Michigan Department of Natural Resources
Status of the Fishery Resource Report 92-8, 1992.
Renumbered in 2024, Status of the Fishery Resource Report 0025

GILEAD LAKE

Branch County (T8S, R7W, Sec. 6,7)
Surveyed

Michael P. Herman

Environment

Gilead Lake, approximately 130 acres in size, is located about 6 miles south of the city of Bronson in southwest Branch County (see map of Gilead Lake). Gilead Lake has no inlets or outlets. The source of water supply for this lake is primarily surface runoff and springs. Gilead Lake is part of the Prairie River watershed within the St. Joseph River Basin. The Prairie River flows westerly, joining the St. Joseph River just south of the community of Three Rivers.

Approximately 60% of this lake's substrate is comprised of organic matter and approximately 35% of marl. The remaining 5% consists of scattered areas of sand found mainly on the southwestern shore. Common bulrush, white and yellow water lily, and several varieties of pondweed are the major aquatic plants found in the lake. Muskgrass or *Chara* is also present in this lake and is almost always found in mineral-rich water. Gilead Lake is a moderately deep lake (49 feet maximum) with steep drop-offs. Approximately 60% of the lake's surface area has water greater than 10 feet in depth. The water is usually light-green in color. The latest limnology survey was in August of 1990. Temperatures ranged from 77°F at the surface to 51°F at the 38-foot depth. On the day of the survey, the thermocline occupied the layer of water between the 20- and 25-foot depths. Dissolved oxygen concentrations in this layer of water ranged from 5.0 to 1.0 ppm.

The terrain surrounding Gilead Lake is gently rolling woodlands and farm fields. The shoreline is moderately developed, with about 100 summer and permanent homes presently on this lake. The undeveloped shoreline areas are mainly wooded with stands of red maple, silver maple, and white oak trees. An access site and park located on the southern basin of Gilead Lake is leased by the county from the Department of Natural Resources.

Bluegills and largemouth bass were stocked in Gilead Lake in the late 1930s and mid-1940s. These stocking programs were discontinued shortly thereafter. Rainbow trout have been stocked in this lake nearly continuously since 1951. Redear sunfish were planted in 1986 and 1991.

Historically, this small lake has been a consistently excellent fishing lake, especially for bluegills. Good numbers of large yellow perch are also available but few anglers report catching them consistently. Although relatively few largemouth bass exist in the lake, this species is sought by many area anglers. Gilead Lake's deeper waters contain adequate oxygen and suitable temperatures for rainbow trout survival, and trout fishermen have enjoyed the benefits of trout stocking for over 30 years.

Fishery Resource

Gilead Lake was last surveyed in May and June, 1991 with five standard 8'x 5'x 3' foot trap nets. No gill nets were used since evaluation of the redear sunfish stocking program was the primary

objective of this survey. Species captured in descending order of abundance included bluegill, bullhead, redear sunfish, black crappie, largemouth bass, pumpkinseed, green sunfish, and yellow perch (Table 1).

Bluegills dominated the trap net sample, comprising 91.3% by number and 78.2% by weight of the total catch (Table 1). Eighty-five percent of all bluegills caught in trap nets were of acceptable size to anglers. Based on growth analysis using fish scales, bluegills caught during the 1991 survey exhibited near state average growth rates (Table 2). However, the 672 bluegills in the sample averaged 7.1 inches each, which is an unusually large average size.

Bluegills are targeted for sampling in inland lakes because of their role in determining fish community structure and overall sport fishing quality (Schneider 1981). Even though the goal of lake surveys is to sample all fish species and all sizes present, many times only the bluegill population is adequately sampled because bluegills are usually the most abundant fish. Recently, a ranking system has been developed that allows fish managers to get an idea of the relative quality of a lake's fish population (Schneider 1990). On a scale of 1 to 7, the quality of the bluegill population in Gilead Lake was calculated as 5.8, or "excellent".

Age composition and survival characteristics of the bluegill population appears to be normal based on scale sample frequencies (Table 3). The longevity of bluegill (10 years) in Gilead Lake appears to be above average. Ages III through VIII were well represented. The estimated age frequency for age VI fish was only 12%, which suggests that a weak year class may exist. Few age II bluegills were caught in trap nets because small fish are much less vulnerable to netting. Too few individuals of other species were captured to be included in this table.

Approximately 12,000 redear sunfish fingerlings were introduced into Gilead Lake in 1986. Redears caught during the 1991 survey averaged 7.5 inches and 0.4 pounds each (Table 1). The presence of age III, six-inch, redears in this lake indicates that natural reproduction occurred. Fish scale analysis showed that redears were growing at near state average growth rates (Table 2). Redear fingerlings were also stocked in 1991 in an attempt to establish another year class.

Although black crappie are not a large component of the fishery in Gilead Lake, they are relatively large in size. Not enough crappies were captured per age group to be statistically significant; however, growth trends indicate that this species is growing above state average rates (Table 2).

Only one yellow perch was caught in trap nets during the 1991 survey, but the low catch was probably due to gear selectivity rather than to low abundance. Past surveys of this lake with gill nets resulted in the capture of good numbers of yellow perch. Yellow perch caught during past surveys exhibited growth rates that were well above the state average and were large in average size.

Growth trends for bluegill, black crappie, and largemouth bass are comparable to those from surveys of Gilead Lake conducted in 1978, 1983, and 1987. Survey records show that species composition has remained relatively unchanged throughout the past 25 years.

Gilead Lake has been managed as a rainbow trout lake from 1951 to the present. Trout stocking was discontinued from 1970 through 1972 but stocking resumed in 1973. A rainbow trout tagging study was conducted on this lake in 1989 and 1990 in an attempt to evaluate angler harvest of this species. Anglers returned only 18 tags in 1989 and 32 tags in 1990 for an estimated total harvest of 1.1% and 2.0%, respectively. Many factors including tag loss and a higher mortality of tagged trout may have contributed significantly to the low harvest estimates. Although the estimated harvest was low during the years of the tagging study, evening (trout) angling activity during the summer of 1991 was reported to be quite high by several riparians. Two lake residents kept daily logs of boats that were observed fishing after dark. Fishing boats were easy to see because anglers used lanterns while still fishing. Average boat counts for May, June, July and August were 5, 31, 30, and 10,

respectively. For more information, refer to the file report regarding the use of Floy tags for estimating angler harvest of rainbow trout from this lake.

This lake has been successfully managed for more than 40 years as a two-story rainbow trout lake. The stocked trout apparently do not conflict with the warmwater species which coexist in the lake. Most of the trout are short-term residents of the lake and a significant portion of them are removed by angling and natural mortality before the end of the summer.

Anglers interviewed during the 1991 survey reported good open-water fishing success for bluegill and small bass. Although few redear sunfish and perch were reportedly caught by anglers, they were large in size. Trout fishing success was rated as good in 1991 by many lake residents.

Management Direction

Gilead Lake has a reputation for consistent catches of bluegill, perch, and rainbow trout of acceptable size and anglers are satisfied with the existing fishery. It is hoped that the introduction of redear sunfish to this lake will give anglers an opportunity to catch a trophy panfish. Rainbow trout provide a unique fishing opportunity popular with many anglers in this area and continued stocking is recommended. This lake should be surveyed in 1994 and its fishery re-evaluated.

References

Schneider, J. C. 1981. Fish communities in warmwater lakes. Michigan Department of Natural Resources. Fisheries Research Report 1890, Ann Arbor.

Schneider, J. C. 1990. Classifying bluegill populations from lake survey data. Michigan Department of Natural Resources, Fisheries Technical Report 90-10, Ann Arbor.

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Table 1-Number, weight, and length indices of fish collected from Gilead Lake with trap nets, May 2 and 19, and June 4, 1991.

Species	Number	Percent by number	Weight (pounds)	Percent by weight	Length range (inches)[1]	Average length	Percent legal size[2]
Bluegill	672	91.3	176.8	78.2	4 - 9.5	7.1	85.0
Bullhead	28	3.8	29.0	12.8	8-16.5	12.0	100.0
Redear sunfish	10	1.4	4.0	1.8	6 - 10.5	7.5	100.0
Black crappie	10	1.4	3.8	1.7	5 - 11.5	8.7	60.0
Largemouth bass	9	1.2	10.4	4.6	7 - 13.5	12.6	55.6
Pumpkinseed	3	0.4	0.9	0.4	5 - 8.5	6.8	66.7
Green sunfish	3	0.4	0.7	0.3	5 - 6.5	5.8	33.3
Yellow perch	1	0.1	0.4	0.2	10.5	10.5	100.0
Total	736	100.0	226.0	100.0			

[1]Note some fish were measured to 0.1 inch, others to inch group: e.g., "5" = 5.0 to 5.9 inches; "12" = 12.0 to 12.9 inches; etc.

[2]Percent legal size or acceptable size for angling.

Table 2.-Average total length (inches) at age, and growth relative to the state average, for three species of fish sampled from Gilead Lake with trap nets, June 4, 1991. Number of fish aged is given in parentheses.

	Age										Mean growth
Species	I	II	III	IV	V	VI	VII	VIII	IX	X	index[1]
Bluegill	-	4.5	5.1	5.8	7.0	7.4	7.9	8.5	8.9	9.0	-0.1
		(1)	(12)	(11)	(10)	(4)	(6)	(4)	(5)	(4)	
Redear sunfish	-	-	6.9	-	9.4	-	-	-	-	-	0.0
			(8)	-	(2)	-	-	-	-	-	
Black crappie	5.3	6.5	-	9.5	9.8	11.6	-	-	-	-	-
	(1)	3)	-	(3)	(1)	(1)	-	-	-	-	
Largemouth bass	-	7.3	11.3	-	12.8	13.3	16.2	-	17.8	-	-
	-	(1)	(2)	-	(2)	(1)	(1)	-	(1)	-	

[1]Mean growth index is the average deviation from the state average length at age.

Table 3.-Estimated age frequency (percent, weighted) of bluegill caught with trap nets, June 4, 1991.

	Age										Number
Species	I	II	III	IV	V	VI	VII	VIII	IX	X	caught
Bluegill	-	0.5	10.0	19.0	32.5	12.0	16.0	6.0	3.0	1.0	672

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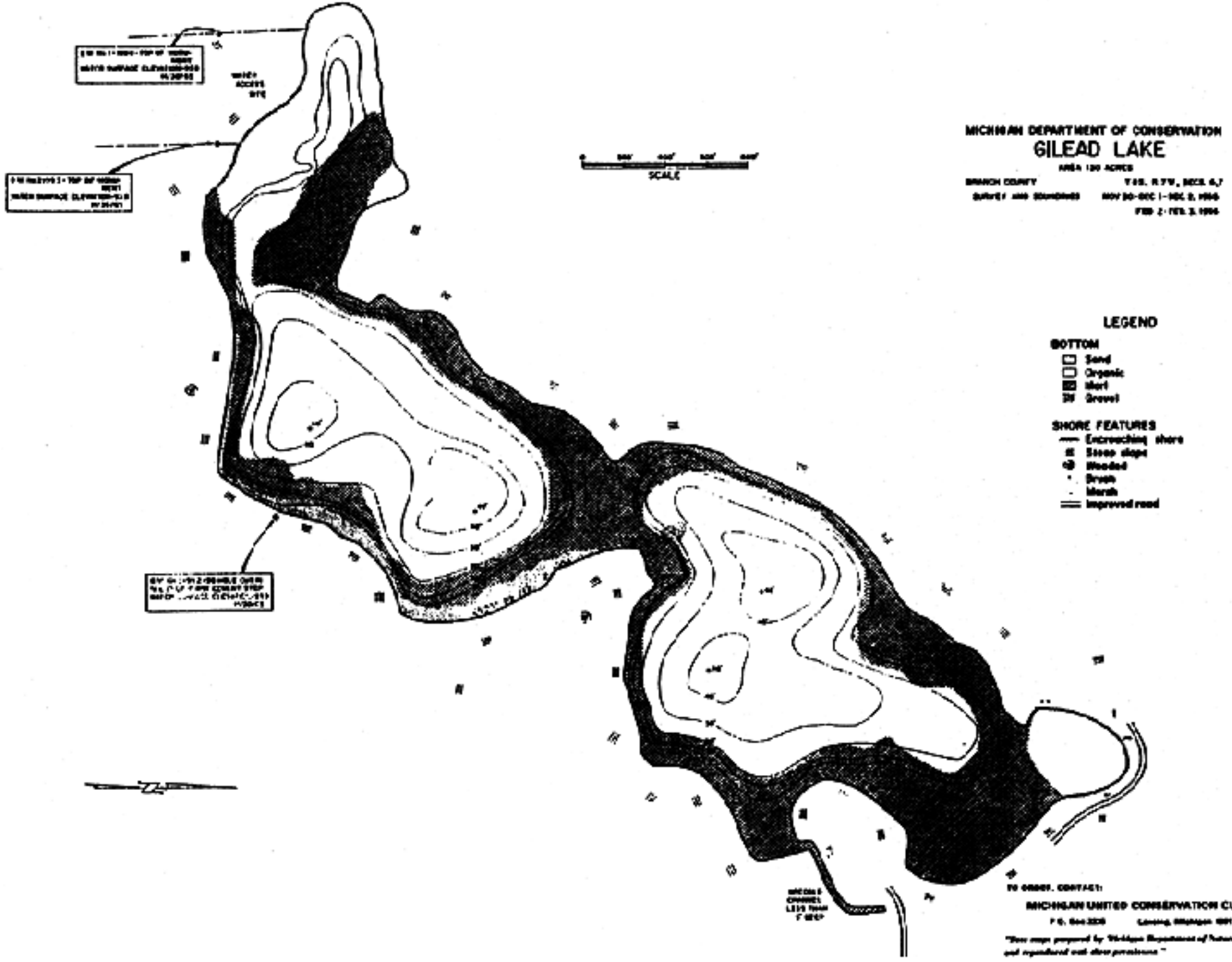
Questions, comments and suggestions are always welcome! Send them to tinchert@michigan.gov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