**New Underwood Lake Survey Summary**

New Underwood Lake is a 20-acre impoundment located a half mile North and a half mile west of the town of New Underwood. Low water combined with the harsh winter of 2022/2023 caused a substantial winterkill. The lake was typically managed as a Largemouth Bass/ Bluegill fishery. The winterkill was such, that Bluegill were not sampled in 2023 after having 336.3 per net in 2022. It also knocked down Black Crappie and Largemouth Bass numbers substantially. Species present in the lake now include Black Bullhead, Black Crappie, Channel Catfish, Golden Shiner, Largemouth Bass, Northern pike and Yellow Perch.

**Black Crappie.** Black Crappie numbers had a huge decline from the winterkill with a catch rate of 3.5 per net in 2023. In 2022, a catch rate of 251.5 was observed. The remaining fish that were sampled were between 6 and 8 inches.

**Largemouth Bass.** Numerous bass were seen floating in the lake after ice out in the spring of 2023. In response, 191 adult bass were stocked. Fall electrofishing yielded a catch rate of 66.0 bass per hour. Fish ranged from 6.5 to 15 inches.

**Yellow Perch.** Perch numbers remain strong, with 1,600 adults stocked in the spring of 2023. Frame net catch sampled 30.0 perch per net. Most perch were between 6 and 8.5 inches in the sample.

# SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
## New Underwood Dam, Pennington County
### MCE-Lake-8-000
### 2023

## Lake Information

**Name:** New Underwood Dam

**County:** Pennington

**Surface Area:** 18 Acres

## Surveys and Investigations

Survey methods used by gear type, date, and effort.

| Gear | Date | Effort |
|---|---|---|
| boat shocker (night) | Jul 04, 2023 | 1781 seconds |
| boat shocker (night) | Sep 25, 2023 | 1200 seconds |
| frame net (std 3/4 in) | Jun 15, 2023 | 4 net-nights |

## Common Fish Species Present

Largemouth Bass

Yellow Perch

Channel Catfish

Bluegill

Black Crappie

Black Bullhead

Northern Pike

Golden Shiner

Catfish

## Terminology

Catch per unit effort (**CPUE**) refers to the relative abundance of a species. It is defined as the number of fish captured per unit of effort (i.e., number of fish captured per net-night or number of fish captured per hour electrofishing). In this report CPUE is typically given for only stock-length fish (see length categories table for stock lengths).

A statewide effort to help make netting efforts comparable to all waters sampled across the state, occurred in 2017, with a switch to American Fisheries Society gill nets. Past gill netting efforts were completed with different style/types of nets and are not comparable side by side.

- **AFS std gill net** – 80 ft experimental gill net containing eight panels (10 ft each) of varying monofilament meshes of 0.75, 1.00, 1.25, 1.50, 1.75, 2.00, 2.25 and 2.50 inches.
- **std experimental gill net for non-Missouri River waters** - 150 ft experimental gill net containing six panels (25 ft each) of varying monofilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.
- s**td experimental gill net for Missouri River reservoirs** – 300 ft experimental gill net containing six panels (50 ft each) of varying multifilament meshes of 0.5, 0.75, 1.00, 1.25, 1.50 and 2.00 inches.

$$CPUE = \frac{number\ of\ fish}{effort}$$

Population size structure is quantified using the indices proportional size distribution of quality-length fish (**PSD**) and proportional size distribution of preferred-length fish (**PSD-P**). These indices indicate the proportion of stock-length fish that are equal to or greater than a given length. Minimum lengths for stock, quality and preferred length fish are given in the length categories table.

$$PSD = \left(\frac{number\ of\ fish \geq quality\ length}{number\ of\ fish \geq stock\ length}\right) \text{x } 100$$

$$PSD - P = \left(\frac{number\ of\ fish \geq preferred\ length}{number\ of\ fish \geq stock\ length}\right) \text{x } 100$$

Relative weight (**Wr**) is used to quantify fish plumpness. Relative weight is the ratio of what a fish weighs (W) compared to a length-specific standard weight (Ws) multiplied by 100. Relative weight values of 95-105 are commonly cited as optimum values, but values in the 80s are common during summer sampling in South Dakota.

$$Wr = \left(\frac{W}{Ws}\right) \text{x } 100$$

Confidence intervals (**CI**) are provided for many of the estimates calculated in this report. The confidence interval provides a range in which the true mean is expected to fall. For example, with an 80% CI we are 80% confident that the interval contains the true value.

Length categories include stock (**S**), quality (**Q**), preferred (**P**), memorable (**M**) and trophy (**T**). Length categories for most species have been defined based on a percentage of the world record length for that species. Some species mentioned in this report do not have defined length categories. Length categories for species used in this report are provided in the following table. Measurements are the minimum total length for each category and are reported in inches (in) and centimeters (cm).

| | Stock | | Quality | | Preferred | | Memorable | | Trophy | |
|---|---|---|---|---|---|---|---|---|---|---|
| Species Name | (in) | (cm) | (in) | (cm) | (in) | (cm) | (in) | (cm) | (in) | (cm) |
| Black Bullhead | 6 | 15 | 9 | 23 | 12 | 30 | 15 | 38 | 18 | 46 |
| Black Crappie | 5 | 13 | 8 | 20 | 10 | 25 | 12 | 30 | 15 | 38 |
| Bluegill | 3 | 8 | 6 | 15 | 8 | 20 | 10 | 25 | 12 | 30 |
| Brown Trout | 8 | 20 | 12 | 30 | 16 | 40 | 20 | 50 | 18 | 46 |
| Channel Catfish | 11 | 28 | 16 | 41 | 24 | 61 | 28 | 71 | 36 | 91 |
| Freshwater Drum | 8 | 20 | 12 | 30 | 15 | 38 | 20 | 51 | 25 | 63 |
| Lake Trout | 12 | 30 | 20 | 50 | 26 | 65 | 31 | 80 | 39 | 100 |
| Largemouth Bass | 8 | 20 | 12 | 30 | 15 | 38 | 20 | 51 | 25 | 63 |
| Muskellunge | 20 | 51 | 30 | 76 | 38 | 97 | 42 | 107 | 50 | 127 |
| Northern Pike | 14 | 35 | 21 | 53 | 28 | 71 | 34 | 86 | 44 | 112 |
| Pumpkinseed | 3 | 8 | 6 | 15 | 8 | 20 | 10 | 25 | 12 | 30 |
| Rainbow Trout | 10 | 25 | 16 | 40 | 20 | 50 | 26 | 65 | 31 | 80 |
| Rudd | 6 | 15 | 10 | 25 | 12 | 30 | 15 | 38 | 19 | 48 |
| Sauger | 8 | 20 | 12 | 30 | 15 | 38 | 20 | 51 | 25 | 63 |
| Smallmouth Bass | 7 | 18 | 11 | 28 | 14 | 35 | 17 | 43 | 20 | 51 |
| Walleye | 10 | 25 | 15 | 38 | 20 | 51 | 25 | 63 | 30 | 76 |
| White Bass | 6 | 15 | 9 | 23 | 12 | 30 | 15 | 38 | 18 | 46 |
| White Crappie | 5 | 13 | 8 | 20 | 10 | 25 | 12 | 30 | 15 | 38 |
| Yellow Bullhead | 4 | 10 | 7 | 18 | 9 | 23 | 11 | 28 | 14 | 36 |
| Yellow Perch | 5 | 13 | 8 | 20 | 10 | 25 | 12 | 30 | 15 | 38 |

## Catch Summary of Stock Length Fish

Catch per unit effort (CPUE), proportional size distribution (PSD), proportional size distribution of preferred length fish (PSD-P), and relative weight (Wr) for species sampled in survey with 80% confidence interval (CI-80).

*** Methods/Species that ignore stock length**

| | | | Abundance | | Stock Density Indices | | | | Condition | |
|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Species | Sample Size (n) | CPUE | CI-80 | PSD | CI-80 | PSD-P | CI-80 | Wr | CI-80 |
| boat shocker (night) | Largemouth Bass | 35 | 38.6 | 29.1 | 56 | 13 | 6 | | 111 | 4 |
| frame net (std 3/4 in) | Black Bullhead | 10 | 2.5 | 1.4 | 100 | | 50 | 28 | 102 | 2 |
| | Black Crappie | 14 | 3.5 | 2.9 | 7 | | 0 | | 109 | 5 |
| | Catfish | 3 | 0.0 | 0.0 | | | | | | |
| | Channel Catfish | 2 | 0.5 | 0.8 | 50 | | 0 | | 84 | 8 |
| | Golden Shiner | 6 | 0.0 | 0.0 | | | | | | |
| | Largemouth Bass | 2 | 0.5 | 0.8 | 0 | | 0 | | 99 | 0 |
| | Northern Pike | 2 | 0.5 | 0.8 | 100 | | 0 | | 92 | 1 |
| | Yellow Perch | 120 | 30.0 | 41.3 | 17 | 5 | 0 | | 100 | 1 |

## 10-Year Catch Per Unit Effort by Gear and Species

Catch per unit effort (CPUE) and average (Avg) of species across 10 years using different gear types.

*** Methods/Species that ignore stock length**

| | | CPUE | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Species | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | Avg |
| AFS std frame net | Black Bullhead | | | | 0.5 | | | | | | | 0.50 |
| | Black Crappie | | | | 13.8 | | | | | | | 13.80 |
| | Bluegill | | | | 62.8 | | | | | | | 62.80 |
| | Golden Shiner | | | | 0.0 | | | | | | | 0.00 |
| | Green Sunfish | | | | 0.3 | | | | | | | 0.30 |
| | Yellow Perch | | | | 1.3 | | | | | | | 1.30 |
| boat shocker (day) | Largemouth Bass | | | | | | | | 162.0 | 61.5 | | 111.75 |
| boat shocker (night) | Largemouth Bass | 205.1 | | | | 102.0 | 144.0 | | | | 38.6 | 122.43 |
| frame net (std 3/4 in) | Black Bullhead | | 2.3 | | | 1.7 | 2.7 | | 5.3 | 0.8 | 2.5 | 2.55 |
| | Black Crappie | | 1.3 | | | 1.7 | 15.3 | | 48.5 | 241.5 | 3.5 | 51.97 |
| | Bluegill | | 67.0 | | | 24.3 | 21.7 | | 162.5 | 335.8 | 0.0 | 101.88 |
| | Catfish | | 0.0 | | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.00 |
| | Channel Catfish | | 0.5 | | | 0.0 | 0.0 | | 0.0 | 0.8 | 0.5 | 0.30 |
| | Golden Shiner | | 0.0 | | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.00 |
| | Green Sunfish | | 0.8 | | | 0.0 | 17.7 | | 0.0 | 0.0 | 0.0 | 3.08 |
| | Largemouth Bass | | 0.5 | | | 0.0 | 0.0 | | 0.3 | 1.3 | 0.5 | 0.43 |
| | Northern Pike | | 0.0 | | | 0.0 | 0.0 | | 0.0 | 0.8 | 0.5 | 0.22 |
| | White Sucker | | 0.3 | | | 0.0 | 0.0 | | 0.0 | 0.3 | 0.0 | 0.10 |
| | Yellow Perch | | 55.3 | | | 4.0 | 3.0 | | 9.5 | 3.8 | 30.0 | 17.60 |

## 10-Year Size Structure and Condition Statistics by Gear and Species

Species proportional size distribution (PSD), proportional size distribution of preferred length fish (PSD-P), and relative weight (Wr) collected by different gear types across 10 years.

| | | | Year | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Species | Index | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| AFS std frame net | Black Bullhead | PSD | | | | 100 | | | | | | |
| | | PSD-P | | | | 100 | | | | | | |
| | | Wr | | | | 89 | | | | | | |
| | Black Crappie | PSD | | | | 44 | | | | | | |
| | | PSD-P | | | | 7 | | | | | | |
| | | Wr | | | | 96 | | | | | | |
| | Bluegill | PSD | | | | 59 | | | | | | |
| | | PSD-P | | | | 8 | | | | | | |
| | | Wr | | | | 99 | | | | | | |
| | Yellow Perch | PSD | | | | 60 | | | | | | |
| | | PSD-P | | | | 20 | | | | | | |
| | | Wr | | | | 82 | | | | | | |
| boat shocker (day) | Largemouth Bass | PSD | | | | | | | | 41 | 50 | |
| | | PSD-P | | | | | | | | 34 | 39 | |
| | | Wr | | | | | | | | 94 | 106 | |
| boat shocker (night) | Largemouth Bass | PSD | 16 | | | | 41 | 36 | | | | 56 |
| | | PSD-P | 11 | | | | 12 | 11 | | | | 6 |
| | | Wr | 95 | | | | 96 | 100 | | | | 111 |
| frame net (std 3/4 in) | Black Bullhead | PSD | | 100 | | | 100 | 100 | | 90 | 100 | 100 |
| | | PSD-P | | 89 | | | 60 | 63 | | 10 | 0 | 50 |
| | | Wr | | 93 | | | 99 | 102 | | 107 | 129 | 102 |
| | Black Crappie | PSD | | 100 | | | 40 | 83 | | 4 | 4 | 7 |
| | | PSD-P | | 0 | | | 0 | 9 | | 1 | 1 | 0 |
| | | Wr | | 99 | | | 101 | 97 | | 94 | 93 | 109 |
| | Bluegill | PSD | | 91 | | | 86 | 97 | | 21 | 17 | |
| | | PSD-P | | 1 | | | 3 | 3 | | 1 | 1 | |
| | | Wr | | 106 | | | 106 | 108 | | 104 | 89 | |
| | Channel Catfish | PSD | | 50 | | | | | | | 33 | 50 |
| | | PSD-P | | 50 | | | | | | | 0 | 0 |
| | | Wr | | 83 | | | | | | | 85 | 84 |
| | Largemouth Bass | PSD | | 100 | | | | | | 0 | 100 | 0 |
| | | PSD-P | | 100 | | | | | | 0 | 80 | 0 |

| | | | Year | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Species | Index | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| frame net (std 3/4 in) | Largemouth Bass | Wr | | 103 | | | | | | 85 | 95 | 99 |
| | Northern Pike | PSD | | | | | | | | | 0 | 100 |
| | | PSD-P | | | | | | | | | 0 | 0 |
| | | Wr | | | | | | | | | 87 | 92 |
| | Yellow Perch | PSD | | 41 | | | 75 | 89 | | 34 | 27 | 17 |
| | | PSD-P | | 0 | | | 0 | 0 | | 3 | 7 | 0 |
| | | Wr | | 95 | | | 100 | 97 | | 83 | 75 | 100 |

## Length at Capture

Mean length at capture by age across years sampled, sample size (N).

Species: Bluegill

| | | Mean Length (expanded sample number) at capture by age | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | N | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10+ |
| 2017 | 248 | 94<br>(1) | 132<br>(94) | 158<br>(51) | 188<br>(72) | 192<br>(22) | 202<br>(8) | | | | |

Species: Largemouth Bass

| | | Mean Length (expanded sample number) at capture by age | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | N | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10+ |
| 2014 | 296 | | 205<br>(15) | 195<br>(49) | 222<br>(120) | 269<br>(73) | 323<br>(35) | 441<br>(4) | | | |

## Fish Condition

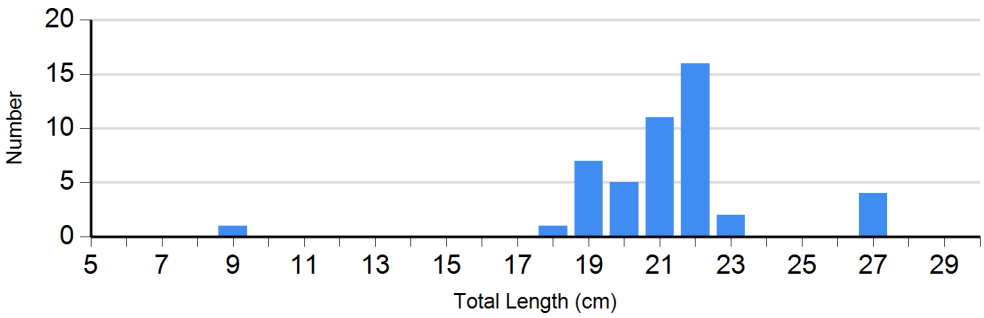
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

| | | Length Groups | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | S-Q | | Q-P | | P-M | | M | |
| Species | Year | N | Wr (SE) | N | Wr (SE) | N | Wr (SE) | N | Wr (SE) |
| Black Crappie Frame Net | 2019 | 8 | 103 (1.0) | 34 | 96 (0.8) | 4 | 90 (1.4) | 0 | |
| | 2021 | 186 | 97 (0.8) | 6 | 76 (1.9) | 2 | 83 | 0 | |
| | 2022 | 930 | 94 (0.4) | 28 | 71 (1.4) | 8 | 76 | 0 | |
| | 2023 | 13 | 110 (4.4) | 1 | 97 | 0 | | 0 | |
| Bluegill Frame Net | 2019 | 2 | 107 | 61 | 108 (0.9) | 2 | 95 | 0 | |
| | 2021 | 515 | 109 (1.2) | 129 | 94 (1.2) | 6 | 92 | 0 | |
| | 2022 | 1113 | 91 (0.5) | 221 | 86 (1.8) | 9 | 79 | 0 | |
| Largemouth Bass Electro Fishing | 2019 | 23 | 101 (1.2) | 9 | 98 (2.1) | 4 | 95 (2.9) | 0 | |
| | 2021 | 17 | 91 (0.7) | 2 | 97 (5.9) | 10 | 99 (1.6) | 0 | |
| | 2022 | 9 | 99 (2.1) | 2 | 119 (8.4) | 7 | 112 (4.4) | 0 | |
| | 2023 | 14 | 114 (4.5) | 16 | 111 (3.1) | 2 | 93 (25.5) | 0 | |

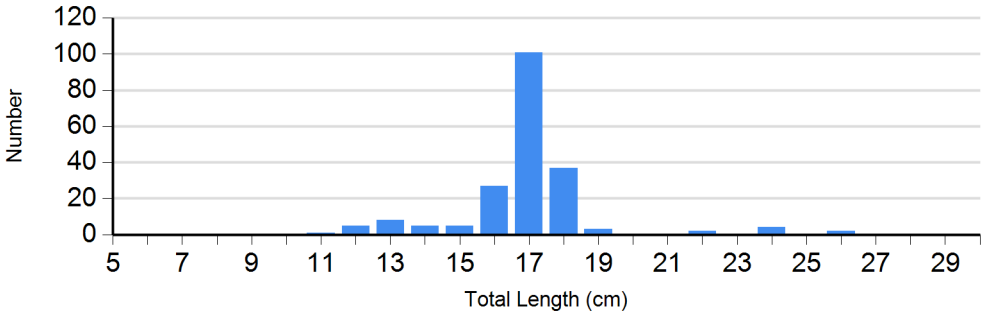
## Length Frequency Distribution

Length frequency histogram of species sampled by year.

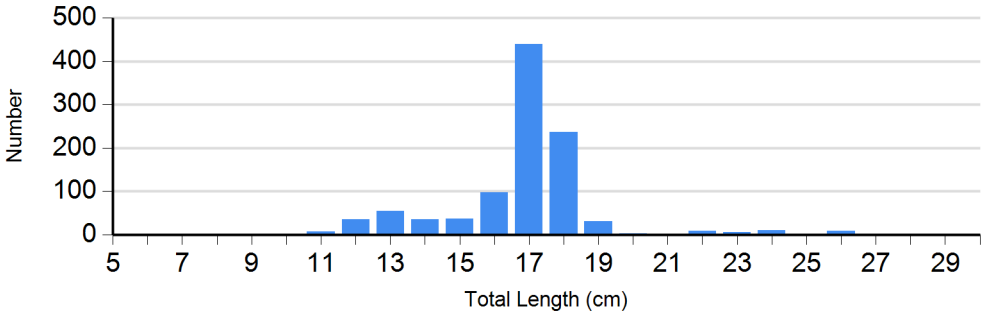
Species: Black Crappie
Gear: frame net (std 3/4 in)



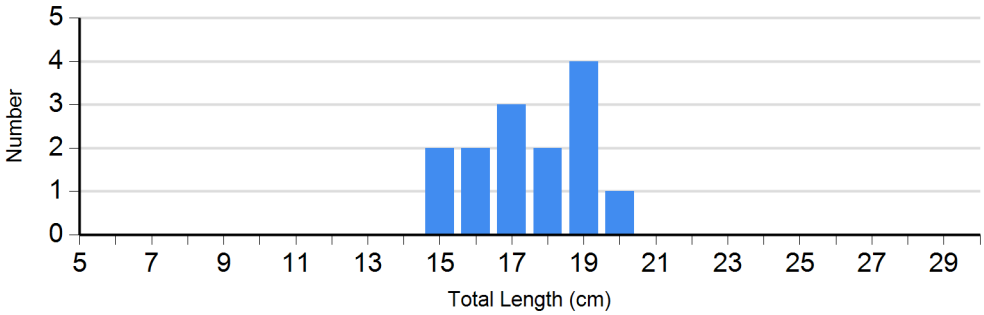

2019




2021

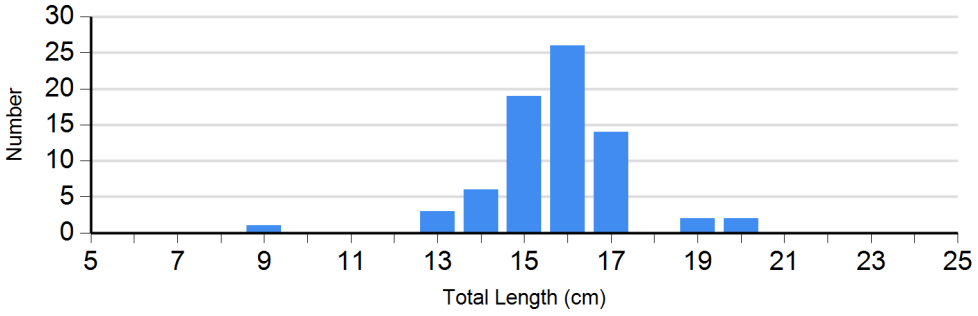



2022

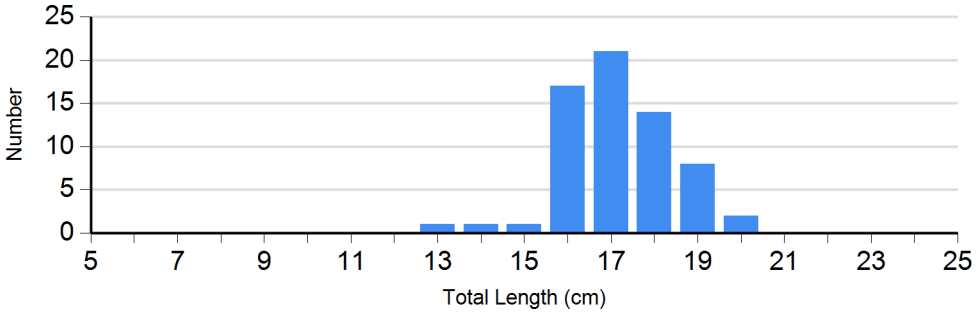



2023

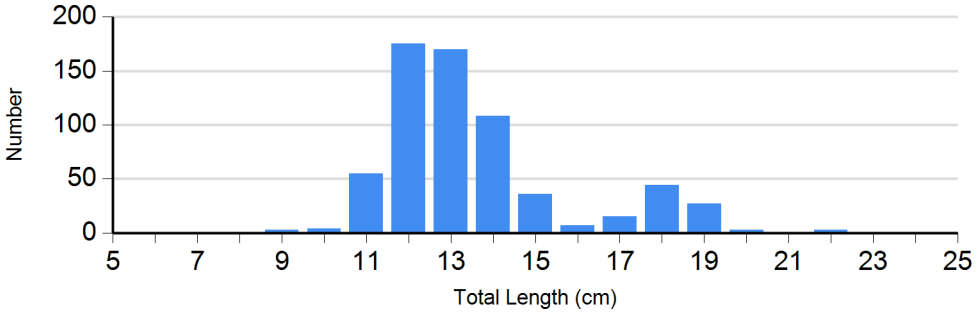
Species: Bluegill
Gear: frame net (std 3/4 in)



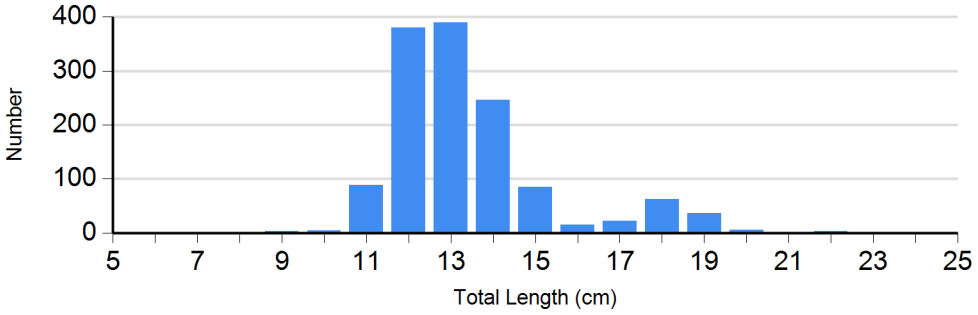

2018




2019

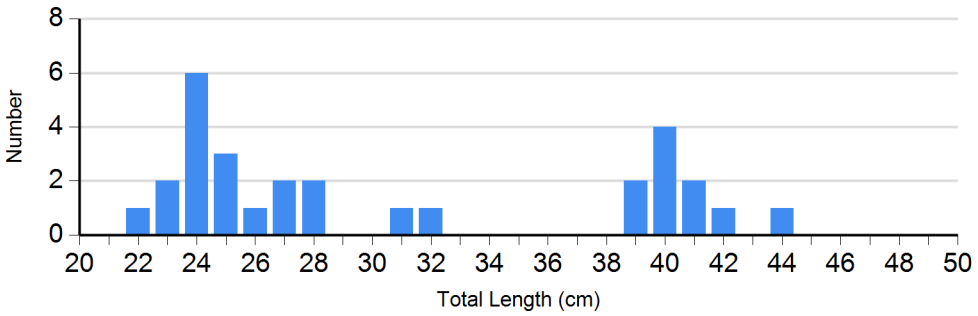



2021

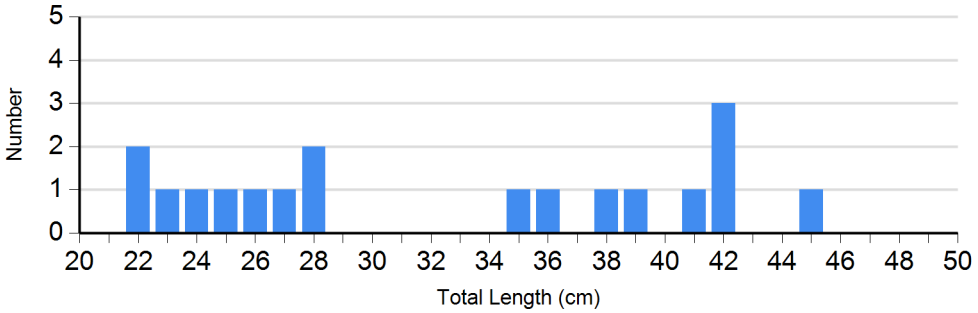



2022

Species: Largemouth Bass
Gear: boat shocker (day)

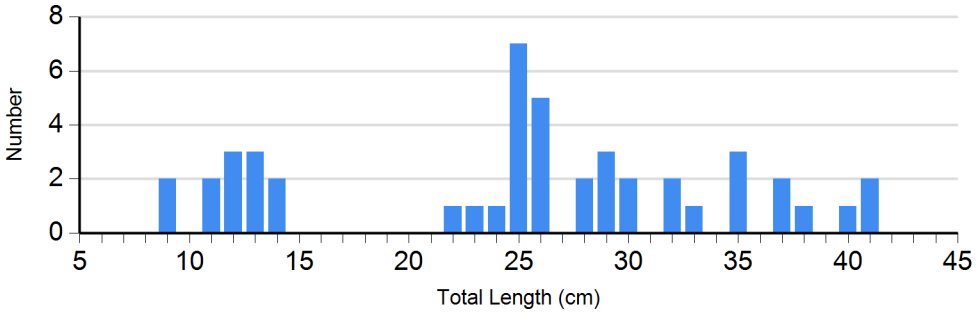



2021

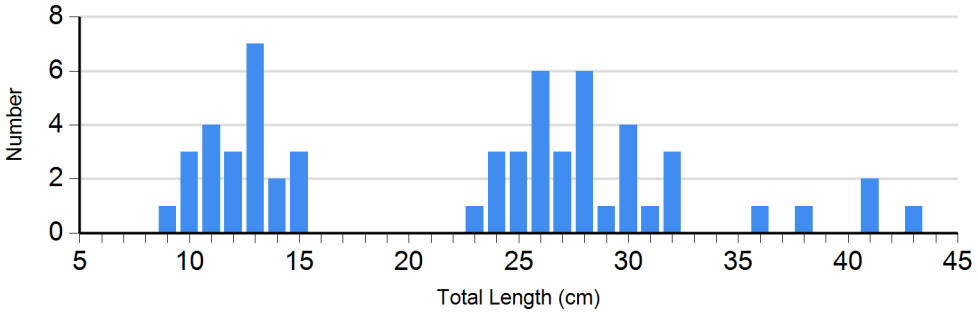



2022

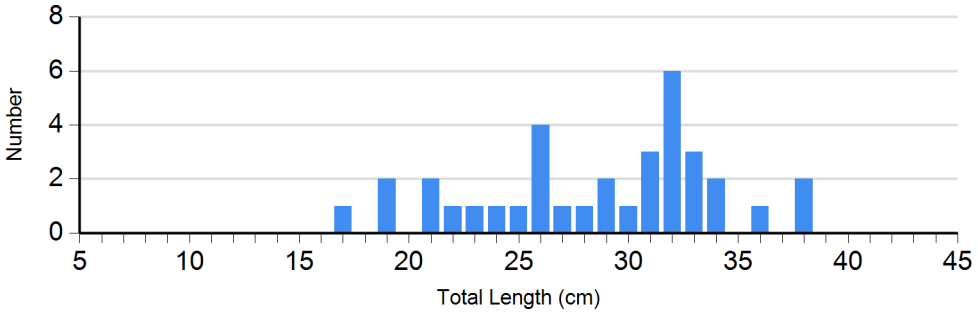
Species: Largemouth Bass
Gear: boat shocker (night)




2018




2019

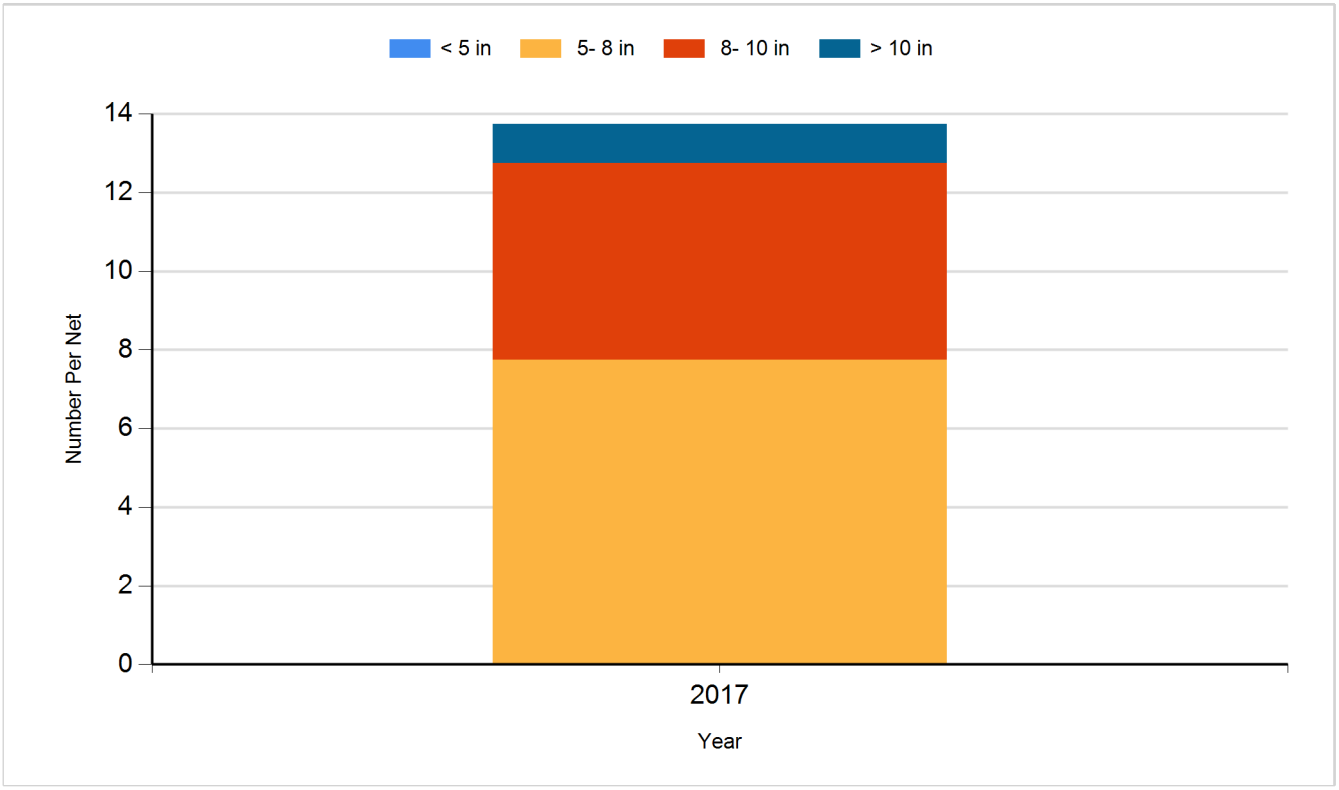



2023

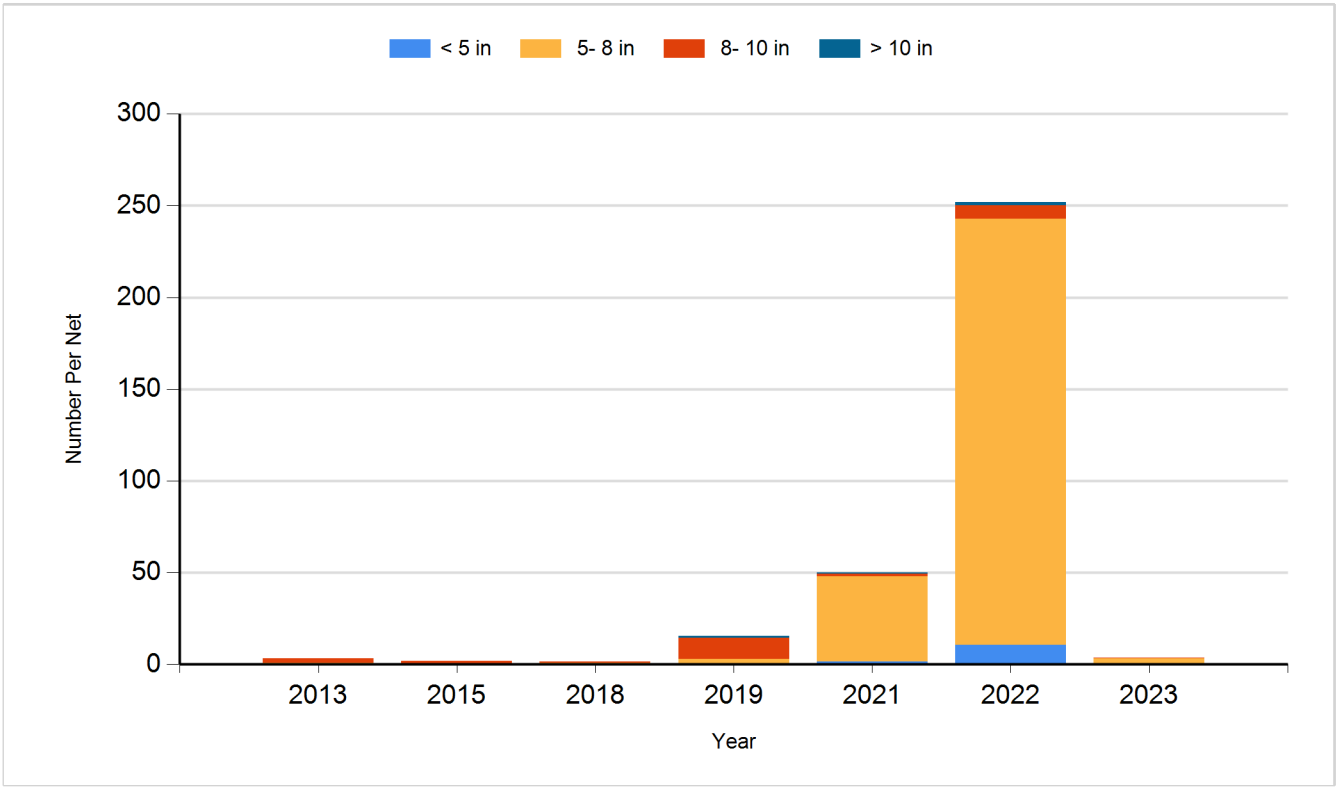
## Historic Fish Sizes and Relative Abundance

Size distribution per net by color for species sampled by year.

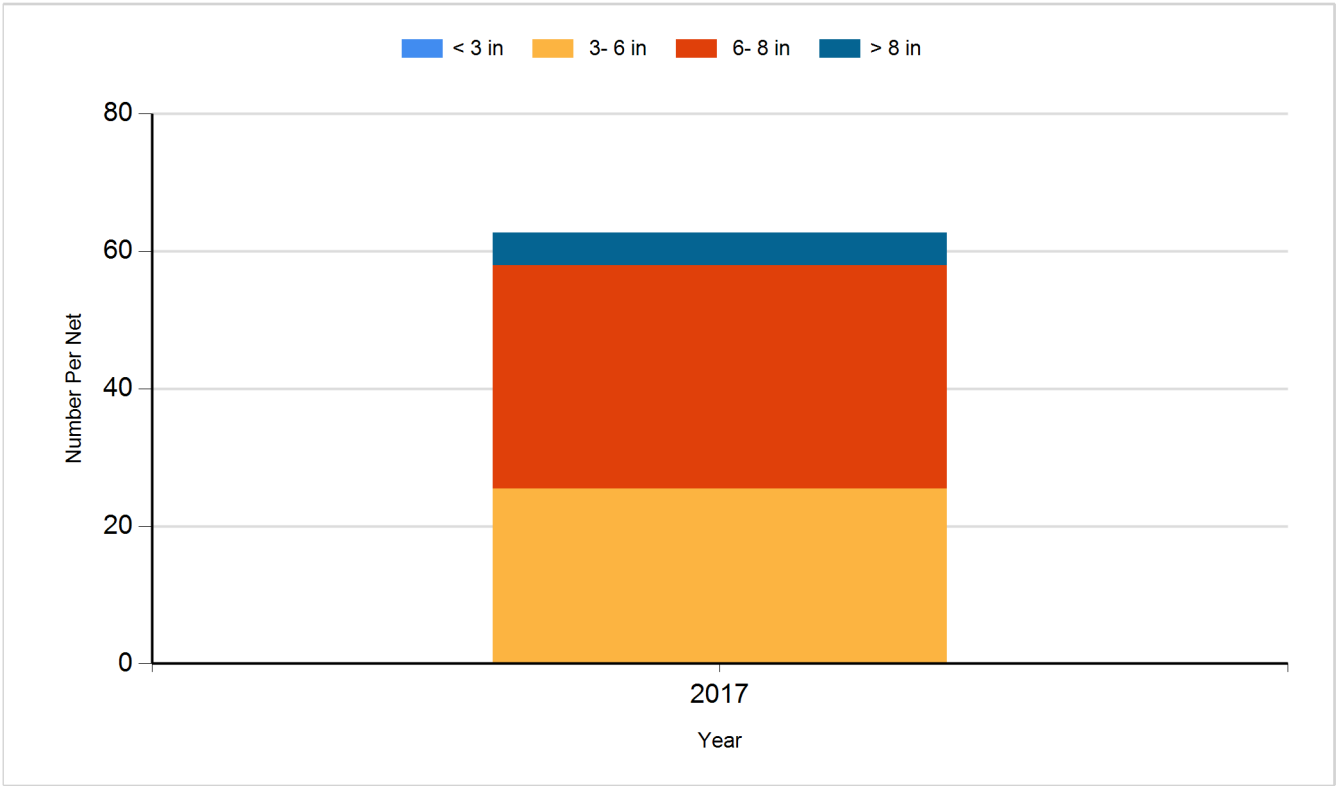
Species: Black Crappie
Gear: AFS std frame net



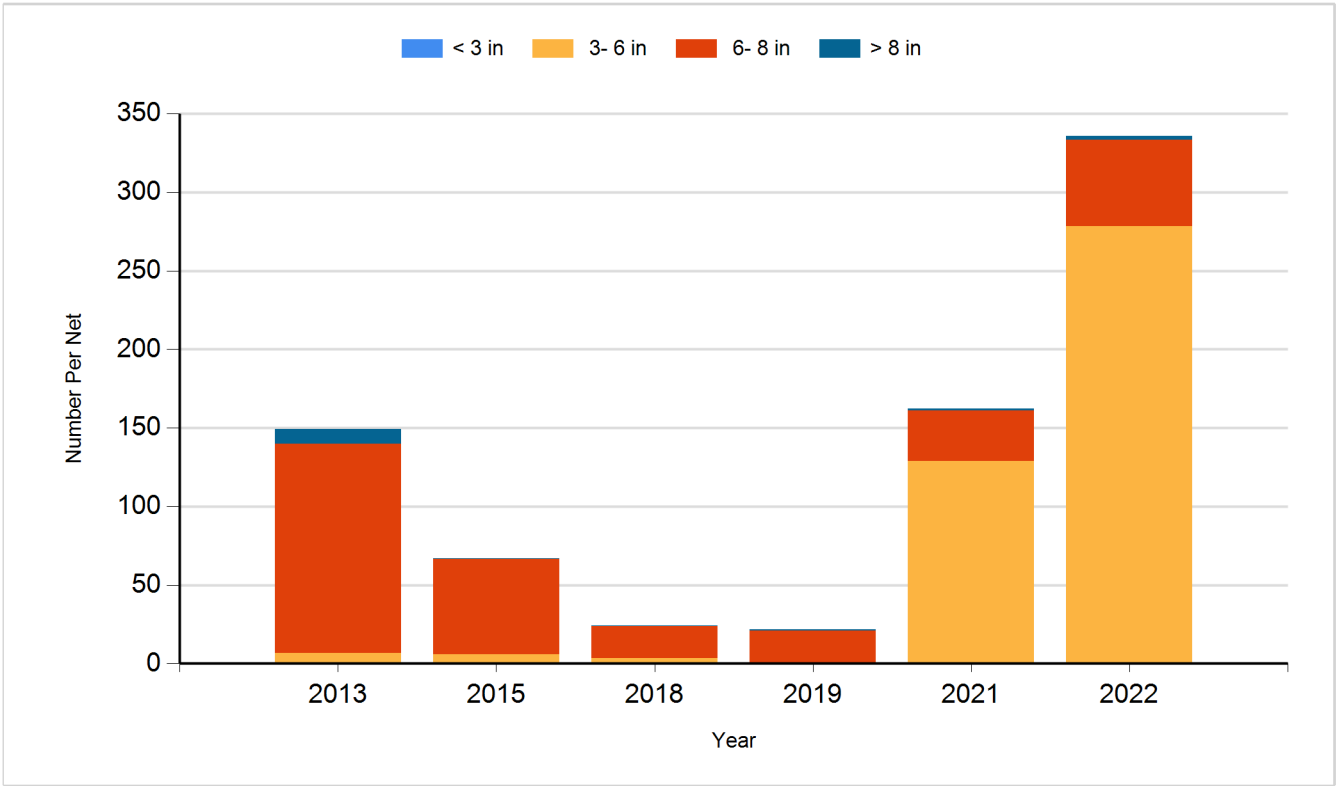

Species: Black Crappie
Gear: frame net (std 3/4 in)



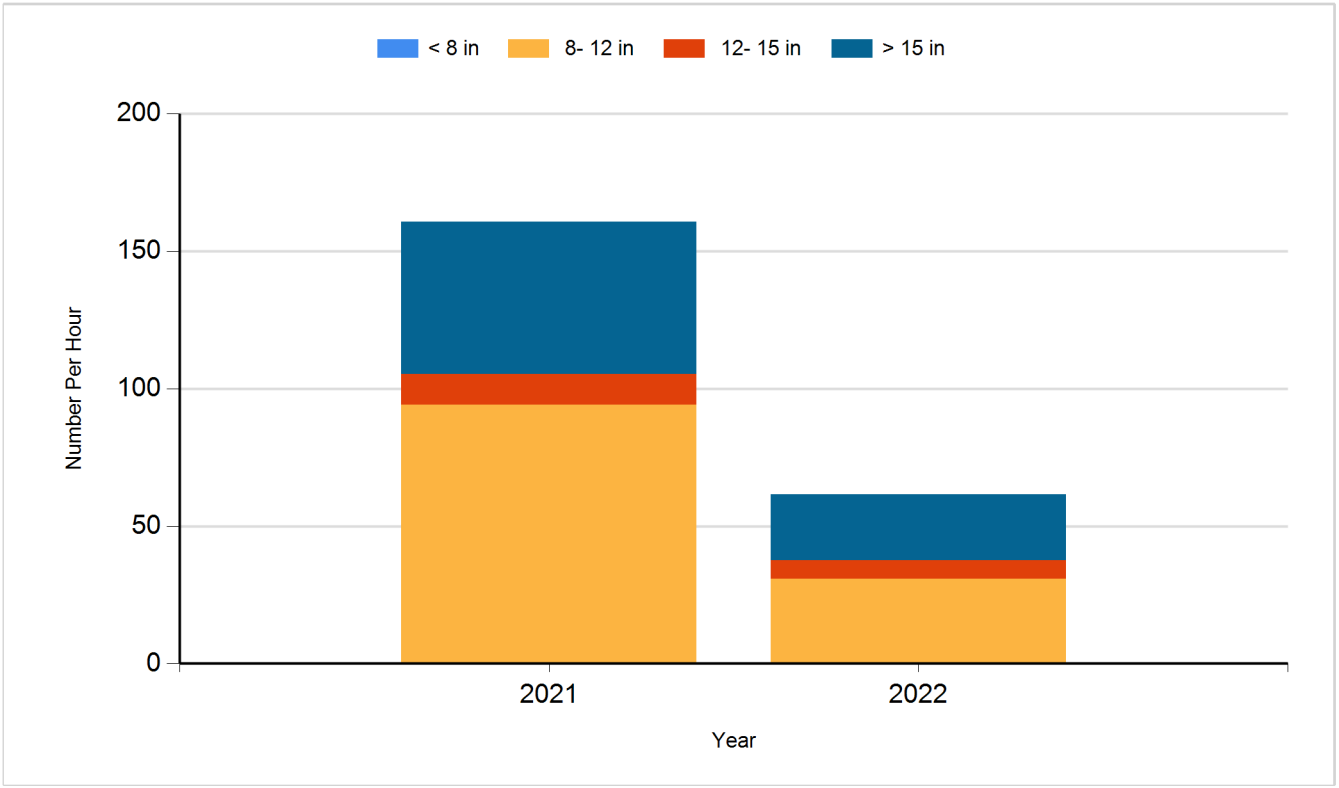
Species: Bluegill
Gear: AFS std frame net



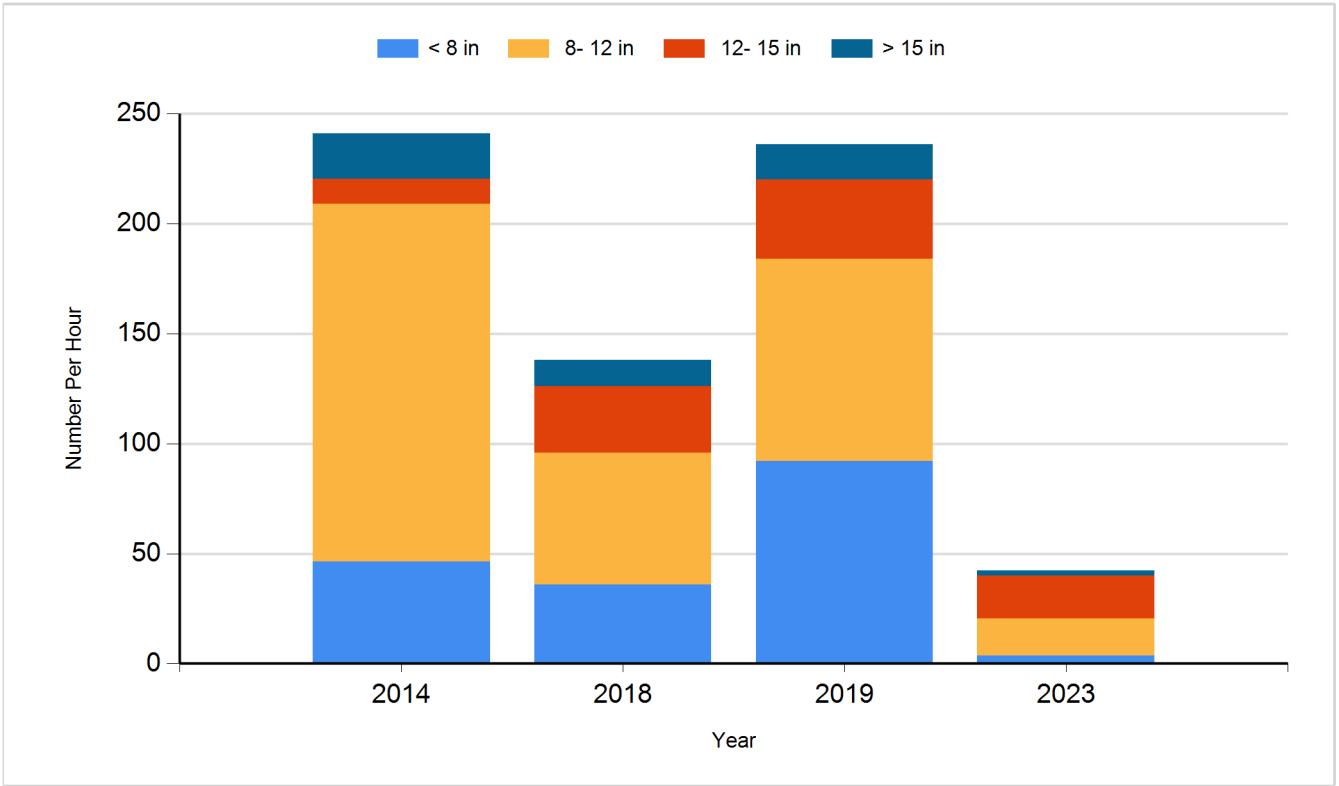

Species: Bluegill
Gear: frame net (std 3/4 in)



Species: Largemouth Bass
Gear: boat shocker (day)




Species: Largemouth Bass
Gear: boat shocker (night)



## Fish Stocking

Number of fish stocked by year, species, and size.

| Year | Species | Size | Number |
|---|---|---|---|
| 2012 | Largemouth Bass | Fingerling | 1,500 |
| 2014 | Channel Catfish | Adult | 143 |
| 2014 | Yellow Perch | Adult | 325 |
| 2015 | Channel Catfish | Adult | 100 |
| 2016 | Channel Catfish | Adult | 200 |
| 2017 | Channel Catfish | Adult | 137 |
| 2018 | Channel Catfish | Adult | 219 |
| 2018 | Largemouth Bass | Juvenile | 272 |
| 2019 | Channel Catfish | Adult | 200 |
| 2020 | Yellow Perch | Adult | 600 |
| 2021 | Channel Catfish | Adult | 300 |
| 2022 | Channel Catfish | Juvenile | 40 |
| 2023 | Channel Catfish | Adult | 150 |
| 2023 | Largemouth Bass | Adult | 191 |
| 2023 | Yellow Perch | | 1,600 |