Original: Fish Division
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Cadillac Big Game Club
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INSTITUTE FOR FISHERIES RESEARCH
DIVISION OF FISHERIES
MICHIGAN DEPARTMENT OF CONSERVATION
COOPERATING WITH THE
UNIVERSITY OF MICHIGAN

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# INVESTIGATION OF THE CLAM RIVER IN THE VICINITY OF THE WATERFOWL REFUGE PROPOSED BY THE CADILLAC BIG GAME CLUB

by

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## Reasons for the investigation

Early in 1940 the Cadillac Big Game Club wished to secure permission from the Department of Conservation to re-establish an old logging dam on the Clam River in Missaukee County, Lake Township, in the southwest quarter of Section 20 (T. 22 N., R. 8 W., Sec. 20), for the purpose of creating a waterfowl refuge. This particular use of the Clam River and the adjacent land upstream did not meet with the approval of the McBain Rod and Gun Club, which organization made the objection that trout fishing above and below the location of the proposed dam would be harmed. The author was appointed by Dr. Hazzard to determine the situation with regard to the present status of the trout fishing of the area under consideration.

## Observations and collection of data

It was hoped that the stream might be visited during a period of maximum summer air temperatures, but on the evening before the Clam River was inspected, a heavy rain began and continued to fall all during the day on August 2. The rain and resultant cool weather undoubtedly lowered the water temperatures, and the readings noted cannot be considered as maximum.

On August 2, 1940, the author, accompanied by Ralph Marks, Supervisor of District Fisheries Operations, and his assistant, William Waters, cruised the Clam River from the Wexford-Missaukee County line downstream to a bridge approximately 2 1/2 miles west of the town of Falmouth. Temperatures were recorded at several different localities on the Clam River and its tributaries, and extensive seinings were made in the vicinity of four of the points inspected. The seine used was 8 feet by 6 feet with 3/8 inch mesh. Samples of the minnows and trout captured were preserved from three of the collections. On August 3, 1940, the author cruised the stream area in sections 19 and 20 in considerable detail, and also that part of the stream in the southwest quarter of section 21. In this latter part of the stream, 1 1/2 hours were spent in angling. The field observations are recorded in the appendix.

Discussion of observations

As already stated, maximum temperatures for the stream were not obtained because of the rainfall encountered during the course of the investigation. However, since many of the water temperatures recorded were almost as high as the air temperatures, there is a possibility that under normal hot weather (air 80-90°), the temperature of the stream may approach the upper limits of trout toleration. The presence of two species of minnows, the mimic shiner (Notropis volucellus) and the Central big mouthed shiner (Notropis dorsalis), more often found in warm lake waters, also lend weight to this supposition.

The presence of brook trout and rainbow trout in fair numbers was demonstrated by either capture in the seine or by observation of the field party at six localities examined from the county line downstream to the M-66 road bridge. Fingerling brook trout of the 1939 spawning were taken

on both sides of the Wexford-Missaukee County line, indicating successful natural reproduction in this section of the stream. The presence of adult brook trout (some as large as 10 inches) in several seine hauls in this general locality would indicate that the present habitat is favorable for this species, as well as the rainbow trout, which was also found here, even though the water temperatures possibly may reach near-lethal limits.

The construction of a 5- or 6-foot dam (as suggested by the Game Division, see correspondence 7/31/40) at the proposed site in section 20 of Lake Township, Missaukee County to create a waterfowl and muskrat habitat would be at the expense of the trout population, as the water temperatures of the flooded area in sections 19 and 20 probably would rise past the limits of tolerance of the trout present. The two tributaries entering the stream in section 20 either do not have enough flow or are warmer than the main stream, so no tempering effect could be expected from their flowage (see Field Notes 4 and 5). The general effect of a dam at the proposed site would be that of a beaver dam on a flat, open marsh. The resulting deposition of silt would also be certain to have a smothering effect on trout food organisms present in the gravel riffles, and also be detrimental if not completely destructive to the spawning activities of the trout. Moreover, a ponded condition with warmer water in sections 19 and 20 would tend to increase the numbers of perch and minnows, and these species would compete for both food and space with any trout remaining.

It is also very likely that the water temperature of the stream below the proposed dam would be raised above the lethal point for brook trout. The volumes and temperatures of the tributaries observed below County Road 597 would probably not affect the main river sufficiently to

cool the water enough to support trout, if the water temperatures were to be increased by the presence of a dam in section 20. Any spawning migrations from the lower river to the upper headwaters would be stopped by the proposed barrier.

The Clam River, from M-66 westward to the county line, still enjoys the reputation of being a good "early-season" brook trout stream, and personal angling experience has shown that the stream can furnish good sport even in late summer. Since it is the policy of the Fish Division to try to perpetuate what is left of the brook trout fishing in the state, it is recommended that no permit be granted for the construction of a dam in Township 22 N., Range 8 W., Section 20. It is the author's belief that this area of the Clam River will serve the economic and sporting interests of the surrounding communities better as a trout stream than as a waterfowl refuge.

It is suggested, however, that stream improvement projects by the local sportsmen's clubs be encouraged, and that as soon as a stream improvement technician is added to the staff of the Fish Division, this general area of the Clam River should receive his early attention.

# APPENDIX

The field notes taken on August 2 and 3, 1940 follow. They are listed as Note 1, 2, etc., and the recorded observations were taken in the vicinity of the several numbered localities on the map attached. Pool grades are given on the basis of size (S), type (T), and frequency (F). Pools wider or longer than the average width of the stream receive a size grade of 1; those that are smaller 2 or 3. The type of pool is graded on the investigator's judgment as to its suitability for trout (depth, shade, submerged cover, etc.). Frequency of pools in the area is graded from a what is considered perfect distribution in a stream--50 per cent of the stream area in pools and 50 per cent in riffles, which would receive a grade of 1. Thus the perfect pool rating for a stream area would be $S_1T_1F_1$. The average of all the pool grades given on the Clam River is $S_2T_2F_3$, which would indicate that the pools are at least average in size and type, but are rather infrequent.

## Note 1

Location - One-half mile east and west of county line, T. 22 N., R. 8-9 W., Sec. 19-24.

Date - August 2. Time - 10:45 a.m.

Air - 63. Water 63. No wind; drizzling rain.

Bottom - Almost entirely gravel and rubble.

Pools - $S_3T_1F_3$. Average width - 15 feet. Average depth - 10 inches.

Flow - Less than 1 cfs.

Shade - 60 to 100 per cent, mostly tag alder.

Aquatic Vegetation - Dominantly watercress and white water buttercup.

Fish Taken - Brook trout (Salvelinus fontinalis) - adults, sub-adults, and fingerlings

Rainbow trout (Salmo irideus) - adults, sub-adults

Perch (Perca flavescens) - fingerlings

Creek chub (Semotilus atromaculatus)

Red-bellied dace (Chrosomis eos)

Common shiner (Notropis cornutus)

Northern dace (Margariscus m. nachtreibi)

Central big-mouthed shiner (Notropis dorsalis dorsalis)

Mud minnow (Umbra limi)

Also crayfish (Cambarus propinquus)

## Note 2

Location - Clam River in T. 22 N., R. 8 W., Sec. 19

Date - August 3, 1940. Time - 11:20 a.m.

Air - 79. Water - 64

General observations here would correspond to those taken for Note 1. Brook and rainbow trout were observed as far down as the mouth of the north tributary.

## Note 3

Location - North tributary above proposed dam site (T. 22 N., R. 8 W., Sec. 18-19)

Date - August 3, 1940. Time - 10:30 a.m.

Air - 77. Water - 57. Sky cloudy; moderate W. wind.

Bottom - Organic debris and silt, some sand and gravel at edges.

Flow - None

Width - 50 - 75 feet. Depth 1 inch at this point, but lower down apparently 3 - 5 feet.

Much down timber here, no shade, considerable lake vegetation such as water lilies, Potamogetons, etc.

## Note 4

Location - Junction of North tributary with Clam River (T. 22 N., R. 8 W., Sec. 20)

Date - August 3, 1940. Time - 11:40 a.m.

Air - 79. Water - 67. Sky 1/2 cloudy; moderate west wind

Flow - Not over 200 gallons per minute.

Temperature of Clam River below confluence - 11:45 a.m. - 65

About 150 yards from the Clam River, the north tributary is locked into a ponded area of unknown depth because of a silt bar, and also because of slight gradient. At present (August 2-3), this pond appears to me to be ideal duck habitat. The pond is at least one mile long and varies from 40 to 100 feet in width.

## Note 5

Location - South tributary above proposed dam site (T. 22 N., R. 8 W., Sec. 20)

Date - August 3, 1940. Time - Noon

Air - 72. Water - 72. Sky cloudy; moderate west wind

Bottom - Mostly silt, with some sand

Flow - Not over 200 gallons per minute

This tributary contributes little or nothing to the Clam River insofar as trout are concerned. The upper end in Section 29 was dry. Near the Clam River many reed patches were choking the stream channel.

## Note 6

Location - Proposed dam site (T. 22 N., R. 8 W., Sec. 20)

Date - August 2, 1940. Time - 10:00 a.m.

Air - 65. Water - 60. Drizzling rain; no wind

Bottom - Mostly sand, some gravel, and silt at the edges

Pools - $S_3T_3F_3$

Flow - 1 - 2 cfs.

Shade - Almost none, banks very low above the site of the proposed dam

Plants - Watercress extremely abundant, but other plants more typical of lakes and swamps, such as arrowhead, cattail, etc.

Average Width - 30 feet. Average depth - about 10 inches

Fish Taken - Rainbow trout (1 fingerling about 6 inches)
Common shiner
Creek chub
Black-nosed dace (Rhynichthys atratulus meleagris)
Mimic shiner
Common sucker
Brassy minnow (Hybognathus hankinsonii)
Central big-mouthed shiner
Johnny darter (Boleosoma n. nigrum)
Common shiner x creek chub hybrid
Also crayfish

## Note 7

Location - Clam River below Missaukee County Road No. 597 (T. 22 N., R. 8 W., Sec. 21)

Date - August 3, 1940. Time - 12:30 p.m.

Air - 79. Water - 64. Sky 1/2 cloudy; strong west wind

Bottom - Mostly sand interspersed with gravel and rubble riffles

Flow - Rapid to sluggish, at least 2 cfs.

Width - Varied from 40 - 75 feet; depth from 4 inches to 5 feet

Pools - $S_2T_1F_3$

Shade - 40 per cent, mostly tag alder and large poplar.

There is some spring seepage in this area.

One and one-half hours of angling over about one mile of water yielded 5 rainbow trout, varying from 9 to 12 inches in length. All these fish were taken in the deep pools created by ~~the~~ partial rock dams ~~shown in the accompanying photograph~~. The successful lure was a sunken Olive Quill fished about 3 feet below the surface of the water.

## Note 8

Location - Clam River above M-55 Bridge (T. 22 N., R. 8 W., Sec. 34)

Date - August 2, 1940. Time - 4:15 p.m.

Air - 70. Water - 62. Rain; no wind

Bottom - Sand and gravel, the latter between moderately dense beds of white water buttercup.

Average Width - 45 feet. Average depth - 12 to 18 inches

Pools - $S_2T_2F_3$

Flow - 2 - 3 cfs.

Fish Taken - Rainbow trout (seen but not captured)

Common sucker

Common shiner

Creek chub

Johnny darter

Muddler

Black-nosed dace

Also crayfish

## Note 9

Location - Above and below M-66 Bridge (T. 21 N., R. 7-8 W., Sec. 1, 6)

Date - August 2, 1940. Time - 2:00 p.m.

Air - 65. Water - 61. Rain; no wind

Bottom - Drifting sand over firm gravel

Flow - 2 - 3 cfs. + rather sluggish

Average Width - 35 feet. Average depth - about 14 inches

Shade - About 40 per cent, chiefly of tag alder

Pools - $S_1T_1F_3$

Banks - Low through here, flood about 2 feet in spring

Fish Taken - Rainbow trout (adults and fingerlings)

Muddlers

Common shiners

Creek chub

Common sucker

Blacknosed dace

Northern dace

Also one clam (species?) and one baby Western Painted Turtle

One fisherman questioned reported a good catch of brook trout in this immediate area during the previous week.

## Note 10

Location - Stick Creek at M-66 (T. 21 N., R 7-8 W., Sec. 1, 6)

Date - August 2, 1940. Time - 2:30 p.m.

Water - 56

This stream had no apparent current, and was not flowing into the Clam River except possibly as underground seepage at the time of investigation.

## Note 11

Location - Marks Creek at road crossing (T. 21 N., R. 7 W., Sec. 5-8)

Date - August 2, 1940. Time - 2:45 p.m.

Air - 73. Water - 69. Sky 1/2 cloudy; sun hot; no wind

Almost no flow here, bottom of soft silt, stream about 20 feet wide and quite deep - 1 - 5 feet. Heavy growth of water lilies and other lake plants.

## Note 12

Location - Confluence of Marks Creek and Clam River (T. 21 N., R. 7 W., Sec. 5)

Date - August 2, 1940. Time - 2:50 p.m.

Air - 73. Water - 64.

Bottom - Sand and silt

Pools - $S_1T_3F_3$

Shade - About 50 per cent, mostly of tag alder and poplar

Flow - Sluggish, about 2 - 3 cfs.

Fishermen contacted here reported fair catches earlier in the season but little luck during the month of July.

## Note 13

Location - Clam River about 2 1/2 miles west of Falmouth (T. 22 N., R. 7 W., Sec. 34 - SW 1/2 of SW 1/4)

Date - August 2, 1940. Time - 3:10 p.m.

Air - 70. Water - 67. Clearing, sun out hot

Bottom - Sand and silt

Average Width - 40 - 50 feet. Average depth 3 1/2 feet

Pools - $S_1T_1F_2$

Flow - 5 cfs., but sluggish. Much fine-leaved pondweed present (apparently P. filiformis). The banks were well shaded where there was no pasturing.

## Note 14

Location - Mosquito Creek at road crossing (T. 22 N., R. 7 W., Sec. 26-27)

Date - August 2, 1940. Time - 3:25 p.m.

Air - 70. Water - 69

Almost no flow here, plants typical of lakes and sluggish, warm streams. Channel choked with plants.

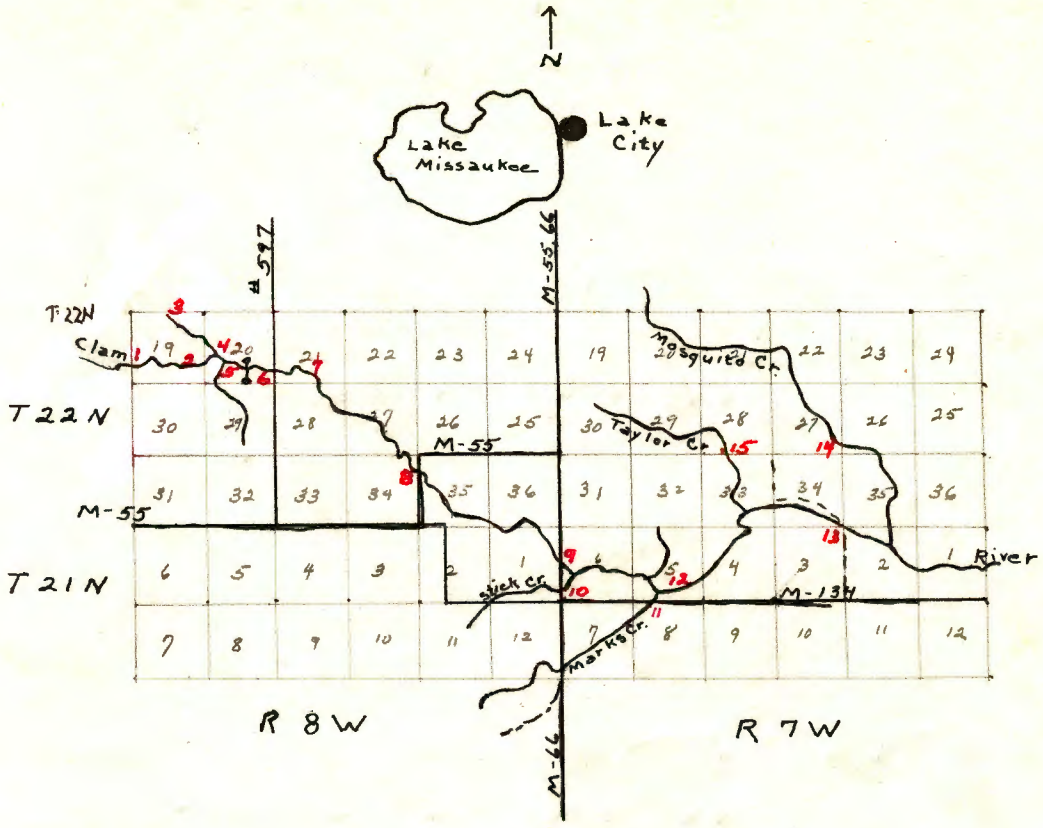
## Note 15

Location - Taylor Creek at road crossing (T. 22 N., R. 7 W., Sec. 28-33)

Date - August 2, 1940. Time - 3:35 p.m.

Air - 70. Water - 57. Sky cloudy, rain threatening.

Flow - Not over 200 gallons per minute.




Missaukee County

I - Proposed dam site

1, 2, 3 etc. - location of field observations

INSTITUTE FOR FISHERIES RESEARCH

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Report approved by Dr. A. S. Hazzard