

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-47

Name: Sully Lake **County(ies):** Sully
Legal Description: T114N-R78W-Sec. 2 & T115N-R78W-Sec. 35 & 36
GPS: 44°42'31.88"N 100°11'33.54"W
Location from nearest town: 5.5 miles west of Onida

Date of present survey: July 7-9, 2014 (netting)
Date of last survey: July 25-27, 2011 (netting)
Most recent lake management plan: F-21-R-39 (January 1, 2007 to December 31, 2011)
Management classification: Warmwater Marginal

| Primary Game Species | Secondary and Other Species |
|----------------------|-----------------------------|
| Northern Pike | Black Bullhead |
| Largemouth Bass | Walleye |
| Yellow Perch | Common Carp |
| Bluegill | Black Crappie |

PHYSICAL DATA

Surface Area: 205 acres **Watershed:** 81,280 acres
Maximum Depth: 10 feet **Mean Depth:** 5.5 feet
Lake elevation at time of survey (field observations): Full
Contour map: NA **Date:** NA

Ownership of lake and adjacent lakeshore properties:

Sully Lake is a 205-acre impoundment 5.5 miles west of Onida in central Sully County. The artificial lake was created in 1936 when the Works Progress Administration (WPA) completed construction of an earthen dam on Okobojo Creek. To allow for the construction of the dam, four public use easements to the State of South Dakota for the lake and a strip of land 12 feet above the high-water mark were recorded with the Sully County Register of Deeds from 1926 to 1930. In addition the Department of Game, Fish and Parks Purchased 3.89 acres of land on the southwest edge of the dam grade in 1929 which contains the fill of the impoundment.

Watershed condition with percentages of land use types:

The watershed of Sully Lake is approximately 81,280 acres or 131 square miles. Land use is estimated at 70% cultivated farmland consisting of small grains and row crops, and 30% native grasses utilized as hay or pastureland, land enrolled in the Conservation Reserve Program, farmsteads, tree belts and roads.

Fishing access:

Fishing at Sully Lake is pretty much confined to shorefishing as no boat ramp exists. Although, a small duck type boat could be launched in a few areas. Plus there is ample ice fishing opportunities.

Condition of all structures (i.e. spillway, boat ramps, level regulators, etc.):

The dam and spillway are in good shape. No other structures are found at Sully Lake.

Field observations of aquatic vegetation condition:

Submergent vegetation consists of dense areas of cattails, rushes and sedges around most of the shoreline. Emergent vegetation consists of multiple species of pondweeds and is forming very dense mats throughout the lake.

CHEMICAL DATA**Field observations of water quality and pollution problems:**

No pollution problems were evident at the time of the survey. Water clarity was fine with a secchi disc reading of 1.5 feet. Other water quality characteristics were measured in the field on July 7, 2014, using a HACH water quality kit and a Hanna multiparameter meter. Results are found in Table 1.

Presence of a thermocline and depth from surface: No
Station for water chemistry located on attached map: No

Table 1. Water chemistry results from Sully Lake, Sully County, July 27, 2014.

| Station | Depth (ft) | Temp (F) | DO (ppm) | CO2 (ppm) | ALK (mg/L) | HRD (mg/L) | pH | Cond. (μS/cm) | TDS (ppm) | Sal. | ORP | Secchi (ft) |
|---------|------------|----------|----------|-----------|------------|------------|------|---------------|-----------|------|--------|-------------|
| A | Surface | 76.9 | 4.80 | 90.6 | 262 | 325 | 8.31 | 1020 | 510 | 0.50 | -109.8 | 1.5 |
| A | 7.5 | 76.7 | 3.90 | 60.0 | 238 | 317 | 8.09 | 1024 | 512 | 0.50 | -115.5 | |

BIOLOGICAL DATA**Methods:**

Sully Lake was sampled on July 7-9, 2014, with ten overnight trap net sets. The trap nets have 3ft x 5ft frames, 60ft leads, and ¾ inch knotted mesh. Two experimental gill nets were also set. The gill nets are 150ft x 6ft with 25ft panels of ½, ¾, 1, 1-1/4, 1-1/2, and 2 inch monofilament mesh. No nighttime electrofishing was done during this survey period. Fish indices and statistics were completed using Winfin.

Results and Discussion:

Gill net catch

Table 2. Total catch of two, 150 ft. experimental gill nets at Sully Lake, Sully County, July 7-9, 2014.

| Species | # | % | CPUE | 80% C.I. | Mean CPUE* | PSD | RSD-P | Mean Wr |
|----------------|----|------|------|----------|------------|-----|-------|---------|
| Common Carp | 60 | 71.4 | 30.0 | ± 9.2 | 3.7 | 0 | 0 | 87 |
| Black Bullhead | 15 | 17.9 | 7.5 | ± 4.6 | 28.8 | 0 | 0 | 86 |
| Northern Pike | 7 | 8.3 | 3.5 | ± 1.5 | 17.9 | 100 | 0 | 107 |
| Yellow Perch | 2 | 2.4 | 1.0 | ± 3.1 | 9.5 | -- | -- | 104 |

* Five year mean (1984, 1994, 1995, 1998, 2011)

Trap Net Catch

Table 3. Total catch of ten, overnight ¾-inch frame nets at Sully Lake, Sully County, July 7-9, 2014.

| Species | # | % | CPUE | 80% C.I. | Mean CPUE* | PSD | RSD-P | Mean Wr |
|----------------|-------|------|-------|----------|------------|-----|-------|---------|
| Black Bullhead | 5,698 | 97.3 | 569.8 | ± 191.3 | 318.7 | 0 | 0 | 74 |
| Common Carp | 141 | 2.4 | 14.1 | ± 6.6 | 7.0 | 6 | 2 | 86 |
| Northern Pike | 9 | 0.2 | 0.9 | ± 0.3 | 5.8 | 43 | 0 | 108 |
| Yellow Perch | 7 | 0.1 | 0.7 | ± 0.5 | 1.7 | 71 | 29 | 98 |

* Eleven year mean (1963, 1970, 1984, 1986, 1989, 1994, 1995, 1998, 2001, 2009, 2011)

Yellow Perch

Sully Lake still contains a yellow perch population, although the numbers significantly decreased this survey. The trap net CPUE of 0.7 is below the 1.5 from the 2011 survey (Table 5) as well as the 1.7 eleven year mean (Table 3). The gill net CPUE of 1.0 is also below the 2.5 from the 2011 survey (Table 5) and the 9.5 five year mean (Table 2). No growth information was obtained this survey. Condition is good with a survey mean Wr of 101. Figures 1 and 2 illustrate the length frequency histograms for the fish sampled the last two surveys. Numerous yellow perch stockings have been done the last few years (Table 4), so hopefully the population will start to grow and make Sully Lake into a quality perch fishery.

Figure 1. Length frequency histogram for yellow perch sampled from Sully Lake, Sully County, 2014.

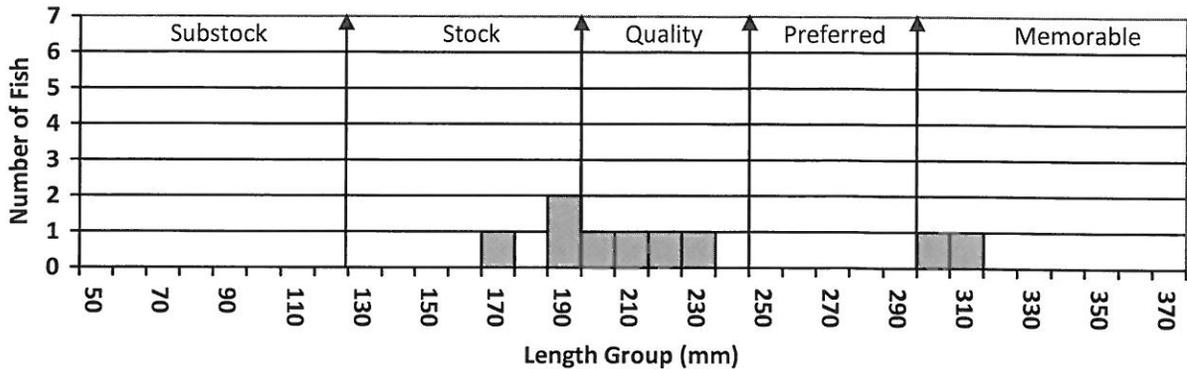
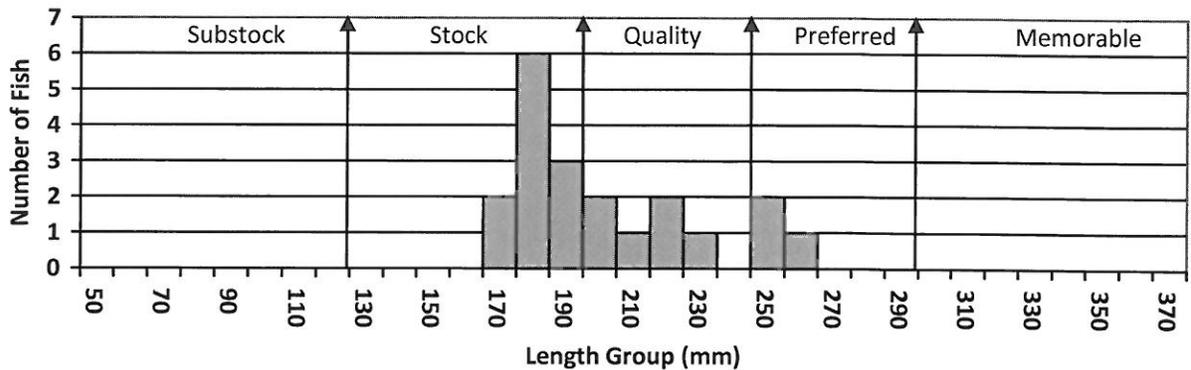


Figure 2. Length frequency histogram for yellow perch sampled from Sully Lake, Sully County, 2011.



Northern Pike

Sully Lake also contains a northern pike population. The trap net CPUE of 0.9 is below the 2.2 from the 2011 survey (Table 5) as well as the 5.8 eleven year mean (Table 3). The gill net CPUE of 3.5 is well below the 30.5 from the 2011 survey (Table 5) as well as the 17.9 five year mean (Table 2). Figures 3 and 4 illustrate the length frequency histograms for the last two surveys. The biggest change is that the population in 2011 was dominated by a group of young fish were as the 2014 population has a couple different size groupings. Condition is good with a survey mean Wr of 108.

Figure 3. Length frequency histogram for northern pike sampled from Sully Lake, Sully County, 2014.

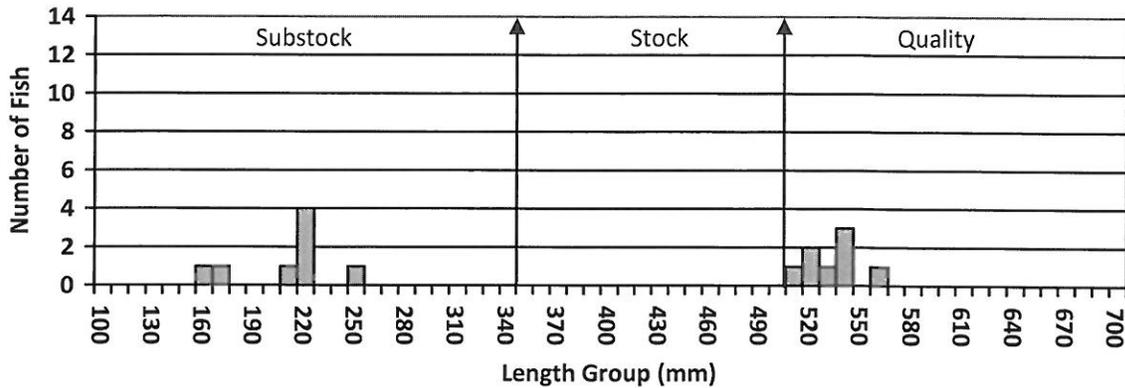
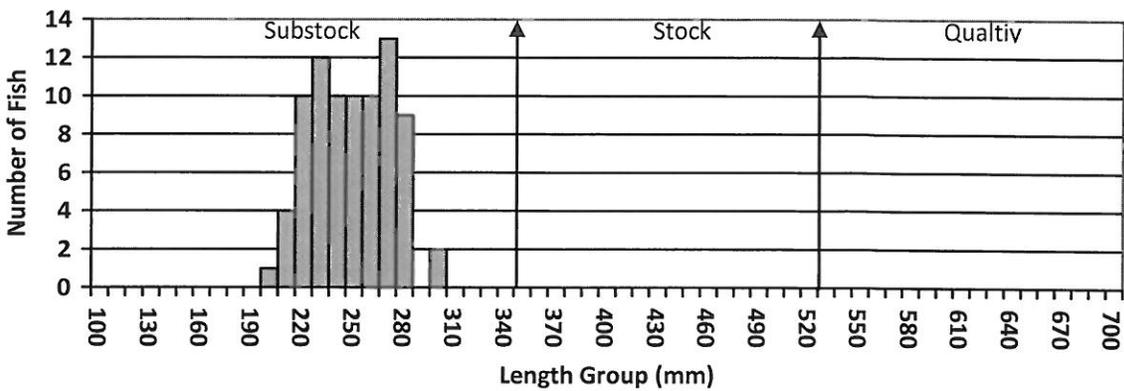


Figure 4. Length frequency histogram for northern pike sampled from Sully Lake, Sully County, 2011.



Other Species

Black bullheads were by far the most dominant species sampled this survey. The trap net CPUE of 569.8 is significantly above the 394.9 from the 2011 survey (Table 5) as well as the 318.7 eleven year mean (Table 3). The gill net CPUE of 7.5 is below the 12.0 from the 2011 survey (Table 5) as well as the 28.8 five year mean (Table 2). Figures 5 and 6 illustrate the length frequency histograms for the last two surveys. The biggest change is that the 2011 survey had a nice distribution of sizes with some that would potentially be of interest to anglers and the 2014 survey is dominated by fish of one size grouping. Hopefully this does not turn into stunted population. Condition is on the low side with a survey mean W_r of 80.

Figure 5. Length frequency histogram for black bullhead sampled from Sully Lake, Sully County, 2014.

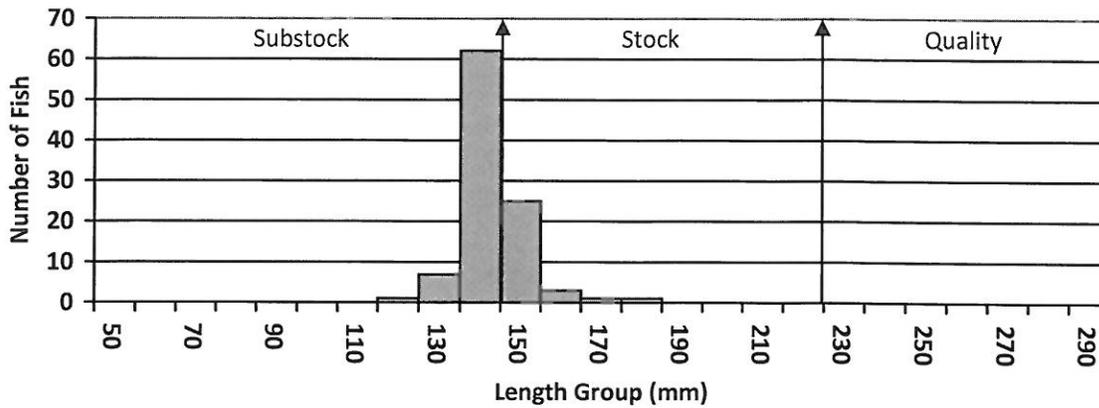
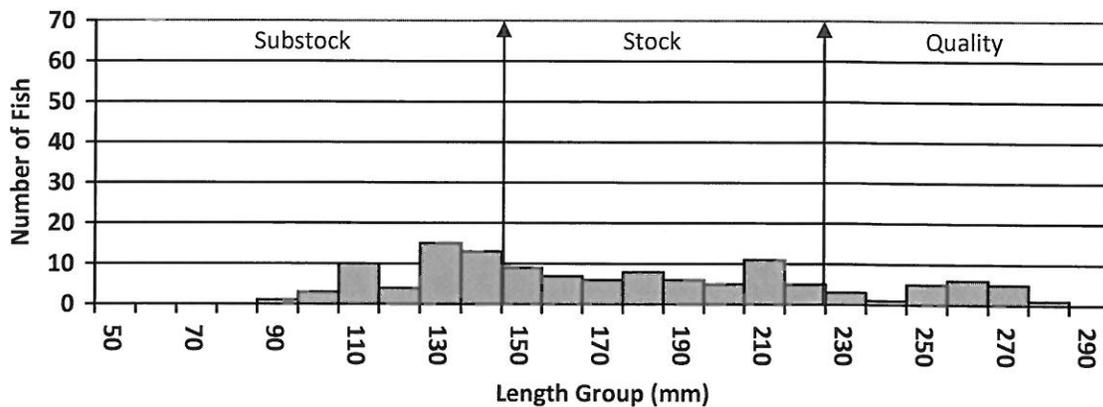


Figure 6. Length frequency histogram for black bullhead sampled from Sully Lake, Sully County, 2011.



Common carp were the next most abundant species sampled in Sully Lake this survey. The trap net CPUE of 14.1 is well below the 42.7 from the 2011 survey (Table 5), but above the 7.0 eleven year mean (Table 3). The gill net CPUE of 30.0 is well above the 10.5 from the 2011 survey (Table 5) as well as the 3.7 five year mean (Table 2). Figures 7 and 8 illustrate the length frequency histograms for the last two surveys. Not any really big changes over these two surveys. Condition is fine with a survey mean W_r of 87.

No other species were sampled this survey. Black crappie, largemouth bass, channel catfish, white sucker, walleye, bluegill and golden shiner were the species not sampled that have been in surveys past (Table 5).

Figure 7. Length frequency histogram for common carp sampled from Sully Lake, Sully County, 2014.

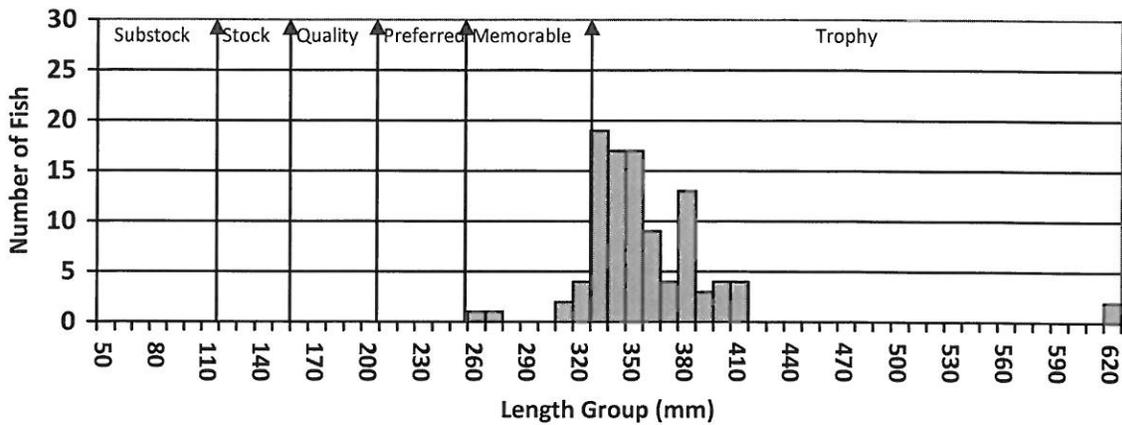


Figure 8. Length frequency histogram for common carp sampled from Sully Lake, Sully County, 2011.

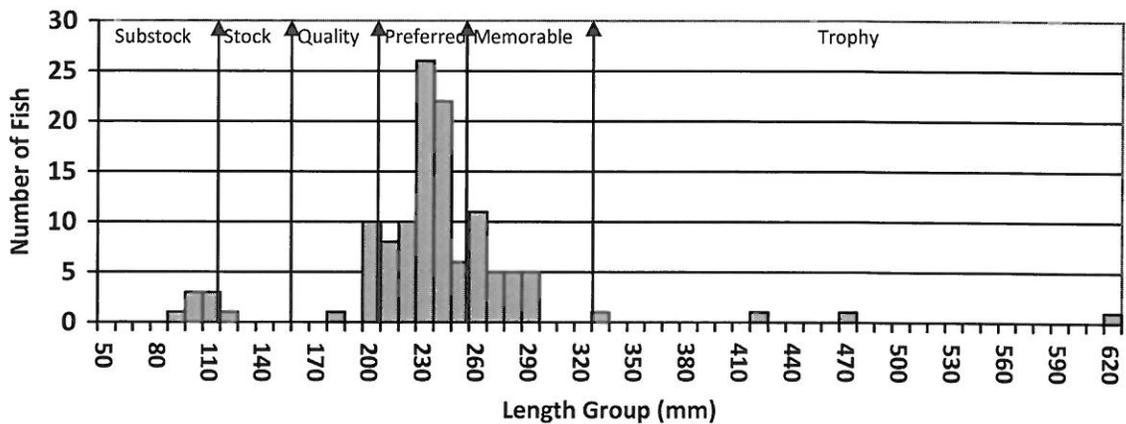


Table 4. Stocking records for the last ten years for Sully Lake, Sully County.

| Year | Number | Species | Size |
|------|--------|---------------|-------|
| 2007 | 210 | Yellow Perch | Adult |
| 2011 | 50 | Northern Pike | Adult |
| 2011 | 368 | Yellow Perch | Adult |
| 2014 | 250 | Yellow Perch | Adult |

RECOMMENDATIONS

1. Resurvey in 2017 to further monitor the fish populations.
2. Stock more adult northern pike to bolster the population.

Figure 5. Gill net (GN) and trap net (TN) CPUE for all fish species sampled in Sully Lake since surveys records began.

| Species | 1963 | 1970 | 1974 | 1976 | 1979 | 1984 | 1986 | 1989 | 1994 | 1995 | 1998 | 2001 | 2009 | 2011 | 2014 |
|----------|------|--------|-------|-------|-------|-------|------|------|-------|------|------|------|------|-------|-------|
| BLB (GN) | -- | -- | 16.0 | -- | -- | -- | -- | -- | 97.0 | 10.0 | 9.0 | -- | -- | 12.0 | 7.5 |
| BLB (TN) | 76.1 | 1928.6 | 124.6 | 109.9 | 195.4 | 124.3 | 14.8 | 72.0 | 465.4 | -- | -- | -- | -- | 394.9 | 569.8 |
| BLC (GN) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| BLC (TN) | -- | -- | -- | -- | 1.5 | -- | -- | 0.1 | 7.1 | -- | -- | -- | -- | -- | -- |
| YEP (GN) | -- | -- | 1.0 | -- | -- | 32.0 | 9.0 | 3.0 | -- | -- | -- | -- | -- | 2.5 | 1.0 |
| YEP (TN) | 4.9 | -- | -- | 1.1 | -- | 1.5 | 1.8 | 8.3 | -- | -- | -- | -- | -- | 1.5 | 0.7 |
| LMB (GN) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| LMB (TN) | 0.3 | -- | -- | -- | -- | 2.4 | -- | -- | 0.2 | -- | -- | -- | -- | -- | -- |
| NOP (GN) | -- | -- | 9.0 | -- | -- | 16.0 | 15.0 | 19.0 | -- | -- | -- | -- | -- | 30.5 | 3.5 |
| NOP (TN) | 25.5 | -- | 7.3 | 1.5 | 0.3 | 5.8 | 3.2 | 15.9 | 2.6 | -- | -- | -- | -- | 2.2 | 0.9 |
| CCF (GN) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| CCF (TN) | -- | -- | 0.3 | 0.3 | -- | -- | -- | 0.1 | -- | -- | -- | -- | -- | -- | -- |
| WHS (GN) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| WHS (TN) | -- | -- | -- | -- | -- | -- | -- | -- | 0.1 | -- | -- | -- | -- | -- | -- |
| WAE (GN) | -- | -- | -- | -- | -- | -- | -- | 4.0 | -- | -- | -- | -- | -- | -- | -- |
| WAE (TN) | -- | -- | -- | -- | -- | -- | -- | 2.9 | 1.1 | -- | -- | -- | -- | -- | -- |
| COC (GN) | -- | -- | -- | -- | -- | -- | -- | 8.0 | -- | -- | -- | -- | -- | 10.5 | 30.0 |
| COC (TN) | -- | -- | -- | -- | -- | -- | 0.2 | 29.9 | 3.9 | -- | -- | -- | -- | 42.7 | 14.1 |
| BLG (GN) | -- | -- | -- | -- | -- | 1.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| BLG (TN) | 9.6 | -- | -- | -- | 3.0 | 113.0 | 18.0 | -- | 0.7 | -- | -- | -- | -- | -- | -- |
| GOS (GN) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| GOS (TN) | -- | 1.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

BLB – Black Bullhead, BLC – Black Crappie, YEP – Yellow Perch, LMB – Largemouth Bass, NOP – Northern Pike, CCF – Channel Catfish, WHS – White Sucker, WAE – Walleye, COC – Common Carp, BLG – Bluegill, GOS – Golden Shiner