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A CHECK ON THE FISHERIES MANAGEMENT OF BURKE LAKE, CLINTON COUNTY, MICHIGAN

by

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On the evening of June 9, 1943, Dr. C. J. D. Brown and I stopped at Burke Lake, Clinton County on the Rose Lake Wildlife Experiment Station area to check on the results of management practices carried out on the lake. Dr. Peter I. Tack accompanied us and we were assisted in the check by Dr. Durward Allen of the Game Division, in charge of the Rose Lake Area.

The inventory of Burke Lake was made during the summer of 1941. Data and management recommendations were included in Institute for Fisheries Research Report No. 689 prepared by Dr. Eugene Roelofs. Recommendations called for poisoning the lake, adding gravel for spawning, planting 1,000 fingerling brook trout in the fall, and special fishing regulations.

Poisoning and construction of a brush filter dam at the outlet to prevent repopulation by undesirable fish were accomplished by a party led by Louis Krumholz.

Stocking plans were modified and 200 brook trout averaging 8 inches in length (average of 50 fish) weighing 36 pounds (2.9 oz. average) were planted December 23, 1942. These fish were supplied by the Wolf Lake Hatchery and planted by the Lydell District. They were 11 months of age.

Because of help shortage, the Game Division was unable to provide the patrol and checking needed to enforce special fishing regulations. It was therefore decided to close the lake to public fishing this year but to make a series of checks by Institute staff members to determine growth, condition and success of natural reproduction--if any. The check described below was the first it was possible to make.

It was originally intended that trout would be caught on flies, weighed and measured and returned alive to the lake. However, by this date the surface water had reached 73°F. with an air temperature of 72.5°F. at 7 p.m. E.W.T. Observing that the water seemed cooler immediately below the surface, Dr. Brown lowered the pocket thermometer off the dock to depths of 3 and 6 feet below the surface and pulled it up quickly for readings. At 3 feet the water was 66°; at 6 feet it was 62°. These rough measurements indicate a rapid drop in temperature close to the surface in Burke Lake at this time of year. (The survey party found a drop of 6 degrees between the surface and a depth of 15 feet, which was the top of the thermocline on August 17, 1938.)

This rapid temperature drop immediately below the surface suggested that wet flies might be used successfully if allowed to sink a few feet. However, efforts to take trout on dry and wet flies were failures. A few trout were seen to rise to surface food while we were there. A number of adult craneflies were on the water at times, but apparently surface feeding is over for the year until the water cools again in the fall. Dr. Allen reported that a week previously his men had observed trout jumping all over the lake. Our experience suggests that if fishing is limited to flies only, there will be few if any trout taken after about June first in a normal year.

Bait fishing with worms off the dock was resorted to in order to secure the sample. Seven trout were taken in the course of about an hour. Their lengths and weights were as follows:

	245 mm. (9.7 inches)	165 gms. (5.8 oz.)
	248 mm. (9.8 ")	158 gms. (5.6 ")
	249 mm. (9.8 ")	151 gms. (5.2 ")
	257 mm. (10.1 ")	155 gms. (5.5 ")
	260 mm. (10.2 ")	182 gms. (6.4 ")
	266 mm. (10.5 ")	173 gms. (6.1 ")
	277 mm. (10.9 ")	212 gms. (7.5 ")
Average	257.4 mm. (10.1 ")	171 gms. (6.0 oz.)

Three of the 7 were hooked deep in the gullet and were killed; the others were released uninjured. Rough examination of the stomachs of the three trout showed that one was full of wheat which had been fed to the ducks and geese on the lake. It also contained a few midge larvae and pupae. Undigested kernals of wheat were found the entire length of the digestive tract, indicating that this food was not being utilized. Another stomach contained a few grains of wheat, but the bulk of the contents consisted of midge larvae (many red in color). Since these larvae are usually found a few inches below the surface, this fish must have been "rooting" or had been following a feeding waterfowl which possibly exposed the larvae. The third stomach also contained midges, but these were nearly all pupae, the stage in which bottom-dwelling midges are commonly taken.

As indicated by the figures, brook trout made an excellent growth in the five and one-half months they had been in Burke Lake, increasing in length by about two inches and in weight by about three ounces.

The fish were in fine condition. All were plump with much mesenteric fat. They were highly colored with bright spots and a reddish tinge to the pelvic fins and belly. They were free of gill lice.

The fighting quality of the fish was excellent.

Dr. Allen ate the three which were killed and reported them to be very good. No "strong" flavor was evident at this time.

It seems that the survey was correct in diagnosing the conditions in Burke Lake and in its recommendations and it is expected that a limited amount of early-season fly fishing can be made available to anglers when it is possible to provide the necessary patrol of the lake.

Examination of the brush filter dam in the outlet showed that water probably went around one end during spring floods. This may have permitted other fish to enter the lake. One of the Station employees told Dr. Allen that he saw small fish off the dock which looked to him like young bluegills. The dam should be repaired this fall or preferably widened by about three feet at each end, digging out the channel on each side and filling with brush to provide a wider "screen."

As recommended by the report, gravel from the size of a pea to the size of an egg should be placed in the outlet stream between the lake and the dam. It would also be desirable to place gravel in the small inlet and at the point where it enters the lake if the bottom is not too soft, in which case brush mats could be used to support the gravel. Gravel piles of a bushel or two each would probably be used by trout for spawning if it is not feasible to cover the entire bottom of these few areas with gravel to a depth of two or three inches. If the Station can place this gravel, it will be much appreciated.

Observations will be made this fall to determine if spawning occurs.

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Report typed by: V. Andres