WISCONSIN DEPARTMENT OF NATURAL RESOURCES

CHEQUAMEGON BAY FALL ASSESSMENT REPORT 2023

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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 2023, 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 inches), 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 sampled from walleye and smallmouth bass. Saggital otoliths were sampled from all deceased individuals of each target species. External marks or diseases (e.g., sea lamprey wound, etc.) were noted.

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

RESULTS/DISCUSSION

Fourteen total fish species were detected during the 2023 Chequamegon Bay Fall Assessment (Table 1). The geometric mean CPE of northern pike decreased in 2023 (Table 2; Figure 2). White perch and white sucker relative abundance has increased since 2019 but was lower in 2023. Walleye relative abundance has been stable over the five years of sampling, and yellow perch relative abundance increased each year since 2019 before dropping in 2023 with fewer small fish represented in the catch (Figures 3 and 4).

A majority of the northern pike sampled were between 22 and 28 inches in total length, and most smallmouth bass sampled were between 16 and 19 inches in total length (Figure 3). Walleye length distribution was similar to the previous year. Yellow perch size structure in 2023 was larger than in 2022, as the main cohort of fish grew larger without much replacement of younger fish (Figure 4). White perch size structure was more widely distributed than in the years prior (Figure 4). White sucker length distributions were similar each year of the survey.

Based on the first five years of sampling, it appears the Chequamegon Bay Fall Assessment will likely serve well as a method for monitoring the coolwater target species in Chequamegon Bay. This survey will be useful for monitoring large-scale changes in the relative abundance of the Chequamegon Bay fish community, in addition to annual changes in walleye and yellow perch size and age distribution.

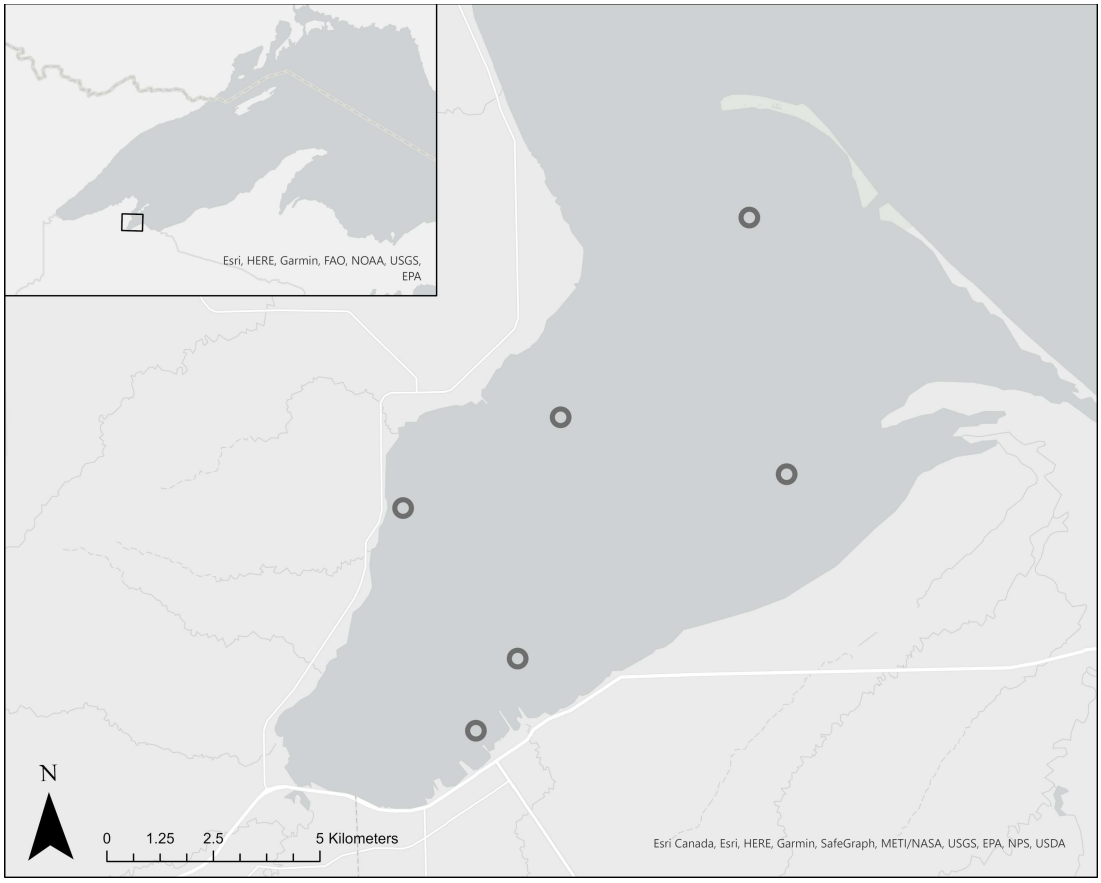

Figure 1. Gill net stations for the Chequamegon Bay Fall Assessment.

Table 1. List of all species detected in the 2023 Chequamegon Bay Fall Assessment.

Species
Brown Bullhead
Brown Trout
Common Carp
Eurasian Ruffe
Lake Whitefish
Northern Pike
Pumpkinseed Sunfish
Shorthead Redhorse
Silver Redhorse
Smallmouth Bass
Walleye
White Perch
White Sucker
Yellow Perch

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

Species	2019	2020	2021	2022	2023
Northern Pike	14.6	11.9	22.4	11.1	3.3
Smallmouth Bass	3.5	2.1	4.5	0.7	0.8
Walleye	51.8	42.1	45.6	46.5	34.5
White Perch	3.6	12.9	9.8	11.7	7.2
White Sucker	119.2	100.8	110.6	182.6	83.2
Yellow Perch	20.2	35.1	80.9	116.3	41.1

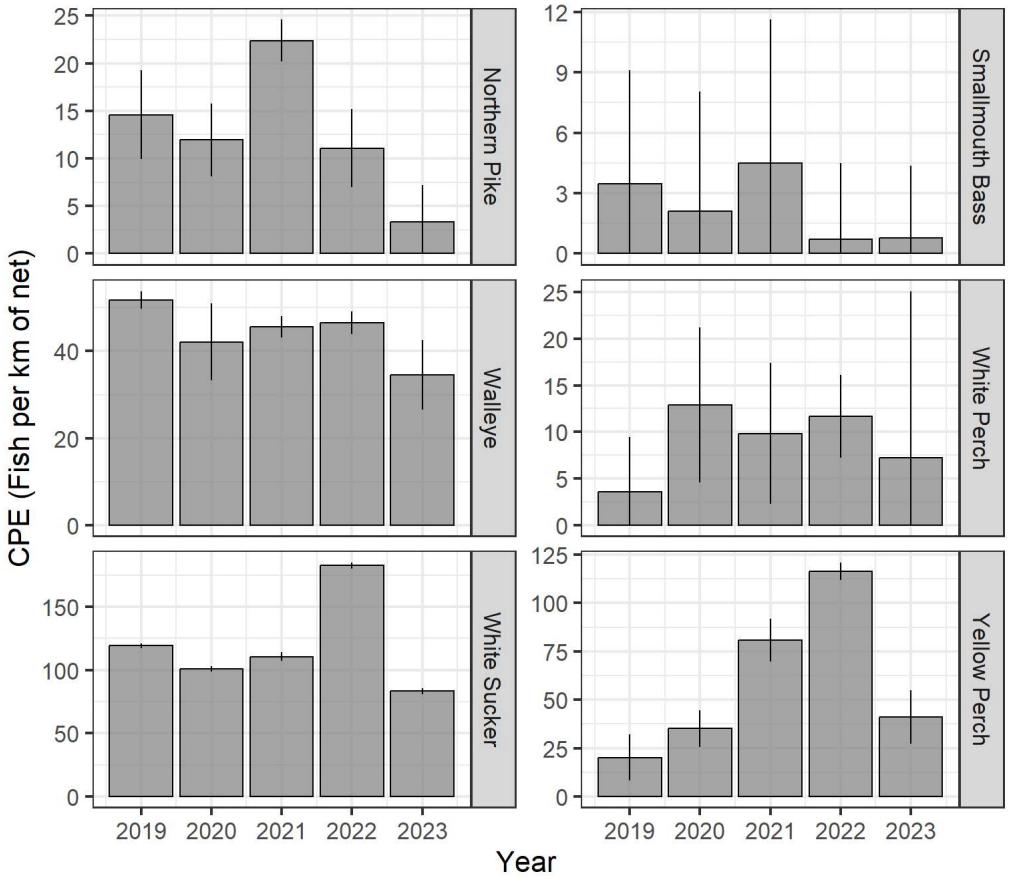

Figure 2. Geometric mean CPE of common species from the Chequamegon Bay Fall Assessment, 2019 to 2023.

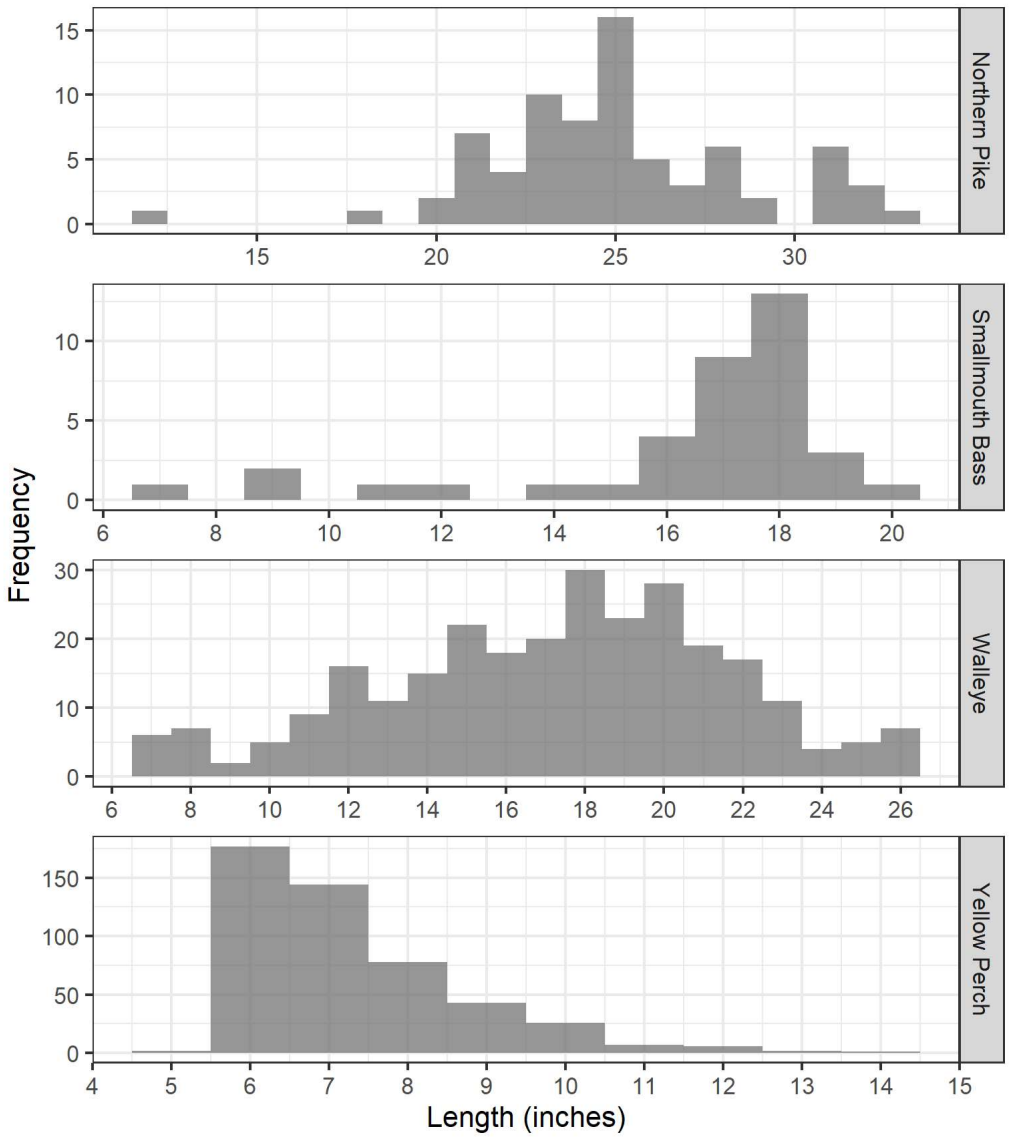

Figure 3. Combined length frequency of target species from the Chequamegon Bay Fall Assessment, 2019 to 2023.

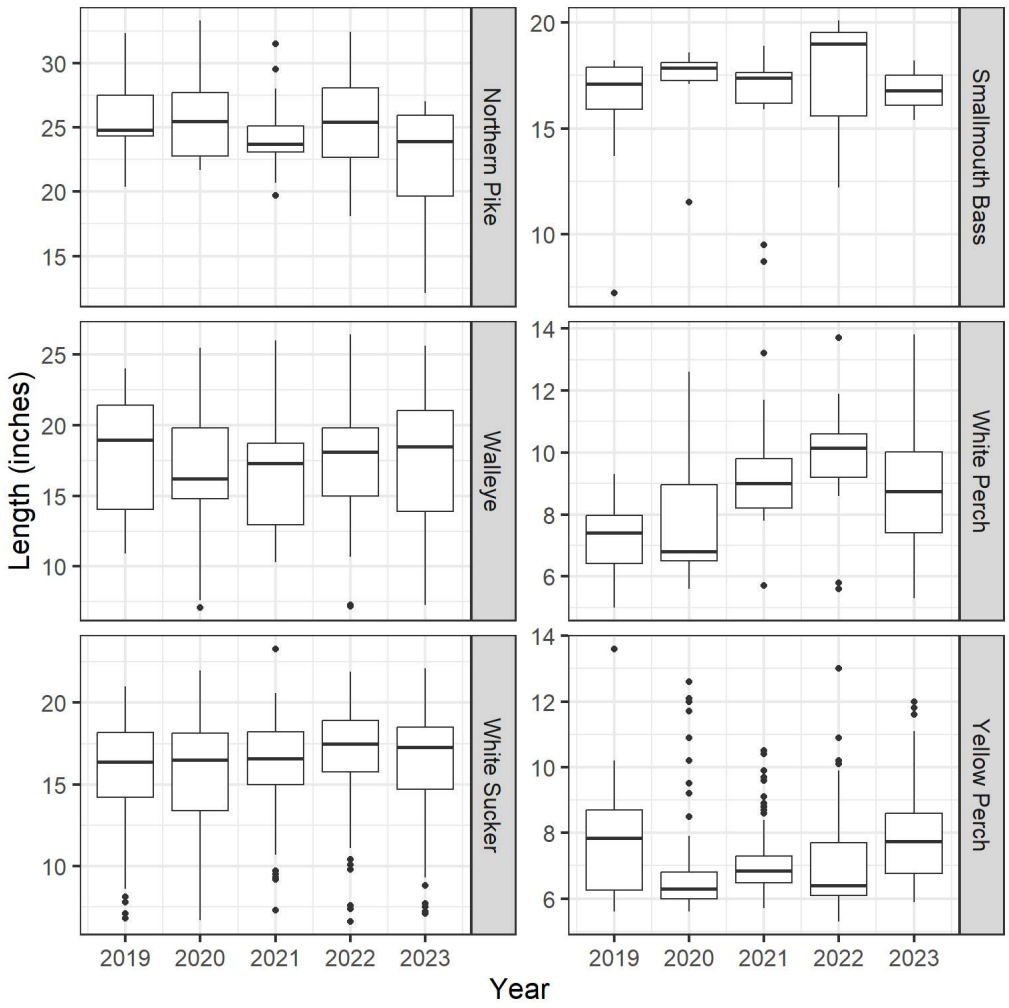

Figure 4. Lengths of common species from the Chequamegon Bay Fall Assessment each year from 2019 to 2023.