SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-43

Name: Wagner Lake **County(ies):** Charles Mix
Legal Description: T96N-R63W-Sec. 33 **GPS:** 43º05'02.44"N 98º18'18.31"W
Location from nearest town: Northwest edge of Wagner

Date of present survey: June 28-30, 2010 (netting); October 14, 2010 (electrofishing)
Date of last survey: July 31-August 2, 2007 (netting)
Most recent lake management plan: None available
Management classification: Warmwater Semi-Permanent

Primary Game Species	Secondary and Other Species
Largemouth Bass	Black Bullhead
Bluegill	Yellow Perch
Northern Pike	Green Sunfish
Black Crappie	Common Carp

PHYSICAL DATA

Surface Area: 8 acres **Watershed:** 4,480 acres
Maximum Depth: 8.5 feet **Mean Depth:** 5 feet
Lake elevation at time of survey (field observations): Full
Contour map: No **Date:** NA

Ownership of lake and adjacent lakeshore properties:

The City of Wagner owns the surrounding land and the State of South Dakota has an easement for 12-feet above the high water mark for public access.

Watershed condition with percentages of land use types:

The watershed on Wagner Lake is 90% agricultural land and 10% grassland.

Fishing access:

There is ample shore fishing opportunities around the lake. The lake is located on the edge of town at the city park and is in walking distance for kids to fish. There is no boat ramp for water access unless a person had a duck boat or canoe.

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

All structures are in good condition. The city has been redoing most of the park structures and installing new sidewalks.

Field observations of aquatic vegetation condition:

No submergent vegetation was observed at the time of the survey. The emergent vegetation consisted of cattails in about nine small clumps around the shoreline. All other vegetation has been removed.

CHEMICAL DATA

Field observations of water quality and pollution problems:

No pollution problems were evident at the time of the survey. The city has been doing many renovation projects to and around the lake in recent years. The lake was dredged and dug out in 2002 and many of the structures have been updated. Water clarity was good with a secchi disc reading of 2.5 feet. Other water quality characteristics were measured in the field on June 29, 2010, 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 Wagner Lake, Charles Mix County, June 29, 2010.

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	77.8	3.21	12.6	195	638	8.33	1375	689	0.69	162.3	2.5
A	?	67.1	0.00	15.4	190	592	7.16	1158	578	0.59	14.7	

BIOLOGICAL DATA

Methods:

Wagner Lake was sampled on June 28-30, 2010, with ten overnight trap net sets. 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 14, 2010, Wagner Lake was electrofished for 20 minutes (2-ten minute transects) to sample the largemouth bass population. The boat was set up with 120 pulses per second DC current at 170 volts with around 15.5 amps to electrofish the lake that had a conductivity of 1724 µS/cm with a water temperature of 62ºF. 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 Wagner Lake, Charles Mix County, June 28-30, 2010.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Bluegill	377	74.9	37.7	± 21.2	77.8	1	0	84
Black Crappie	114	22.7	11.4	± 4.3	35.6	1	0	88
Yellow Perch	4	0.8	0.4	± 0.4	2.6	--	--	72
Common Carp	3	0.6	0.3	± 0.3	0.7	--	--	85
Largemouth Bass	2	0.4	0.2	± 0.3	0.03	--	--	95
Channel Catfish	2	0.4	0.2	± 0.3	0.1	--	--	95
Green Sunfish	1	0.2	0.1	± 0.1	0.2	--	--	97

* Three year mean (2000, 2004, 2007)

Electrofishing Catch

Table 3. Total catch from two, ten-minute transects of fall nighttime electrofishing on Wagner Lake, Charles Mix County, October 14, 2010.

Species	#	%	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Largemouth Bass	48	100	144.0	± 73.9	0.0	70	35	99

* First year electrofishing

Largemouth Bass

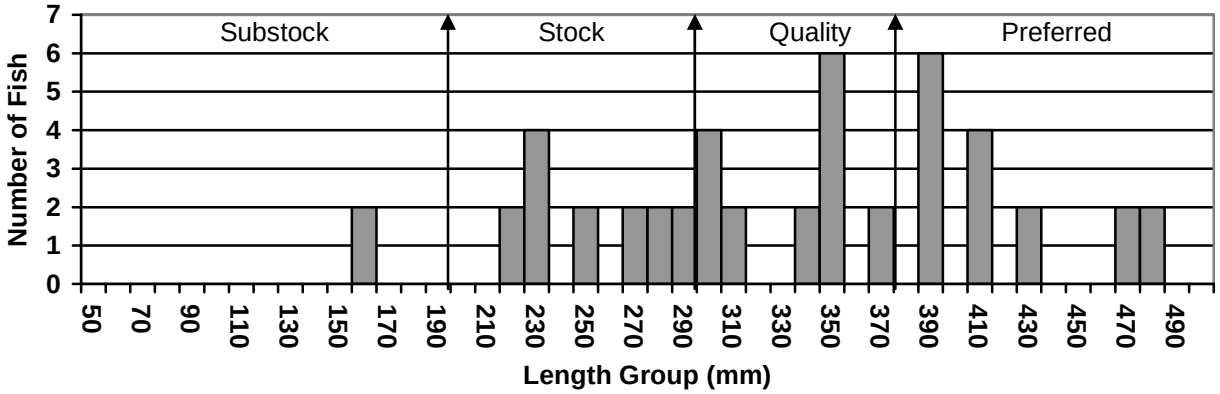
The Wagner Lake largemouth bass population was sampled for the first time this survey. The lake has a better bass population than was anticipated. The fall electrofishing CPUE was 144 fish per hour. Size structure was very good as well as can be seen in Figure 1. This is also indicated by the PSD of 70 with an RSD-P of 35 (Table 3). Growth is fine with means right around statewide, regional and SLI means (Table 4). Condition is also good with a mean Wr of 99.

Table 4. Average back-calculated lengths (mm) for each age class of largemouth bass sampled from Wagner Lake, Charles Mix County, 2010.

			Back-calculated Age							
Year Class	Age	N	1	2	3	4	5	6	7	8
2009	1	2	90							
2008	2	4	90	166						
2007	3	10	82	158	242					
2006	4	14	82	156	227	299				
2005	5	6	89	164	228	277	330			
2004	6	6	73	157	240	301	342	366		
2003	7	2	88	132	181	240	273	350	412	
2002	8	4	81	160	214	275	361	394	402	420
All Classes		**48**	**84**	**156**	**222**	**278**	**327**	**370**	**407**	**420**
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 Wagner Lake, Charles Mix County, 2010.



Bluegill

Bluegills have once again become the dominant species sampled in Wagner Lake this survey period. The CPUE of 37.7 is slightly above the 30.5 from the 2007 survey (Table 8) but still well below the 77.8 three year mean (Table 2). Size structure has remained relatively constant over the past three surveys as can be seen in Figures 2 through 4. This can also be seen by the PSD of 1 with an RSD-P of 0, which is identical to the 4 and 0, respectively, from the 2007 survey. Growth is slow with means below statewide, regional and SLI means (Table 5). Condition is on the low side but still fine with a mean Wr of 84. The bluegill population is showing signs of stunting even though there is a good largemouth bass population. Some manual removal may have to be done to help increase the size of these fish and improve growth rates.

Table 5. Average back-calculated lengths (mm) for each age class of bluegill sampled from Wagner Lake, Charles Mix County, 2010.

			Back-calculated Age									
Year Class	Age	N	1	2	3	4	5	6	7	8	9	10
2008	2	77	55	100								
2007	3	7	44	104	126							
2006	4	6	42	92	114	130						
2005	5	8	45	83	116	127	134					
2004	6	3	47	68	107	119	129	137				
2000	10	1	38	63	77	90	99	110	127	137	149	159
All Classes		**102**	**45**	**85**	**108**	**116**	**121**	**123**	**127**	**137**	**149**	**159**
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 2. Length frequency histogram for bluegill sampled from Wagner Lake, Charles Mix County, 2010.

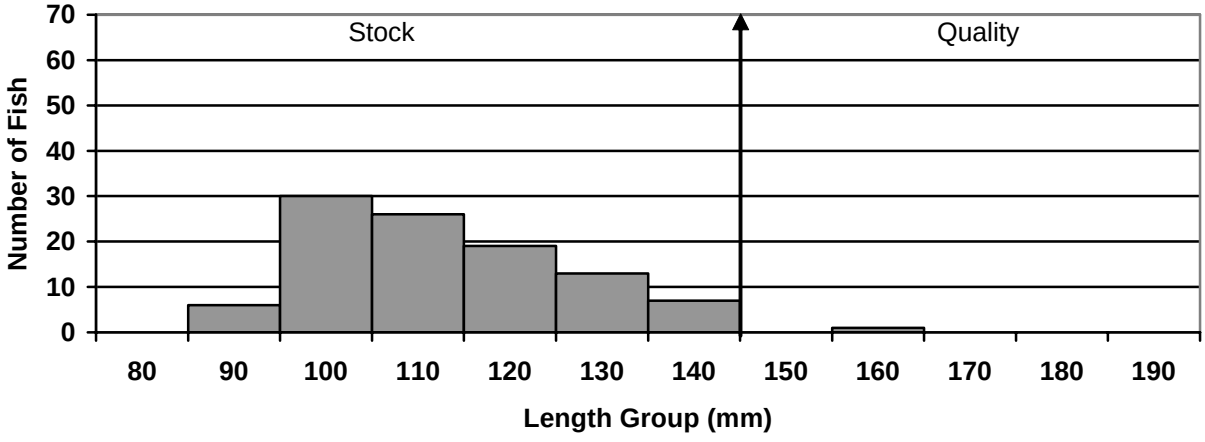


Figure 3. Length frequency histogram for bluegill sampled from Wagner Lake, Charles Mix County, 2007.

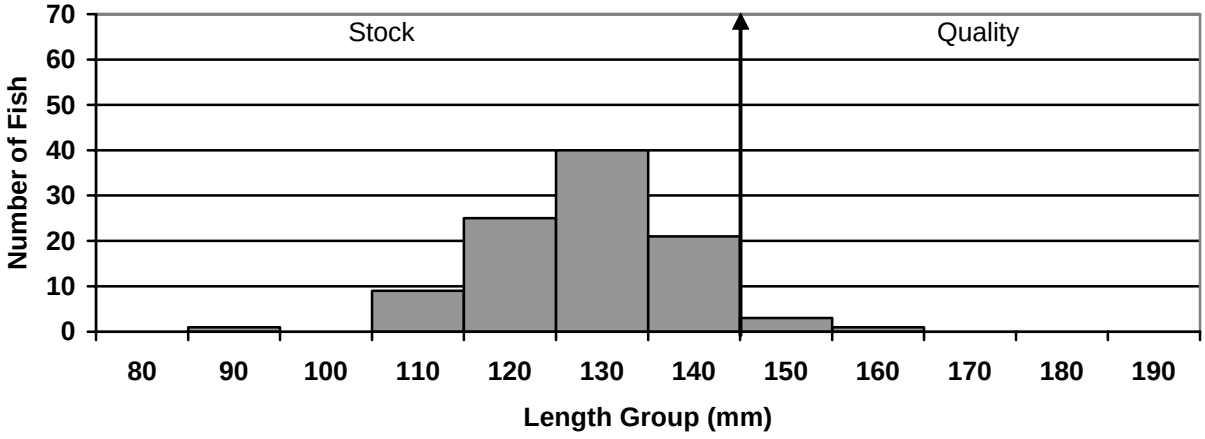
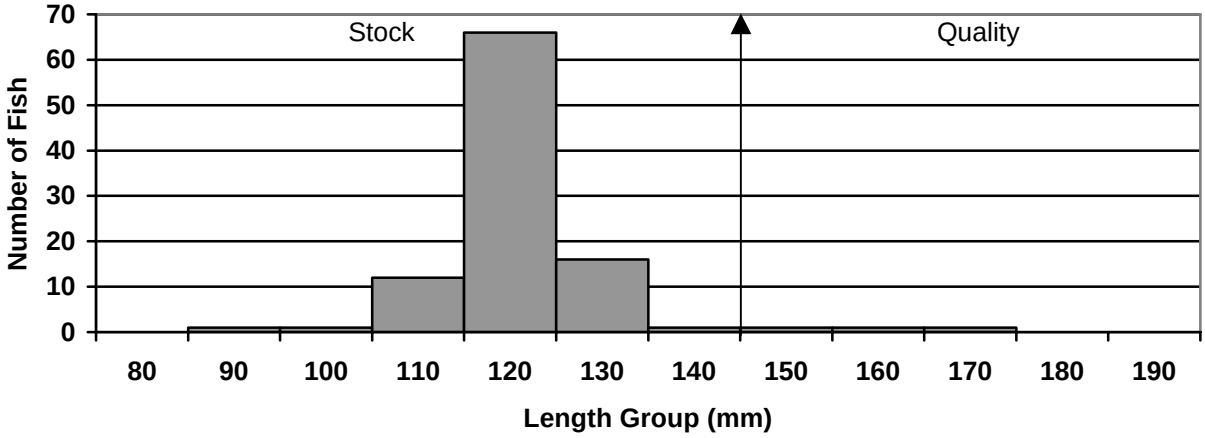


Figure 4. Length frequency histogram for bluegill sampled from Wagner Lake, Charles Mix County, 2004.



Black Crappie

Black crappies have dropped back to the second most dominant species in Wagner Lake this survey. The CPUE of 11.4 is below the 42.0 from the 2007 survey (Table 8) as well as the 35.6 three year mean (Table 2). Figures 5 through 8 illustrate the length frequency histograms from the last four surveys. Not much has changed other than the densities from year to year. The population is dominated by small fish as can be seen with the PSD of 1 and an RSD-P of 0, which is identical to the 2 and 0, respectively, for the 2007 survey. Growth is slow with means below statewide, regional and SLI means (Table 6). Condition is fine with a mean Wr of 88.

Table 6. Average back-calculated lengths (mm) for each age class of black crappie sampled from Wagner Lake, Charles Mix County, 2010.

			Back-calculated Age					
Year Class	Age	N	1	2	3	4	5	6
2009	1	3	77					
2008	2	63	82	131				
2007	3	38	92	149	160			
2004	6	1	106	169	185	202	216	226
All Classes		**105**	**89**	**150**	**173**	**202**	**216**	**226**
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 5. Length frequency histogram for black crappie sampled from Wagner Lake, Charles Mix County, 2010.

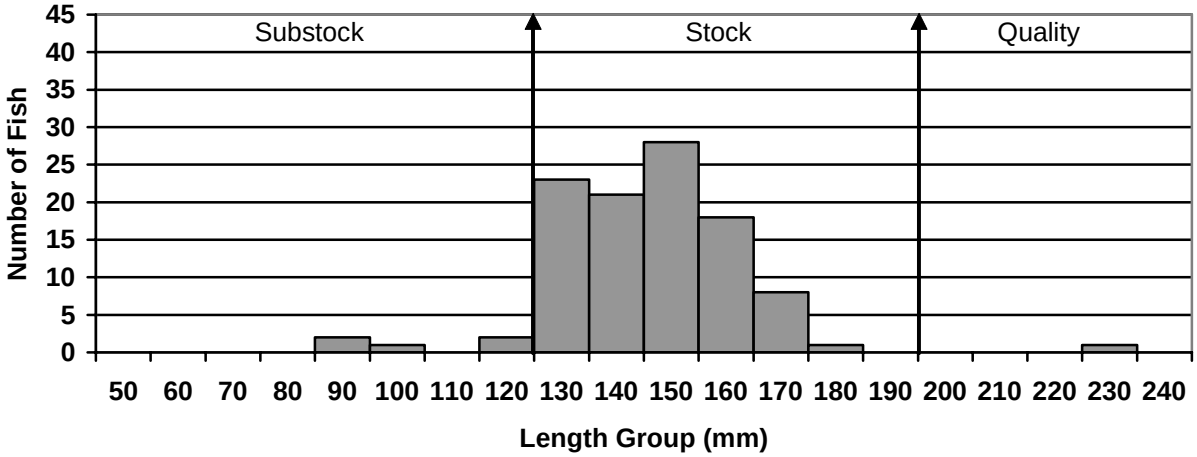


Figure 6. Length frequency histogram for black crappie sampled from Wagner Lake, Charles Mix County, 2007.

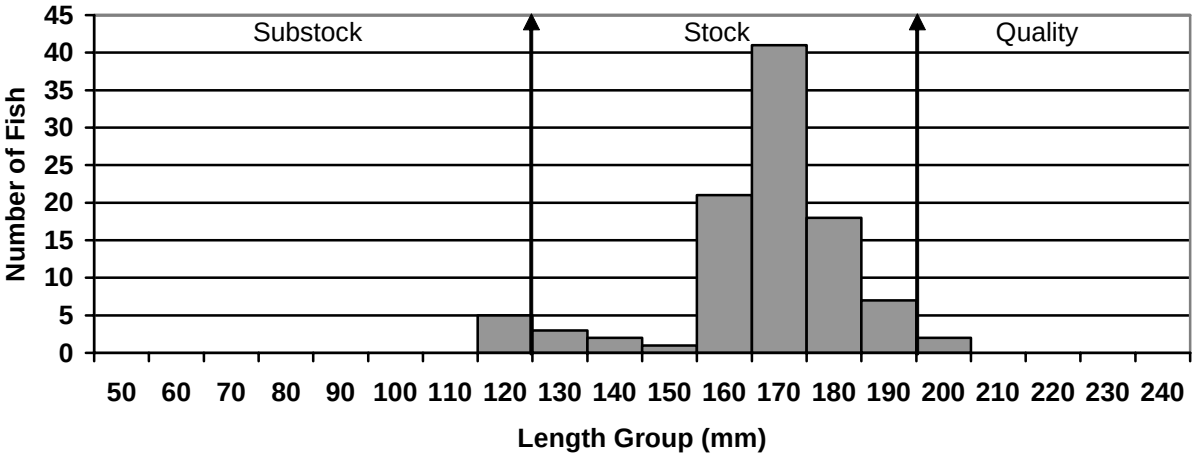


Figure 7. Length frequency histogram for black crappie sampled from Wagner Lake, Charles Mix County, 2004.

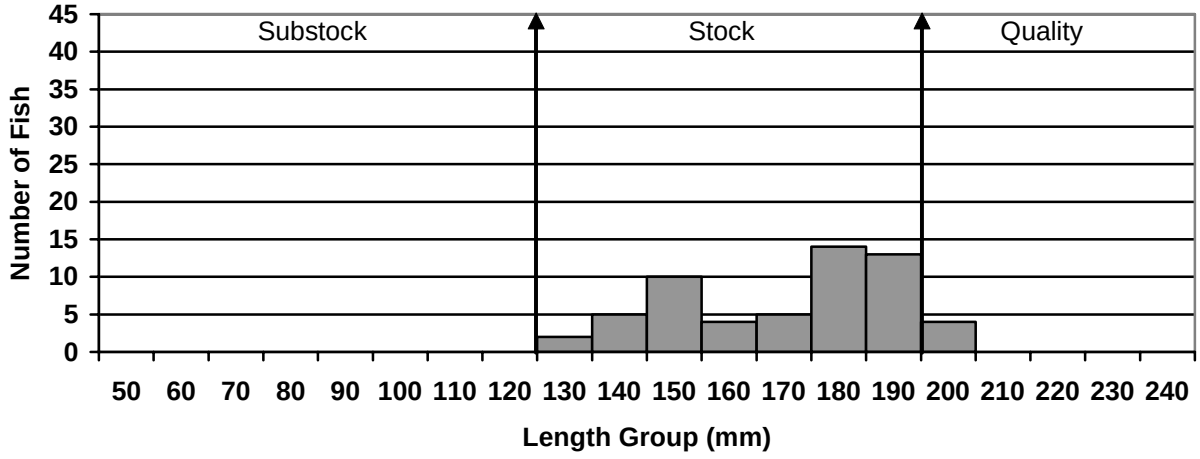
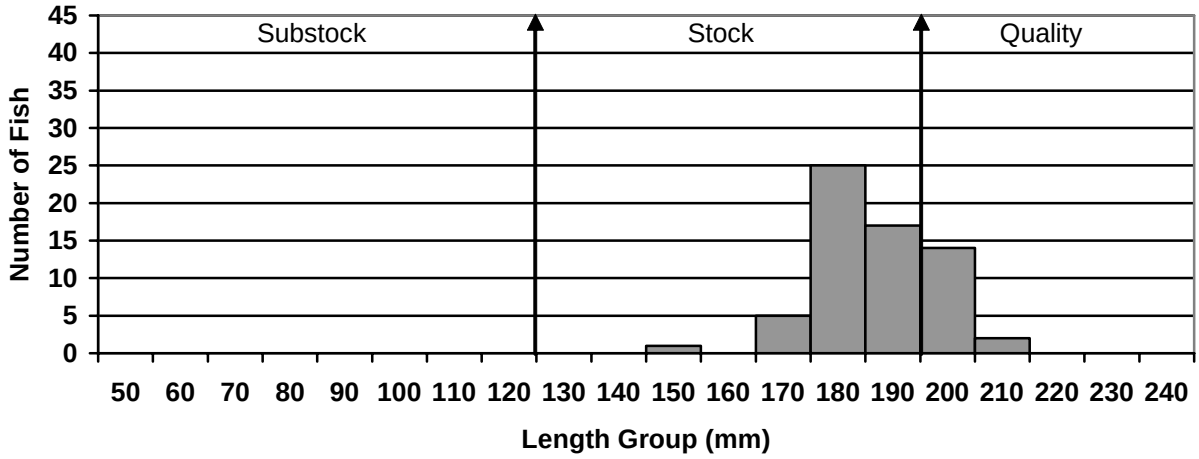


Figure 8. Length frequency histogram for black crappie sampled from Wagner Lake, Charles Mix County, 2000.



Others species

Yellow perch, common carp, channel catfish, and green sunfish were the only other species sampled this survey. None were sampled in large enough quantities to make any inferences about their populations. White crappie, northern pike, smallmouth bass, pumpkinseed sunfish and hybrid sunfish were the species not sampled this survey that have been in years past (Table 8).

Table 7. Stocking records for the last ten years for Wagner Lake, Charles Mix County.

Year	Number	Species	Size
2004	100	Largemouth Bass	Juvenile

RECOMMENDATIONS

1. Resurvey in 2013 to further monitor the fish population in Wagner Lake.

2. Continue to stock largemouth bass juveniles to control the stunting bluegill and black crappie populations. They will also help keep the other fish populations in check.

3. Consider stocking a secondary predator, such as channel catfish or northern pike to further help control the panfish populations in a lake that has potential as being a highly utilized fishery right next to the town of Wagner.

Table 8. Trap net (TN) CPUE for all fish species sampled in Wagner Lake since survey records started in 1987.

Species	1987	1990	2000	2004	2007	2010
Black Bullhead (TN)	289.9	371.3	234.9	13.4	1.0	--
Black Crappie (TN)	--	--	59.0	5.7	42.0	11.4
White Crappie (TN)	--	7.8	--	--	--	--
Yellow Perch (TN)	--	--	7.1	0.7	0.1	0.4
Largemouth Bass (EF)	--	--	--	--	--	144.0
Largemouth Bass (TN)	0.5	--	--	--	0.1	0.2
Northern Pike (TN)	--	2.6	0.1	--	--	--
Channel Catfish (TN)	--	0.1	--	0.1	0.1	0.2
Common Carp (TN)	9.5	0.9	1.9	0.1	0.1	0.3
Bluegill (TN)	--	59.5	0.1	202.8	30.5	37.7
Smallmouth Bass (TN)	--	--	0.1	--	0.1	--
Green Sunfish (TN)	29.3	0.1	0.5	0.2	--	0.1
Pumpkinseed Sunfish (TN)	--	0.9	--	--	--	--
Hybrid Sunfish (TN)	--	--	--	--	0.3	--