

Original: Fish Division
cc: Education-Game
Institute for Fish. Research
Mr. Edward Basford

INSTITUTE FOR FISHERIES RESEARCH Mr. W. F. Carbine
DIVISION OF FISHERIES Mr. R. S. Marks
MICHIGAN DEPARTMENT OF CONSERVATION Copy to: *Carbine, Ely - 11/16/45*
COOPERATING WITH THE **Marcus Schaaf**
UNIVERSITY OF MICHIGAN **R. A. Smith**

ALBERT S. HAZZARD, PH.D.
DIRECTOR

November 30, 1945

ADDRESS
UNIVERSITY MUSEUMS ANNEX
ANN ARBOR, MICHIGAN

REPORT NO. 1025

AN INVESTIGATION OF GRASS LAKE, BENZIE COUNTY,
TO DETERMINE WHETHER FISH WOULD BENEFIT
FROM ANY ELEVATION OF THE WATER LEVEL

by

W. F. Carbine

On April 12, 1945, the Benzie County Board of Supervisors introduced a resolution requesting that the Department of Conservation build a dam on the Betsie River that would restore Grass Lake to a size approximating that maintained by the former logging dam. This resolution was sent to Mr. M. P. Adams, who brought it to the attention of the various divisions having an interest in the matter.

On July 26 and 27, 1945, the writer and Mr. William Cristanelli, made an inspection of Grass Lake and the Betsie River. We wish to thank Mr. Rex Joslin, Conservation Officer in Benzie County, and Mr. William Johnson, the Colfax Township Supervisor, for their kind cooperation in showing us around the Grass Lake area.

Grass Lake is located in Section 35 of Inland Township (T 26N, R 13W), which is within the boundaries of the Fife Lake State Forest. (See attached map.) Grass Lake has no inlet at present and it is apparently spring fed. The outlet stream, Grass Lake Creek, is a tributary to the

Betsie River. Green Lake (headquarters of the National Music Camp) is located about two miles east of Grass Lake and forms the headwaters of the Betsie River. There are no roads leading directly to Grass Lake; the only access to the lake is by boat. There are no cottages or boats on either the river or the lake.

Many years ago a dam was built on the Betsie River for the purpose of driving logs downstream. The remains of this old dam are still in evidence, but its exact location on the map attached to this report is subject to question. Mr. William Johnson, Colfax Township Supervisor, provided the 1915 Township maps from which the boundary of the old Grass Lake was traced. Mr. Johnson believed the site of the logging dam was at I on the attached map and Mr. Joslin thought the dam should be located at II. We were unable to decide on the correct location of the dam and it will probably be necessary for a surveyor to definitely establish its location.

Grass Lake at present has an area of about 100 acres. When the logging dam was in operation about 1,000 acres were flooded. According to Mr. Westerman (memorandum to Dr. R. A. Smith, dated May 2, 1945) the State is the owner of all of the riparian rights on this lake.

Very little fishing (if any) is done on Grass Lake at present. Some fishing is done on this part of the Betsie River during the spring run of northern pike and suckers. A few people hunt ducks and geese on Grass Lake. Duck hunting was reported to be excellent by several parties. According to reports, Grass Lake provided excellent fishing (mostly northern pike) when the logging dam was in.

Grass Lake has a depth of between one and possibly three feet. The bottom is entirely covered with rushes and from what we saw it is doubtful

whether there is any open water. The bottom is composed of fibrous and pulpy peat over marl. An oar could be pushed out of sight any place. There are several hundred acres of muck land above water there and around the lake. This land is covered with rushes and cattail. All of the rest of the land that was once flooded by the old dam supports mixed stands of second growth timber. According to Mr. Joslin, one of the best deer yards in the County is to be found in this land that was once flooded.

The following species of fish were observed in Grass Lake: northern pike, largemouth bass, smallmouth bass, perch, bluegill, pumpkinseed sunfish and at least one species of minnow.

Grass Lake Creek is just over one half mile in length. It is extremely difficult to get a boat through the narrow channel because of the dense weed beds and the muck flats.

The Betsie River from Grass Lake Creek to the site of the old logging dam varies from 100 to 150 feet in width. Excellent shade provided by over-hanging trees is to be found at intervals along the stream. The water is very clear. The bottom is composed mainly of sand and muck. Numerous muck flats are also present. The entire river is extremely shallow except for ~~occasional~~ ^{occasional} pools; some of which are perhaps seven or eight feet deep. The dense growth of aquatic vegetation prevents use of an outboard motor. The following plants were observed in the river: white and yellow waterlilies, chara, wild celery, floating pondweed, rushes, cattails and algae. Perch were exceedingly numerous in the river.

The exact height of the old logging dam is not known. From our observations it could not have been higher than four to six feet. The east bank of the Betsie at the dam site is about 8 or 10 feet above the present

river level, but the west bank is much lower. It is our belief, therefore, that if a dam were constructed on the Betsie River below Grass Lake, not more than 4 to 6 feet of water could be added to the present shallow Grass Lake.

A definite improvement of the fish habitat (especially for northern pike) will result if a dam is installed on the Betsie River. There might be some winterkill on the impoundment but it is doubtful whether this would be serious considering that the river would enter the lake. Also, northern pike are known to be able to withstand low oxygen concentrations. If the dam is installed, the northern pike population in Green Lake would be increased. Northern pike are already present in the lake.

Before any definite decision is made, the Game and Forestry Divisions should look into the situation. Although good pike fishing would undoubtedly result from the installation of a dam, perhaps the destruction of the timber and of a good deer yard might nullify this one benefit. Other questions that are brought to mind are: 1. Would duck or goose hunting be improved? 2. What would be the size of the area flooded? 3. Would it be desirable or necessary to remove the timber if the area were flooded? 4. Would the muskrat habitat be improved?

INSTITUTE FOR FISHERIES RESEARCH

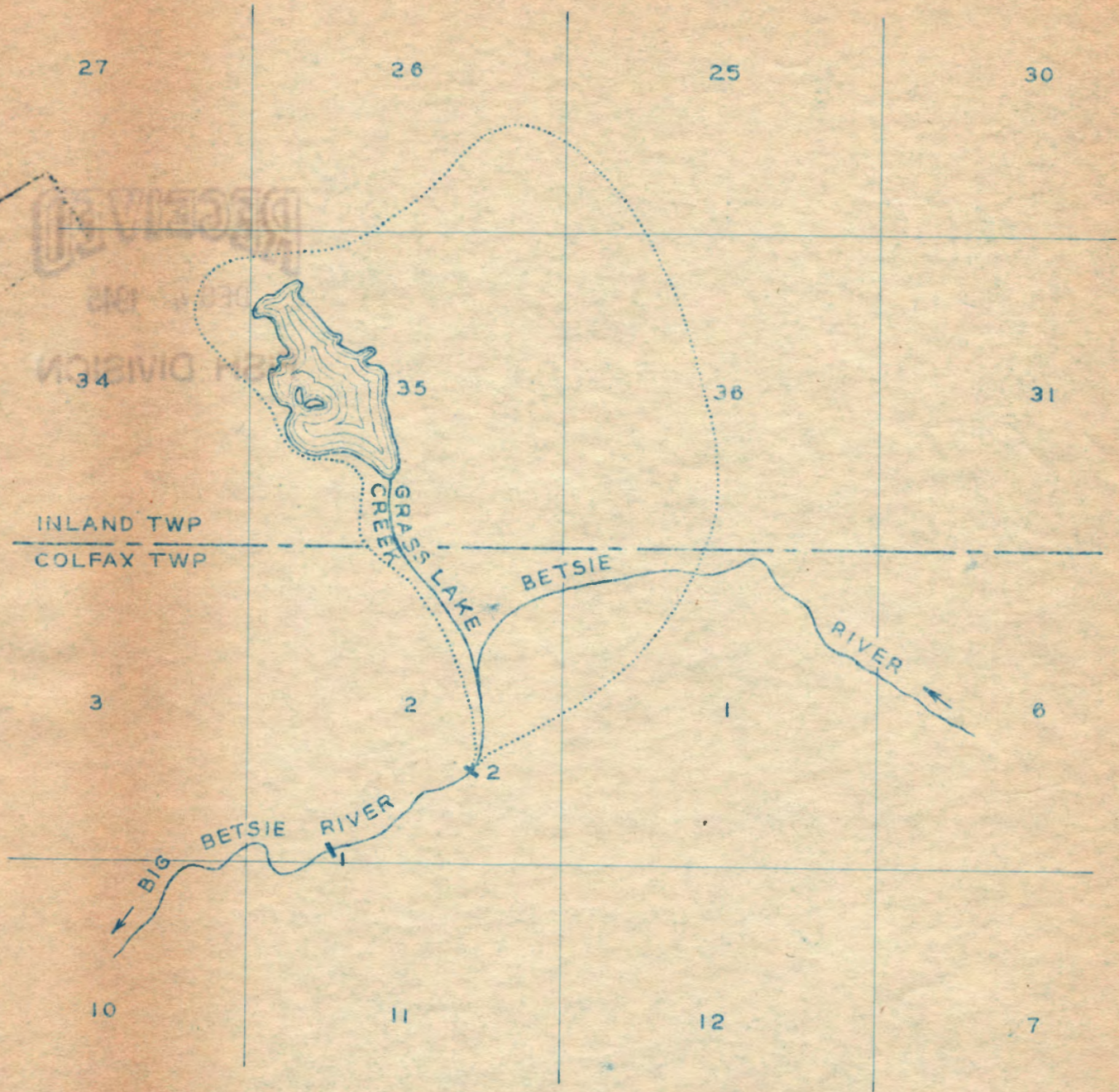
W. F. Carbine
Assistant Aquatic Biologist

Report approved by A. S. Hazzard

Report typed by E. F. Livingston

GRASS LAKE

BENZIE COUNTY T. 26 N., R. 13 W



Broken line - boundary of Grass Lake when logging dam was in operation. The exact location (on the map) of the logging dam I and II is in doubt. See explanation in text.