

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-47

Name: Rahn Lake **County:** Tripp
Legal Description: T96N-R76W-Sec. 28 **GPS:** 43°06'17.10"N 99°50'05.59"W
Location from nearest town: 19 miles south and 1 1/2 miles east of Winner

Date of present survey: July 8-10, 2013 (netting); October 8, 2013 (electrofishing); October 6, 2014 (electrofishing)

Date of last survey: June 27-29, 2011 (netting); September 27, 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
Northern Pike	Yellow Perch
Bluegill	Golden Shiner
Largemouth Bass	Black Bullhead
Black Crappie	Green Sunfish

PHYSICAL DATA

Surface Area: 26.0 acres **Watershed:** 19,840 acres
Maximum Depth: 16 feet **Mean Depth:** 6.3 feet
Lake elevation at time of survey (field observations): Full
Contour map: Yes **Date:** 1974

Ownership of lake and adjacent lakeshore properties:

Rahn Lake is a 26-acre impoundment located on an unnamed tributary of the Keyopaha River east of Winner in Tripp County. The earthen dam and concrete spillway that create the lake were constructed by the Works Progress Administration (WPA) in 1941. To allow for the construction of the dam and resulting flooded property, two easements were granted to the State of South Dakota in 1934 for public use of the lake and a strip of land twelve feet above the high water contour. In 1940, another easement to the State for an additional 15.15 acres to allow improved public access was granted. The State of South Dakota, Game and Fish Commission also purchased 120 acres including the majority of the lake and land, including the dam grade, on the west side of the lake in 1940.

Watershed condition with percentages of land use types:

The watershed for Rahn Lake is 19,840 acres or about 31 square miles, which primarily consists of privately owned agricultural land. Land use in the watershed is approximately 30% cultivated cropland, 50% pasture and hayland, and 20% trees, residences and roads.

Fishing access:

There is a boat ramp on the southwest corner of the lake for lake access. There is also an access road all along the west side of the lake with shoreline fishing access to the lake on the public land. The shoreline fishing is severely hindered due to vegetation during the summer months.

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

The dam grade, concrete spillway and boat ramp are all in good condition.

Field observations of aquatic vegetation condition:

Emergent vegetation is located along most of the shoreline with the exception of the dam face. The shallow areas, especially the upper portion of the lake, are nearly choked with submergent vegetation. A lot of filamentous alga was found throughout the lake.

CHEMICAL DATA

Field observations of water quality and pollution problems:

No pollution problems were evident at the time of the survey. The water clarity was good with a secchi disc reading of 4 feet. Other water quality characteristics were measured in the field on July 8, 2013, using a HACH water quality kit and a Hanna multiparameter meter. The 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 Rahn Lake, Tripp County, July 8, 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	82.0	1.78	54.4	301	263	8.79	595	298	0.29	-15.0	4.0
A	15	66.0	0.25	28.8	324	315	7.80	676	336	0.33	-268.9	

BIOLOGICAL DATA

Methods:

Rahn Lake was sampled on July 8-10, 2013, with ten overnight trap net sets. The trap nets have 3ft x 5ft frames, 60ft leads, and 3/4 in. knotted mesh. No experimental gill nets were set during this survey. On the evening of October 8, 2013, Rahn Lake was electrofished for 40 minutes (4-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 590 μ S/cm with a water temperature of 55.9°F. On the evening of October 6, 2014, Rahn Lake was electrofished for 50 minutes (5-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 11 amps to electrofish the lake that had a conductivity of 545 μ S/cm with a water temperature of 58.3°F. Fish indices and statistics were completed using Winfin.

Results and Discussion:

Trap Net Catch

Table 2. Total catch of ten, overnight 3/4-inch frame nets at Rahn Lake, Tripp County, July 8-10, 2013.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Bullhead	323	84.6	32.3	± 16.8	33.3	73	0	98
Black Crappie	26	6.8	2.6	± 2.7	21.4	32	0	113
Yellow Perch	22	5.8	2.2	± 1.4	1.3	59	5	112
Bluegill	7	1.8	0.7	± 0.5	22.2	17	0	106
Northern Pike	4	1.0	0.4	± 0.4	1.3	--	--	75

* Seventeen year mean (1959, 1961, 1964, 1966, 1969, 1978, 1982, 1984, 1986, 1990, 1992, 1996, 1999, 2002, 2005, 2008, 2011)

Electrofishing Catch

Table 3. Total catch from four, ten-minute runs of fall nighttime electrofishing at Rahn Lake, Tripp County, October 8, 2013.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Largemouth Bass	188	100	282.0	± 56.0	28.7	63	33	122

* Five year mean (1986, 2002, 2005, 2008, 2011)

Table 4. Total catch from five, ten-minute runs of fall nighttime electrofishing at Rahn Lake, Tripp County, October 6, 2014.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Largemouth Bass	66	100	79.2	± 22.6	73.4	100	71	114

* Six year mean (1986, 2002, 2005, 2008, 2011, 2013)

Largemouth Bass

Largemouth bass have reestablished themselves in Rahn Lake after a couple surveys of nothing. The previous survey may have had bass present, but due to extremely dense mats of aquatic vegetation prevented a fall electrofishing survey to be done. The current CPUE of 282.0 fish per hour is well above the five year mean of 28.7 (Table 3). The one misleading part about this CPUE is that the vast majority of the fish were substock in size, so that CPUE of fish stock size and larger would have been 36 fish per hour which is much more in line with the five year mean. Figure 2 illustrates the length frequency histogram for the fish sampled from this survey and shows how the population is made up of predominantly small fish. The PSD of 63 with an RSD-P of 33 is also misleading as the large group of substock fish is not factored into these calculations. Growth is good with means right on to slightly above statewide, regional and SLI means (Table 5). Condition is also good with a mean Wr of 122. Hopefully this population will continue to build and start to control all the panfish species to increase their sizes.

The Rahn Lake largemouth bass population was once again electrofished in the fall of 2014 to further evaluate the success of the advanced largemouth bass stocking that was done in the spring of 2013. These bass were marked with a freeze brand so they would be readily identifiable. Overall the bass population appears to be headed in the right direction with a good mix of sizes and year classes showing up. As for the stocking, no marked bass were seen this survey and only 3 were seen last year. The advanced size stocked appears to be a least marginally successful, but is somewhat difficult to fully evaluate with the higher than anticipated natural population that is developing. Figure 1 illustrates the length frequency histogram for the fish sampled from this survey. Condition continues to be good with a mean Wr of 114.

Table 5. Average back-calculated lengths (mm) for each age class of largemouth bass sampled from Rahn Lake, Tripp County, 2013.

Year Class	Age	N	Back-calculated Age				
			1	2	3	4	5
2012	1	9	88				
2011	2	2	110	195			
2010	3	6	94	197	311		
2009	4	2	115	188	317	371	
2008	5	3	143	229	336	402	429
All Classes		22	110	202	321	386	429
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 1. Length frequency histogram for largemouth bass sampled from Rahn Lake, Tripp County, 2014.

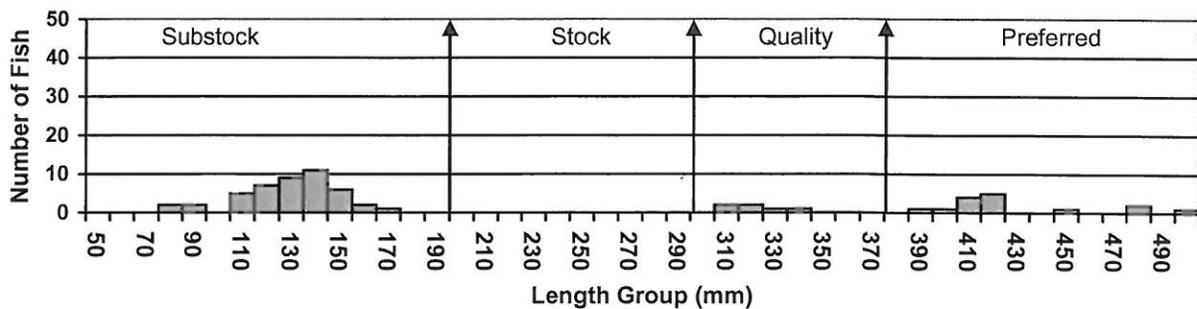
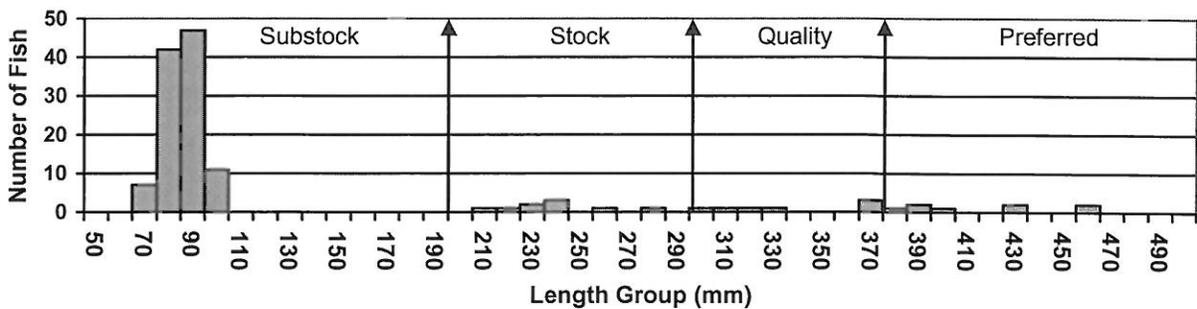


Figure 2. Length frequency histogram for largemouth bass sampled from Rahn Lake, Tripp County, 2013.



Black Crappie

The black crappie population in Rahn Lake has declined for the third consecutive survey. The CPUE of 2.6 fish per net night is below the 7.0 from the 2011 survey (Table 9) as well as the 21.4 seventeen year mean (Table 2). Figures 3 through 8 illustrate the length frequency histograms for the past six surveys. Growth continues to be slow with means again below statewide, regional and SLI means (Table 6). Condition is good though with a mean Wr of 113. Looking back at past surveys, this black crappie has a tendency to fluctuate in numbers like this. Hopefully with the increased largemouth bass population, the numbers for all the panfish species will remain on the low side to increase growth rates and the size structure.

Table 6. Average back-calculated lengths (mm) for each age class of black crappie sampled from Rahn Lake, Tripp County, 2013

Year Class	Age	N	Back-calculated Age						
			1	2	3	4	5	6	
2012	1	1	73						
2011	2	17	84	138					
2010	3	7	93	146	182				
2007	6	1	84	130	153	178	192	204	
All Classes		26	84	138	167	178	192	204	
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 3. Length frequency histogram for black crappie sampled on Rahn Lake, Tripp County, 2013.

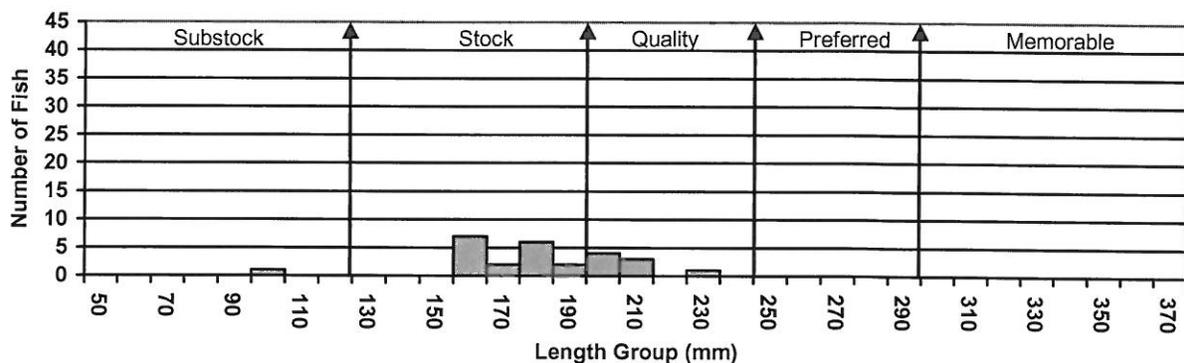


Figure 4. Length frequency histogram for black crappie sampled on Rahn Lake, Tripp County, 2011.

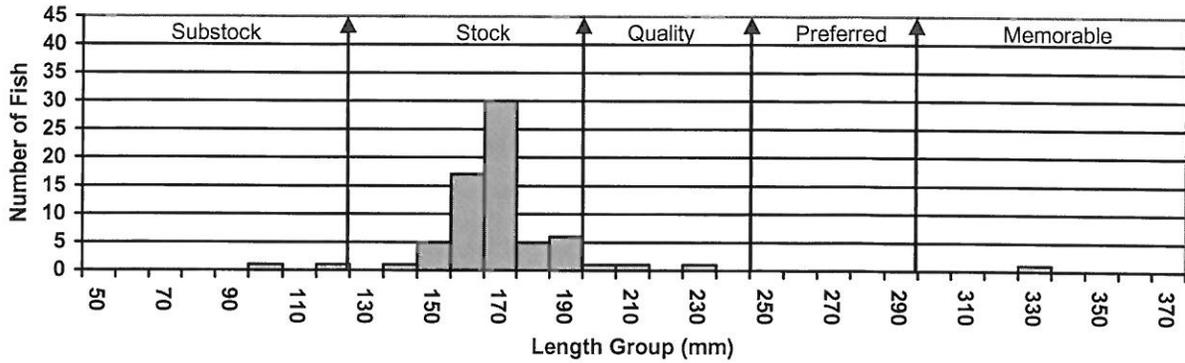


Figure 5. Length frequency histogram for black crappie sampled on Rahn Lake, Tripp County, 2008.

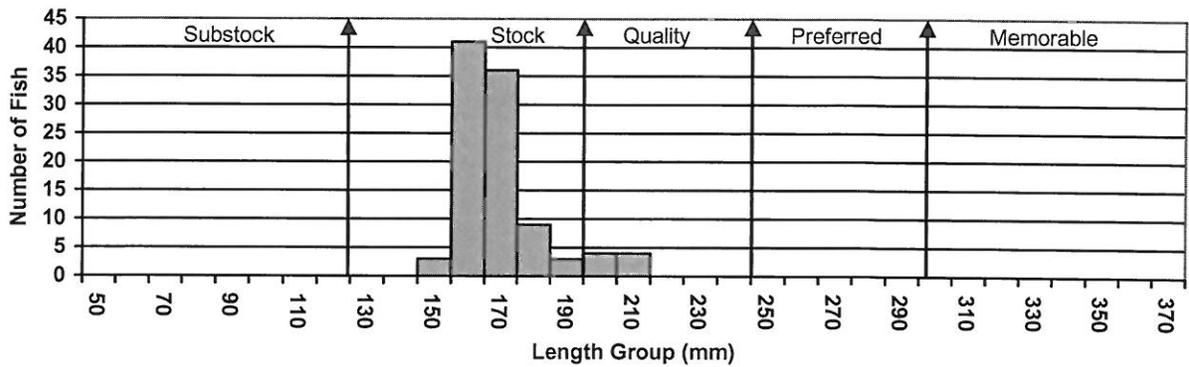


Figure 6. Length frequency histogram for black crappie sampled on Rahn Lake, Tripp County, 2005.

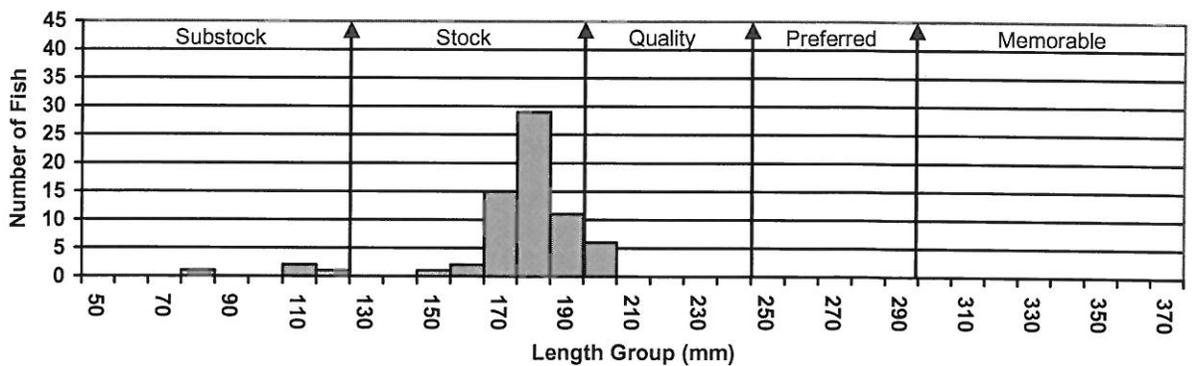


Figure 7. Length frequency histogram for black crappie sampled on Rahn Lake, Tripp County, 2002.

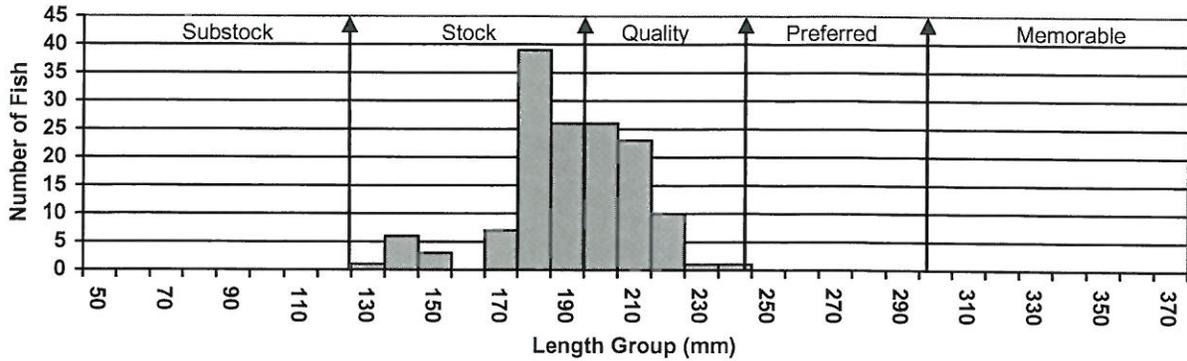
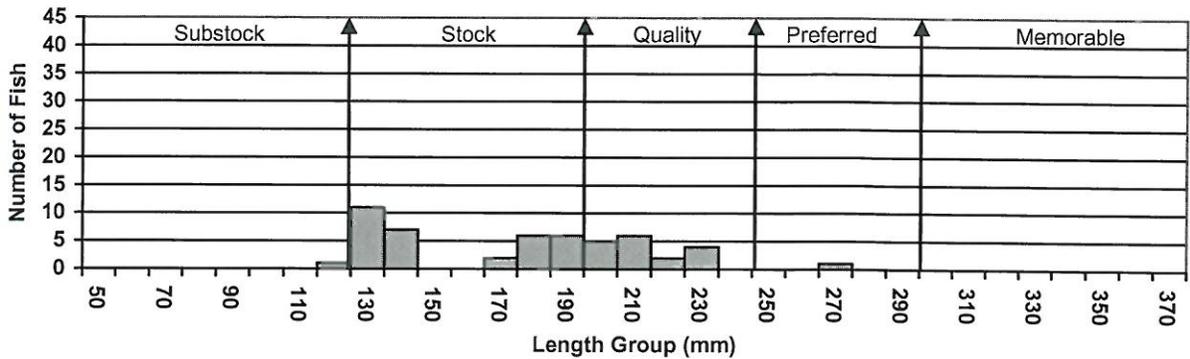


Figure 8. Length frequency histogram for black crappie sampled on Rahn Lake, Tripp County, 1999.



Bluegill

Bluegill numbers have once again declined. The CPUE of 0.7 is below the 6.8 from the 2011 survey (Table 9) as well as the 22.2 seventeen year mean (Table 2). Figures 9 through 13 illustrate the length frequency histograms for the past five surveys and show how the size structure has changed over the years. The current survey only had seven fish sampled, so it does not necessarily give an accurate picture of the size structure. Growth was not figured this survey with the low numbers of fish sampled, but it has been slow in years past. Condition is good though with a mean W_r of 106. Hopefully the increase in the largemouth bass population will help to turn this population into one desired by anglers.

Figure 9. Length frequency histogram for bluegill sampled on Rahn Lake, Tripp County, 2013.

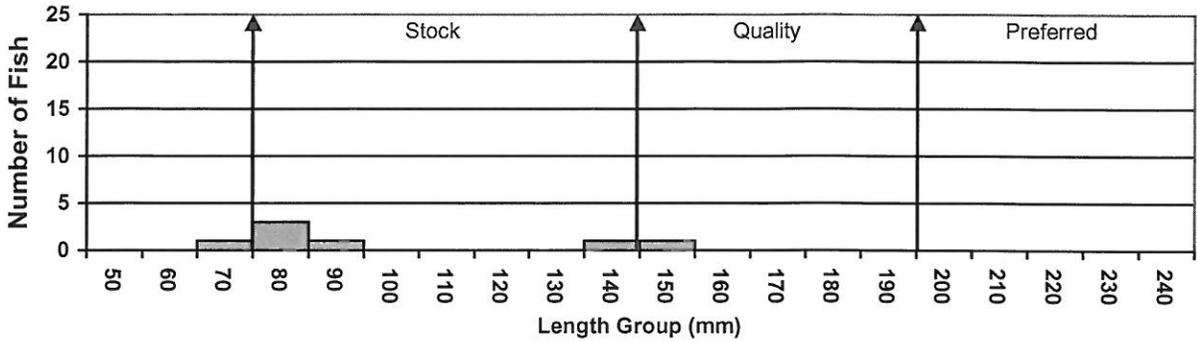


Figure 10. Length frequency histogram for bluegill sampled on Rahn Lake, Tripp County, 2011.

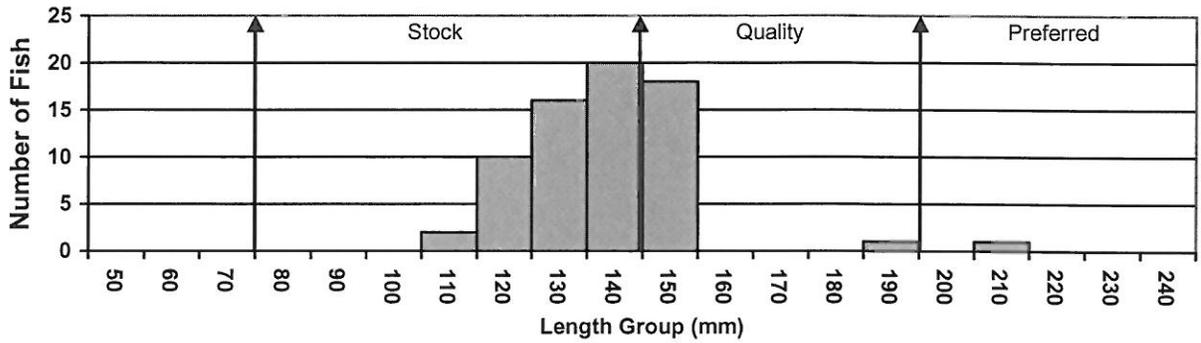


Figure 11. Length frequency histogram for bluegill sampled on Rahn Lake, Tripp County, 2005.

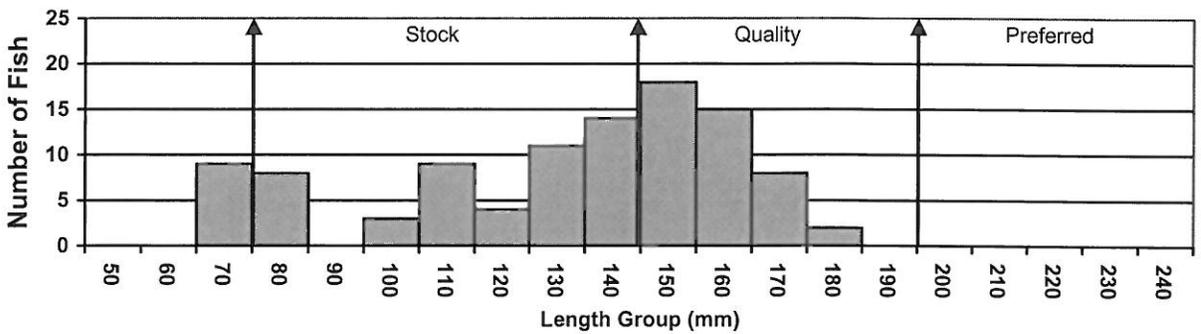


Figure 12. Length frequency histogram for bluegill sampled on Rahn Lake, Tripp County, 2002.

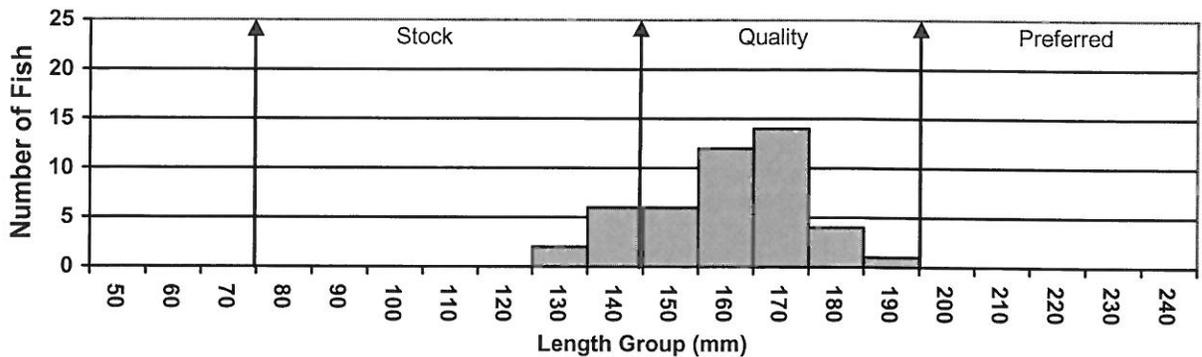
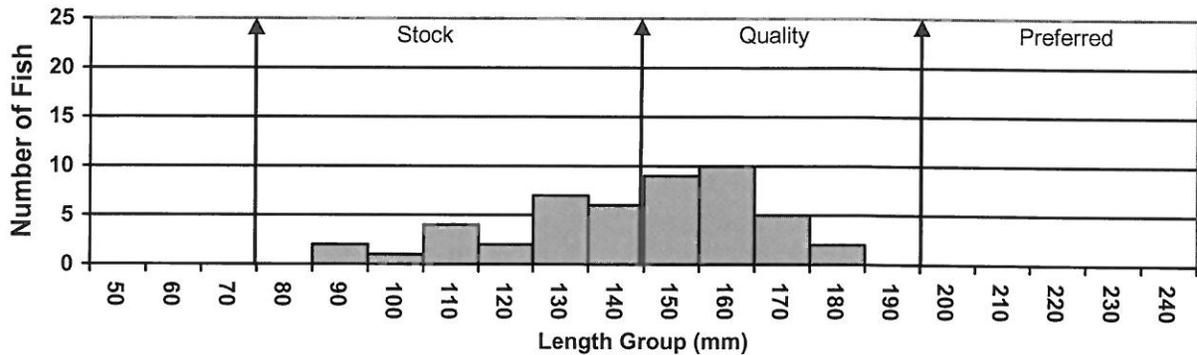


Figure 13. Length frequency histogram for bluegill sampled on Rahn Lake, Tripp County, 1999.



Yellow Perch

Yellow perch numbers have declined just like all the other panfish species. The CPUE of 2.2 is below the 7.2 from the 2011 survey (Table 9) but is slightly above the 1.3 seventeen year mean (Table 2). Figures 14 through 16 illustrate the length frequency histograms for the last three surveys. Size structure has improved with a PSD of 59 with an RSD-P of 5 compared to the 24 and 1, respectively, from the 2011 survey. Growth is slow with means below statewide, regional and SLI means (Table 7). Slow growth is a common occurrence for any panfish species present in Rahn Lake, but hopefully the increase largemouth bass population will help thin the numbers down to allow for growth rates to increase. Condition is good with a mean W_r of 112.

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

Year Class	Age	N	1	2	3	4	5	6
2011	2	1	90	142				
2010	3	6	81	117	148			
2009	4	9	85	121	149	173		
2008	5	5	91	129	147	173	189	
2007	6	1	74	132	183	197	217	234
All Classes		22	84	128	157	181	203	234
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 14. Length frequency histogram for yellow perch sampled on Rahn Lake, Tripp County, 2013.

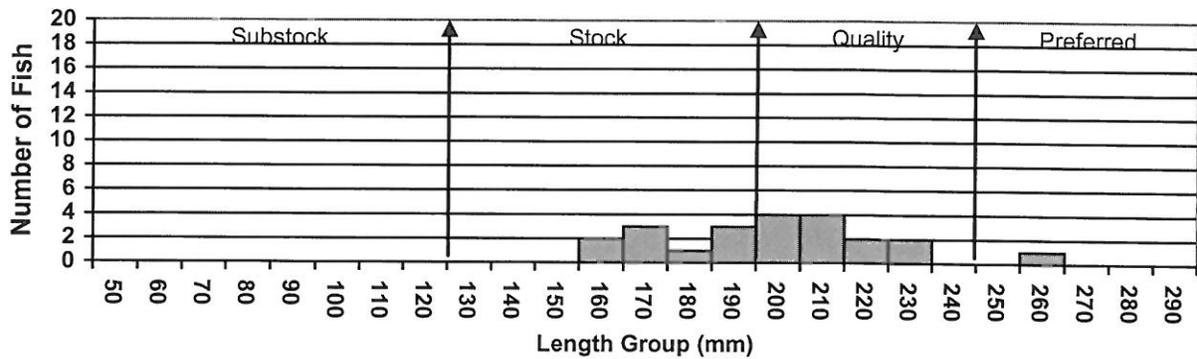


Figure 15. Length frequency histogram for yellow perch sampled on Rahn Lake, Tripp County, 2011.

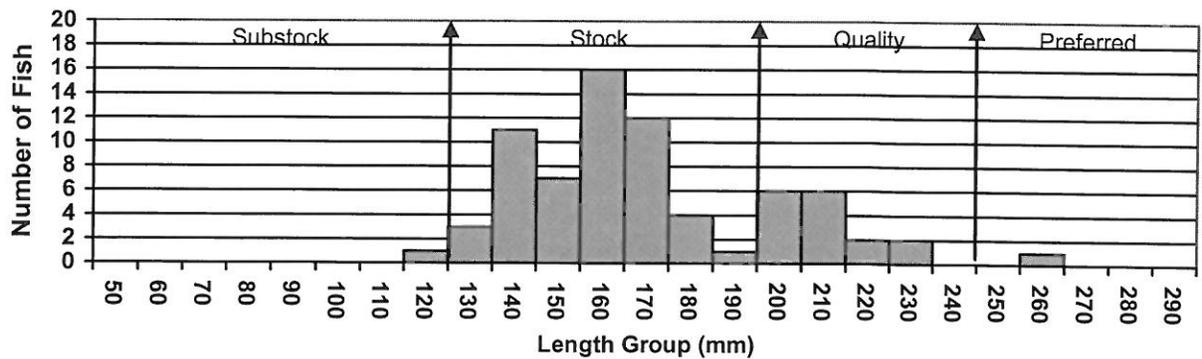
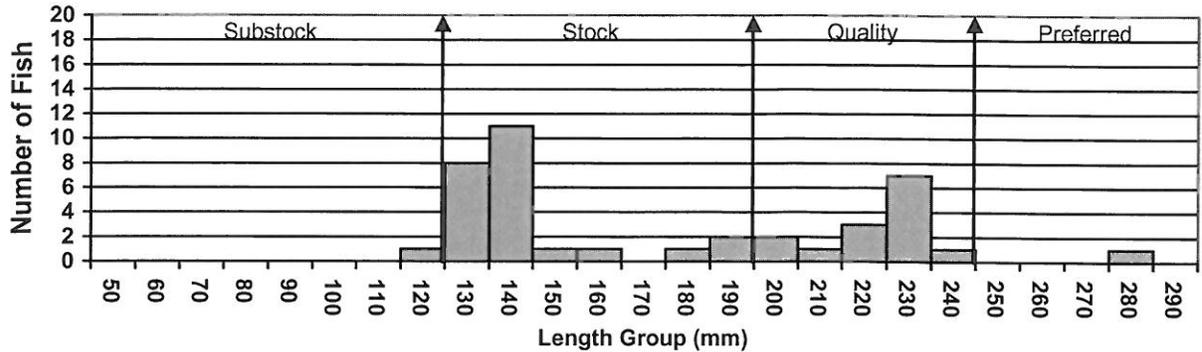


Figure 16. Length frequency histogram for yellow perch sampled on Rahn Lake, Tripp County, 2008.



Other Species

Black bullheads were again the dominant species sampled during the summer part of the survey. The CPUE of 32.3 is down from the 78.4 from the 2011 survey (Table 9) but right on with the 33.3 seventeen year mean (Table 2). Figures 17 through 19 illustrate the length frequency histograms for the last three surveys. Size structure has increased with a PSD of 73 with an RSD-P of 0 compared to the 3 and 0, respectively, from the 2011 survey. Condition is good with a mean W_r of 98.

Northern pike were the only other species sampled this survey. The CPUE of 0.4 is below the 1.4 from the 2011 survey (Table 9) as well as the 1.3 seventeen year mean (Table 2). White crappie, channel catfish, green sunfish, and golden shiner were the species not sample this survey that had been in surveys past (Table 9).

Figure 17. Length frequency histogram for black bullhead sampled on Rahn Lake, Tripp County, 2013.

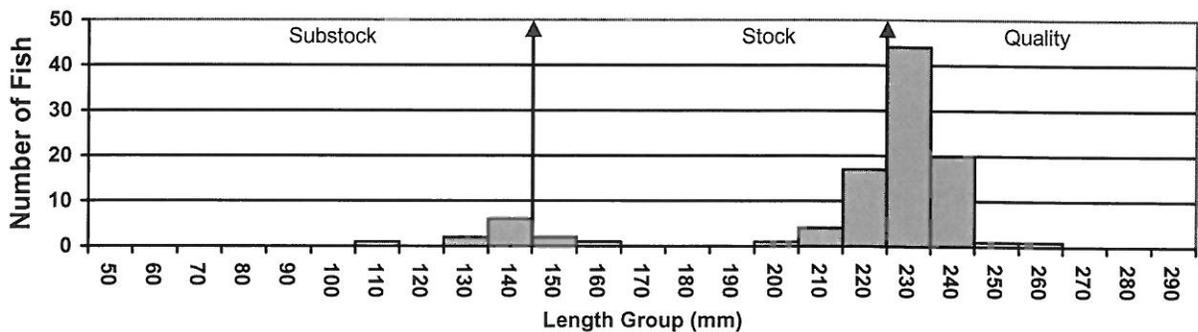


Figure 18. Length frequency histogram for black bullhead sampled on Rahn Lake, Tripp County, 2011.

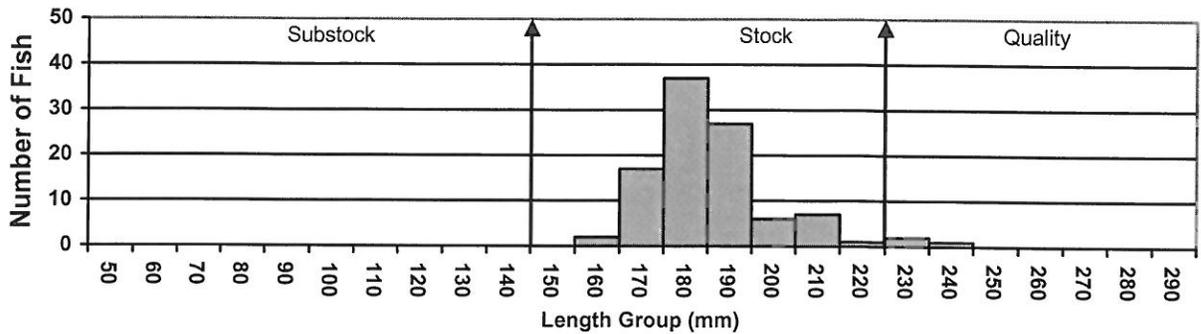


Figure 19. Length frequency histogram for black bullhead sampled on Rahn Lake, Tripp County, 2008.

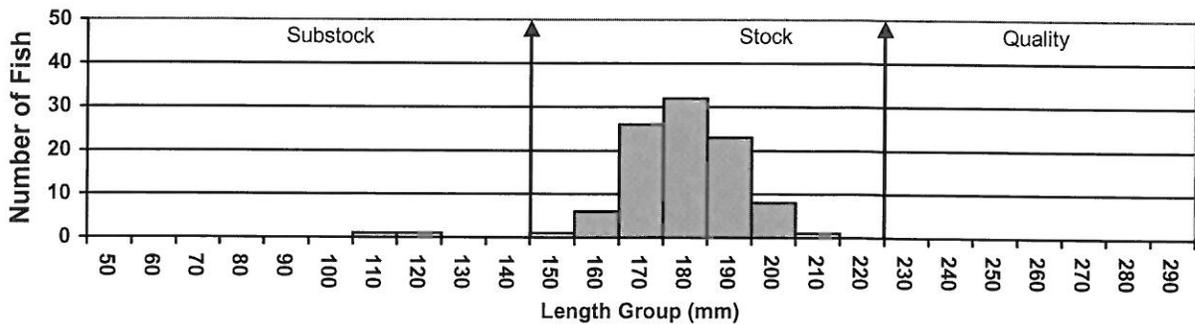


Table 8. Stocking records from 2001 to the present for Rahn Lake, Tripp County.

Year	Number	Species	Size
2001	2,600	Largemouth Bass	Fingerling
2009	175	Largemouth Bass	Juvenile
2009	150	Largemouth Bass	Adult
2012	100	Largemouth Bass	Juvenile
2013	648	Largemouth Bass	Large Fingerling

RECOMMENDATIONS

1. Remove black crappie from the population to help growth rates and prevent stunting in the populations.
2. Stock some larger adult largemouth bass to increase the density of predators to help the stunting taking place in the panfish populations.
3. Resurvey in 2016 to monitor all fish populations.

Table 9. Gill net (GN), trap net (TN) and electrofishing (EF) CPUE for all fish species sampled in Rahn Lake since surveys started.

Species	1959	1961	1964	1966	1969	1978	1982	1984	1986	1990	1992	1996	1999	2002	2005	2008	2011	2013	2014
BLB (GN)	--	--	--	--	--	1.0	1.0	--	--	--	--	--	--	--	--	--	--	--	--
BLB (TN)	33.5	34.5	3.5	1.0	6.3	1.6	--	12.4	5.5	82.4	42.1	93.5	58.1	11.5	0.9	100.7	78.4	32.3	--
BLC (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BLC (TN)	47.3	55.3	31.8	118.0	--	--	--	--	--	--	0.7	4.1	11.3	41.9	8.0	38.0	7.0	2.6	--
WHC (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
WHC (TN)	--	--	11.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YEP (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
YEP (TN)	0.3	0.5	--	--	--	--	--	--	0.1	4.5	2.7	1.6	0.8	0.3	0.1	4.0	7.2	2.2	--
LMB (EF)	--	--	--	--	--	--	--	--	16.0	--	--	--	--	112.5	30.0	0.0	0.0	282.0	79.2
LMB (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LMB (TN)	--	1.3	0.3	--	--	0.1	--	--	0.4	--	--	--	0.1	--	--	--	--	--	--
NOP (EF)	--	--	--	--	--	--	--	--	0.9	--	--	--	--	--	--	--	--	--	--
NOP (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NOP (TN)	0.3	--	--	--	--	--	--	0.6	0.9	7.3	0.1	7.6	1.4	1.4	0.2	0.6	1.4	0.4	--
CCF (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CCF (TN)	2.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BLG (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BLG (TN)	14.3	143.3	11.8	21.3	--	16.1	0.6	7.0	14.4	71.9	11.1	17.1	18.0	8.9	14.9	0.2	6.8	0.7	--
GSF (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GSF (TN)	--	--	--	--	0.5	0.9	--	0.3	--	--	0.2	2.3	1.1	0.8	--	0.1	0.2	--	--
GOS (EF)	--	--	--	--	--	--	--	--	11.0	--	--	--	--	--	--	--	--	--	--
GOS (GN)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GOS (TN)	--	--	--	0.7	--	--	0.1	0.05	--	0.1	--	0.1	--	--	--	--	--	--	--

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