

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-47

Name: Campbell Lake

County: Campbell

Legal Description: T126N-R77W-Sec. 10, 11, & 15

Location from nearest town: 1 mile west, 2 miles north, and ½ mile west of Mound City

Date of present survey: June 2-4, 2014 (netting); October 1, 2014 (electrofishing)

Date of last survey: June 11-13, 2012 (netting); September 24, 2012 (electrofishing)

Most recent lake management plan: F-21-R-46 (January 1, 2014 to December 31, 2018)

Management classification: Warmwater Semi-Permanent

Primary Game Species	Secondary and Other Species
Largemouth Bass	Yellow Perch
Bluegill	Black Bullhead
Black Crappie	

PHYSICAL DATA

Surface Area: 40 acres

Watershed: 9,230 acres

Maximum Depth: 22 feet

Mean Depth: 9 feet

Lake elevation at time of survey (field observations): Full

Contour map: Yes

Date: 1985

Ownership of lake and adjacent lakeshore properties:

Lake Campbell is 40-acre impoundment that was created by the Works Progress Administration (WPA) in 1934 with the construction of an earthen dam and spillway on Olsen Creek. The lake derived its name from Campbell County who has ownership of 40 acres of land in Section 11 on which the dam and spillway are located. The remainder of the impoundment lies in sections 10 and 15 and is privately owned with a public use easement to the State of South Dakota for the lake and a 12-foot strip of land above the high water contour.

Watershed condition with percentages of land use types:

The watershed in Lake Campbell is approximately 9,230 acres or 14 ½ square miles that is almost entirely privately owned. Land use in the watershed is 60% cultivated agricultural land, 38% native grasses utilized for pasture and hay land and 2% farmsteads, roads, and tree belts.

Fishing access:

Most of the north shoreline has good fishing access with a boat ramp and a picnic area. Some other shoreline fishing exists around the lake that is limited by aquatic vegetation during the summer months.

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

The new boat ramp was built at Lake Campbell in fall of 2011. The dam is in good shape since the work was completed to repair the leaky spillway. An older vault toilet is also found at the boat ramp area.

Field observations of aquatic vegetation condition:

Emergent vegetation surrounds about 60% of the shoreline with cattails being the main species. Patches of submergent vegetation are found throughout the lake to depths of around 6-8ft and become more prominent in shallow water areas. Submergent vegetation is a mixture of pondweed species.

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 2.5 feet. Other water quality characteristics were measured in the field on June 2, 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: Yes

Table 1. Water chemistry results from Campbell Lake, Campbell County, June 2, 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	68.7	2.62	91.8	377	890	8.31	2631	1290	3.20	-257.0	2.5
A	18.0	60.2	0.28	112	350	874	7.39	--	1324	1.38	-336.0	

BIOLOGICAL DATA

Methods:

Campbell Lake was sampled on June 2-4, 2014, with ten overnight trap net sets. The trap nets have 3ft x 5ft frames, 60ft leads, and ¾ in. knotted mesh. No experimental gill nets were set during the current survey. On the evening of October 1, 2014, Campbell Lake was electrofished for 60 minutes (6-ten minute transects) to sample the largemouth bass population. The boat was set up with 120 pulses per second of DC current at 170 volts with around 29 amps to electrofish the lake that had a conductivity of 2744µS/cm with a water temperature of 59.8°F. Fish indices and statistics were completed using Winfin.

Results and Discussion:

Trap Net Catch

Table 2. Total catch of ten, overnight ¾-inch frame nets at Campbell Lake, Campbell County, June 2-4, 2014.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	6,320	94.3	632.0	± 153.0	77.9	17	0	89
Black Crappie	353	5.3	35.3	± 16.5	4.0	55	1	109
Yellow Perch	22	0.3	2.2	± 1.2	1.8	95	77	84
Common Carp	1	0.1	0.1	± 0.1	0.07	--	--	67

* Twenty-one year mean (1959, 1962-64, 1966, 1969, 1972, 1976, 1979, 1982-83, 1985, 1991, 1994-95, 1997, 1999, 2002, 2005, 2008, 2012)

Electrofishing Catch

Table 3. Total catch from six ten-minute runs of fall nighttime electrofishing on Campbell Lake, Campbell County, October 1, 2014.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Largemouth Bass	63	100	63.0	± 19.8	65.5	100	0	112

* Five year mean (1999, 2002, 2005, 2008, 2012)

Black Bullhead

Black bullhead numbers in Lake Campbell have jumped significantly since the last survey in 2012. The CPUE of 632.0 is well above the 69.1 from 2012 (Table 9) as well as the 77.9 twenty-one year mean (Table 2). Figures 1 through 6 illustrate the length frequency histograms for the last six surveys. With the predator species down the bullhead population had flourished. Condition is good with a mean Wr of 89. Some manual removal is on schedule over the next few years to attempt to get a head of this population as well as the stockings of more largemouth bass of various sizes to get their population reestablished.

Figure 1. Length frequency histogram for black bullhead sampled in Campbell Lake, Campbell County, 2014.

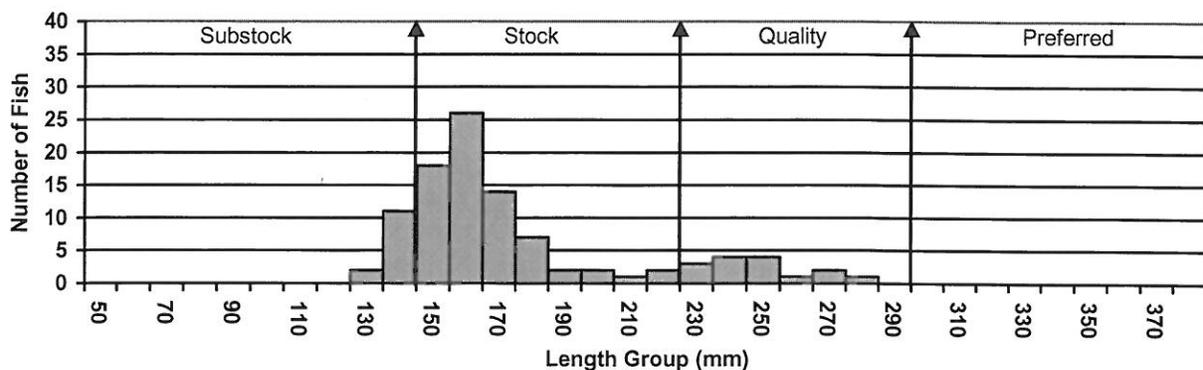


Figure 2. Length frequency histogram for black bullhead sampled in Campbell Lake, Campbell County, 2012.

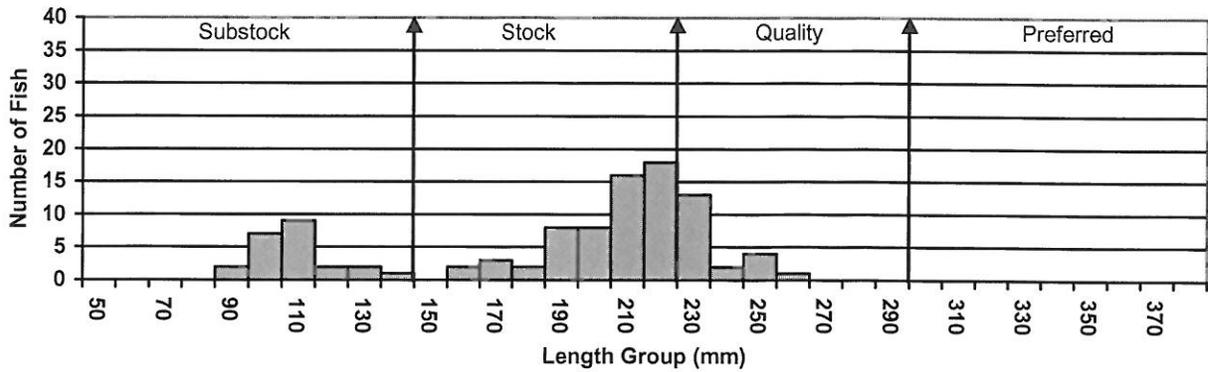


Figure 3. Length frequency histogram for black bullhead sampled in Campbell Lake, Campbell County, 2008.

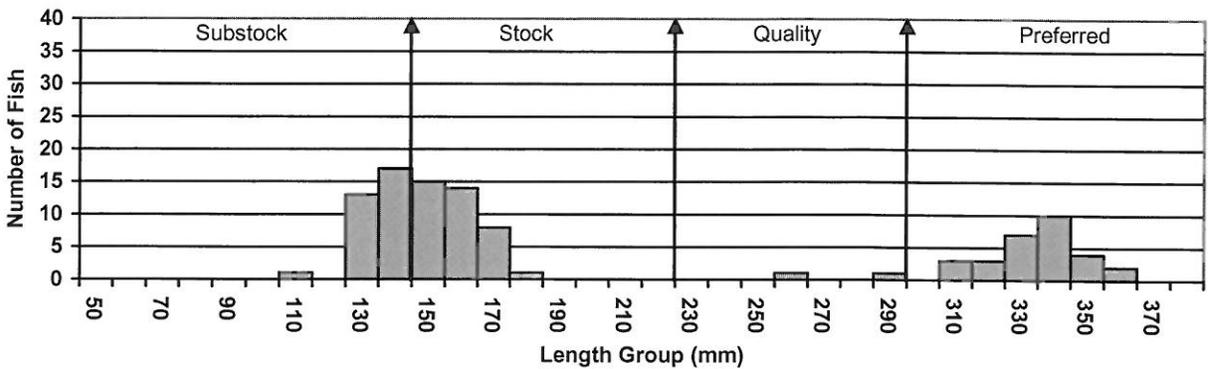


Figure 4. Length frequency histogram for black bullhead sampled in Campbell Lake, Campbell County, 2005.

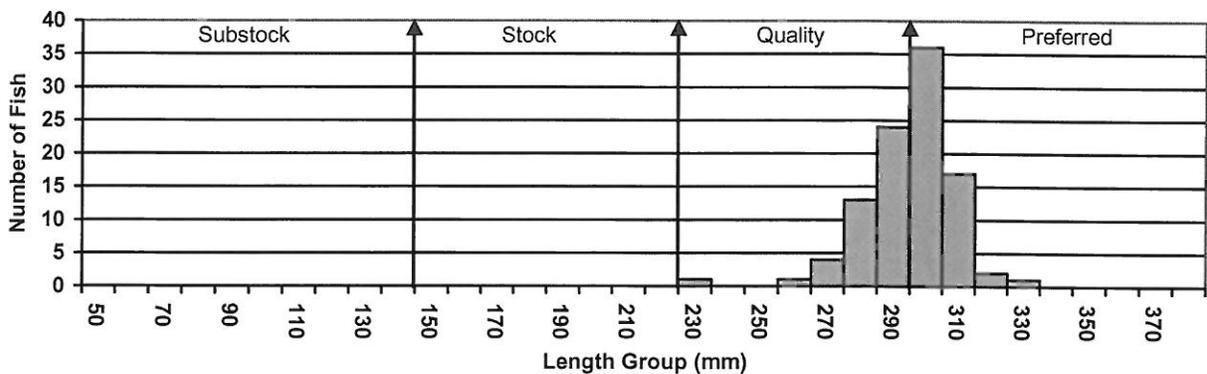


Figure 5. Length frequency histogram for black bullhead sampled in Campbell Lake, Campbell County, 2002.

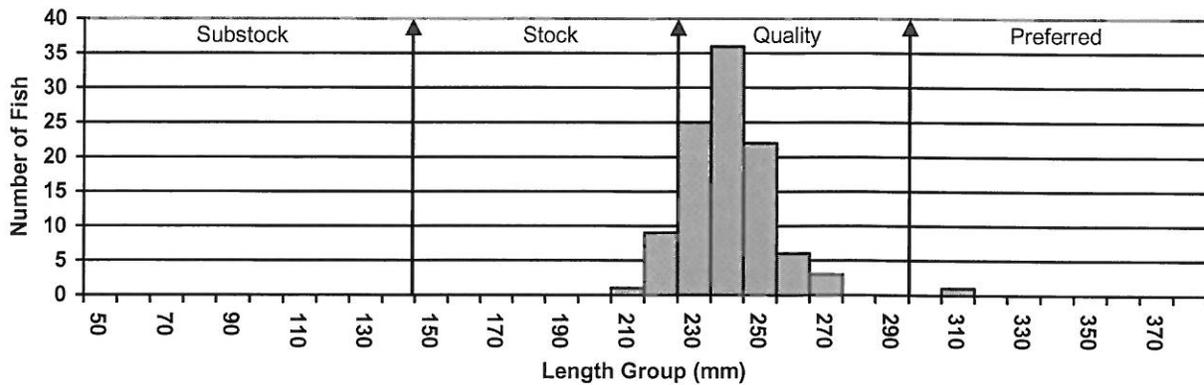
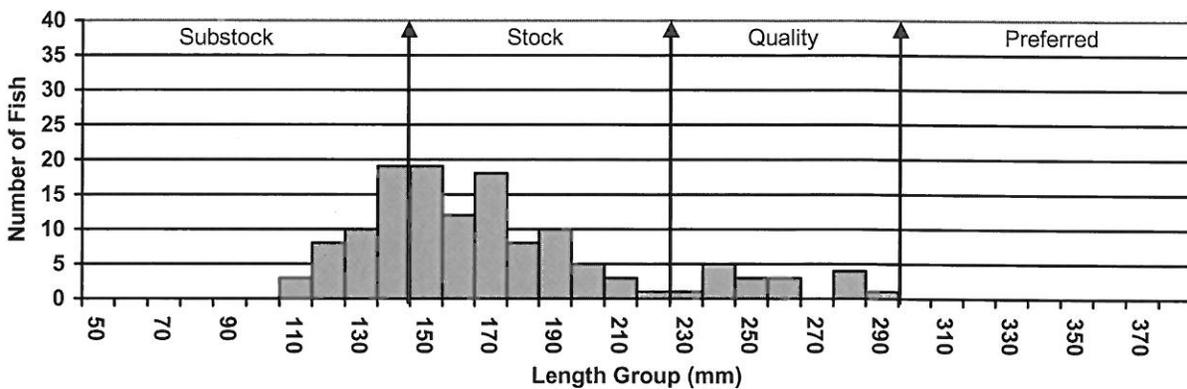


Figure 6. Length frequency histogram for black bullhead sampled in Campbell Lake, Campbell County, 1999.



Largemouth Bass

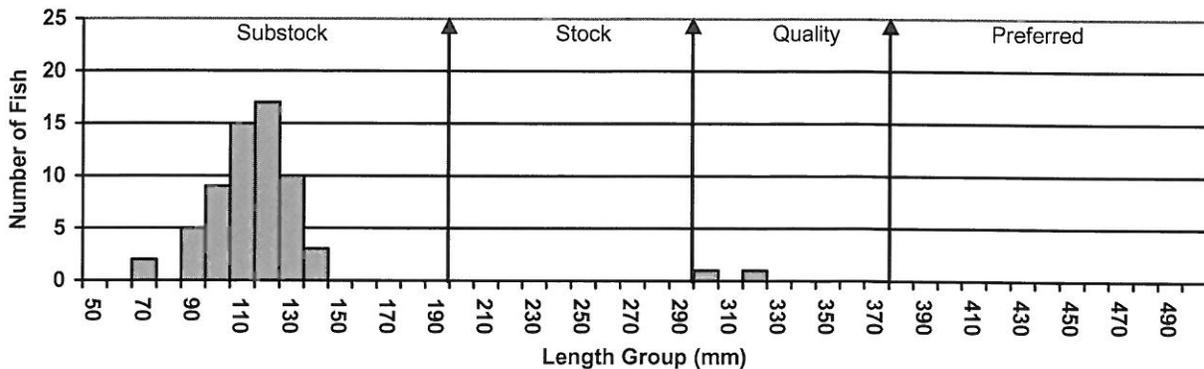
Largemouth bass numbers appear to be on the rebound with an increased density. The only kicker to this is that most of the fish sampled were stocked shortly before the fall electrofishing survey. The CPUE was 63.0 fish per hour of electrofishing which is well above the 8.4 from the 2012 survey. Figure 7 illustrates the length frequency histogram for the fish sampled this survey and this also illustrates that most of the fish sampled are all the same size and age. Table 4 shows the age of the two fish outside of the stocked group and their age was 1 year old. This population is lacking the adult component to have any natural reproduction. Additional stockings will continue to be made to get this population going in the right direction. An increase in bass will hopefully lead to a decrease in the bullhead population allowing for the other panfish species to benefit.

Table 4. Average back-calculated lengths (mm) for each age class of largemouth bass sampled from Lake Campbell, Campbell County, 2014.

Year Class	Age	N	Back-calculated Age
2013	1	2	195
All Classes		2	195
Statewide Mean			96
Region II Mean			105
SLI* Mean			99

*Small Lakes and Impoundments

Figure 7. Length frequency histogram for largemouth bass sampled in Campbell Lake, Campbell County, 2014.



Black Crappie

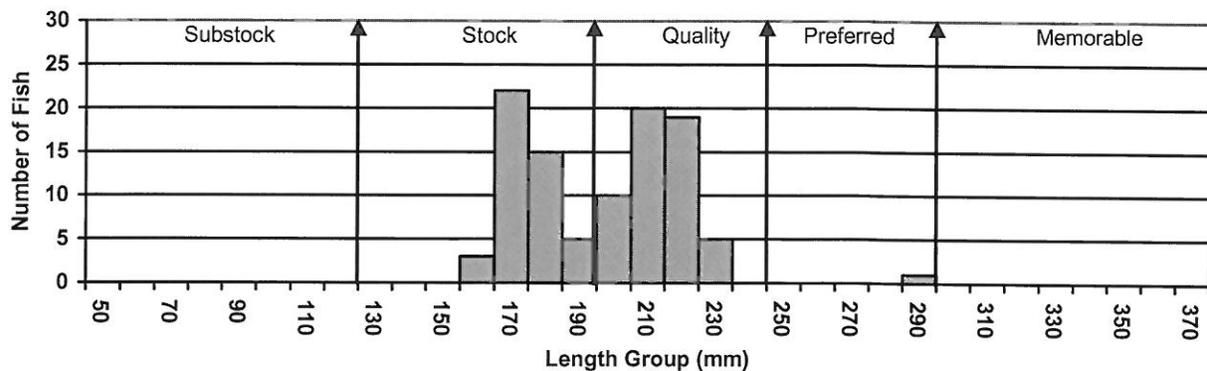
This is the second survey in a row that shows an increasing black crappie population in Lake Campbell. The CPUE of 35.3 is well above the 0.8 from 2012 (Table 9) as well as the 4.0 twenty-one year mean (Table 2). Growth is good with means at or above statewide, regional and SLI means (Table 5). Condition is also good with a mean Wr of 109. Figure 8 illustrates the length frequency histogram for the fish sampled this survey. Two different year classes have been produced, which should make for a good adult population to keep this population going. The increased black crappie population should also have an impact on the black bullhead population.

Table 5. Average back-calculated lengths (mm) for each age class of black crappie sampled from Lake Campbell, Campbell County, 2014.

Year Class	Age	N	Back-calculated Age				
			1	2	3	4	5
2012	2	99	105	195			
2009	5	1	96	181	234	271	295
All Classes		100	100	188	234	271	295
Statewide Mean			83	147	195	229	249
Region II Mean			75	132	177	209	235
SLI* Mean			78	134	180	209	226

*Small Lakes and Impoundment

Figure 8. Length frequency histogram for black crappie sampled in Campbell Lake, Campbell County, 2014.



Yellow Perch

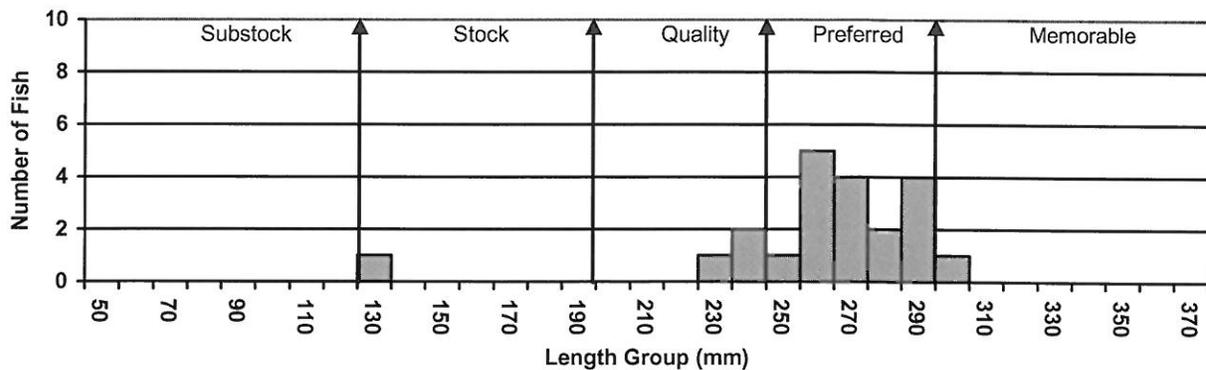
A small yellow perch population was also found this survey period. The CPUE of 2.2 is above the 0.1 from 2012 (Table 9) as well as slightly above the 1.8 twenty-one year mean (Table 2). Growth is good with means right around statewide, regional and SLI means (Table 6). Condition is also good with a mean Wr of 84. Figure 9 illustrates the length frequency histogram for the fish sampled this survey. These fish are getting to a size that would be desirable to anglers.

Table 6. Average back-calculated lengths (mm) for each age class of yellow perch sampled from Lake Campbell, Campbell County, 2014.

Year Class	Age	N	Back-calculated Age						
			1	2	3	4	5	6	
2013	1	1	129						
2011	3	4	113	191	247				
2010	4	5	93	158	223	264			
2009	5	12	73	112	170	225	266		
2008	6	1	76	117	179	196	266	298	
All Classes		23	97	145	205	229	266	298	
Statewide Mean			86	145	190	220	242		
Region II Mean			91	152	196	219	242		
SLI* Mean			87	142	185	205	219		

*Small Lakes and Impoundments

Figure 9. Length frequency histogram for yellow perch sampled in Campbell Lake, Campbell County, 2014.



Other species

Common carp were the only other species sampled this survey. Only 1 was caught so no inferences about the population can be made. White crappie, northern pike, channel catfish, walleye, bluegill, green sunfish, and golden shiner were the species not sampled this survey that have been in the past (Table 8 and9).

Table 7. Stocking records from 2007 to present for Campbell Lake.

Year	Number	Species	Size
2007	85	Largemouth Bass	Juvenile
2008	4,000	Largemouth Bass	Fingerling
2008	72	Largemouth Bass	Adult
2009	700	Largemouth Bass	Juvenile
2010	146	Bluegill	Adult
2010	211	Largemouth Bass	Juvenile
2010	210	Yellow Perch	Adult
2011	147	Channel Catfish	Adult
2011	110	Black Crappie	Adult
2012	300	Yellow Perch	Adult
2012	90	Black Crappie	Adult
2012	200	Largemouth Bass	Juvenile
2014	100	Channel Catfish	Juvenile
2014	1,000	Largemouth Bass	Large Fingerling
2014	1,260	Largemouth Bass	Fingerling
2014	100	Bluegill	Adult

RECOMMENDATIONS

1. Resurvey in 2016 to check the status of the fish populations.
2. Stock adult, juvenile, and fingerling largemouth bass to get a population established.
3. Stock bluegill to get a population established.
4. Stock yellow perch to get a population established.
5. Stock additional black crappie to supplement the population present.
6. Manual removal of black bullheads so they do not overpopulate and allow the other species to establish.

Table 8. Gill net (GN), trap net (TN) and electrofishing (EF) CPUE for all fish species sampled in Campbell Lake, Campbell County since survey data was recorded.

Species	1959	1962	1963	1964	1966	1969	1972	1976	1979	1982	1983	1985
BLB (GN)	--	--	--	--	--	--	--	--	6.0	160.0	--	--
BLB (TN)	1.88	--	--	--	--	214.5	0.7	44.1	12.3	85.6	428.9	313.0
BLC (GN)	--	--	--	--	--	--	--	--	--	--	--	--
BLC (TN)	84.0	--	--	--	--	--	--	--	--	--	--	--
WHC (GN)	--	--	--	--	--	--	--	--	--	--	--	--
WHC (TN)	--	--	--	--	--	--	--	--	--	--	--	--
YEP (GN)	--	--	--	--	--	--	--	--	4.0	3.0	--	--
YEP (TN)	9.13	--	--	--	--	0.3	0.3	1.88	0.75	--	0.6	0.96
LMB (EF)	--	--	--	--	--	--	--	--	--	--	--	--
LMB (GN)	--	--	--	--	--	--	--	--	--	--	--	--
LMB (TN)	--	--	--	--	--	--	--	--	--	--	--	0.04
NOP (GN)	--	--	--	--	--	--	--	--	1.0	--	--	--
NOP (TN)	0.38	--	2.5	1.6	0.2	--	0.5	0.38	--	--	0.13	0.29
CCF (GN)	--	--	--	--	--	--	--	--	--	--	--	--
CCF (TN)	0.38	--	--	--	--	--	--	--	--	--	--	--
WAE (GN)	--	--	--	--	--	--	--	--	--	--	--	--
WAE (TN)	0.13	--	--	--	1.0	3.7	--	--	--	--	--	--
COC (GN)	--	--	--	--	--	--	--	--	--	--	--	--
COC (TN)	1.38	--	--	--	--	--	--	--	--	--	--	--
BLG (GN)	--	--	--	--	--	--	--	--	--	--	--	--
BLG (TN)	--	5.3	50.0	66.0	27.4	0.4	--	1.63	--	0.12	5.0	24.7
GSF (TN)	--	--	--	--	--	--	--	--	--	--	--	--
GSF (GN)	--	--	--	--	0.6	--	--	--	--	--	--	--
GOS (GN)	--	--	--	--	--	--	--	--	--	--	--	--
GOS (TN)	0.38	--	--	--	--	--	--	--	--	--	--	--

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

Table 9. Gill net (GN), trap net (TN) and electrofishing (EF) CPUE for all fish species sampled in Campbell Lake, Campbell County since survey data was recorded.

Species	1991	1994	1995	1997	1999	2002	2005	2008	2012	2014
BLB (GN)	--	--	--	--	--	--	--	--	--	--
BLB (TN)	5.25	39.9	6.0	24.1	247.3	73.8	56.3	13.1	69.1	632.0
BLC (GN)	--	--	--	--	--	--	--	--	--	--
BLC (TN)	--	--	--	--	0.1	--	--	--	0.8	35.3
WHC (GN)	--	--	--	--	--	--	--	--	--	--
WHC (TN)	--	--	--	--	--	--	--	--	0.1	--
YEP (GN)	--	--	--	--	--	--	--	--	--	--
YEP (TN)	4.25	0.13	0.75	--	--	0.2	--	18.7	0.1	2.2
LMB (EF)	--	--	--	--	96.0	96.0	109	18	8.4	63.0
LMB (GN)	--	--	--	--	--	--	--	--	--	--
LMB (TN)	--	1.13	--	0.5	0.1	--	--	--	--	--
NOP (GN)	--	--	--	--	--	--	--	--	--	--
NOP (TN)	0.37	--	--	--	--	--	0.6	0.8	--	--
CCF (GN)	--	--	--	--	--	--	--	--	--	--
CCF (TN)	--	--	--	--	--	--	--	--	--	--
WAE (GN)	--	--	--	--	--	--	--	--	--	--
WAE (TN)	--	--	--	--	--	--	--	--	--	--
COC (GN)	--	--	--	--	--	--	--	--	--	--
COC (TN)	--	--	--	--	--	--	--	--	--	0.1
BLG (GN)	--	--	--	--	--	--	--	--	--	--
BLG (TN)	5.12	1.13	--	0.25	148.3	17.4	15.4	56.1	--	--
GSF (TN)	--	--	--	--	--	--	--	--	--	--
GSF (GN)	--	--	--	--	--	--	--	--	--	--
GOS (GN)	--	--	--	--	--	--	--	--	--	--
GOS (TN)	--	--	--	--	--	--	--	--	--	--

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