

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Vermillion East, McCook County
VER-Lake-62-800
2019

Lake Information

| | | | |
|---------------------------|---|-----------------------|---------|
| Name: | Vermillion East | Maximum Depth: | 23 Feet |
| County: | McCook | Mean Depth: | 12 Feet |
| Legal Description: | T102N-R53W-Sec. 14-15, 22-23, 26-27, 33-35 | | |
| Surface Area: | 580 Acres | | |

Surveys and Investigations

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

| Gear | Date | Effort |
|------------------------|--------------|---------------|
| AFS std gill net | Jun 10, 2019 | 10 net-nights |
| frame net (std 3/4 in) | Jun 10, 2019 | 10 net-nights |

Common Fish Species Present

Walleye

White Sucker

Freshwater Drum

Bluegill

Black Crappie

Northern Pike

Common Carp

White Crappie

Black Bullhead

Channel 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.
- **std 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.

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

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.

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

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

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.

$$Wr = \left(\frac{W}{W_s} \right) \times 100$$

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).

| Species Name | Stock | | Quality | | Preferred | | Memorable | | Trophy | |
|-----------------|-------|------|---------|------|-----------|------|-----------|------|--------|------|
| | (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**

| Gear | Species | Sample Size (n) | Abundance | | Stock Density Indices | | | Condition | | |
|------------------------|-----------------|-----------------|-----------|-------|-----------------------|-------|-------|-----------|-----|-------|
| | | | CPUE | CI-80 | PSD | CI-80 | PSD-P | CI-80 | Wr | CI-80 |
| AFS std gill net | Black Bullhead | 2 | 0.2 | 0.2 | 0 | | 0 | | | |
| | Black Crappie | 1 | 0.0 | 0.0 | 0 | | 0 | | | |
| | Channel Catfish | 2 | 0.2 | 0.2 | 100 | | 50 | 117 | 8 | |
| | Common Carp | 14 | 1.3 | 0.6 | 100 | | 85 | | | |
| | Freshwater Drum | 88 | 7.0 | 3.0 | 99 | | 40 | 8 | | |
| | Northern Pike | 9 | 0.9 | 0.6 | 33 | | 11 | | 89 | 8 |
| | Redhorse | 2 | 0.0 | 0.0 | | | | | | |
| | Walleye | 2 | 0.2 | 0.2 | 100 | | 0 | | 84 | 3 |
| | White Crappie | 2 | 0.1 | 0.1 | 0 | | 0 | | 109 | |
| frame net (std 3/4 in) | White Sucker | 46 | 4.6 | 1.4 | 100 | | 91 | | | |
| | Black Bullhead | 7 | 0.7 | 0.3 | 71 | | 43 | | | |
| | Black Crappie | 20 | 1.8 | 1.6 | 72 | 18 | 44 | 19 | 102 | 3 |
| | Bluegill | 30 | 3.0 | 2.1 | 80 | 12 | 50 | 14 | 125 | 4 |
| | Channel Catfish | 1 | 0.1 | 0.1 | 100 | | 100 | | 113 | |
| | Common Carp | 7 | 0.7 | 0.5 | 86 | | 43 | | | |
| | Freshwater Drum | 1 | 0.1 | 0.1 | 100 | | 0 | | | |
| | Northern Pike | 17 | 1.5 | 0.8 | 27 | | 0 | | 92 | 2 |
| | Sunfish Hybrid | 1 | 0.0 | 0.0 | | | | | | |
| | Walleye | 7 | 0.7 | 0.4 | 43 | | 14 | | 85 | 3 |
| White Crappie | 9 | 0.9 | 0.5 | 56 | | 11 | | 108 | 6 | |
| White Sucker | 75 | 7.5 | 3.0 | 100 | | 97 | | | | |

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.

| Gear | Species | CPUE | | | | | | | | | | Avg |
|------------------------|------------------|-------|------|-------|-------|------|------|------|------|------|------|-------|
| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | |
| AFS std frame net | Black Bullhead | | | | | | | | 3.0 | | | 3.00 |
| | Black Crappie | | | | | | | | 1.0 | | | 1.00 |
| | Bluegill | | | | | | | | 1.3 | | | 1.30 |
| | Channel Catfish | | | | | | | | 0.1 | | | 0.10 |
| | Common Carp | | | | | | | | 1.6 | | | 1.60 |
| | Freshwater Drum | | | | | | | | 0.2 | | | 0.20 |
| | Green Sunfish | | | | | | | | 0.1 | | | 0.10 |
| | Northern Pike | | | | | | | | 0.5 | | | 0.50 |
| | Sunfish Hybrid | | | | | | | | 0.0 | | | 0.00 |
| | Walleye | | | | | | | | 0.7 | | | 0.70 |
| | White Bass | | | | | | | | 0.8 | | | 0.80 |
| | White Crappie | | | | | | | | 0.0 | | | 0.00 |
| White Sucker | | | | | | | | 6.9 | | | 6.90 | |
| AFS std gill net | Black Bullhead | | | | | | | | 0.2 | 0.1 | 0.2 | 0.17 |
| | Black Crappie | | | | | | | | 0.2 | 0.1 | 0.0 | 0.10 |
| | Bluegill | | | | | | | | 0.1 | 0.0 | 0.0 | 0.03 |
| | Channel Catfish | | | | | | | | 3.4 | 3.8 | 0.2 | 2.47 |
| | Common Carp | | | | | | | | 1.6 | 0.5 | 1.3 | 1.13 |
| | Freshwater Drum | | | | | | | | 5.7 | 3.8 | 7.0 | 5.50 |
| | Northern Pike | | | | | | | | 0.6 | 0.3 | 0.9 | 0.60 |
| | Redhorse | | | | | | | | 0.0 | 0.0 | 0.0 | 0.00 |
| | Walleye | | | | | | | | 1.1 | 0.7 | 0.2 | 0.67 |
| | White Bass | | | | | | | | 2.6 | 6.5 | 0.0 | 3.03 |
| | White Crappie | | | | | | | | 0.1 | 0.1 | 0.1 | 0.10 |
| | White Sucker | | | | | | | | 10.5 | 8.8 | 4.6 | 7.97 |
| Yellow Perch | | | | | | | | 0.0 | 0.1 | 0.0 | 0.03 | |
| fall night EF-WAE | Walleye | 102.0 | 51.5 | 59.0 | 149.5 | 1.2 | 82.5 | | | | | 74.28 |
| frame net (std 3/4 in) | Bigmouth Buffalo | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.8 | 0.0 | | 0.1 | 0.0 | 0.16 |
| | Black Bullhead | 35.9 | 77.9 | 152.4 | 64.0 | 23.4 | 50.1 | 12.8 | | 2.8 | 0.7 | 46.67 |
| | Black Crappie | 11.3 | 35.6 | 0.9 | 0.8 | 0.6 | 0.2 | 0.9 | | 1.5 | 1.8 | 5.96 |
| | Bluegill | 2.1 | 4.1 | 2.1 | 3.7 | 5.9 | 0.8 | 3.3 | | 1.2 | 3.0 | 2.91 |
| | Channel Catfish | 0.2 | 0.1 | 1.1 | 1.2 | 1.4 | 1.5 | 0.5 | | 0.5 | 0.1 | 0.73 |
| | Common Carp | 1.7 | 0.9 | 3.1 | 7.6 | 3.2 | 10.7 | 2.1 | | 4.0 | 0.7 | 3.78 |
| | Freshwater Drum | 0.6 | 0.5 | 0.4 | 0.2 | 0.2 | 1.2 | 0.1 | | 0.4 | 0.1 | 0.41 |

| | | CPUE | | | | | | | | | | |
|---------------------------|-----------------------|------|------|-------|------|------|------|------|------|------|------|-------|
| Gear | Species | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Avg |
| frame net (std 3/4 in) | Green Sunfish | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.01 |
| | Largemouth Bass | 0.0 | 0.1 | 0.2 | 0.0 | 0.0 | 0.1 | 0.1 | | 0.0 | 0.0 | 0.06 |
| | Northern Pike | 0.6 | 2.7 | 3.2 | 1.2 | 2.2 | 1.9 | 1.9 | | 1.0 | 1.5 | 1.80 |
| | Orangespotted Sunfish | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.00 |
| | Sunfish Hybrid | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.00 |
| | Walleye | 1.5 | 1.1 | 0.3 | 0.4 | 1.9 | 0.7 | 0.5 | | 0.3 | 0.7 | 0.82 |
| | White Bass | 0.0 | 0.3 | 0.1 | 0.3 | 0.9 | 3.8 | 2.1 | | 5.9 | 0.0 | 1.49 |
| | White Crappie | 0.1 | 4.1 | 1.1 | 0.3 | 0.1 | 0.6 | 1.1 | | 1.2 | 0.9 | 1.06 |
| | White Sucker | 4.4 | 5.2 | 2.0 | 0.6 | 1.9 | 11.7 | 2.9 | | 13.5 | 7.5 | 5.52 |
| | Yellow Perch | 1.5 | 1.9 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.39 |
| std exp gill net | Bigmouth Buffalo | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.00 |
| | Black Bullhead | 59.0 | 51.0 | 164.7 | 20.3 | 8.2 | 1.8 | 0.0 | | | | 43.57 |
| | Black Crappie | 2.0 | 2.0 | 2.3 | 0.3 | 0.3 | 0.0 | 0.0 | | | | 0.99 |
| | Bluegill | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.8 | 0.0 | | | | 0.16 |
| | Channel Catfish | 0.3 | 0.3 | 2.3 | 0.3 | 1.5 | 2.8 | 1.8 | | | | 1.33 |
| | Common Carp | 0.3 | 1.0 | 3.3 | 1.8 | 1.0 | 0.0 | 1.3 | | | | 1.24 |
| | Freshwater Drum | 0.5 | 0.5 | 1.7 | 4.3 | 1.2 | 5.3 | 5.2 | | | | 2.67 |
| | Northern Pike | 1.0 | 3.5 | 3.7 | 4.0 | 3.7 | 1.8 | 2.7 | | | | 2.91 |
| | Orangespotted Sunfish | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.00 |
| | Walleye | 6.3 | 4.5 | 13.3 | 8.0 | 3.3 | 5.5 | 3.7 | | | | 6.37 |
| | White Bass | 0.0 | 0.0 | 0.0 | 1.0 | 5.0 | 6.5 | 9.0 | | | | 3.07 |
| | White Crappie | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | | | | 0.36 |
| | White Sucker | 18.5 | 19.8 | 3.3 | 9.0 | 8.7 | 8.5 | 12.5 | | | | 11.47 |
| | Yellow Perch | 4.3 | 12.0 | 1.7 | 3.0 | 1.3 | 1.3 | 1.2 | | | | 3.54 |

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.

| Gear | Species | Index | Year | | | | | | | | | | | | |
|-------------------|-----------------|-------|------|------|------|------|------|------|------|------|------|------|-----|--|--|
| | | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | | | |
| AFS std frame net | Black Bullhead | PSD | | | | | | | | | 97 | | | | |
| | | PSD-P | | | | | | | | | 80 | | | | |
| | | | | | | | | | | | | | | | |
| | Black Crappie | PSD | | | | | | | | | | 60 | | | |
| | | PSD-P | | | | | | | | | | 20 | | | |
| | | Wr | | | | | | | | | | 105 | | | |
| | Bluegill | PSD | | | | | | | | | | 77 | | | |
| | | PSD-P | | | | | | | | | | 0 | | | |
| | | Wr | | | | | | | | | | 121 | | | |
| | Channel Catfish | PSD | | | | | | | | | | 100 | | | |
| | | PSD-P | | | | | | | | | | 0 | | | |
| | | Wr | | | | | | | | | | 101 | | | |
| | Common Carp | PSD | | | | | | | | | | 88 | | | |
| | | PSD-P | | | | | | | | | | 75 | | | |
| | Northern Pike | PSD | | | | | | | | | | 60 | | | |
| | | PSD-P | | | | | | | | | | 40 | | | |
| | | Wr | | | | | | | | | | 87 | | | |
| | Walleye | PSD | | | | | | | | | | 71 | | | |
| | | PSD-P | | | | | | | | | | 29 | | | |
| | | Wr | | | | | | | | | | 77 | | | |
| White Crappie | PSD | | | | | | | | | | 0 | | | | |
| | PSD-P | | | | | | | | | | 0 | | | | |
| White Sucker | PSD | | | | | | | | | | 100 | | | | |
| | PSD-P | | | | | | | | | | 100 | | | | |
| AFS std gill net | Black Bullhead | PSD | | | | | | | | | 100 | 100 | 0 | | |
| | | PSD-P | | | | | | | | | 50 | 100 | 0 | | |
| | Black Crappie | PSD | | | | | | | | | 50 | 0 | 0 | | |
| | | PSD-P | | | | | | | | | 0 | 0 | 0 | | |
| | | Wr | | | | | | | | | 113 | 124 | | | |
| | Bluegill | PSD | | | | | | | | | 100 | | | | |
| | | PSD-P | | | | | | | | | 100 | | | | |
| | | Wr | | | | | | | | | 119 | | | | |
| | Channel Catfish | PSD | | | | | | | | | 79 | 82 | 100 | | |
| | | PSD-P | | | | | | | | | 3 | 18 | 50 | | |

| Gear | Species | Index | Year | | | | | | | | | | |
|------------------------|-----------------|-------|------|------|------|------|------|------|------|------|------|------|-----|
| | | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | |
| AFS std gill net | Channel Catfish | Wr | | | | | | | | | 109 | 104 | 117 |
| | | PSD | | | | | | | | | 50 | 60 | 100 |
| | | PSD-P | | | | | | | | | 31 | 20 | 85 |
| | Northern Pike | PSD | | | | | | | | | 100 | 100 | 33 |
| | | PSD-P | | | | | | | | | 17 | 0 | 11 |
| | | Wr | | | | | | | | | 90 | 90 | 89 |
| | Walleye | PSD | | | | | | | | | 64 | 86 | 100 |
| | | PSD-P | | | | | | | | | 27 | 14 | 0 |
| | | Wr | | | | | | | | | 95 | 80 | 84 |
| | White Crappie | PSD | | | | | | | | | 100 | 0 | 0 |
| | | PSD-P | | | | | | | | | 100 | 0 | 0 |
| | | Wr | | | | | | | | | 104 | 113 | 109 |
| | White Sucker | PSD | | | | | | | | | 100 | 94 | 100 |
| | | PSD-P | | | | | | | | | 99 | 94 | 91 |
| | | | | | | | | | | | | | |
| fall night EF-WAE | Walleye | Wr | 83 | 88 | 84 | 93 | 83 | 81 | | | | | |
| frame net (std 3/4 in) | Black Bullhead | PSD | 33 | 33 | 5 | 93 | 92 | 99 | 99 | | 100 | 71 | |
| | | PSD-P | 1 | 3 | 0 | 0 | 0 | 50 | 70 | | 93 | 43 | |
| | | Wr | 90 | 83 | 90 | 92 | | | | | | | |
| | Black Crappie | PSD | 47 | 41 | 89 | 100 | 33 | 100 | 89 | | 100 | 72 | |
| | | PSD-P | 3 | 5 | 11 | 29 | 33 | 0 | 22 | | 60 | 44 | |
| | | Wr | 111 | 109 | 101 | 110 | 106 | 119 | 101 | | 106 | 102 | |
| | Bluegill | PSD | 57 | 93 | 100 | 100 | 53 | 88 | 85 | | 42 | 80 | |
| | | PSD-P | 10 | 17 | 57 | 79 | 42 | 50 | 42 | | 17 | 50 | |
| | | Wr | 116 | 109 | 102 | 119 | 122 | 118 | 116 | | 118 | 125 | |
| | Channel Catfish | PSD | 100 | 100 | 82 | 27 | 79 | 80 | 20 | | 80 | 100 | |
| | | PSD-P | 0 | 100 | 27 | 9 | 0 | 40 | 0 | | 0 | 100 | |
| | | Wr | 103 | 100 | 79 | 103 | 90 | 103 | 99 | | 100 | 113 | |
| | Common Carp | PSD | 65 | 22 | 42 | 94 | 94 | 98 | 76 | | 88 | 86 | |
| | | PSD-P | 41 | 0 | 26 | 40 | 53 | 67 | 52 | | 55 | 43 | |
| | | Wr | 95 | 97 | 82 | 98 | | | | | | | |
| | Northern Pike | PSD | 67 | 26 | 38 | 27 | 77 | 89 | 89 | | 100 | 27 | |
| | | PSD-P | 50 | 11 | 3 | 0 | 5 | 16 | 16 | | 20 | 0 | |
| | | Wr | 93 | 89 | 75 | 78 | 88 | 83 | 83 | | 80 | 92 | |
| | Walleye | PSD | 73 | 27 | 33 | 50 | 100 | 71 | 80 | | 67 | 43 | |
| | | PSD-P | 13 | 0 | 33 | 50 | 37 | 29 | 20 | | 33 | 14 | |
| | | Wr | 83 | 82 | 73 | 92 | 87 | 83 | 81 | | 89 | 85 | |

| Gear | Species | Index | Year | | | | | | | | | |
|---------------------------|-----------------|-------|------|------|------|------|------|------|------|------|------|------|
| | | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| frame net (std 3/4 in) | White Crappie | PSD | 0 | 51 | 82 | 100 | 100 | 67 | 64 | | 50 | 56 |
| | | PSD-P | 0 | 20 | 36 | 100 | 0 | 50 | 9 | | 42 | 11 |
| | | Wr | 217 | 105 | 94 | 100 | 107 | 100 | 102 | | 110 | 108 |
| | White Sucker | PSD | 100 | 100 | 100 | 80 | 100 | 98 | 100 | | 100 | 100 |
| | | PSD-P | 98 | 98 | 90 | 80 | 100 | 96 | 83 | | 99 | 97 |
| | | Wr | 112 | 90 | 82 | 98 | | | | | | |
| std exp gill net | Black Bullhead | PSD | 53 | 0 | 0 | 96 | 100 | 86 | | | | |
| | | PSD-P | 0 | 0 | 0 | 0 | 2 | 29 | | | | |
| | | Wr | 94 | 100 | 96 | 101 | | | | | | |
| | Black Crappie | PSD | 38 | 0 | 100 | 100 | 50 | | | | | |
| | | PSD-P | 0 | 0 | 43 | 100 | 50 | | | | | |
| | | Wr | 121 | 122 | 107 | 125 | 101 | | | | | |
| | Bluegill | PSD | | | | 100 | | 67 | | | | |
| | | PSD-P | | | | 100 | | 0 | | | | |
| | | Wr | | | | 103 | | 119 | | | | |
| | Channel Catfish | PSD | 100 | 100 | 100 | 100 | 100 | 73 | 82 | | | |
| | | PSD-P | 0 | 100 | 43 | 100 | 11 | 36 | 45 | | | |
| | | Wr | 92 | 117 | 94 | 114 | 105 | 112 | 108 | | | |
| | Common Carp | PSD | 100 | 25 | 0 | 71 | 100 | | 100 | | | |
| | | PSD-P | 0 | 25 | 0 | 0 | 50 | | 75 | | | |
| | | Wr | 98 | 95 | 93 | 100 | | | | | | |
| | Northern Pike | PSD | 50 | 64 | 45 | 38 | 59 | 86 | 81 | | | |
| | | PSD-P | 25 | 0 | 9 | 6 | 5 | 0 | 13 | | | |
| | | Wr | 91 | 86 | 78 | 85 | 85 | 98 | 90 | | | |
| | Walleye | PSD | 40 | 33 | 43 | 22 | 85 | 9 | 36 | | | |
| | | PSD-P | 0 | 11 | 8 | 3 | 20 | 5 | 5 | | | |
| | | Wr | 85 | 85 | 82 | 90 | 88 | 83 | 81 | | | |
| | White Crappie | PSD | 13 | | | | | 0 | | | | |
| | | PSD-P | 0 | | | | | 0 | | | | |
| | | Wr | 123 | | | | | 98 | | | | |
| White Sucker | PSD | 93 | 99 | 100 | 100 | 92 | 100 | 100 | | | | |
| | PSD-P | 82 | 34 | 100 | 94 | 90 | 65 | 87 | | | | |
| | Wr | 105 | 95 | 88 | 108 | | | | | | | |

Length at Capture

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

Species: Black Crappie

| Mean Length (expanded sample number) at capture by age | | | | | | | | | | | |
|--|-----|--------------|--------------|-------------|-------------|-------------|---|---|---|---|-----|
| Year | N | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10+ |
| 2018 | 15 | | 224 (1) | 246 (2) | 260 (10) | 290 (2) | | | | | |
| 2013 | 7 | | 214 (3) | 254 (4) | | | | | | | |
| 2012 | 9 | 142 (1) | 226 (4) | 236 (3) | 272 (1) | | | | | | |
| 2011 | 354 | 160 (173) | 201 (143) | 238 (13) | 254 (11) | 248 (14) | | | | | |

Species: Bluegill

| Mean Length (expanded sample number) at capture by age | | | | | | | | | | | |
|--|----|------------|-------------|------------|-------------|------------|-------------|------------|---|---|-----|
| Year | N | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10+ |
| 2018 | 12 | 88 (1) | 133 (7) | 200 (3) | | | 249 (1) | | | | |
| 2013 | 33 | | 162 (3) | 184 (2) | 208 (8) | 216 (7) | 217 (12) | | | | |
| 2012 | 21 | | | 196 (8) | 204 (11) | 215 (1) | | 238 (1) | | | |
| 2011 | 41 | 111 (1) | 166 (11) | 183 (9) | 187 (13) | 192 (6) | | 233 (1) | | | |
| 2010 | 19 | 111 (7) | | 166 (3) | 171 (7) | | 240 (2) | | | | |

Species: Walleye

| Mean Length (expanded sample number) at capture by age | | | | | | | | | | | |
|--|----|-------------|-------------|-------------|-------------|------------|------------|------------|------------|------------|------------|
| Year | N | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10+ |
| 2019 | 2 | | | | | | | 467 (1) | 499 (1) | | |
| 2018 | 23 | 231 (16) | 328 (1) | 402 (2) | 414 (2) | 429 (1) | | | 588 (1) | | |
| 2016 | 28 | 214 (8) | 316 (13) | 419 (2) | | | 466 (4) | 434 (1) | | | |
| 2015 | 30 | 227 (14) | 310 (14) | | 394 (1) | | | | | 646 (1) | |
| 2014 | 22 | 248 (3) | | 373 (2) | 404 (10) | 461 (4) | | | 594 (1) | 485 (1) | 576 (1) |
| 2013 | 32 | | 304 (6) | 347 (22) | 466 (4) | | | | | | |
| 2012 | 41 | 269 (1) | 320 (17) | 391 (15) | 449 (3) | 497 (3) | 587 (2) | | | | |
| 2011 | 29 | 195 (11) | 334 (13) | 397 (2) | | 466 (2) | | | | | 550 (1) |
| 2010 | 39 | 254 (28) | | 409 (3) | 437 (8) | | | | | | |

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).

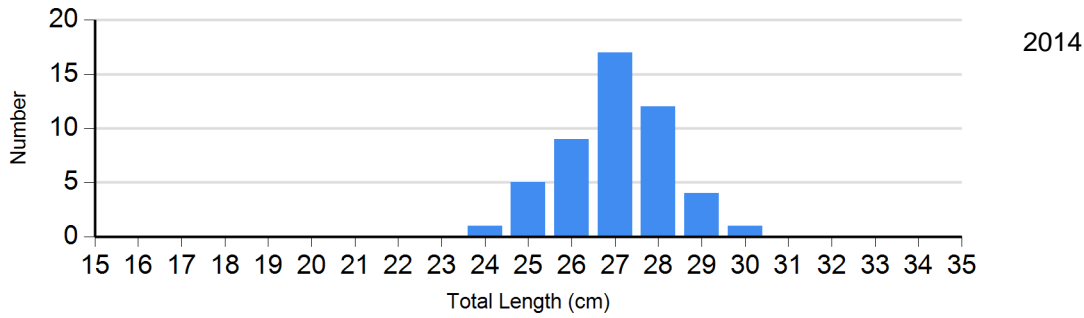
| Species | Year | Length Groups | | | | | | | |
|-----------------------------|------|---------------|---------------|-----|---------------|-----|--------------|---|---------------|
| | | S-Q | | Q-P | | P-M | | M | |
| | | N | Wr (SE) | N | Wr (SE) | N | Wr (SE) | N | Wr (SE) |
| Black Crappie Frame Net | 2015 | 0 | | 2 | 119 (0.9) | 0 | | 0 | |
| | 2016 | 1 | 100 | 6 | 103 (2.8) | 2 | 96 (4.1) | 0 | |
| | 2017 | 4 | 114 (4.6) | 4 | 100 (1.8) | 2 | 98 (0.4) | 0 | |
| | 2018 | 0 | | 6 | 111 (3.1) | 9 | 103 (1.8) | 0 | |
| | 2019 | 5 | 115 (4.6) | 5 | 101 (1.6) | 8 | 94 (2.3) | 0 | |
| Bluegill Frame Net | 2015 | 1 | 128 | 3 | 121 (5.4) | 4 | 114 (4.4) | 0 | |
| | 2016 | 5 | 115 (8.8) | 14 | 117 (1.9) | 14 | 115 (3.4) | 0 | |
| | 2017 | 3 | 119 (6.2) | 10 | 122 (2.1) | 0 | | 0 | |
| | 2018 | 7 | 117 (7.0) | 3 | 119 (3.0) | 2 | 124 (8.6) | 0 | |
| | 2019 | 6 | 149 (7.4) | 9 | 126 (4.6) | 15 | 114 (1.8) | 0 | |
| Channel Catfish Gill Net | 2015 | 3 | 113 (3.5) | 4 | 105 (3.7) | 2 | 120 (3.9) | 2 | 113 (11.7) |
| | 2016 | 2 | 112 (5.0) | 4 | 110 (1.1) | 5 | 104 (5.9) | 0 | |
| | 2017 | 7 | 103 (2.4) | 26 | 110 (5.5) | 1 | 109 | 0 | |
| | 2018 | 7 | 100 (2.4) | 24 | 103 (1.8) | 7 | 114 (4.5) | 0 | |
| | 2019 | 0 | | 1 | 111 | 1 | 123 | 0 | |
| Northern Pike Gill Net | 2015 | 1 | 78 | 6 | 102 (14.0) | 0 | | 0 | |
| | 2016 | 3 | 106 (15.5) | 11 | 87 (1.4) | 2 | 82 (2.5) | 0 | |
| | 2017 | 0 | | 5 | 88 (4.5) | 1 | 102 | 0 | |
| | 2018 | 0 | | 3 | 90 (5.1) | 0 | | 0 | |
| | 2019 | 6 | 80 (3.9) | 2 | 114 (12.3) | 1 | 97 | 0 | |
| Walleye Gill Net | 2015 | 20 | 84 (1.2) | 1 | 80 | 0 | | 1 | 69 |
| | 2016 | 14 | 82 (1.7) | 7 | 81 (1.5) | 1 | 79 | 0 | |

| Species | Year | Length Groups | | | | | | | |
|----------------------------|------|---------------|---------------|-----|--------------|-----|--------------|---|-------------|
| | | S-Q | | Q-P | | P-M | | M | |
| | | N | Wr (SE) | N | Wr (SE) | N | Wr (SE) | N | Wr (SE) |
| Walleye Gill Net | 2017 | 4 | 112 (24.5) | 4 | 84 (4.6) | 1 | 85 | 2 | 89 (4.1) |
| | 2018 | 1 | 88 | 5 | 80 (1.7) | 1 | 76 | 0 | |
| | 2019 | 0 | | 2 | 84 (2.4) | 0 | | 0 | |
| White Crappie Frame Net | 2015 | 2 | 106 (0.4) | 1 | 93 | 2 | 102 (0.5) | 1 | 92 |
| | 2016 | 4 | 104 (6.7) | 6 | 103 (1.4) | 1 | 86 | 0 | |
| | 2017 | 0 | | 0 | | 0 | | 0 | |
| | 2018 | 6 | 122 (3.4) | 1 | 107 | 4 | 97 (4.0) | 1 | 93 |
| | 2019 | 4 | 119 (7.1) | 4 | 101 (2.2) | 0 | | 1 | 92 |

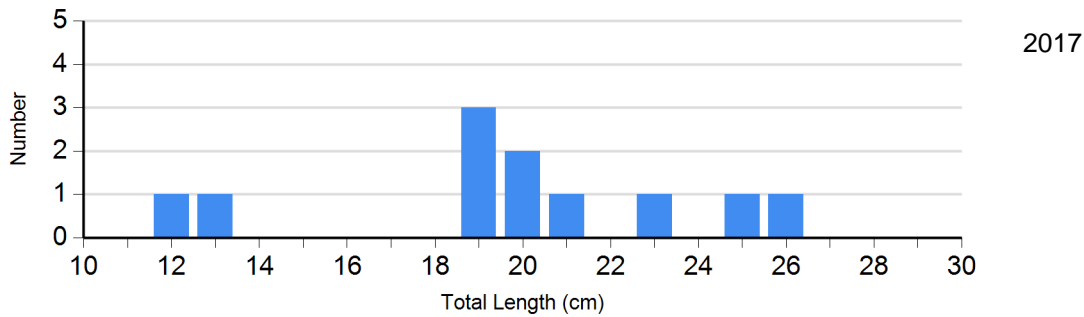
Length Frequency Distribution

Length frequency histogram of species sampled by year.

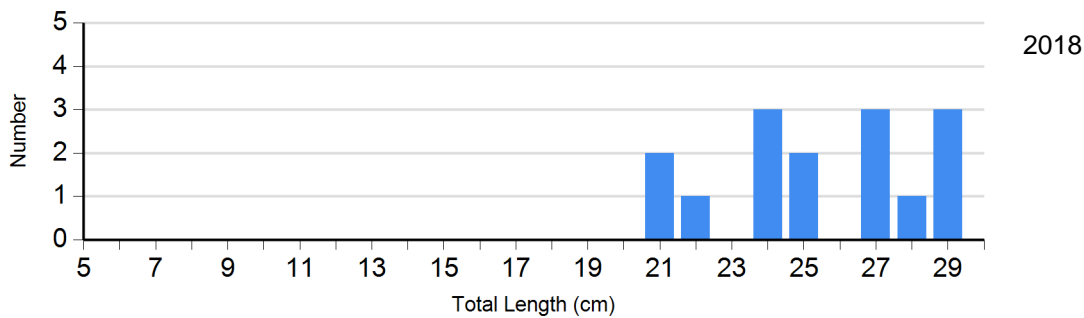
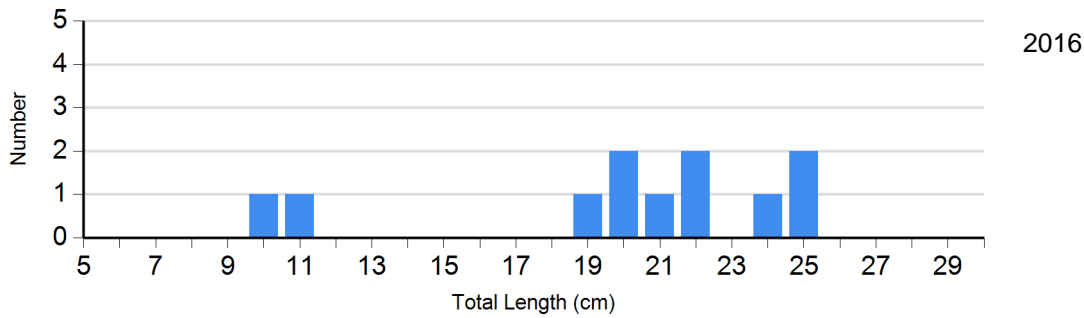
Species: Black Bullhead
Gear: std exp gill net

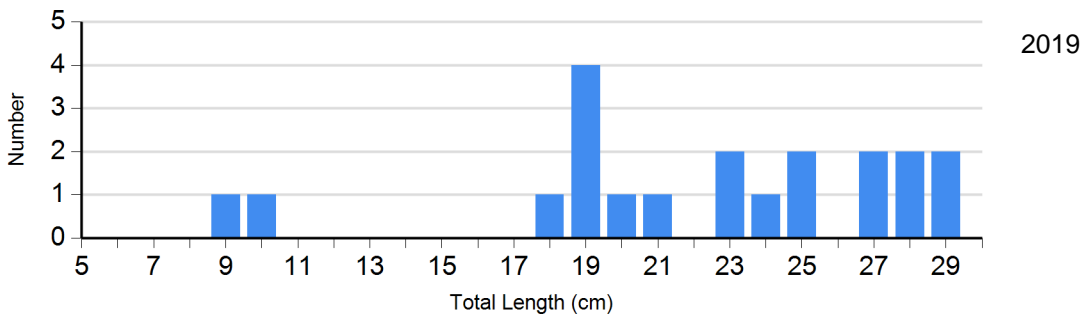


Species: Black Crappie
Gear: AFS std frame net

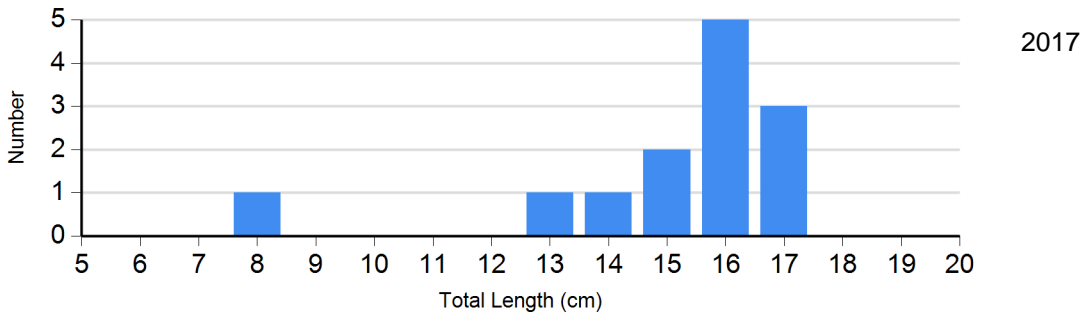


Species: Black Crappie
Gear: frame net (std 3/4 in)

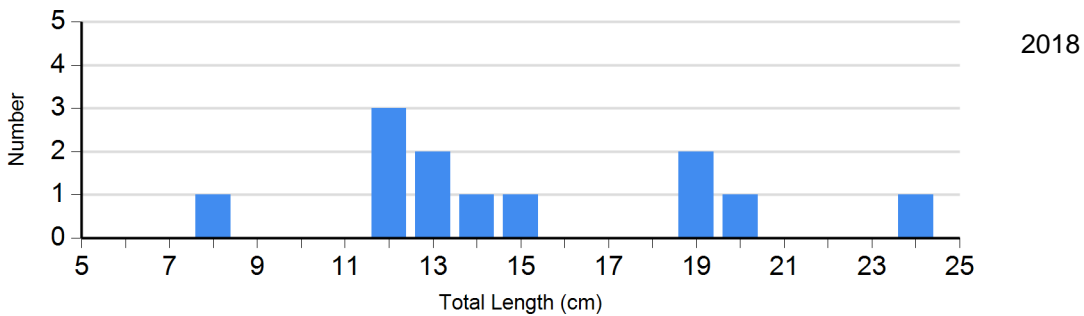
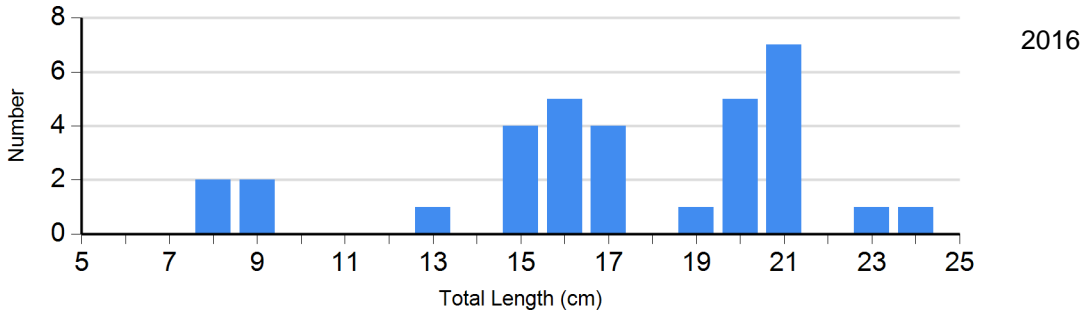
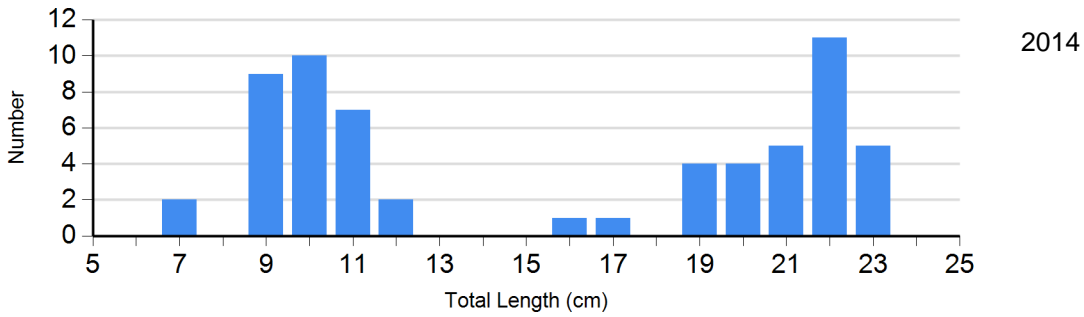


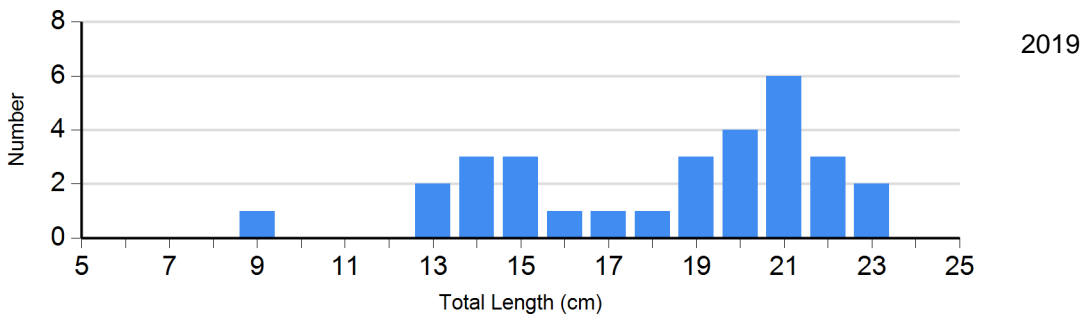


Species: Bluegill
Gear: AFS std frame net

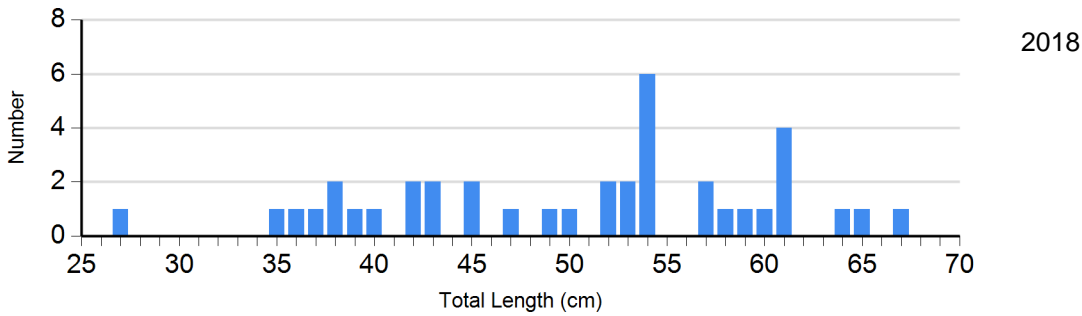
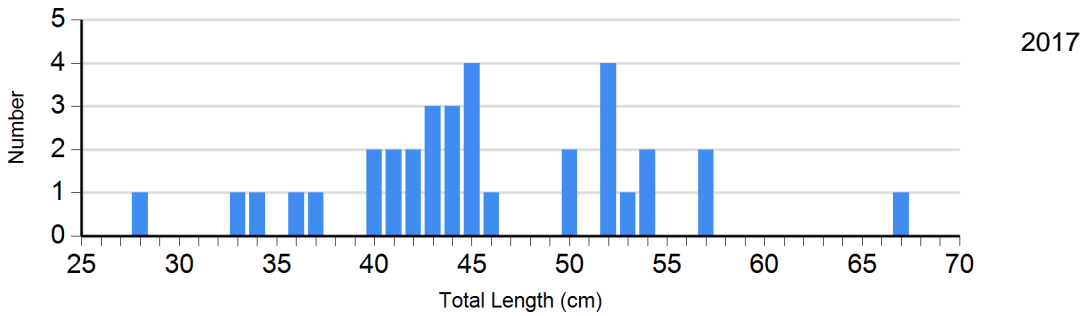


Species: Bluegill
Gear: frame net (std 3/4 in)

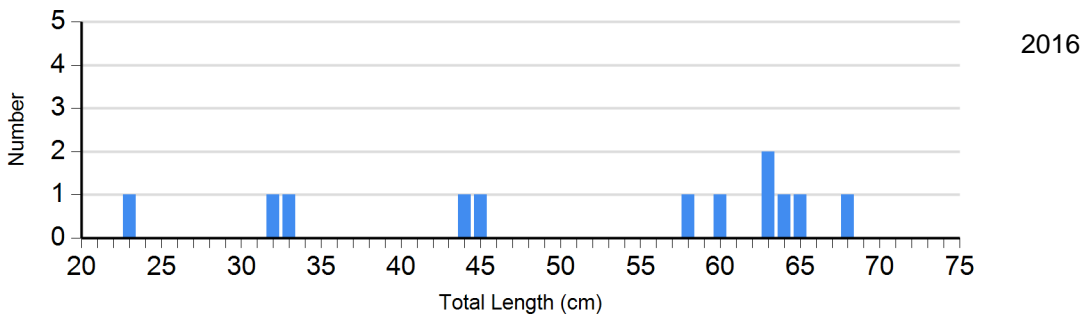
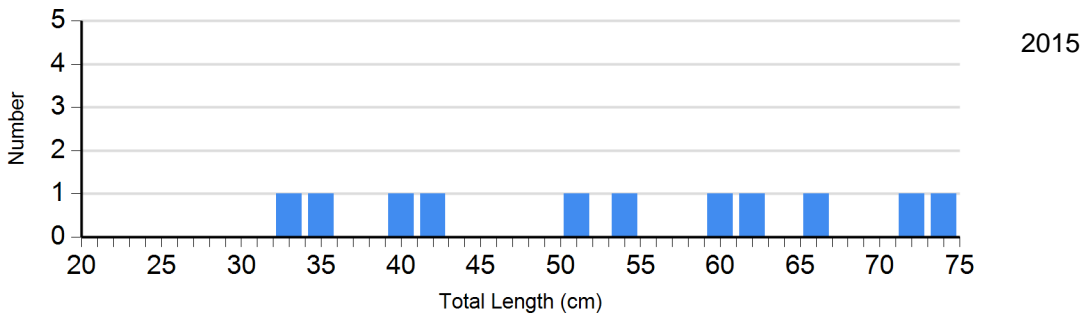




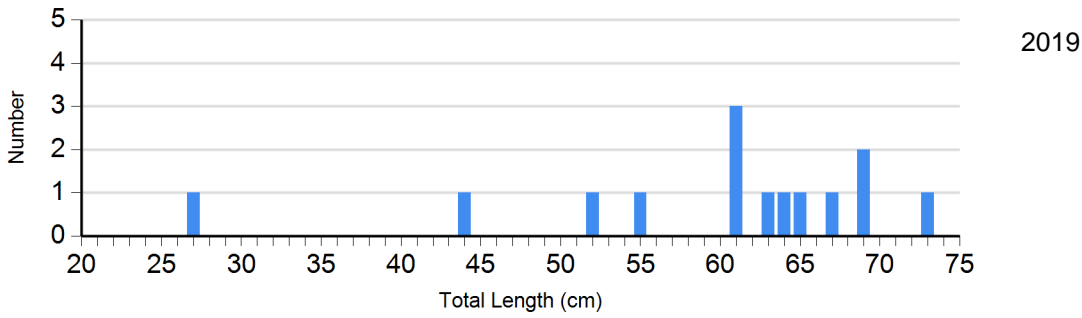
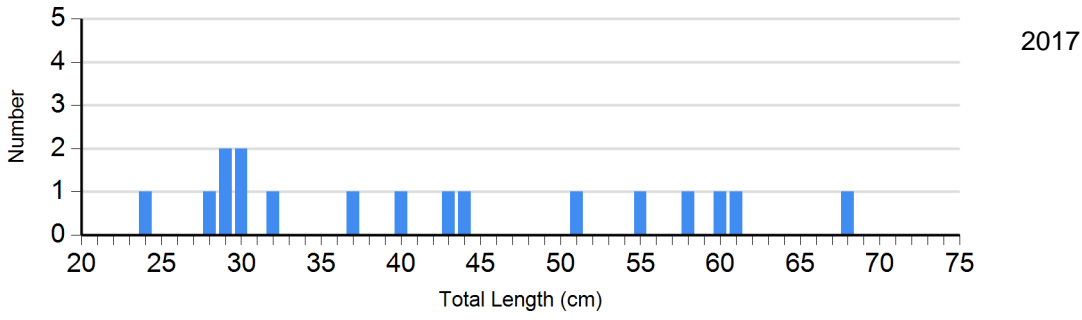
Species: Channel Catfish
Gear: AFS std gill net



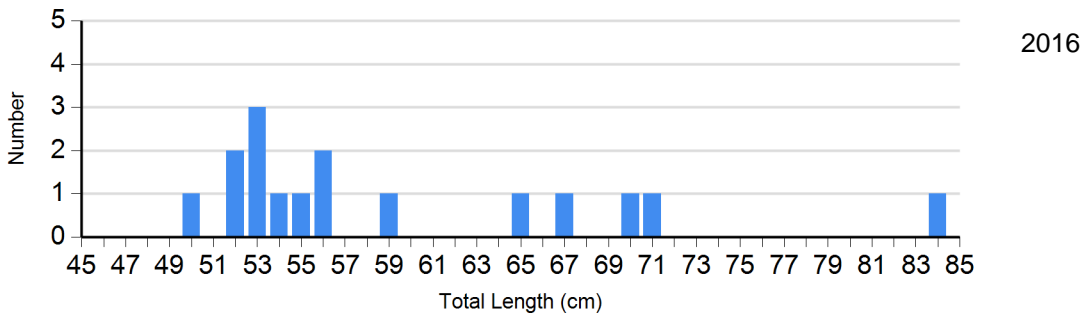
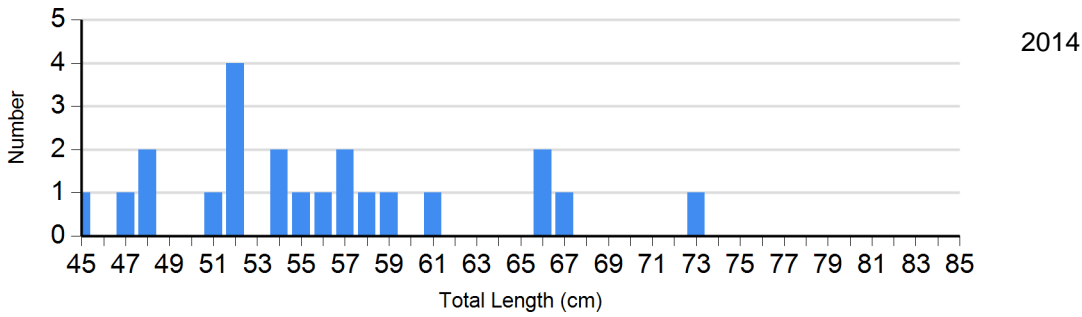
Species: Channel Catfish
Gear: std exp gill net



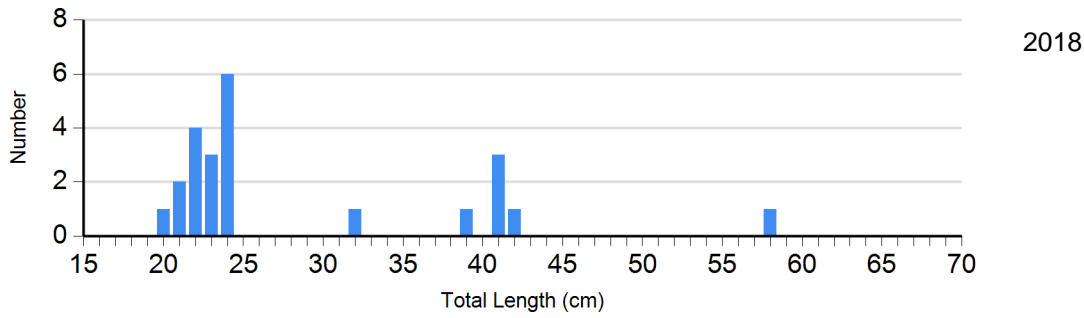
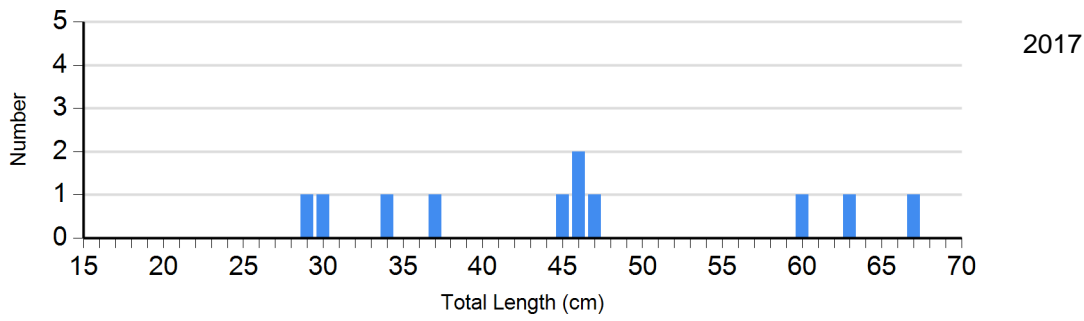
Species: Common Carp
 Gear: AFS std gill net



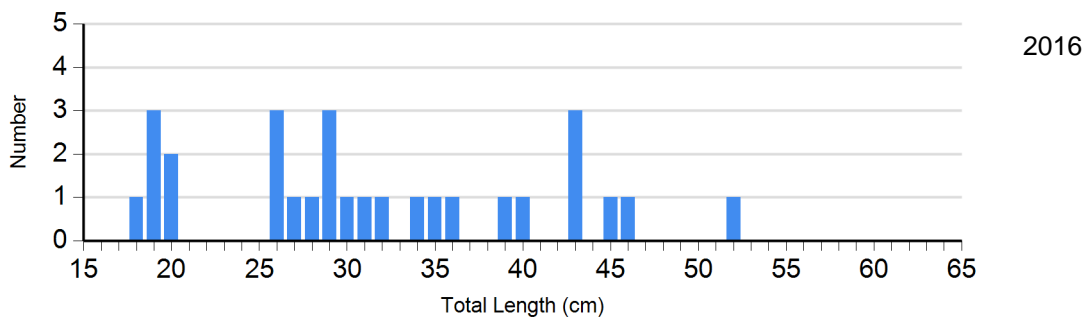
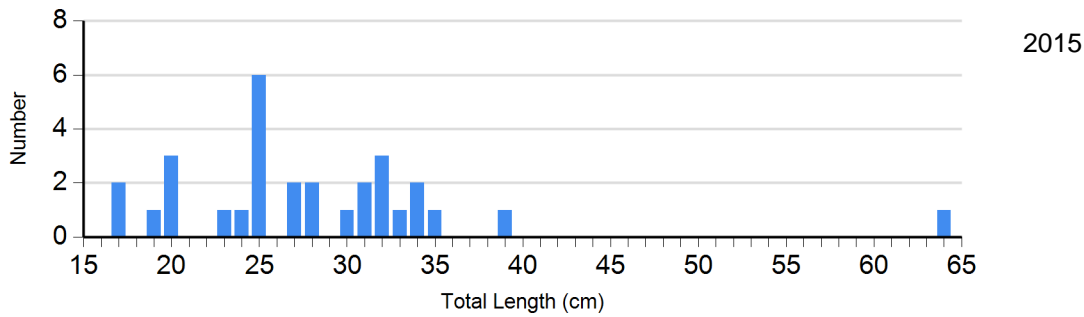
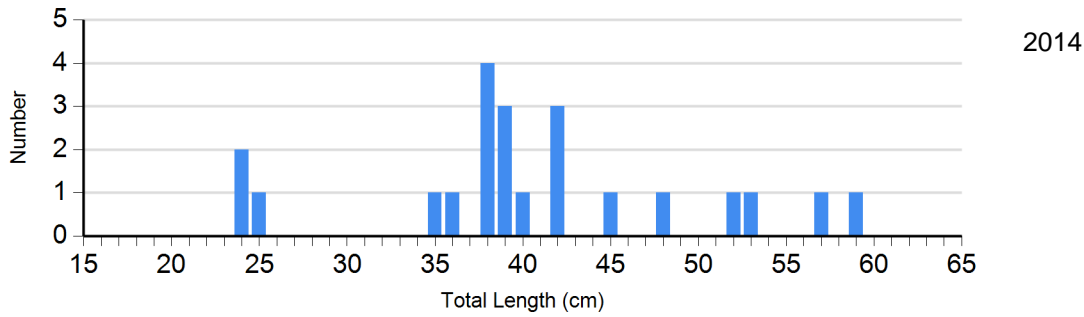
Species: Northern Pike
 Gear: std exp gill net



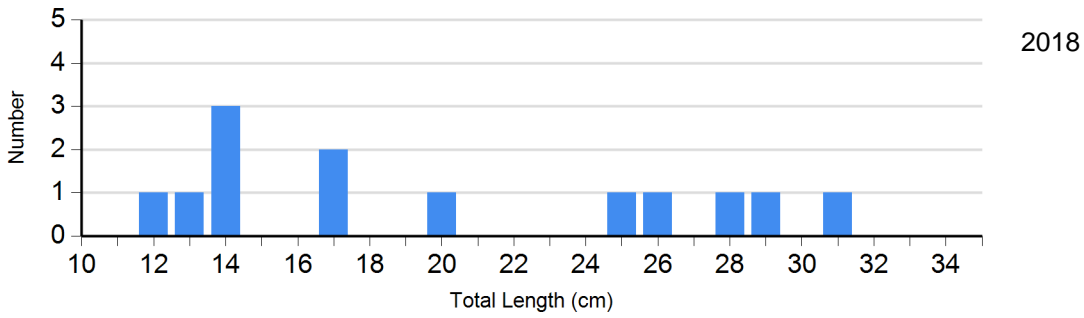
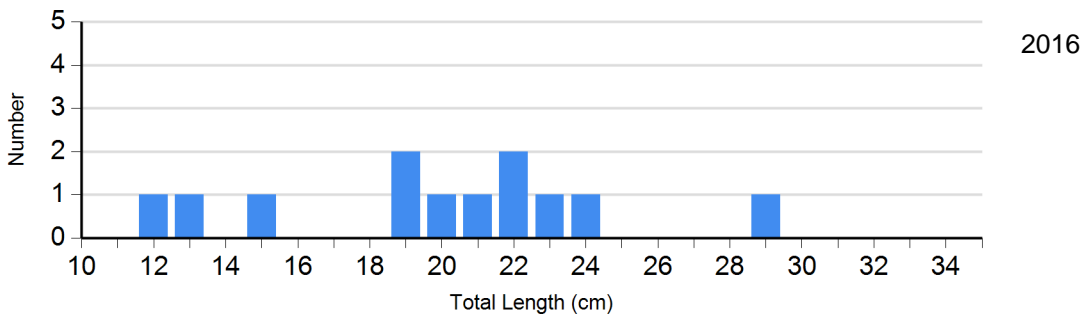
Species: Walleye
 Gear: AFS std gill net



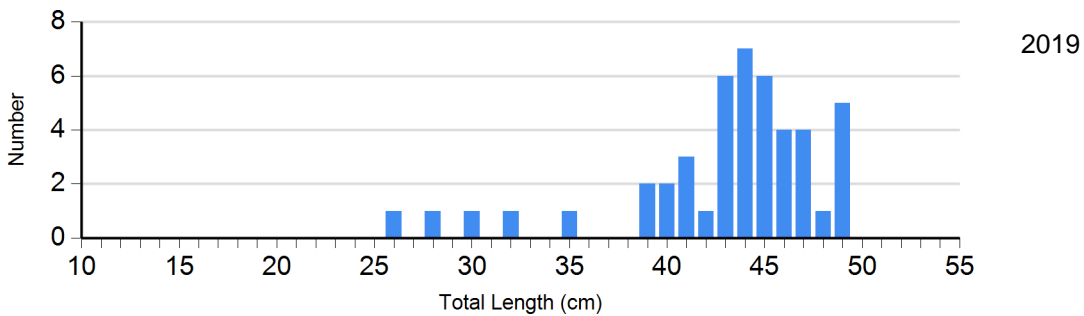
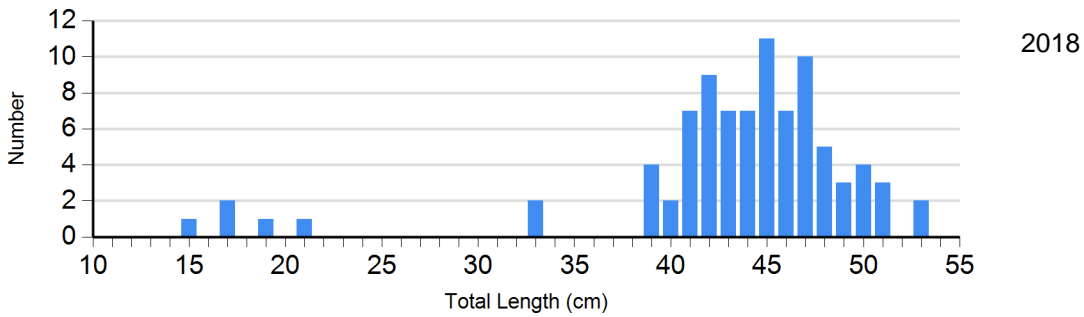
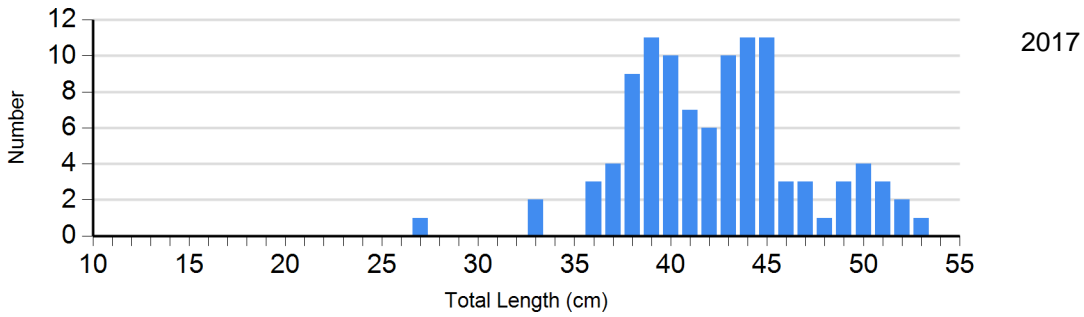
Species: Walleye
 Gear: std exp gill net



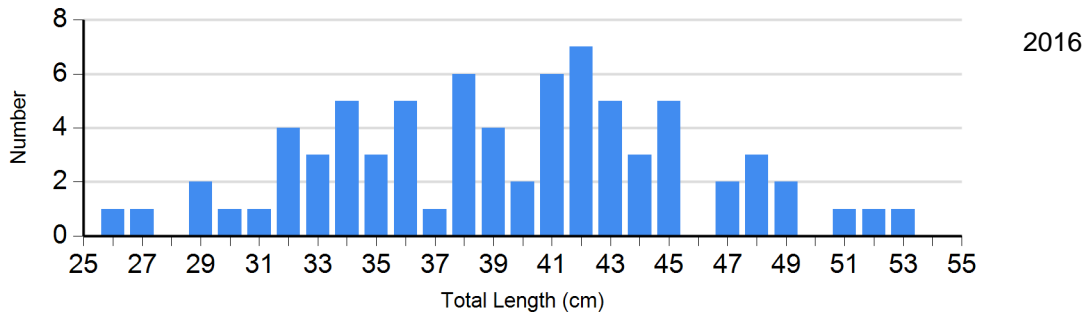
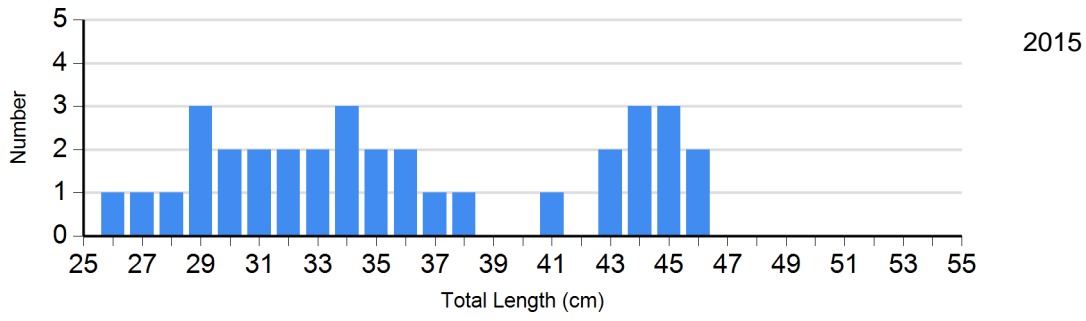
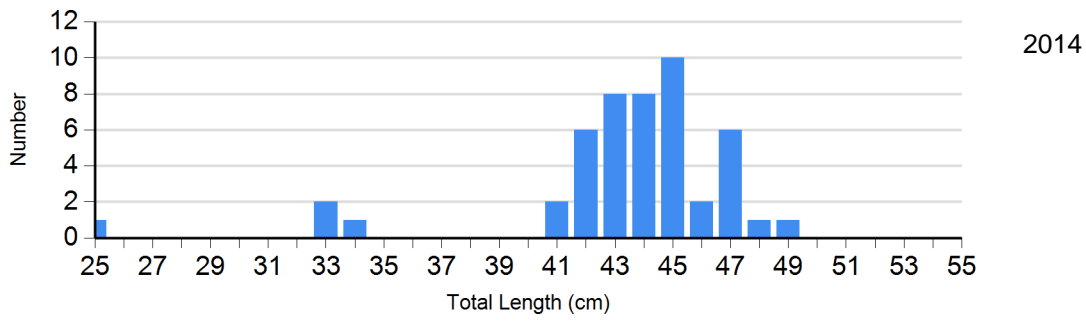
Species: White Crappie
 Gear: frame net (std 3/4 in)



Species: White Sucker
 Gear: AFS std gill net



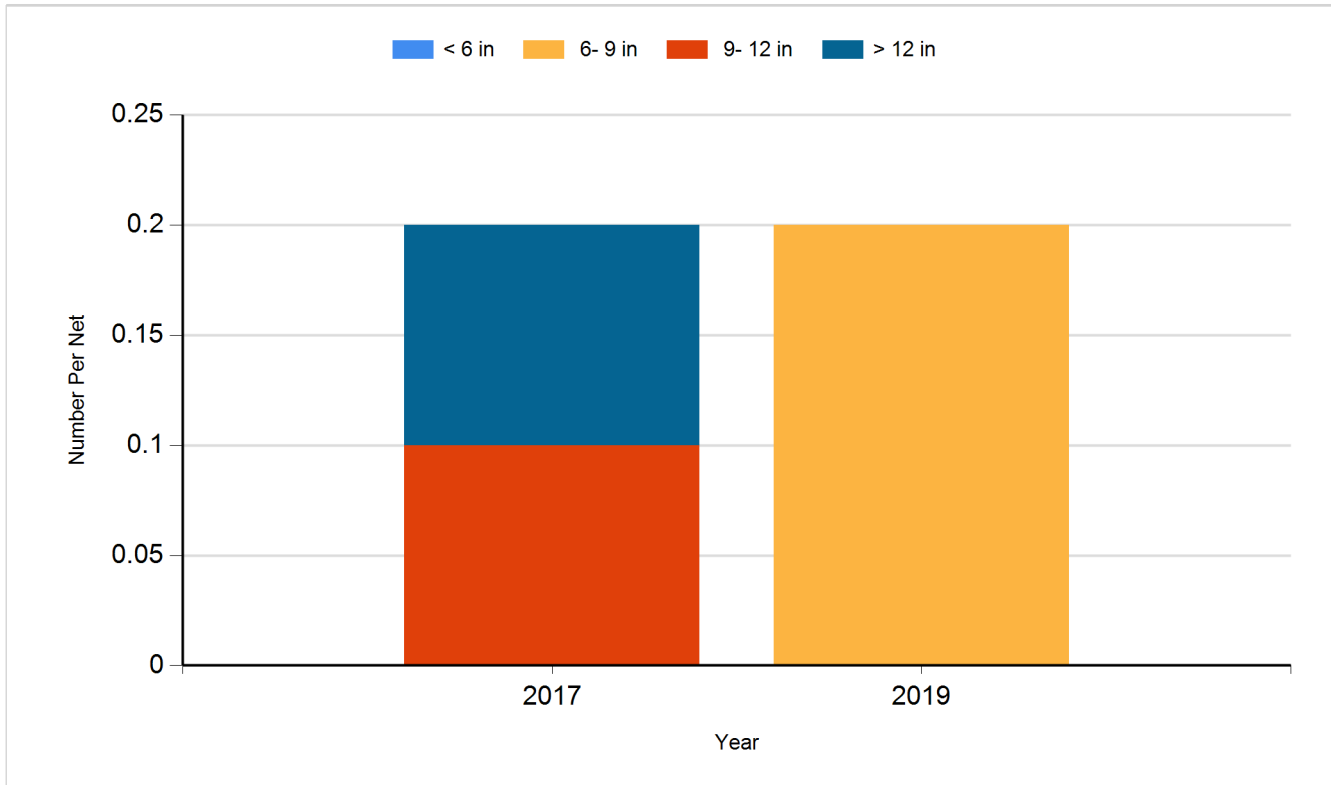
Species: White Sucker
Gear: std exp gill net



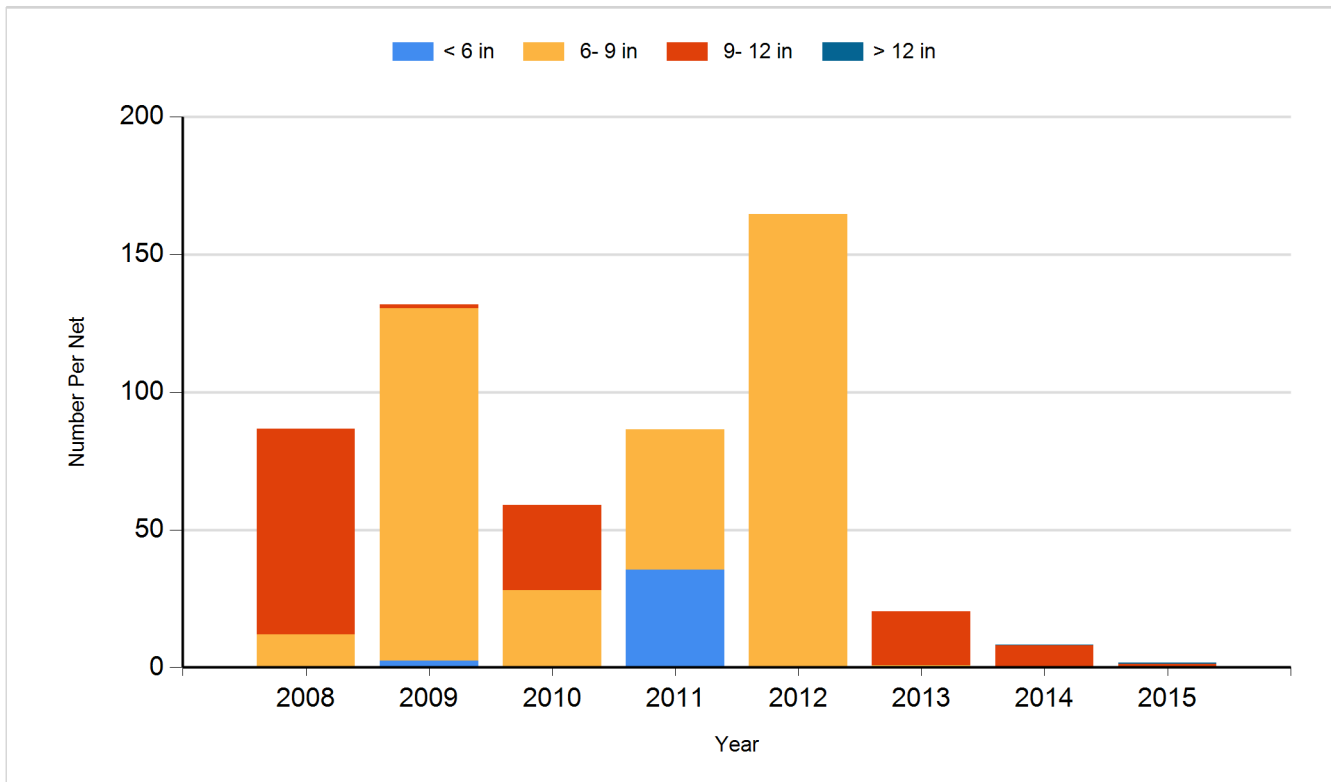
Historic Fish Sizes and Relative Abundance

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

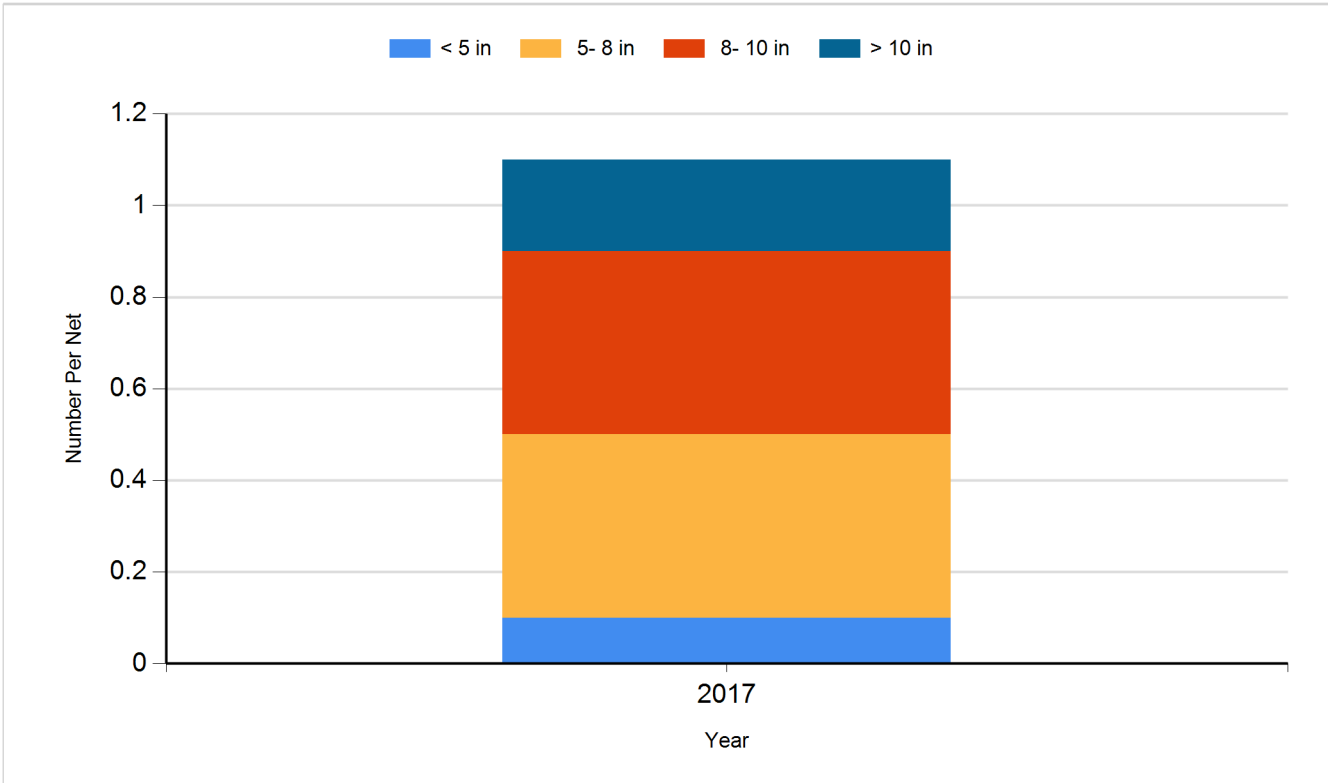
Species: Black Bullhead
Gear: AFS std gill net



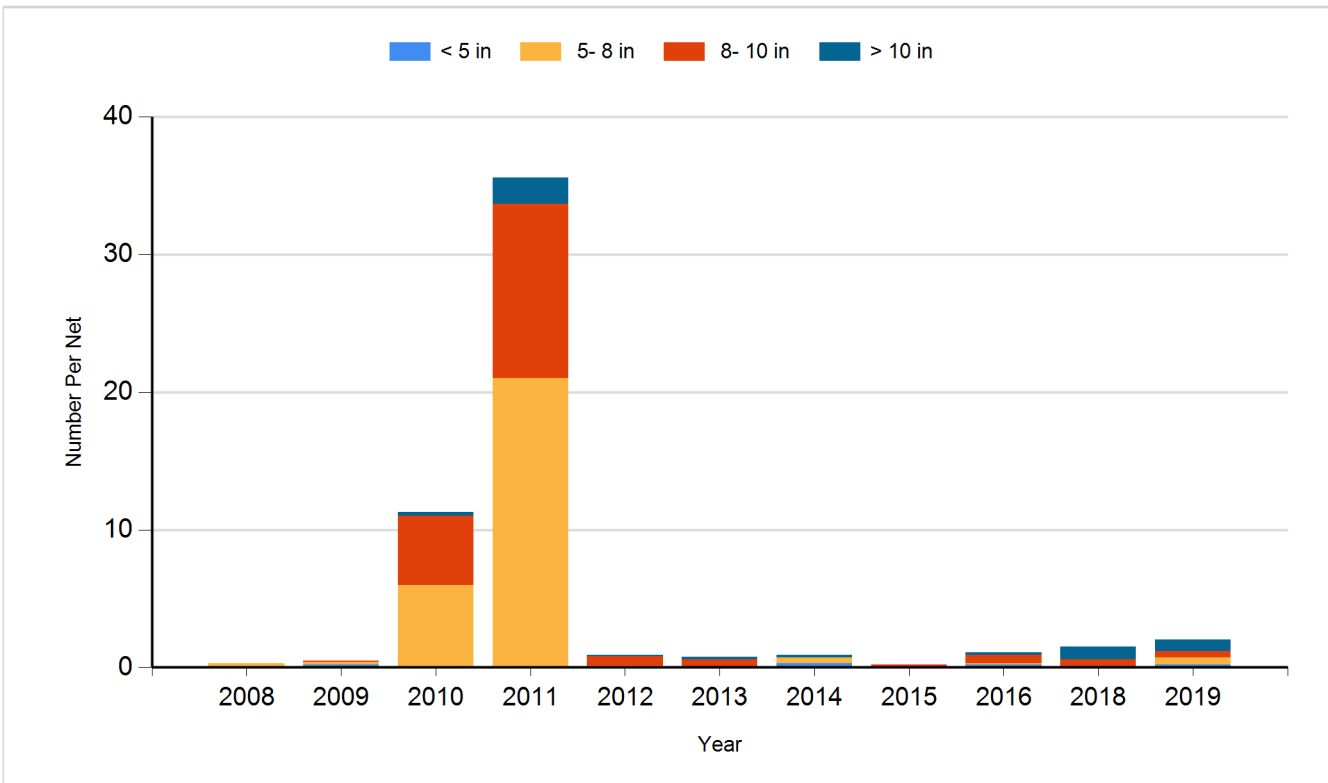
Species: Black Bullhead
Gear: std exp gill net



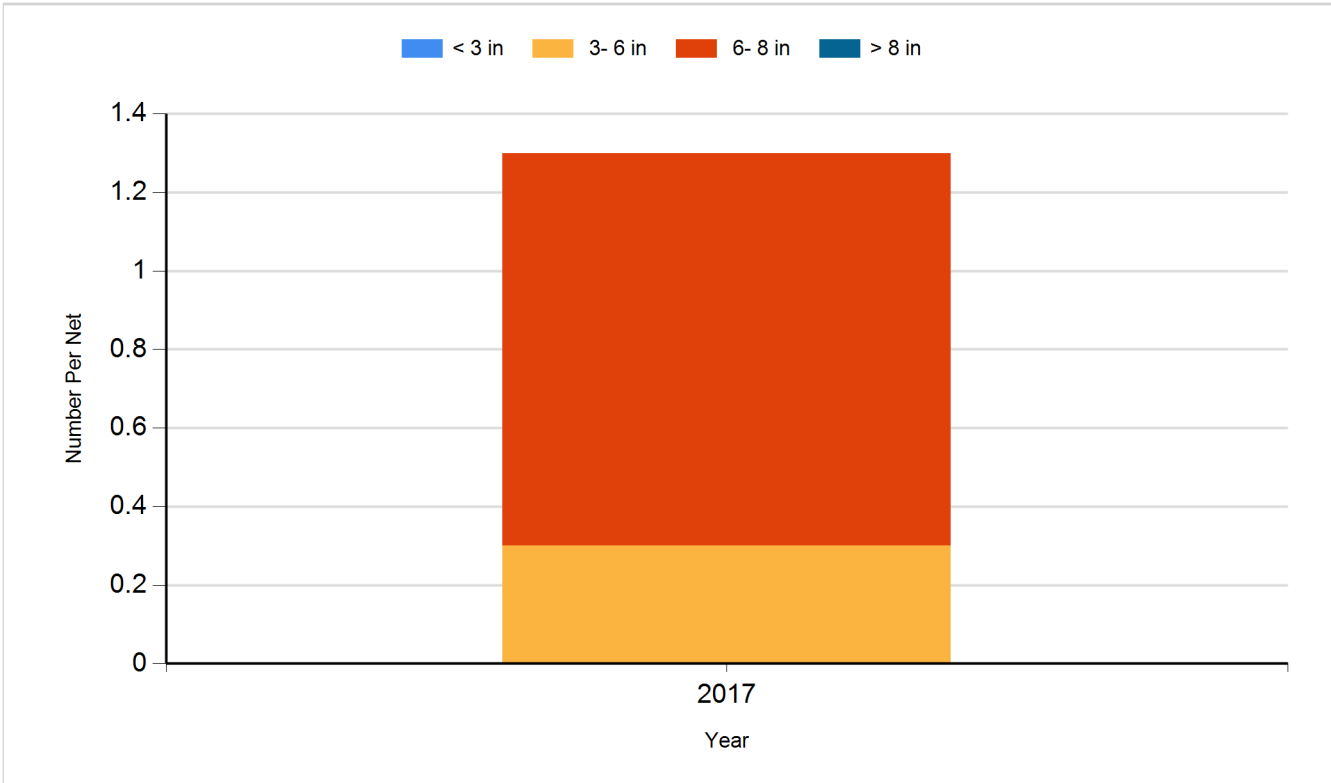
Species: Black Crappie
Gear: AFS std frame net



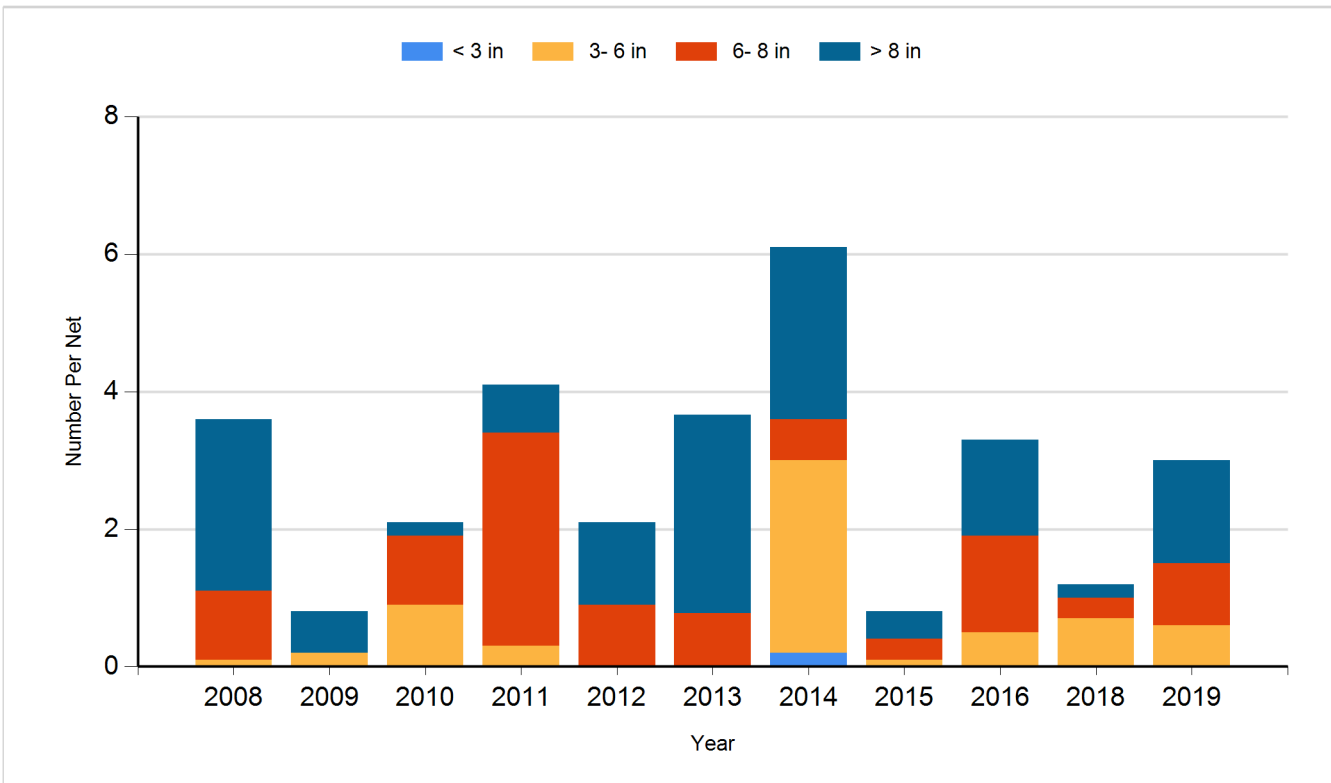
Species: Black Crappie
Gear: frame net (std 3/4 in)



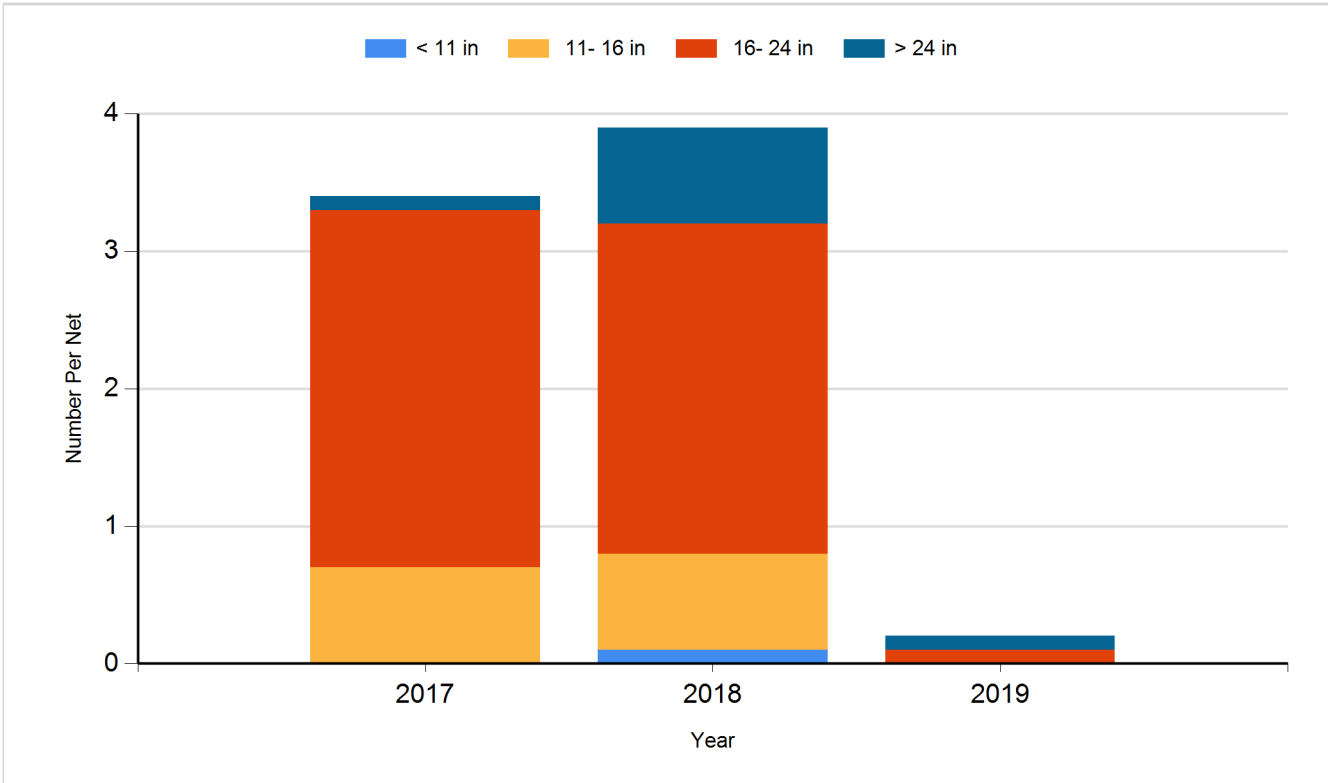
Species: Bluegill
Gear: AFS std frame net



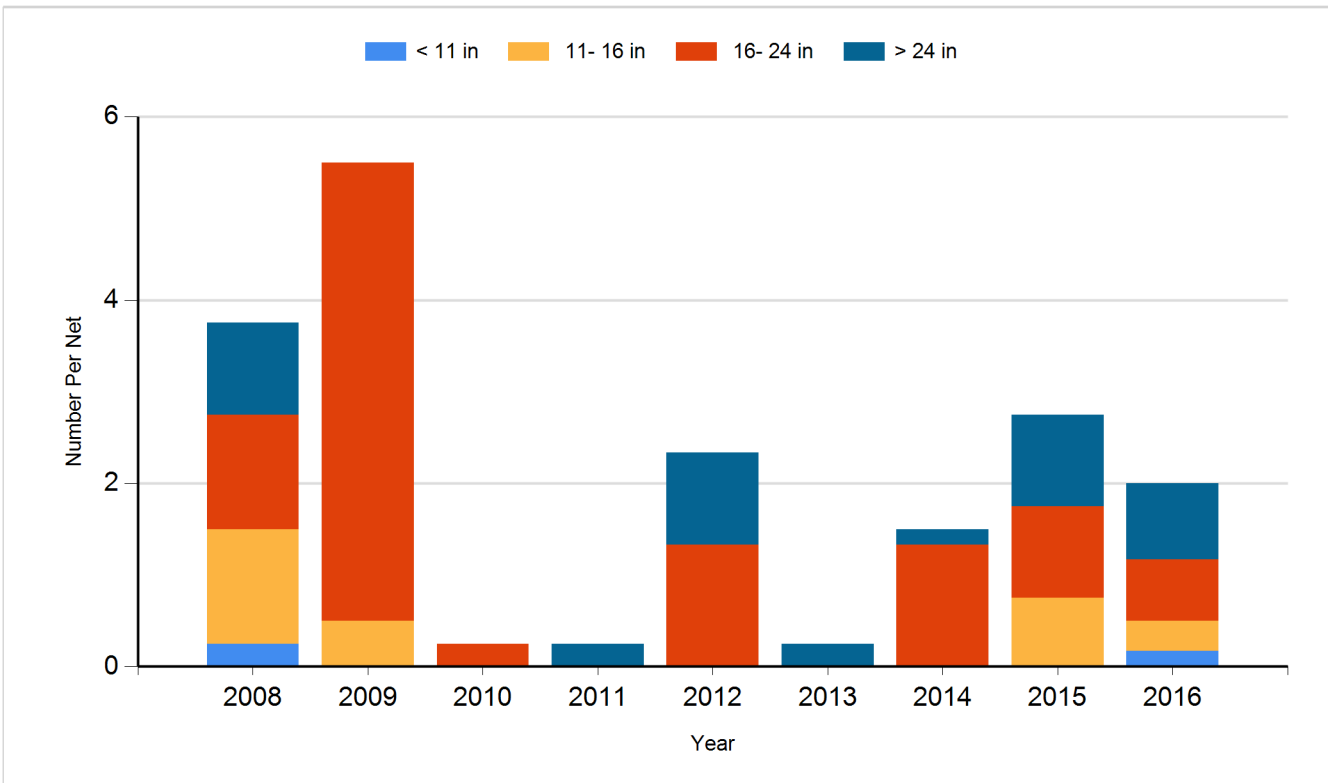
Species: Bluegill
Gear: frame net (std 3/4 in)



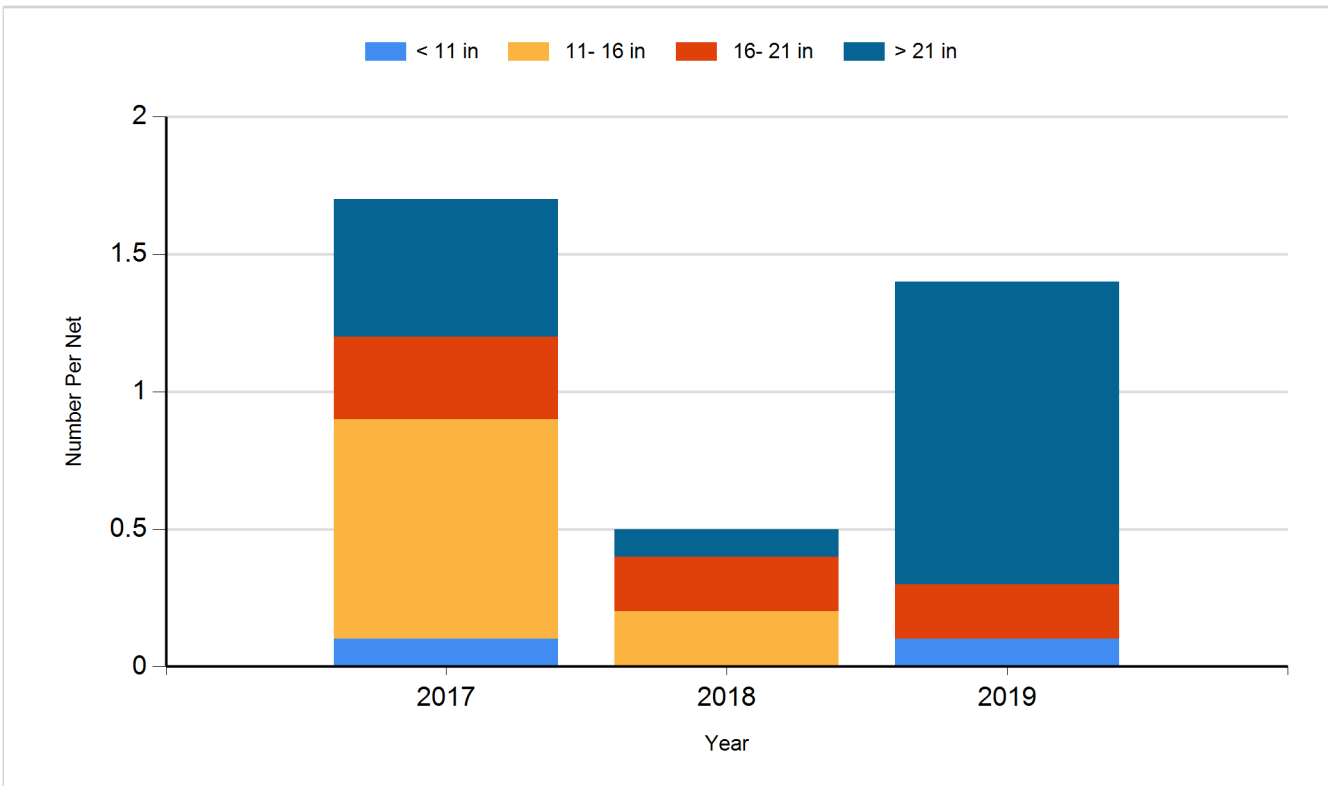
Species: Channel Catfish
Gear: AFS std gill net



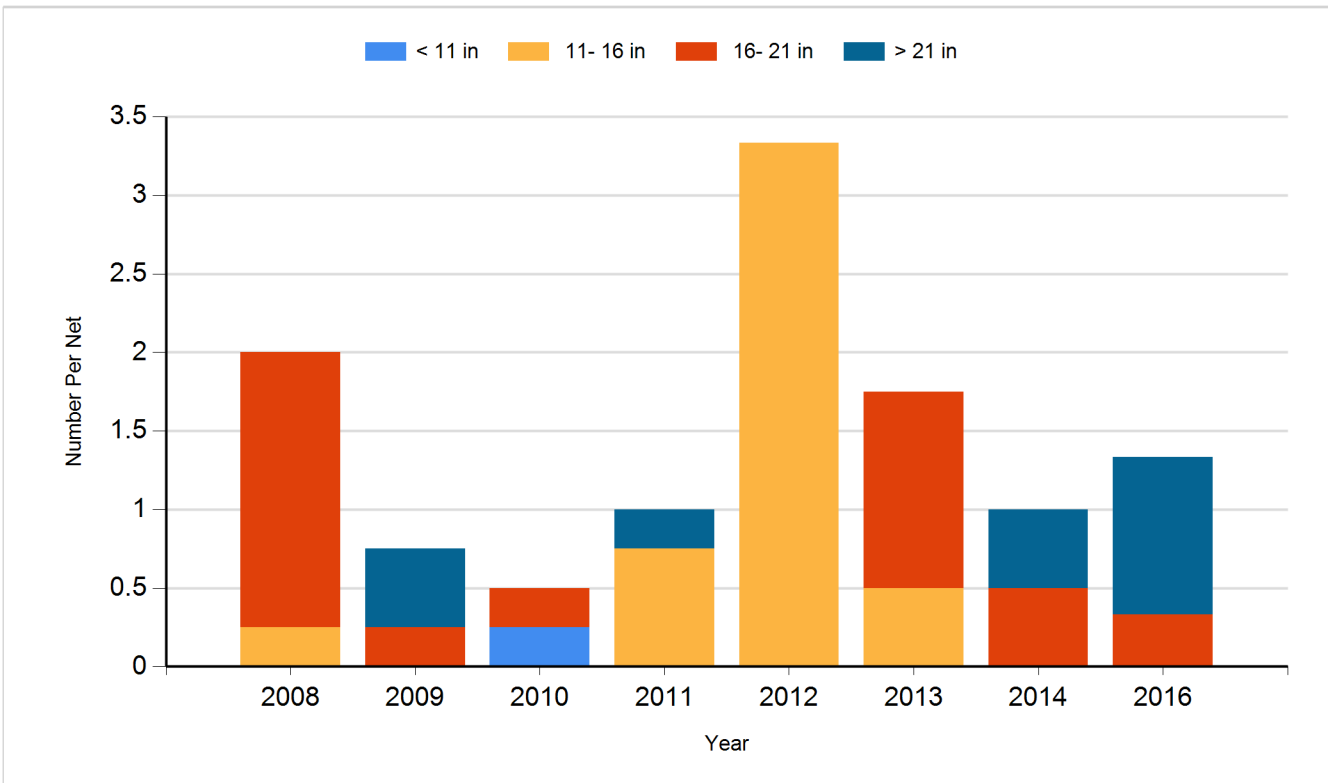
Species: Channel Catfish
Gear: std exp gill net



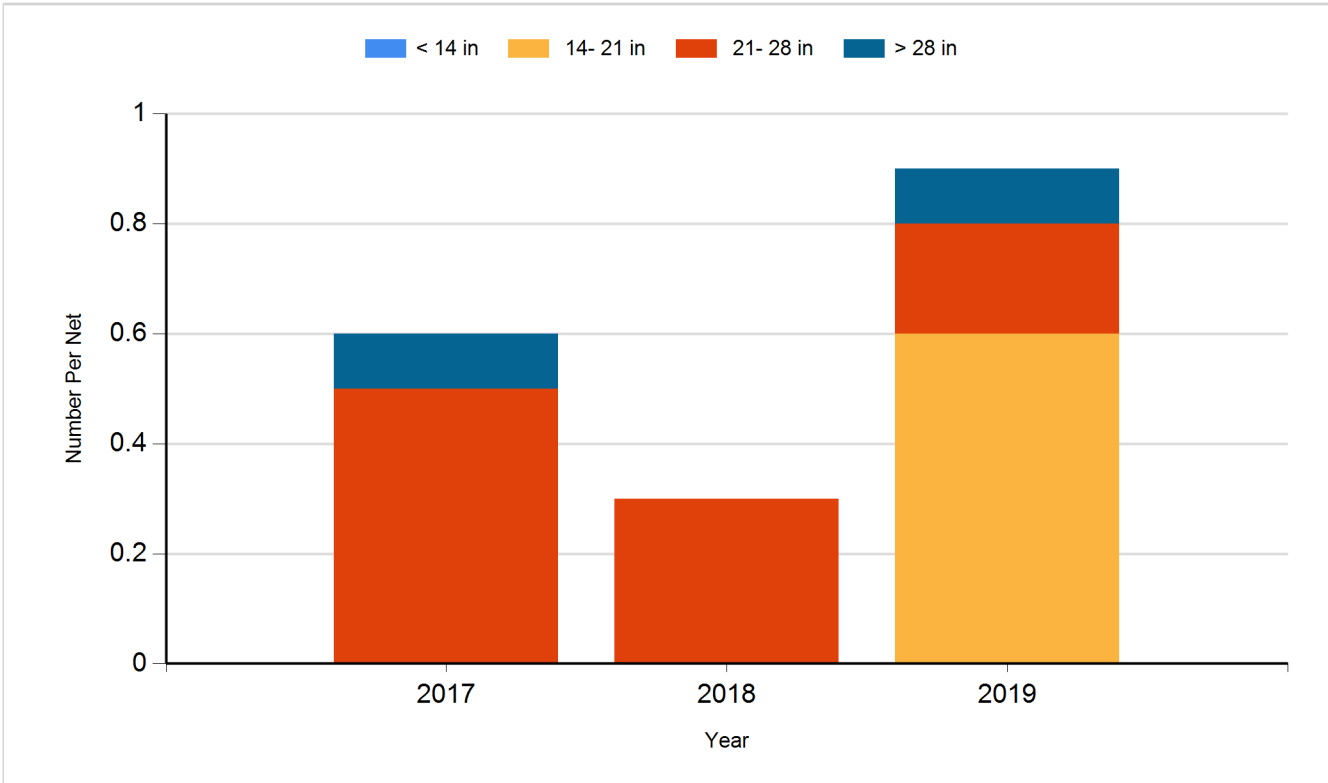
Species: Common Carp
Gear: AFS std gill net



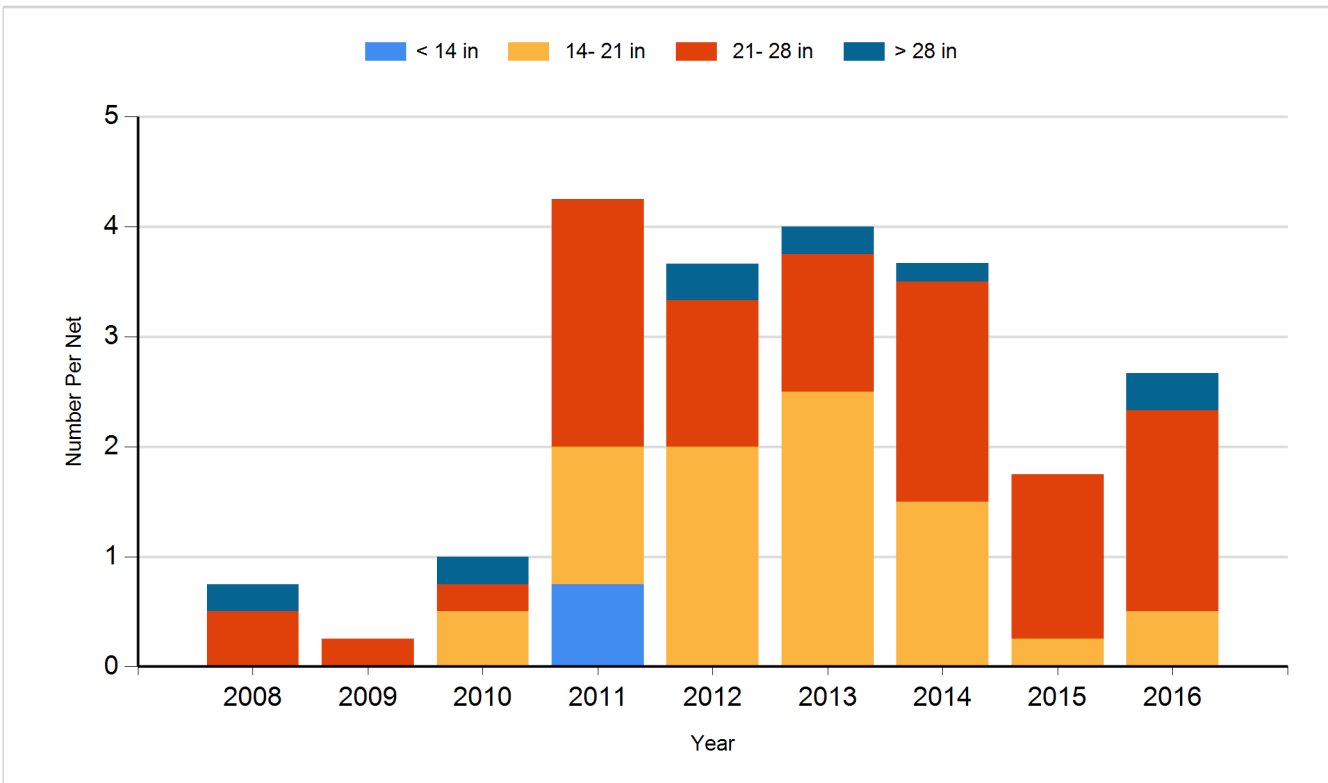
Species: Common Carp
Gear: std exp gill net



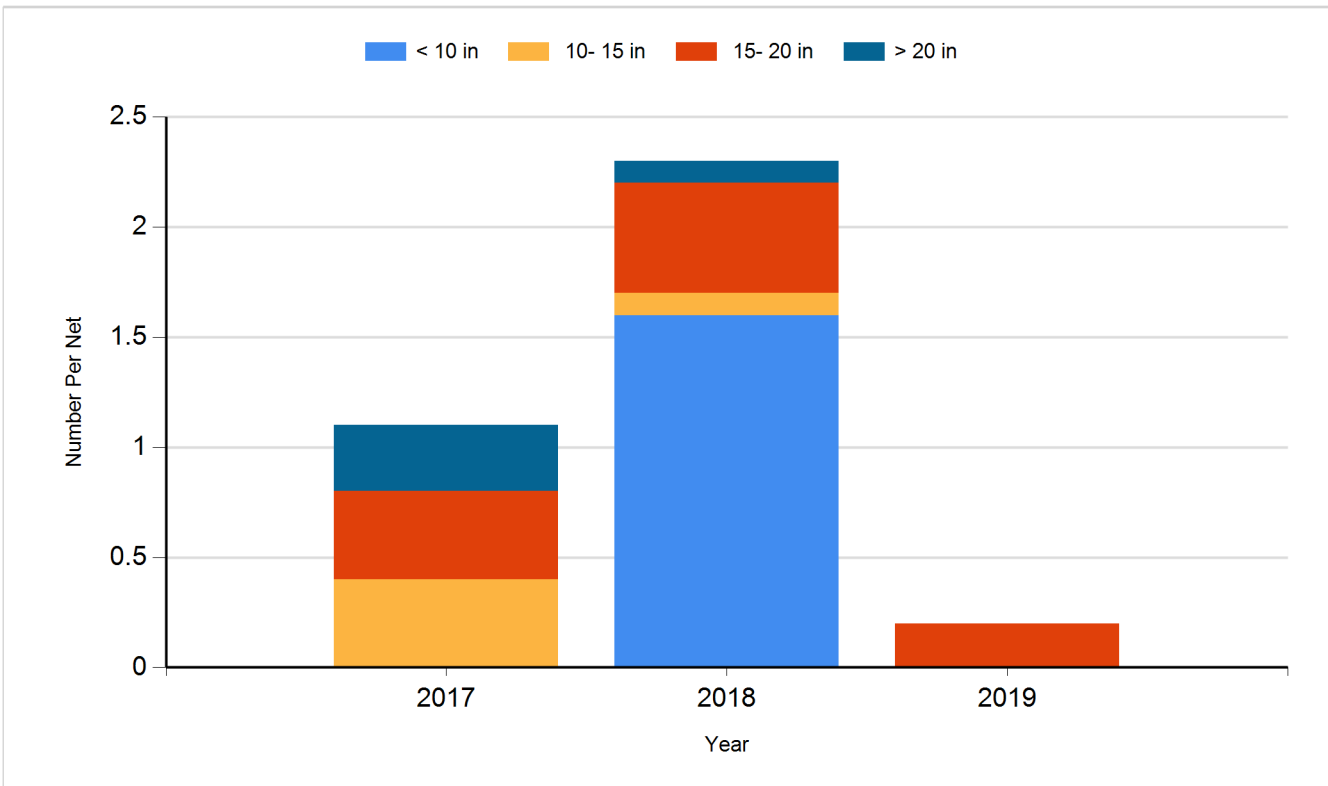
Species: Northern Pike
Gear: AFS std gill net



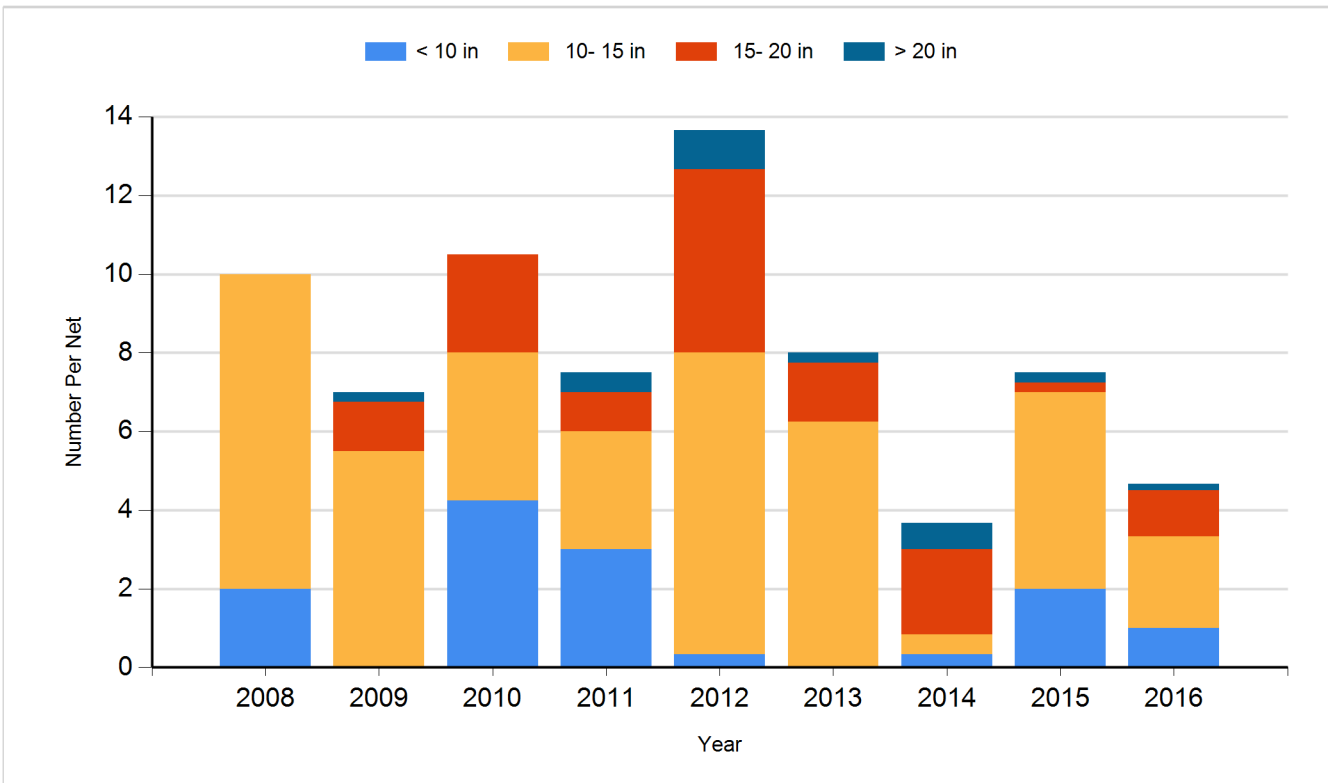
Species: Northern Pike
Gear: std exp gill net



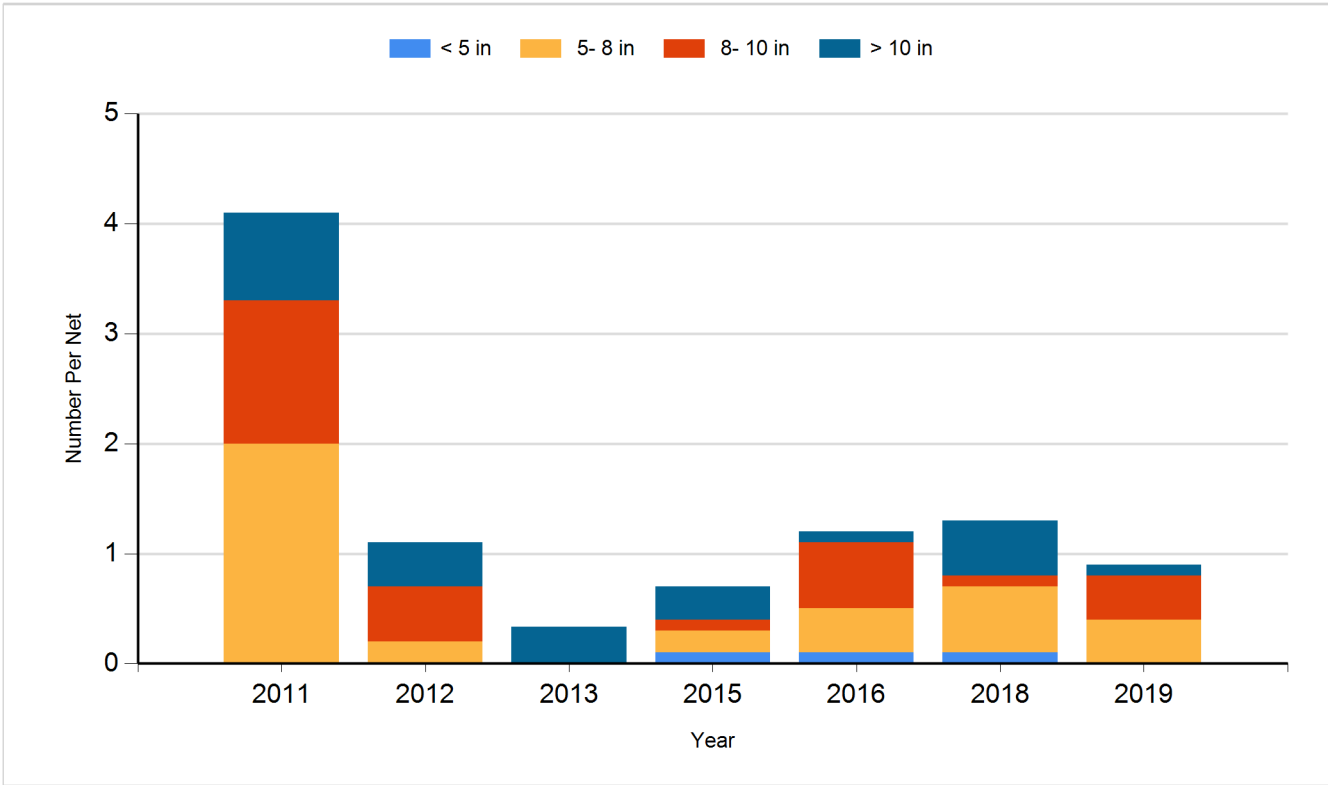
Species: Walleye
Gear: AFS std gill net



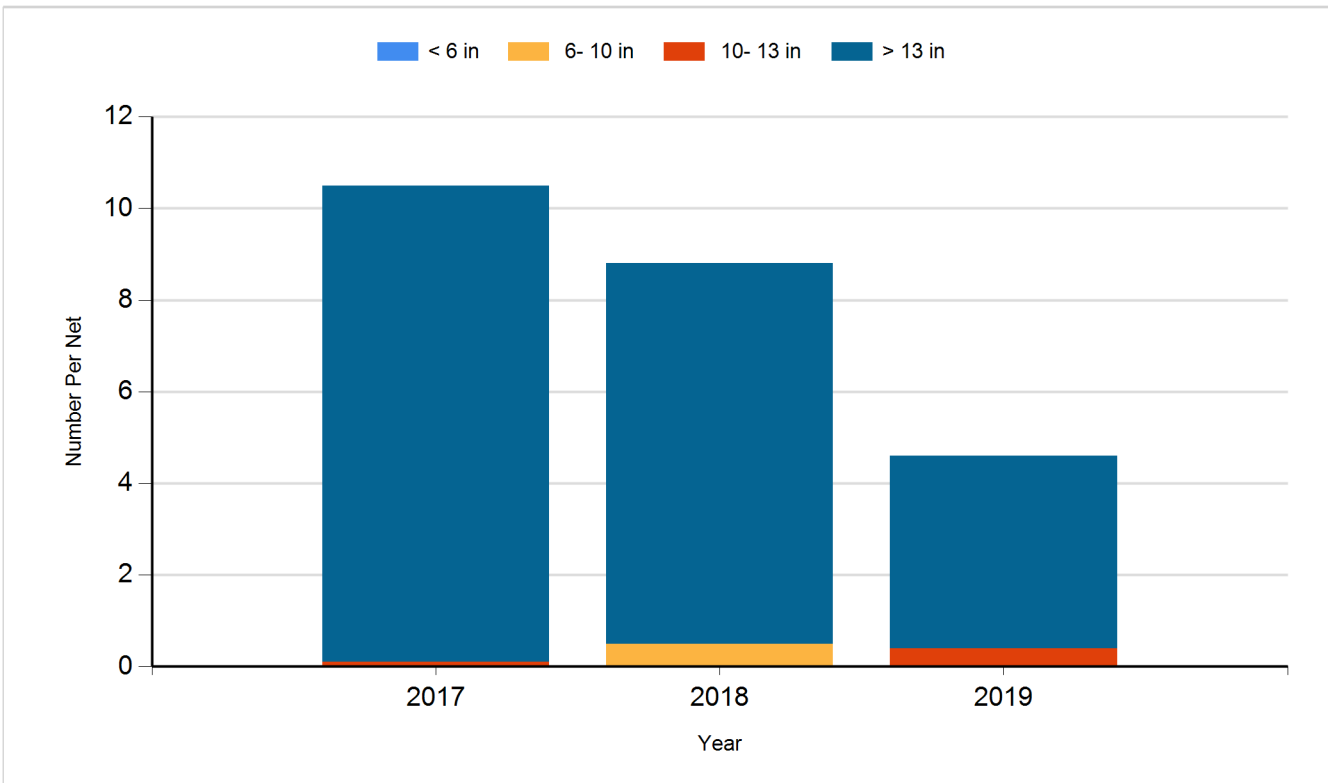
Species: Walleye
Gear: std exp gill net



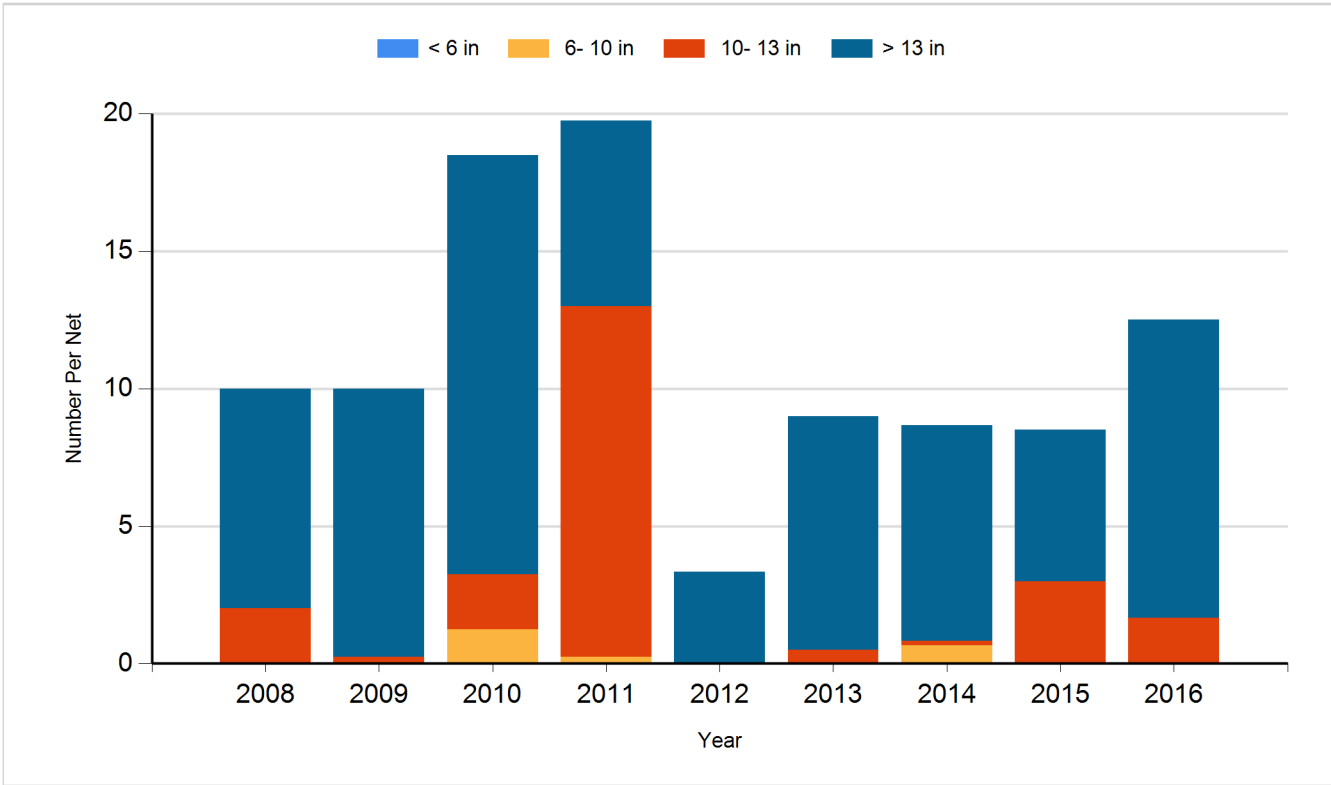
Species: White Crappie
Gear: frame net (std 3/4 in)



Species: White Sucker
Gear: AFS std gill net



Species: White Sucker
Gear: std exp gill net



Fish Stocking

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

| Year | Species | Size | Number |
|------|--------------|------------------|---------|
| 2018 | Walleye | Small Fingerling | 35,280 |
| 2019 | Walleye | Fingerling | 7,475 |
| 2019 | Walleye | Small Fingerling | 35,905 |
| 2019 | Yellow Perch | Small Fingerling | 284,320 |