# 2024 Spring Lake Survey Summary

**Water:** Spring Lake

**County:** Walworth

**Legal Description:** T124N R74W S6

**GPS:** 45.43121 -99.83202

**Surface Area:** 852 Acres

**Class:** Warm Water Permanent

**Maximum Depth:** 9 feet

**Mean Depth:** 6 feet

Spring Lake is an 852-acre natural lake 10 miles west and 1 mile south of the City of Bowdle in east central Walworth County. A dirt trail from a county gravel road off US HWY 12 provides access to the west shoreline of the lake. A primitive, rock boat ramp on a Game Production Area provides opportunity to launch small to mid-sized boats and allows ice access. There are no other public use facilities at Spring Lake. Most of the angling pressure occurs during the ice-fishing season.

Primary game fish managed at Spring Lake include Walleye and Yellow Perch. Yellow Perch were introduced naturally when the lake filled to current levels. Recent Walleye stockings occurred in 2023, 2021, 2018 and 2015. Northern Pike and Black Bullhead also have a historical presence.

Spring Lake was surveyed on June 24-25, 2024, utilizing 5, ¾ inch standard frame nets sets. Yellow Perch, Walleye, Northern Pike, and Black Bullhead were observed during the 2024 survey.

- **Walleye:** Catch rates were lower in 2024 than recorded in 2023, but still good with an average of 2.0 fish sampled per standard frame net set. This is more than likely a result of only one night of sampling with frame nets. Several year classes of walleyes were recorded with numerous fish between 18 and 25 inches. Condition was comparable to the state average. Growth rates were well above average with fish reaching 18 inches at age 3. In addition to years that fry stockings occurred, the 2024 survey documented walleyes from the 2017 and 2020 year classes indicating natural reproduction occurs during favorable conditions. It is anticipated that the 2023 fry stocking will develop another strong year class due to increased water levels.

- **Yellow Perch:** Numbers decreased from 15.7 per net in 2021 to 3.2 in 2024. The major factors for this decline are mortality of larger fish and the high density walleye population. All perch observed were small, likely from the 2021 and 2023 year classes. Relative condition (weight at length) was above the state average. Perch year classes at Spring Lake tend to vary greatly based on success of reproduction and recruitment associated with seasonal water levels.

- **Other Species:** 10.4 Black Bullhead per net were observed with many fish being over 12 inches and another large group of bullheads from 8 to 10 inches. Small bullheads likely have high mortality from predation as it is believed they are a major prey source for adult Walleye. 3 northern Pike were also sampled.

# SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
## Spring, Walworth County
### LLO-Lake-239-000
### 2024

## Lake Information

**Name:** Spring

**County:** Walworth

**Legal Description:** T122-R74-S6

**Surface Area:** 852 Acres

**Maximum Depth:** 9 Feet

**Mean Depth:** 6 Feet

## Surveys and Investigations

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

| Gear | Date | Effort |
|---|---|---|
| frame net (std 3/4 in) | Jul 10, 2024 | 5 net-nights |

## Common Fish Species Present

Yellow Perch

Walleye

Black Bullhead

Northern Pike

## 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 |
| frame net (std 3/4 in) | Black Bullhead | 52 | 10.4 | 5.0 | 81 | 8 | 27 | 9 | 106 | 3 |
| | Northern Pike | 3 | 0.6 | 0.4 | 0 | | 0 | | 85 | 7 |
| | Walleye | 9 | 1.6 | 0.9 | 63 | | 25 | | 91 | 3 |
| | Yellow Perch | 16 | 3.0 | 2.7 | 47 | 21 | 0 | | 102 | 3 |

## 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 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | Avg |
| AFS std gill net | Black Bullhead | | | | 0.0 | | 0.0 | 5.0 | | | | 1.67 |
| | Northern Pike | | | | 0.3 | | 0.0 | 1.0 | | | | 0.43 |
| | Walleye | | | | 29.7 | | 0.0 | 14.0 | | | | 14.57 |
| | Yellow Perch | | | | 4.7 | | 12.3 | 34.0 | | | | 17.00 |
| fall night EF-WAE* | Walleye | | | | | | | 161.0 | | | | 161.00 |
| frame net (std 3/4 in) | Black Bullhead | 0.3 | | | 1.3 | | 2.2 | 66.1 | | 13.2 | 10.4 | 15.58 |
| | Black Crappie | 0.0 | | | 0.0 | | 0.1 | 0.0 | | 0.0 | 0.0 | 0.02 |
| | Green Sunfish | 0.0 | | | 0.0 | | 0.0 | 1.4 | | 0.0 | 0.0 | 0.23 |
| | Northern Pike | 0.0 | | | 0.2 | | 0.6 | 0.4 | | 0.2 | 0.6 | 0.33 |
| | Walleye | 9.8 | | | 45.8 | | 21.1 | 6.1 | | 13.0 | 1.6 | 16.23 |
| | Yellow Perch | 0.5 | | | 0.6 | | 2.0 | 14.9 | | 0.4 | 3.0 | 3.57 |
| std exp gill net | Walleye | 29.5 | | | | | | | | | | 29.50 |

## 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 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| AFS std gill net | Black Bullhead | PSD | | | | | | | 80 | | | |
| | | PSD-P | | | | | | | 10 | | | |
| | | Wr | | | | | | | 100 | | | |
| | Northern Pike | PSD | | | | 100 | | | 100 | | | |
| | | PSD-P | | | | 0 | | | 100 | | | |
| | | Wr | | | | 102 | | | 96 | | | |
| | Walleye | PSD | | | | 100 | | | 89 | | | |
| | | PSD-P | | | | 6 | | | 32 | | | |
| | | Wr | | | | 91 | | | 103 | | | |
| | Yellow Perch | PSD | | | | 100 | | 70 | 62 | | | |
| | | PSD-P | | | | 100 | | 19 | 25 | | | |
| | | Wr | | | | 115 | | 112 | 95 | | | |
| frame net (std 3/4 in) | Black Bullhead | PSD | 67 | | | 94 | | 69 | 94 | | 100 | 81 |
| | | PSD-P | 0 | | | 88 | | 8 | 36 | | 92 | 27 |
| | | Wr | 104 | | | 98 | | 125 | 118 | | 93 | 106 |
| | Northern Pike | PSD | | | | 100 | | 14 | 100 | | 0 | 0 |
| | | PSD-P | | | | 0 | | 0 | 0 | | 0 | 0 |
| | | Wr | | | | 101 | | 98 | 89 | | 98 | 85 |
| | Walleye | PSD | 100 | | | 100 | | 49 | 88 | | 77 | 63 |
| | | PSD-P | 0 | | | 4 | | 30 | 12 | | 35 | 25 |
| | | Wr | 81 | | | 92 | | 104 | 97 | | 86 | 91 |
| | Yellow Perch | PSD | 100 | | | 100 | | 83 | 66 | | 0 | 47 |
| | | PSD-P | 80 | | | 100 | | 63 | 3 | | 0 | 0 |
| | | Wr | 87 | | | 113 | | 106 | 91 | | 106 | 102 |
| std exp gill net | Walleye | PSD | 100 | | | | | | | | | |
| | | PSD-P | 0 | | | | | | | | | |
| | | Wr | 86 | | | | | | | | | |

## Back-Calculated Lengths

Mean species back-calculated total length (mm) at age, standard error (SE), and sample size (N).

Species: Walleye

| Year Class | Age | N | Mean back-calculated length (SE) at age | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2023 | 1 | 1 | 140 | | | | | | | | | |
| 2021 | 3 | 1 | 156 | 275 | 350 | | | | | | | |
| 2019 | 5 | 2 | 179 (12.6) | 263 (27.8) | 345 (68.8) | 419 (109.3) | 458 (125) | | | | | |
| 2018 | 6 | 3 | 184 (18.3) | 267 (29.8) | 350 (19.7) | 412 (23.4) | 443 (17.2) | 475 (10) | | | | |
| 2014 | 10 | 1 | 140 | 140 | 305 | 305 | 407 | 407 | 455 | 455 | 497 | 497 |
| Weighted Mean | | 8 | 168 | 249 | 342 | 397 | 442 | 458 | 455 | 455 | 497 | 497 |

| Year Class | Age | N | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2023 | 1 | 1 | | | | | | | | | | |
| 2021 | 3 | 1 | | | | | | | | | | |
| 2019 | 5 | 2 | | | | | | | | | | |
| 2018 | 6 | 3 | | | | | | | | | | |
| 2014 | 10 | 1 | | | | | | | | | | |
| Weighted Mean | | 8 | | | | | | | | | | |

Species: Yellow Perch

| Year Class | Age | N | Mean back-calculated length (SE) at age | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2023 | 1 | 2 | 107 (2.4) | | | | | | | | | |
| 2022 | 2 | 5 | 78 (4.1) | 114 (2.1) | | | | | | | | |
| 2021 | 3 | 1 | 79 | 127 | 151 | | | | | | | |
| 2020 | 4 | 2 | 88 (5.4) | 126 (1.5) | 164 (1.2) | 191 (1.8) | | | | | | |
| 2019 | 5 | 1 | 93 | 132 | 172 | 198 | 211 | | | | | |
| 2014 | 10 | 1 | 91 | 91 | 127 | 127 | 153 | 153 | 178 | 178 | 198 | 198 |
| Weighted Mean | | 12 | 87 | 117 | 156 | 177 | 182 | 153 | 178 | 178 | 198 | 198 |

| Year Class | Age | N | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2023 | 1 | 2 | | | | | | | | | | |
| 2022 | 2 | 5 | | | | | | | | | | |
| 2021 | 3 | 1 | | | | | | | | | | |
| 2020 | 4 | 2 | | | | | | | | | | |
| 2019 | 5 | 1 | | | | | | | | | | |
| 2014 | 10 | 1 | | | | | | | | | | |
| Weighted Mean | | 12 | | | | | | | | | | |

## Length at Capture

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

Species: Walleye

| | | Mean Length (expanded sample number) at capture by age | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | N | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10+ |
| 2021 | 28 | 263 (2) | 473 (1) | 393 (5) | 443 (7) | | | 470 (3) | | | 551 (10) |
| 2018 | 89 | | | | 435 (72) | | | 491 (18) | | | |
| 2015 | 100 | 191 (41) | | | 431 (59) | | | | | | |

Species: Yellow Perch

| | | Mean Length (expanded sample number) at capture by age | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | N | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10+ |
| 2021 | 68 | | 177 (23) | 205 (11) | 227 (14) | 251 (8) | 255 (1) | 288 (7) | 315 (2) | 338 (1) | |
| 2020 | 42 | 135 (13) | 144 (2) | 217 (9) | 237 (12) | | | 300 (3) | | 299 (2) | 340 (1) |
| 2018 | 14 | | | | | | 282 (4) | 307 (6) | 294 (4) | | |

## Fish Condition

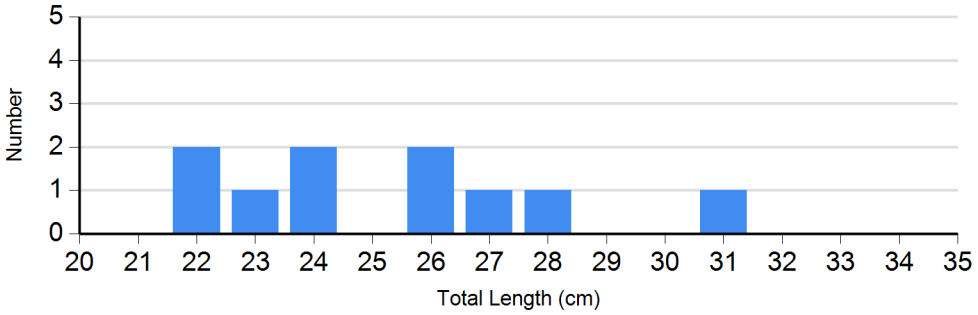
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

| | | Length Groups | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | S-Q | | Q-P | | P-M | | M | |
| Species | Year | N | Wr (SE) | N | Wr (SE) | N | Wr (SE) | N | Wr (SE) |
| Black Bullhead<br>Gill Net | 2021 | 2 | 93<br>(0.7) | 7 | 102<br>(3.8) | 1 | 93 | 0 | |
| Northern Pike<br>Gill Net | 2021 | 0 | | 0 | | 2 | 96<br>(4.3) | 0 | |
| Walleye<br>Gill Net | 2021 | 3 | 158<br>(67.1) | 16 | 98<br>(1.7) | 9 | 95<br>(3.3) | 0 | |
| Yellow Perch<br>Gill Net | 2020 | 11 | 111<br>(1.9) | 19 | 112<br>(2.1) | 4 | 120<br>(3.7) | 3 | 109<br>(4.9) |
| | 2021 | 26 | 97<br>(1.2) | 25 | 95<br>(1.3) | 15 | 91<br>(2.0) | 2 | 93<br>(1.7) |

## Length Frequency Distribution

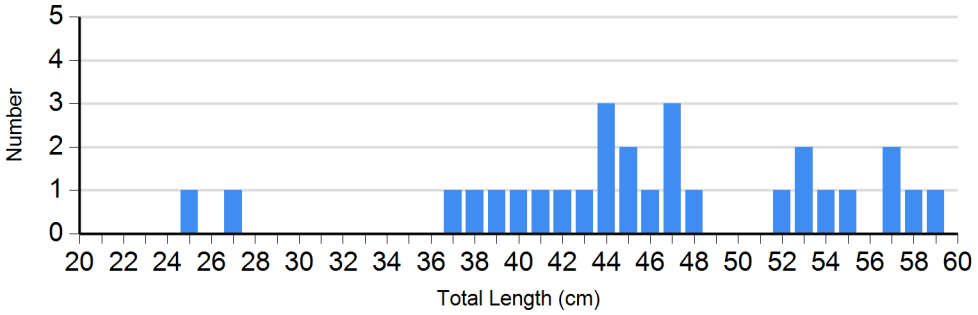
Length frequency histogram of species sampled by year.

Species: Black Bullhead
Gear: AFS std gill net



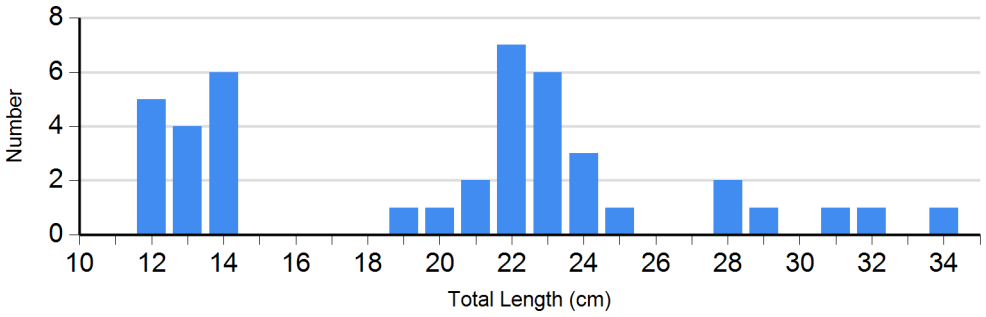

2021

Species: Walleye
Gear: AFS std gill net

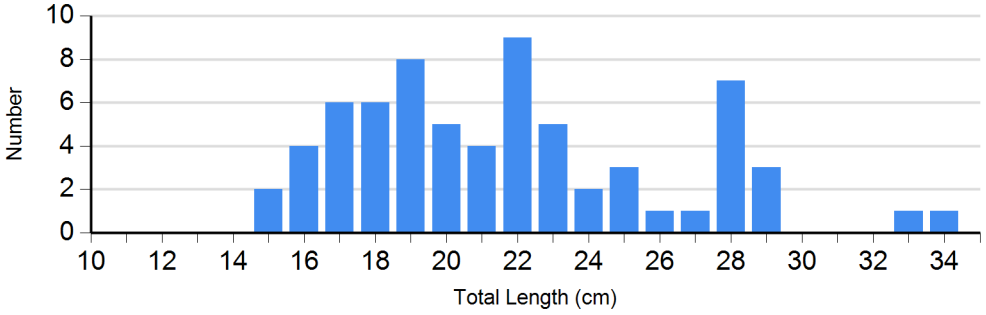



2021

Species: Yellow Perch
Gear: AFS std gill net




2020

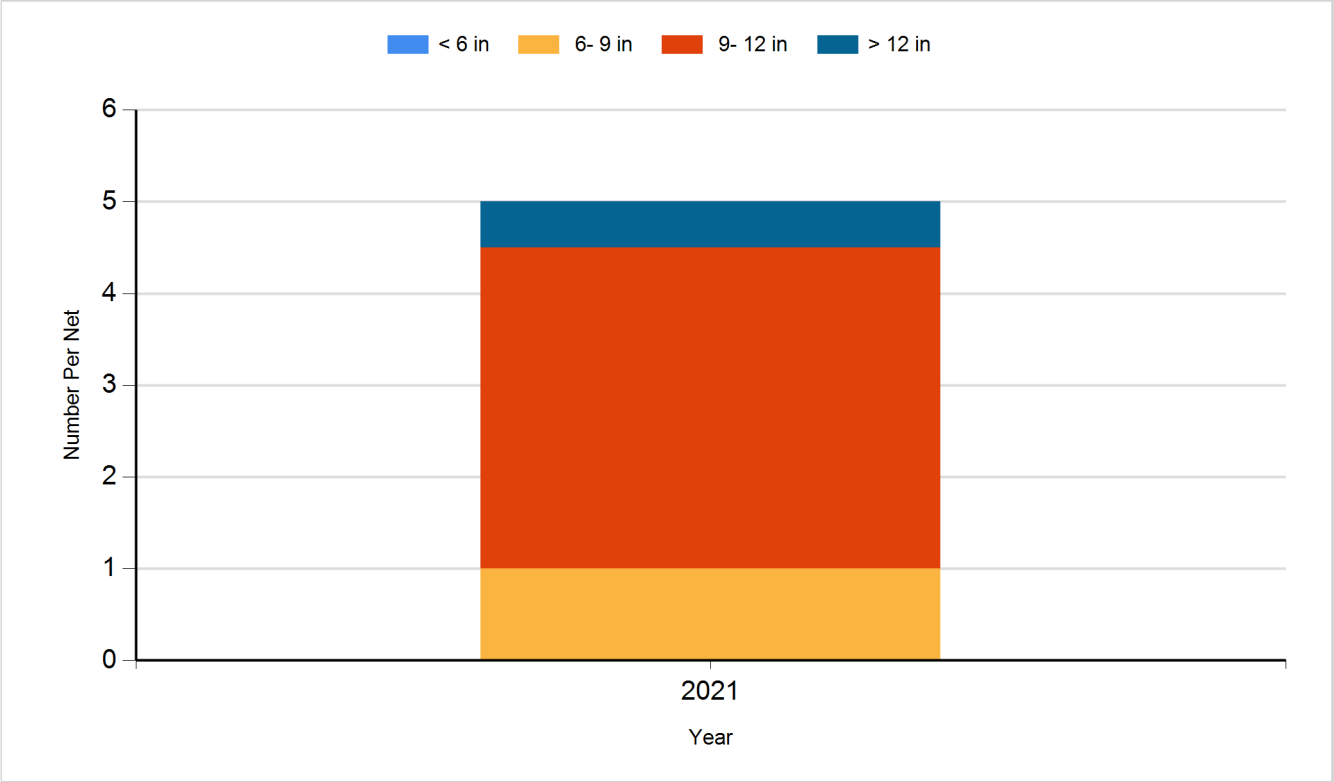



2021

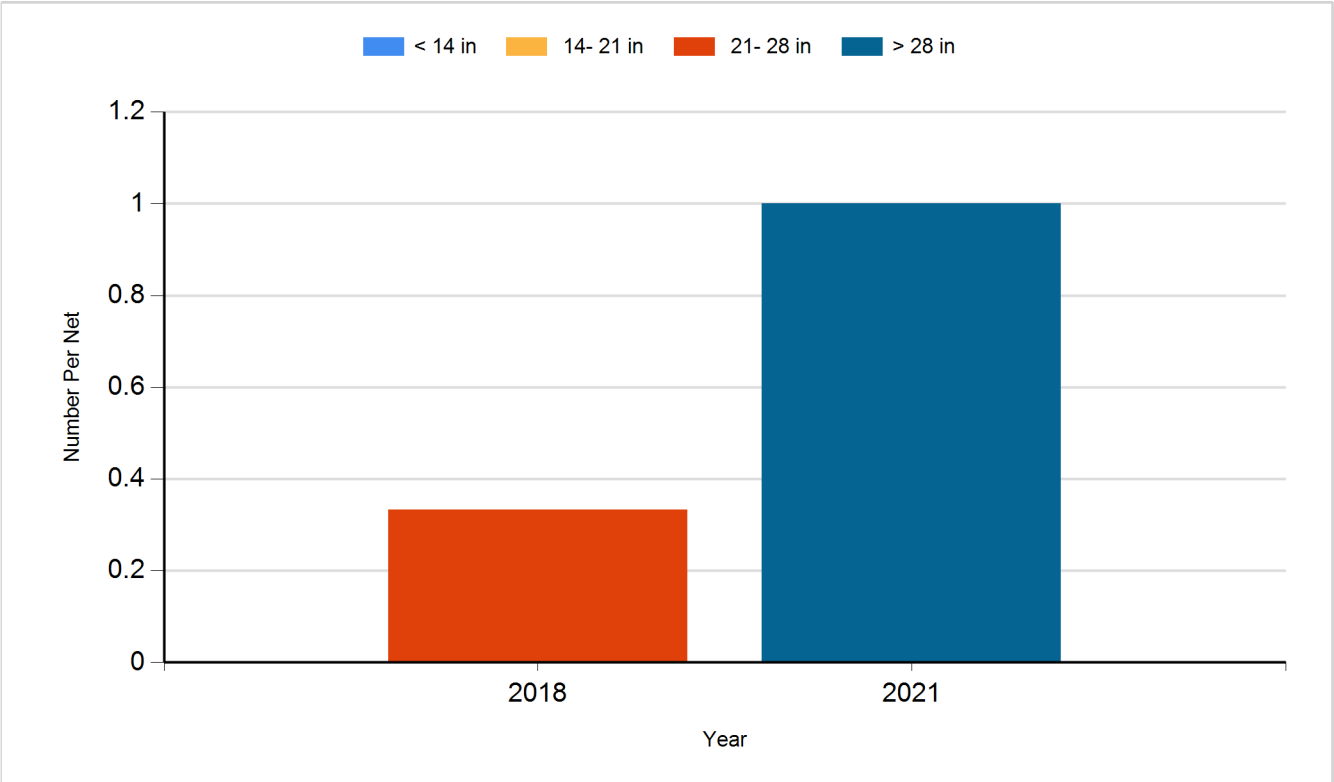
## Historic Fish Sizes and Relative Abundance

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

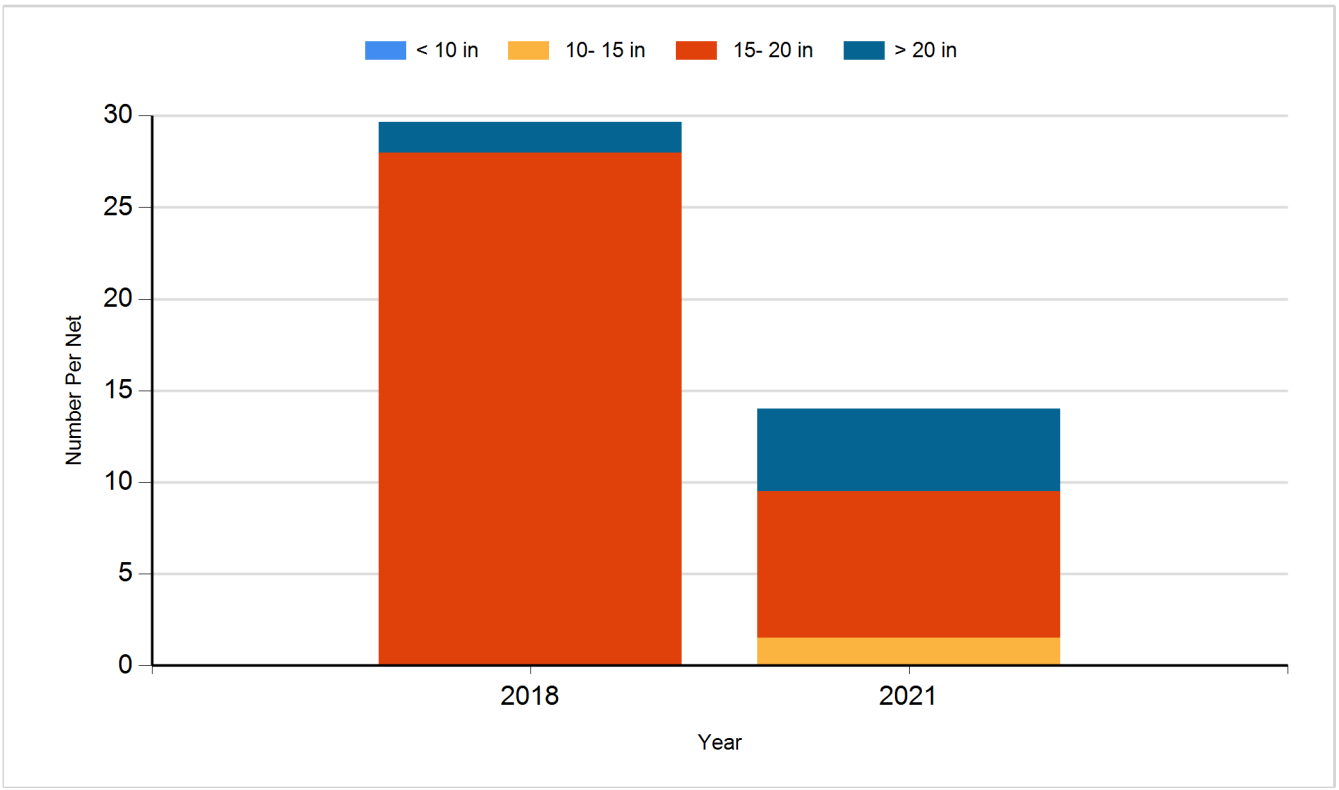
Species: Black Bullhead
Gear: AFS std gill net



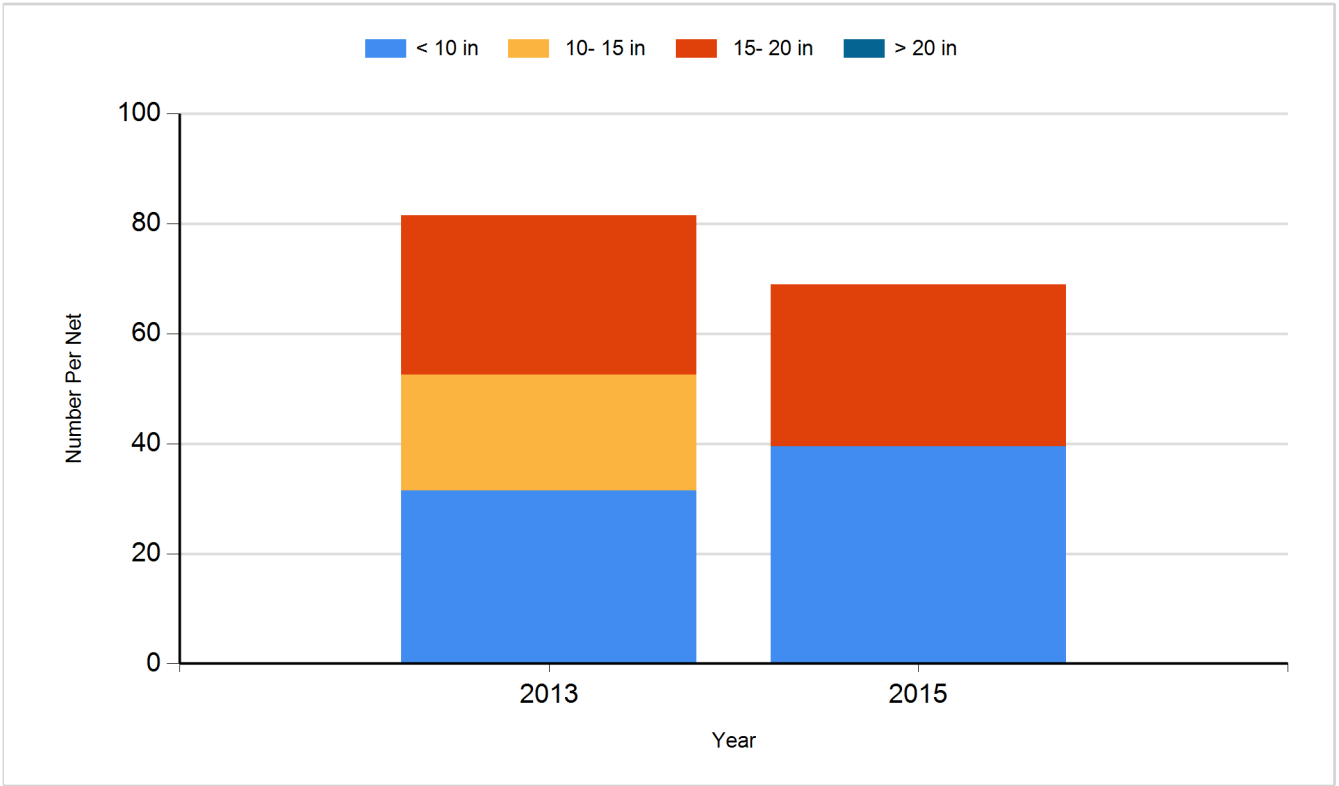

Species: Northern Pike
Gear: AFS std gill net



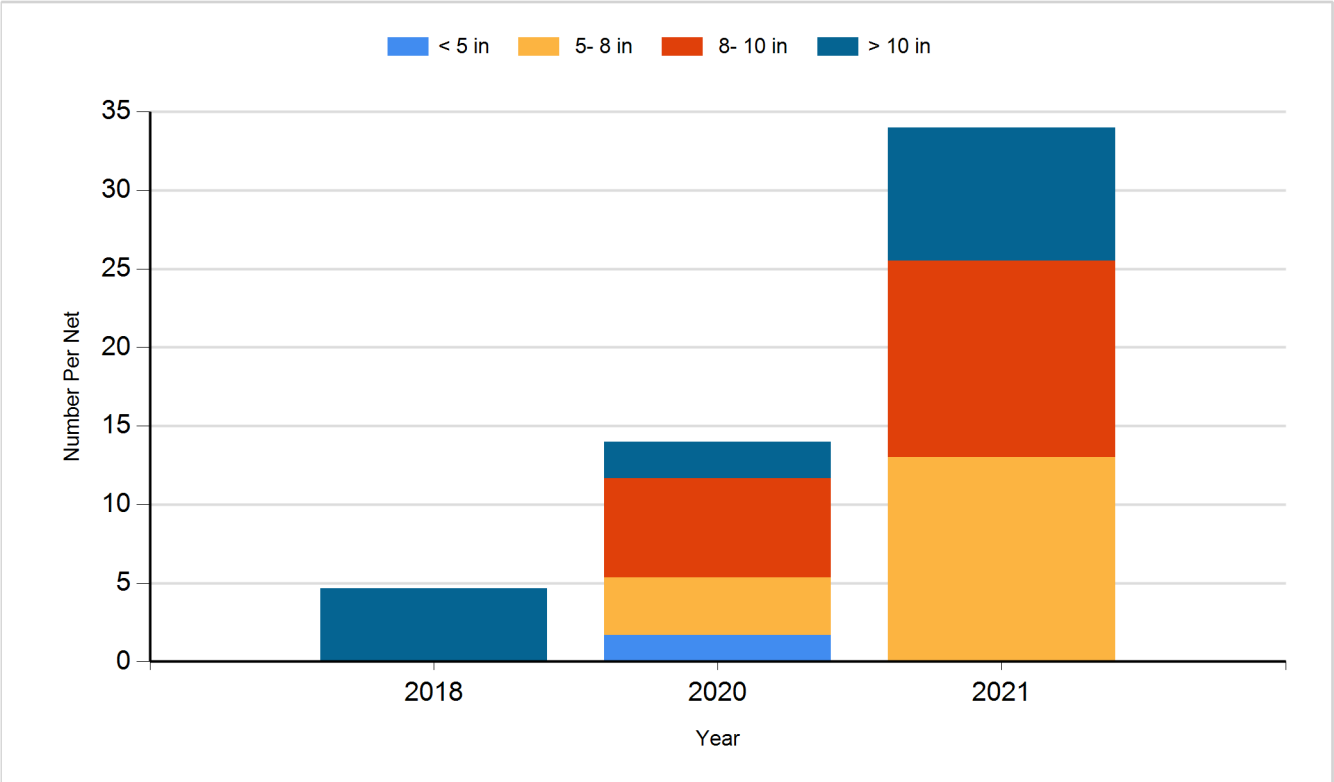
Species: Walleye
Gear: AFS std gill net




Species: Walleye
Gear: std exp gill net



Species: Yellow Perch
Gear: AFS std gill net



## Fish Stocking

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

| Year | Species | Size | Number |
|---|---|---|---|
| 2014 | Walleye | Fry | 750,000 |
| 2015 | Yellow Perch | Fingerling | 6,600 |
| 2018 | Walleye | Fry | 720,000 |
| 2021 | Walleye | Fry | 400,000 |
| 2023 | Walleye | Fry | 400,000 |