SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-47

Name: Lake Hurley **County:** Potter
Legal Description: T119N-R77W-Sec. 28, 29, & 33
GPS: 45°05'24.82"N 100°08'47.20"W
Location from nearest town: 5 miles west, 6 miles north, and 4 miles west of Gettysburg

Date of present survey: July 1-3, 2013 (netting); August 26, 2014 (electrofishing)
Date of last survey: July 5-7, 2011 (netting), October 14, 2011 (electrofishing)
Most recent lake management plan: F-21-R-43 (January 1, 2011 to December 31, 2015)
Management classification: Warmwater Permanent

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

PHYSICAL DATA

Surface Area: 79 acres **Watershed:** 28,800 acres
Maximum Depth: 29 feet **Mean Depth:** 12 feet
Lake elevation at time of survey (field observations): Full
Contour map: Yes **Date:** 1968

Ownership of lake and adjacent lakeshore properties:

Lake Hurley is a 79-acre impoundment located on the lower portion of Cheyenne Creek in west central Potter County. The earthen dam that created the lake was constructed by the Works Progress Administration (WPA) in 1938. The lake is 100% privately owned. To allow for the construction of the dam and for public access to a 12-foot strip of land above the high water mark, tow easements to the State of South Dakota were signed in 1937. The South Dakota Department of Game, Fish and Parks applied for and received vested water rights to 675 acre/feet of water annually at Lake Hurley. The Wildlife Division of the Department of Game, Fish and Parks completes fisheries management activities.

Watershed condition with percentages of land use types:

The watershed for Lake Hurley is 28,800 acres or approximately 45 square miles that is made up entirely of privately owned agricultural land. Land use in the watershed are approximately 40% cropland consisting of small grains and row crops, 58% pastureland or Conservation Reserve acres, 1% feedlots and livestock wintering area, and 1% trees, shelter belts, and farmlands. The immediate shoreline is native grasses utilized as pasture with hardwood trees and shrubs found along the water edge and in the main creek drainage.

Fishing access:

The north shore of the lake has a new single boat ramp. Shore fishing access is found around most of the lake's shoreline, but is limited during the summer months by submergent vegetation.

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

The access road is in good condition. The boat ramp is new. The dam grade and spillway are in good condition. The vault toilet is in good condition.

Field observations of aquatic vegetation condition:

Lake Hurley's shoreline is about 90% surrounded by emergent vegetation, which consists mainly of cattails and rushes. Submergent vegetation was found in the shallow areas as well as around the majority of the shoreline to depths of about 4 feet of water. Submergents consist mainly of floating leaf pondweed, sago pondweed, and clasping leaf pondweed with other species mix in.

CHEMICAL DATA

Field observations of water quality and pollution problems:

No siltation or pollution problems were evident during this survey. Water clarity was good with a secchi disc reading of 10.0 feet. Other water quality characteristics were measured in the field on July 1, 2013, 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 Hurley, Potter County, July 1, 2013.

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	75.2	5.47	52.0	293	580	8.58	1545	771	0.78	-145.1	10.0
A	21.5	71.8	1.26	48.0	287	570	8.20	1545	773	0.78	-215.0	

BIOLOGICAL DATA

Methods:

Lake Hurley was surveyed on July 1-3, 2013, with ten overnight trap net sets. The trap nets have 3ft x 5ft frames, 60ft leads, and ¾ in. knotted mesh. Two overnight experimental gill nets were also used. The gill nets were 150ft x 6ft with 25ft panels of ½, ¾, 1, 1-1/4, 1-1/2, and 2 inch monofilament mesh. No fall nighttime electrofishing was done this survey due to a cold fall that decreased water temperatures below effective ranges. On the evening of August 26, 2014, Lake Hurley 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 DC current at 340 volts with around 15 amps to electrofish the lake that had a conductivity of 902µS/cm with a water temperature of 68.1°F. Fish indices and statistics were completed using Winfin.

Results and Discussion:

Gill net catch

Table 2. Total catch of two, 150ft experimental gill nets at Lake Hurley, Potter County, July 1-3, 2013.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	56	77.8	28.0	± 67.7	8.7	100	0	98
Northern Pike	11	15.2	5.5	± 1.5	3.3	100	9	81
Walleye	3	4.2	1.5	± 4.6	1.6	--	--	84
Yellow Perch	2	2.8	1.0	± 3.1	30.1	--	--	119

* Ten year mean (1980, 1982, 1985, 1993, 1996, 1999, 2002, 2005, 2008, 2011)

Trap Net Catch

Table 3. Total catch of ten, overnight ¾-inch frame nets at Lake Hurley, Potter County, July 1-3, 2013.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	349	93.8	34.9	± 14.9	89.1	98	9	97
Northern Pike	11	3.0	1.1	± 0.7	1.5	91	9	82
Bluegill	7	1.9	0.7	± 0.5	23.2	100	100	121
Black Crappie	2	0.5	0.2	± 0.2	26.1	--	--	98
Walleye	2	0.5	0.2	± 0.2	0.4	--	--	76
Yellow Perch	1	0.3	0.1	± 0.1	2.9	--	--	107

* Seventeen year mean (1961, 1964, 1968, 1971, 1977, 1980, 1982, 1985, 1988, 1992, 1993, 1996, 1999, 2002, 2005, 2008, 2011)

Electrofishing Catch

Table 4. Total catch from six, ten-minute runs of fall nighttime electrofishing on Lake Hurley, Potter County, August 26, 2014.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Largemouth Bass	51	100	51.0	± 28.2	17.7	18	18	122

* Six year mean (1988, 1993, 1999, 2005, 2008, 2011)

Black Crappie

Black crappie numbers continue to decline in Lake Hurley. The trap net CPUE of 0.2 is below the 1.0 from the 2011 survey (Table 11) as well as the 26.1 seventeen year mean (Table 3). Growth appears to be fine with means right on with statewide, regional and SLI means (Table 5), although how much can be known from a two fish sample. Condition again appears to be good with a mean Wr of 98. Figures 1 through 6 illustrate the length frequency histograms for the last six surveys. Lake Hurley used to contain a very good black crappie population and it is not known what is happening to this population.

Table 5. Average back-calculated lengths (mm) for each age class of black crappie sampled from Lake Hurley, Potter County, 2013.

			Back-calculated Age							
Year Class	Age	N	1	2	3	4	5	6	7	8
2009	4	1	90	139	196	242				
2005	8	1	79	150	163	177	203	221	242	255
All Classes		**2**	**85**	**144**	**180**	**210**	**203**	**221**	**242**	**255**
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 Impoundments

Figure 1. Length frequency histogram for black crappie sampled from Lake Hurley, Potter County, 2013.

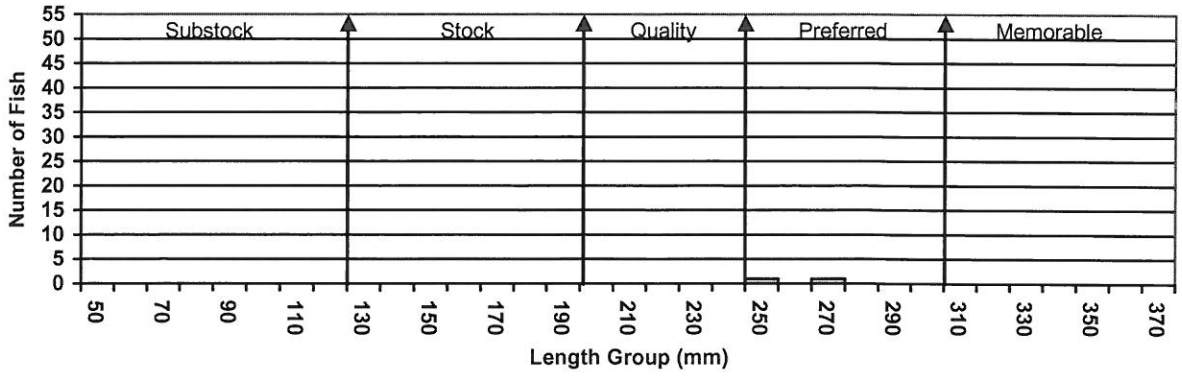


Figure 2. Length frequency histogram for black crappie sampled from Lake Hurley, Potter County, 2011.

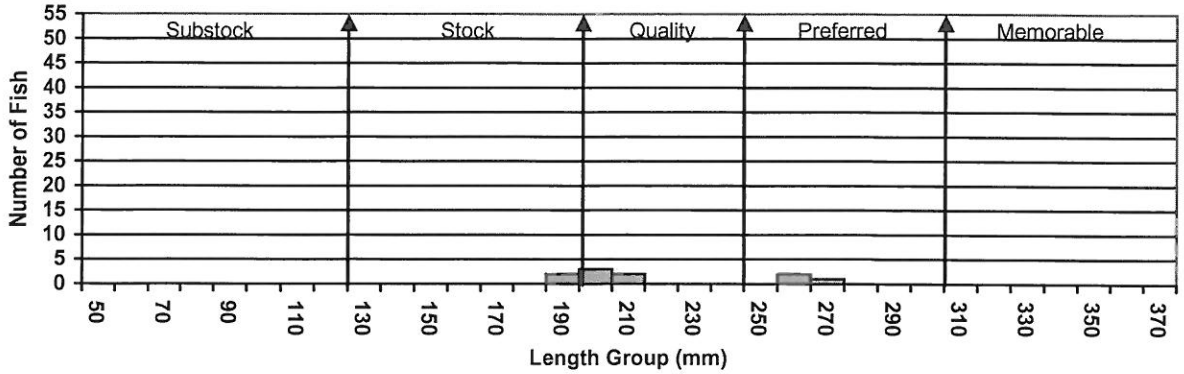


Figure 3. Length frequency histogram for black crappie sampled from Lake Hurley, Potter County, 2008.

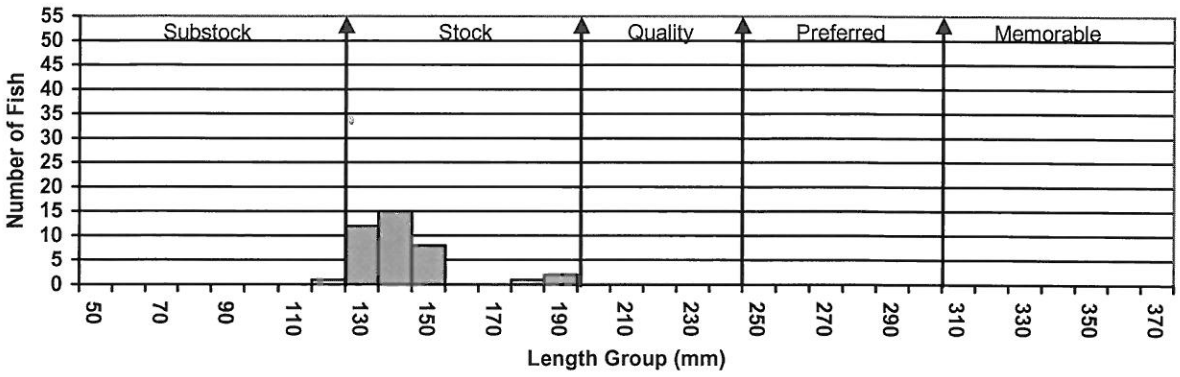


Figure 4. Length frequency histogram for black crappie sampled from Lake Hurley, Potter County, 2005.

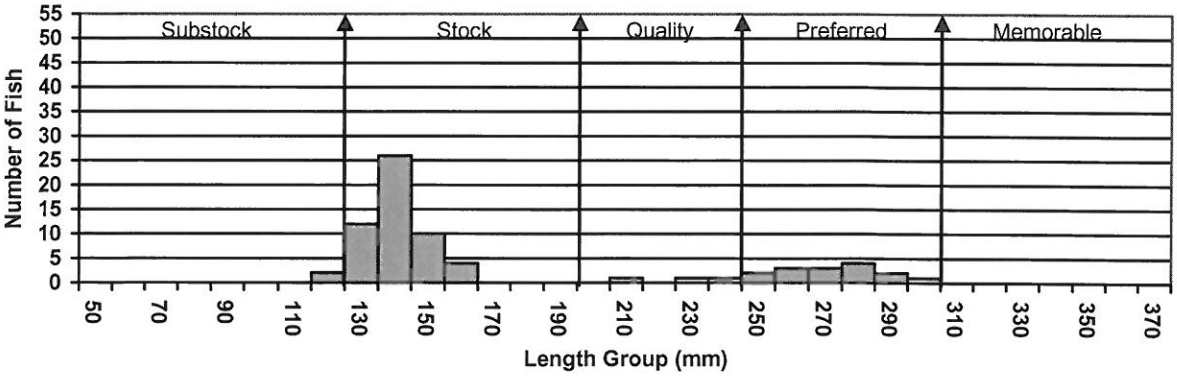


Figure 5. Length frequency histogram for black crappie sampled from Lake Hurley, Potter County, 2002.

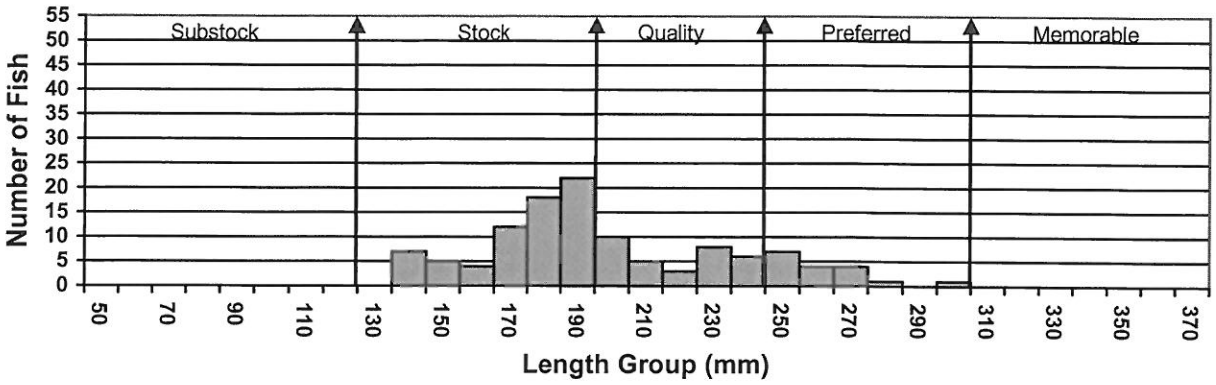
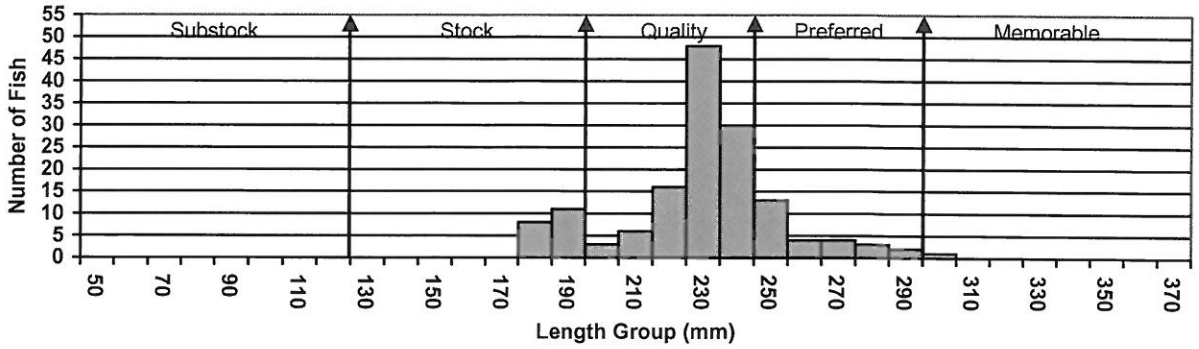


Figure 6. Length frequency histogram for black crappie sampled from Lake Hurley, Potter County, 1999.



Bluegill

The bluegill population in Lake Hurley has seen a significant drop in the population. The trap net CPUE of 0.7 is below the 4.9 from the 2011 survey (Table 11) as well as the 23.2 seventeen year mean (Table 3). Not a lot can be said about the population with only seven fish sampled. Growth appears to be good with means at or slightly above statewide, regional and SLI means (Table 6). Condition is good with a mean Wr of 121. Figures 7 through 12 illustrate the length frequency histograms for the last six surveys. Hopefully this population along with all the others will start to see their numbers increase after several years of below average catches.

Table 6. Average back-calculated lengths (mm) for each age class of bluegill sampled from Lake Hurley, Potter County, 2013.

			Back-calculated Age								
Year Class	Age	N	1	2	3	4	5	6	7	8	9
2009	4	1	71	132	173	212					
2008	5	1	72	129	189	212	221				
2007	6	2	48	87	141	174	192	213			
2006	7	1	70	132	176	192	210	219	229		
2004	9	2	49	88	144	185	201	213	227	237	241
All Classes		**7**	**62**	**113**	**165**	**195**	**206**	**215**	**228**	**237**	**241**
Statewide Mean			55	103	141	166	180				
Region II Mean			52	97	134	164	180				
SLI* Mean			53	101	138	163	180				

* Small Lakes and Impoundments

Figure 7. Length frequency histogram for bluegill sampled from Lake Hurley, Potter County, 2013.

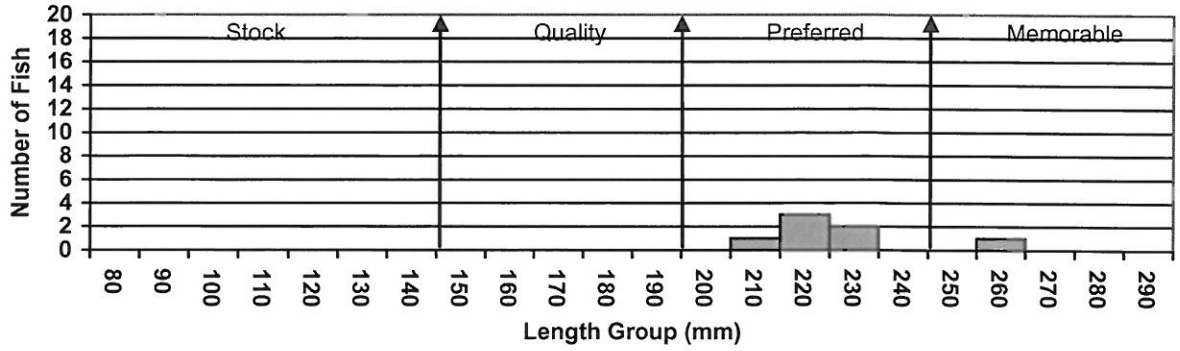


Figure 8. Length frequency histogram for bluegill sampled from Lake Hurley, Potter County, 2011.

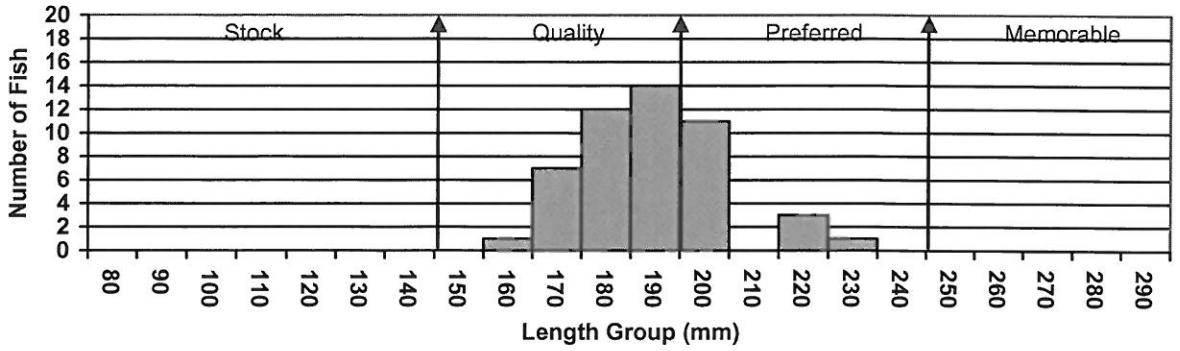


Figure 9. Length frequency histogram for bluegill sampled from Lake Hurley, Potter County, 2008.

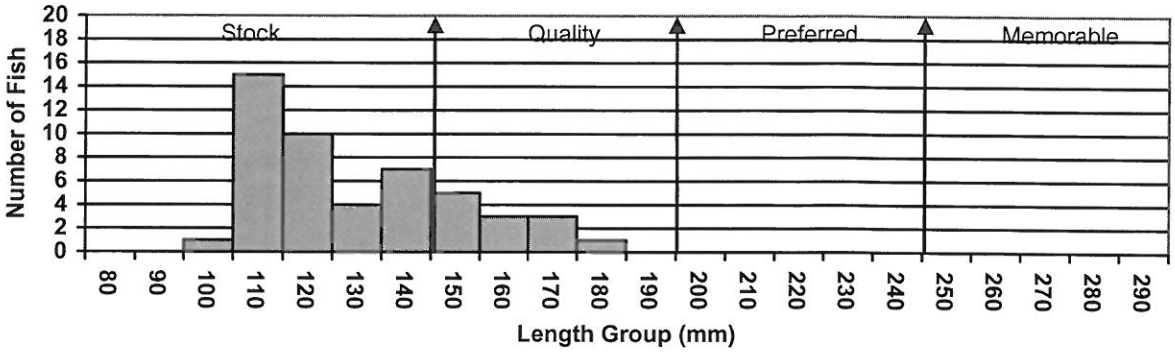


Figure 10. Length frequency histogram for bluegill sampled from Lake Hurley, Potter County, 2005.

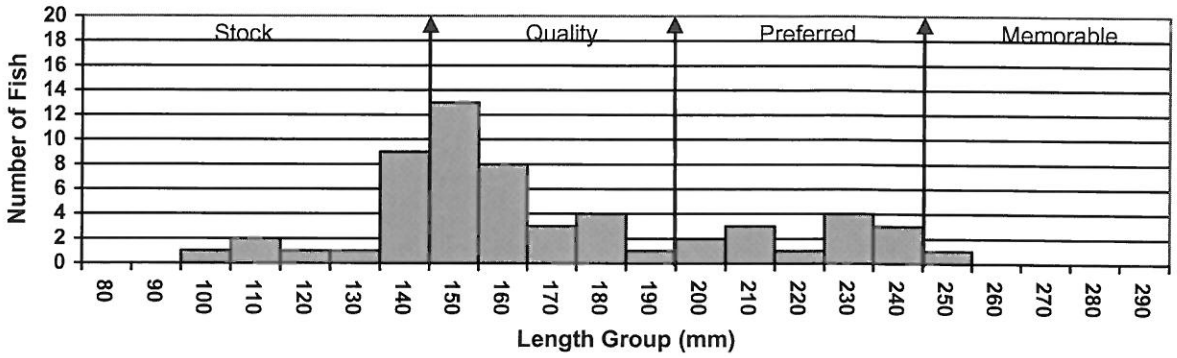


Figure 11. Length frequency histogram for bluegill sampled from Lake Hurley, Potter County, 2002.

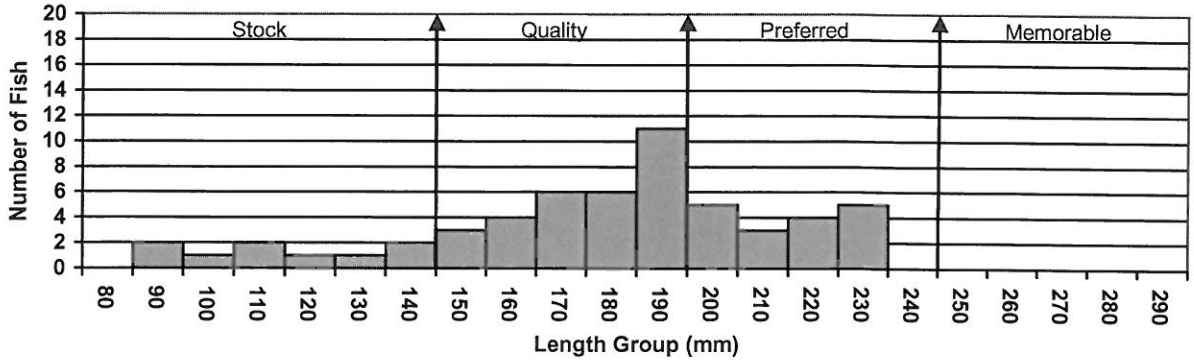
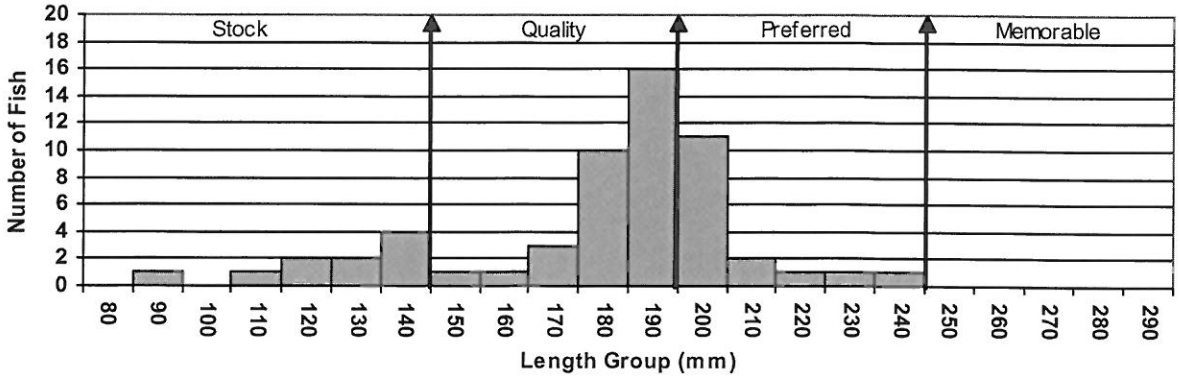


Figure 12. Length frequency histogram for bluegill sampled from Lake Hurley, Potter County, 1999.



Yellow Perch

The yellow perch population continues to remain at low levels. The gill net CPUE of 1.0 is actually above the 0.0 from the 2011 survey (Table 11) but still well below the 30.1 ten year mean (Table 2). The trap net CPUE of 0.1 is below the 0.9 from the 2011 survey (Table 11) as well as the 2.9 seventeen year mean (Table 3). Again not much can be said about the population with such a small number of fish sampled. Figures 13 through 18 illustrate the length frequency histograms for the last six surveys. Growth is on the slow side with means slightly below statewide, regional and SLI means (Table 7). Condition is good with a mean Wr of 113.

Table 7. Average back-calculated lengths (mm) for each age class of yellow perch sampled from Lake Hurley, Potter County, 2013.

			Back-calculated Age				
Year Class	Age	N	1	2	3	4	5
2009	4	2	83	122	154	190	
2008	5	2	89	135	159	184	215
All Classes		**3**	**86**	**129**	**157**	**187**	**215**
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 13. Length frequency histogram for yellow perch sampled from Lake Hurley, Potter County, 2013.

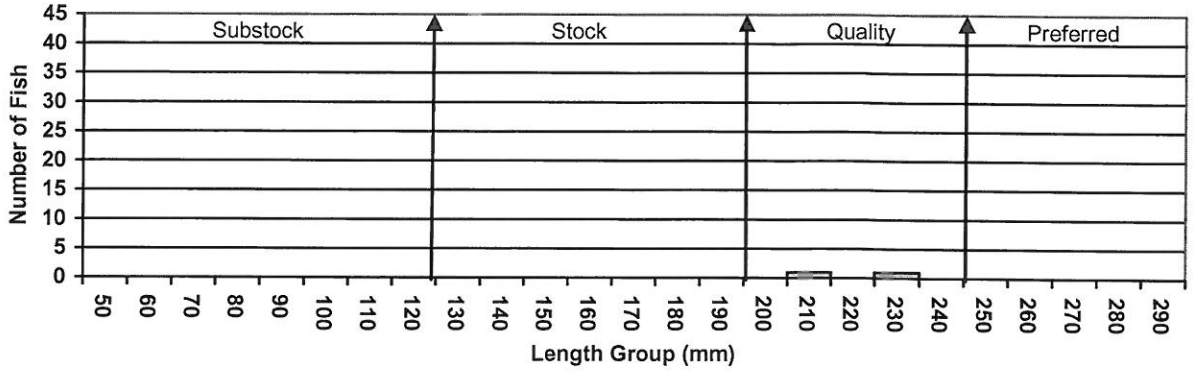


Figure 14. Length frequency histogram for yellow perch sampled from Lake Hurley, Potter County, 2011.

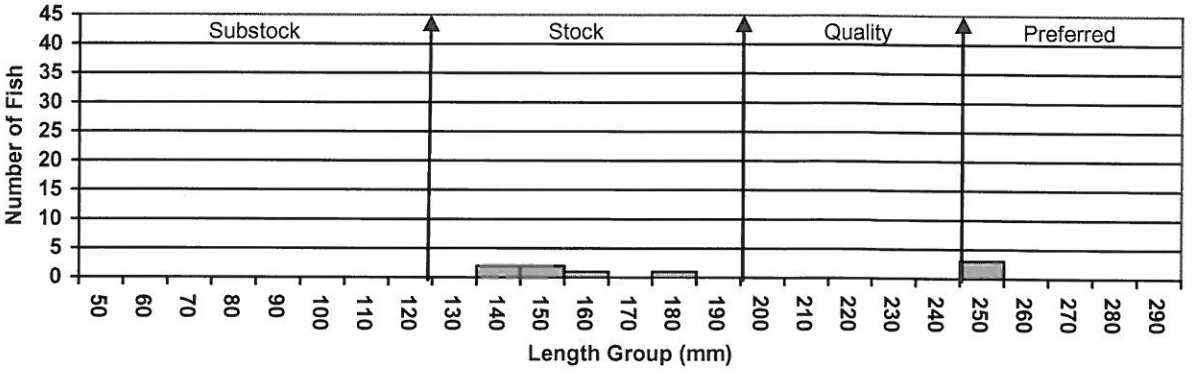


Figure 15. Length frequency histogram for yellow perch sampled from Lake Hurley, Potter County, 2008.

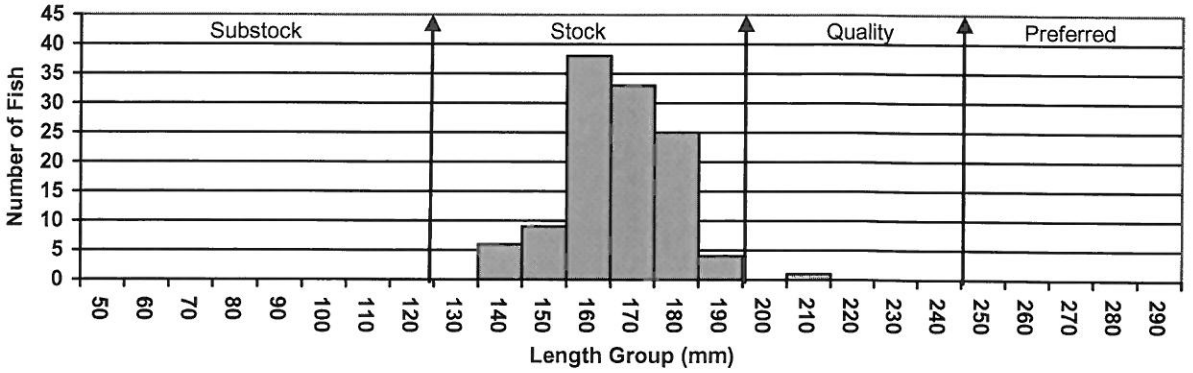


Figure 16. Length frequency histogram for yellow perch sampled from Lake Hurley, Potter County, 2005.

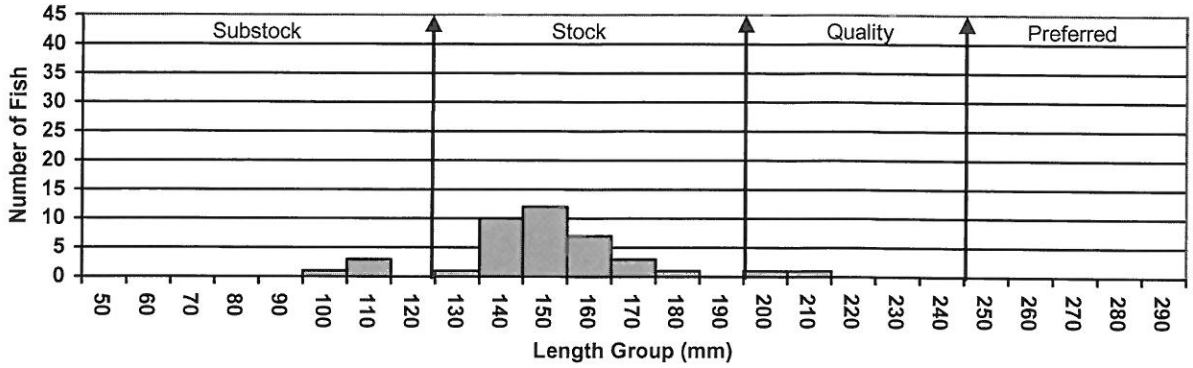


Figure 17. Length frequency histogram for yellow perch sampled from Lake Hurley, Potter County, 2002.

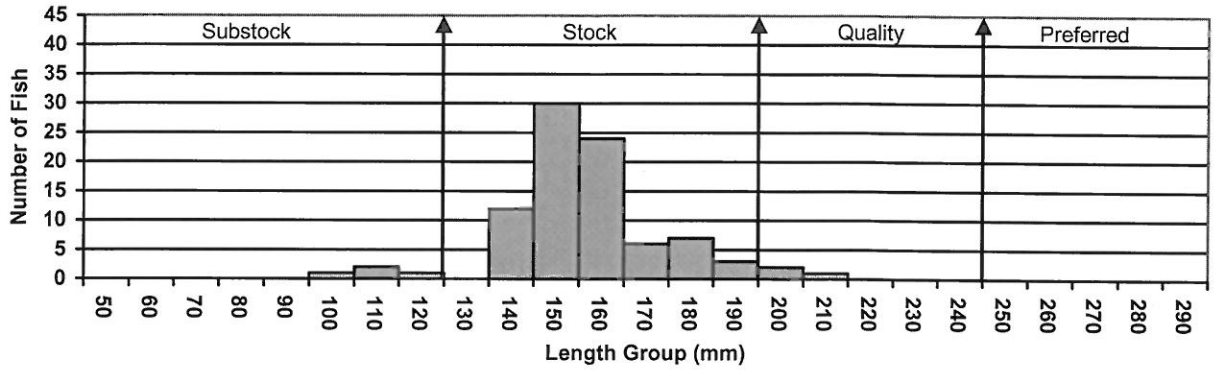
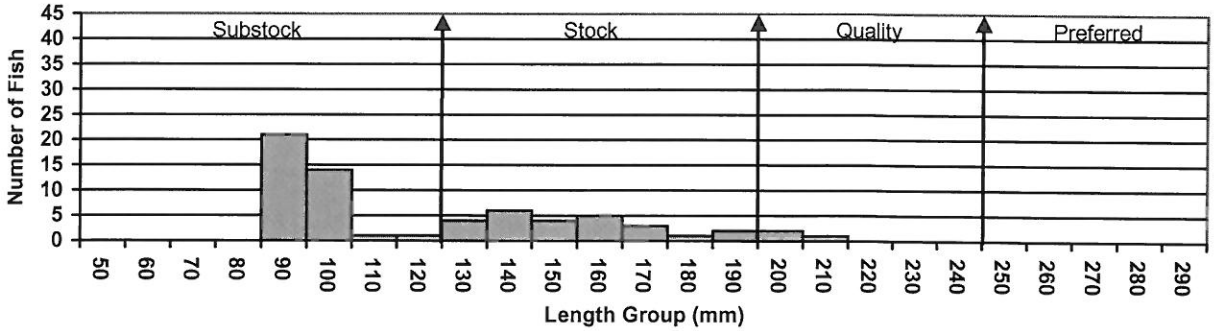


Figure 18. Length frequency histogram for yellow perch sampled from Lake Hurley, Potter County, 1999.



Largemouth Bass

The largemouth bass population was a good surprise this electrofishing survey. The numbers have been down that last couple surveys with a very nice bounce back this survey. The CPUE was 51 fish per hour compared to the 18 from the 2011 survey (Table 11) as well as the 17.7 six year mean (Table 4). Growth is good with means right around statewide, regional and SLI means (Table 8). Condition is also good with a mean Wr of 122. Figures 19 through 24 illustrate the length frequency histograms for the last six surveys. The CPUE may have increased but the fish sampled are dominated by young fish. The positive is that the young fish are starting to recruit with a good number of age 1 fish. Hopefully this trend continues and returns this bass population back to the quality population that it has been known for.

Table 8. Average back-calculated lengths (mm) for each age class of largemouth bass sampled from Lake Hurley, Potter County, 2014.

			Back-calculated Age								
Year Class	Age	N	1	2	3	4	5	6	7	8	9
2014	0	16									
2013	1	29	84								
2012	2	1	98	122							
2009	5	1	68	239	334	383	408				
2006	8	2	85	155	242	317	371	427	444	456	
2005	9	1	129	151	226	267	332	418	451	463	472
All Classes		**50**	**93**	**167**	**267**	**322**	**371**	**422**	**448**	**459**	**472**
Statewide Mean			96	182	250	305	342				
Region II Mean			105	183	246	296	328				
SLI* Mean			99	183	246	299	332				

* Small Lakes and Impoundments

Figure 19. Length frequency histogram for largemouth bass sampled from Lake Hurley, Potter County, 2014.

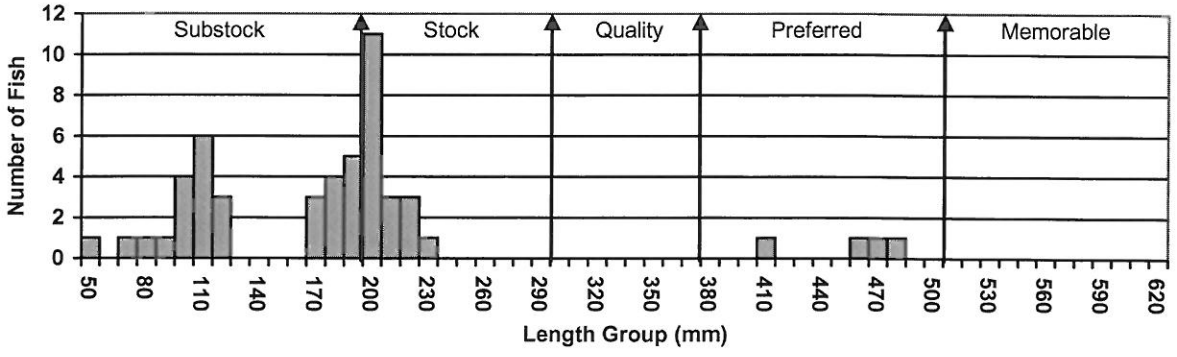


Figure 20. Length frequency histogram for largemouth bass sampled from Lake Hurley, Potter County, 2011.

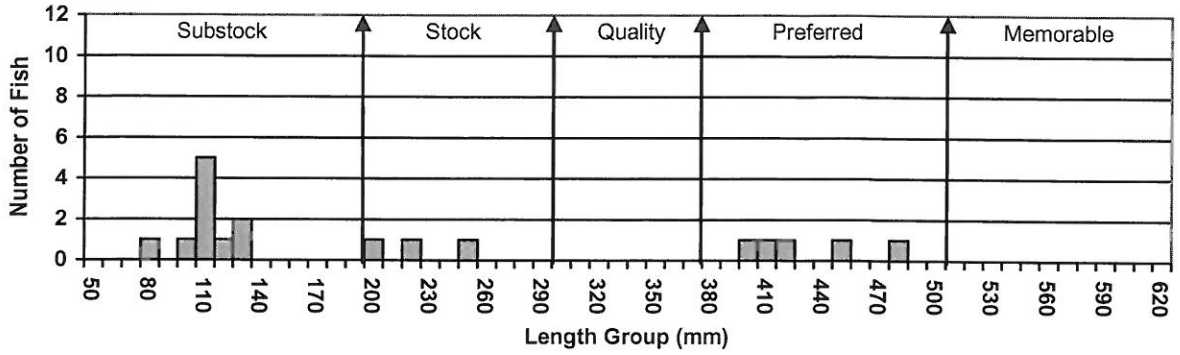


Figure 21. Length frequency histogram for largemouth bass sampled from Lake Hurley, Potter County, 2008.

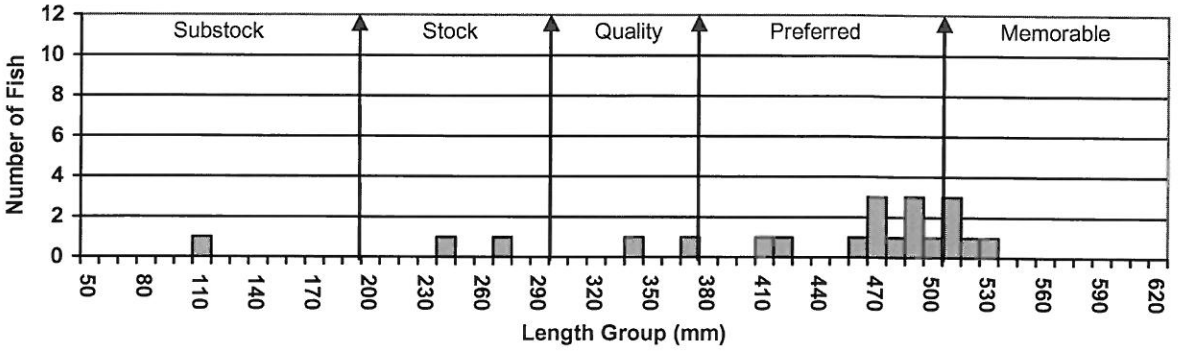


Figure 22. Length frequency histogram for largemouth bass sampled from Lake Hurley, Potter County, 2005.

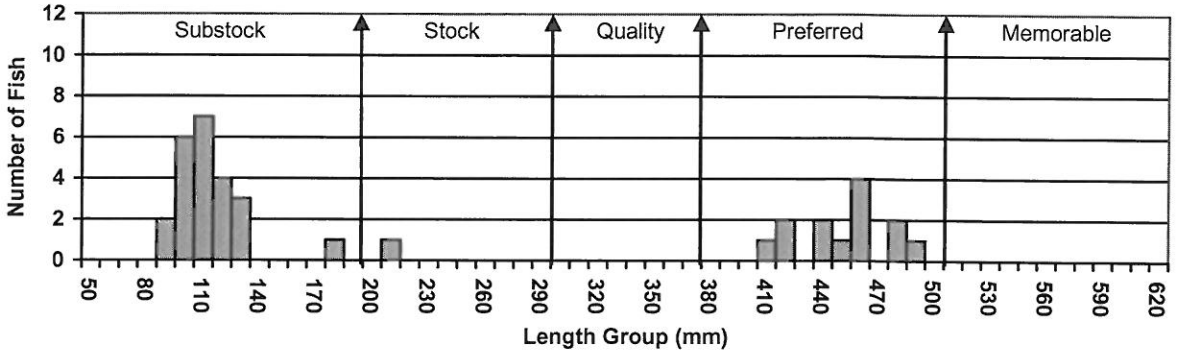


Figure 23. Length frequency histogram for largemouth bass sampled from Lake Hurley, Potter County, 2002.

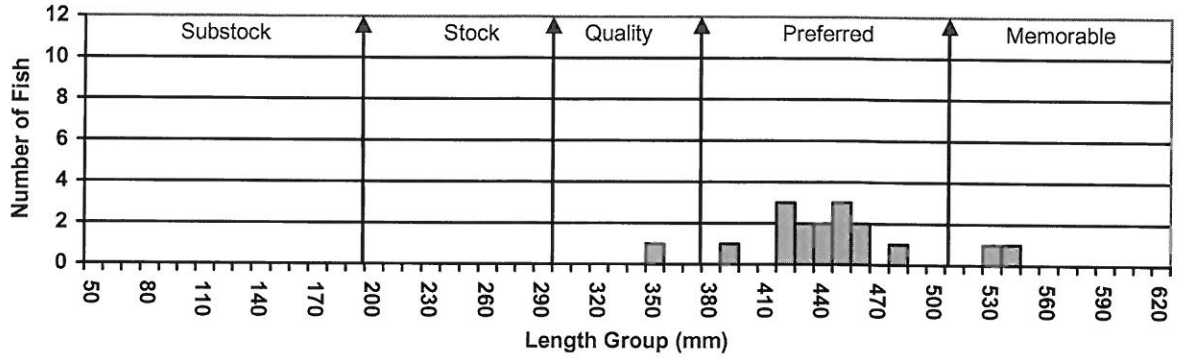
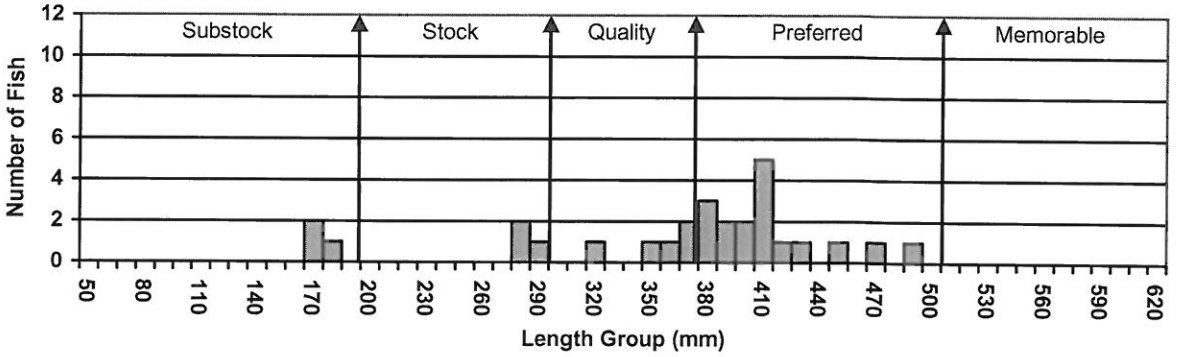


Figure 24. Length frequency histogram for largemouth bass sampled from Lake Hurley, Potter County, 1999.



Northern Pike

Northern pike continue to be the most consistent species surveyed in Lake Hurley. The trap net CPUE of 1.1 is actually slightly below the 2.7 from the 2011 survey (Table 11) but right on with the 1.5 seventeen year mean (Table 3). The gill net CPUE of 5.5 is above the 2.5 from the 2011 survey (Table 11) as well as the 3.3 ten year mean (Table 2). Figures 25 through 28 illustrate the length frequency histograms for the last four surveys. Condition is good with a mean Wr of 82.

Figure 25. Length frequency histogram for northern pike sampled from Lake Hurley, Potter County, 2013.

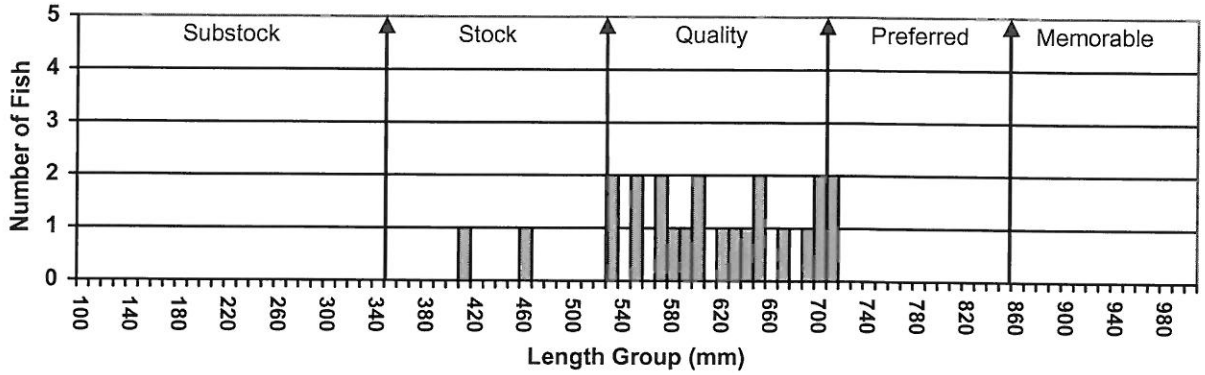


Figure 26. Length frequency histogram for northern pike sampled from Lake Hurley, Potter County, 2011.

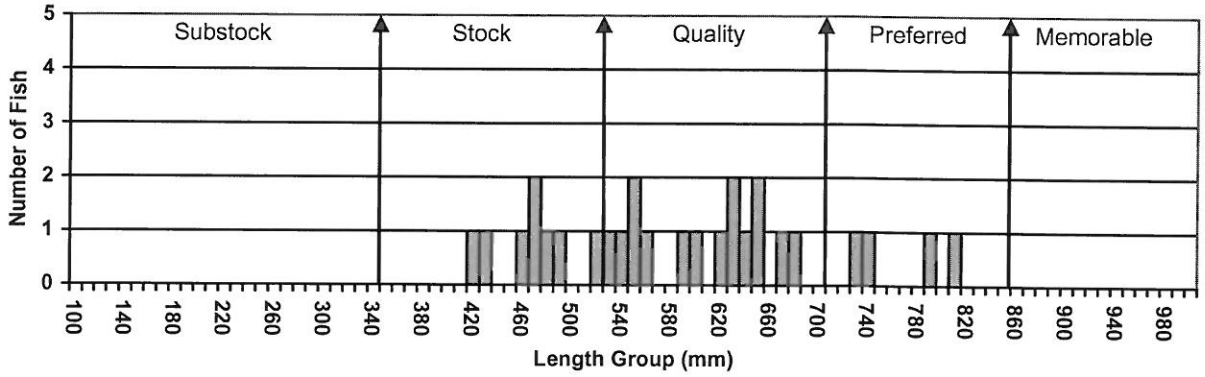


Figure 27. Length frequency histogram for northern pike sampled from Lake Hurley, Potter County, 2008.

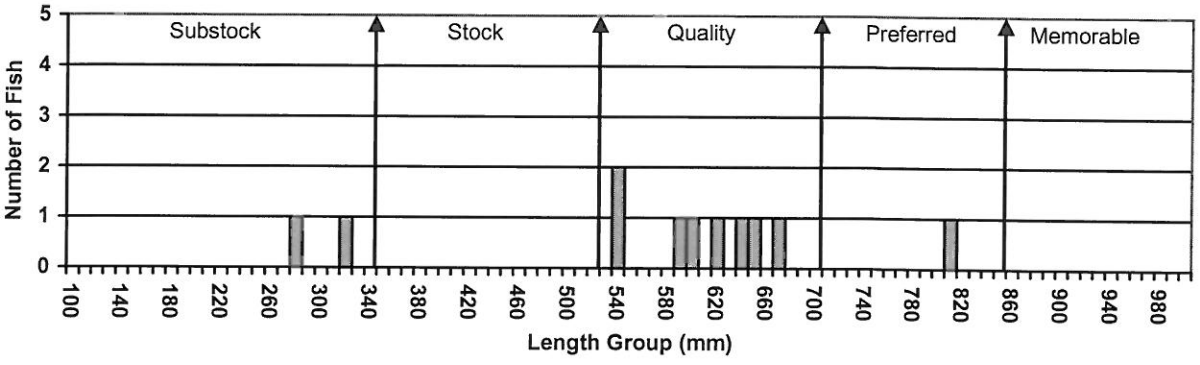
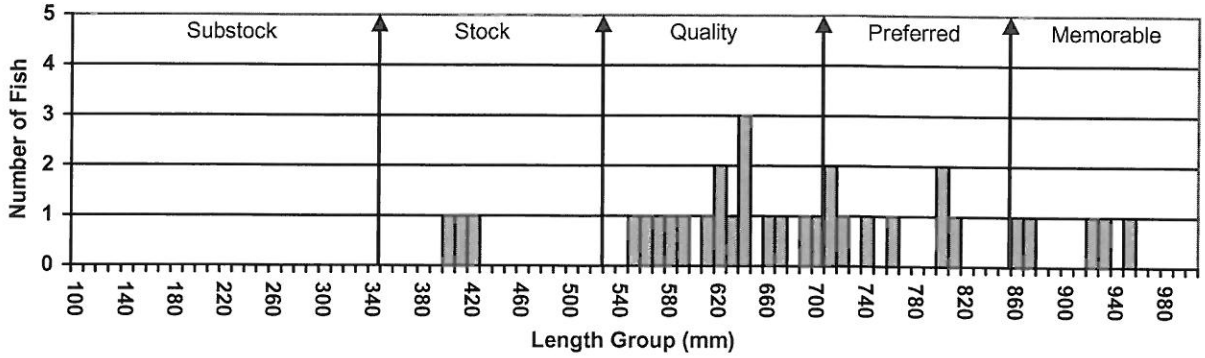


Figure 28. Length frequency histogram for northern pike sampled from Lake Hurley, Potter County, 2005.



Walleye

Lake Hurley continues to contain a low density walleye population. The gill net CPUE of 1.5 fish per net night is above the 0.0 from the 2011 survey (Table 11) but right on with the 1.6 ten year mean (Table 2). The trap net CPUE of 0.2 is also above the 0.0 from the 2011 survey (Table 11) but right on with the 0.4 seventeen year mean (Table 3). Figures 29 and 30 illustrate the length frequency histograms for the last two surveys. The fish in Figure 30 come from the sample that was collected during the fall electrofishing. Growth is good with means right around or above statewide, regional and SLI means (Table 9). Condition is also fine with a mean Wr of 80. Stocking will continue on an every other year to maintain this fishery.

Table 9. Average back-calculated lengths (mm) for each age class of walleye sampled from Lake Hurley, Potter County, 2013.

			Back-calculated Age			
Year Class	Age	N	1	2	3	4
2011	2	1	178	296		
2010	3	3	161	271	380	
2009	4	1	189	313	417	503
All Classes		**5**	**176**	**293**	**399**	**503**
Statewide Mean			168	279	360	425
Region II Mean			169	282	346	408
SLI* Mean			176	271	384	431

* Small Lakes and Impoundments

Figure 29. Length frequency histogram for walleye sampled from Lake Hurley, Potter County, 2013.

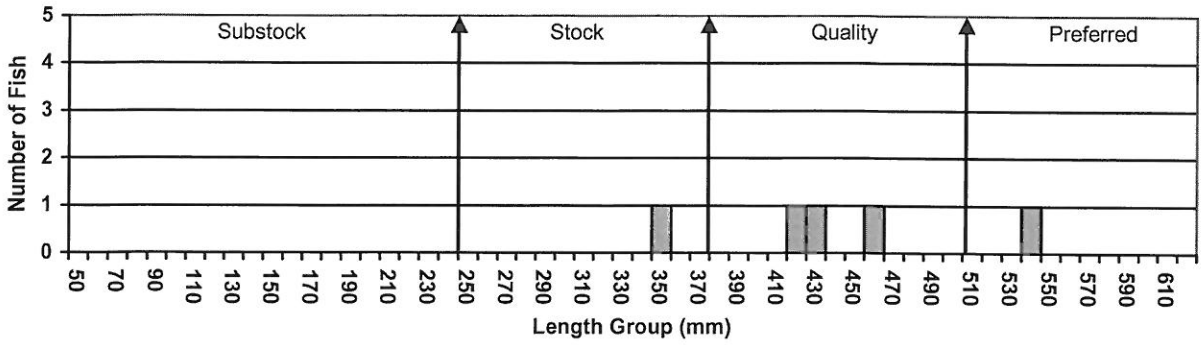
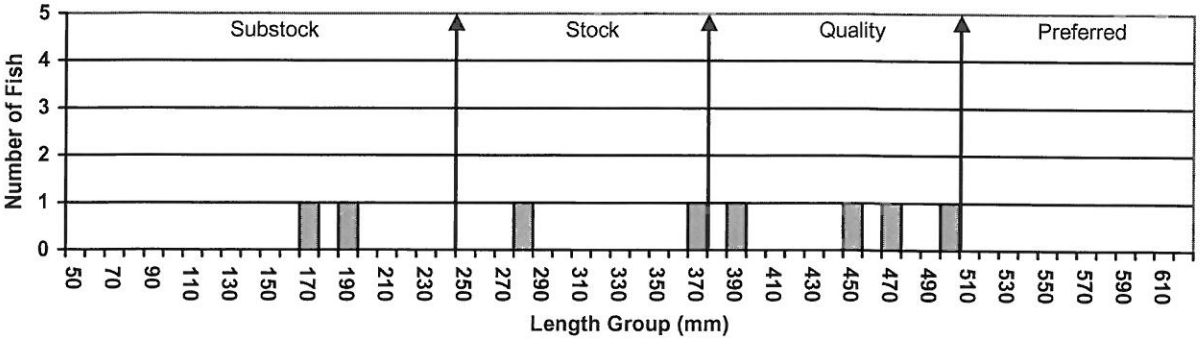


Figure 30. Length frequency histogram for walleye sampled from Lake Hurley, Potter County, 2011.



Other species

Black bullheads were the only other species sampled this survey and they were the dominant species in all gears. The gill net CPUE of 28.0 was well above the 6.5 from the 2011 survey (Table 11) as well as the 8.7 ten year mean (Table 2). The trap net CPUE of 34.9 is well above the 9.9 from the 2011 survey (Table 11) but well below the 89.1 seventeen year mean (Table 3). Figures 31 and 32 illustrate the length frequency histograms for the last two surveys. This survey the population is dominated by about one size grouping, whereas the past survey is much more balanced. Condition is good with a mean Wr of 98.

White crappie, white sucker, and golden shiner were the species not sampled this survey that had been in surveys past (Table 11).

Figure 31. Length frequency histogram for black bullhead sampled from Lake Hurley, Potter County, 2013.

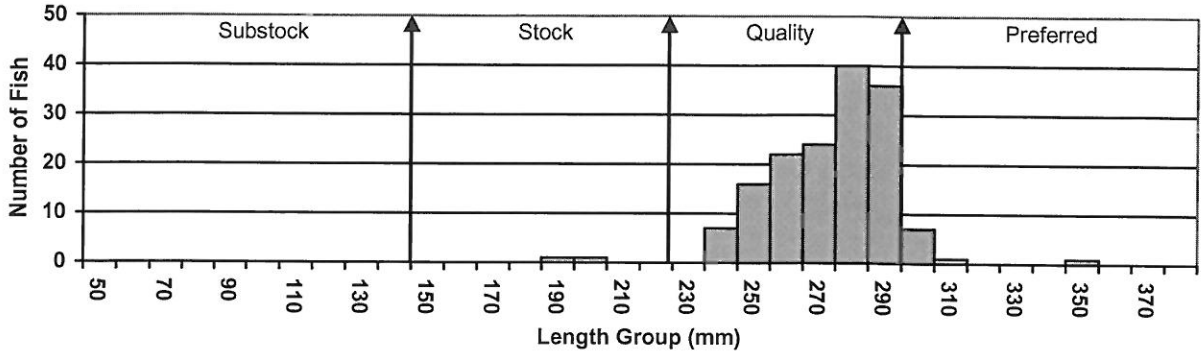


Figure 32. Length frequency histogram for black bullhead sampled from Lake Hurley, Potter County, 2011.

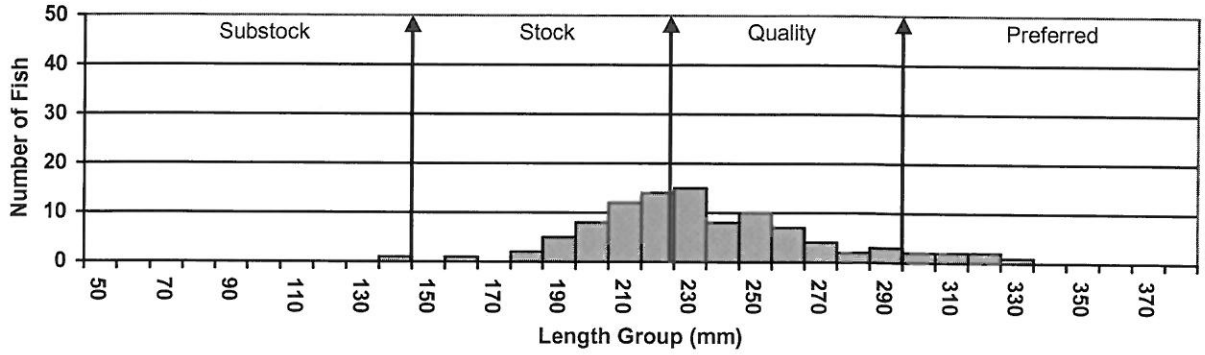


Table 10. Stocking records from 1992 to present for Lake Hurley, Potter County.

Year	Number	Species	Size
1992	1087	Walleye	Large Fingerling
1994	1975	Walleye	Fingerling
1997	1975	Walleye	Fingerling
1999	1,975	Walleye	Fingerling
2004	1,891	Walleye	Fingerling
2006	2,100	Walleye	Large Fingerling
2008	780	Walleye	Large Fingerling
2010	8,560	Walleye	Small Fingerling
2012	980	Walleye	Large Fingerling
2013	1,960	Largemouth Bass	Large Fingerling

RECOMMENDATIONS

1. Resurvey again in 2016 with trap nets, gill nets and electrofishing to sample all fish species.
2. Continue to stock walleye fingerlings on an every other year basis to maintain this fishery.

Table 11. Gill net (GN), trap net (TN), and electrofishing (EF) CPUE for all fish species sampled from Lake Hurley since survey records started in 1961.

Species	1961	1964	1968	1971	1977	1980	1982	1985	1988	1992	1993	1996	1999	2002	2005	2008	2011	2013	2014
BLB (GN)	--	--	--	--	--	21.0	6.0	53.0	--	--	--	--	--	--	--	--	6.5	28.0	--
BLB (TN)	53.0	36.0	120.0	9.2	437.3	190.6	131.3	289.9	188.5	22.9	15.6	9.5	--	--	--	1.8	9.9	34.9	--
BLC (GN)	--	--	--	--	--	2.0	--	1.0	--	--	1.0	--	6.0	1.0	1.0	--	--	--	--
BLC (TN)	159.4	116.5	11.0	5.5	--	16.1	34.4	4.3	--	6.1	4.6	2.5	42.1	28.7	7.2	3.9	1.0	0.2	--
WHC (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
WHC (TN)	--	--	--	--	--	--	--	--	46.6	--	--	--	--	--	--	--	--	--	--
YEP (GN)	--	--	--	--	--	77.0	--	3.0	--	--	11.0	37.0	61.0	70.0	20.0	22.0	--	1.0	--
YEP (TN)	2.8	11.0	4.0	1.2	--	5.0	--	2.0	2.8	0.9	1.3	5.0	0.9	2.3	1.9	7.2	0.9	0.1	--
LMB (EF)	--	--	--	--	--	--	--	--	8.0	--	9.8	--	20.7	--	37.0	12.6	18.0	--	51.0
LMB (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LMB (TN)	0.2	--	0.1	--	0.01	--	--	0.2	0.5	0.5	1.0	0.4	0.1	1.7	0.1	0.1	--	--	--
NOP (GN)	--	--	--	--	--	7.0	--	1.0	--	--	1.0	2.0	9.0	7.0	1.5	1.5	2.5	5.5	-
NOP (TN)	1.4	4.5	0.9	0.8	0.5	1.0	0.4	0.1	1.9	1.3	1.6	2.3	2.0	1.3	3.2	0.8	2.7	1.1	--
WHS (GN)	--	--	--	--	--	1.0	--	--	--	--	--	--	--	--	--	--	--	--	--
WHS (TN)	--	--	--	--	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--
WAE (EF)	--	--	--	--	--	--	--	--	2.0	--	--	--	--	--	--	--	8.0	--	--
WAE (GN)	--	--	--	--	--	--	--	2.0	--	--	--	4.0	6.0	3.0	--	0.5	--	1.5	--
WAE (TN)	0.2	2.5	0.1	0.2	0.4	0.3	0.3	0.2	1.0	0.3	0.5	0.4	--	0.6	0.1	0.2	--	0.2	--
BLG (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BLG (TN)	129.8	52.5	16.0	1.5	0.5	3.1	0.8	8.1	56.7	75.0	9.8	12.0	7.1	5.6	5.7	4.9	4.9	0.7	--
GOS (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GOS (TN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.1	--	--	--

BLB – Black Bullhead, BLC – Black Crappie, WHC – White Crappie, YEP – Yellow Perch, LMB – Largemouth Bass, NOP – Northern Pike, WHS – White Sucker, WAE – Walleye, BLG - Bluegill