

Fife Lake
Grand Traverse County (T25N, R09W, Section 13)
Surveyed June 4-8, 2001

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Environment

Fife Lake is a natural lake of glacial origin located in southeast Grand Traverse County (see map). It is about 18 miles southeast of Traverse City, Michigan. Gently rolling hills and deep sandy soils (Kalkaska and Rubicon sands) characterize the geography of the area. The watershed is predominantly a mixture of pine (Jack and Red), oak, and lowland conifers (balsam, tamarack, black spruce, and cedar). There is a scattering of farmland in the area. The immediate area along the south and southwest shoreline consists of mucky soils and lowland conifers. The remaining shoreline is developed uplands with a mixture of brush, hardwoods and some conifers. The Village of Fife Lake is located at the northwest end of the lake.

Fife Lake (Figure 1) is 617 acres with two islands (Helen's and Florence) and up to 60 feet deep. Shoals, comprised primarily of sand and marl, cover 50-60% of the area. Muck and pulpy peat are found along the southwest part of the lake. Aquatic vegetation is sparse except near the inlet from Spring Lake where there is a moderate amount of rooted macrophytes. That inlet enters at the southwest and drains through muck soils. Another small unnamed inlet (that originates from springs) is at the northeast end of the lake. A small outlet, named Fife Lake Outlet, is on the south end of the lake. Fife Lake Outlet is a Designated Trout Stream (DFI-101) below the dam in T25N, R9W, Sec. 10. It flows through lowland conifers and muck soils into the Manistee River.

Water quality conditions in Fife Lake have been surveyed at least seven times between 1973 and 2001 (U.S. EPA 2002). Water quality conditions were last surveyed on July 19, 2001 by MDNR

Fisheries personnel. The water was dark brown but clear with a Secchi disk reading of 14 feet. Secchi disk readings have ranged from 9 feet in 1974 to 14 feet in 2001. Zebra mussels have colonized the lake in recent years, and their presence may enhance water clarity in the future. In the 2001 limnology survey, water temperature varied from 77°F at the surface to 59°F at 50 feet. A poorly defined thermocline occurred between 25 and 35 feet. Typically, summer oxygen levels are sufficient for fish down to a depth of 25 feet. Dissolved oxygen at 25 feet was 5.3 ppm. Below this depth there is insufficient oxygen for fish to live during late summer. The water quality data collected in 2001 are consistent with data collected in past monitoring efforts. Overall water quality is excellent and Fife Lake is a good environment for warm and cool water species. A sanitary sewer system was installed around the lake in the 1940s, and it should help to maintain the excellent water quality in Fife Lake today.

About 90% of the Fife Lake shoreline is developed with residential homes and cottages. Approximately 150 buildings were counted during a 1993 survey of the lake. There is no development near the inlet from Spring Lake. MDNR Parks and Recreation Division operates a Public Access Site with a boat launch on the north side of the lake within the Village limits. A marina is also located on the lake near the public launch. Swimmer's itch has been a problem on Fife Lake, so the lake is treated annually with copper sulfate for swimmer's itch by the Village of Fife Lake. Zebra mussels were first discovered in Fife Lake in 2000.

Fishery Resource

According to records on file at the MDNR Cadillac Unit Office, Fife Lake has been actively managed by the State since 1929, when bluegill were stocked (Table 1). Bluegill, yellow perch, largemouth bass, smallmouth bass and walleye were stocked in varying numbers over the next nine years. From 1939-68 no plantings were made except for smallmouth bass (1946-48) and walleye (1961-62). Since 1969, Fife Lake has been intensively managed for walleye by MDNR Fisheries Division. Walleye were planted every year (except two) from 1969-86. Beginning in 1988, walleye were stocked every third year, with 23,589 spring fingerlings stocked in 2001. The every-third-year regime was implemented in order to avoid cannibalism and competition for resources between year classes, which can result in stunting. Between 1936 and 2001, MDNR Fisheries Division conducted 13 netting surveys of Fife Lake, and creel census studies were conducted in 1934-1937 (Eschmeyer 1935, Eschmeyer 1937, Eschmeyer 1939).

The smallmouth bass plantings in 1946-1948 were part of a statewide experiment (Christensen and Cooper 1955). The fish were fin clipped, and creel census and netting was used to determine survival of the stocked fish and their contribution to the fishery. Returns on the marked fish were very poor, as only five of them were ever seen again. The smallmouth bass population was estimated at 7,300 legal fish in 1950 (the minimum size limit for smallmouth bass in 1950 was 10 inches), and the harvest estimate for the period from 1948 to 1953 was 2,954. The 1946 to 1950 creel census study conducted on Fife Lake was also used to help MDNR Fisheries Division determine that less restrictive regulations on panfish were not necessarily harmful to their populations (Christensen 1953).

Most management actions on Fife Lake have focused on walleye. In an attempt to improve walleye natural reproduction, an experimental walleye spawning reef, constructed of rock, was placed at the western end of Florence Island in 1958. In the mid-1960s another walleye spawning area was constructed in the small inlet stream (at the north end of the lake) between the

lake and the road. In 1969 an experimental walleye rearing pond was constructed nearby by the Walton Junction Sportsmen's Club in cooperation with the MDNR. It was the first drainable walleye pond in the state, and its success resulted in the creation of many more walleye ponds, some of which are still in use. In most years the fingerlings reared in the pond were planted in Fife Lake. The program was in operation until the mid-1990s. Since then, walleyes from other MDNR rearing ponds have been stocked in Fife Lake.

Notes from the 1936 survey indicated that pumpkinseed sunfish, suckers, and bullhead were abundant. Northern pike, largemouth bass, smallmouth bass, rock bass, bluegill and yellow perch were common. Black crappie were scarce. These species were also present in a 1946 netting survey. Walleye were not mentioned in either survey despite previous stockings. Christensen (1960) did not find any walleye in a 1958 fisheries survey of Fife Lake. However, according to creel data (Schneider and Lockwood 1979), walleye were at least a small component of the sport catch in the years 1933-1937 and 1946-1965. In those years, the annual walleye catch estimates ranged from a 16 to 502 fish.

Population estimates for walleye in Fife Lake were done for 1964, 1965, and 1974. Using mark/recapture netting surveys, Schneider (1969) estimated the walleye population in Fife Lake to be 1,397 in 1964 and 1,087 in 1965. Pettengill (1975) used netting and creel surveys to estimate the walleye population in Fife Lake in 1974. The 1974 netting estimate was 1,248 fish, and the creel estimate was 1,009 fish. Pettengill (1975) concluded that the sustained walleye stocking program begun in 1969 had not significantly changed the estimated population, but that it had resulted in increased catch per effort and estimated catch.

The fish community of Fife Lake was most recently surveyed by MDNR Fisheries Division on June 4-8, 2001. The netting effort consisted of four overnight sets of four large mesh fyke nets and one small mesh fyke net. Two trap nets were added on the second day of the survey.

Gill nets were not used since loons were observed in the lake during the survey.

A total of 547 bluegill ranging from 3-10 inches in length were captured in the 2001 survey (Table 2). About 65% of the bluegill captured in the survey exceeded 6 inches in length. Length-at-age for bluegill from age classes 2-5 was 0.9 inches greater than the State of Michigan average (Table 3). Fife Lake produces larger bluegill than many northern Michigan lakes due to a favorable combination of recruitment, growth and survival. It is likely that walleye and bass predation helps to keep the bluegill population in balance. Growth rates for other panfish species are also good (Table 2). Pumpkinseed sunfish, rock bass, and yellow perch are growing significantly better than the State average. It also should be noted that age-3 fish comprise a large portion of the populations of bluegill, pumpkinseed sunfish, rock bass, and yellow perch (Table 4). Apparently, 1998 was a very good year for panfish reproduction and survival.

The smallmouth bass population in Fife Lake is also good. In the 2001 survey, 67 smallmouth bass up to 20" were caught (Table 2). Smallmouth bass growth was normal, as lengths-at-age were near the State of Michigan average for several age classes (Table 3), although most of those caught in the survey were below the legal minimum size of 14 inches. Largemouth bass and northern pike were also collected in the catch, but in smaller numbers. Largemouth bass growth was slightly better than the State average, but northern pike lengths-at-age for age classes 1 and 2 were 1.1 inches below the State average (Table 3). The majority of both the largemouth bass and smallmouth bass captured in the 2001 survey were from the age-3 (1998) and age-4 (1997) year classes (Table 4). It is interesting to note that no northern pike older than age-2 were caught in the survey.

One hundred eleven walleye ranging from 12-23" in length were captured from Fife Lake in the 2001 survey (Table 2). The walleye averaged 16.3 inches in length, and growth was normal. Lengths-at-age for age classes 3-6 were 0.4 inches below the State of Michigan average

(Table 3). Age classes 2-8 were represented in the catch, even though walleye were only stocked in 1998 (age-class 3) and 1995 (age-class 6). The presence of walleye from non-stocking year classes indicates natural recruitment. Even so, the two most well represented year classes in the catch were age-3 and age-6 (stocked years). From these data, it would appear that the stocked walleye are surviving and recruiting to the fishery. Seventy-three percent of the walleye captured in the survey were larger than the minimum legal size of 15 inches.

Today's fish community has changed from that of 50 years ago (Table 1). Walleye and smallmouth bass have largely replaced northern pike and largemouth bass, which were more common in the 1930s and 1940s. The decline in northern pike and largemouth bass may be due to a loss of suitable habitat, as riparian land was developed and wetlands were filled in. Bluegill, pumpkinseed sunfish, rock bass and yellow perch still provide a good fishery. Black crappie remain scarce, most likely due to a lack of suitable habitat.

Since 1990, nine Master Angler entries were received for fish caught from Fife Lake. Three of the entries were for yellow perch, some of which exceeded 15 inches in length. Two entries were for bluegill, two were for black crappie, one was for a rock bass, and one was for a walleye.

Management Direction

Fife Lake will continue to be managed as one of northwestern Michigan's better coolwater fishing lakes. Fife Lake has a reputation for excellent walleye fishing during the spring, summer, and winter. For the last 25 years it has been one of the better walleye fishing lakes in the area. Walleye stocking will continue to supplement natural reproduction. The walleye stocking program will continue at a rate of 35 fingerlings/acre (20,125 fish), every third year. Fife Lake was last stocked with 23,589 spring fingerlings in 2001. In years when walleye are stocked, electrofishing using the Serns Index should occur that fall to assess the success of the

plant. The extent of walleye natural reproduction should also be determined using the Sern's Index in a non-stocking year. Based on the results of the evaluation, the walleye stocking program could be further refined to reduce competition of stocked walleye with naturally reproduced walleye. Also, electroshocking will provide more information on prey species in Fife Lake, as well as information on the reproduction and recruitment of other species. Other gamefish and panfish species in Fife Lake will continue to support excellent populations through natural reproduction.

Another goal for Fife Lake for the 21st century should be to maintain the health of the aquatic ecosystem. All remaining riparian wetlands should be protected from development. Such wetlands are a critical component to the lake ecosystem and should remain in a natural condition. Another goal for Fife Lake should include educating riparian landowners about ecologically-wise best management practices for their lands and shoreline. The Village of Fife Lake may also wish to pursue other methods of dealing with swimmer's itch. The practice of treating inland lakes with copper sulfate may have negative impacts on invertebrate and fish populations.

Fishing on Fife Lake is an enjoyable experience. The water is clear and vegetation is not a problem for boating or fishing. Although the shoreline is developed there is adequate vegetation to be aesthetically pleasing and helps to reduce erosion. The presence of two islands adds to the aesthetic enjoyment. Loons are also known to live and nest successfully on Fife Lake. Water quality should be preserved because the Village of Fife Lake has a sewage treatment facility. Access is assured through the MDNR-operated public access site and boat launch. Walleye, smallmouth bass, yellow perch, and bluegill should continue to provide a good, stable fishery on Fife Lake.

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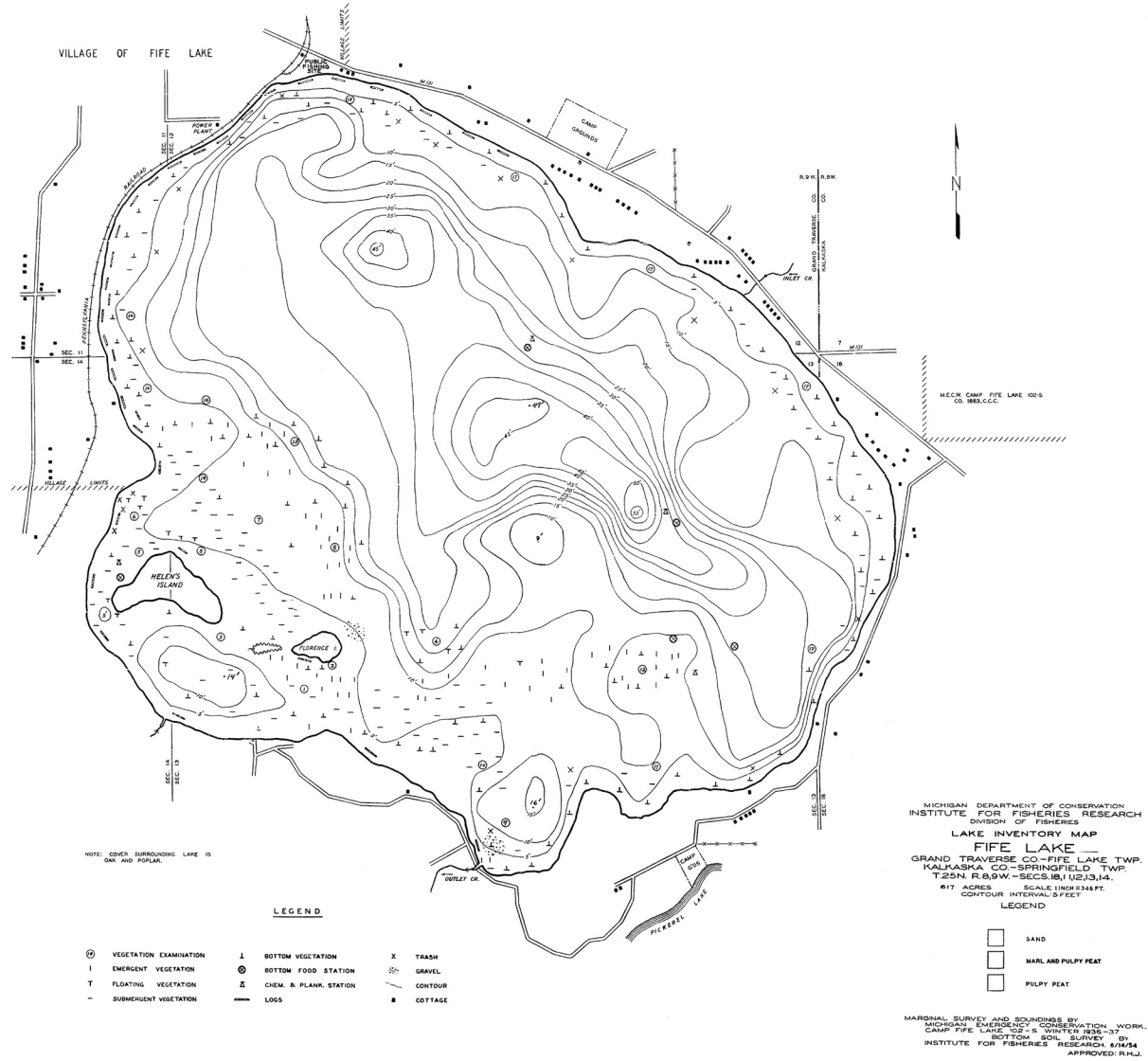


Figure 1.—Fife Lake map.

Table 1.-Fish stocked into Fife Lake, Grand Traverse County, 1929-2001.

Year	Species	Number	Size	Strain
1929	Bluegill	2,000	4 mo.	
1930	Bluegill	6,000	?	
1931	Smallmouth bass	250	6 mo.	
	Bluegill	2,500	6 mo.	
1932	Largemouth bass	400	?	
	Bluegill	200	?	
1933	Largemouth bass	2,000	?	
	Bluegill	1,500		
1934	Yellow Perch	5,000	?	
	Walleye	?	fry	
	Bluegill	8,000	?	
1935	Walleye	255,000	fry?	
	Bluegill	4,000	?	
1936	Largemouth bass	190	yearlings	
	Walleye	300,000	fry?	
	Bluegill	150	yearlings	
1937	Largemouth bass	500	fingerlings	
	Smallmouth bass	300	fingerlings	
	Walleye	255,000	fry?	
	Yellow Perch	25,000	fingerlings	
	Bluegill	10,000	fingerlings	
1938	Largemouth bass	3,500	4 mo.	
	Walleye	200,000	fry?	
1946	Smallmouth bass	9,850	3.4"	
1947	Smallmouth bass	5,861	2.8"	
1948	Smallmouth bass	10,000	3.4"	
1961	Walleye	22,950	fingerlings	
1962	Walleye	25,000	fingerlings	
1969	Walleye	5,200	fingerlings	
1970	Walleye	9,100	fingerlings	
1971	Walleye	18,200	yearlings	
1972	Walleye	14,414	yearlings	
1973	Walleye	11,494	fingerlings	
1974	Walleye	9,412	fingerlings	
1975	Walleye	11,470	spring fingerlings	
1976	Walleye	456	fall fingerlings	
1978	Walleye	937	fall fingerlings	Minnesota
1980	Walleye	15,076	spring fingerlings	Muskegon
1981	Walleye	21,300	fall fingerlings	Minnesota
1982	Walleye	600	fall fingerlings	

Table 1.–Continued.

Year	Species	Number	Size	Strain
1983	Walleye	500	fall fingerlings	
1984	Walleye	20,800	fall fingerlings	Muskegon
1985	Walleye	30,180	fall fingerlings	
1986	Walleye	5,064	fall fingerlings	Muskegon
1988	Walleye	19,000	fall fingerlings	Bay de Noc
1992	Walleye	16,265	fall fingerlings	Bay de Noc
1995	Walleye	20,295	spring fingerlings	Muskegon
1998	Walleye	19,660	spring fingerlings	Muskegon
2001	Walleye	23,589	spring fingerlings	Muskegon

Table 2.–Number, weight and length (inches) of fish collected from Fife Lake, Grand Traverse County, with small-mesh fyke nets, large-mesh fyke nets, and trap nets, June 4-8, 2001.

Species	Number	Percent by number	Weight (pounds)	Percent by weight	Length range (inches) ¹	Average length (inches)	Percent legal size ²
Bluegill	547	38.4	102.8	17.0	2.7-10.4	5.3	65 (6)
Rock bass	530	37.2	190.3	31.5	3.7-12.0	7.5	89 (6)
Walleye	111	7.8	161.4	26.7	12.2-23.3	16.3	73 (15)
Smallmouth bass	67	4.7	64.3	10.6	3.3-20.3	11.7	14 (14)
Yellow perch	67	4.7	25.3	4.2	7.1-13.2	9.4	100 (6)
Pumpkinseed	49	3.4	10.0	1.7	4.6-7.3	6.2	54 (6)
Northern pike	24	1.7	16.3	2.7	12.0-21.7	14.5	0 (24)
Largemouth bass	18	1.3	17.0	2.8	9.1-15.5	12.0	12 (14)
Black crappie	5	0.4	3.7	0.6	10.2-11.8	10.9	100 (7)
Brown bullhead	4	0.3	4.1	0.7	12-13	13.0	100 (8)
White sucker	3	.2	9.9	1.6	18-22	20.2	---
Total	1,425	100.0	605.1	100.0			

¹ Some fish were measured to 0.1 inch, others to inch group: e.g., “5” = 5.0 to 5.9 inch, “12” = 12.0 to 12.9 inches; etc.

² Percent legal size or acceptable size for angling. Legal or acceptable size (inches) for angling is given in parentheses.

Table 3.—Average weighted total length (inches) at age, and growth relative to the State of Michigan average, for fish sampled from Fife Lake, Grand Traverse County, with small-mesh fyke nets, large-mesh fyke nets, and trap nets, June 4-8, 2001. Number of fish aged is given in parentheses.

Species	Age										Mean growth index	
	1	2	3	4	5	6	7	8	9	10		
Black crappie			10.4 (2)	11.1 (2)		11.8 (1)						---
Bluegill		3.9 (5)	5.9 (48)	7.5 (9)	8.7 (8)	9.5 (3)						+0.9
Largemouth bass		9.1 (2)	11.1 (7)	12.4 (6)	14.9 (2)	14.1 (1)						+0.5
Northern pike	13.4 (18)	17.9 (5)										-1.1
Pumpkinseed		5.1 (2)	6.3 (27)	6.2 (2)								+1.1
Rock bass		4.5 (18)	6.5 (27)	8.0 (17)	9.1 (4)	9.8 (2)	10.5 (6)	10.7 (9)	11.3 (9)	11.5 (3)		+1.0
Smallmouth bass	3.3 (1)	8.0 (9)	10.9 (29)	13.1 (14)	14.7 (4)	15.8 (3)	20.3 (1)	17.1 (1)				-0.3
Walleye		13.1 (4)	14.8 (23)	16.3 (13)	17.5 (10)	18.2 (17)	17.5 (4)	20.0 (1)				-0.4
Yellow perch		7.1 (1)	8.9 (19)	10.4 (10)	11.4 (4)	13.2 (1)	13.0 (1)					+2.4

Table 4.—Estimated age frequency (percent) of fish caught from Fife Lake, Grand Traverse County, with small-mesh fyke nets, large-mesh fyke nets, and trap nets, June 4-8, 2001.

Species	Age										Number caught	
	1	2	3	4	5	6	7	8	9	10		
Black crappie			40	40	20							5
Bluegill		7	66	12	11	4						547
Largemouth bass		11	39	33	11	6						18
Northern pike	78	22										24
Rock bass		19	28	18	4	2	6	9	9	3		530
Smallmouth bass	2	15	47	23	6	5	2	2				67
Walleye		6	32	18	14	24	6	1				111
Yellow perch		3	53	28	11	3	3					67