



2022 SURVEY REPORT

WATER: LILY LAKE

COUNTY: FOREST

INTRODUCTION AND SURVEY OBJECTIVES

The Wisconsin Department of Natural Resources (DNR) conducted a spring netting survey of Lily Lake-Forest County- to analyze the health of its Walleye fishery. A spring netting survey is designed to assess the abundance, size structure and growth of the Walleye population within the lake. The summary that follows will detail the current fishery, as well as the changes observed in this fishery over time. Lily Lake is located approximately 16 miles south of Crandon off of County Rd Q, with boat access to Lily Lake off of Lily Lake Ln.

Acres: 211 Shoreline Miles: 3.6 Maximum Depth (feet): 24
Lake Type: Drainage Public Access: DNR boat landing
Regulations: Statewide Default Regulations

WISCONSIN DNR CONTACT INFO.

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Table 1. Summary of all surveys conducted during 2022 **SURVEY INFORMATION**

Species	Survey Dates	Gear Used	Effort	Water Temp. (°F)
Walleye	4/27-4/29/2022	Fyke Net	14 Net-Nights	41-43
Walleye	4/29/2022	Boomshocker	3.6 miles	45
Walleye	9/20/2022	Boomshocker	5.1 miles	70

FISH METRIC DESCRIPTIONS

Population estimate (PE) is estimated by marking a portion of the population, then capturing another sample of fish and using the ratio of new fish : previously marked fish to estimate the number of fish that are in the population.

Catch per unit effort (CPUE) is the number of fish per mile (electrofishing) or per net-night (netting)- and is used to index abundance when we are unable to get a PE.

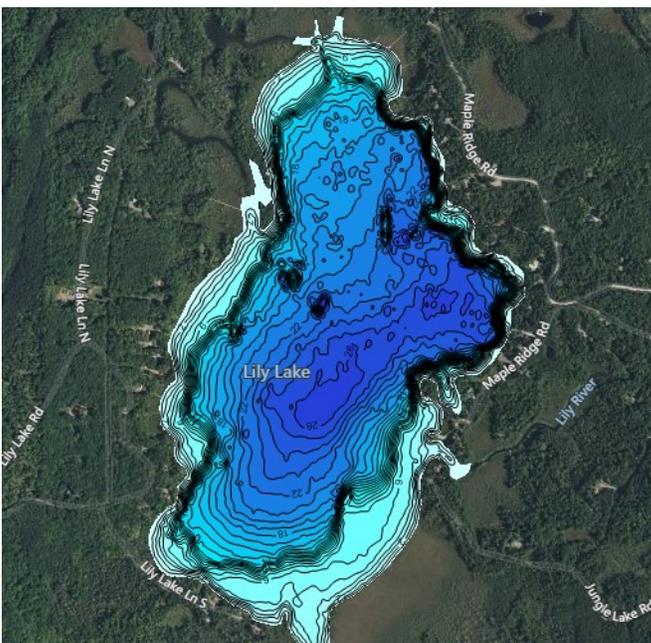
Relative stock density (RSD) is an index used to describe the size structure of fish populations. It is calculated by dividing the number of fish larger than a certain length by the number of stock size fish for a given species. Stock size is a length set for each species, and is used to offset potential large year classes of juvenile fish.

Length frequency distribution (LFD) is a graphical representation of the number of fish captured by inch group. Smaller fish (or younger age classes) may not always be represented in the length frequency due to different habitat usage or sampling gear limitations.

Body condition (W_r) is a measure of the physical health of a population of fish based on the fish's relative plumpness or fatness. Most often the condition is computed by comparing the actual weight of a fish to some expectation of weight based on the length of the fish.

SURVEY METHODS

- Surveys are designed to evaluate each species when they are particularly vulnerable to our gear.
- Standard fyke nets and electrofishing gear is used to capture fish.
- Data is collected from the target species of each survey to gather population metrics.
- Fish metrics are compared to previous surveys of this water, lakes with similar characteristics, other waters in the area or region, and all waters of the state.
- Data collected is used to monitor the fishery, determine if stocking is necessary, evaluate fishing regulations, and determine how to improve the fishery.



GEAR USED DURING THIS SURVEY

- **Fyke Nets** are set in areas where we anticipate fish to congregate. Fish traveling along the shoreline will be met by a "lead", which is similar to a fence. The lead directs the fish toward the trap end of the net, fish travel through a series of funnels and eventually become trapped. Fish are then removed from the net and placed in holding tanks to gather data before being returned to the lake.
- **Boomshocker** is a specially designed boat that creates an electric current in the water immediately in front of the boat. The boat is driven along the shoreline and shallow areas of the lake, when the boat encounters fish they are momentarily stunned. Once the fish is stunned they can be netted out of the lake and placed in a holding tank. After data is collected the fish are returned to the lake.



Photo Credit: Wisconsin DNR

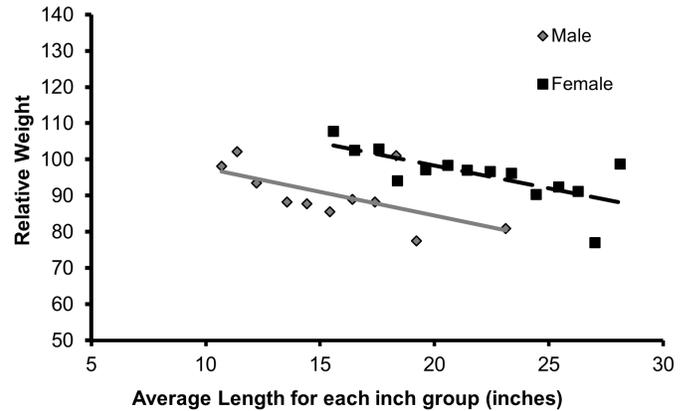
Photos: Above- DNR work boat and crew checking a fyke net. Below- DNR crew and boomshocker sampling along a shoreline.



Photo Credit: Wisconsin DNR

BODY CONDITION

Weight was measured from a random sample of 135 sexually mature Walleye to assess the body condition of the Lily Lake population using relative weight (W_r) analysis. The figure at the right shows that W_r ranged from 86 to 103 and averaged 90 for male Walleye. Female Walleye W_r ranged from 77 to 108 and averaged 96. Both male and female Walleye from Lily Lake are below the benchmark of 100. However, the measured W_r values are more than acceptable for a high-density Walleye population like Lily Lake.



Photos: Above- Florence netting crew working up Walleye from 2022 fyke netting surveys on Lily Lake. Right- Fisheries Technician Katie Renschen holding a Walleye captured during spring 2022 fyke netting surveys on Lily Lake.

RECRUITMENT

Like many good naturally reproducing Walleye lakes, recruitment in Lily Lake has been quite variable (Table 3). Typically, only one good year class of Walleye (≥ 20 age-0/mile) every five years is needed to sustain a quality fishery. We have monitored the natural reproduction of Walleye in Lily Lake 29 of the last 35 years. The data we have collected suggests Lily Lake will create a significant year class of Walleye approximately 41% of the time. This amount of natural reproduction is exceptionally rare in this area of Wisconsin. As long as this trend continues, there are no concerns about the stability of this Walleye population.

Table 3. Recruitment of Walleye, indexed by catch per mile of age-0 and age-1 Walleye during fall electrofishing surveys Lily Lake, Forest County, 1988-2022.

	2022	2021	2020	2019	2018	2017	2016	2015	2014	2012
Age 0/mi.	3.50	66.10	25.90	1.40	17.30	1.38	4.71	18.30	67.84	55.13
Age 1/mi.	38.80	18.20	5.70	21.20	3.50	0.34	13.92	22.55	5.29	0.88

	2011	2010	2009	2008	2007	2006	2004	2003	2002	2001
Age 0/mi.	77.06	7.06	1.18	34.12	2.75	7.25	1.57	27.84	8.04	33.53
Age 1/mi.	2.16	9.22	9.22	3.92	7.65	5.69	16.67	0.58	5.88	8.82

	2000	1998	1997	1996	1995	1993	1992	1991	1988
Age 0/mi.	0.00	3.33	61.18	0.78	4.12	1.18	37.45	61.18	46.55
Age 1/mi.	2.35	15.29	0.39	18.43	55.69	3.53	31.57	17.06	78.97