present
2008 – minimal wild fish present
2009 – minimal wild fish present
2010 – assumed minimal wild fish present, strong stocked year class present
2011 – minimal wild fish present, strong stocked year class present
2012 – minimal wild fish present, very strong stocked year class present
2013 – minimal wild fish present
2014 – minimal wild fish present, acceptable stocked year class present
2015 – minimal wild fish present
2016 – minimal wild fish present
2017 - minimal wild fish present, strong stocked year class present
2018 - minimal wild fish present, strong stocked year class present
2019 – minimal wild fish present
2020 – no wild fish sampled
2021 - stocked fish present in the survey, but unknown ratios due to marking uncertainties and 49% of fish stocked not marked
2022 – stocked fish present in the survey, sample of 19/19 sacrificed fish all tested positive for OTC (stocked)
2023 – stocked fish present in the survey, sample of 20/20 sacrificed fish all tested positive for OTC (stocked)

Black Lake walleye populations were reliant on natural recruitment prior to 2008. We have hypothesized that zebra mussels have changed the nutrient dynamics in Black Lake over the recent two decades. This has been documented through water quality sampling results by Tip of the Mitt Watershed Council. Plankton levels may have changed and are likely in lower supply for wild walleye fry in Black Lake and other lakes infested with mussels. Spawning is not interrupted in the Black Lake system, but recruitment of wild fry to fingerling stage may likely be a bottleneck. DNR and ITFAP (Inter Tribal Fisheries Assessment Program) and Soo Tribe have stocked spring fingerlings (which are beyond reliance on eating



plankton) in Black Lake in 2010, 2011, 2012, and 2014, 2017, 2018, 2021, 2022, and 2023 (Table 1). Survival of these fingerlings has been acceptable based on first year (fall) sampling results and angler reports as these cohorts mature. In addition, fall fingerlings were stocked by the lake association in multiple years, but survival of these fish has not been evaluated.

DNR, and tribal partners including Little Traverse Bay Band of Odawa Indians and the Sault Ste. Marie Tribe of Chippewa Indians will continue to evaluate year class strength of walleye in Black Lake in the next decade. This may be done annually when possible, but may be completed in alternate years. Age-0 walleye catches in non-stocked years remains low (e.g. 2013, 2015, 2016, 2019, 2020). Future periodic stocking source should be State of Michigan spring fingerlings or Sault Tribe fingerlings. If possible, stocked walleye fingerlings should be OTC marked. Stocking probability will be based on walleye fingerling availability in any given year and be need based.

Note that good numbers of age-1 walleye were captured in 2022 and 2023 (Table 2) following stocking events in prior years. This indicated acceptable survival of age-0 fish though the winter to the next fall and is a positive sign of a slowly building population of juvenile walleye.

Table 1. Recent walleye stocking history for Black Lake. Private stocking indicated by asterisk.

Year	Strain	Period stocked	Size (in)	OTC mark?	Number	Number/acre
2023	St. Marys	June	1.8	Yes	360,808	36
2022	Muskegon	June	2.2	Yes	200,000	19
2021	Muskegon	June	1.6	yes 51%	388,463	38
2018	St. Marys	June	2.0	yes	241,399	24
2017	Muskegon	June	1.5	yes	174,200	17
2017	St. Marys	June	2.1	yes	101,035	10
2016*	St. Marys	October	7.5	no	9,750	1
2014	St. Marys	June	1.2	yes	147,200	14
2014	Muskegon	June	1.4	yes	57,488	5
2012*	St. Marys	Late Oct	6-7	yes	10,000	1
2012	Muskegon	June	2.1	yes	192,541	19
2011*	St. Marys	Late Oct.	6-8	yes	10,167	1
2011	Muskegon	June	1.8	yes	119,983	11
2010	Muskegon	early/mid June	2.0	no	196,130	19
2009*	St. Mary's	late Oct.	6.0	Yes	10,000	1
2008*	St. Mary's	mid Oct.	5.5	Yes	5,000	0.5
2008*	St. Mary's	late May	8.0	Yes	2,950	0.3



Table 2. Recent results of fall walleye indexes at Black Lake. All data collected by MDNR Fisheries Division with the exception of 2010 when LTBB assisted, and 2013 through 2015 when LTBB conducted the entire survey and in 2023 when Sault Tribe assisted.

<i>Year</i>	<i>Date</i>	<i>Water Temp (F)</i>	<i>Hours Shocked</i>	<i>Miles Shocked</i>	<i>Age-0 walleye collected</i>	<i>No. age-0 per hour</i>	<i>No. age-0 per mile</i>	<i>Yearling walleye collected</i>	<i>Adults collected</i>	<i>% age-0 stocked (sample #)*</i>
1997	9/2	65	2.33	2.50	3	1.3	1.2	4	5	-
1998	8/24	76	2.00	1.00	9	4.5	9.0	1	7	-
1999	-	-	-	-	-	-	-	-	-	-
2000	8/28,29	69	9.50	--	45	4.7	--	10	25	-
2005	9/12	74	3.83	7.62	1	0.3	0.1	1	2	-
2006	9/20	60	4.00	8.10	0	0.0	0.0	1	5	-
2007	9/18	64	4.00	8.77	1	0.3	0.1	0	9	-
2008	9/15	64	4.00	8.03	0	0.0	0.0	0	2	-
2009	9/15,16	70, 64	4.00	9.27	1	0.3	0.1	6	7	-
2010	9/14, 28	58-59	4.32	7.3	59	13.7	8.1	2	2	NA
2011	9/28	64	3.40	7.5	40	11.8	5.3	17	11	100 (19)
2012	9/26	60	3.33	7.1	103	30.9	14.5	4	7	100 (25)
2013	10/1, 2	62-65	3.08	6.0	2	0.6	0.3	6	3	NA
2014	9/30	62	2.78	7.66	15	5.4	2.0	0	13	67 (15)
2015	10/15	57	1.74	4.51	0	0.0	0.0	0	10	NA
2016	9/21	70	3.97	7.71	3	0.8	0.4	1	4	NA
2017	9/18	67-69	3.15	7.71	48	15.2	6.2	2	8	90 (30)
2018	9/13	69	3.64	7.14	49	13.4	6.8	10	2	96 (30)
2019	9/16	64	2.86	7.98	7	2.3	0.9	5	6	NA
2020	9/23	67	3.20	7.69	0	0.0	0.0	2	11	NA
2021	9/13	68	3.18	7.25	43	13.5	5.9	0	3	Unknown
2022	9/30	60	3.80	8.00	27	7.1	3.3	16	4	100 (19)
2023	9/21-10/2	67-71	6.2	15.1	36	5.8	2.4	20	23	100 (20)

Notes:

- many young walleye were observed in 1999 (but not netted) while looking for sturgeon with electrofishing gear in mid-August



- asterisk indicates that OTC analysis only completed for state fingerling stocking effort, since private stocking of fall fingerlings done after the fall evaluation\
- larger year classes in 2010-2012, 2014, 2017, 2018, 2021, 2022, and 2023 correspond with DNR/CORA spring fingerling walleye stocking efforts
- OTC results in 2021 provide high uncertainty since 49% of fish stocked were not marked with OTC, and some of the fish stocked had questionable marks with no QAQC
- All sacrificed fish (n=19) age-0 were positive for OTC mark in 2022
- All sacrificed fish (n=20) age-0 were positive for OTC mark in 2023

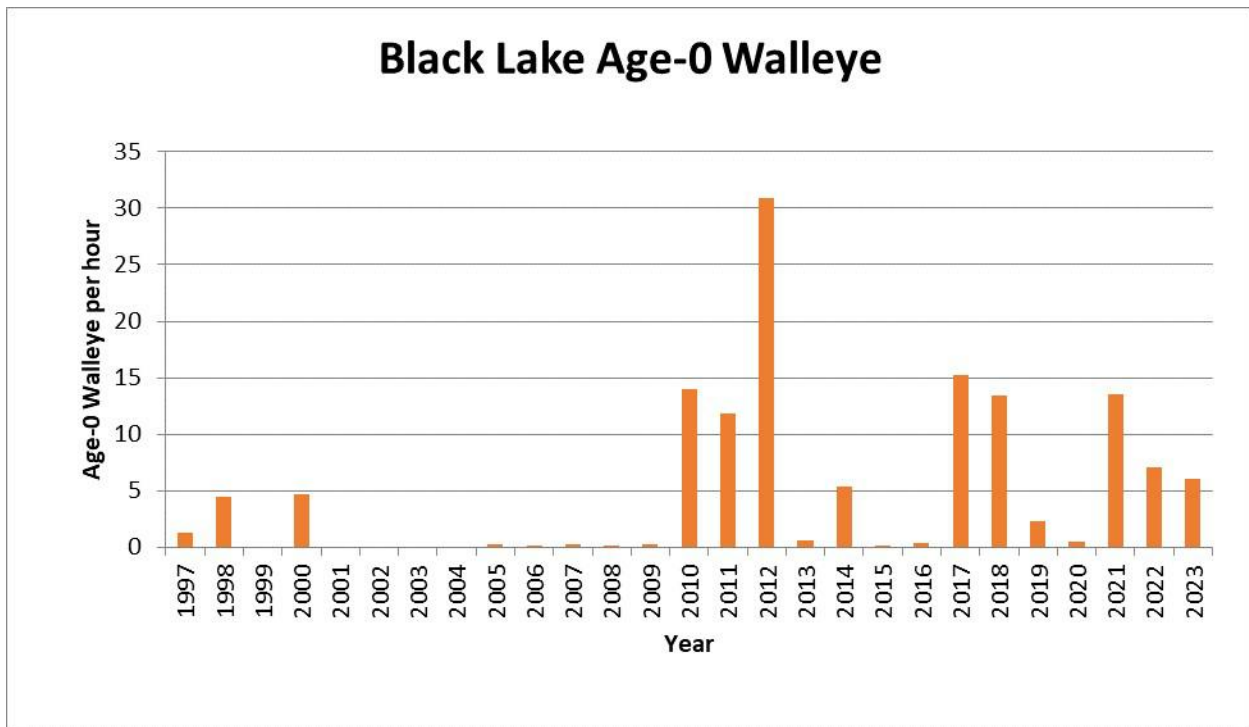


Figure 1. Graph illustrating strength of walleye year classes in Black Lake based on fall catch of age-0 in given years. **Sampling was not conducted in 1999, 2001-2004. Spring fingerling walleye were stocked in 2010, 2011, 2012, 2014, 2017, 2018, 2021, 2022, and 2023.**

Electrofishing routes by year:

2023 – Boat 1 – 5 Mile Pt (south of Black Rv mouth) south, then east to the mouth of the Rainy R, Boat 2 – (Sault Tribe) – East shore (Black R outlet to Rainey R mouth)

2016 – 2022 - 5 Mile Pt (south of Black Rv mouth) or Upper Black River mouth, then south, then east to the mouth of the Rainy River

2015 - 5 Mile Point south to near Onaway State Park (wind cut route short)

2014 - Boat 1 – 5 Mile Pt (south of Black Rv mouth) south, then east to the mouth of the Rainy River

2013 - Entire southern half of lake

2012 - Boat 1 – 5 Mile Pt (south of Black Rv mouth) south, then east to the mouth of the Rainy River

2011 - Boat 1 - 5 Mile Pt (south of Black Rv mouth) south, then east to the mouth of the Rainy River

2010 - Boat 1 - Mouth of Black Rv south towards Rainy Rv mouth

Boat 2 – Rainy Rv mouth north



- 2009 - Boat 1 – north of Rainy River mouth proceeding northwest past the Bluffs Bar area (east shore)
Boat 2 – Onaway State Park west towards UAW
- 2008 - Boat 1 – Mouth of Black Rv south towards UAW
Boat 2 – Onaway State Park west towards UAW
- 2007 - Boat 1 – Mouth of Black River north towards Zollner Road
Boat 2 – Onaway State Park west towards UAW
- 2006 - Boat 1 – Mouth of Black Rv south towards UAW
Boat 2 – state forest campground shocking N/W
- 2005 - Boat 1 - Onaway State Park west towards UAW
Boat 2 – state forest campground shocking N/W
- 2000 - Mouth of Black River north towards Zollner Road
- 1997 - Mouth of Black River north towards Zollner Road