Avery Lake

Montmorency County, T29N, R2E
Thunder Bay River watershed

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Environment

Avery Lake is located in southwestern Montmorency County in the northern Lower Peninsula, eight miles south of the town of Atlanta. Acreage estimates range from 254-372 acres and can fluctuate with water control. Michigan Department of Natural Resources and Environment (MDNRE) records estimate it at 254 acres. Two small cold water streams enter the lake on the south shore, and both are known to contain brook trout. A control structure is located on the north end of Avery Lake and is administered with a court ordered legal lake level. The outlet stream for Avery Lake just below the control structure is called Crooked Creek, which is a tributary to the Thunder Bay River. The legal lake level was established at 891.3 feet in 1970 for the period of May 1 through September 30. The lake would be maintained at 890.3 feet for the remainder of each year. The local county Board of Commissioners was given responsibility for dam and water level maintenance.

Avery Lake consists of a north and south basin, which reach depths of 79 and 52 feet, respectively. Much of the lake is surrounded by state forest land intermingled with some private ownership. A campground facility and boat access site are provided on the east shore, including parking for approximately 15 trailers. Shallow shoals exist between and along the periphery of the two deep lake basins. Large amounts of woody debris exist with the lake, offering both fish cover and invertebrate production. Submersed and emergent vegetation is also common in the shallow water depths. Two small islands exist in the lake, one near the south end and one in the middle of the lake. Lake bottom type is primarily sand, marl, and organic muck. Hard substrate such as gravel or cobble is limited.

History

Fish management practices date back to the 1920s at Avery Lake when the first basic fish assessments were completed in northern Michigan. Summer examinations of the lake by Michigan Department of Conservation (MDOC) personnel found the lake rich in lime, with a bottom of marl and mud. Algae or vegetation types such as pondweeds, lillies, and coontail were abundant. Similar to current conditions, the lake consisted of two basins as we find today, and an old dam regulated water levels at the outlet. At that time, fish reports consisted of smallmouth and largemouth bass, northern pike, yellow perch, rock bass, pumpkinseed, bluegill, shiners, darters, and minnows.

Avery Lake started receiving fish stocking efforts soon following this initial survey. This was at a time when MDOC stocked a variety of fish throughout northern Michigan, regardless of the need for fish stocking. From 1933 to 1945, a number of fish species were stocked regularly into Avery Lake, despite the fact this lake already had many of these species. Smallmouth bass adults were planted (from Lake Huron) during this period. Largemouth bass, yellow perch, and bluegill fingerlings were stocked on occasion during this era as well. Walleye fry were stocked on five occasions between 1935 and 1940.

Despite the stocking efforts, records in the mid 1940s indicated that bass, bluegill, and northern pike fishing opportunities were still inadequate at Avery Lake. A second fish community survey was made in 1943 and found lake habitat similar to what is found today at the lake. The 1943 survey was done to evaluate the previous decade of stocking efforts, and the results echoed what anglers had been saying. However, sampling effort was limited to shoreline seining and limited gill net effort. During this time, only 11 cottages were found on Avery Lake. Dissolved oxygen and temperature profiles were conducted the same summer. Results showed that Avery Lake was thermally stratified from the surface to the bottom, with decreasing dissolved oxygen levels below 35 feet in the southern basin (hereafter referred to as basin 1), and good dissolved oxygen for fish nearly to the bottom in the northern basin (hereafter referred to as basin 2). Thus, Avery Lake was found to have plenty of deep, cold, well oxygenated water during the summer months. Fisheries managers at that time recognized the potential to utilize highly oxygenated cold water because records indicate that rainbow trout stocking efforts were prescribed for Avery Lake in 1944. Despite these prescriptions, stocking records do not exist indicating that rainbow trout introductions were implemented.

A follow-up survey utilizing experimental gill netting was made by MDOC in 1946. This effort showed a continued warm- and cool-water fish community, and forage was considered abundant based on those observations. Recommendations were made to not stock any fish and thus rely on wild production. Managers also recommended replacement of the control structure in order to raise water levels to former levels as noted by old shoreline stage marks.

MDOC used nine gill-net lifts to assess the fish community of Avery Lake in late-July, 1968. Numerous yellow perch were collected, along with smallmouth bass, bluegill, rock bass, and white suckers. Only one walleye was netted, and no northern pike were observed. Yellow perch growth was considered excellent. Dissolved oxygen and temperature profiling found both basins thermally stratified as was suspected, with declining oxygen levels found halfway down the water column.

In 1969, the control structure washed out on Avery Lake. A legal lake level was established in the early 1970s and the control structure was rebuilt in 1971. Rainbow trout stocking efforts began during this period and continued for three years (1973 through 1975). A follow-up fish survey was made in 1975 to determine the survival of stocked trout. Out of the 14 gill-net lifts that were used in the survey, no rainbow trout were collected and such stocking efforts were discontinued. However, northern pike were common in the catches along with naturally reproducing walleye. Pike growth was poor while walleye growth was superior to the statewide average length-at-age for each species. It was believed by managers of the time that the increase in walleye production was related to the low water levels following the control structure failure. Reports indicate that fishing pressure was considered heavy during the mid 1970s at Avery Lake.

A general fish survey of the lake was then completed in May, 1985, by MDNR. Effort consisted of trap-, gill- and fyke-netting. It was noted from the survey that a healthy, sustainable fishery was present in the lake. Growth rates of northern pike, largemouth bass, yellow perch, and bluegill were above the state averages. Growth rates of smallmouth bass and rock bass were below the state averages. Species such as white sucker, yellow perch, pike, largemouth bass, smallmouth bass, and rock bass were considered abundant. Good numbers of 11-12 inch yellow perch were available to anglers. Only two adult walleye were collected during the survey. It was noted that an apparent lake drawdown in 1980 resulted in poor walleye production similar to conditions during the early 1970s on

Avery Lake. Despite the impacts of fluctuations in water levels on walleye production, the overall fishing was rated as good by former fisheries managers. Following these observations, walleye stocking efforts by MDNR soon commenced for Avery Lake and continued for over a decade (Table 1).

A follow-up fish survey was conducted in late-May and late-June 1999 at Avery Lake with special emphasis on evaluating the walleye stocking efforts of the previous decade. Sampling effort consisted of 30 trap-net lifts, 4 fyke-net lifts, and 13 inland experimental gill-net lifts. Minnows were noted as sparse while crayfish were abundant. Fish cover such as woody debris was still heavy on the south and southwest side of Avery Lake but sparse on the north end. Aquatic vegetation such as milfoil species and chara were present, with bulrushes heavy in the shallow water on the northeast lake end. A water chemistry profile was conducted on August 10th of the same year. On that date, suitable dissolved oxygen levels (at least 6ppm) for fish were found down to 36 feet with a corresponding water temperature of 52 F. Alkalinity ranged from 135-140ppm (bottom-surface) while pH levels were normal at 8.0.

More than 300 bluegill were collected during the survey with 14% of the catch 8-inches and larger. The catch was dominated by 4-6 inch fish. Bluegill growth was superior in Avery Lake compared to the statewide average for this species. Although few largemouth bass were collected (18), 56% were legal size (14 inches). Largemouth bass also grow very well in Avery Lake in comparison to other Michigan lakes. Northern pike were fairly common in the 1999 survey catch (19) with 47% of legal size (24 inches). Pike in Avery Lake grew well above the statewide average for this species. Yellow perch were less abundant in the catch and dominated by smaller 5-6 inch fish. Growth for this species remained good.

White suckers, rock bass and smallmouth bass were very abundant in Avery Lake in 1999. However, growth for the latter two game fish was still below the statewide average growth for each species. The slow growth is most likely a result of competition. Only 17% (58/341) of the smallmouth bass collected were legal size (14-inches) or larger. Age composition of the smallmouth bass population was adequate with at least ten year classes represented in the catch. Large numbers of 18-inch and larger white suckers were found in Avery Lake, which is a good indicator of adequate prey levels because small white suckers are an important food source for predators. The finding that white suckers are likely a good food source for predator fish in Avery Lake is supported by higher than average pike and largemouth bass growth rates.

Nine walleye were captured during the 1999 survey and ranged in length from 9-23 inches. Only three of these fish were from the substantial 1998 stocking effort (Table 1). Fair numbers of larger walleye could still be found in the lake as noted by the relatively larger (but still low) catch of age-6 and age-8 fish. Walleye growth in Avery Lake was above the statewide average for this species during that period.

The Avery Lake fish community was considered diverse and offered anglers a wide variety of recreational possibilities. Plenty of 4-6 inch bluegill were collected in 1999 and would grow to a more desirable size. Good numbers of predators, such as pike and black bass (largemouth and smallmouth) existed in the lake and growth was typically good. The lake had a dated history of walleye stocking efforts, which had met with marginal success based on survey catches in 1985 and 1999. Walleye

survival following stocking may have been limited due to the excessive number of smallmouth bass in Avery Lake. In addition, minimal walleye natural reproduction had been observed.

Current Status

A recent fish community survey was conducted at Avery Lake by MDNR Fisheries Division in 2009. Effort consisted of 6 large-mesh trap-net nights (lifts), 3 large-mesh fyke-net nights, 5 small-mesh fyke-net nights, 6 experimental gill-net nights, and 4 maxi-mini fyke net nights. Each lift was equal to an overnight gear sit in the lake. This survey was conducted in mid-May. Lead lengths for the larger mesh trap- and fyke-nets were typically 75-100 feet. Additional sampling effort included 30 minutes of nighttime direct current electrofishing nearshore in late-June.

Nineteen species of fish were collected during the 2009 survey (Table 2). Total catch was 3,956 fish weighing 232 pounds. Large predator fish included smallmouth and largemouth bass, walleye, and northern pike which, in total made up 3% of the total catch by number and 69% by weight. These proportions of the total catch are skewed because of the higher number of shiners captured in the survey. Non-game species such as bullheads and suckers were less of a component in Avery Lake compared to many other northern Michigan waterbodies. The panfish community of Avery Lake is dominated by bluegill and rock bass, and to a lesser extent, yellow perch, pumpkinseed sunfish, green sunfish, and black crappie (Table 2).

Bluegill are an important component of the Avery Lake fish community and the most abundant panfish captured during the 2009 survey. Bluegill ranged from 1-9 inches in length and were represented by seven ages. A good length-distribution of fish was demonstrated (Table 3), but fewer bluegill larger than 8 inches were found in 2009 (4%) compared to previous surveys. On average, an Avery Lake bluegill will need about seven years to reach eight inches in length, which is relatively slow growing. Younger bluegill tend to be more abundant in the catch suggesting the possibility for stunted growth conditions. Growth for this species is very slow below age-4, but increases beyond this age. Thus, competition among young fish probably inhibits growth. Overall, growth appears slower today for bluegill in Avery Lake than in past years (Table 4).

Rock bass are also abundant in the survey catches in Avery Lake and represented by seven year classes. The high abundance of rock bass in Avery Lake may explain why they grow about one-inch slower when compared to growth rates of this species currently across the State of Michigan (Table 2). Fish in the 5-7 inch range are prevalent. Yellow perch are also common in Avery Lake and occasionally reach large sizes (Table 3). Based on current and past survey catches (Table 3), however, their numbers appear to be slightly lower in the recent survey, although current abundance levels are still within normal year-to-year variation. Six year classes of perch were represented in the catch and growth is about an inch slower than the statewide average. Pumpkinseed sunfish are also found in Avery Lake, but in low numbers. Pumpkinseed sunfish tend to inhabit lakes with shallower, warmer conditions and an abundance of submersed aquatic vegetation. These characteristics are generally lacking in Avery Lake which explains why pumpkinseed abundance is relatively low. Pumpkinseed have been found to grow to approximately seven inches in Avery Lake. Black crappie are also found in lower numbers, but can attain adequate sizes for harvest. Green sunfish are common in the lake, which is not typical for most northeast Michigan lakes, and is usually undesirable because they do not grow to a large size and do not offer quality table fare.

Based on their abundance and food habits, smallmouth bass are the dominant predator fish in Avery Lake. They can grow up to 20 inches in length at this lake and are prolific. Density-dependent regulation of growth is likely occurring because growth is very slow (see Table 2 and 4). Table 3 shows that smallmouth bass catches in 2009 were less than in past years, but differences in survey timing (water temperatures) and effort likely account for the differences in the catch (or make direct comparisons with previous surveys not possible). Legal size (14 inches and larger) smallmouth bass are still common today. Smallmouth bass grow nearly the same today in Avery Lake as they have in the past (Table 4).

Largemouth bass are likely the next important top predator, based on their abundance in Avery Lake (Table 2). Numbers have not changed significantly from year-to-year based on survey catches (Table 3). Legal size fish are also common and growth of this species is faster than the statewide average, by nearly one inch. Nine year classes of largemouth bass were represented in the catch and it takes about 6 years for an individual to attain legal size (14 inches).

Walleye have not been stocked in Avery Lake by MDNR since 1998 (Table 1). Thus, any fish younger than age 11 would be from natural reproduction. Four naturally reproduced walleye were collected from the survey based on the fact that they were less than 10 years old (Table 4). Walleye catches in the 1985 survey (probable wild fish) were also low similar to the recent survey. Following a decade of periodic stocking, walleye catches in 1999 were relatively higher (Table 3).

Northern pike were again relatively uncommon in Avery Lake as demonstrated by the recent survey catch (Table 2). Individual growth of these fish is probably above average, but sample sizes were too low (2 fish) to say conclusively. Pike appeared to be relatively more abundant a decade ago, but they were still in low abundance relative to other predators at that time. Currently, we do not know conclusively what is limiting northern pike populations in Avery Lake.

Other species found in Avery Lake include a variety of shiners, minnows, and non-game species (Table 1). For example, large schools of mimic shiners were found throughout parts of the lake. During the survey, we intentionally modified net locations to avoid over-sampling such species. In contrast, white suckers and bullhead species were not found to be overly abundant in Avery Lake based on recent catches. This species composition observed in Avery Lake appears to be very different from many other lakes in northeast Michigan of similar size (larger than 100 acres with a sand and marl bottom).

Analysis and Discussion

The current fish community of Avery Lake can be generally characterized as having the following:
1) a panfish community considered to have moderate diversity, and dominated by bluegill and rock bass, 2) a predator population having moderate density and dominated by smallmouth and largemouth bass, 3) remaining predators such as walleye and northern pike in very low densities and produced naturally, 4) a probable cold-water niche in the lake that is poorly understood or is not very well developed, 5) a good population of small bait fish including shiners and minnows, and 6) a non-game fish community with low diversity and numbers. Management of Avery Lake fishes has primarily been with the use of statewide regulations, maintenance of most species through natural reproduction, and providing low level, periodic stocking of walleye in past decades.

The Avery Lake panfish community is moderate in diversity and fairly poor in quality. Species available to anglers include bluegill, rock bass, yellow perch, pumpkinseed sunfish, and an occasional black crappie. Growth of panfish is typically slow when compared to growth rates for each species statewide. This may be a result of competition for sparse nutrients found throughout this forested watershed lake. Some individual fish do attain quality harvest size though, particularly bluegill and yellow perch.

The predator base of Avery Lake is dominated by smallmouth and largemouth bass. Both species are important predators which are needed to help keep many other species in balance. Smallmouth bass are an important predator on rusty crayfish which is a non-native species and now inhabits many of northern Michigan's lakes. Smallmouth bass provide a quality fishing experience in Avery Lake. Largemouth bass appear to be doing well and growth rates for this species appear to be good. There are not many lakes that offer good opportunities to catch a trophy fish of each species in the same lake.

Walleye were stocked in Avery Lake for nearly a decade and survey results suggest that stocking will compliment wild recruitment and bolster the population. It was not known, however, to what extent stocking is needed to create a viable fishery. Natural reproduction is evident for this species today, although the population continues to be very low and is likely not productive enough to produce a viable fishery. Walleye can be an important component of the predator base because they are capable of assisting in thinning out slow growing panfish populations, and at the same time they can increase the quality of the fishery experience. Large numbers of shiners were present in the lake during the survey and would also offer quality forage.

Northern pike remain in low numbers in Avery Lake, but survey results suggest that they can attain large sizes. Pike spawn on flooded aquatic vegetation and can even leave their egg masses on submersed aquatic vegetation. These types of habitat are not prevalent in Avery Lake and might help explain the low natural densities of this fish. Chara, a different type of algae which lies flat on the bottom, appears to have increased in its abundance in Avery Lake. Whether or not Chara will increase northern pike reproduction, however, it is not known at this time. In other lakes with Chara, muskellunge have been found to use it for reproduction. This species was considered as a stocking option for this lake. However, muskellunge need large numbers of white suckers for prey, which is lacking for Avery Lake.

Management Direction

1) The Avery Lake aquatic community is dynamic and should be monitored on a fairly consistent basis. Each game fish plays a vital role not only in the fishery, but also for overall ecosystem balance. A complete fish community survey documenting changes should be accomplished approximately every 10-15 years at Avery Lake. Previous fish community surveys were done in 1985, 1999, and 2009 although survey effort and timing varied.

2) Supplement the walleye population at Avery Lake through stocking and try to produce a fishery. The program was discontinued over a decade ago after some stocking efforts. The program was considered a failure due to high predator densities already in the lake. It was apparent that stocking would be the only way to produce a viable fishery here, and predator densities are currently lower. In addition, sunfish appear to be experiencing density-dependent growth and increasing walleye numbers through stocking will increase predation on small, stunted sunfish. Walleye spring fingerlings (1-2

inches) should be stocked for three years in a row at a rate of 70/acre and then in an alternate year manner. Walleye are a popular fish in this region of Michigan and some lakes nearby produce quality fisheries, but maintain a lot of fishing pressure. Avery Lake receives relatively less pressure, even though it has an excellent launch site and a maintained state forest campground, so by building a viable walleye fishery in Avery Lake it will also help to alleviate walleye pressure in nearby lakes. Actual stocking of fish will certainly be a product of variable walleye production annually by Fisheries Division and allocation of limited resources.

3) Northern pike are native to Avery Lake but are found in very low numbers, possibly as a result of lake level management. Numbers were never high in the past or in current surveys. Efforts should not be made to bolster their numbers through stocking, but instead the focus should be on walleye because they better compliment the existing predator base, they have a better chance for survival, and are more valued by local fishers.

4) Smallmouth bass, largemouth bass, and a variety of panfish offer quality fishing opportunity in Avery Lake and help control existing panfish populations. Fishing regulations for bass are appropriate here.

5) Avery Lake has had an established legal lake level for nearly four decades. Fisheries Division Policy and Procedure 02.02.008 discourages the construction of lake level controls or establishment of legal levels. It is encouraged that lake level operations should minimize disruption of annual or seasonal hydrological regimes. However, the control structure and legal lake level do exist and have become part of the Avery Lake system. High and low water cycles from natural processes have less influence now on lakeshore vegetation, beaches, and shorelines at Avery Lake.

References

Fisheries Division Policy and Procedure. 2008. Lake Level Management 02.02.008. Lansing, MI.

Table 1.-Recent walleye stocking history for Avery Lake, Montmorency County.

Month	Year	Strain	Number	Number/Acre	Avg. Length (in)
July	1982	--	2,000	--	--
June	1986	--	28,000	110	1.4
June	1989	Muskegon	13,000	51	1.3
June	1991	Muskegon	15,000	59	1.6
June	1994	Muskegon	15,000	59	1.4
June	1996	Bay De Noc	17,000	67	1.2
May	1998	Bay De Noc	30,000	118	1.0

Table 2.-Species and relative abundance of fishes collected with survey gear at Avery Lake, May 18-21, and June 22, 2009.

Common Name	Number	Percent	Length Range *(inches)*	Weight (lbs)	Percent	Growth* (in)
Mimic shiner	3,136	79%	1 - 3	0.1	<1%	
Bluegill	318	8%	1 - 9	26.4	11%	-0.6
Bluntnose minnow	218	6%	1 - 3	0.5	<1%	
Rock bass	75	2%	2 – 9	6.7	3%	-1.1
Smallmouth bass	72	2%	3 – 19	73.2	32%	-1.6
Largemouth bass	42	1%	3 – 19	66.4	29%	+0.7
Yellow perch	31	1%	2 - 12	3.1	1%	-0.9
Pumpkinseed	17	<1%	2 – 7	2.3	1%	-0.2
Green sunfish	13	<1%	1 – 6	0.7	<1%	
White sucker	9	<1%	3 – 23	23.8	10%	
Brown bullhead	6	<1%	12 – 13	6.1	3%	
Johnny darter	6	<1%	1 – 2	0.1	<1%	
Walleye	4	<1%	18 – 23	13.4	6%	
Black crappie	2	<1%	8 - 10	1.0	<1%	
Creek chub	2	<1%	3 – 5	0.1	<1%	
Northern pike	2	<1%	23 - 27	7.5	3%	
Banded killifish	1	<1%	1	0.1	<1%	
Iowa darter	1	<1%	2	0.1	<1%	
Stickleback	1	<1%	1	0.1	<1%	
TOTAL	**3,956**			**231.7**		

** growth is compared to statewide average for that species*

Table 3.-Length-frequency distribution of certain game fishes collected during the 1985, 1999, and 2009 netting survey at Avery Lake. Netting effort was variable between years.

Length (in)	N. pike 85	N. pike 99	N. pike 09	Walleye 85	Walleye 99	Walleye 09
1						
2						
3						
4						
5						
6						
7						
8					1	
9					1	
10					1	
11						
12						
13					1	
14		1				
15		2				
16		1				
17						
18						1
19		1				
20		1			3	1
21		1				
22		1				
23		1	1	1	2	2
24				1		
25		2				
26	1	1				
27		2	1			
28	2	1				
29	2	1				
30	1	1				
31						
32						
33		1				
34						
35						
36	1					
37						
38						
39						
40		1				
41						
42						
43						

Table 3.-Continued

Length (in)	Y. Perch 85	Y. Perch 99	Y. Perch 09	S. Bass 85	S. Bass 99	S. Bass 09
1						
2			4	1		
3		6	3	1	1	1
4		4	9		1	3
5		12	7	5	11	4
6		13	4	8	19	9
7	1	6	1	13	27	7
8	11		1	43	38	3
9	9	6		29	42	2
10	18		1	23	39	8
11	7			44	36	7
12	4		1	20	37	5
13	1	1		14	32	7
14				7	17	3
15				7	14	1
16				1	18	1
17					6	4
18					2	5
19					1	2
20						
21						
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42						
43						

Table 3.-Continued

Length (in)	L. Bass 85	L. Bass 99	L. Bass 09	Bluegill 85	Bluegill 99	Bluegill 09
1						2
2				1		76
3			1	4	15	96
4			1	4	96	57
5				1	57	22
6		1		8	69	41
7		1		19	32	12
8	1	1		30	24	8
9		1	1	9	8	4
10	7	1	4		7	
11	9	1	3		3	
12	4		8			
13	6	2	8			
14	5	1	2			
15	3	4				
16	8	1	7			
17	5	1	2			
18	2	2	4			
19	3		1			
20	1					
21		1				
22						
23						
24						
25						
26						
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42						
43						

Table 4.-Comparison of mean length (inches) at age for various game fishes of Avery Lake from 1985 to 2009. Number in parentheses represents number aged. Growth comparison in last column was across all ages for 2009.

Species	Age group	1985 May	1999 May/June	2009 May	2009 growth compared to state average
Yellow perch	I	--	3.8 (1)	2.7 (3)	-0.9 in
	II	5.3 (10)	5.9 (14)	4.5 (14)	
	III	7.3 (13)	6.7 (16)	5.5 (11)	
	IV	8.1 (20)	9.4 (5)	7.8 (2)	
	V	9.9 (27)	9.7 (2)	--	
	VI	11.0 (13)	--	10.5 (1)	
	VII	11.8 (22)	13.3 (1)	--	
	VIII	12.7 (5)	--	12.2 (1)	
Walleye	I	--	9.7 (3)	--	
	II	--	13.8 (2)	--	
	III	--	--	--	
	IV	--	--	--	
	V	--	--	20.6 (1)	
	VI	--	21.2 (5)	18.2 (1)	
	VII	--	--	--	
	VIII	--	23.8 (3)	--	
	IX	--	--	23.4 (2)	
	X	--	--	--	
	XI	--	--	--	
	XII	--	--	--	
	XIII	23.4 (1)	--	--	
	XIV	24.4 (1)	--	--	
Bluegill	I	2.8 (1)	--	--	-0.6 in
	II	3.7 (6)	4.0 (28)	2.8 (15)	
	III	4.5 (2)	6.1 (27)	3.8 (22)	
	IV	6.3 (6)	7.9 (10)	5.9 (17)	
	V	7.5 (17)	8.4 (17)	6.7 (12)	
	VI	8.1 (9)	9.1 (4)	7.6 (8)	
	VII	9.3 (4)	10.0 (1)	8.4 (4)	
	VIII	9.3 (2)	10.5 (3)	9.3 (4)	

Table 4.-continued

Species	Age group	1985 May	1999 May/June	2009 May	2009 growth compared to state average
L. bass	I	--	--	3.7 (2)	+0.7
	II	8.7 (1)	8.3 (9)	--	
	III	10.9 (17)	12.8 (3)	10.6 (7)	
	IV	13.4 (9)	14.9 (3)	12.7 (15)	
	V	14.5 (5)	15.2 (5)	13.6 (5)	
	VI	16.5 (13)	--	16.5 (1)	
	VII	18.0 (4)	--	16.4 (7)	
	VIII	18.7 (3)	17.6 (1)	18.2 (4)	
	IX	19.6 (2)	18.1 (1)	18.7 (1)	
	X	--	18.4 (1)	19.3 (1)	
	XI	--	--	--	
	XII	--	21.6 (1)	--	
S. bass	I	3.0 (2)	--	4.4 (2)	-1.6 in
	II	6.2 (12)	6.1 (29)	6.4 (20)	
	III	8.5 (26)	8.4 (19)	8.6 (5)	
	IV	10.8 (26)	10.7 (30)	11.2 (21)	
	V	12.7 (17)	12.9 (21)	13.1 (5)	
	VI	14.2 (14)	14.5 (17)	13.4 (6)	
	VII	15.8 (4)	15.8 (4)	15.8 (4)	
	VIII	18.2 (1)	16.1 (12)	17.6 (4)	
	IX	--	17.5 (5)	18.5 (2)	
	X	--	--	18.2 (2)	
	XI	--	18.7 (3)	19.5 (1)	
	XII	--	19.1 (1)	--	
N. pike	I	--	17.2 (7)	--	
	II	--	22.6 (5)	--	
	III	23.6 (1)	26.8 (6)	--	
	IV	27.1 (6)	31.0 (3)	27.5 (1)	
	V	28.3 (3)	--	23.5 (1)	
	VI	--	--	--	
	VII	30.7 (2)	40.0 (1)	--	
	VIII	--	--	--	
	IX	36.0 (1)	--	--	