Michigan Department of Natural Resources
Status of the Fishery Resource Report 91-15, 1991.

BELAS LAKE

Cass County (T6S, R14W, Section 24)
Surveyed June 26&endash;27, 1990

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Environment

Belas Lake is a very shallow, small natural lake located in central Cass County (see map of Belas Lake). More than ½ of the land around the lake is owned by the State and is in Crane Pond State Game Area. A public access site was constructed by the Fisheries Division in 1981. This small gravel site has room for 10 vehicles with trailers. The small town of Vandalia is located about 2 miles to the southwest. Cassopolis is about 8 miles to the west.

The immediate shoreline area of the lake is marshy, with no development. The watershed is a mixture of cultivated farm fields, pig farms, and woods. The topography consists of slightly rolling hills. No information is available on the soil types in Cass County, as a soil survey has not been completed.

The surface area of Belas Lake is 30 acres and the maximum depth is 17 feet. The lake bottom is mostly pulpy peat. No significant bottom structure exists. One small inlet drains a pond from the east side. An outlet on the south side drains into Kirk Lake. Both inlet and outlet are rated as second quality warm-water streams. No control structure is present. The lake is in the St. Joseph River Watershed.

Water quality measurements were taken on July 27, 1990. The water color was dark brown. The Secchi disk reading was 8 feet. Alkalinities ranged from 96 ppm at the surface to 116 ppm at the bottom and pH was 8.5. These values represent moderately hard water that is well buffered against acidification. Water temperatures were 77.4°F at the surface and 62.6°F at the bottom. A thermocline began at about 5 feet. Dissolved oxygen levels declined from 9.9 ppm at the surface to 0.3 ppm at the bottom. Sufficient oxygen levels for most fish species was absent below the 12 foot depth.

Fishery Resource

Little historical information exists for Belas Lake. Bluegills were stocked in 1936 and 1937 and largemouth bass in 1948. Records from the 1940's indicate the lake had a history of winterkills. Dissolved oxygen samples taken in February of 1948 and 1955 confirm this, with oxygen levels as low as 0.2 ppm at the 6&endash;foot depth. In 1948 local farmers informed fisheries investigators that yellow perch typically move up into

the inlet in large numbers and die, and then at ice out, dead bass and bluegill show up. This scenario was observed in 1948.

Creel census figures from the 1950's and research notes from the 1940's indicate that the fishery was fair to good for largemouth bass, bluegill, yellow perch, and black crappie. A fyke net survey conducted in September of 1978 showed about the same community, with the exception that the first record of northern pike was entered. These most likely were offspring from a stocking of 100 northern pike fingerlings in 1954.

During the June 27-28, 1990 survey, three different types of nets (two each) were fished for one night. These nets included standard 6' x 3' x 1.5" trap nets, mini-mesh (¼") full size fyke nets, and experimental gill nets.

The present fishery of Belas Lake is similar to that of 1978. The fish community found during the 1990 survey (Table 1) was dominated by bluegill, pumpkinseed sunfish, and bullhead. Three legal sized northern pike were collected. Yellow perch, black crappie, and largemouth bass were also present, but not in great numbers.

Bluegills provide the most fishing activity at Belas Lake. Schneider (1990) developed 5 criteria for ranking bluegill populations from survey catches in Michigan. Using these criteria, this bluegill population ranked 4 (good) on a scale of 1&endash;7. Nineteen percent of the bluegill sampled were over 7 inches.

The growth rate of bluegill (Table 2) was good compared to the state average. Yellow perch were growing at their state average rate. Pike, crappie, and bass do not appear to be experiencing growth problems but only a few samples of each were collected.

The age composition and survival characteristics of bluegill are hard to interpret (Table 3). It appears that heavy mortality may be affecting the population between ages III and IV. More likely, however, our limited netting effort under sampled older bluegills, because they had moved offshore after spawning and were not vulnerable to our nets. More intensive netting would be necessary to determine what is actually happening.

The history of winterkills on this lake undoubtedly leads to the good growth of most game species. The constant reduction of the total population allows more room and less competition. Belas Lake should continue to provide good fishing in future years. Limited access and low use will contribute to sustaining the fishery.

Management Direction

No intensive management is needed at Belas Lake. The watershed should not be under- going any major changes in the near future. The possibility of winterkills will continue, however, and may cause major changes in the fish population and composition. Belas Lake should continue to produce an acceptable warmwater fishery for years to come. Adequate natural reproduction, good growth, a favorable species

mix, and low public use will all contribute to maintaining the good health of the fish community.

Report completed: June, 1991.

References

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

Table 1. Number, weight, and length (inches) of fish collected from Belas Lake with trap, fyke, and gill nets on June 26-27, 1990.

Species	Number	Percent by number	Weight (pounds)	Percent by weight	Length range (inches)[1]	Average length	Percent legal size[2]
Bluegill	263	53.2	36.7	32.4	2-8	6.0	49.0 (6)
Pumpkinseed	128	25.9	11.9	10.5	2-6	5.0	11.7 (6)
Bullhead	45	9.1	16.6	14.7	6-10	8.8	95.6 (7)
Warmouth	20	4.0	1.2	1.1	2-5	4.1	-
Yellow perch	12	2.4	2.6	2.3	6-8	7.3	66.7 (7)
Golden shiner	10	2.0	2.6	2.3	6-7	7.1	-
Bowfin	6	1.2	26.8	23.7	19-26	23.2	-
Black crappie	4	0.8	1.1	1.0	6-8	7.5	75.0 (7)
Northern pike	3	0.6	12.1	10.7	22-27	25.8	100.0 (20)
Largemouth bass	2	0.4	1.2	1.1	10-13	12	50.0 (12)
Lake chubsucker	1	0.2	0.4	0.4	9	9.5	-
Total	494	100.0	113.2	99.9			

[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. Legal size or acceptable size for angling is given in parentheses.

Table 2.-Average total length (inches) at age, and growth relative to the state average, for fish sampled from Belas Lake with trap, fyke, and gill nets on June 26-27, 1990. Number of fish aged is given in parentheses. The top average is weighted by length frequency distribution; the bottom average is unweighted.

	Age								Mean growth
Species	I	II	III	IV	V	VI	VII	VIII	index[1]
Bluegill	2.0	4.4	6.0	7.7	8.2	-	-	-	+0.7
	(1)	(13)	(27)	(5)	(4)	-	-	-	-
	2.0	4.3	6.1	7.7	8.2	-	-	-	-
Largemouth bass	-	-	10.6	-	13.2	-	-	-	-
	-	-	(1)	-	(1)	-	-	-	-
	-	-	10.6	-	13.2	-	-	-	-
Yellow perch	-	-	6.4	7.5	8.0	-	-	-	+0.1
	-	-	(5)	(5)	(3)	-	-	-	-
	-	-	6.4	7.5	8.1	-	-	-	-
Northern pike	-	-	-	22.0	27.7	-	-	-	-
	-	-	-	(1)	(2)	-	-	-	-
	-	-	-	22.0	27.7	-	-	-	-
Black crappie	-	6.2	7.3	8.6	-	-	-	-	-
	-	(1)	(2)	(1)	-	-	-	-	-
	-	6.2	7.3	8.6	-	-	-	-	-

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

Table 3.-Estimated age frequency (percent) of fish caught from Belas Lake with trap, fyke, and gill nets on June 26-27, 1990.

	Age							Number
Species	I	II	III	IV	V	VI	VII	VIII	caught
Bluegill	-	18	73	7	2	-	-	-	263
Largemouth bass	-	-	50	-	50	-	-	-	2
Yellow perch	-	-	42	42	17	-	-	-	12
Northern pike	-	-	-	33	67	-	-	-	3
Black crappie	-	25	50	25	-	-	-	-	4

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