# SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
## Byre, Lyman County
### MED-Lake-25-000
### 2016

## Lake Information

**Name:** Byre

**County:** Lyman

**Legal Description:** T75-R105-S4

**Surface Area:** 121 Acres

**Maximum Depth:** 17 Feet

**Mean Depth:** 7 Feet

## Surveys and Investigations

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

| Gear | Date | Effort |
|---|---|---|
| boat shocker (night) | September 21, 2016 | 3600 seconds |
| frame net (std 3/4 in) | June 30, 2016 | 5 net-nights |
| frame net (std 3/4 in) | July 01, 2016 | 5 net-nights |
| std exp gill net | June 30, 2016 | 1 net-nights |
| std exp gill net | July 01, 2016 | 1 net-nights |

## Common Fish Species Present

Largemouth Bass

Walleye

Black Crappie

Black Bullhead

Common Carp

Northern Pike

Bluegill

Yellow Perch

Green Sunfish

## 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).

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

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) |
| Bigmouth Buffalo | 11 | 28 | 18 | 46 | 24 | 61 | 30 | 76 | 37 | 94 |
| Black Bullhead | 6 | 15 | 9 | 23 | 12 | 30 | 15 | 38 | 18 | 46 |
| Black Crappie | 5 | 13 | 8 | 20 | 10 | 25 | 12 | 30 | 15 | 38 |

| | Stock | | Quality | | Preferred | | Memorable | | Trophy | |
|---|---|---|---|---|---|---|---|---|---|---|
| Species Name | (in) | (cm) | (in) | (cm) | (in) | (cm) | (in) | (cm) | (in) | (cm) |
| Blue Catfish | 12 | 30 | 20 | 51 | 30 | 76 | 35 | 89 | 45 | 114 |
| Bluegill | 3 | 8 | 6 | 15 | 8 | 20 | 10 | 25 | 12 | 30 |
| Bluegill X Gr. Sunfish Hybrid | 3 | 8 | 6 | 15 | 8 | 20 | 10 | 25 | 12 | 30 |
| Brown Bullhead | 5 | 13 | 8 | 20 | 11 | 28 | 14 | 36 | 17 | 43 |
| Burbot | 8 | 20 | 15 | 38 | 21 | 53 | 26 | 67 | 32 | 82 |
| Channel Catfish | 11 | 28 | 16 | 41 | 24 | 61 | 28 | 71 | 36 | 91 |
| Common Carp | 11 | 28 | 16 | 41 | 21 | 53 | 26 | 66 | 33 | 84 |
| Flathead Catfish | 14 | 35 | 20 | 51 | 28 | 71 | 34 | 86 | 40 | 102 |
| Freshwater Drum | 8 | 20 | 12 | 30 | 15 | 38 | 20 | 51 | 25 | 63 |
| Gizzard Shad | 7 | 18 | 11 | 28 | | | | | | |
| Green Sunfish | 3 | 8 | 6 | 15 | 8 | 20 | 10 | 25 | 12 | 30 |
| Lake Herring | 5 | 13 | 8 | 20 | 11 | 28 | 14 | 35 | 17 | 43 |
| Largemouth Bass | 8 | 20 | 12 | 30 | 15 | 38 | 20 | 51 | 25 | 63 |
| Longnose Gar | 16 | 41 | 27 | 69 | 36 | 91 | 45 | 114 | 55 | 140 |
| Muskellunge | 20 | 51 | 30 | 76 | 38 | 97 | 42 | 107 | 50 | 127 |
| Northern Pike | 14 | 35 | 21 | 53 | 28 | 71 | 34 | 86 | 44 | 112 |
| Paddlefish | 16 | 41 | 26 | 66 | 33 | 84 | 41 | 104 | 51 | 130 |
| Pumpkinseed | 3 | 8 | 6 | 15 | 8 | 20 | 10 | 25 | 12 | 30 |
| Redear Sunfish | 4 | 10 | 7 | 18 | 9 | 23 | 11 | 28 | 13 | 33 |
| River Carpsucker | 7 | 18 | 11 | 28 | 14 | 36 | 18 | 46 | 22 | 56 |
| Rock Bass | 4 | 10 | 7 | 18 | 9 | 23 | 11 | 28 | 13 | 33 |
| Rudd | 6 | 15 | 10 | 25 | 12 | 30 | 15 | 38 | 19 | 48 |
| Sauger | 8 | 20 | 12 | 30 | 15 | 38 | 20 | 51 | 25 | 63 |
| Saugeye | 9 | 23 | 14 | 35 | 18 | 46 | 22 | 56 | 27 | 69 |
| Shorthead Redhorse | 6 | 15 | 10 | 25 | 13 | 33 | 16 | 41 | 20 | 51 |
| Smallmouth Bass | 7 | 18 | 11 | 28 | 14 | 35 | 17 | 43 | 20 | 51 |
| Smallmouth Buffalo | 11 | 28 | 18 | 46 | 24 | 61 | 30 | 76 | 37 | 94 |
| Spotted Bass | 7 | 18 | 11 | 28 | 14 | 35 | 17 | 43 | 20 | 51 |
| Striped Bass | 12 | 30 | 20 | 51 | 30 | 76 | 35 | 89 | 45 | 114 |
| Striped Bass Hybrid (wiper) | 8 | 20 | 12 | 30 | 15 | 38 | 20 | 51 | 25 | 63 |
| 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 |
| White Perch | 5 | 13 | 8 | 20 | 10 | 25 | 12 | 30 | 15 | 38 |
| White Sucker | 6 | 15 | 10 | 25 | 13 | 33 | 16 | 41 | 20 | 51 |
| Yellow Bass | 4 | 10 | 7 | 18 | 9 | 23 | 11 | 28 | 13 | 33 |
| 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).

| | | Abundance | | Stock Density Indices | | | | Condition | |
|---|---|---|---|---|---|---|---|---|---|
| Gear | Species | CPUE | CI-80 | PSD | CI-80 | PSD-P | CI-80 | Wr | CI-80 |
| boat shocker (night) | Largemouth Bass | 7.0 | 6.6 | 100 | | 43 | | 116 | 5 |
| | Walleye | 33.0 | 21.8 | 24 | 15 | 0 | | 89 | 2 |
| frame net (std 3/4 in) | Black Bullhead | 45.8 | 28.2 | 88 | 2 | 1 | | 88 | 1 |
| | Black Crappie | 26.0 | 5.9 | 69 | 4 | 0 | | 101 | 1 |
| | Bluegill | 0.9 | 0.6 | 67 | | 22 | | 108 | 7 |
| | Common Carp | 0.9 | 0.5 | 89 | | 22 | | 87 | 3 |
| | Green Sunfish | 0.2 | 0.2 | 50 | | 0 | | 129 | 1 |
| | Northern Pike | 1.1 | 0.4 | 91 | | 27 | | 73 | 4 |
| | Walleye | 1.3 | 0.8 | 62 | | 54 | 23 | 75 | 2 |
| | Yellow Perch | 0.2 | 0.3 | 0 | | 0 | | 103 | 4 |
| std exp gill net | Black Bullhead | 35.5 | 53.9 | 85 | 6 | 0 | | 86 | 3 |
| | Black Crappie | 7.0 | 12.3 | 86 | | 0 | | 93 | 3 |
| | Common Carp | 2.0 | 3.1 | 75 | | 25 | | 89 | 3 |
| | Northern Pike | 0.5 | 1.5 | 100 | | 0 | | 74 | |
| | Walleye | 8.0 | 0.0 | 13 | | 6 | | 78 | 2 |

## 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.

| | | CPUE | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gear | Species | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | Avg |
| boat shocker (night) | Largemouth Bass | | 12.0 | | 28.0 | | | 11.0 | | | 7.0 | 14.5 |
| | Walleye | | 45.0 | | 74.0 | | | 69.0 | | | 33.0 | 55.3 |
| frame net (std 3/4 in) | Black Bullhead | | 10.0 | | 3.7 | | | 1.4 | | | 45.8 | 15.2 |
| | Black Crappie | | 9.8 | | 10.1 | | | 9.8 | | | 26.0 | 13.9 |
| | Bluegill | | 0.5 | | 1.6 | | | | | | 0.9 | 1.0 |
| | Common Carp | | 1.4 | | 0.2 | | | 1.8 | | | 0.9 | 1.1 |
| | Green Sunfish | | | | | | | | | | 0.2 | 0.2 |
| | Largemouth Bass | | | | 0.5 | | | 0.4 | | | | 0.5 |
| | Northern Pike | | 0.3 | | 0.4 | | | 0.3 | | | 1.1 | 0.5 |
| | Walleye | | 1.9 | | 0.8 | | | 1.9 | | | 1.3 | 1.5 |
| | Yellow Perch | | | | | | | | | | 0.2 | 0.2 |
| std exp gill net | Black Bullhead | | 1.5 | | 5.0 | | | 0.5 | | | 35.5 | 10.6 |
| | Black Crappie | | | | 7.5 | | | | | | 7.0 | 7.3 |
| | Common Carp | | | | 1.0 | | | 1.0 | | | 2.0 | 1.3 |
| | Northern Pike | | | | | | | | | | 0.5 | 0.5 |
| | Walleye | | | | 5.0 | | | 1.0 | | | 8.0 | 4.7 |

## 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 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
| boat shocker (night) | Walleye | PSD | | 0 | | 20 | | | 32 | | | 24 |
| | | PSD-P | | 0 | | 0 | | | 5 | | | 0 |
| | | Wr | | 95 | | 86 | | | 91 | | | 89 |
| frame net (std 3/4 in) | Black Crappie | PSD | | 0 | | 6 | | | 89 | | | 69 |
| | | PSD-P | | 0 | | 1 | | | 1 | | | 0 |
| | | Wr | | 104 | | 99 | | | 88 | | | 101 |
| | Northern Pike | PSD | | 100 | | 50 | | | 100 | | | 91 |
| | | PSD-P | | 67 | | 25 | | | 0 | | | 27 |
| | | Wr | | 82 | | 90 | | | 86 | | | 73 |
| | Walleye | PSD | | 100 | | 63 | | | 89 | | | 62 |
| | | PSD-P | | 79 | | 0 | | | 47 | | | 54 |
| | | Wr | | 84 | | 77 | | | 83 | | | 75 |
| | Yellow Perch | PSD | | | | | | | | | | 0 |
| | | PSD-P | | | | | | | | | | 0 |
| | | Wr | | | | | | | | | | 103 |
| std exp gill net | Black Crappie | PSD | | | | 0 | | | | | | 86 |
| | | PSD-P | | | | 0 | | | | | | 0 |
| | | Wr | | | | 103 | | | | | | 93 |
| | Northern Pike | PSD | | | | | | | | | | 100 |
| | | PSD-P | | | | | | | | | | 0 |
| | | Wr | | | | | | | | | | 74 |
| | Walleye | PSD | | | | 50 | | | 50 | | | 13 |
| | | PSD-P | | | | 0 | | | 0 | | | 6 |
| | | Wr | | | | 77 | | | 77 | | | 78 |

## Back-Calculated Lengths

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

Species: Black Crappie

| Year Class | Age | N | Mean back-calculated length (SE) at age | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2013 | 3 | 17 | 82 (1.3) | 162 (4.5) | 203 (4) | | | | | | | |
| 2012 | 4 | 4 | 91 (4.9) | 191 (18.5) | 215 (14.2) | 227 (13) | | | | | | |
| Weighted Mean | | 21 | 84 | 168 | 205 | 227 | | | | | | |

| Year Class | Age | N | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2013 | 3 | 17 | | | | | | | | | | |
| 2012 | 4 | 4 | | | | | | | | | | |
| Weighted Mean | | 21 | | | | | | | | | | |

Species: Walleye

| Year Class | Age | N | Mean back-calculated length (SE) at age | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2016 | 0 | 6 | | | | | | | | | | |
| 2015 | 1 | 16 | 202 (8.5) | | | | | | | | | |
| 2014 | 2 | 1 | 252 | 322 | | | | | | | | |
| 2014 | 2 | 2 | 162 (65) | 221 (14.2) | | | | | | | | |
| 2014 | 2 | 64 | 251 (1.3) | 291 (1.1) | | | | | | | | |
| 2013 | 3 | 2 | 265 (2.6) | 315 (10.9) | 330 (9) | | | | | | | |
| 2013 | 3 | 3 | 265 (20) | 308 (16.4) | 351 (25.4) | | | | | | | |
| 2013 | 3 | 48 | 252 (1.5) | 291 (1.5) | 305 (1.5) | | | | | | | |
| 2012 | 4 | 1 | 194 | 292 | 380 | 469 | | | | | | |
| 2012 | 4 | 16 | 183 (.2) | 346 (1.8) | 458 (2.7) | 501 (6.4) | | | | | | |
| 2011 | 5 | 1 | 157 | 288 | 379 | 465 | 490 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | 6 | 2 | 200 (32.4) | 352 (5.6) | 383 (5.9) | 442 (4.9) | 502 (5.5) | 521 (7.3) | | | | |
| 2009 | 7 | 1 | 224 | 316 | 393 | 421 | 510 | 582 | 609 | | | |
| Weighted Mean | | 163 | 237 | 298 | 346 | 488 | 501 | 541 | 609 | | | |

| Year Class | Age | N | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | 0 | 6 | | | | | | | | | | |
| 2015 | 1 | 16 | | | | | | | | | | |
| 2014 | 2 | 1 | | | | | | | | | | |
| 2014 | 2 | 2 | | | | | | | | | | |
| 2014 | 2 | 64 | | | | | | | | | | |
| 2013 | 3 | 2 | | | | | | | | | | |
| 2013 | 3 | 3 | | | | | | | | | | |
| 2013 | 3 | 48 | | | | | | | | | | |
| 2012 | 4 | 1 | | | | | | | | | | |
| 2012 | 4 | 16 | | | | | | | | | | |
| 2011 | 5 | 1 | | | | | | | | | | |
| 2010 | 6 | 2 | | | | | | | | | | |
| 2009 | 7 | 1 | | | | | | | | | | |
| Weighted Mean | | 163 | | | | | | | | | | |

## 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+ |
| 2016 | 259 | | | 203 (235) | 218 (25) | | | | | | |
| 2013 | 99 | 100 (1) | 163 (3) | 193 (7) | 211 (17) | 220 (45) | 224 (26) | | | | |
| 2010 | 101 | | 155 (94) | 211 (3) | 245 (3) | | 243 (1) | | | | |
| 2008 | 100 | 109 (2) | 151 (92) | 183 (4) | 184 (2) | | | | | | |

Species: Walleye

| | | Mean Length (expanded sample number) at capture by age | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | N | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10+ |
| 2016 | 16 | | 303 (8) | 309 (6) | 508 (2) | | | | | | |
| 2013 | 2 | | 324 (1) | 404 (1) | | | | | | | |
| 2010 | 12 | 216 (2) | 354 (1) | 378 (9) | | | | | | | |

## Fish Condition

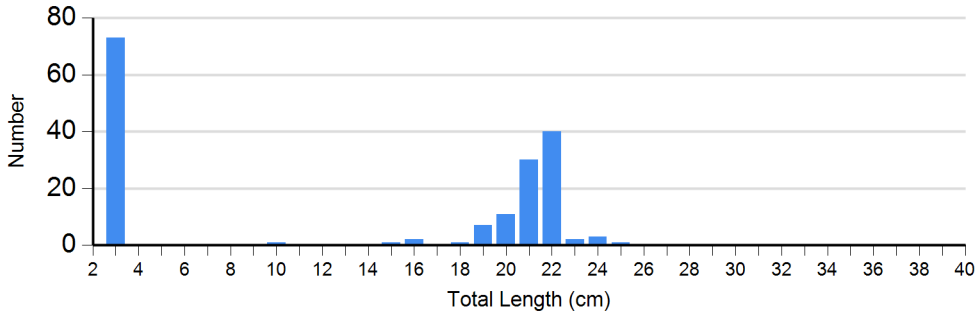
Mean relative weight (Wr) by sample size (N), length category stock to quality (S-Q), quality to preferred (Q-P), preferred to memorable (P-M), and memorable (M) for species collected across survey years with standard error (SE).

| | | 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 | 2013 | 11 | 95 (2.2) | 86 | 87 (0.6) | 1 | 82 | 0 | |
| | 2016 | 80 | 107 (1.6) | 179 | 98 (0.9) | 1 | 84 | 0 | |
| Northern Pike Gill Net | 2016 | 0 | | 1 | 74 | 0 | | 0 | |
| Walleye Gill Net | 2013 | 1 | 78 | 1 | 76 | 0 | | 0 | |
| | 2016 | 14 | 79 (1.3) | 1 | 67 | 1 | 72 | 0 | |

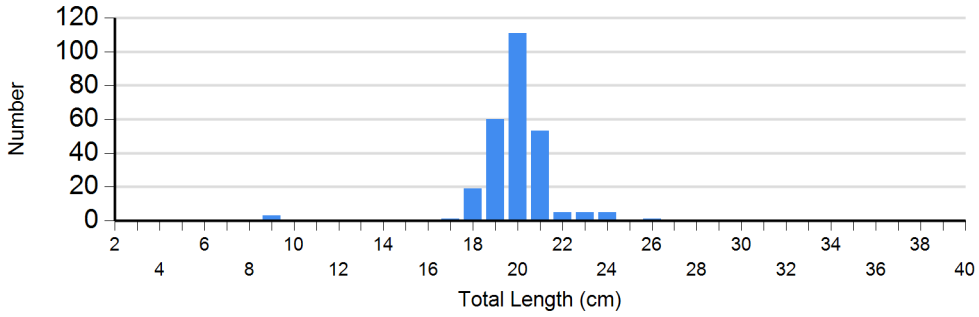
## Length Frequency Distribution

Length frequency histogram of species sampled by year.

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

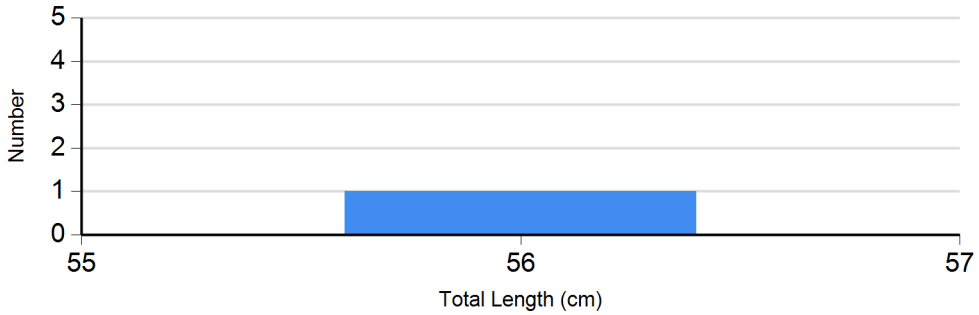



2013



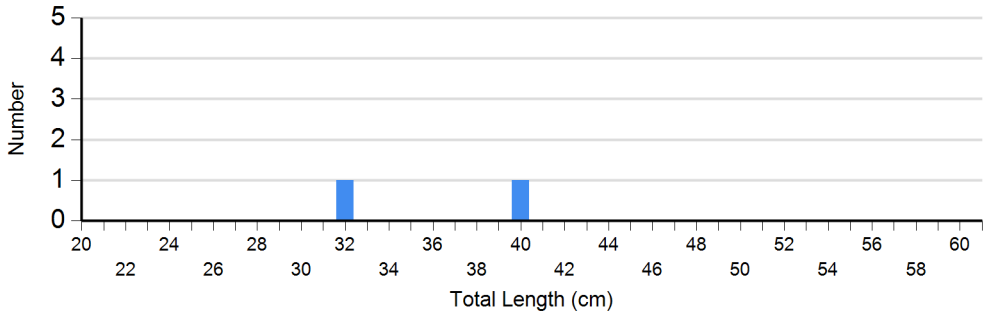

2016

Species: Northern Pike
Gear: std exp gill net

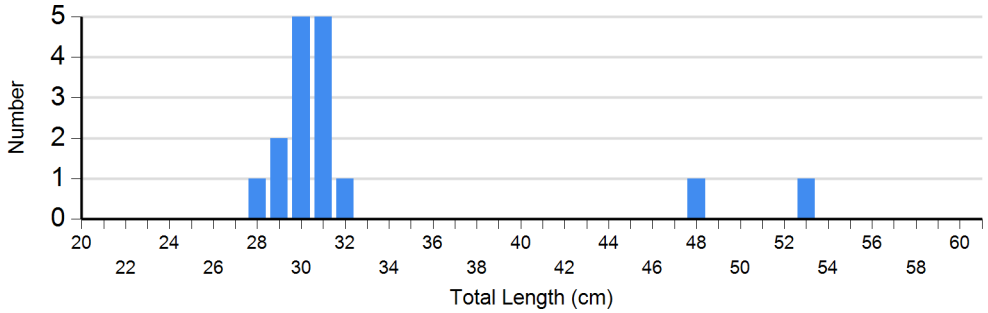



2016

Species: Walleye
Gear: std exp gill net




2013

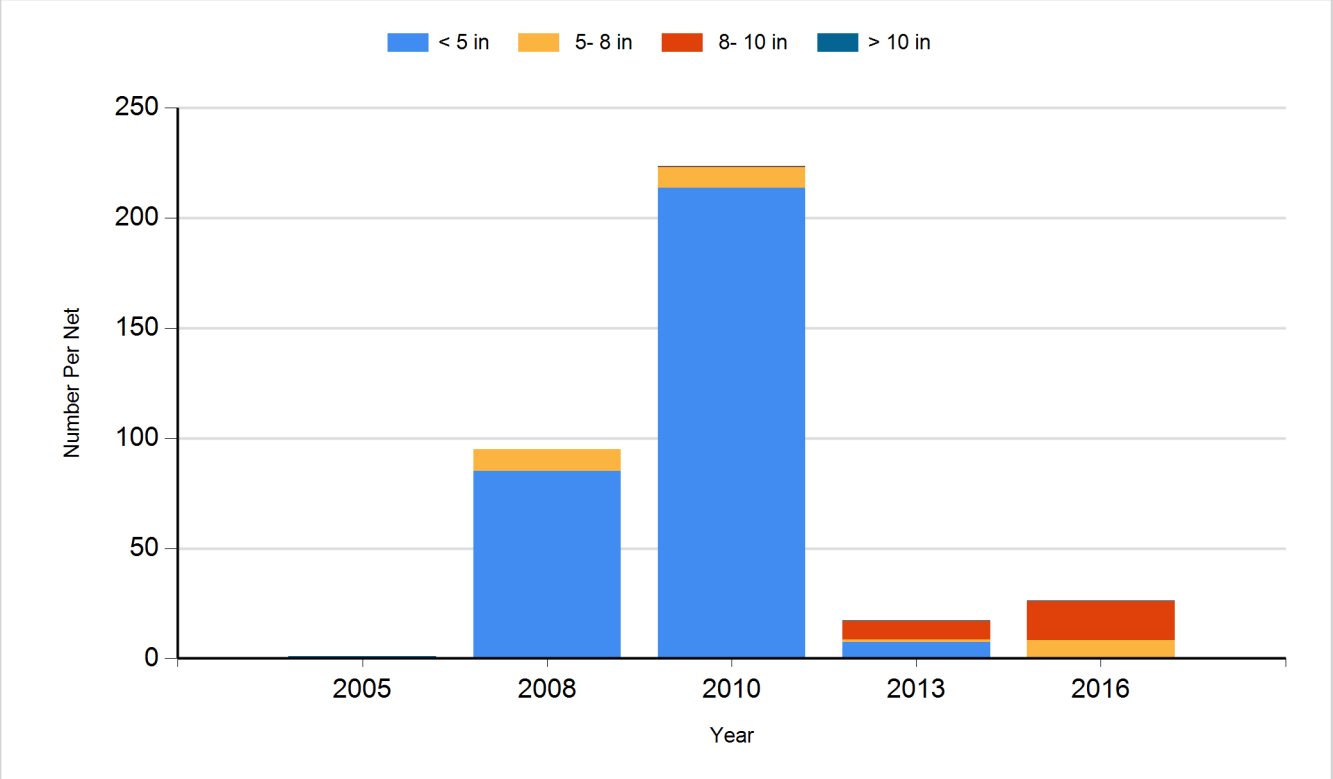

Number
5
4
3
2
1
0
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50
52
54
56
58
60
Total Length (cm)

2016

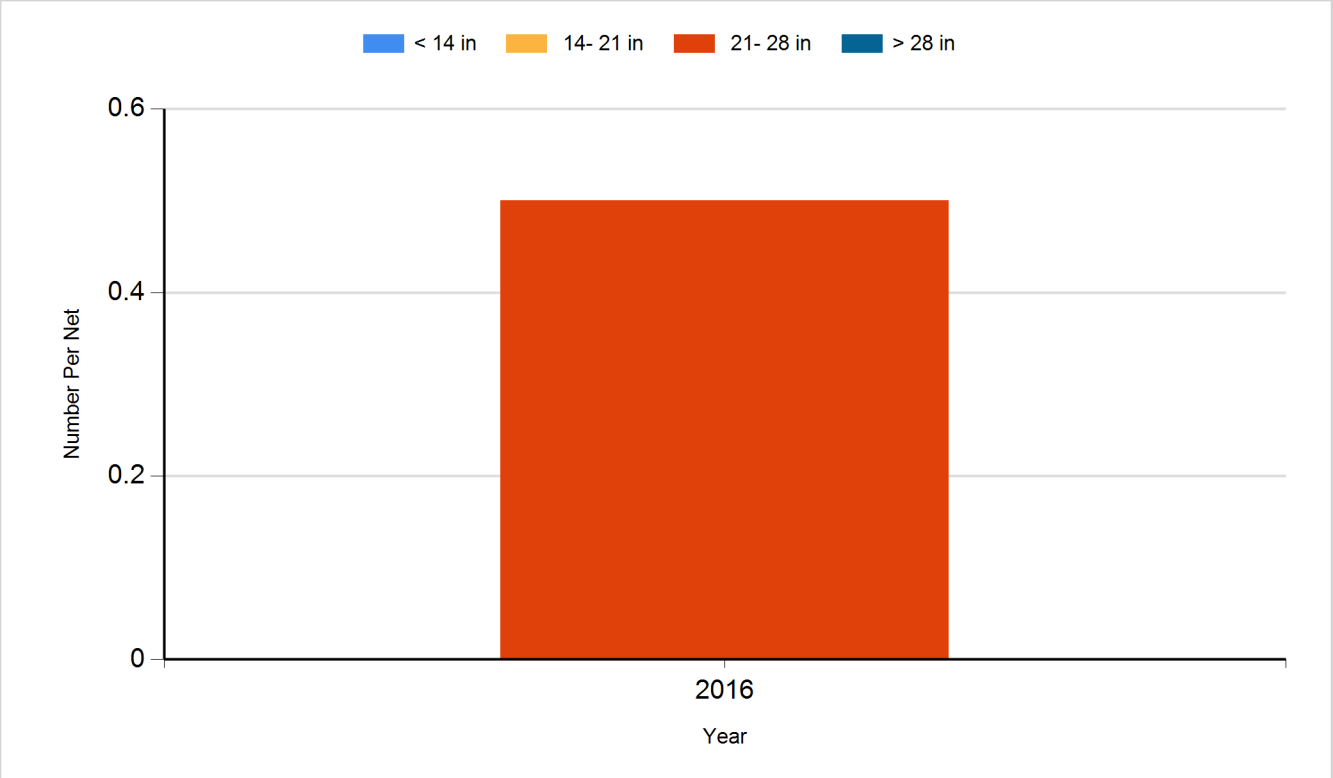
## Historic Fish Sizes and Relative Abundance

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

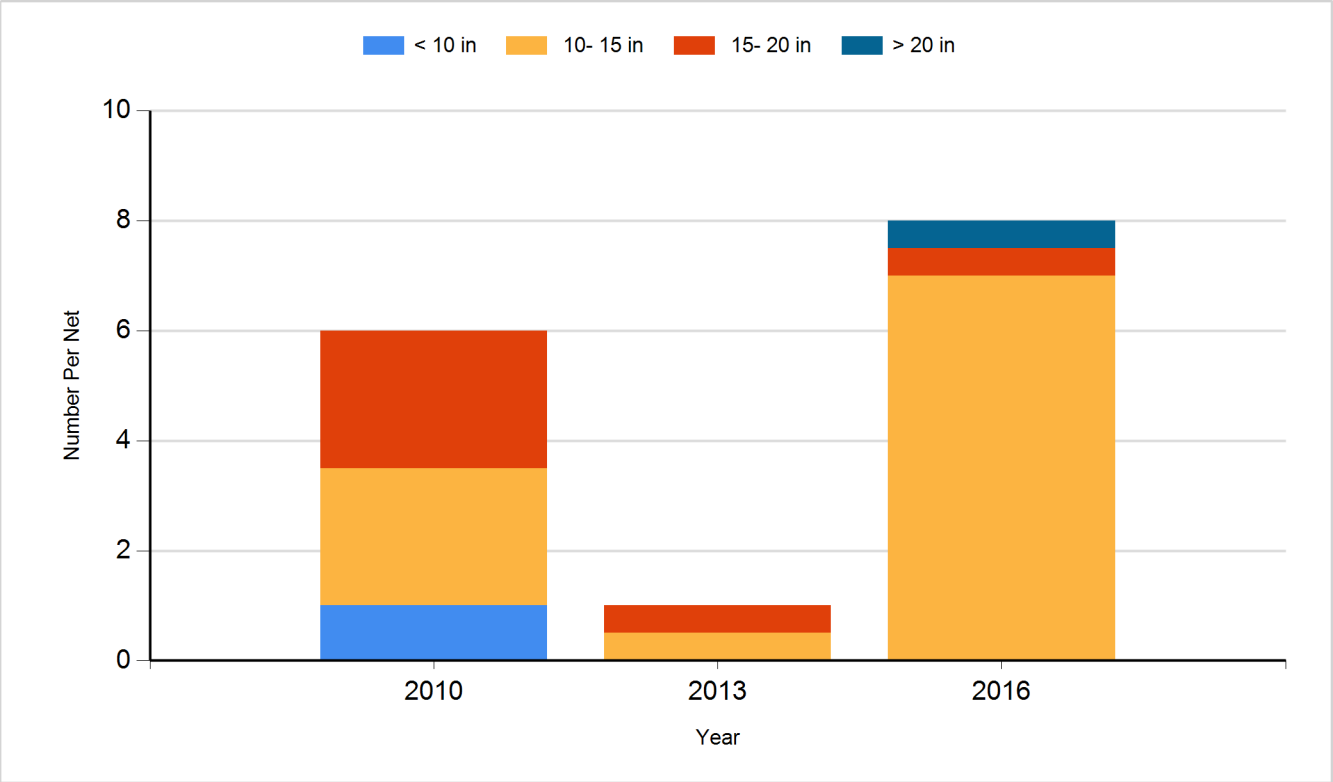
Species: Black Crappie
Gear: Frame Net




Species: Northern Pike
Gear: Gill Net



Species: Walleye
Gear: Gill Net



## Fish Stocking

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

| Year | Species | Size | Number |
|---|---|---|---|
| 2005 | Black Crappie | Adult | 31 |
| 2005 | Walleye | Fingerling | 2,505 |
| 2008 | Black Crappie | Adult | 36 |
| 2008 | Largemouth Bass | Juvenile | 34 |
| 2010 | Walleye | Small Fingerling | 14,980 |
| 2013 | Walleye | Large Fingerling | 1,144 |
| 2015 | Walleye | Large Fingerling | 900 |