WISCONSIN DEPARTMENT OF NATURAL RESOURCES

CHEQUAMEGON BAY FALL ASSESSMENT REPORT 2021

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INTRODUCTION

Chequamegon Bay is a 34,000-acre, shallow (mean depth of 28 feet) embayment on Wisconsin's south shore of Lake Superior (Figure 1). It is a productive, nearshore area of the lake that supports a diverse assemblage of fishes and serves as a restricted use area from high-efficiency commercial gears. The Chequamegon Bay Fall Assessment was developed to provide an index of relative abundance for important recreational coolwater species (Walleye, Yellow Perch, Northern Pike and Smallmouth Bass) using a gear that is effective at capturing representative amounts of all nearshore target species during a season that is not biased by spawning dynamics. The use of gill nets in Chequamegon Bay also provides better spatial coverage of the study area relative to other types of sampling gears.

METHODS

From 2019 to 2021, Walleye, Smallmouth Bass, Northern Pike and Yellow Perch were targeted with graded-mesh, monofilament gill nets (400-feet gangs composed of 50-feet nets constructed with 1.5 to 5.0-inch mesh by 0.5-inch increments). Gill nets were fished for one net-night (24-hours) in six fixed locations (Figure 1) using the R/V Hack Noyes (three sites/day; two overall days) during the beginning of October.

All target species were measured (nearest 0.1 inch), weighed (when possible; nearest gram) and tagged with a uniquely numbered Floy tag on the left side of the dorsal fin. Tag data were recorded for all recaptured fish. Non-target species were also measured or counted depending on the total number and time constraints. Dorsal spines were taken from Walleye and Smallmouth Bass and anal rays were taken from Northern Pike. Saggital otoliths were taken from all deceased individuals of each target species. External marks or diseases (e.g., sea lamprey wound, lympho sarcoma, etc.) were noted.

Relative abundance (geometric mean catch-per-unit-effort [CPE]) was calculated as number of fish per 100 feet of gill net (stations as replicates).

RESULTS/DISCUSSION

Nineteen total fish species were detected during the 2021 Chequamegon Bay Fall Assessment (Table 1), and we captured 43 Walleye, 132 Yellow Perch, 21 Northern Pike and 15 Smallmouth Bass. Mean CPE of Northern Pike and Yellow Perch increased in 2021 (Table 2). Walleye and Smallmouth Bass CPE remained relatively stable compared to previous years.

Size structure of Northern Pike was similar among years, and a majority of the Northern Pike sampled were between 23 and 28 inches total length (Figure 2). Most Smallmouth Bass sampled were between 16 and 19 inches total length. Walleye length distribution was bimodal with centers around 12 and 18 inches in 2021, representing the 2019 and 2017 year-classes, respectively. The 2019 year-class should begin recruiting to the recreational fishery as they approach the 15-inch minimum length limit in 2022. Yellow Perch size structure in 2021 was comprised of mostly 7-inch individuals, slightly larger than 2020. A larger year-class of White Perch was detected in 2020 at 6-7 inches total length and was detected again in 2021 at 8-10 inches total length (Figure 3). White Sucker length distributions were similar each year of the survey.

Based on the first three years of sampling, it appears the Chequamegon Bay Fall Assessment will likely serve well as a method for monitoring the target species in Chequamegon Bay. This survey will be useful for monitoring drastic changes in relative abundance of the Chequamegon Bay fish community in addition to annual changes in Walleye and Yellow Perch size distribution. Future work could involve including more stations for better spatial coverage and replication or comparing results to other surveys (e.g., USGS Chequamegon Bay trawling).

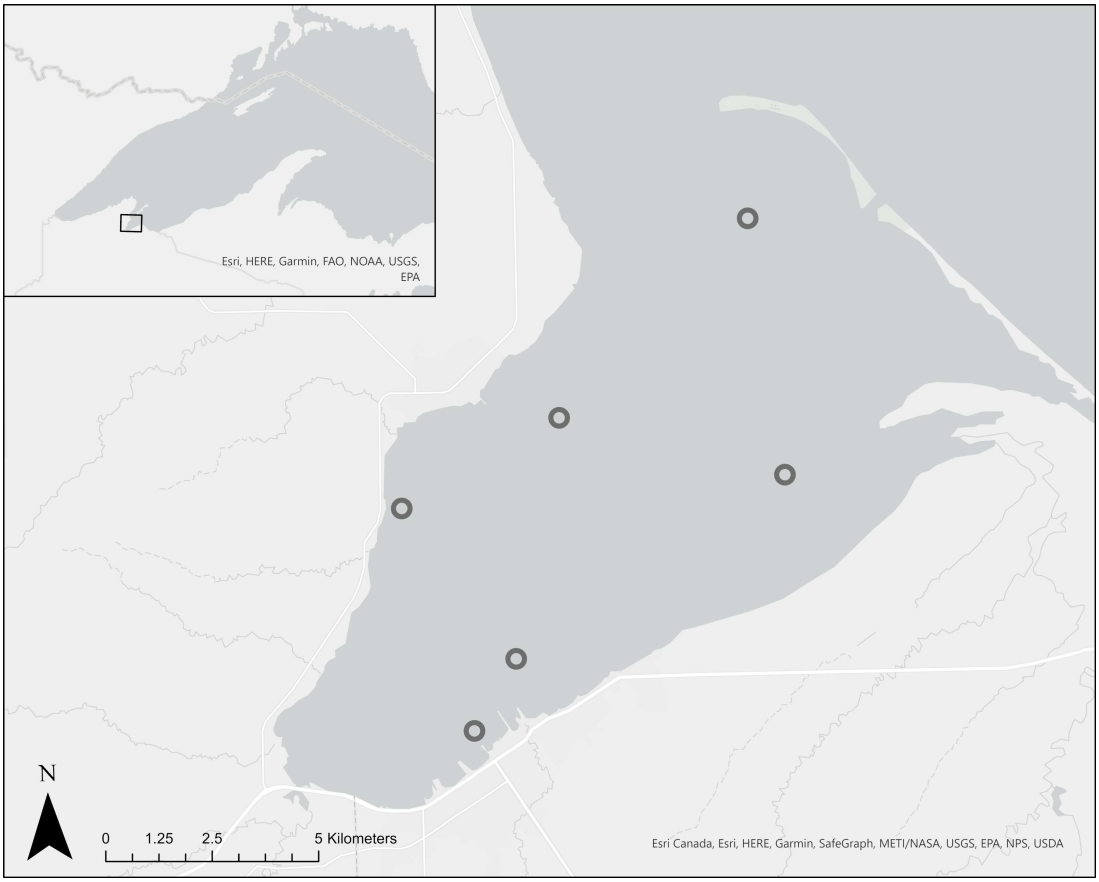

Figure 1. Gill net stations for the Chequamegon Bay Fall Assessment.

Table 1. List of all species detected in the 2021 Chequamegon Bay Fall Assessment.

Species
Black Crappie
Brown Bullhead
Common Carp
Eurasian Ruffe
Lake Sturgeon
Lake Whitefish
Northern Pike
Pumpkinseed Sunfish
Rainbow Trout
Rock Bass
Round Whitefish
Shorthead Redhorse
Silver Redhorse
Smallmouth Bass
Splake
Walleye
White Perch
White Sucker
Yellow Perch

Table 2. Geometric mean CPE (fish/100 ft) estimates of common species in the Chequamegon Bay Fall Assessment (stations as replicates).

Species	2019	2020	2021
Northern Pike	8.9	7.4	12.1
Silver Redhorse	1.7	1.7	3.3
Smallmouth Bass	3.2	2.5	3.9
Splake	2.9	3.2	1.3
Walleye	26.4	24.2	23.5
White Perch	3.3	8.7	6.9
White Sucker	59.2	44.8	55.7
Yellow Perch	13.2	16.7	38.3

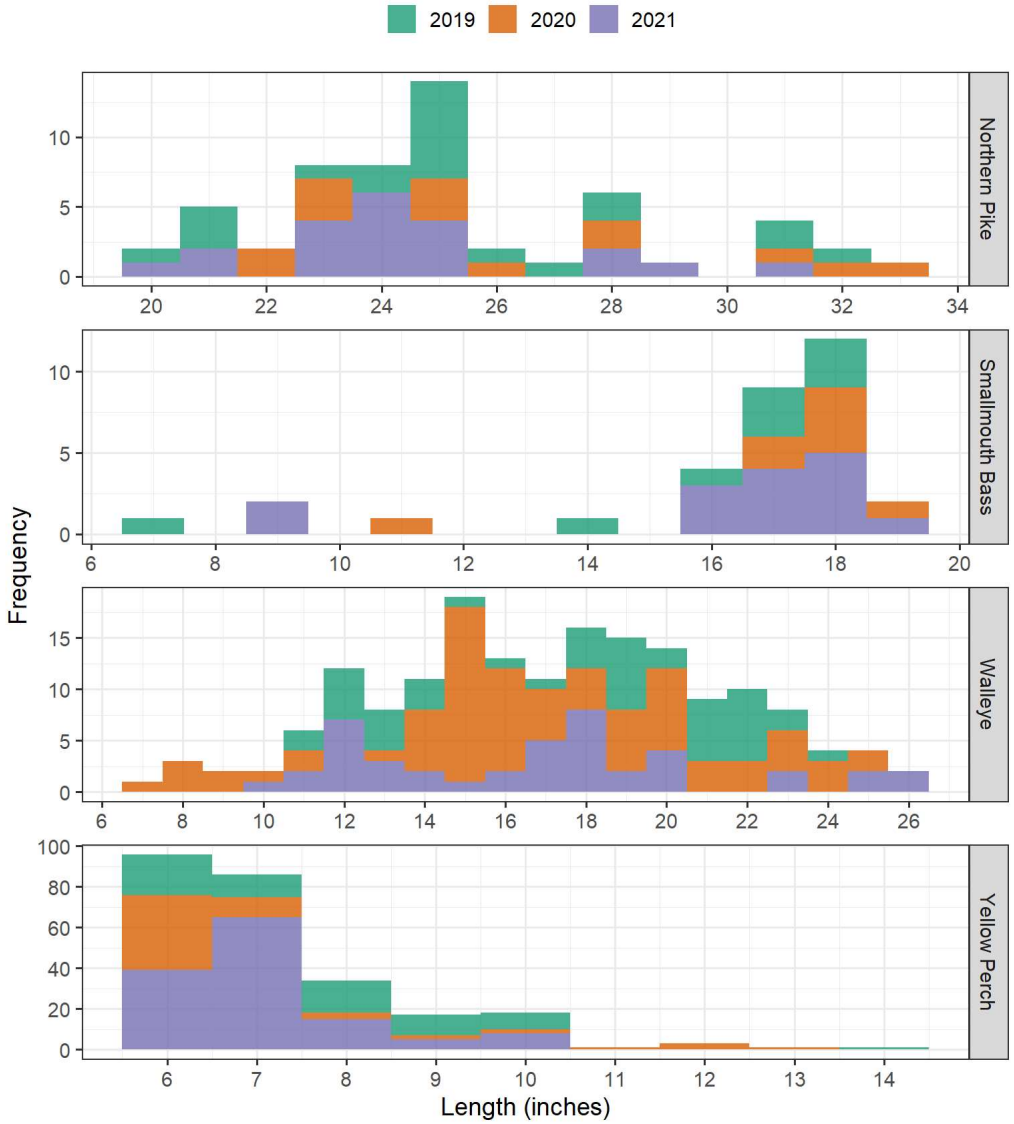

Figure 2. Length frequency of target species from the Chequamegon Bay Fall Assessment, 2019 to 2021.

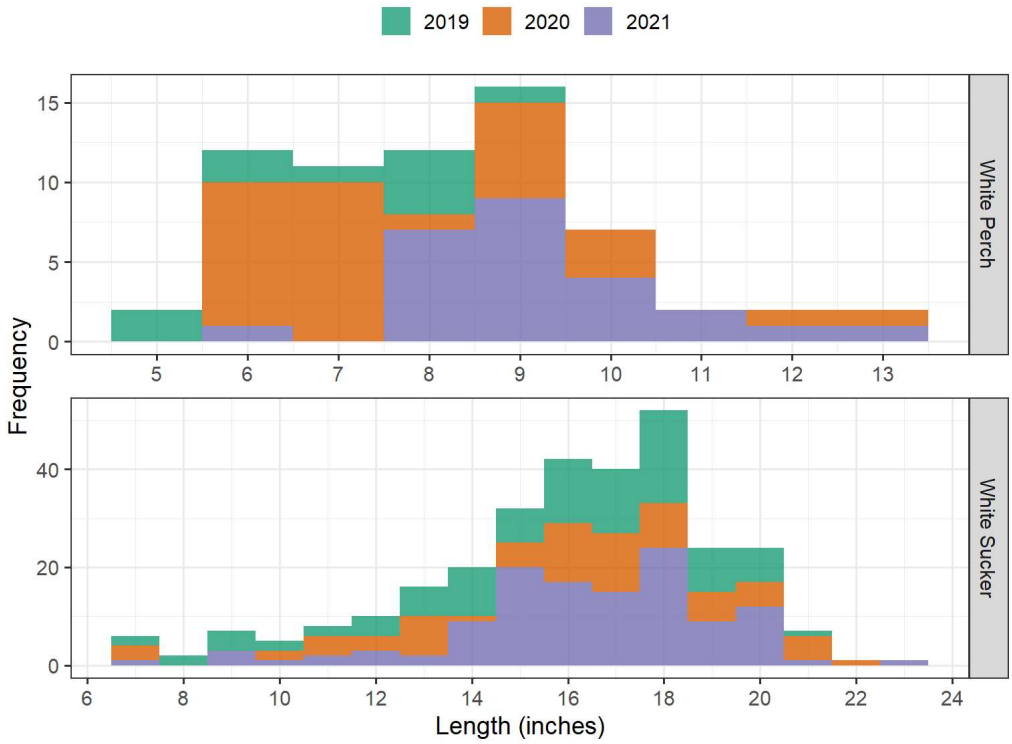

Figure 3. Length frequency of other common species from the Chequamegon Bay Fall Assessment, 2019 to 2021.