WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Fishery Survey Summary
Mason and Evergreen Lakes
Sawyer County, Wisconsin, 2022-2024

Introduction

In a follow-up to our comprehensive evaluation in 2021, the Wisconsin Department of Natural Resources' (DNR) Fisheries Management Team from Park Falls completed consecutive fyke netting surveys in the spring of 2022 and 2023 to estimate the adult density of the muskellunge population in Mason and Evergreen lakes combined. Though we did not target walleye in mid-spring fyke nets, those samples complemented our understanding of walleye abundance and size distribution. Electrofishing surveys in the fall of 2022 and 2024 added to scarce information on walleye recruitment in both lakes. Quality, preferred, memorable and trophy sizes referenced in this summary are based on standard proportions of world record lengths developed for each species by the American Fisheries Society.

HABITAT AND PUBLIC ACCESS CHARACTERISTICS

Located within the Flambeau River State Forest about 10 miles west of Fifield, Wisconsin, 190-acre Mason Lake and 200-acre Evergreen Lake are drainage lakes connected by a shallow, navigable channel. An unnamed tributary drains from Swamp Lake into Mason Lake, and Mason Creek flows about 1.3 miles from Mason Lake to the North Fork Flambeau River. Together, the pair of lakes has 5.7 miles of shoreline. Except for a few scattered dwellings, nearly all shorelands are forested, publicly owned and managed within the state forest's Scenic Lake Management Zone to maintain their natural aesthetics and undeveloped landscape for long-term public enjoyment.

Mason Lake has low turbidity and moderately clear water (average Secchi depth=9 feet), even though dissolved organic compounds bring about its tea-colored stain. Its maximum depth is 39 feet, and its average depth is 17 feet. The bottom substrate is 60% sand, 5% gravel and 35% muck. Mason Lake is classified with lakes that have a complex fish community and cool, clear water.

Evergreen Lake has noticeably different characteristics. Evergreen Lake is moderately clear in early spring, but water clarity drops as summer progresses. Severe algae blooms produce the turbidity and the pea-green color that inspired a name change from Round Lake to Evergreen Lake. The average late summer Secchi depth is 6 feet. Evergreen Lake's maximum depth is 25 feet, and its average depth is 12 feet. Near shore, the lakebed composition is roughly 40% sand, 55% gravel and 5% muck. Evergreen Lake's classification falls into the complex, cool, dark category.

The DNR maintains a boat landing with minimal improvement at the outlet of Mason Lake near the end of Snuss Boulevard. The Township of Draper's 1981 ordinance limits the size of motors used on Mason Lake to 15 horsepower or less.

SURVEY EFFORT

In the spring of 2022 and 2023, we set fyke nets for muskies in Mason and Evergreen lakes immediately after completing netting and electrofishing surveys that targeted walleye in several other lakes. In both years, we scanned all muskies captured and injected a Passive Integrated Transponder (PIT) tag into the dorsal musculature of all that were not already tagged. We recorded the length of all gamefish and the unique identification number of all tags applied or detected by date, lake and net location. In 2023, we recaptured enough tagged muskies to estimate adult density with high statistical confidence using just over half the netting effort put forth in 2022. Fyke net survey effort for both years is summarized in the table below.

FYKE NETTING EFFORT	MAY 1-12, 2022		MAY 4-10, 2023	
	Net-nights	Water °F	Net-nights	Water °F
Mason Lake	43	42-60	24	47-61
Evergreen Lake	44	44-60	24	49-63
Total	87	42-60	48	47-63

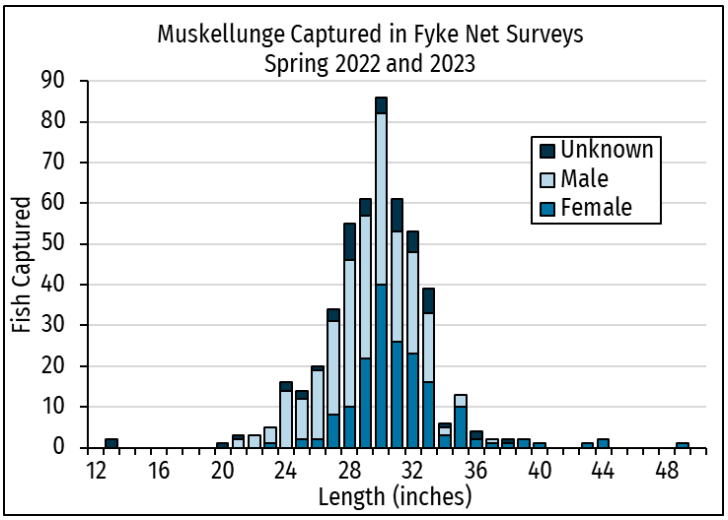
Our fall electrofishing surveys targeted young walleye, but we collected all gamefish along the entire perimeter of both lakes in 2022 and 2024.

ELECTROFISHING EFFORT	SEPTEMBER 22, 2022			OCTOBER 9, 2024		
	Miles	Hours	Water °F	Miles	Hours	Water °F
Mason Lake	3.53	1.43	65	3.49	1.62	60
Evergreen Lake	2.43	1.12	66	2.37	1.02	61
Total	5.96	2.55	65-66	5.86	2.64	60-61

Results and Discussion

MUSKELLUNGE

Indications of high musky abundance in our 2021 surveys prompted us to estimate their population density by the mark-recapture method, using fyke net samples combined from both lakes in the spring of 2022 and 2023. Based on the ratio of muskies marked and released in 2022 and recaptured in 2023, Mason and Evergreen lakes had 679 adults or 1.74 adults per acre (95% confidence interval = 603-755; coefficient of variation = 0.057).



Length frequency (without duplicates) of muskellunge captured in fyke nets in Mason and Evergreen lakes (combined) in the spring of 2022 and 2023 (combined) by gender (male, female, unknown).

Fyke nets captured muskies at similar rates in both lakes and both years. These fyke net catch rates exceeded the 99th or 100th percentile values among lakes in the complex-cool-clear and the complex-cool-dark categories.

CATCH PER EFFORT	MASON LAKE		EVERGREEN LAKE		COMBINED LAKES	
	2022	2023	2022	2023	2022	2023
Number captured	193	133	273	155	466	288
Number per net-night	4.5	5.5	6.2	6.5	5.4	6.0

Muskies in both lakes had mediocre size distributions, probably due to intense food competition resulting from very high population density. All length statistics increased from 2022 to 2023, but the proportion of preferred-size muskies 38 inches or longer was less than 5% in all fyke net samples.

SIZE DISTRIBUTION	MASON LAKE		EVERGREEN LAKE		COMBINED LAKES	
	2022	2023	2022	2023	2022	2023
Number measured	187	111	262	140	449	251
Average Length	29.6	31.8	30.0	30.7	29.8	31.2
Maximum Length	39.9	44.3	44.0	49.7	44.0	49.7
% Quality Size ≥ 30"	58	78	57	65	57	71
% Preferred Size ≥ 38"	1.4	4.8	1.1	3.0	1.2	3.8
% Legal Size ≥ 40"	0	4.8	0.6	2.1	0.3	3.3
% Memorable Size ≥ 42"	0	2.5	0.6	1.2	0.3	1.8

If our age estimates are accurate, ring counts on cross-sectioned anal fin rays collected from both lakes in 2023 revealed that a combined sample of 15 male and five female muskies grew to an average of 25.5 inches in three years (range 25.4-25.5; n=2), 29.4 inches in five years (range 27.5-31.2; n=6), 31.9 inches in six years (range 30.7-33.0; n=4) and 33.1 inches in seven years (range 31.4-34.3; n=4). Unexpectedly, two males and two females averaged 31.8 inches long at age eight (range 29.6-35.2). The average length of age-5 muskies in Mason and Evergreen lakes ranked near the median value for lakes in the complex-cool-clear class and near the 75th percentile value among those in the complex-cool-dark category.

Natural reproduction has been the sole source of recruitment to the musky population since the DNR suspended stocking muskies into these lakes in 1990. In October 2024, electrofishing captured 12 muskellunge from 10.8 to 12.7 inches long that we presumed were age-0 fingerlings.

PIT tag recoveries bring to light the change in the length of individual fish between capture events. This method of growth assessment relies on length measurements at the beginning and the end of a period, rather than subjective interpretation of annular marks on bony structures, such as anal fin rays. Males recaptured about one year after any earlier encounter gained just over an inch in length, while the annual increment for females was just under an inch. In a much smaller sample, the length gain for females in two years was over twice that of males. So far, the longest time between capture events was 1,234 days during which that fish grew from 31.1 to 32.4 inches long. The largest increment recorded to date was 16 inches that a 12.5-inch musky gained in 1,100 days. Negative and zero increments are likely due to measurement error.

LENGTH INCREMENT	AFTER ONE YEAR (343-373 DAYS)			AFTER TWO YEARS (711-716 DAYS)		
	Male	Female	All	Male	Female	All
Average	1.14	0.86	1.06	1.30	3.10	1.69
Minimum	-0.1	0	-0.1	0.2	1.9	0.2
Maximum	4.8	2.2	4.8	3.7	4.1	4.1
Count (positive)	140	61	207	11	3	14
Count (zero)	1	1	2	0	0	0
Count (negative)	1	0	1	0	0	0
Count (all)	142	62	210	11	3	14

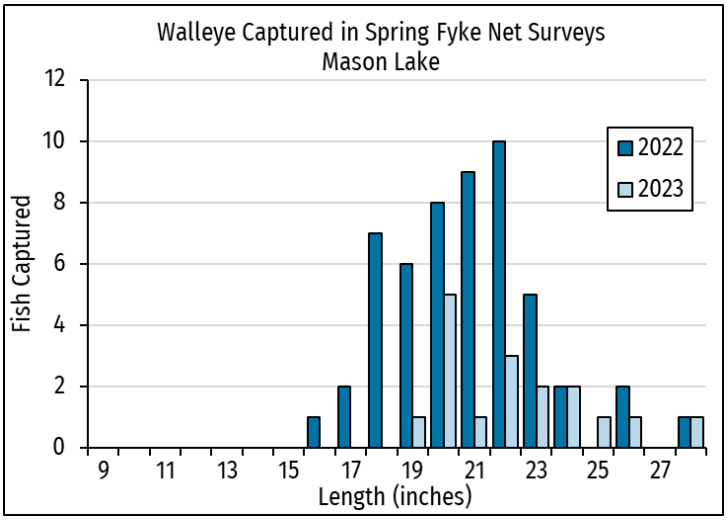
PIT tag detections also provide a narrow glimpse of musky's bidirectional movements between Mason and Evergreen lakes. Sixteen PIT-tagged muskies moved from Mason Lake to Evergreen Lake sometime between the netting or electrofishing visit when their tags were initially applied in Mason Lake and a later netting or electrofishing encounter when those fish were recaptured and their tags were detected in Evergreen Lake. The average period between tagging and recapture was 209 days (range 1-370). Similarly, 13 PIT-tagged fish moved from Evergreen Lake to Mason Lake over periods ranging from 2 to 371 days (average=267). Four tagged fish moved from Mason Lake to Evergreen Lake and then returned to Mason Lake, and one moved round trip from Evergreen to Mason and back to Evergreen Lake. PIT-tag detections cannot reveal the full scope of musky movements between these lakes because we had only occasional opportunity to recapture tagged fish in our surveys since we began tagging muskies here in the spring of 2021. Among 34 documented passages between lakes, 35% happened within one to eight days of the previous tag detection. Our netting and electrofishing visits were concentrated in the spring and the fall with long periods between surveys. We suspect that muskies cross between Mason and Evergreen lakes more often than tag detections indicate. This interchange supports our decision to group muskies in both lakes as a single population.

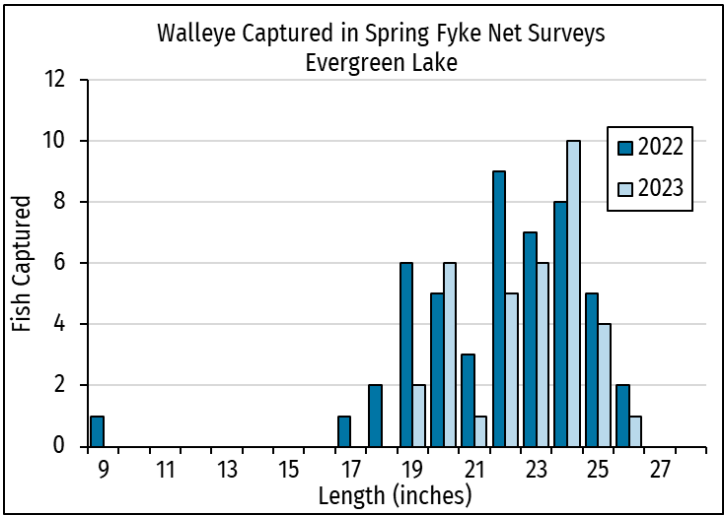
Several indications of high musky abundance suggest that anglers should find fast fishing action for intermediate-size muskies in Mason and Evergreen lakes. Though they are rare, the largest muskies in our samples demonstrate that the musky population can produce fish approaching trophy size ≥ 50 inches long. Under the present-day fishing regulations, anglers in the Northern Management Zone may keep a daily bag limit of one musky at least 40 inches long in the open-water period from the Saturday closest to Memorial Day to December 31. We are currently developing an experimental regulation proposal that would promote the survival of the fastest-growing individuals toward memorable and trophy sizes and offer anglers opportunity to harvest intermediate-size muskies too in these and several similar lakes with high-density muskellunge populations.

WALLEYE

Fyke netting directed toward muskellunge in the spring of 2022 and 2023 took place after the period when we typically target spawning walleyes in fyke net surveys. Despite this untimeliness, the incidental catch of walleye provides the only representation of adult population status that we have from contemporary springtime fyke net samples.

Fyke nets captured walleyes at similar rates in both lakes and both years. The netting catch rates were below the 25th percentile value in the complex-cool-clear class and near that value in the complex-cool-dark class. From these comparisons, we can cautiously infer that walleye in both lakes have low to moderate population abundance.





The length distributions in samples from both lakes and both years include high proportions of preferred-size fish at least 20 inches long and memorable-size fish 25 inches or longer. The average length of walleye in Mason and Evergreen lakes exceeded the 95th percentile value of the respective lake classes. The longest walleye captured in Mason Lake exceeded the 100th percentile value for maximum length in the complex-cool-clear category. The longest walleye from Evergreen Lake ranked between the 50th and 75th percentile values in the complex-cool-dark lake class.

CATCH PER EFFORT & SIZE DISTRIBUTION	COMPLEX-COOL-CLEAR LAKE CLASS						COMPLEX-COOL-DARK LAKE CLASS					
	Mason Lake		Percentiles				Evergreen Lake		Percentiles			
	2022	2023	25th	50th	75th	95th	2022	2023	25th	50th	75th	95th
Number captured	55	18					54	36				
Catch per net-night	1.3	0.8	1.8	3.7	9.3	29.2	1.2	1.5	1.4	4.3	9.7	29.2
Number measured	53	17					49	35				
Average Length	21.2	22.8	13.1	14.7	17.4	20.5	22.2	23.0	13.0	15.1	17.4	20.1
Maximum Length	28.7	28.6	22.3	24.6	26.1	27.4	26.1	26.2	22.4	25.6	27.1	28.5
% Quality Size	100	100					100	100				
% Preferred Size	70	94					81	94				
% Memorable Size	6	18					15	14				
% Legal Size	40	35					49	49				

Those who want to keep a meal of walleye from Mason and Evergreen lakes may have difficulty selecting among legal-size fish, especially if they follow the general advice on fish consumption to limit their exposure to ingested contaminants. No fish from Mason and Evergreen lakes have been analyzed for contaminants. However, all fish contain some mercury. Large fish, especially walleye, contain more mercury than small fish. Anglers may keep a daily bag limit of three walleyes at least 15 inches but less than 20 inches long, except one of the three may be over 24 inches. Our combined fyke net samples from both

lakes and both years included 68 legal-size walleyes of which 59% were over 24 inches long. The 16- to 17-inch walleyes that anglers typically like to eat are scarce in these lakes.

Natural reproduction supplies all of the new recruits to the adult walleye population. We have no record of walleyes stocked into Mason or Evergreen lakes. Fall electrofishing, our standard assessment of walleye recruitment, detected no year classes produced in either lake in 2014, 2019, 2021 and 2022. The electrofishing catch rates of 4.6 and 0 fingerlings per mile in our most recent fall surveys indicates that walleye in Mason Lake produced a weak cohort and Evergreen Lake produced none in 2024. By comparison, the average catch rate of age-0 walleye in populations sustained entirely by natural reproduction across Wisconsin's Ceded Territory was 32.7 fingerlings per mile in 3,226 recruitment surveys completed by the DNR or the Great Lakes Indian Fish & Wildlife Commission from 1985 to 2023. We captured young walleyes ≤ 12 inches long by electrofishing in the spring and fall of 2021, suggesting some natural recruitment in both lakes. We will continue to evaluate walleye recruitment by electrofishing in the fall of alternate years to build upon the five recruitment surveys on record.

For questions contact:

Jeff Scheirer, Fisheries Biologist
Wisconsin Department of Natural Resources
875 4th Ave. S.
Park Falls, WI 54552

jeffrey.scheirer@wisconsin.gov
715-762-1354