Pigeon Lake
Comprehensive Fisheries Survey

Elliot Hoffman – Senior Fisheries Biologist

5/28/2025

Outline

- Background
- DNR Fish Surveys – How and Why
- Fish Populations – Current Status
- Stocking History & Future
- Discussion

Major Concerns

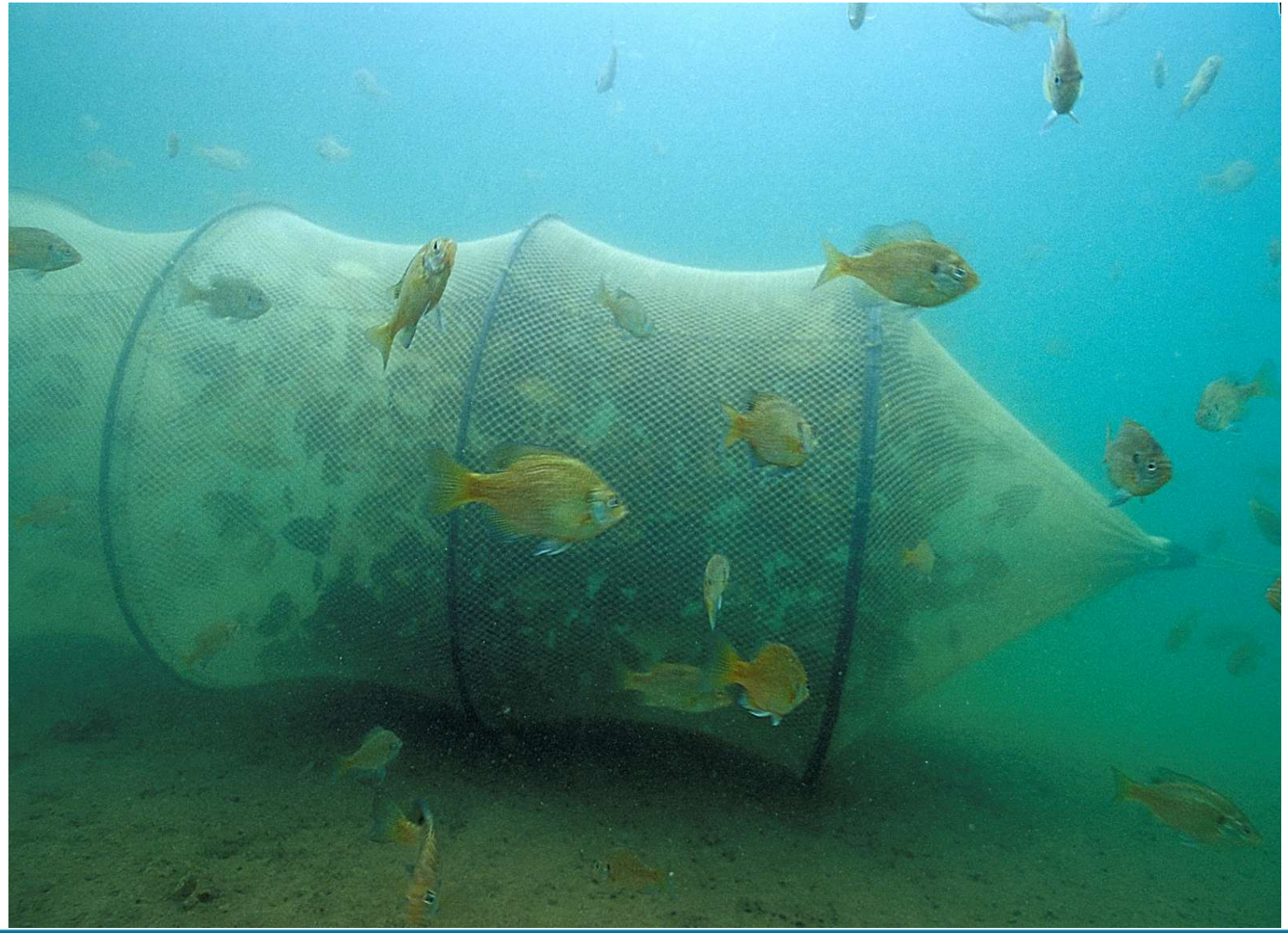
- Poor Size of Bluegill
- Common Carp Abundance
- History of heavy vegetation

Fish Population Assessment

How does the DNR sample fish in Pigeon Lake?

Sampling Schedule

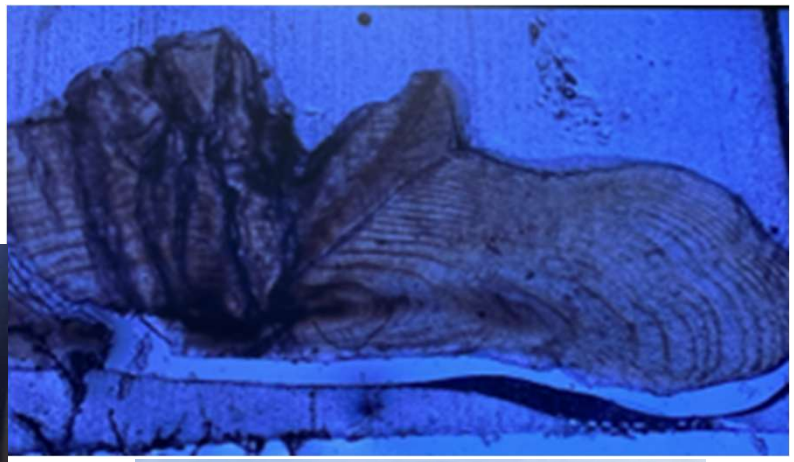
- 8 year Comprehensive Survey Rotation
  - Fyke Netting Survey targeting Northern Pike
  - Electrofishing Survey targeting Largemouth Bass and Panfish
- Last comprehensive surveys completed in 2013
- 2019 – 2022 Common Carp abundance surveys and removals




WS3168BD
MERCURY

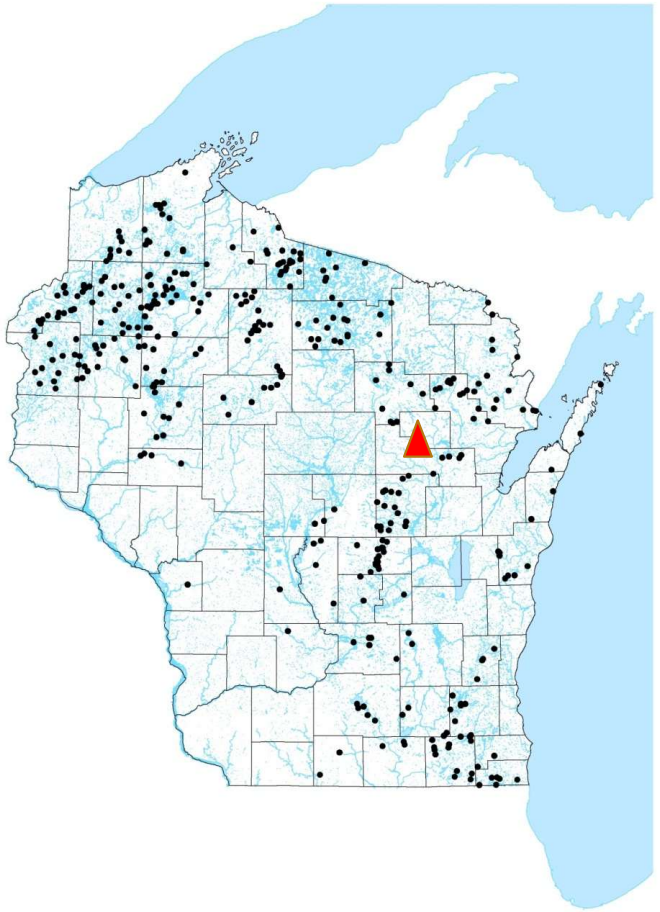
What Information is Collected?

- Length
- Weight
- Gender
- Count (Abundance, Total and Relative)
- Age and Growth
- Tag (Given or Recapture)
- Fin Clip



Metric Analysis

- Statewide Comparisons
- Trends over time in Pigeon Lake
- PSD (Proportional Stock Density)
  - Number of quality size and larger fish divided by number of stock size and larger fish.
    Balanced fishery = 40 - 60
- CPE/Mile or CPE/Net Night
- Growth Rates
- Population Estimates



Introduction And Objectives

In 2024, the Wisconsin Department of Natural Resources (DNR) conducted a comprehensive fish survey of the Upper Red Lake in order to provide insight and direction for the future fisheries management of this system. Comprehensive fish surveys include both spring fyke netting and spring electrofishing surveys. The primary sampling objectives of these surveys are to characterize species composition, relative abundance and size structure. The following report is a brief summary of the activities conducted, the general status of fish populations and future management options for the Upper Red Lake.

DNR Contact

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Lake Information

Combined Acres:188
Max. Depth: 15
Shoreline Miles: 4.8
Public Access: 2 Boat Landings

Regulations

Statewide regulations

SURVEY INFORMATION

Site Location	Survey Dates	Water Temperature (°F)	Target Species	Gear	Number of Nets	Effort
Upper Red Lake	4/14/2022-4/30/2022	33 - 40	Northern Pike	Fyke Net	9	90 net nights
Upper Red Lake	5/22/2024	60	Bass and Panfish	Boomshocker	-	3.9 Miles

Metric Descriptions

- **Catch per unit effort (CPUE) is an index used to measure fish population relative abundance**, which simply refers to the number of fish captured per unit of distance or time. For netting surveys, we typically quantify CPUE by the number and size of fish per net night. For electrofishing, we quantify CPUE as the number caught per mile of water electrofished. CPUE indexes are compared to statewide data by percentiles and within lake trends. For example, if a CPUE is in the 90th percentile, it is higher than 90% of the other CPUEs in the state.
- **Proportional Stock Density (PSD) is an index used to describe the size structure of fish populations.** It is calculated by dividing the number of quality-size fish by the number of stock-size fish for a given species. PSD values between 40 - 60 generally describe a balanced fish population.
- **Length frequency distribution (LFD) is a graphical representation of the number or percentage of fish captured by half-inch or one-inch size intervals.** Smaller fish (or younger age classes) may not always be represented in the length frequency due to different habitat usage or sampling gear limitations.
- **Mean age at length is an index used to assess fish growth.** Calcified structures (e.g., otoliths, spines or scales) are collected from a specified length bin of interest (e.g., 7.0-7.9 inches for bluegill). Mean age is compared to statewide data by percentile with growth characterized by the following benchmarks: slow (<33rd percentile); moderate (33rd to 66th percentile); and fast (>66th percentile).

Survey Method

- Upper Red Lake was sampled according to spring netting I (SNI), and spring electrofishing II (SEII) protocols as outlined in DNR Fisheries Monitoring Protocols. The primary objective of the spring fyke netting survey is to count and measure adult walleye and northern pike while marking adult northern pike to estimate northern pike abundance. The primary objective of the spring electrofishing II survey is to count and measure adult largemouth bass, smallmouth bass and panfish. Other species of fish may be sampled during each survey but are considered bycatch as part of that survey.
- Boom shockers were used to electrofish 3.9 miles of shoreline. Gamefish were collected and measured throughout, and panfish were collected and counted along 1.5 miles of shoreline.
- Fyke nets were deployed in areas of the lake that contained spawning habitat or were likely travel areas for northern pike, and muskellunge. All newly captured individuals were marked with a fin clip or PIT tag. Aging structures (spines/otoliths) were taken from a sample of northern pike, bluegill, black crappie, and largemouth bass for age and growth analyses.

RELATIVE ABUNDANCE— CATCH PER UNIT EFFORT (CPUE)

Species	Protocol	Total Number Captured	CPUE	Units	Lake Class Percentile
Northern Pike	Spring Netting I	286	1.7	fish/net night	25 - 50th
Muskellunge	Spring Netting I	6	0.1	fish/net night	25 - 50th
Largemouth Bass	Spring Electrofishing II	73	18.7	fish/mile	50 - 75th
Black Crappie	Spring Netting I	3,097	23.1	fish/net night	75 - 90th
Bluegill	Spring Electrofishing II	651	411.3	fish/mile	95 - 99th
Pumpkinseed	Spring Electrofishing II	49	33.0	fish/mile	90 - 95th
Yellow Perch	Spring Netting I	202	2.0	fish/net night	25 - 50th

Muskellunge

- Muskellunge (*Esox masquinongy*) are a predatory fish species found across the three main drainage basins of Wisconsin but are historically more common in the northern half of the state. Muskellunge typically spawn in shallow nearshore areas at approximately 50-60°F water temperatures. Fyke netting is the preferred sampling gear for muskellunge. All results presented for muskellunge are from spring fyke netting surveys.

YEAR SIZE STRUCTURE METRICS

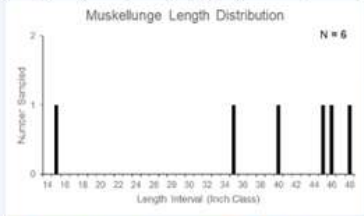
Total Number Measured	Average Length (inches)	Length Range (inches)	Stock and Quality Size (inches)	Stock Number	Quality Number	PSD	Percentile Rank	Size Rating
6	38.4	15.7 - 48.2	20.0 and 30.0	5	5	100	-	High

RELATIVE ABUNDANCE (CPUE = NUMBER PER NET NIGHT)

Total Sampled	2007	2015	2024	Historical Median	2024 Statewide Percentile Rank	2024 Abundance Rating
6	0.1	0	0.1	0.1	21	Low

SIZE STRUCTURE (PSD) TRENDS

PSD by Year			Historical Median
2007	2015	2024	
25	-	100	-



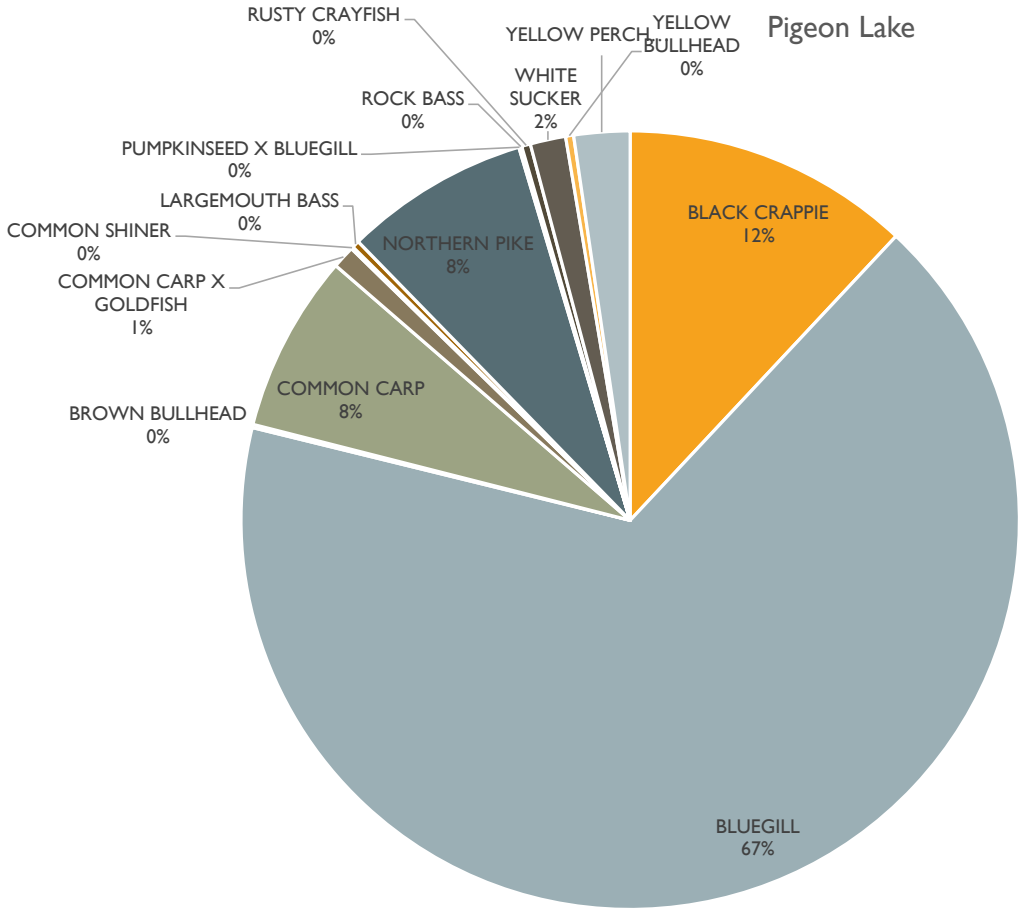
Species Summary

- Upper Red Lake supports a low-density muskellunge population with a catch rate of 0.1 fish per net night. A catch rate of 0.1 fish per net night ranks in the 21st percentile when compared to muskellunge catch rates statewide. Relative abundance estimates have remained stable when compared among recent surveys on Upper Red Lake
- The size structure of muskellunge in the 2024 Upper Red Lake survey was high with a PSD of 100. Few samples during the survey may not be a true representation of the size structure of muskellunge. Over the years between surveys and angling reports there are some quality muskellunge found in Upper Red.
- The Upper Red Lake muskellunge population can be characterized by a low number of larger individuals, resulting in a low-density but high-quality fishery. There was also an individual from more recent stocking events represented in the sample that may supplement the adult population in the future. Figure 8 musky club has stocked 188 muskies, four out of the last seven years.
- The 2024 muskellunge netting survey on the Upper Red Lake ideally would be year one (marking event) of a two-year survey protocol used to estimate adult muskellunge population numbers. However, too few newly captured individuals were handled in the 2024 survey to warrant a recapture sampling. Therefore, no population estimate was conducted for this survey cycle, and the population will be re-evaluated in 2032.

Pigeon Lake

3/27/2025 – 4/4/2025

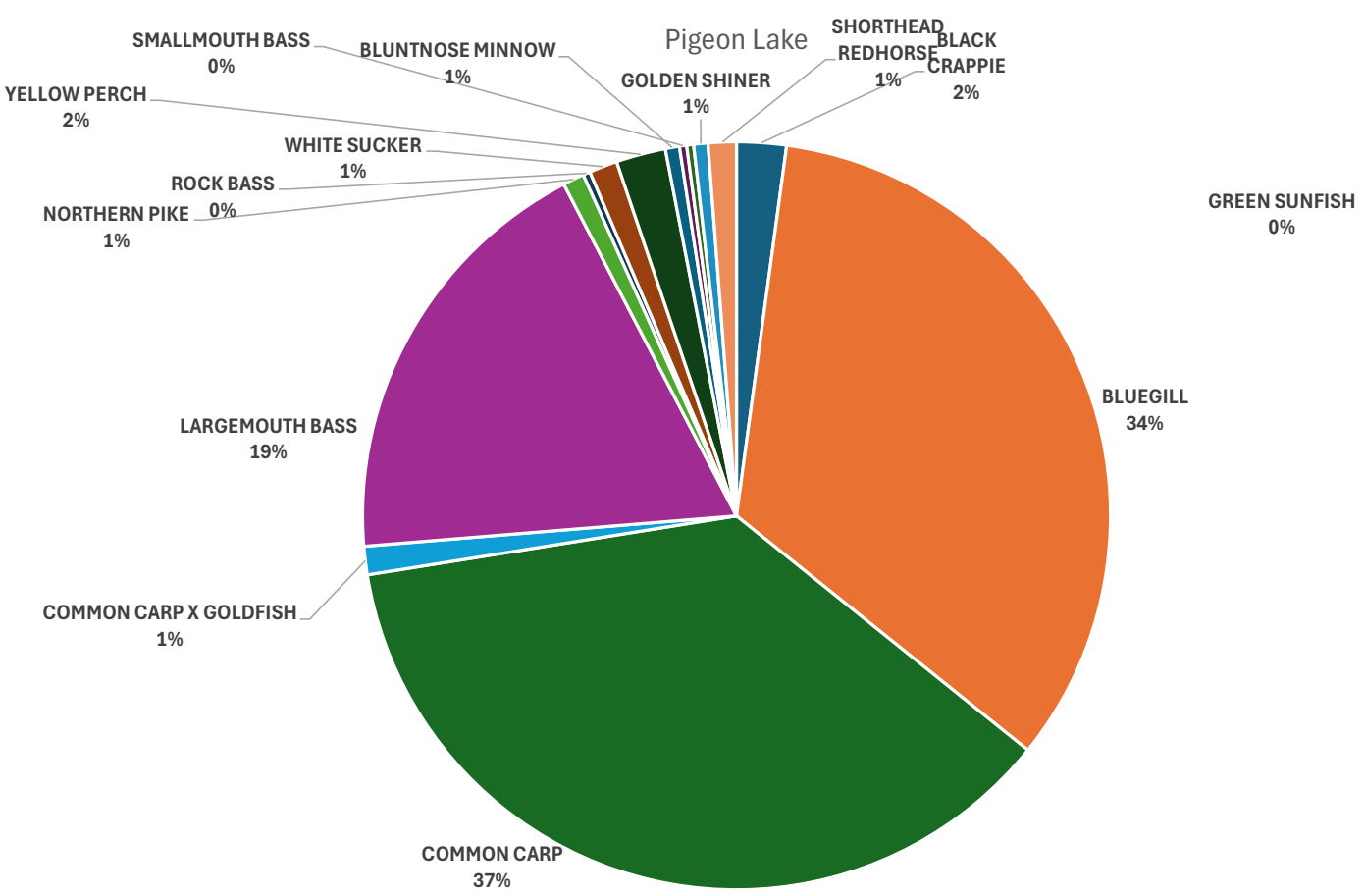
173
Acres

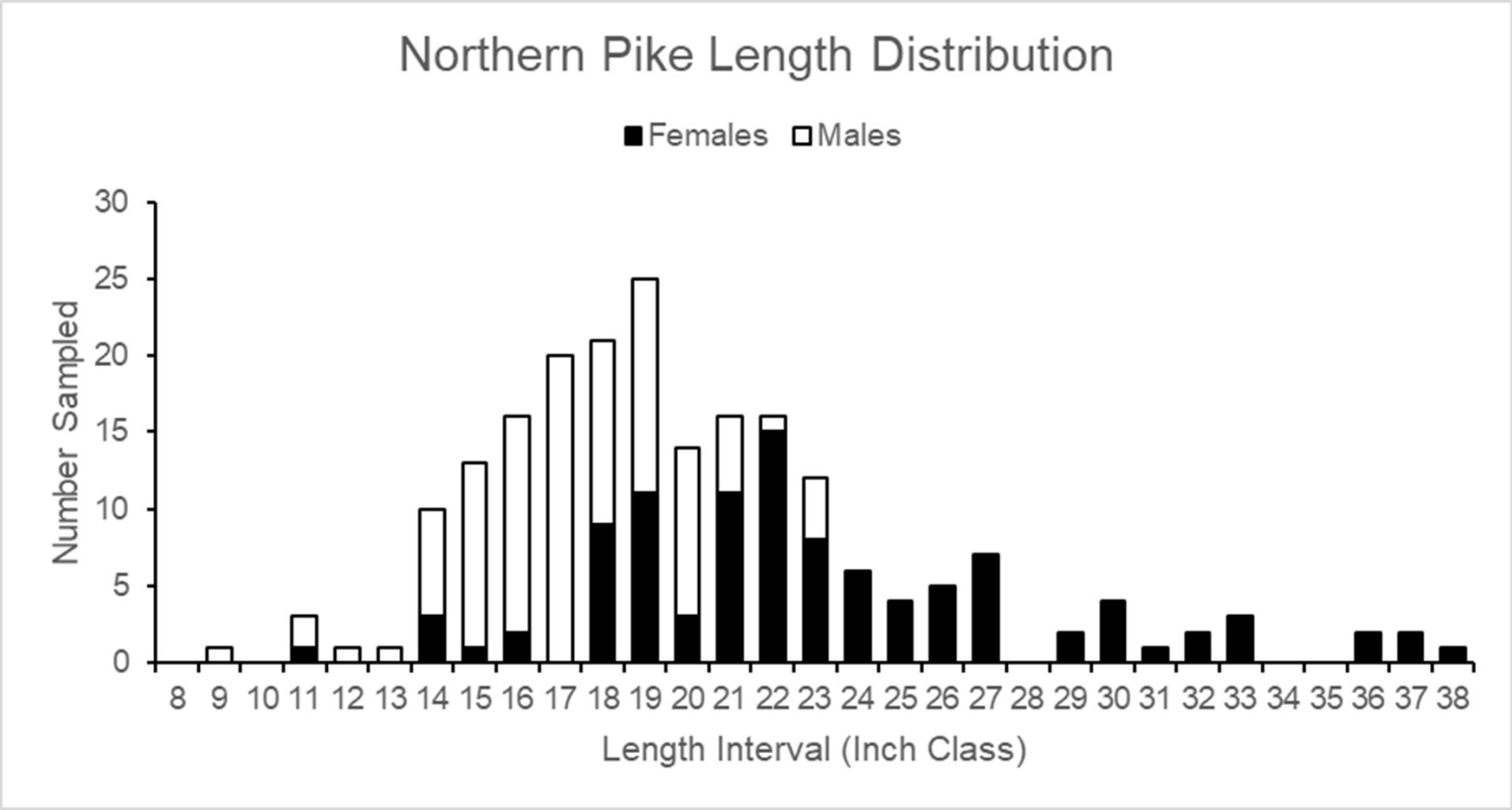

Pigeon Lake
RUSTY CRAYFISH 0%
YELLOW PERCH
YELLOW BULLHEAD 0%
WHITE SUCKER 2%
ROCK BASS 0%
PUMPKINSEED X BLUEGILL 0%
LARGEMOUTH BASS 0%
COMMON SHINER 0%
COMMON CARP X GOLDFISH 1%
BROWN BULLHEAD 0%
BLACK CRAPPIE 12%
NORTHERN PIKE 8%
COMMON CARP 8%
BLUEGILL 67%

SNI

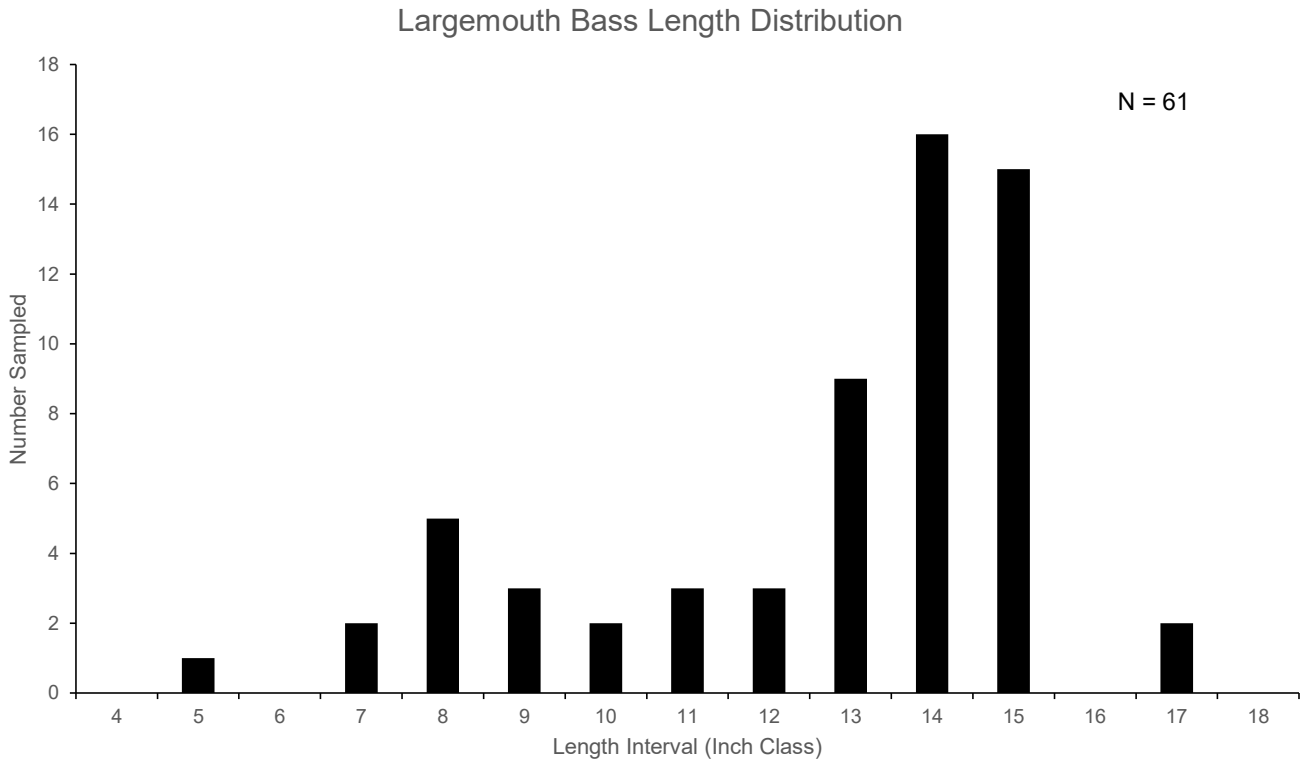
SEII

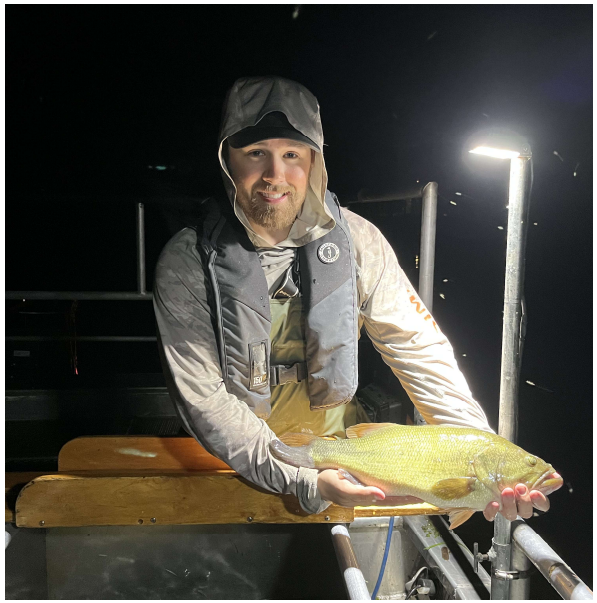
5/12/2025



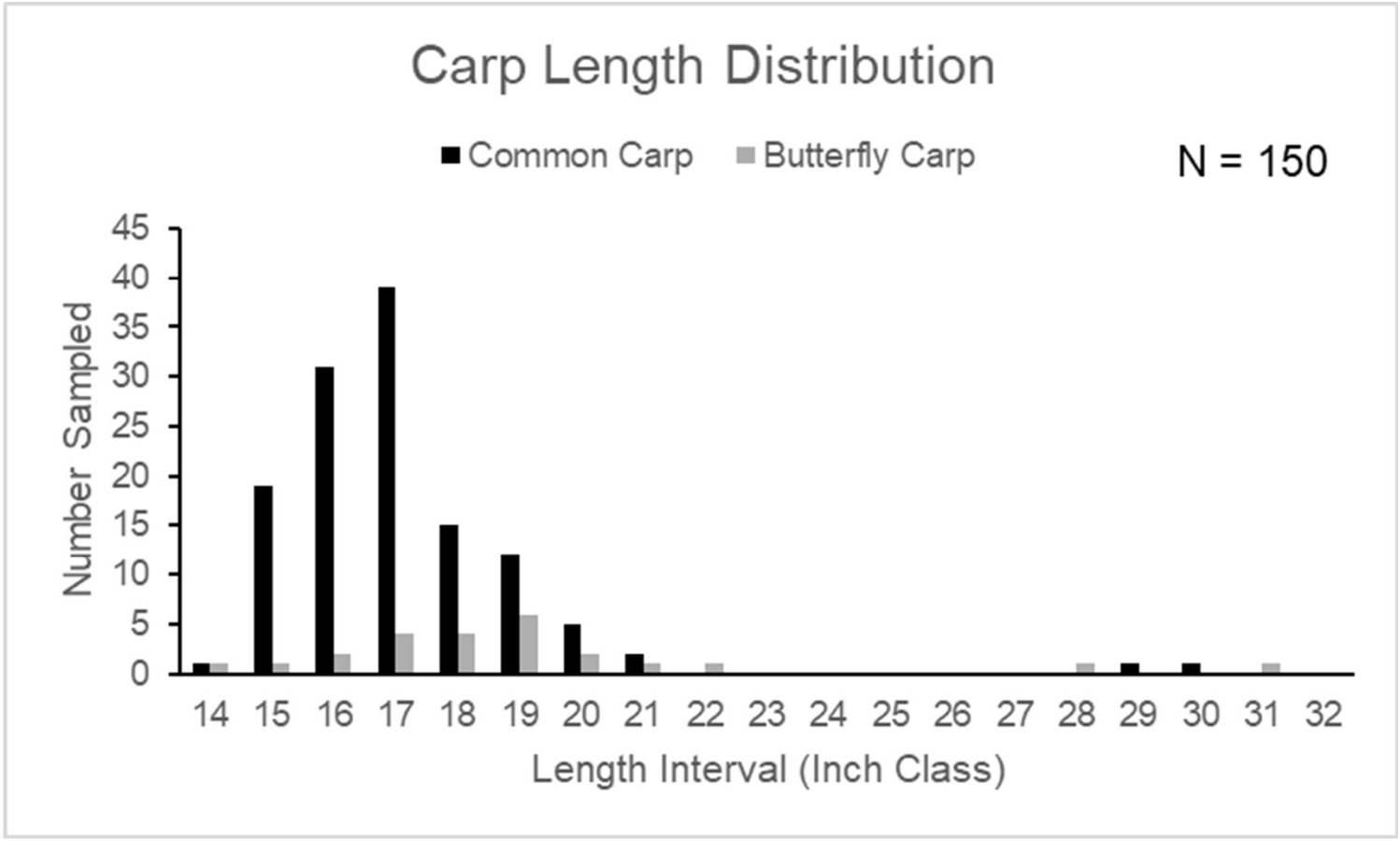


- 4.5/Net Night (50 – 75th)
- Population Estimate 703 (494 – 1,210)
  - 4.1 per acre
- 20.2 inches average length (9.7 – 38.0)
- PSD = 41

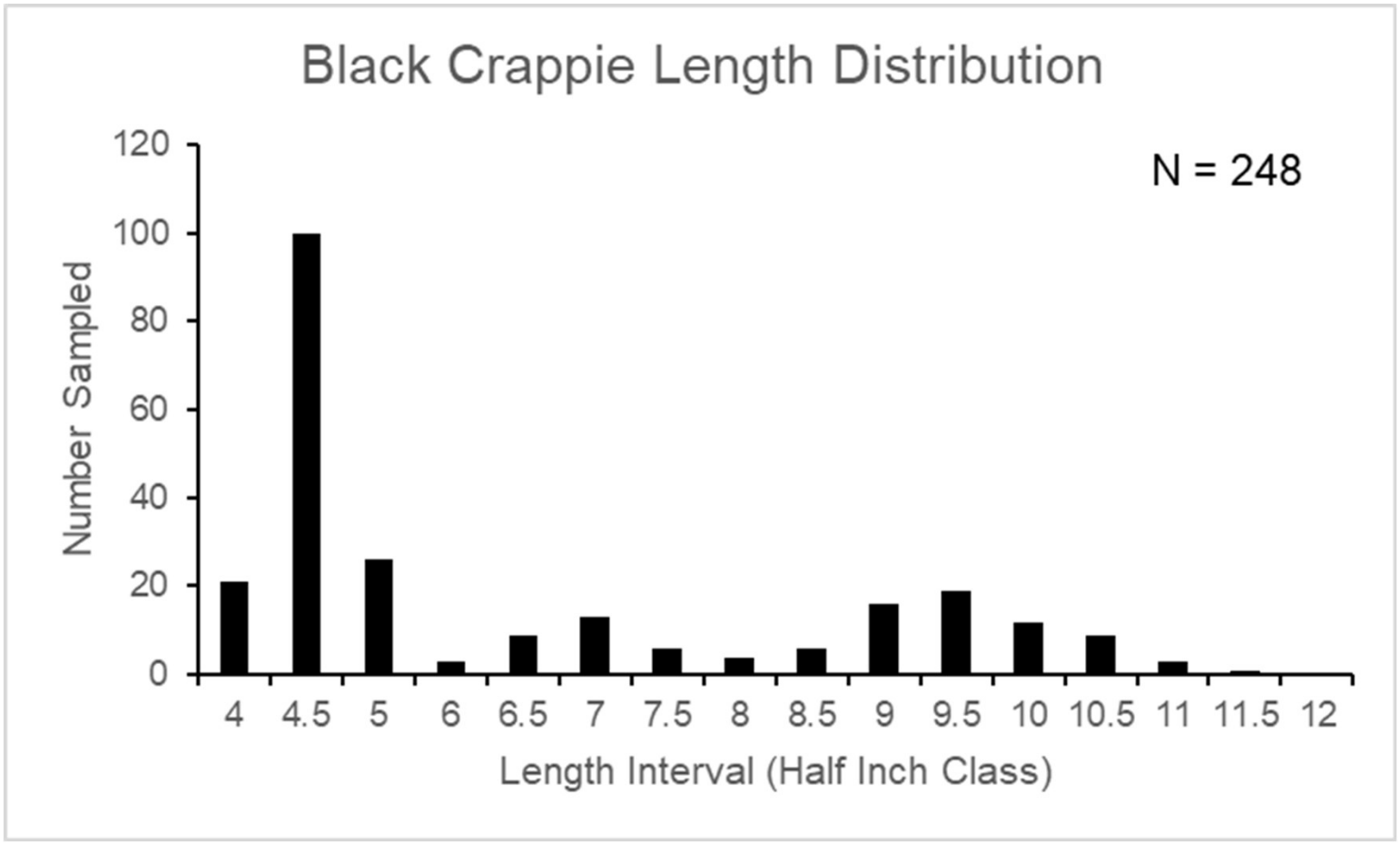




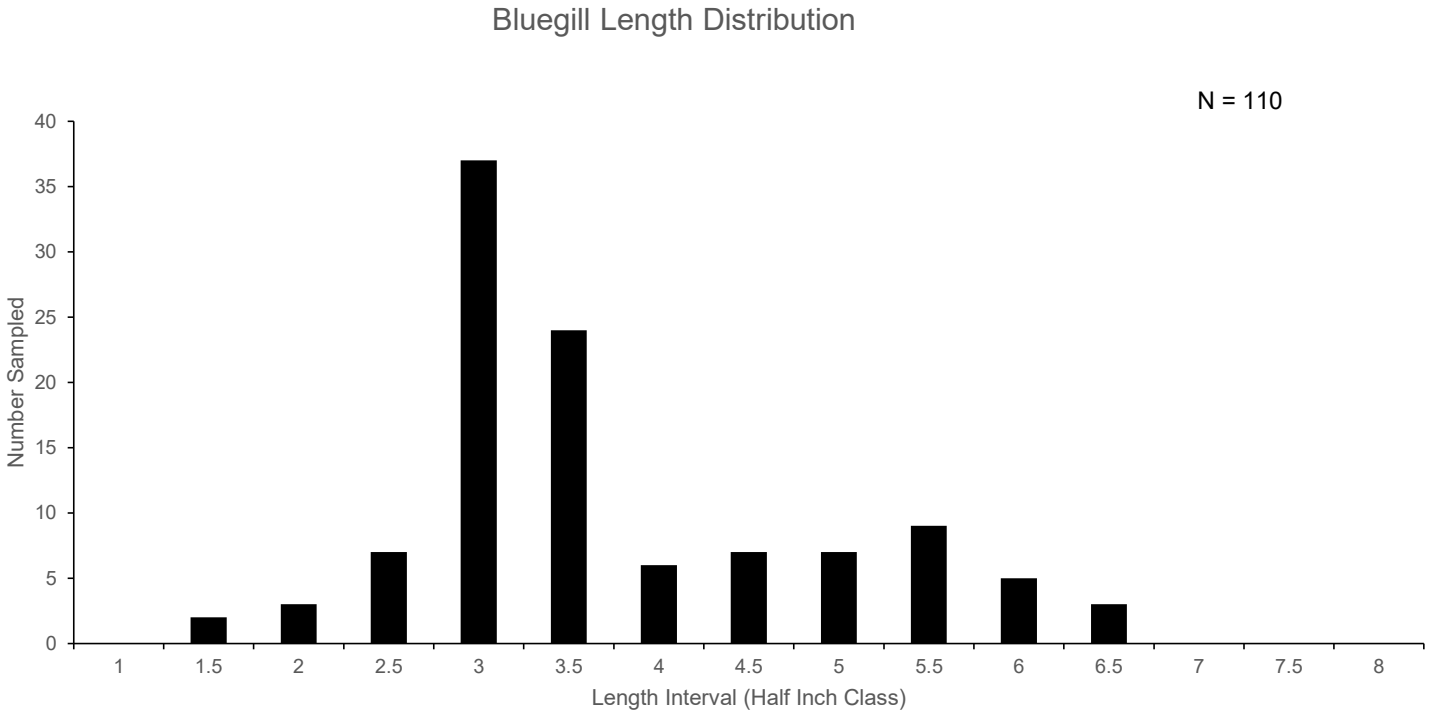
- 13.2 inches average length (5.9 – 17.)
- 17/Mile (25 – 50th)
- PSD 78



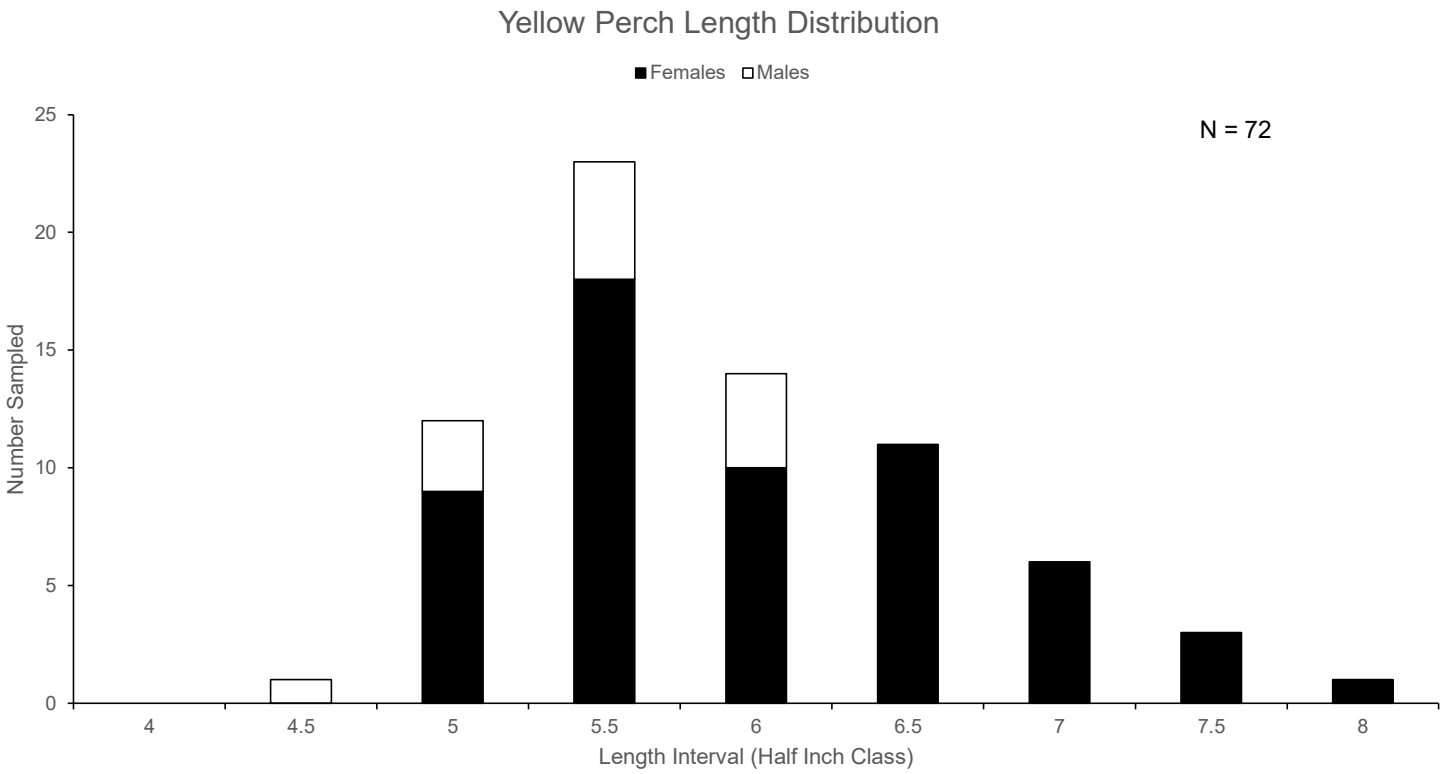
- 17.6 inches average length (14.5 – 31.2)
- 17/Net
- 33.4/Mile (75 – 90th)



- 6.4 inch average length (4.0 – 11.5)
- 7.0/Net Night (50-75th)
- PSD = 55



- 3.9 inch average length (1.8 – 6.8)
- 110/Mile(50 – 75th)
- PSD = 8



- 6.1 inch average length (4.7 – 8.4)
- 1.4/Net Night (50 – 75th)
- PSD = 1

Historical Stocking Pigeon Lake

- Northern Pike
  - 2019 - 1,730 Large Fingerling (7.7 inches)
  - 2020 – 4,326 Large Fingerling (9.6 inches)
  - 2021 – 3,731 Large Fingerling (8.1 inches)
- Largemouth Bass
  - 2019 – 4,315 Large Fingerling (2.7 inches)
  - 2020 - 4,314 Large Fingerling (2.3 inches)
  - 2021 – 6,510 Large Fingerling (2.8 inches)
- Black Crappie
  - 2019 – 13,966 Large Fingerling (1.3 inches)
- Bluegill
  - 2019 – 10,544 (0.5 inches)
- Yellow Perch
  - 2020 – 3,000 Yearling (7.0 inches)

Management Recommendations

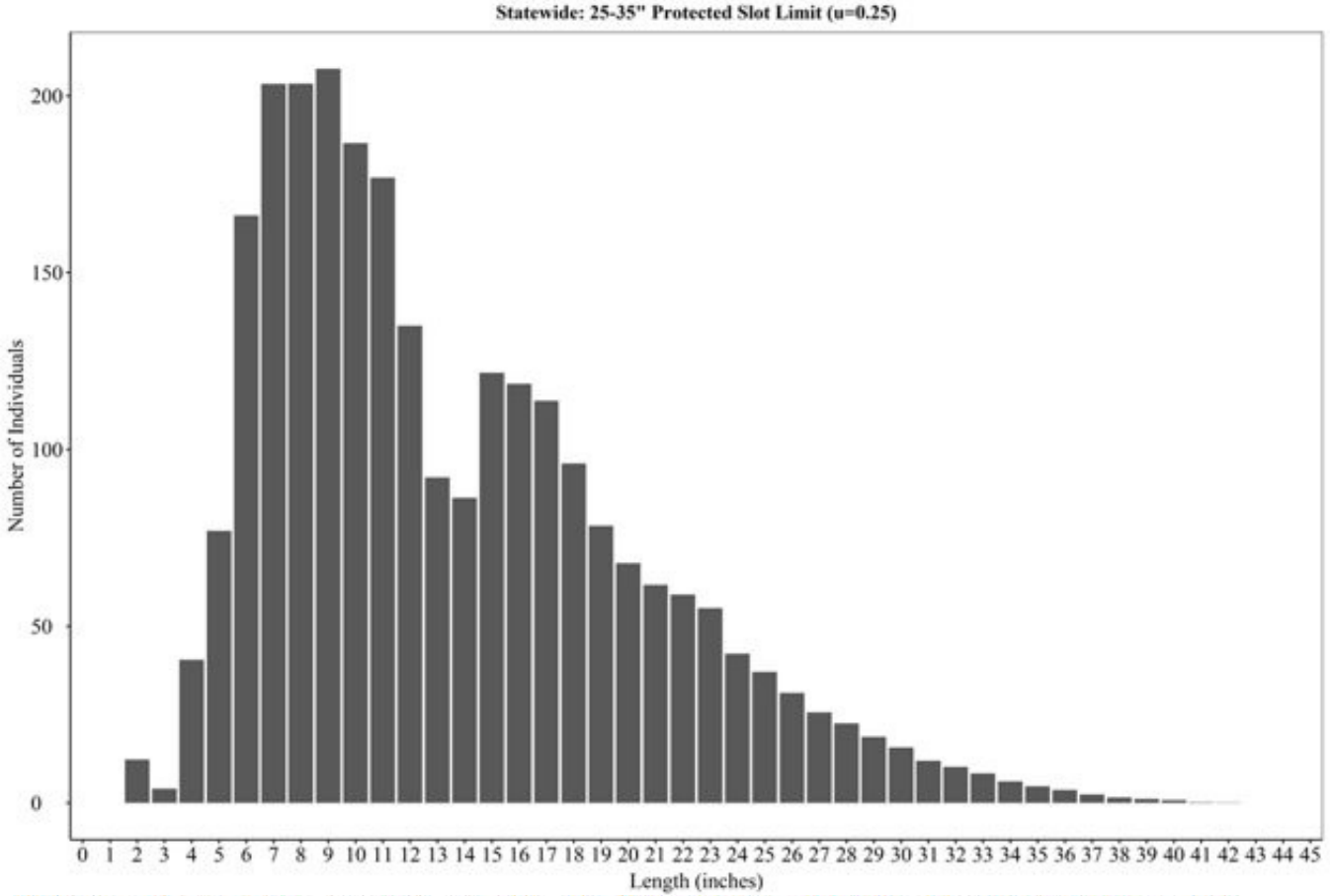
Northern Pike

- 25 – 35 inch protected slot, 2 fish daily bag limit

- 32 inch minimum size limit. 1 fish daily bag limit
- No size limit; 5 fish daily bag limit
- 26 inch minimum size, 2 fish bag limit

Common Carp Removal

- Private Consultant (Pop nets, commercial carp fishermen)
- Roughfish Tournament
- Bounty per fish



Wider slot sizes (i.e. 22-40”, 24-40”, 30-40”) produced highest PSD 40 values, but did not produce the highest PSD 28 values. Thus, these slots perform well as trophy regulations, but not for balancing harvest opportunity with quality (i.e. PSD 28).

CONNECT WITH US

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OFF THE RECORD"