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A FISHERIES SURVEY OF DUMONT, ROUND, ELY AND LITTLE TOM LAKES, ALLEGAN COUNTY

by

L. E. Perry

Introduction

Location and Drainage

Dumont Lake is located in central Allegan County (T. 2, 3 N., R. 13 W., Secs. 4, 5, 32 and 33) about five miles north of the City of Allegan. It drains southward into Allegan Reservoir of the Kalamazoo River, just three miles distant. Round (T. 2 N., R. 14, 15 W., Secs. 13, 24, 18 and 19), Ely (T. 2 N., R. 15 W., Sec. 26), and Little Tom Lakes (T. 2 N., R. 15 W., Sec. 26) are about ten miles west of Allegan, within the boundaries of the Allegan Resettlement Project. They lie in a swampy area between the drainage basins of the Black and Kalamazoo Rivers, but are within a mile radius of Crooked Lake, which drains into Black River. All four lakes are easily accessible by improved roads from Allegan. Round Lake is on the State Highway M-89, and the others are reached by county roads.

Acknowledgments

These lakes were mapped and given biological inventories in July, 1937, by a party of the Institute for Fisheries Research.*

Past and Present Use

There is no evidence that these lakes have had any industrial use, and their principal value at present is recreation. There are several cottages and a county park on the shores of Dumont Lake and also several cottages at Round Lake. Camping facilities are found at Ely and Little Tom Lakes. All four lakes are open to public fishing. Round, Ely and Little Tom Lakes are on the former Allegan Resettlement Project of the United States Soil Conservation Service, now the Allegan State Forest of the Department of Conservation. These lakes are of importance as recreation centers because of their location and easy accessibility. They have provided fairly good

*This party consisted of: David C. Chandler, leader; Walter Crowe and E. L. Cheatum, assistants.

fishing in the past for largemouth bass and bluegills, and Dumont Lake still retains a good reputation. It has been reported that Ely Lake was dynamited several years before the survey was made and good fishing had not been reestablished. Little change has been reported for the fishing at the other lakes.

Physical Characteristics

Geological Origin

No definite information on the geology of these lakes is available.

Shape of Basin and Extent of Drainage

Dumont Lake is about a mile long and one-half mile wide. Its basin has a single depression, 50 feet deep. The shoreline is irregular with several prominent bays that provide productive areas. The immediate shore is swampy and partly wooded. The surrounding country is of a rolling nature and mostly cultivated. Dumont Lake drains an area of about 8-10 square miles.

Round, Ely and Little Tom Lakes are small, shallow lakes which are similar in many respects. They have regular shorelines that outline more or less oval-shaped basins. Round Lake is the largest of the three, having 45.6 acres, and Ely Lake is the deepest (15 feet). The immediate shores are swampy and partly wooded. The surrounding terrain is flat, wooded and swampy, with some pasture land. The drainage basins of these lakes are confined to the immediately surrounding land and probably would not exceed one square mile for each lake.

Water Fluctuation

Considerable fluctuation of lake level was noticed in Dumont Lake, governed mainly by precipitation. Also a marked change in the level of Round Lake was reported by the survey party as presumably caused by the drainage of nearby swamps. Some fluctuation of the other lakes is expected and this will most probably follow precipitation trends.

Round, Ely and Little Tom Lakes have neither inlets nor outlets. Their water supply is confined to seepage and runoff.

Dumont Lake has three small inlets which drain nearby swamps and lakes. One stream drains from both Big and Little Spectacle Lakes into the northwest end of Dumont Lake. Another drains from Wetmore (Whitemore) Lake on the east, and a third stream of about two miles length drains the terrain to the north and northeast.

The outlet of Dumont Lake is Dumont Creek. It flows about three and one-half miles southward to the Allegan Reservoir and the Kalamazoo River and ultimately into Lake Michigan.

Some of the physical features of these lakes have been summarized in Table I.

Table I
Some Physical Characters of Dumont, Round, Ely and Little Tom Lakes, Allegan County

	Dumont Lake	Round Lake	Ely Lake	Little Tom Lake
Area (acres)	215	45.6	18	17.4
Maximum depth (feet)	51	5	16	12
Shore development	1.8	1.1	1.4	1.0+
Dominant bottom types:				
Shallows (0-15 ft.)	Sand, marl	Sand, fibrous peat, pulpy peat.	Sand, fibrous peat, pulpy peat.	Sand, fibrous peat, pulpy peat.
Depths (over 15 ft.)	Marl, pulpy peat.	...	...	...
Color of water	Colorless	Colorless	Colorless	Amber
Transparency of water (by Secchi disc in feet)	15	5	8	9

The shore development, as shown in this table, expresses the number of times the shoreline of a lake is greater than that of a perfectly round lake of the same area, hence a lake with a very irregular shore and many embayments has a high shore development and, in general, such a lake is more productive because of the many protected areas.

Discussion of the Physical Factors in Relation to Fisheries

Dumont Lake is fairly large, has a moderate depth and an irregular shoreline with several large bays. The bottom is mostly marl and pulpy peat and the shores are sandy. The water is colorless and very transparent. This permits the growth of plants to fairly great depths but it also is a sign of little dissolved organic matter and plankton in the water at the time the observation is made.

Round, Ely and Little Tom Lakes are small, shallow lakes with few irregularities in the shoreline. The bottom soils are mainly fibrous and pulpy peat. The water is either colorless or amber and quite transparent.

In general, these four lakes may be considered to have physical features that are favorable to fairly high productivity and suitable to warm-water fishes.

Temperature and Chemical Conditions

Temperature

The temperature in Dumont Lake ranged from 80°F. at the surface to 51°F. at the bottom at the time of the survey (July 21-27, 1937). The upper water was uniformly warm to a depth of 12 feet, then the temperature dropped rapidly to 53°F. at 33 feet. There was little change from there to the bottom at 51 feet. The middle layer of rapid change in temperature is known as the thermocline and is important in isolating the bottom cold water from the warmer surface. In this way the bottom of a lake may remain cold throughout the summer.

The other lakes--Round, Ely, and Little Tom--have warm water throughout. In these, the depth is not great enough to permit the establishment of a regular thermocline. Winds stir up the entire body of water frequently during the summer.

Chemical Conditions

Oxygen is usually considered the most important single chemical factor in a lake since no fish can live without it. The oxygen requirements of fish vary with the different species, but, in general, warm-water fish require less than trout and other cold-water fish.

In Round and Ely Lakes oxygen was abundant from the surface to the bottom. In Little Tom Lake it ranged from 7.8 parts per million at the surface to 2.6 p.p.m. at 9 feet, and none was present at the bottom (12 feet). In Dumont Lake the oxygen dropped from 7.8 p.p.m. at the surface to 0.7 p.p.m. at 27 feet, and to 0.0 p.p.m. at the bottom (51 feet). Thus a considerable part of the lower water of Dumont Lake is deficient in oxygen and the water is not available to fish life. This condition probably exists throughout most of the summer.

Alkalinity and pH

The water of Dumont Lake was found to be hard (Methyl Orange alkalinity 157-178 p.p.m.) and alkaline (pH 7.4-8.4). The water of Round, Ely and Little Tom Lakes was soft and acid (see Table II). In general, lakes with moderately hard and alkaline waters are considered more productive than lakes with soft, acid water. The various chemical data are summarized below in Table II.

Table II
Chemical and temperature data of Dumont, Round, Ely, and Little Tom Lakes, Allegan County

	Dumont Lake	Round Lake	Ely Lake	Little Tom Lake
Date	7/21/37	7/27/37	7/24/37	7/24/37
Depth of station (feet)	51	5	15	12
Temperature (°F.)				
Surface	80	72	79	82
Bottom	51	71	69	72
Oxygen (p.p.m.)				
Surface	7.8	7.0	7.2	7.8
Bottom	0.0	7.0	6.0	0.0
M. O. alkalinity (p.p.m.)	157-178	19-24	10-60	0-14
pH	7.4-8.4	6.4	5.7-6.3	5.6-6.1

Pollution

There was no evidence of pollution in any of these lakes.

Discussion of Temperature and Chemical Factors in Relation to Fisheries

Dumont, Round, Ely and Little Tom Lakes are suited to warm-water fish only. Although the bottom water of Dumont Lake is cold, there is not enough oxygen present to sustain fish life and the remaining water of the lake is warm. The other lakes are warm throughout and have sufficient oxygen except in the bottom water of Little Tom Lake. The hardness and alkalinity of Dumont Lake is better suited to game fish than the soft acid water of Round, Ely and Little Tom Lakes.

Biological Characteristics

Vegetation

A list of plants and their relative abundance in each lake is given in Table III.

Table III
List of species and relative abundance of plants collected in Dumont, Round, Ely and Little Tom Lakes, Allegan County

Common name	Scientific name	Dumont Lake	Round Lake	Ely Lake	Little Tom Lake
Waterweed	(Anacharis canadensis)	Few	...	...	...
Water shield	(Brasenia Schreberi)	...	Common	Few	Few
Coontail	(Ceratophyllum demersum)	Few	...	...	Few
Cladium	(Cladium mariscoides)	...	...	Few	...
Spike rush	(Eleocharis calva)	Few	...	...	...
Triangle spike rush	(Eleocharis Robbinsii)	...	...	...	Few
Pipewort	(Eriocaulon septangulare)	...	Few	...	Few
Water milfoil	(Myriophyllum spicatum)	Few	...	...	...
Bushy pondweed	(Najas flexilis)	Few	Abundant	...	...
White water lily	(Nymphaea odorata)	Few	Abundant	Few	Few
Yellow water lily	(Nuphar advena)	Few	Common	Few	Abundant
Arrow arum	(Peltandra virginica)	...	...	Few	...
Smartweed	(Polygonum amphibium)	...	Few	Few	...
Pickerel weed	(Pontederia cordata)	Few	Abundant	Few	Few
Large-leaf pondweed	(Potamogeton amplifolius)	...	Few	...	...
Pondweed	(P. angustifolius)	Few	...	...	...
Pondweed	(P. capillaceus)	...	...	Few	Common
Pondweed	(P. Friesii)	Few	...	...	...
Pondweed	(P. gramineus var. nigris)	...	Common	...	...
Floating pondweed	(P. natans)	Few	...	...	...
Pondweed	(P. nodosus)	Few	...	...	...
Sago pondweed	(P. pectinatus)	Common	...	...	...
Whitestem pondweed	(P. praelongus)	Common	...	...	...
Pondweed	(P. Oakesianus)	...	...	...	Few
Hardstem bulrush	(Scirpus acutus)	Few	...	...	...
Bulrush	(S. atrovirens)	Few	...	...	...
Bulrush	(S. cyperinus)	...	...	Abundant	Few
Bulrush	(S. Torreyi)	...	...	...	Few
Bulrush	(S. validus)	...	Abundant	...	...
Bulrush	(S. americanus ?)	Few	...	...	...
Bur reed	(Sparganium eurycarpum ?)	...	...	Few	...
Big duckweed	(Spirodela polyrhiza)	Few	...	...	...
Narrow-leaved cattail	(Typha angustifolia ?)	Few	Few	Few	...
Bladderwort	(Utricularia purpurea)	...	...	...	Common
Bladderwort	(U. vulgaris var. americana)	Common	Common	Common	...
Wild celery	(Vallisneria spiralis)	Few	...	...	Common
Moss	(Fontinalis novae-angliae)	...	...	...	Common
Moss	(Sphagnum subsecundum)	...	...	Common	...
Musk grass	(Chara sp.)	Common	Abundant	...	...

In Round and Little Tom Lakes the vegetation extends over most of the bottom and is certainly sufficient for the proper maintenance of fish life. Although Ely Lake is not over 16 feet deep the vegetation is limited to a depth less than 5 feet. Dumont Lake has a large variety of plants in fairly great abundance which extend to depths as great as 25 feet. This is ample to meet fisheries needs in the lake.

Fish Foods

The food of fish varies considerably with the habits of the different

species and also with the age of the same species. Young fish of most species feed on plankton, the very small organisms that float freely in the water. Adult fish feed on a great variety of organisms according to their specific habits. Some feed on plankton, some on insects, worms and other invertebrate animals and some on fish; thus, the presence of most or all of these organisms in a lake is important to the maintenance of a fish population.

Plankton was most abundant in Round Lake and least in Ely Lake when sampled by the party. However, such isolated samples are of little significance and do not give a satisfactory picture of the plankton in a lake because it varies greatly from time to time in no predictable manner.

Insects and other large invertebrates are found in the bottom soil and on aquatic plants. Generally, they are more abundant on plants. Bottom samples, taken with an Ekman dredge, showed midge larvae to be very abundant in Dumont Lake and mayfly nymphs, beetle larvae and aquatic earthworms to be present in fairly large numbers. Bottom organisms were fairly common, also, in Round Lake. Here they consisted largely of aquatic earthworms, scuds, mayfly nymphs, and midge larvae. In Ely and Little Tom Lakes the abundance was less. Midge and fly larvae were the predominant types.

Forage fish were collected in large numbers from Dumont and Round Lakes (see Table IV) but only a few mudminnows were found in Ely and Little Tom Lakes. The lake chub sucker was common in Ely Lake and probably serves as a forage fish to some extent; however, mud pickerel were the only predacious fish species collected in Ely Lake.

Fish Present

A list of fish and their relative abundance as determined by collections of the survey party is given in Table IV. The extent of stocking from 1933 to 1941 is also given.

Table IV
Kinds and relative abundance, and stocking (1933-41), of fishes collected from Dumont, Round, Ely and Little Tom Lakes, Allegan County

Species	Dumont Lake		Round Lake		Ely Lake		Little Tom Lake	
	Abundance	Stocking	Abundance	Stocking	Abundance	Stocking	Abundance	Stocking
GAME FISH								
Smallmouth bass	...	1,000 fingerlings.	...	...	...	...	...	...
Largemouth bass	Few	10,750 fingerlings, 3,500 yearlings.	Common	...	...	...	Reported	...
Warmouth bass	...	...	...	...	...	...	Few	...
Northern pike	Few	...	Reported	...	...	...	...	...
Mud pickerel	Reported	...	...	...	Few	...	Few	...
Perch	Common	70,000 fingerlings, 500 yearlings.	Few	...	...	...	...	...
Bluegill	Common	565,000 fingerlings, 1,500 yearlings.	Common	20,000 fingerlings.	Few	20,000 fingerlings.	Common	20,000 fingerlings.
Green sunfish	Few	...	...	...	...	...	...	...
Long-eared sunfish	Few	...	...	...	...	...	...	...
Pumpkinseed	Few	...	Reported	...	...	...	Few	...
Rock bass	Few	...	Reported	...	...	...	...	...
Black crappie	Common	20,000 fry.	Common	...	...	...	...	...
COARSE FISH								
Common sucker	Few	...	...	...	...	...	...	...
Lake chub-sucker	...	...	...	...	Common	...	...	...
Black bullhead	Few	...	...	...	Common	...	...	...
Brown bullhead	Few	...	...	...	...	...	...	...
Yellow bullhead	Few	...	...	...	...	...	Common	...
OBNOXIOUS FISH								
Long-nosed gar	Reported	...	...	...	...	...	...	...
Carp	Few	...	...	...	...	...	...	...
Dogfish	Few	...	Reported	...	...	...	...	...
FORAGE FISH								
Black-nosed shiner	...	...	Common	...	...	...	...	...
Black-chinned shiner	Few	...	Common	...	...	...	...	...
Mimic shiner	Few	...	...	...	...	...	...	...
Straw-colored shiner	Few	...	...	...	...	...	...	...
Common shiner	Few	...	...	...	...	...	...	...
Blunt-nosed minnow	Common	...	Common	...	...	...	...	...
Mudminnow	Few	...	...	...	Few	...	Few	...
Menona killifish	Common	...	...	...	...	...	...	...
Iowa darter	Few	...	...	...	...	...	...	...
Johnny darter	Few	...	...	...	...	...	...	...
Steel-colored shiner	Few	...	...	...	...	...	...	...
Brook stickleback	Few	...	...	...	...	...	...	...

Dumont Lake has the greatest variety of fish of the four lakes here considered and also, perhaps, the best fishing. Bluegills and black crappies are the species that have been most commonly caught by sportsmen; however, perch and largemouth bass have also been rather common in the take. Smallmouth bass were planted in the lake in 1933 but there is no evidence of their survival or any report of their being caught. The following coarse and obnoxious fish were collected or reported: common sucker, three species of bullheads, gar, carp and dogfish. The effect of these fish on the population is not known but it is believed that they are not entirely detrimental and the predacious forms may be useful in preventing over-population of other species.

In Round Lake, bluegills are probably the most common fish and they have provided a fairly successful fishery in the past. Other species collected were largemouth bass, black crappies and perch. Creel census reports show that northern pike, pumpkinseed, rock bass and dogfish have been caught from the lake.

In Ely Lake, bluegills were the only game fish collected. As mentioned above, this lake was reported to have been dynamited sometime previous to the survey. The effect, as reported, was the killing of all fish in the lake and that by 1937 only a few species had been reestablished. However, it is considered highly improbable that enough dynamite could have been used to accomplish this. A more likely explanation of the reported disappearance of fish is an unobserved "winter-kill" during the exceptionally severe season of 1935-36. In 1937 and 1938, 20,000 fingerling bluegills were planted. The bluegills collected by the party were not of this plant. The lake chub-sucker and the black bullhead were found to be common in Ely Lake.

Census reports on Little Tom Lake show fairly good bluegill fishing in the past and also some catches of largemouth bass. Besides these species, warmouth bass, mud pickerel, pumpkinseed and yellow bullheads were collected. The stocking of bluegills shown in Table IV has been made since the survey.

The forage fish in these lakes have been discussed under the heading of "Fish Foods."

Growth Rate of Game Species

A limited amount of information on the growth of game fish from Dumont Lake is presented in Table V. No such data are available from the other lakes.

Table V
Age, length and weight of fish collected
from Dumont Lake, Allegan County

	Age*	Number of specimens	Total length, inches	Weight	
				Pounds	Ounces
Northern pike	III	1	24.0	3	4.2
Perch	III	1	7.9	...	2.6
Bluegill	III	1	7.1	...	3.7
Pumpkinseed	III	1	6.3	...	3.3

* Ages were determined by W. C. Beckman.

All the species listed show normal growth; however, no conclusions can be drawn from these single specimens.

Natural Propagation

Young fish of game species were observed in all four lakes, which is evidence of natural propagation. Spawning facilities appear to be adequate for all game fish present in each lake. Also, artificial beds and spawning boxes have been installed in Ely and Little Tom Lakes to supplement the natural facilities. The effectiveness of these artificial devices is not known.

Management Proposals

Designation of Lakes

Dumont, Round, Ely and Little Tom Lakes have been in the "all other lakes" category and present information indicates that this is the proper designation.

Stocking

No fish should be planted in these lakes. Round, Ely and Little Tom Lakes are apparently most suitable to bluegills which were present in sufficient abundance. They have also been stocked with bluegills since the survey in 1937. Dumont Lake has been stocked in recent years with bluegills, largemouth bass, perch and black crappie and fishing for these species is reported to be good. It is believed these lakes are capable of maintaining their present populations without stocking.

Predators and parasites

Herons, kingfishers and turtles were observed on the lakes. The dogfish and gars in Dumont Lake are probably more important predators than the birds and turtles; however, their effect is possibly more beneficial than harmful in controlling the fish populations. No fish parasites have been reported in any of the lakes.

Shelter

Shelter is provided in the form of vegetation in all four lakes and artificial brush shelters have also been installed in Ely and Little Tom Lakes. No additional improvements are believed necessary.

Regulation of Water Level

Any fluctuation in the levels of these lakes is caused by variations in precipitation and no control methods are possible. Drainage of nearby swamps may permanently affect the level of a lake and in such case a choice must be made between the drainage project and the conservation of the lake for fisheries.

Improvement of Spawning Facilities

Spawning facilities are adequate for the fish now in the lakes. Artificial aids have already been added in Ely and Little Tom Lakes.

Fertilization

The low alkalinity and pH of Round, Ely and Little Tom Lakes suggest possible experiments with inorganic fertilizers to determine their value in Southern Michigan lakes. Such experiments have been planned for several soft-water Upper Peninsula lakes and this work should be conducted in the Lower Peninsula also. A note has been made to investigate more thoroughly the possibilities of these lakes for such experiments.

INSTITUTE FOR FISHERIES RESEARCH

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