

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-47

Name: Lake Hiddenwood
Legal Description: T124N-R76W-Sec. 23
Location from nearest town: 2 miles east, 3 miles north and ¾ mile east of Selby

County(ies): Walworth
GPS: 45°32'45.99"N 99°58'41.43"W

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-41 (January 1, 2009 to December 31, 2013)
Management classification: Warmwater Semi-permanent

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

PHYSICAL DATA

Surface Area: 28 acres
Maximum Depth: 17 feet
Lake elevation at time of survey (field observations): Full
Contour map: No

Watershed: 20,340 acres
Mean Depth: 8 feet
Date: NA

Ownership of lake and adjacent lakeshore properties:

Lake Hiddenwood is a 28-acre impoundment located 3 miles north and 2.5 miles east of Selby in northeastern Walworth County. The lake was created in 1926 under the direction of the Walworth County Highway Department. It was later agreed that the Department of Game, Fish and Parks would buy the already flooded land, reimburse the County for construction of the dam grade, and manage the fishery. A group of citizens, the Hiddenwood Lake Association and a couple other individuals all sold, dedicated or allowed easements around the lake to create the now 320 acre State Park around Lake Hiddenwood. A more detailed description of this can be found in the management plan.

Watershed condition with percentages of land use types:

Lake Hiddenwood has a watershed of 20,340 acres or approximately 31.7 square miles. The watershed is located primarily to the east with a small portion south of the lake. The immediate shoreline is wooded land on steep slopes within a State Recreation Area. The remainder of the watershed is nearly 80% cultivated cropland, 18% native grasses utilized as pasture or hayland, and 2% roads, residences and farmyards.

Fishing access:

There is ample fishing access at Lake Hiddenwood. The shoreline is fishable around most of the lake and backwaters. A boat ramp also exists at the lake for docking all sizes of boats. There is also ample opportunity for ice fishing.

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

The dam, spillway, boat ramp and other facilities are in excellent condition.

Field observations of aquatic vegetation condition:

The emergent vegetation is primarily cattails and is found around about 70% of the shoreline. There is some submergent vegetation found in areas throughout the lake and consists of mainly pondweed species. The creek arm contains a very dense mat of submergent vegetation during the summer months.

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

No pollution problems were evident at the time of the survey. Water clarity was good with a secchi disc reading of 8.0 feet. Other water quality measurements 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 Lake Hiddenwood, Walworth County, June 2, 2014.

Station	Depth (ft)	Temp (F)	DO (ppm)	CO ₂ (ppm)	ALK (mg/L)	HRD (mg/L)	pH	Cond (μS/cm)	TDS (ppm)	Sal.	ORP	Secchi (ft)
A	Surface	69.7	3.80	64.0	279	570	8.78	1218	611	0.61	-265.2	8.0
A	15.0	61.9	0.00	94.8	307	651	8.21	1440	706	0.71	-483.0	

BIOLOGICAL DATA**Methods:**

Lake Hiddenwood was sampled on June 2-4, 2014, using ten overnight trap nets. The trap nets have 3ft x 5ft frames, 60ft leads, and ¾ inch knotted mesh. No experimental gill nets were set during this survey period. On the evening of October 1, 2014, Hiddenwood Lake was electrofished for 50 minutes (5-ten minute transects) to sample the largemouth bass population. The boat was set at 120 pulses per second of DC current at 340 volts with around 16 amps to electrofish the lake that had a conductivity of 1321 μS/cm with a water temperature of 60.6°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 Lake Hiddenwood, Walworth County, June 2-4, 2014.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	837	86.5	83.7	± 31.5	220.9	23	0	90
Yellow Perch	91	9.4	9.1	± 3.8	70.5	24	11	95
White Sucker	23	2.4	2.3	± 1.8	11.3	87	22	89
Black Crappie	16	1.7	1.6	± 1.1	30.2	100	100	86
Northern Pike	1	0.1	0.1	± 0.1	0.3**	--	--	101

* Seven year mean (1998, 2000, 2001, 2004, 2007, 2010, 2012)

** Two year mean (2010, 2012, first year sampled since 1988)

Electrofishing Catch

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

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Largemouth Bass	80	100	96.0	± 18.4	125.2	9	0	128

* Seven year mean (1998, 2000, 2001, 2004, 2007, 2010, 2012)

Largemouth Bass

The largemouth bass population in Lake Hiddenwood seems to still be somewhat of a question mark in the lake. The fall electrofishing CPUE of 96.0 fish per hour is well below the 196.5 from the 2012 survey (Table 6) and is below the 125.2 seven year mean (Table 3). Figures 1 through 8 illustrate the length frequency histograms for the last eight surveys. They really show the up and down trend of this population. They also show young fish are being produced and introduced into the population, but no recruitment is taking place. Not sure what is causing the young fish to disappear before they get to larger sizes. Growth is good with means right on with statewide, regional and SLI means (Table 4). Condition is also good with a mean Wr of 128. Several stockings have been made to try and help jump start this population with little to no success for the long term. Added surveys and stockings will continue until there is confidence of an established population.

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

Year Class	Age	N	Back-calculated Age	
			1	2
2013	1	41	111	
2012	2	2	95	207
All Classes		43	103	207
Statewide Mean			96	182
Region II Mean			105	183
SLI* Mean			99	183

* Small Lakes and Impoundments

Figure 1. Length frequency histogram for largemouth bass sampled from Lake Hiddenwood, Walworth County, 2014.

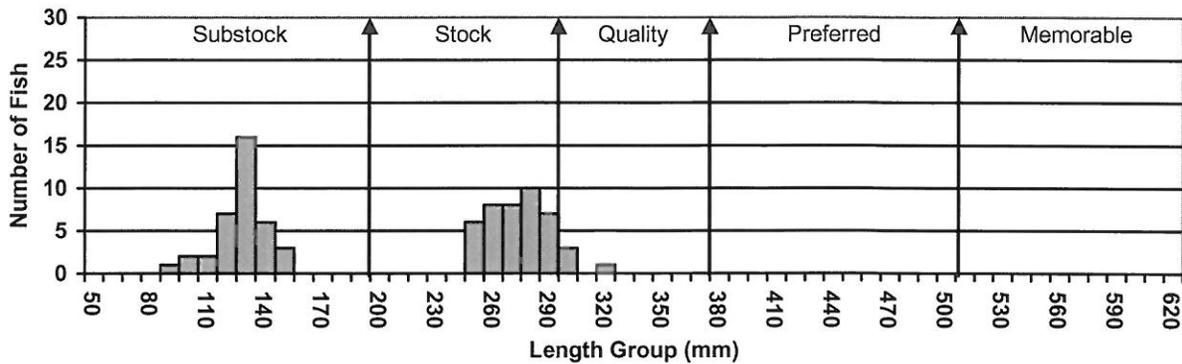


Figure 2. Length frequency histogram for largemouth bass sampled from Lake Hiddenwood, Walworth County, 2012.

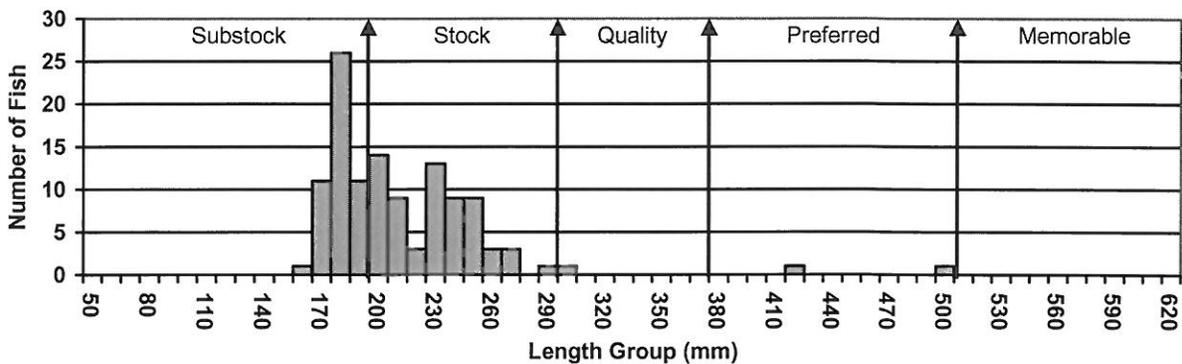


Figure 3. Length frequency histogram for largemouth bass sampled from Lake Hiddenwood, Walworth County, 2010.

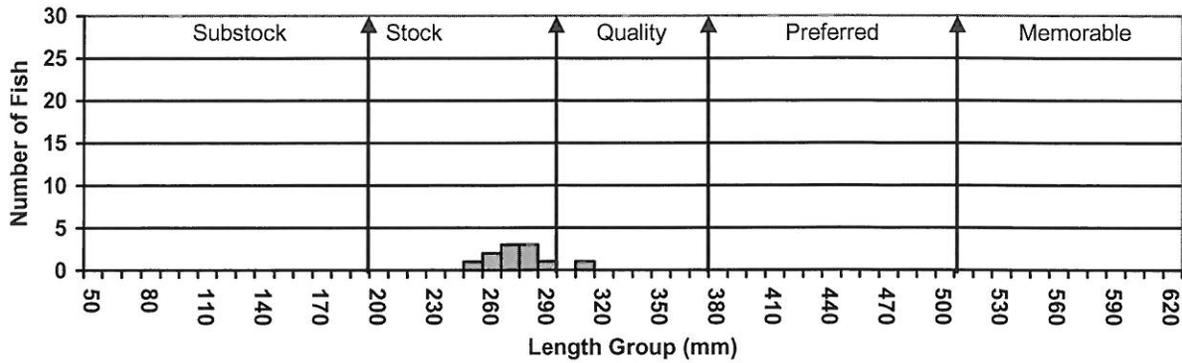


Figure 4. Length frequency histogram for largemouth bass sampled from Lake Hiddenwood, Walworth County, 2007.

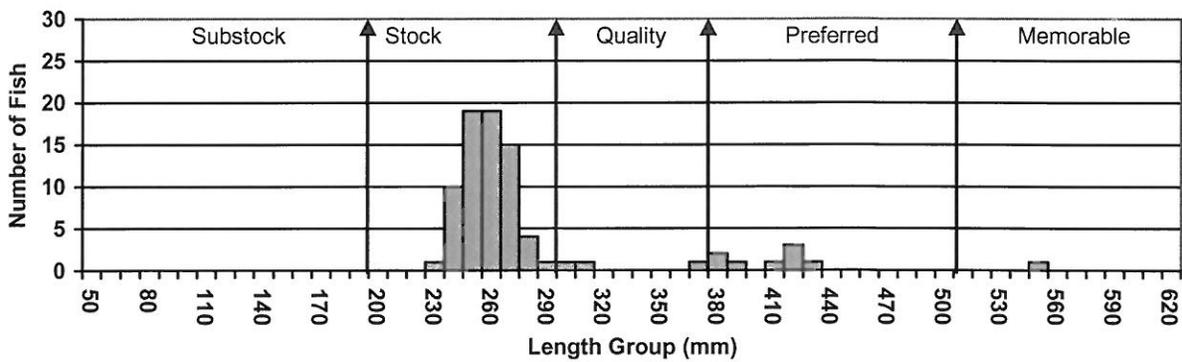


Figure 5. Length frequency histogram for largemouth bass sampled from Lake Hiddenwood, Walworth County, 2004.

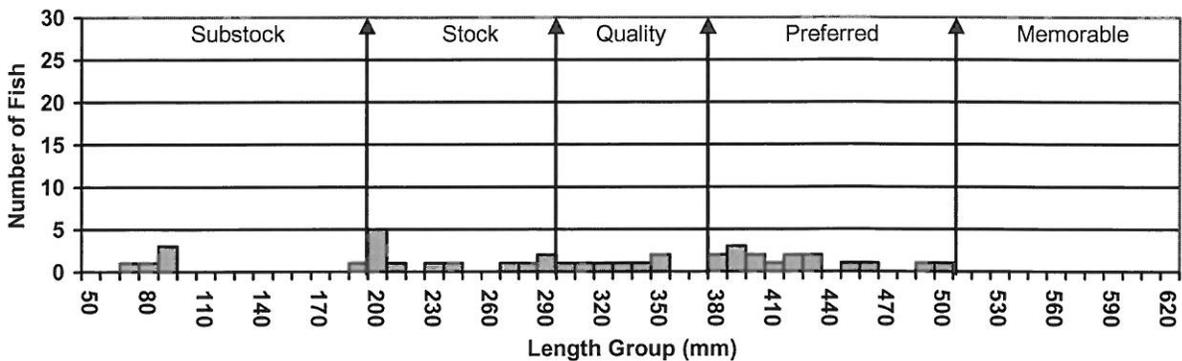


Figure 6. Length frequency histogram for largemouth bass sampled from Lake Hiddenwood, Walworth County, 2001.

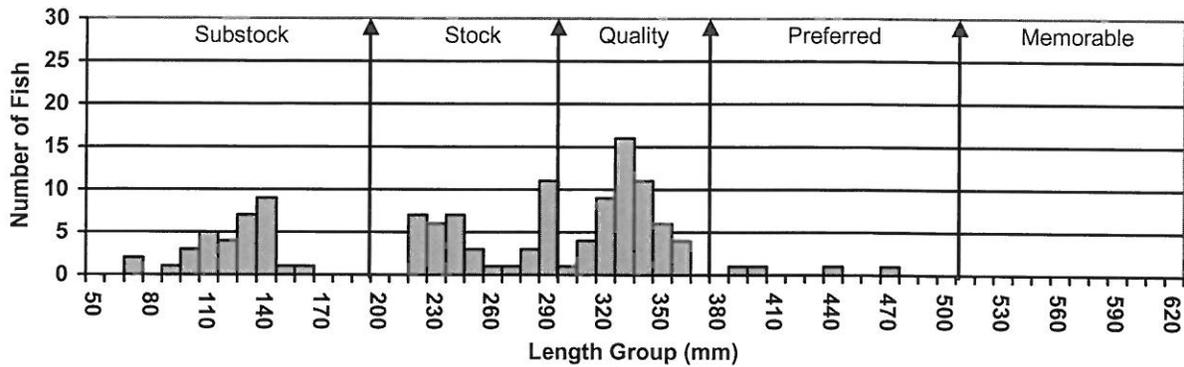


Figure 7. Length frequency histogram for largemouth bass sampled from Lake Hiddenwood, Walworth County, 2000.

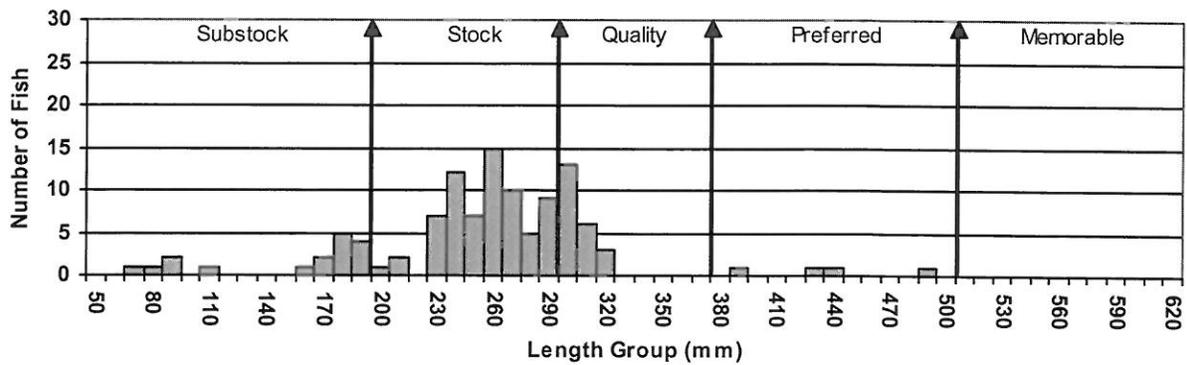
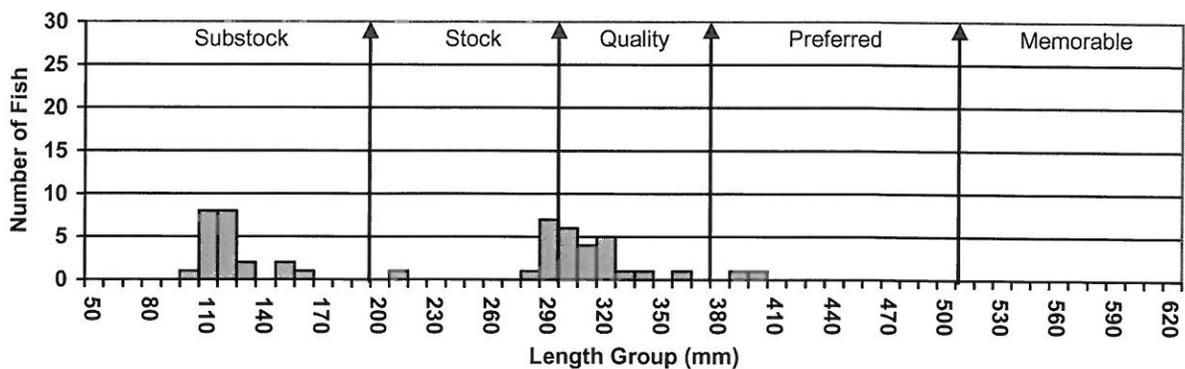


Figure 8. Length frequency histogram for largemouth bass sampled from Lake Hiddenwood, Walworth County, 1998.



Black Crappie

Lake Hiddenwood continues to contain a very low density black crappie population. The CPUE of 1.6 is below the 3.5 from the 2012 survey (Table 6), but is well below the 30.2 seven year mean (Table 2). Tables 9 through 16 illustrate the length frequency histograms for the fish sampled over the last eight surveys. They show the changes over time and show that a low density population and about one year class is found in the lake and is move up in size over the course of the last three surveys. Condition is fine with a mean Wr of 86. One positive is that the fall electrofishing survey for bass revealed that a good year class of young fish was produced this summer, so hopefully this is a start to rebuilding this population.

Figure 9. Length frequency histogram for black crappie sampled from Lake Hiddenwood, Walworth County, 2014.

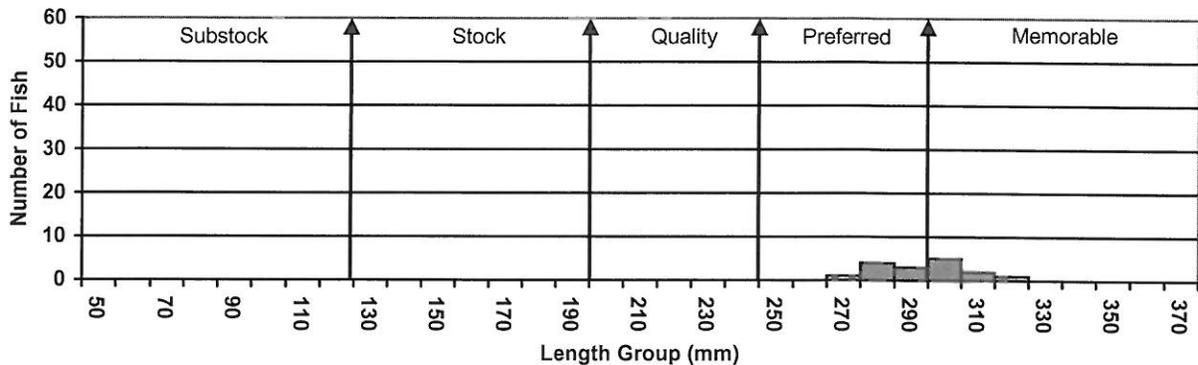


Figure 10. Length frequency histogram for black crappie sampled from Lake Hiddenwood, Walworth County, 2012.

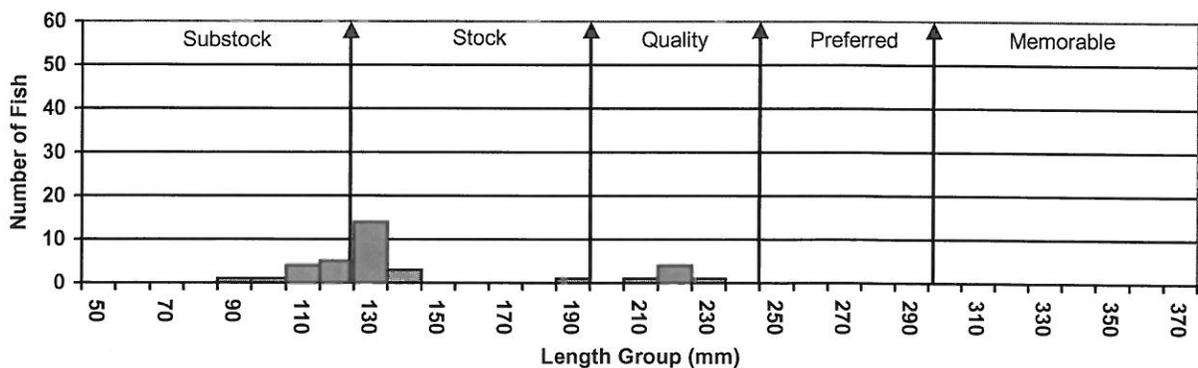


Figure 11. Length frequency histogram for black crappie sampled from Lake Hiddenwood, Walworth County, 2010.

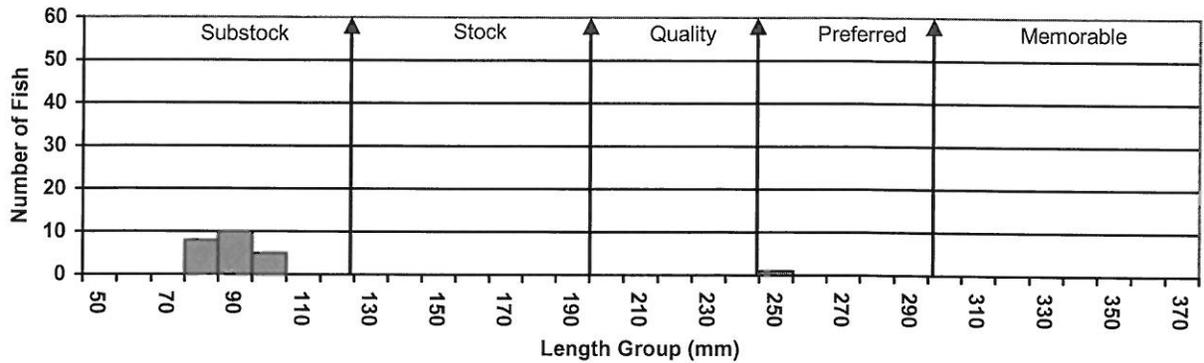


Figure 12. Length frequency histogram for black crappie sampled from Lake Hiddenwood, Walworth County, 2007.

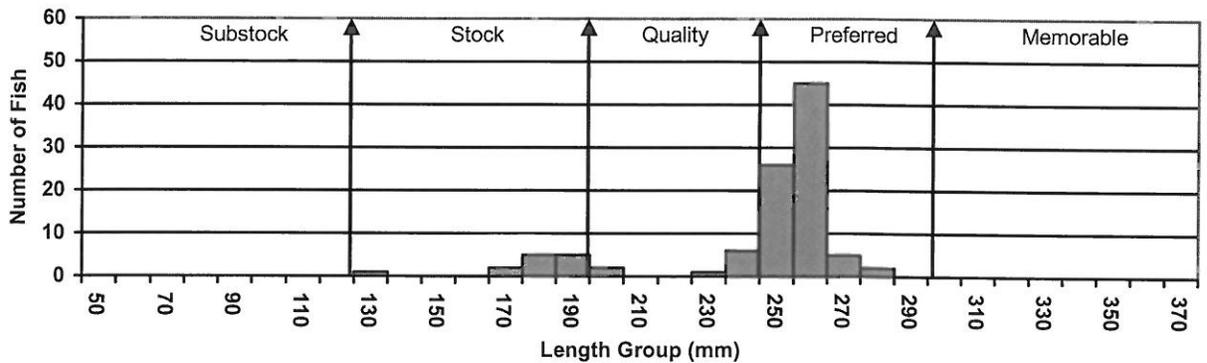


Figure 13. Length frequency histogram for black crappie sampled from Lake Hiddenwood, Walworth County, 2004.

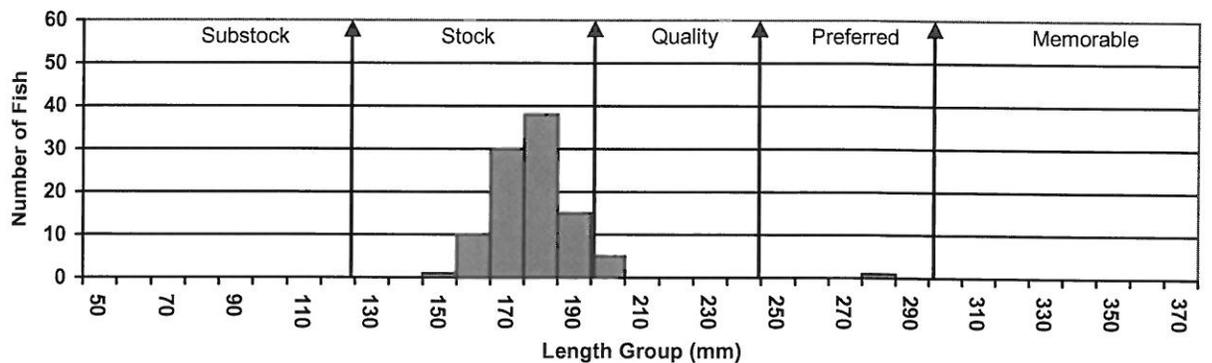


Figure 14. Length frequency histogram for black crappie sampled from Lake Hiddenwood, Walworth County, 2001.

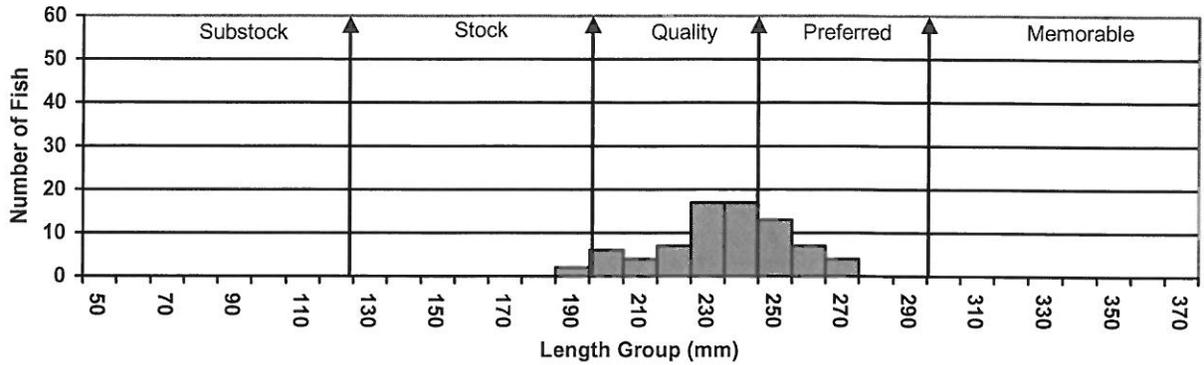


Figure 15. Length frequency histogram for black crappie sampled from Lake Hiddenwood, Walworth County, 2000.

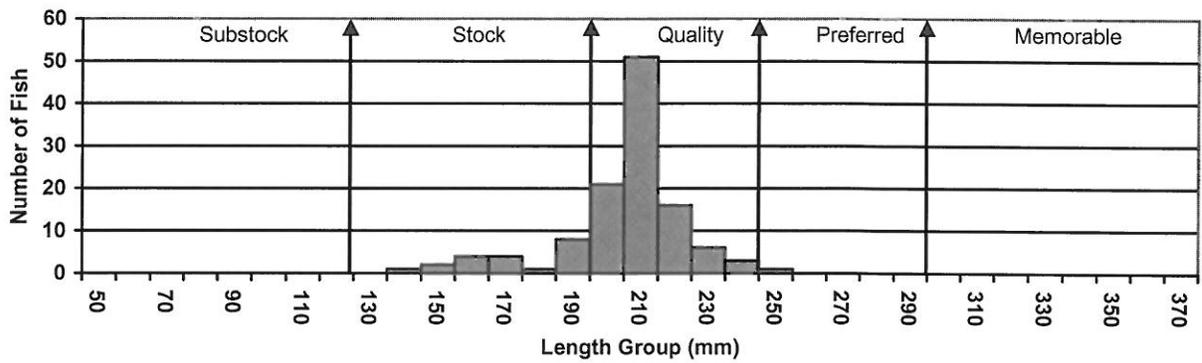
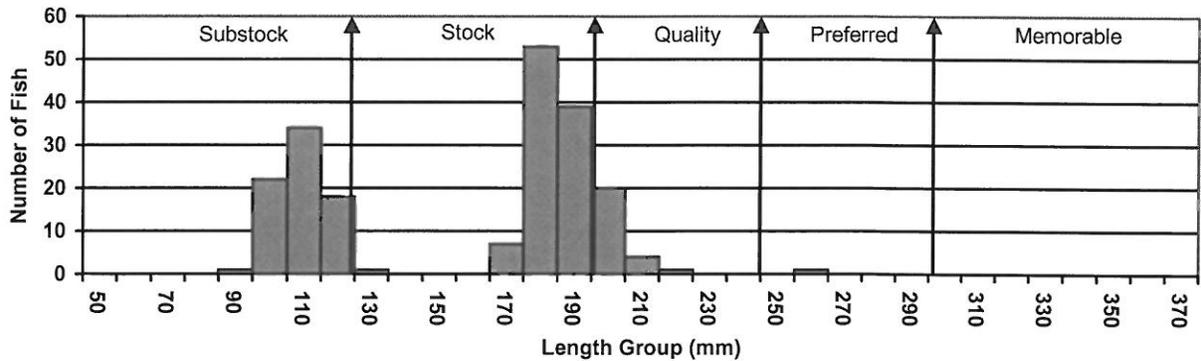


Figure 16. Length frequency histogram for black crappie sampled from Lake Hiddenwood, Walworth County, 1998.



Yellow Perch

Yellow perch were the dominant panfish species present in Lake Hiddenwood for years until the lake suffered a winterkill and now the dominant species is black bullheads. The CPUE of 9.1 is well below the 382.5 from the 2012 survey (Table 6) as well as the 70.5 seven year mean (Table 2). Figures 17 through 23 illustrate the length frequency histograms for the last seven surveys. Size structure has improved with a current PSD of 24 with an RSD-P of 11 compared to the 0 and 0, respectively, from the 2012 survey. The population appears to be on the right trend with the current survey showing the size structure has increased to having some fish of a desired size to anglers. Condition is good with a mean Wr of 95.

Figure 17. Length frequency histogram for yellow perch sampled from Lake Hiddenwood, Walworth County, 2014.

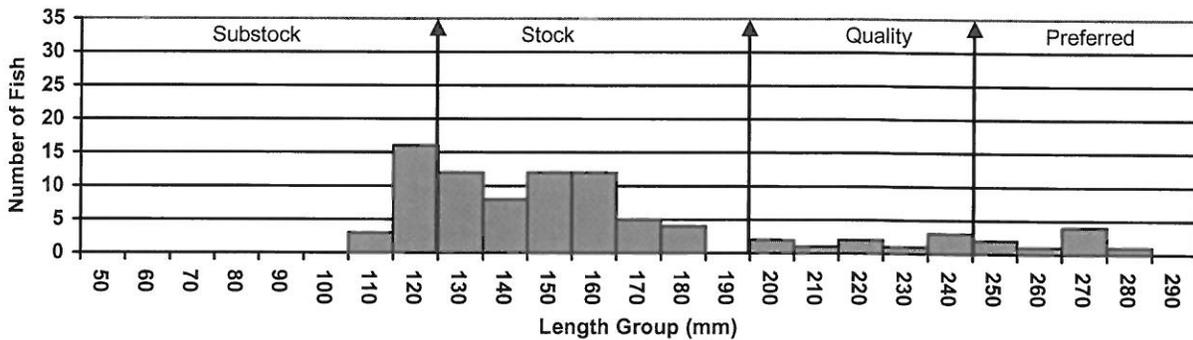


Figure 18. Length frequency histogram for yellow perch sampled from Lake Hiddenwood, Walworth County, 2012.

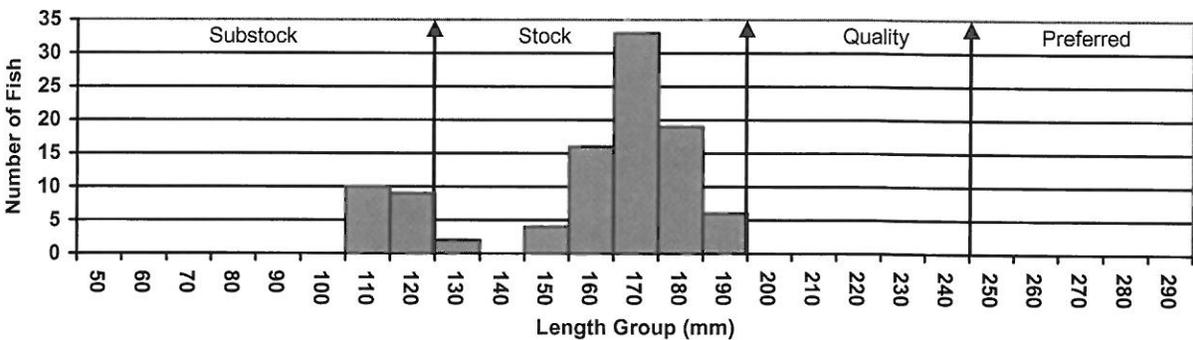


Figure 19. Length frequency histogram for yellow perch sampled from Lake Hiddenwood, Walworth County, 2010.

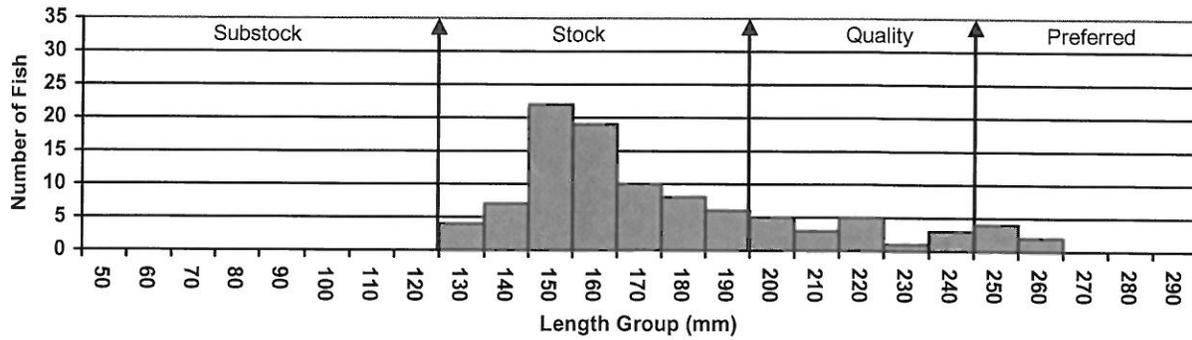


Figure 20. Length frequency histogram for yellow perch sampled from Lake Hiddenwood, Walworth County, 2007.

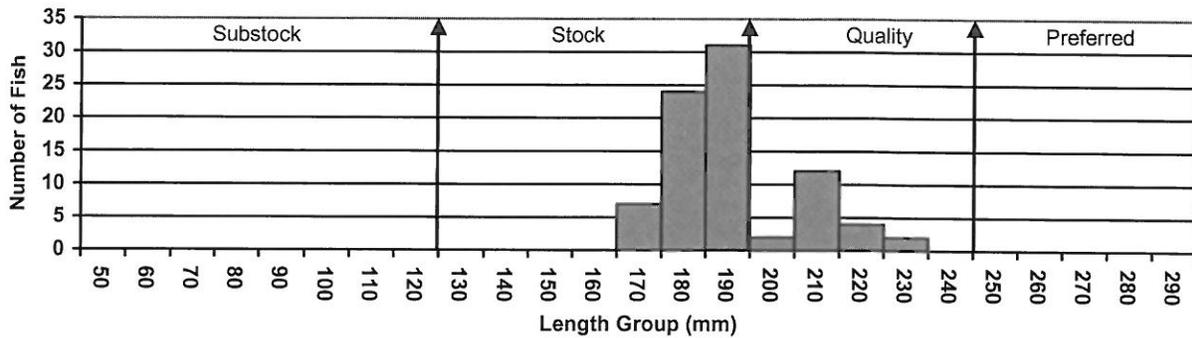


Figure 21. Length frequency histogram for yellow perch sampled from Lake Hiddenwood, Walworth County, 2004.

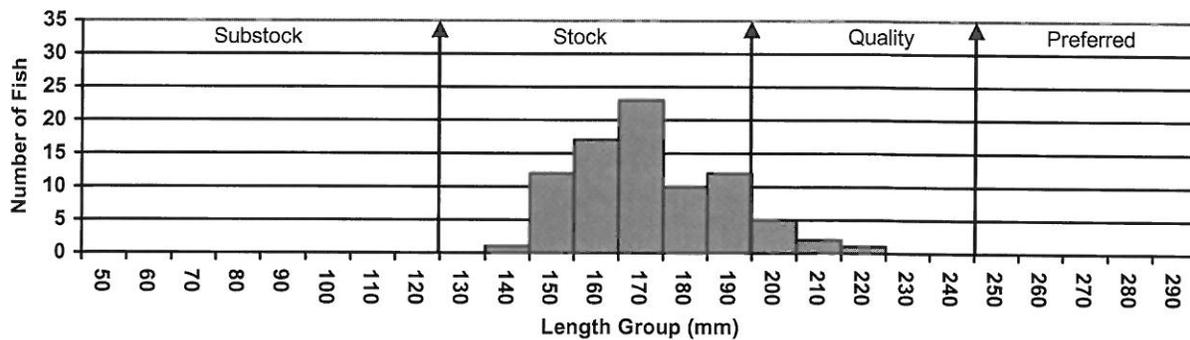


Figure 22. Length frequency histogram for yellow perch sampled from Lake Hiddenwood, Walworth County, 2001.

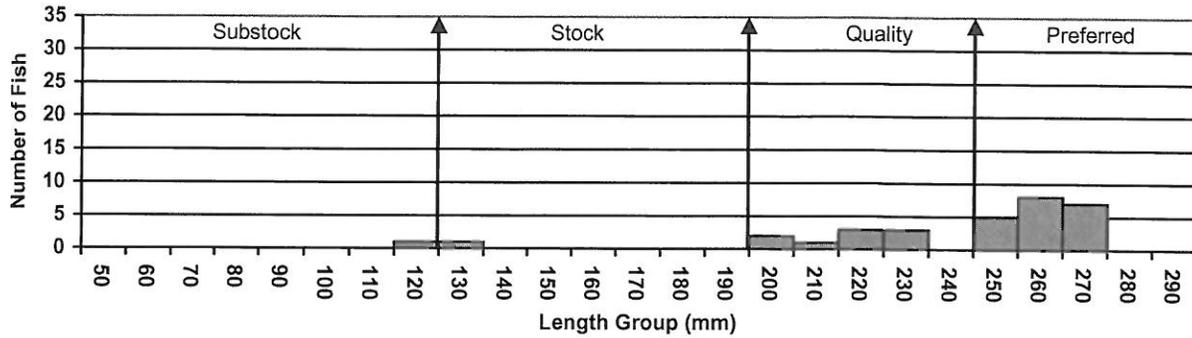
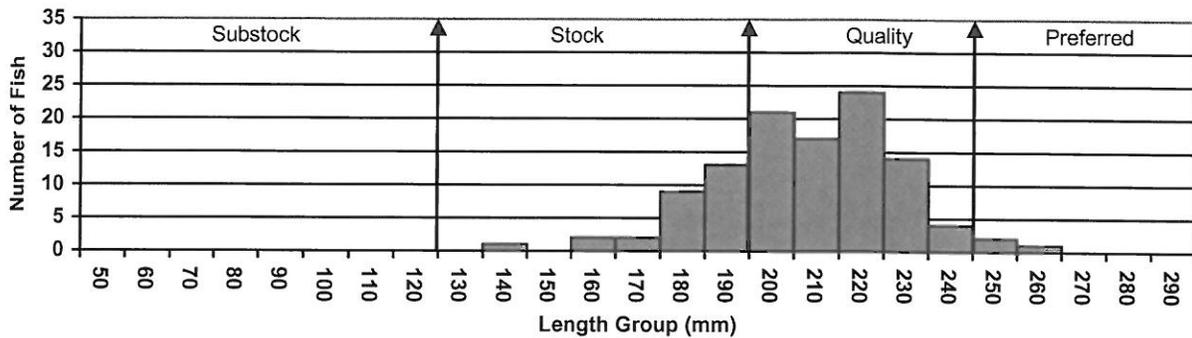


Figure 23. Length frequency histogram for yellow perch sampled from Lake Hiddenwood, Walworth County, 2000.



White Sucker

Lake Hiddenwood continues to contain a good white sucker population. The CPUE of 2.3 is below the 14.4 from the 2012 survey (Table 6) as well as the 11.3 seven year mean (Table 2). Condition is good with a mean W_r of 89. Figures 24 through 28 illustrate the length frequency histograms for the fish sampled over the last five surveys. This is an interesting population to have in Lake Hiddenwood that does not appear to be negatively affecting the game fish populations.

Figure 24. Length frequency histogram for white sucker sampled from Lake Hiddenwood, Walworth County, 2014.

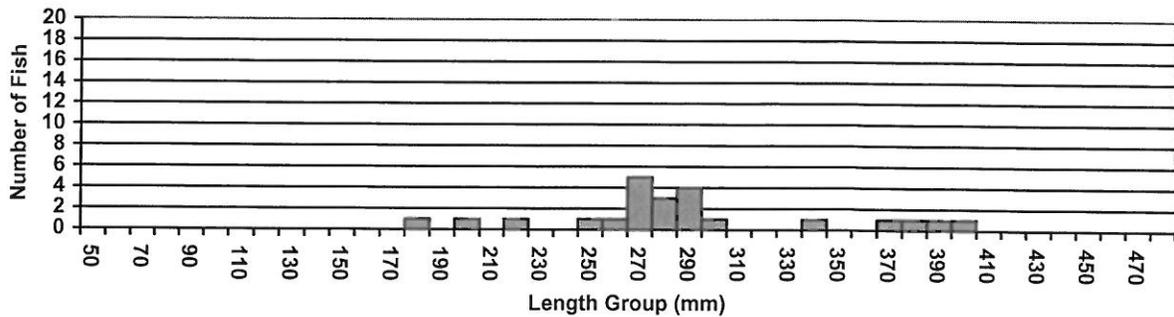


Figure 25. Length frequency histogram for white sucker sampled from Lake Hiddenwood, Walworth County, 2012.

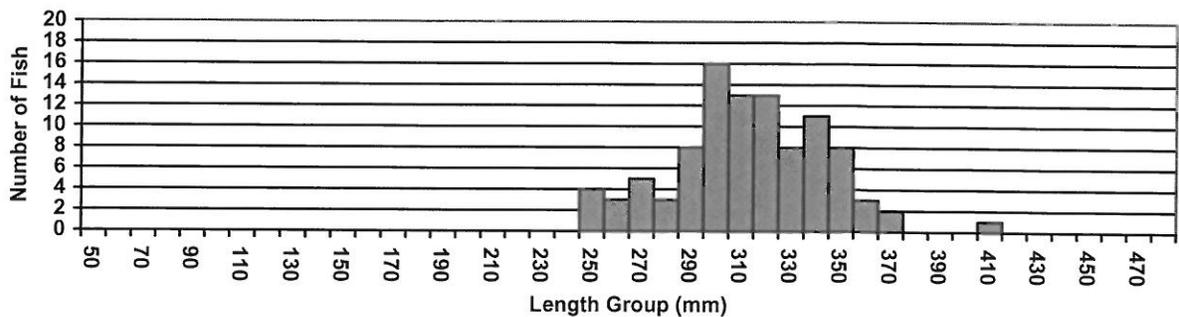


Figure 26. Length frequency histogram for white sucker sampled from Lake Hiddenwood, Walworth County, 2010.

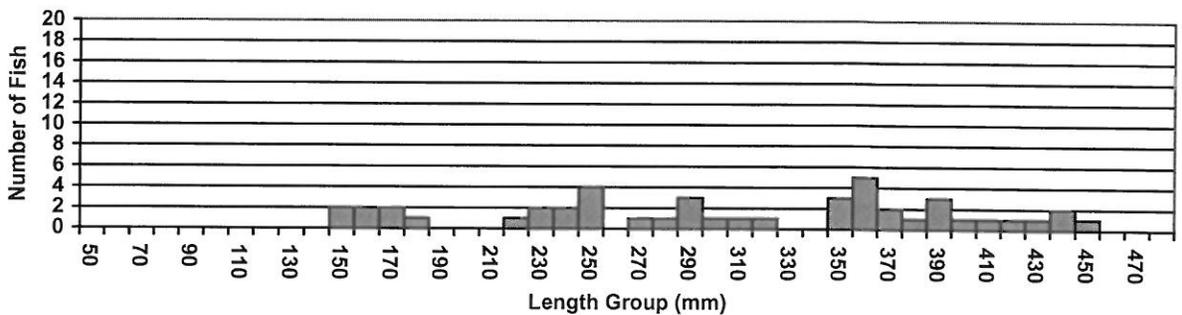


Figure 27. Length frequency histogram for white sucker sampled from Lake Hiddenwood, Walworth County, 2007.

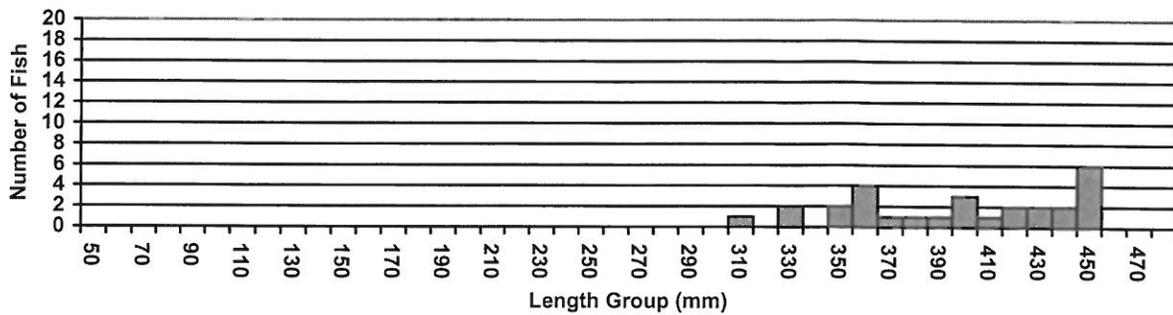
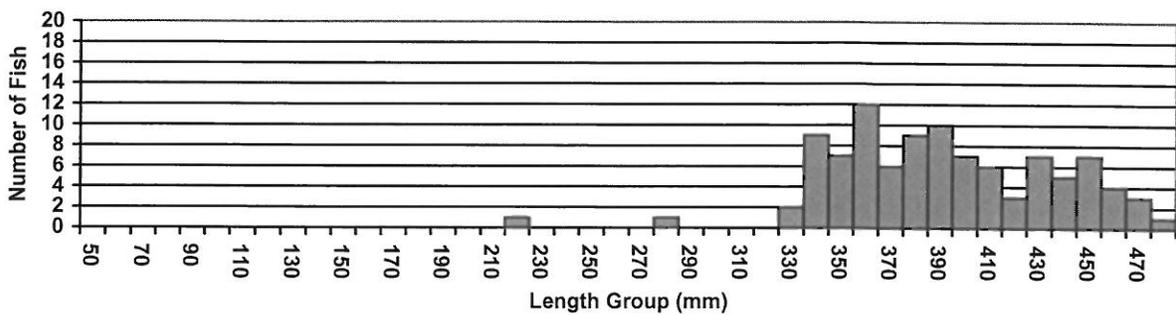


Figure 28. Length frequency histogram for white sucker sampled from Lake Hiddenwood, Walworth County, 2004.



Black Bullhead

Black bullheads continue to be the dominant species sampled in Lake Hiddenwood. The CPUE of 83.7 is well below the 1,367.6 from the 2012 survey (Table 6) and the 220.9 seven year mean (Table 2). Condition is good with a mean Wr of 90. Figures 29 through 30 illustrate the length frequency histograms for the fish sampled over the last three surveys. The sizes are staying in relatively the same size groups, with the higher density moving to the larger sizes. Hopefully with increasing the largemouth bass and black crappie populations will start to decrease this population so they do not continue to have a negative effect on the lake and its fish populations.

Figure 29. Length frequency histogram for black bullhead sampled from Lake Hiddenwood, Walworth County, 2014.

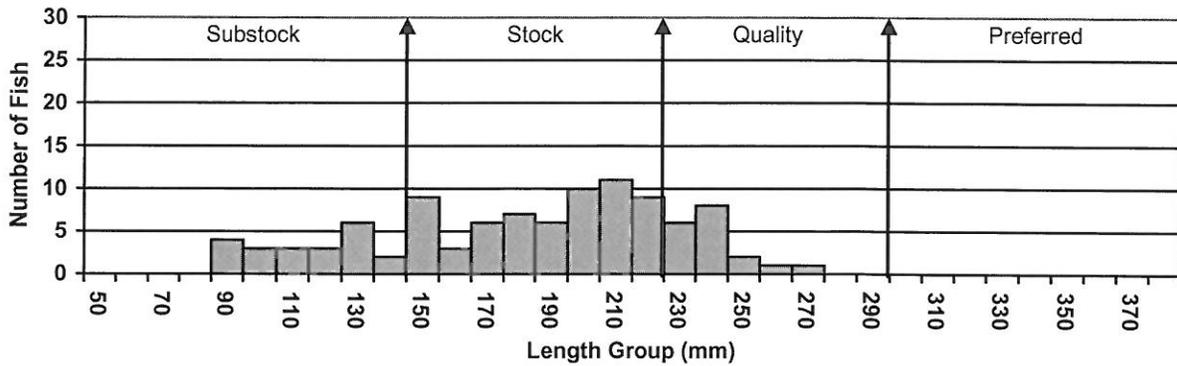


Figure 30. Length frequency histogram for black bullhead sampled from Lake Hiddenwood, Walworth County, 2012.

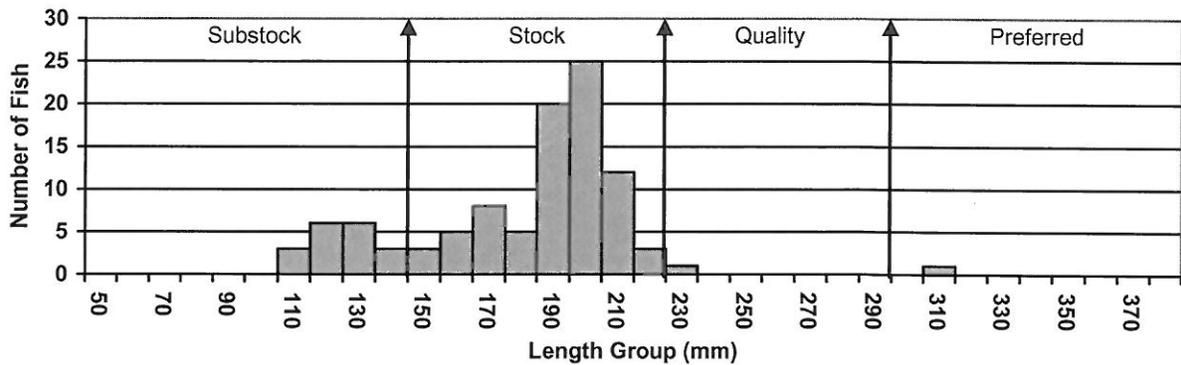
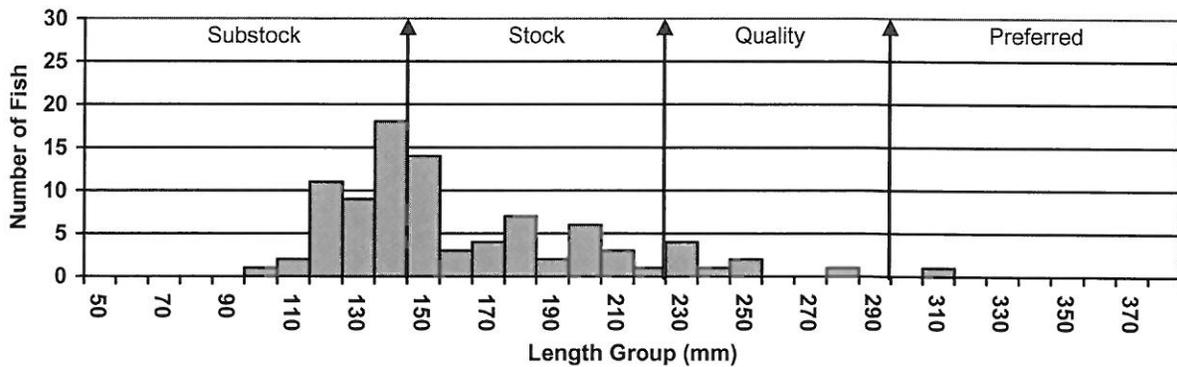


Figure 31. Length frequency histogram for black bullhead sampled from Lake Hiddenwood, Walworth County, 2010.



Other Species

Northern pike were the only other species sampled this survey. There were not enough sampled to make any inferences about their population. They do seem to be fully established in Lake Hiddenwood due to this being the third survey in a row that they have been sampled again after years of not sampling them (Table 6).

Channel catfish, common carp, bluegill, orangespotted sunfish, and golden shiner were the species not sampled that had been in years past (Table 6).

Table 5. Stocking records for the last ten years for Lake Hiddenwood, Walworth County.

Year	Number	Species	Size
2012	100	Largemouth Bass	Juvenile
2013	45	Black Crappie	Adult
2013	995	Largemouth Bass	Fingerling
2014	201	White Crappie	Adult
2014	250	Yellow Perch	Adult
2014	680	Largemouth Bass	Large Fingerling

RECOMMENDATIONS

1. Continue to survey the fish populations every third year to monitor the trends in the different populations. The next survey will be in 2017.
2. Consider stocking largemouth bass of all sizes to supplement the existing population that seems to be suffering.
3. Manual removal of rough fish which include black bullhead, white sucker, and common carp. This will help reduce their numbers to more manageable levels.

Table 6. Trap net (TN) and electrofishing (EF) CPUE for all fish species sampled from Lake Hiddenwood since survey records started.

Species	1963	1965	1968	1971*	1979	1985	1987	1988*	1998	2000	2001	2004	2007	2010	2012	2014
BLB (TN)	92.0	150.0	246.1	116.9	68.8	1080.0	112.5	137.6	114.4	34.7	18.5	1.7	0.1	9.0	1367.6	83.7
BLC (TN)	17.7	--	8.3	5.5	--	98.0	35.9	137.0	45.9	45.6	7.7	81.8	24.7	2.4	3.5	1.6
YEP (TN)	--	--	0.5	--	--	0.3	2.3	3.5	--	27.9	3.1	8.3	40.4	31.5	382.5	9.1
LMB (EF)	--	--	--	--	--	--	--	--	67.0	166.5	141.0	49.2	243.0	13.2	196.5	96.0
LMB (TN)	2.1	--	--	--	--	--	--	--	2.8	--	--	0.1	--	--	--	--
NOP (TN)	21.0	--	--	0.3	--	1.3	0.1	0.3	--	--	--	--	--	0.3	0.2	0.1
CCF (TN)	--	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--
WHS (TN)	0.5	--	306.7	14.5	1.0	0.1	7.5	20.5	0.1	26.1	10.7	20.5	2.8	4.5	14.4	2.3
COC (TN)	--	--	--	--	--	--	--	--	--	--	--	0.1	0.1	0.3	--	--
BLG (TN)	3.4	--	--	--	0.8	--	0.3	--	--	--	--	--	--	--	--	--
OSF (TN)	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--
GOS (TN)	--	--	30.6	0.3	--	--	--	--	--	--	--	--	--	--	--	--

BLB – Black Bullhead, BLC – Black Crappie, YEP – Yellow Perch, LMB – Largemouth Bass, NOP – Northern Pike, CCF – Channel Catfish, WHS – White Sucker, COC – Common Carp, BLG – Bluegill, OSF – Orangespotted Sunfish, GOS – Golden Shiner
 * Dredged in 1975-76 and again in 1996