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Education-Game
M. L. Livingston
E. L. Peterson
J. Southwick
J. T. Wilkinson

INSTITUTE FOR FISHERIES RESEARCH
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ALBERT S. HAZZARD, PH.D.
DIRECTOR

ADDRESS
UNIVERSITY MUSEUMS ANNEX
ANN ARBOR, MICHIGAN

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SOME OBSERVATIONS CONCERNING NORTHERN PIKE
IN FLETCHER POND DURING 1939-1945

by

M. L. Livingston

Fletcher Pond, also known as Fletcher Floodwater or Stump Lake, is located in Rust Township, Montmorency County, and Green and Ossineke townships, Alpena County. The floodwater is formed by a dam on the Upper South Branch of the Thunder Bay River which backs up the water for a distance of about 12 miles. The dam was built in 1930 and is owned by the Alpena Power Company. The lake itself is over 16 square miles in area and is shallow and has a great many stumps protruding from the surface of the water. Fluctuation in the water level is from 1 to 6 feet annually. ↓ The species of fish most commonly taken by fishermen are northern pike and bullheads, but occasionally sunfish are caught.

A food analysis of 34 northern pike stomachs from this lake is summarized in Table 1. These fish were obtained by spearing during the months of January and February, 1944. Collections of the stomachs and length and weight data were made by D. S. Shetter and W. F. Carbine. The fish ranged in length from 15 to 29 inches, averaging about 20 inches.

↓ Information on history of this floodwater obtained from files of the Fish Division in Lansing.

Table 1.--Contents of stomachs of 34 Northern pike (6 stomachs empty), 15 to 29 inches in length, from Fletcher Pond, January and February, 1944

Kind of food item	Number of food items	Volume in c.c.	Number pike stomachs containing food item	Percentages of occurrence		
				Number	Volume	In what percent of pike stomachs
Yellow perch	18	50.8	10	21.4	46.1	35.7
Bluegills	2	0.5	2	2.4	0.4	7.1
Pumpkinseeds	1	9.0	1	1.2	8.2	3.6
Centrarchids (not bass)	7	4.3	3	8.3	3.9	10.7
<u>All Centrarchids</u>	10	13.8	6	11.9	12.5	21.4
Golden shiners	13	11.7	7	15.5	10.6	25.0
Blackchin shiners	7	2.4	7	8.3	2.2	25.0
Blacknose shiners	2	0.3	1	2.4	0.3	3.8
Minnows (undifferentiated)	13	11.5	9	15.5	10.4	32.7
<u>All minnows</u>	35	25.9	15	41.7	23.5	53.6
Fish, unidentified	21	19.8	13	25.0	17.9	46.3
Totals	84	110.3	28	100.0	100.0	...

Six of the stomachs were completely empty. Examination of the contents of the remainder revealed that the diet of these pike had been practically 100 percent fish. Identifications of fish remains were made by G. P. Cooper. The volume of each type of food item in each stomach was determined by displacement in water. The total volume of each type in all stomachs (obtained by adding individual figures), on a percentage basis, is as follows: yellow perch, 46.1 percent; minnows, 23.5 percent; unidentified fish remains, 17.9 percent; and centrarchids (not bass), 12.5 percent. Minnows included these species: golden shiners, 10.6 percent; blackchin shiners, 2.2 percent; blacknose shiners, 0.3 percent; and unidentified minnows, 10.4 percent. Centrarchids (other than bass) included: pumpkinseeds, 6.2 percent; bluegills, 0.4 percent; and unidentified centrarchids (probably pumpkinseeds and bluegills), 3.9 percent.

In identifying fish remains which were in an advanced state of digestion, the remains of minnows could be identified as such, presumably in most instances, by the presence of the heavy and persistent pharyngeal bones. Thus most of the unidentified fish presumably were species other than minnows. It was estimated that approximately 10 percent of the "unidentified fish" might be minnows, while 90 percent were other species. It is reasonable to assume that the other species involved were perch and centrarchids in a frequency of occurrence in proportion to the numbers of these species positively identified. After allocating the "unidentified fish" in this manner, the volume percentages become: yellow perch, 58.75 percent; minnows, 25.27 percent; and centrarchids, 15.95 percent.

Analysis of stomach contents by volumetric methods alone is not entirely satisfactory since the presence of one or two large fish caught by one pike may give an exaggerated picture of the importance of that species of fish as a pike food. Therefore, the percentage of the total

number of food items represented by each food species consumed by these pike has been determined also. In some instances it was impossible to determine the actual number of individual fish represented by well-digested remains, and such debris was counted as one individual to a stomach. Based on positive identifications, the minnows made up 41.7 percent of the total number of fish; unidentified fish remains, 25 percent; yellow perch, 21.4 percent; and centrarchids (other than bass) 11.9 percent. These percentages could also be revised as were the percentages of total volume, but the ratios would remain the same. Of the minnows, the golden shiner was the most common, constituting 15.5 percent of the total. Unidentified minnows (probably mostly golden shiners) also made up 15.5 percent of the total number. Among the centrarchids, bluegills were more numerous than pumpkinseeds. Unidentified centrarchids represented 8.3 percent.

The data were also analyzed on the basis of the number of stomachs containing each type of food. Yellow perch were found in 35.7 percent of the stomachs examined, minnows in 53.6 percent, centrarchids in 21.4 percent, and unidentified fish remains in 46.3 percent. Further breakdown to species by this method is given in Table 1.

Most of the food species were small, and the perch and centrarchids were mostly young-of-the-year and fingerlings.

Reports of other investigators of pike food have been consulted and, although many writers mention the fact that pike are wholly or almost wholly piscivorous, only a few give any quantitative data as to species eaten. Kendall (1917) reports that pike (Esox lucius) "devours indiscriminately other fishes, young waterfowl, small mammals, and carrion." McHamara (1937) notes that 2 pike, 16 and 18 inches long, ate 3 black bass, and that a 19-inch pike contained 11 brook silversides, while other pike stomachs analyzed contained golden shiners, bluegills,

and fish hooks and lines! Pike stomachs were found by Forbes and Richardson (1939) to contain the following foods: "--fishes including sunfish and black bass, frogs, crawfishes, and larger insects; also mice, reptiles, and young ducks---,"

Compilation of data from various authors yields the following qualitative listing of the foods of adult pike.

Leeches

Worms

Insects (dragonfly nymphs)

Crawfishes

Molluscs

Fishes

Gizzard shad, smelt, cisco (tullibee), trout, suckers, golden shiners, northern fathead minnows, rosyface shiners,² blackchin shiners,² blacknose shiners,² creek chubs,² bullheads, mud minnows, pickerel, pirate perch, yellow perch, walleyes, darters, bluegills, sunfish, crappies, black bass (species not given), brook silversides, buffalo fish, muddlers, and sticklebacks.

Reptiles (watersnakes)

Young ducks and other waterfowl

Mammals

Meadow mice, short-tailed shrews.

Carrion

More detailed analyses of pike foods are given by other authors and the results of their surveys are summarized in Table 2.

Thus it will be seen that the results of the present investigations are unique only in respect to the limited numbers of species eaten. This fact might be accounted for by noting that the Fletcher Pond is of comparatively recent origin and possibly there has not been sufficient time to allow a large number of species of fish to accumulate. Unfortunately, other than those given in creel census reports, there are no data as to the species extant in this body of water at the time the subject collection was made.

Information obtained from data on scale sample envelopes from these pike and others captured during this period shows that the average total length of 66 fish was 20.0 inches, the males (18.8 inches) being some-

Table 2

A Summary of Information on Northern Pike Foods as Compiled by

Various Investigators

Investigator	Locality of Investigation	Number Stomachs Examined	Item	FOOD CONTENT		Percentage Frequency Occurrence
				% Total Volume	Pike Containing Item	
Forbes, S. A. (1888)	Illinois	37	Fish	99.0		
			Sunfish & bass	21.0		
			Crappies	9.0		
			Cyprinids & buffalo fish	not given		
			Gizzard shad	46.0		
			Insects	1.0		
Marshall J. & Gilbert (1905)	Wisconsin	22	Minnows		17	
			Bluegills		1	
			Pickereel		1	
			Crawfish		1	
			Leeches		1	
Hunter, G. W. & Rankin, J.S. (1939)	Various--Information compiled from various writers and includes <u>E. lucius</u> and <u>E. Americanus</u> . Methods of measurement not stated.	not given	Cyprinidae	21.8		
			Perçidae	6.7		
			Centrarchidae	1.17		
			Catostomidae			
			Ameiuridae			
			Salmonidae	less		
			Clupeidae	than		
			Osmeridae	1%		
			Percopsidae	each		
			Cottidae			
Eddy, S. (1942)	Minnesota	Summer 128	Perch			37.0
			Minnows			15.0
			Tullibee			very common
		Winter 75	Minnows			50.0
			Fish remains (mostly perch)			40.0
			Frogs			4.0
Lagler, K. F. (1945)	Seney Nat. Wildlife Refuge, Mich. Analyses were made from pike caught during summer of 1941-1943	1218 (All fish 14" long or longer).	Ducklings		3	0.2
			Other birds		1	0.1
			Game & panfishes		257	21.1
			Forage fishes		396	32.5
			Frogs		26	2.1
			Meadow mice		1	0.1
			Molluscs		11	0.9
			Leeches		185	15.2
			Crayfishes		530	43.5
			Insects		136	11.2
			Solman, V. E. (1945)	Saskatchewan River Delta, Canada, Summers 1940 and 1941. Average weight of food in 14" long female pike found to be 3 times that of male pike food.	2998 (343 fish less than 14" long).	Empty		1933
Waterfowl (1-5 weeks old)		34				
Mammals		6				
Amphipods		481				
Crayfish		18				
Insect remains		204				
Fish remains		164				
Leeches		106				
Unidentified		135				

what smaller than the females (20.7 inches).³ These figures agree rather closely with data gathered from creel census records for the winter of 1944 which give the average total length of 54 pike as being 19.8 inches. Although this information may be considered as indicative of the average total length of the pike in the Fletcher Pond at this time, it would be desirable to have a larger and more truly random sample before a definite statement as to average length is made.

Scale samples taken were examined but were not considered usable for age determinations due to the difficulty of making accurate age readings of pike scales.

General creel census records have been taken by Conservation Officers for the years 1939 and 1941-45. The data from these records are tallied in Tables 3 and 4. Here again, it would be better to have more records on which to base conclusions.

Examination of Table 3 reveals several trends: (1) during the past two years (1944 and 1945) ice fishing seems to have increased in popularity. Reports confirm this statement, and apparently such good winter fishing is to be had that the fishermen are passing the word from one to another. (2) The catch per hour of pike and bullheads had increased from 0.30 in 1939 to a peak of 0.55 in 1944 but dropped to 0.41 in 1945. A comparison of summer and winter fishing is not possible on the basis of the available data. (3) The number of fish caught per angler also increased reaching a peak of over 4 per angler in 1944 but decreasing to 2.23 in 1945. (4) There has been an apparent decrease in average size of both the bullheads and northern pike caught. This may be significant. A decrease in average total length of northern pike from 19.9 inches in 1939 to 17.0

³ Length frequencies were as follows: 15 inches, 2 pike; 16 inches, 4 pike; 17 inches, 8 pike; 18 inches, 7 pike; 19 inches, 13 pike; 20 inches, 15 pike; 21 inches, 7 pike; 22 inches, 5 pike; 23 inches, 4 pike; 25 inches, 1 pike; and 28 inches, 2 pike.

Table 3.--General creel census data for Fletcher Pond

Year and Season	Number of days records taken	Total hours fished	Total number of anglers	Total number of fish taken	Catch per hour	Northern pike		Bullheads		Fish caught per angler
						Number taken	Average size	Number taken	Average size	
1939	18	73	19	22	0.30	22	19.9	0	...	1.15
Winter	0	0	0	0	...	0	...	0	...	0
Summer	18	73	19	22	0.30	22	19.9	0	...	1.15
1941	4	449	163	193	0.48	84	19.6	102	9.0	1.18
Winter	0	0	0	0	...	0	...	0	...	0
Summer	4	449	163	193	0.48	84	19.6	102	9.0	1.18
1942	10	888.5 ✓	205	180	0.20	167	18.9	12	7.8	0.87
Winter	2	55	8	0	...	0	...	0	...	0
Summer	8	833.5	197	180	0.20	167	18.9	12	7.8	0.90
1943	20	635	125	278	0.43	238	19.3	40	7.0	2.22
Winter	10	282	59	108	0.38	115	19.6	0	...	1.80
Summer	10	353	66	170	0.48	123	19.1	40	7.0	2.57
1944	18	1,965.5	331	1,087	0.55	649	18.0	435	7.9	4.28 - ?
Winter	1	225.5	59	54	0.24	54	19.8	0	...	0.91
Summer	17	1,740	272	1,033	0.59	595	17.8	435	7.9	3.79
1945	14	1,983.5	361	806	0.41	636	17.0	170	6.8	2.23
Winter	9	1,217.5	170	444	0.36	444	17.4	0	...	2.61
Summer	5	766	191	362	0.47	192	16.1	170	6.8	1.89
All years	84	5,994.5	1,200	2,566	0.43	1,796	18.0	759	7.8	2.13
All winters	22	1,780	296	606	0.33	613	18.0	0	0	2.04
All summers	62	4,214.5	904	1,960	0.39	1,183	18.0	759	7.8	2.16

✓ An estimate of 72 hours added for one day for which no hours were given. Estimate based on hours per fish for year times fish that day.

Table 4.--Residences of fishermen during
the years 1943--1945 on Fletcher Pond

County	1943	1944	1945
Alcona	...	2	7
Alpena	7	4	14
Arenac	7	...	...
Bay	2	4	11
Genesee	2	10	2
Gladwin	...	2	...
Gratiot	...	...	4
Iron	4	...	...
Jackson	...	4	4
Lapeer	...	7	...
Lenawee	...	...	6
Menominee	...	...	2
Midland	2	20	22
Monroe	...	1	2
Montcalm	...	...	8
Montmorency	21	48	67
Oakland	...	30	34
Ogemaw	...	6	4
Osceola	16	6	...
Oscoda	19	45	30
Otsego	...	3	19
Presque Isle	3	3	46
Roscommon	...	2	...
Saginaw	...	18	8
St. Clair	4	4	...
Sanilac	...	2	...
Shiawassee	2	6	...
Van Buren	3	...	...
Washtenaw	4	...	...
Wayne	21	32	44
Unknown	2	1	3
Indiana	6	12	6
Ohio	...	59	18
Totals	125	331	361

inches in 1945 may indicate that the fishing pressure is increasing to the point where the fish are being cropped soon after reaching legal length. Again, this decrease may be due to an increase in the pike population to a point where the rate of growth has been retarded by population pressure and lack of food.

Summarizing the creel census data for the years 1939 and 1941-1945, the average angler fished about 5 hours and caught 2.13 fish, 71 percent of which were northern pike and 29 percent of which were bullheads. The pike averaged about 18 inches in length and the bullheads about 7.8 inches. Records indicate that other species of fishes were taken occasionally.

Table 4 lists the residences of anglers fishing the Fletcher Pond during the years covered by the creel census. It will be noted that the majority of the fishermen were residents of the neighboring Montgomery County and that large numbers of sportsmen from Wayne and Oakland counties as well as from Indiana and Ohio enjoy the pike fishing at these waters.

Summary and conclusions

1. The main foods of 34 northern pike speared in the winter of 1944 in the Fletcher Pond were minnows, perch, and centrarchids (not bass). Perch was the most important single species eaten.
2. The average total length of 66 fish speared in the winter of 1944 was 20.0 inches. Male pike were slightly smaller on the average than were the female pike.
3. The average size of the pike and bullheads caught in these waters during recent years has been less than that of fish caught when creel census records were first taken.
4. A slight decline in fishing success has been noted for 1945.

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by M. L. Livingston

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