

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY
Lower Missouri, Yankton County
LCL-Lake-73-001
2016

Lake Information

Name: Lower Missouri
County: Yankton
Surface Area: 21,121 Acres

Surveys and Investigations

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

| Gear | Date | Effort |
|--------------------|--------------|--------------|
| boat shocker (day) | May 25, 2016 | 3600 seconds |

Common Fish Species Present

Smallmouth Bass

Largemouth Bass

Burbot

American Eel

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).

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

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) |
| 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 |

| Species Name | Stock | | Quality | | Preferred | | Memorable | | Trophy | |
|-------------------------------|-------|------|---------|------|-----------|------|-----------|------|--------|------|
| | (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).

| Gear | Species | Abundance | | Stock Density Indices | | | Condition | | |
|--------------------|-----------------|-----------|-------|-----------------------|-------|-------|-----------|----|-------|
| | | CPUE | CI-80 | PSD | CI-80 | PSD-P | CI-80 | Wr | CI-80 |
| boat shocker (day) | American Eel | 0.0 | 0.0 | | | | | | |
| | Burbot | 1.0 | 1.9 | 0 | | 0 | | 70 | |
| | Largemouth Bass | 7.0 | 8.2 | 0 | | 0 | | 93 | 3 |
| | Smallmouth Bass | 21.0 | 13.1 | 19 | | 5 | | 97 | 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.

| Gear | Species | CPUE | | | | | | | | | | Avg |
|-----------------------|-----------------|------|------|------|------|------|------|------|------|------|------|------|
| | | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | |
| boat shocker (day) | American Eel | | | | | | | | | | 0.0 | 0.0 |
| | Burbot | | | | | | | | | | 1.0 | 1.0 |
| | Largemouth Bass | | | | | | 1.0 | | 0.0 | 0.0 | 7.0 | 2.0 |
| | Smallmouth Bass | 33.0 | 42.0 | 71.2 | | 51.0 | 20.0 | 26.0 | 40.0 | 10.1 | 21.0 | 34.9 |