Douglas Lake

Cheboygan County, T37N, R3W, many sections
last surveyed 2000

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Environment

Douglas Lake is a 3,395 acre natural lake in northwestern Cheboygan County. It is the 28th largest lake in Michigan based on surface acreage. The nearest prominent town, Pellston, is located about 5 miles southwest of the lake.

The maximum water depth of Douglas Lake is 80 feet deep. Most of the lake is less than 30 feet deep. It is composed of seven distinct basins, or glacial depressions, with expansive shoals between. Shoals, defined as waters less than 15 feet deep, extend over a large percentage of the lake's acreage. Douglas Lake is considered a mesotrophic lake, with some limited oligotrophic characteristics which provide for suitable levels of dissolved oxygen in cold water depths. Limnological examinations were conducted by the Michigan Department of Conservation on Douglas Lake in 1959, 1967, and 1977. In July 1959, the lake was found to be stratified thermally with dissolved oxygen levels below 4 ppm at 45 feet below the surface. In late June 1967, the water column was again noted as thermally stratified, yet dissolved oxygen levels did not drop below 6 ppm at the bottom (55 foot depth location).

The Douglas Lake riparian zone is typically hilly, wooded, and partially developed. Riparian ownership is nearly all private with a large percentage owned by the University of Michigan. Lake-bottom types consist of sand, marl, rock, and small gravel with sand being the dominant substrate. Aquatic vegetation is limited and consists mainly of an emergent variety of rushes and lilies. Near-shore cover is also sparse.

Notable landmarks of Douglas Lake include North Fishtail Bay, South Fishtail Bay, and Marl Bay; Maple, Bentley, Sedge, and Grapevine Points; and Pells Island, which is also known as Fairy Island. The drainage area of Douglas Lake is about twenty square miles (12,800 acres). Major inlets include Lancaster (also known as Bessey) and Beavertail Creeks. These are warm water streams which enter the lake at the northwestern and northeastern shores, respectively. Lancaster Creek provides access for migrating fish to a vast flooded marsh north of Marl Bay. This marsh has been primarily used for propagation of northern pike for many decades. The outlet, the East Branch Maple River, exits Douglas Lake on the southwest shore. This river is a designated Michigan trout stream. A hard-surfaced boat ramp is located on the south shore near Pells Island at a county road ending. Access is limited, however, to five boat-trailers. The site is cooperatively maintained in a limited capacity by Michigan Department of Natural Resources (MDNR) Parks and Recreation Division. Fishing pressure is considered relatively light at Douglas Lake as a result of limited accessibility.

History

Fisheries management started at Douglas Lake in the late 1920's, when the first fish stocking efforts were initiated. Fingerling yellow perch were stocked on six occasions between 1929 and 1938. Bluegill

fingerlings were stocked eleven times between 1932 and 1945. Smallmouth bass adults and fingerlings were stocked on eight occasions between 1933 and 1942, while largemouth bass were stocked six times between 1932 and 1945. The period of these stocking efforts coincides directly with an era when stocking of warm water fish was an often used management tool by the Michigan Department of Conservation. Splake were planted in Douglas Lake in 1968 (5,000 yearlings) and 1972 (35,956 yearlings) in attempts to improve the stunted yellow perch population. The effort was unsuccessful, and splake have not been stocked since.

Northern pike and walleye are two other popular predator game fish that were stocked into Douglas Lake. Walleye were stocked as spring fingerlings in 1937, 1954, 1955, and 1957. The stocking rates during this period were relatively low. An attempt to gain better walleye production and recruitment was made in 1974 by the Michigan Department of Conservation (MDOC) and the Douglas Lake Association. A total of 750,000 fry were released into the Douglas Lake Pike Marsh on the northwest end of the lake as an experiment to determine the effectiveness of rearing young walleye in the marsh. Northern pike were excluded from entering the marsh that year. The rearing of walleye fry to fingerling stage was deemed unsuccessful due to eventual oxygen deficits in the marsh and predation from aquatic insects. Walleye have not been stocked into Douglas Lake since 1974.

Historically, northern pike used the near-shore and expansive adjacent wetlands near Marl Bay for spawning. When inundated, northern pike would use the flooded timber and small ditch and creek drainages for accessing appropriate spawning habitat (Williams 1951). Investigations into early pike spawning habitat on Douglas Lake arose from concerns over a declining northern pike fishery, and concerns regarding the stranding of adults and offspring in drying marshes on the northwest shore (Williams 1951). The author examined these areas of concern in 1951 and found few spawning pike in the various tributaries and marshes along the northwest shore. He also found that most suitable spawning locations were dry later in May when northern pike stranding could occur. In addition to these variables (stranding, limited spawning runs of pike), Williams noted that heavy localized spearing/poaching was known to occur during heavy spawning migrations, which also contributed to limiting the northern pike fishery.

By the late 1960's, concerns over consistent pike production in and around Douglas Lake were occuring. In response, the Douglas Lake Association completed the renovation and expansion of a natural pike marsh in 1969 north of Marl Bay and near Lancaster Creek. Since then, minor modifications have been undertaken by the lake association in order to improve pike production and accessibility to the 10-acre marsh. MDOC, later known as the Michigan Department of Natural Resources (MDNR), has served in an advisory capacity throughout this period and receive annual production reports from facility operators. Since 1969, production has been variable based on annual fingerling counts (Table 1). Adult migration into the marsh and fingerling production is heavily linked to precipitation and spring runoff.

Douglas Lake has always had an abundant white sucker population, and this species has been manually removed from the lake in various years. In the past, overabundant non-game fish populations were believed to hinder game fish densities and growth in Douglas Lake. Manual removals of white suckers and bowfin were made at Douglas Lake during the 1950's and as recent as 1979. This was often done by commercial operators under permit from the MDOC. White sucker eggs were removed from

Douglas Lake fish in many of those years and transported to various state hatcheries where they would be used as forage. White sucker egg takes were conducted from 1969 through at least 1976.

The University of Michigan has owned and operated a biological station on the shores of Douglas Lake for more than 100 years. The lake has served as a study ground for many professors and students in a variety of biological disciplines. Many dissertations, theses, and other informative studies are listed under the University of Michigan Biological Station website (http://www.umich.edu/~umbs/research/fairchil.htm) and are too numerous to summarize here. Major focuses of many of these projects involved the following Douglas Lake topics: wetlands, historical biota and limnology, algal and vascular plant communities, plankton dynamics, and trophic state.

Historical fish community surveys were done less frequently at Douglas Lake compared to other large local waterbodies such as Burt and Mullett lakes. This may have been a result of the limited accessibility to the lake. Despite this, a few fisheries surveys were completed and they provide snapshots of the fish communities of Douglas Lake over time.

The first documented fish survey dates back to the spring and summer of 1959. MDOC personnel used various mesh-sized seines and gill nets to capture 21 species of fish. MDOC extracted eggs from northern pike immediately following ice-out at the mouth of Lancaster Creek for statewide rearing purposes. The summer survey was done to evaluate recent walleye stocking efforts. A total of 34 adult walleye were collected, and mostly represented fish stocked in the 1950's. Largemouth and smallmouth bass were noted as common, while northern pike were abundant. Also noted as abundant were panfish such as rock bass, yellow perch, bluegill, and pumpkinseed. Cisco, or lake herring, were sparse.

The next fish survey was made by MDOC in the spring and summer of 1967. This survey was done in response to complaints of poor fishing and concerns over the current fish community. Electrofishing and gill nets were used to survey the fish population. Twelve species of fish were collected. Northern pike growth was considered poor, with fish growing two inches less than the statewide average at the time. It was also believed that most pike were harvested by anglers at or near the 1967 size limit of 20 inches. Eight year classes of walleye were collected ranging in length from 16-26 inches. Walleye growth was considered excellent. Yellow perch were growing below the statewide average. As a result of the survey, fish managers believed that forage fish numbers were too high in Douglas Lake in 1967, while predator numbers were too low. In response, the MDOC and the Douglas Lake Association expanded the northern pike spawning and rearing marsh in 1969 on the northwest side of the lake in an attempt to increase northern pike numbers.

From 1969 to 1974, fisheries surveys on Douglas Lake were limited to species-specific evaluations. Splake were stocked in the lake in 1968, but attempts to capture them in gill nets in 1969 failed. Northern pike were collected during the spring white sucker egg take in 1971. Growth of northern pike was still poor, with fish still growing nearly two inches less than the statewide average. Accounts during the year noted that walleye were migrating up Lancaster Creek in attempts to spawn. MDOC personnel made attempts to capture fry walleye near the creek outlet in the same year but found no direct evidence of natural reproduction. Trap netting or spring electrofishing in the spring of 1972 and 1974 found that walleye aged 8-10 were still inhabiting Douglas Lake, but were not overly abundant. These fish were probably offspring of a low-level naturally reproducing population. Lake residents and MDOC then tried rearing walleye fry in the pike marsh in 1974. If successful, walleye released back

into Douglas Lake would add another popular predator fish. However, the pike marsh was not suitable to rearing fry walleye to the fingerling stage, at least in that year.

Fourteen species of fish were collected during a May 1977 survey of Douglas Lake. The survey consisted of a combination of 76 trap and gill net lifts. Five large predator fish species were collected in varying numbers, including bowfin, largemouth bass, smallmouth bass, walleye, and northern pike. Northern pike were considered to be highly abundant, with plenty of fish 22-inches or larger in Douglas Lake. Growth was considered average to slightly below average. Thus, it appeared that northern pike size structure and growth had improved favorably from previous years. Angling reports for the period confirmed this. Therefore, fisheries managers suggested the continued operation of the Douglas Lake Pike Marsh. Only four walleye were collected during the 1977 survey. This again suggested the existence of a low-level, naturally reproducing walleye population. Recommendations to stock walleye were made by fisheries managers, but this was not accomplished. Bowfin were abundant and grew to impressive sizes. Largemouth bass were common, and exhibited average growth. Smallmouth bass were highly abundant with many 14-18 inch fish available to anglers. Growth was average for this species. In addition, 404 smallmouth bass from 10-19 inches in length were tagged by fisheries managers in attempt to gain insight into bass catch and exploitation. Length frequency analysis of the tagged bass provides insight into the high size structure of this population (Table 2). Fisheries managers at the time indicated that this quality smallmouth bass population was underexploited.

Five species of panfish were collected during the 1977 fish community survey. Yellow perch were abundant but characterized by poor growth. Most were 6-8 inches in length. Rock bass were abundant and demonstrated good size structure and growth. Only two bluegill were collected during the survey, while pumpkinseed sunfish were common. Black crappie were uncommon in the fish catch, yet some very large specimens were collected. Other fish collected included a few cisco, and many bullheads. Splake, which had been stocked five years earlier, were not collected during the 1977 fish community survey. In fact, none of the stocked splake were ever collected in a fisheries survey, and none were ever reported as caught by anglers. It is likely that predation from northern pike may have played a major role in the failure of the two splake stocking attempts.

Current Status

A recent fish community survey was made at Douglas Lake by MDNR Fisheries Division from June 5-15, 2000. Sampling effort consisted of 21 large mesh trap net lifts and 12 inland gill net lifts. Twelve species of fish were collected during the survey (Table 3). Total catch was 1,347 fish weighing 861 pounds. Large predator fish including bowfin, northern pike, largemouth bass, and smallmouth bass made up 16% of the total catch by number and 44% by weight. Non-game fish such as bowfin, white sucker, and bullhead made up 27% of the total catch by number and 46% by weight. The panfish community of Douglas Lake in 2000 was dominated by pumpkinseed sunfish, yellow perch, rock bass, bluegill, and black crappie. Pumpkinseed sunfish were the most commonly collected fish in the survey (Table 3). Most of the pumpkinseed ranged in length from 5-7 inches (Table 4), and no specimens larger than 8 inches were observed. Growth of this species was normal compared to the statewide average (Table 5).

Eighty-two bluegill were collected during the 2000 survey. More bluegill were collected during the recent survey compared to many previous Douglas Lake surveys. It had been speculated by previous fisheries managers that bluegill do not successfully reproduce in many years in Douglas Lake as a result of unsuitable water temperatures during spawning. However, six age classes of bluegill were present in Douglas Lake in 2000 and represented by ages II-VII. However, only 2% of the total bluegill catch was comprised of fish 8-inches or larger. Growth of this species was average compared to the statewide average (Table 5). It takes a bluegill approximately seven years to reach 8-inches in length at Douglas Lake. These data may indicate that harvest and natural mortality may be reducing the number of bluegill recruiting to 8-inches.

Black crappie appear more common in Douglas Lake today than in previous decades based on catch numbers. Sixteen black crappie were collected in 2000 and ranged in length from 6-13 inches (Table 4). Five year classes were present with most individuals from the 1996 and 1998 year classes. Black crappie grow very well in Douglas Lake. Nine year classes of rock bass were collected during the survey with many fish 8-inches and larger available to anglers (Table 4). Rock bass growth was average compared to the statewide average for this species (Table 5).

Yellow perch continue to be abundant in Douglas Lake, but growth was still considered poor (Table 5), which was also the case in 1977. In general, yellow perch in Douglas Lake were growing one inch less at each age group when compared to other yellow perch populations in Michigan. This poor growth is more obvious for young perch, which may be a result of intraspecific competition. Five year classes of yellow perch were collected in 2000, but only 14% of the yellow perch catch was 8-inches or larger (Table 4).

The predator game fish population in 2000 at Douglas Lake was dominated by smallmouth bass, northern pike, and largemouth bass. Walleye were not collected during the fish community survey, yet occasional angler reports verify their low-level presence. Smallmouth bass remain a highly abundant predator in Douglas Lake. Length of smallmouth bass collected ranged from 5-19 inches, with an apparent strong 1998 year class evident by the high catch of two year old fish ranging in length from 7-10 inches (Table 4). Ten year classes of smallmouth bass (ages I-X) were represented. Good numbers of legal-size (14-inches and larger) smallmouth bass remain available to anglers. Mean lengths at ages for smallmouth bass have not changed significantly over time (Table 5), while growth for this species was average compared to other Michigan populations.

Largemouth bass are present in Douglas Lake, but are not overly abundant. Largemouth bass are more common in shallower lakes with greater amounts of aquatic vegetation. These are rare habitat types in Douglas Lake. No harvestable size (14-inches and larger) largemouth bass were collected (Table 4) while growth for this species was average to slightly below average (Table 5).

Northern pike continue to be an important predator and game fish in Douglas Lake. By weight, northern pike made up 22% of the total catch by weight (Table 3). This species ranged in length from 12-30 inches with most fish below the minimum harvest size of 24-inches (Table 4). Pike growth has not changed significantly through time, and this species continues to demonstrate growth just below the statewide average (Table 5). Six year classes were represented in the catch including fish ages I-VI. There is a sharp decrease in abundance from age IV to V pike, which correlates with attainment of the

legal size of 24-inches. This may indicate high exploitation of legal northern pike, or simple natural variation between these two year classes.

Only three cisco (all age II) were collected in 2000, yet sampling effort did not target this species. However, cisco were never collected in high numbers in previous surveys and was always considered sparse. Appropriate water temperatures and dissolved oxygen levels may have always (and still are) been limited for this species in Douglas Lake. Their continued presence in recent surveys may suggest that water quality and limnological profiles have changed little at Douglas Lake through time. White sucker, an important prey item, were common in the 2000 survey of Douglas Lake, with most ranging from 10-20 inches. Bowfin were also common and well represented by 18-26 inch fish.

Analysis and Discussion

The overall fish community of Douglas Lake has not changed much through time, with a few exceptions. The current community can generally be characterized as having the following: 1) an average growing and diverse panfish community with some species more abundant than others, 2) an abundant rough fish community, 3) a remnant cold water fish community, 4) and a predator game fish component consisting mainly of two abundant species (northern pike and smallmouth bass) and one uncommon species (largemouth bass). The large game fish tend to exhibit average to slightly below average growth.

The Douglas Lake panfish community includes yellow perch, rock bass, bluegill, pumpkinseed sunfish, and black crappie. Yellow perch have always proven to be an abundant species, as was again documented in 2000. Growth of this species was poor in earlier decades and remains so today. This was despite attempts to stimulate yellow perch growth by increasing predators in Douglas Lake (walleye, northern pike, splake). Rock bass and pumpkinseed sunfish remain abundant in Douglas Lake today as they have in the past, and both exhibit average growth. Survey catches of bluegill through the years has been highly variable. Their overall abundance may be limited by a variety of abiotic factors including cold temperatures during spawning as has been suggested by earlier fisheries managers. However, when present, not many individual bluegill attain quality harvest size, possibly from harvest or natural mortality causes. Black crappie are an uncommon species in Douglas Lake, but add diversity to the fishery.

Non-game fish such as white sucker, bullhead, and bowfin continue to be plentiful in Douglas Lake today. These species have co-existed with game fish in the lake for centuries, and will continue to do so. These species compete with, and yet also provide a food source for many game fish. Cisco, or lake herring, continue to exist in Douglas Lake, although their true abundance is not fully understood. It appears this species has historically been a rare part of the fish community, yet fish sampling effort has never been directed at this species. Cisco are an indicator of the health of Douglas Lake. Douglas Lake can be classified as a mesotrophic lake, with some oligotrophic characteristics which provide the cold water and dissolved oxygen levels necessary for survival of cisco. Future reductions in water quality could reduce or eliminate this relatively rare cisco population. Cisco, when abundant, can be a very important prey item for predators like northern pike and walleye. Another cold water fish, splake, were stocked on two occasions in Douglas Lake, but the plants were deemed unsuccessful.

Fisheries managers have actively attempted to manipulate large game fish numbers in Douglas Lake since the 1950's. Walleye were stocked on various occasions, while modifications to a northern pike spawning marsh were done in hopes of increasing pike abundance. Smallmouth and largemouth bass continue to provide diversity to the sportfishery. Smallmouth bass are abundant and grow to impressive sizes in Douglas Lake. Largemouth bass are less abundant, but still common.

Walleye can still be found in Douglas Lake, but it also can be considered a remnant part of the fish community. This species was stocked in the 1950's in low numbers. This was probably done on top of an existing low-level wild population. Walleye numbers appeared quite good as documented by surveys in 1959, 1967, and 1972. Supplemental stocking may have enhanced broodstock numbers enough to stimulate higher natural reproduction levels. Yet by the late 1970's, their numbers began to decline until no walleye were captured during the 2000 survey. Today, Douglas Lake walleye act as an additional predator in a lake where forage is abundant.

Northern pike have always been a common and important predator game fish in Douglas Lake. Fisheries managers recognized this many decades ago, and thus took steps to increase their production and recruitment in the system. The Douglas Lake Pike Marsh has been an effective means of maintaining pike densities in the lake. The marsh has been successfully operated by volunteers for decades, in cooperation with the MDNR Fisheries Division and is an extremely cost effective means of predator enhancement. Operation of the marsh as a "pike marsh" should continue.

Management Direction

The panfish and non-game fish populations of Douglas Lake have remained relatively stable through time. Bag limits are in place to prevent excessive overharvest of important panfish. Growth of most panfish, with the exception of yellow perch, is average and allows most fish to attain quality size.

Predators are essential for maintaining a healthy panfish population and limiting overcrowding of non-game species such as white sucker and bullhead. Exploitation of northern pike appears to be high in Douglas Lake, as evidenced by a sharp decline in numbers of pike after age-4 (which approximates the 24-inch minimum size limit). The Douglas Lake Pike Marsh is unique and provides a cost effective means of enhancing northern pike spawning and recruitment. Operation of this facility as a pike marsh should continue. The marsh is operated and maintained by lake resident volunteers in partnership with the MDNR Fisheries Division. The operation is very successful, and highly suited to the rearing of northern pike. MDNR Fisheries Division should continue to work cooperatively with the volunteer operators of the pike marsh. This includes gathering annual out-migrating fingerling pike estimates from marsh operators.

Walleye have done well in Douglas Lake in previous years, but their current abundance seems to be at a very low-level. This may be since they have not been stocked in many decades and broodstock numbers are not high enough to sustain enough reproduction to support a fishery. The Douglas Lake Association has recently approached the MDNR with inquiries regarding walleye enhancement in the lake. Marsh operators have suggested altering the pike marsh into a deeper rearing pond for the production of walleye. MDNR Fisheries Division does not recommend this activity and again suggests maintaining the marsh for northern pike production. Limited public access at Douglas Lake and shortage of state reared walleye preclude stocking efforts in Douglas Lake by the Michigan DNR. In addition, Douglas Lake has a healthy predator population base of smallmouth bass and northern pike,

all of which typically exhibit average growth. Managers should strive to manage the native game fish communities within Douglas Lake. However, MDNR Fisheries Division would work cooperatively (in an advisory capacity) if infrequent private walleye stocking efforts were pursued by the Douglas Lake Association.

If the above goals are achieved, an intensive fish community survey should be made no later than 2015. Standard fish community sampling effort should be applied. Efforts to determine the current status of the cisco population should also be attempted. If walleye are stocked by a private source, fall evaluations can determine the success of stocking efforts, and the difference in stocking rates and fish sizes. MDNR Fisheries Division and Parks and Recreation Division should work cooperatively to pursue a more appropriate public access site at this large inland waterbody.

The remaining riparian wetlands adjacent to Douglas Lake are critically important to the health of the Douglas Lake fish community. Unwise riparian development and wetland loss will result in deterioration of the water quality and fisheries habitat of Douglas Lake, which would likely impact fish populations. Cisco, in particular, are sensitive to changes in water quality. Northern pike rely on riparian wetlands for spawning and rearing purposes. For these reasons, all remaining riparian wetlands adjacent to Douglas Lake should be protected.

References

J.E. Williams. 1951. An investigation of the pike spawning areas in and around Douglas Lake, Cheboygan County, Michigan, during the spring of 1951. Report No. 1300, Institute of Fisheries Research, Ann Arbor, MI.

University of Michigan Biological Station. A 75-year history of aquatic research at the University of Michigan Biological Station. Available: http://www.umich.edu/~umbs/research/fairchil.htm [January 2005].

Table 1.-Estimated number of fingerling northern pike released into Douglas Lake from the adjacent pike rearing marsh, 1970-2004.

Date released	Estimated number released *	Average length (in.)
1970	3,000	--
1971	2,500	--
1972	100,000	--
1973	5,000	--
1974	0	--
1975	20,000	--
1976	20,000	--
1977	40,000	--
1978	20,000	--
June 10, 1979	5,000	4.2
June 14, 1980	2,000	3.2
1981	--	--
June 19, 1982	18,000	2.1
June 10, 1983	5,000	2.2
June 2, 1984	5,150	1.5
June 2, 1985	50,000	2.0
June 2, 1986	20,000	2.0
1987	--	--
May 27, 1988	10,000	3.0
June 10, 1989	10,000	3.0
1990-1992	--	--
June 10, 1993	100,000	2.0
May 15, 1994	80,000	3.0
May 17, 1995	3,000	1.7
May 31, 1996	100,000	1.2
June 11, 1997	2,000	3.0
1998	--	--
May 20, 1999	6,000	2.0
May 20, 2000	2,000	1.8
May 30, 2001	2,500	2.0
May 30, 2002	1,500	2.0
May 24, 2004	137	--
May 22-25, 2004	3,395	--

* Associated variability is high for these estimates; estimates may be overestimated in some years, and underestimated in others. Based on marsh operator counts and/or estimation.

Table 2.-Number of smallmouth bass tagged per inch group during the 1977 fish community survey at Douglas Lake.

Length	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"
Number collected	5	9	42	64	52	57	78	58	29	9

Table 3.-Species catch and relative abundance of fishes collected during the Douglas Lake fish community survey, June 5-15, 2000.

Species	Number	Percent by number	Weight (lb.)	Percent by weight	Length range (in.)
pumpkinseed	372	27.6	74.6	8.7	3-7
brown bullhead	327	24.3	258.2	30.0	5-14
rock bass	217	16.1	69.5	8.1	3-11
smallmouth bass	96	7.1	92.4	10.7	5-19
yellow perch	95	7.1	12.3	1.4	5-10
northern pike	86	6.4	192.1	22.3	12-29
bluegill	82	6.1	8.9	1.0	3.8
white sucker	21	1.6	48.1	5.6	10-20
bowfin	20	1.5	90.4	10.5	18-26
black crappie	16	1.2	9.2	1.1	6-13
largemouth bass	12	0.9	5.4	0.6	6-13
lake herring	3	0.2	0.3	0.0	6-7
Total	1,347		861.2		

Table 4.-Number per inch group of important game fishes collected during the 2000 Douglas Lake fish survey. BLC=black crappie, BLG=bluegill, PSF=pumpkinseed, RKB=rock bass, YEP=yellow perch, LMB=largemouth bass, NOP=northern pike, SMB=smallmouth bass.

Length (in.)	BLC	BLG	PSF	RKB	YEP	LMB	NOP	SMB
3		33	18	2				
4		15	33	18				
5		10	90	25	33			9
6	3	13	171	45	42	1		2
7	3	9	60	63	7	2		16
8		2		38	8	2		19
9	1			19	3	3		10
10	5			5	2	3		4
11	2			2				5
12	1						1	
13	1					1	2	7
14							1	5
15							1	4
16							3	3
17							5	4
18							1	3
19							5	5
20							9	
21							22	
22							16	
23							9	
24							3	
25							5	
26							2	
27								
28								
29							1	

Table 5.-Comparison of mean length (inches) at age for various game fishes of Douglas Lake from 1959 to 2000. Number in parentheses represents number aged. Growth comparison was across all ages.

Species	Age group	1959	1967	1977	2000	2000 growth compared to state average
largemouth bass	I	4.3	--	--	--	-0.8
	II	7.1	--	--	7.9 (6)	
	III	9.9	--	--	11.2 (4)	
	IV	12.3	--	13.4	--	
smallmouth bass	I	5.4	4.9	--	5.5 (10)	+0.2
	II	7.5	--	8.0	8.4 (31)	
	III	10.4	--	11.9	11.2 (8)	
	IV	13.2	--	13.4	13.7 (13)	
	V	14.2	14.5	15.2	15.4 (3)	
	VI	--	15.5	16.3	16.7 (4)	
	VII	17.4	--	17.1	17.6 (3)	
	VIII	--	16.7	--	18.0 (1)	
	IX	--	--	18.7	19.0 (5)	
	X	--	--	19.7	19.7 (2)	
walleye	II	14.2	16.0	--	--	
	III	--	18.9	--	--	
	IV	18.9	20.9	--	--	
	V	21.5	23.0	--	--	
	VI	--	23.5	--	--	
	VII	--	25.0	--	--	
	VIII	--	25.0	25.4	--	
	X	--	25.5	--	--	
	XI	--	--	--	--	
northern pike	I	11.5	13.1	--	13.2 (4)	-1.0
	II	18.9	18.1	19.3	17.6 (12)	
	III	20.9	19.9	21.1	21.1 (36)	
	IV	23.3	24.9	23.4	23.3 (26)	
	V	24.2	22.5	25.1	26.0 (4)	
	VI	29.4	--	28.1	29.5 (1)	
	VII	30.7	--	31.0	--	

Table 5-continued

Species	Age group	1959	1967	1977	2000	2000 growth compared to state average
cisco	II	--	7.8	--	7.0 (3)	--
	III	8.1	9.5	9.5	--	
	IV	--	12.1	--	--	
	VI	--	14.6	--	--	
pumpkinseed	I	--	3.4	--	--	-0.1
	II	--	4.2	--	3.4 (5)	
	III	--	--	4.9	4.4 (18)	
	IV	5.1	--	6.3	6.1 (19)	
	V	6.2	--	6.8	7.3 (7)	
	VI	6.9	--	--	7.7 (3)	
	VII	7.0	--	--	--	
bluegill	II	--	--	--	3.9 (23)	+0.2
	III	--	--	--	5.5 (9)	
	IV	--	--	--	6.5 (13)	
	V	--	--	--	7.1 (4)	
	VI	--	--	--	7.8 (5)	
	VII	--	--	--	7.8 (1)	
rock bass	II	--	--	--	4.0 (4)	
	III	--	--	--	4.8 (10)	
	IV	--	--	--	6.3 (14)	
	V	--	--	--	7.6 (35)	
	VI	--	--	--	9.0 (14)	
	VII	--	--	--	9.8 (6)	
	VIII	--	--	--	10.4 (1)	
	IX	--	--	--	10.7 (3)	
	X	--	--	--	11.0 (2)	
yellow perch	I	3.2	3.2	--	--	-1.2
	II	4.2	4.5	4.0	--	
	III	5.2	5.9	6.3	5.0 (1)	
	IV	5.9	7.2	7.2	6.1 (34)	
	V	6.4	--	8.6	7.7 (7)	
	VI	7.5	8.7	--	8.7 (8)	
	VII	8.7	--	--	10.1 (3)	
	VIII	9.8	10.0	--	--	
	IX	10.2	10.3	--	--	
	X	11.3	--	--	--	
	XII	--	11.7	--	--	