

A FISH SURVEY OF THE GRASS RIVER NATURAL AREA
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INTRODUCTION

This study was undertaken to determine the distribution and relative abundance of fishes in the Grass River Natural Area located in Antrim County, Michigan. The Grass River Natural Area contains cold-water trout streams, a warm-water river, extensive wetlands, several small ponds, and two lakeshores. Some sampling has been done in the Natural Area and adjacent waters by various government agencies, but this is the first systematic study of the area.

METHODS

Sampling locations

Nineteen sites, representing five major types of aquatic habitat within the Natural Area, were sampled. Areas previously sampled by government agencies, such as Clam Lake and Lake Bellaire, were not extensively sampled in this study. A list of sampling sites is presented in Table 1; site locations are shown in Figure 1.

Sampling gear

Fish were collected with steel minnow traps, six- and fifteen-foot-long seines, a minnow lift net, and experimental gill nets. Minnow traps were baited with peanuts, bread, or crackers. The gillnets were made of monofilament nylon and contained five panels of different mesh sizes: 0.5", 0.75", 1.0", 1.5", and 2.0" (square

Several habitat types were extremely difficult to sample with the available gear. The deep reaches of the Grass River can be sampled only with a boat-mounted shocker (for larger fishes) and with a small-mesh trawl (for smaller fishes). Some marshy areas provided very poor footing, which made seining difficult and in some cases impossible.

Identification of large specimens was done in the field. Captured fish were returned to the water alive whenever possible. Smaller specimens were preserved in ten percent formalin and identified later. Fish names used in this report are those adopted by the American Fisheries Society.

RESULTS AND DISCUSSION

Results of fish sampling are presented in Tables 2 and 3. The results are discussed by habitat type.

Trout Streams (Sites 1,2,3,8)

Finch, Cold, and Shanty Creeks drain sandy outwash areas east of the Natural Area. These streams are similar in habitat, characterized by cold, swift water, sand bottoms, and limited cover provided by fallen trees. The typical Michigan trout stream inhabitants, brown and brook trout and slimy sculpins, were found upstream in Finch Creek. At the mouth of Finch Creek, backwaters provide warm water conditions favorable to mudminnows. A lamprey survey of Finch Creek by the U.S. Fish and Wildlife Service in 1974 found brown trout and sculpins. A similar survey of Shanty Creek found rainbow, brown and brook trouts and sculpins. Neither survey found lamprey in the creeks. See Appendix I..

Cold Creek was sampled only at the mouth where it flows into the Grass River. The bluntnose minnows found there are more likely residents of the Grass River than of Cold Creek.

The trout streams are not highly productive due to the lack of spawning gravel and adequate cover for adult fish. The sand bottom of the stream is poor habitat for the aquatic insects that trout feed upon.

Grass River (Sites 4,5,6,7,8,10,13)

The Grass River is a warm-water stream with extensive areas of aquatic plants and many backwaters. This combination provides the river with excellent fish cover, spawning areas, and food supply. Plankton and detritus flowing in from Lake Bellaire also provide food for immature fish and for minnows.

The Grass River fish fauna is characterized by a typical warm-water assemblage including pike, perch, basses, sunfishes, and minnows. The bluntnose minnow was the most common Cyprinid. Sand shiners were also present near the Lake Bellaire inlet. The river provides excellent minnow habitat; large schools of many thousand individuals were observed. It is likely that other minnow species are present in the river. A spring season survey would probably capture additional species during their spawning. A fine-mesh trawl run behind an outboard boat would also be more effective in capturing small river fish than were the traps and seines used in this study.

Other river fishes caught were black bullhead, johnny darter, and slimy sculpin.

Grass River Backwaters (Sites 9,11,12)

For this study, I have named the small creek forming the southwest boarder of Grass Island "Grass Island Creek". This creek, which has no permanent connection to Lake Bellaire, could be the remnent of an earlier Grass River channel. Flow in the creek was

creek probably has a very slight downstream flow of groundwater from Grass Island.

This backwater area has a sand and muck bottom, tea-colored water, many aquatic plants, and warm water temperatures (21.1°C). The fish collected here were perch, rock bass, longear sunfish, pumpkinseed sunfish, northern pike, and blacknose and blackchin shiners, all typical still-water species.

Grass Island Ponds (Sites 16,17,18,19)

The four small ponds on Grass Island are a unique environment that bears further study. At the time of the study, all were land-locked. Water-filled muskrat channels criss-crossing the island may connect some of the ponds with the river at high water periods. The ponds are quite shallow (1-3 feet) and unless supplied with a flow of groundwater, they could easily freeze solid in winter.

The largest, most southerly pond contained northern pike and largemouth bass. Other species may be present, but sampling was difficult due to the dense growths of reeds and other aquatic plants and the soft, muck bottom.

The other three ponds were quite small, 3 to 10 feet in diameter. They appear to be spring-fed and supported dense growths of Chara and filamentous algae. Two of the ponds contained mudminnows; no fish were observed in the last pond. Frogs were common in all the ponds.

Lake Bellaire

The northwest shore of Grass Island was seined extensively. Johnny and Iowa darters, banded killifish, largemouth bass, bluntnose minnow, and immature, unidentified minnows were collected.

A total of twenty-nine species has been collected from Lake Bellaire over the past fifty years. Species collected by the Michigan Department of Natural Resources (DNR), but not found in the Grass River by this study, are: cisco, rainbow smelt, bluegill, lake trout, walleye, splake, longnose gar, trout perch, common shiner, and brook silversides. Some of these fishes undoubtedly could be collected in the Grass River by more extensive sampling, especially in the spring and early summer.

The brook silversides, reported abundant along the east shore of Lake Bellaire in 1931 and 1932 (see Appendix I) has not been reported from the lake since, and is very rare in northern Michigan.

The Michigan DNR has also made extensive plantings of fishes in Lake Bellaire. Plantings of lake trout, splake, brown trout, and rainbow trout from 1961 to 1981 are listed in Appendix II.

Clam Lake

Twenty-four fish species have been reported from Clam Lake (see Appendix I). Of note are reports of muskellunge in 1952 and 1958 and a reference to "crappies" in 1958 Department of Conservation field notes. Black crappie has also been reported in the Chain of Lakes from Intermediate Lake and above, but not from the other lakes. The Department of Conservation planted walleye and largemouth bass in Clam Lake during the 1930s.

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CLAM LAKE

NITELLES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

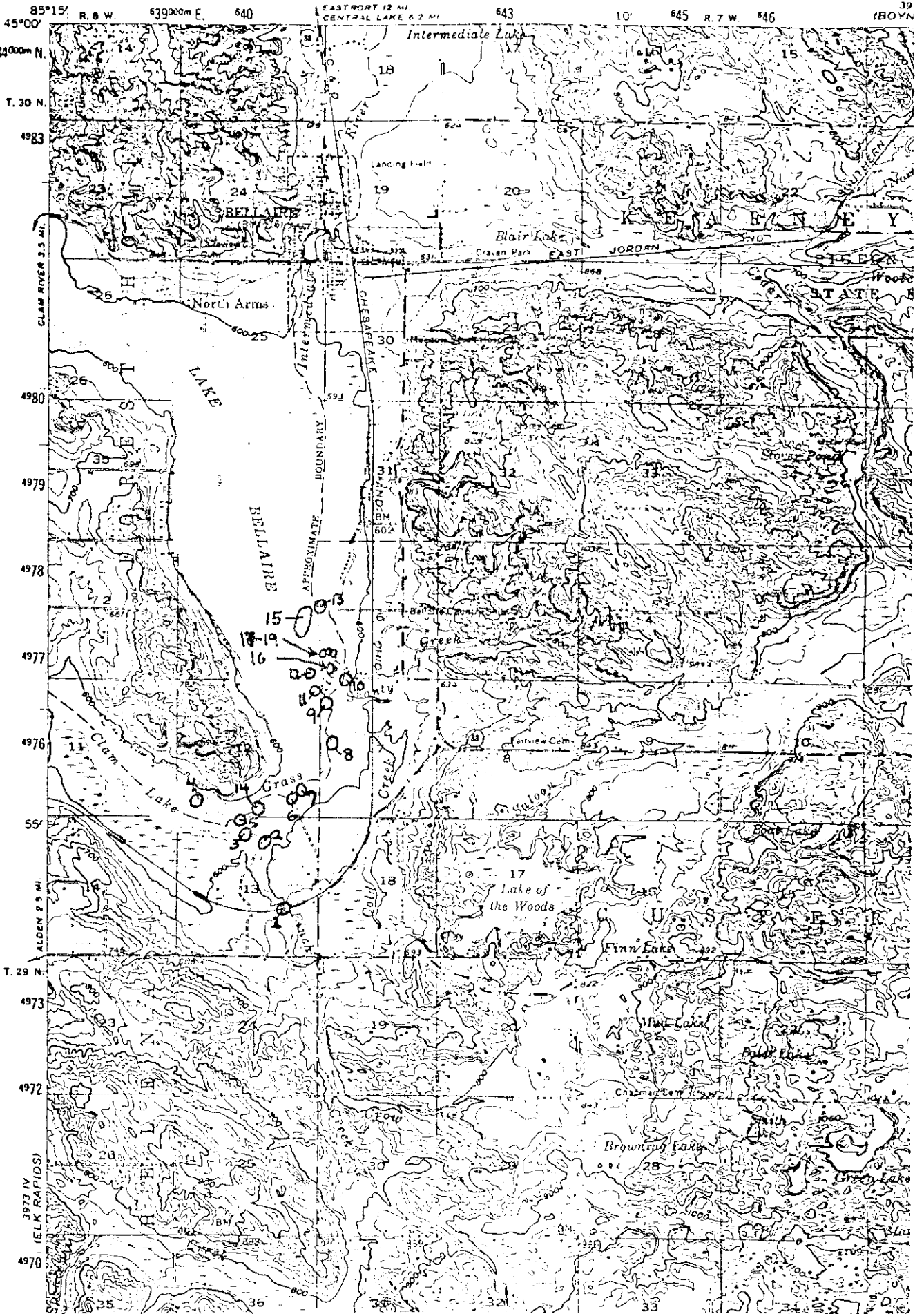


FIGURE 1. MAP OF THE NITELLES AREA, IDAHO.

TABLE 1. Sampling Localities

<u>Site Number</u>	<u>Location</u>
1	Finch Creek at C&O Railroad bridge T29N, R8W, Sec. 13, SE $\frac{1}{4}$
2	Finch Creek at GRNA Bridge No. 1 T29N, R8W, Sec. 13, NE $\frac{1}{4}$
3	Finch Creek near mouth, GRNA Bridge No. 2 and 500 feet downstream T29N, R8W, Sec. 13, NW $\frac{1}{4}$
4	Grass River at Clam Lake T29N, R8W, Sec. 12, SW $\frac{1}{4}$
5	Grass River at Finch Creek eastern outlet T29N, R8W, Sec. 13, NW $\frac{1}{4}$
6	Grass River 0.5 miles east of Site 5 T29N, R8W, Sec. 12, SE $\frac{1}{4}$
7	Grass River, 500 feet east of Site 6 T29N, R8W, Sec. 12, SE $\frac{1}{4}$
8	Grass River at Cold Creek outlet T29N, R7W, Sec. 7, SW $\frac{1}{4}$
9	Grass River at Grass Island Creek T29N, R7W, Sec. 7, NW $\frac{1}{4}$
10	Grass River at access road east of Grass Island T29N, R7W, Sec. 6-7 boundry
11	Grass Island Creek, 500 feet northwest of Grass River T29N, R8W, Sec. 12, NE $\frac{1}{4}$
12	Grass Island Creek, 300 feet northwest of Site 11 T29N, R8W, Sec. 1, SE $\frac{1}{4}$
13	Grass River 0.1 mile downstream from Lake Bellaire T29N, R8W, Sec. 1, SW $\frac{1}{4}$
14	Grass River 0.5 miles upstream from Clam Lake T29N, R8W, Sec. 12, SE $\frac{1}{4}$
15	Lake Bellaire, northwest shore of Grass Island T29N, R8W, Sec. 1, SE $\frac{1}{4}$

TABLE 1. (continued)

<u>Site Number</u>	<u>Location</u>
16	Grassy Island Pond (largest of four sampled), west of Site 10 T29N, R7W, Sec. 6, SW $\frac{1}{4}$
17	Grassy Island Pond, northwest of Site 16 T29N, R7W, Sec. 6, SW $\frac{1}{4}$
18	Grassy Island Pond, northwest of Site 17 T29N, R7W, Sec. 6, SW $\frac{1}{4}$
19	Grassy Island Pond, west of Site 18 T29N, R7W, Sec. 6, SW $\frac{1}{4}$

TABLE 2. Sampling Results

Site No.	Date (9-81)	Depth (ft)	Water Temp C.	Gear Used*	Species, Number, (Total Lengths, mm)
1	7-10	2.5	11.1	s,t	Slimy sculpin, 3(76,44,45)
2	7-10	2.0	11.1	s,t	Brown trout, 1 (73) Slimy sculpin, 2 (21,64)
3	7-10	2.0	11.7	s,t	Central mudminnow, 1 Brook trout, 1 ** Slimy sculpin, 13 (range 23-32, x 2) Northern water snake, 1
4	7-11	1.0	17.8	t	Crayfish, 2
5	7-11	1.0	18.9	t	None
6	7	3.0	20.0	s	Yellow perch, 1 Largemouth bass, 1
7	7-21	2.0	14.4	t	Bluntnose minnow, common** White sucker, ** Logperch, ** Rockbass, 1 Crayfish, 1
8	7-11	3.0	21.1	t	Bluntnose minnow, 7
9	7-11	3.0	21.1	t,g	Yellow perch, 8 (96,115,147,187,190,190,214,-) Rockbass, 1 (70) Northern pike, 2 (355,680)
10	8-11	2.0	19.4	t	Smallmouth bass, 1 Rockbass, 2 (57,67) Bluntnose minnow, 1 (78) Crayfish, 1
11	10-11	3.5	-	t,g	Northern pike, 3 (-, 310,340) Crayfish, 1
12	10-21	2.0	-	t,l	Longear sunfish, 8 (53,56,60,66,69,71,75,78) Pumpkinseed, 7 (41,43,47,47,47,50,50) Blackchin shiner, 3 (25,27,31) Blacknose shiner, 1 (40)
13	10-11	-	19.4	t,s	Bluntnose minnow, 2 (34,40) Sand shiner, 215 (range 20-56) Johnny darter, 1 (37) Slimy sculpin, 1 (23)

TABLE 2 continued.

<u>Site No.</u>	<u>Date</u>	<u>Depth</u>	<u>Water Temp.</u>	<u>Gear Used</u>	<u>Species, Number, (TL, mm)</u>
14	10-11	5.0	20.6	g	Yellow perch, 3 (114,227,281) Northern pike, 3 (443,480,491) Black bullhead, 1, (300) Largemouth bass, 1 (233) Rockbass, 2 (210,215)
15	11	2.5	21.1	s	Banded killifish, 3 Largemouth bass, 1 Johnny darter, 5 Iowa darter, 1 (41) Bluntnose minnow, 3 Unidentified minnow, 3 (20,30,31)
16	11	2.0	-	s	Northern pike ** Largemouth bass, 1
17	11	2.5	19.4		Central mudminnow **
18	11	2.5	-		No fish observed
19	11	2.0	16.7		Central mudminnow **

*Gear code: t-minnow trap
s-seine
g-gillnet
l-lift net

**Observed in water, not captured

APPENDIX I

Fish Collection Data From Other Sources

Lake Bellaire: Michigan Department of Natural Resources

1977, June. Smelt die-off reported

1976, Sept. 6-10. Gillnet collection

Cisco	Lake trout
Yellow perch	Walleye
Rainbow smelt	Splake
Smallmouth bass	Longnose gar
Brown bullhead	White sucker
Northern pike	Bluegill
	Rockbass

1976, Sept. 6-10. Trawl collection.

Logperch	Rockbass
Johnny darter	Largemouth bass
Trout perch	Yellow perch
Sculpin sp.	Rainbow smelt

1971. Fish survey. Results similar to above, no additional species collected.

1962. Trap net collection. Rainbow trout and pumpkinseed collected in addition to above noted species.

1957.	Blacknose shiner*	Common shiner*
	Bluntnose minnow*	Sand shiner
	Banded killifish	Logperch
	Johnny darter	Iowa darter
	Longear sunfish	(*most common species in collectio

1932 Brook silversides reported abundant. "Straw-colored" minnows and "Rosy-fronted" shiners present.

1931 East shore seining collection.

Brooksilversides n=152
Bluntnose minnow n=125
Blacknose shiner n= 33

Clam Lake: Michigan Department of Natural Resources

1958, July-August.

Largemouth bass	Smallmouth bass
Bluegill	Pumpkinseed
Rock bass	Yellow perch
Northern pike	Blackchin chiner
Blacknose shiner	Common shiner
Mudminnow	Sand shiner
Banded killifish	Bluntnose minnow
White sucker	Logperch
Brown bullhead	Johnny darter
Yellow bullhead	Iowa darter
Longear sunfish	Muskellunge

APPENDIX I
(Continued)

Clam Lake: Michigan Department of Natural Resources

1932. Longnose gar
Citation of Bollman 1888-Johnny darter, Bluntnose
minnow, "spottail minnow"

Shanty Creek: U. S. Fish and Wildlife Service

1974. Shocking survey for lamprey amocetes (none found).
Rainbow trout n=2 Brook trout n=15
Brown trout n=1 Sculpin sp. n=20

Finch Creek: U. S. Fish and Wildlife Service

1974. Shocking survey.
Brown trout n=1 Sculpin n=15

APPENDIX II

Fish Plantings by the Michigan Department of Natural Resources

Lake Bellaire:

<u>Year</u>	<u>Species</u>	<u>Number</u> (Thousands)
1961	Lake trout	2.5
1963	Lake trout	2.5
1964	Lake trout	2.6
1965	Lake trout	22.5
1966	Splake	50
1968	Splake	5
1969	Rainbow trout	15
1969	Splake	12
1970	Splake	22
1971	Splake	22
1972	Splake	22
1973	Splake	15
1974	Splake	22
1975	Splake	22
1977	Splake	7.4
1977	Brown trout	10
1978	Lake trout	25
1979	Brown trout	15
1980	Brown trout	15
1981	Splake	30

Clam Lake:

1932	Largemouth bass	1
1933	Walleye	300
1939	Walleye	100,000