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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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DIRECTOR

March 2, 1953

ADDRESS
UNIVERSITY MUSEUMS ANNEX
ANN ARBOR, MICHIGAN

Report No. 1362

THE USE OF EXPERIMENTAL STREAMS AND LAKES IN MICHIGAN

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FISH DIVISION

By

Albert S. Hazzard and Kenneth E. Christensen

Abstract

Legislative authority to the Conservation Commission to establish a limited number of experimental streams and lakes where research on the value of regulations can be conducted has been used on 23 lakes and on 9 streams to date. Results have been determined by creel census, population studies using nets or electric shockers and by age composition and growth rate investigations.

This research has demonstrated that size limits and closed seasons are needless restrictions on fishing for bluegills, sunfish, perch and other pan fish and the legislature has accepted recommendations by the Department to eliminate or adjust these restrictions. One season's test of spring and summer spearing seasons for carp, dogfish and garpike led to authority for the Director to open lakes to such fishing. Five years of fishing for rainbow trout from April 15 to November 30 in the lower course of a stream tributary to Lake Michigan with no untoward results and with increased fishing and harvest of trout otherwise unavailable to anglers resulted in authority for the ^{DIRECTOR}(Commission) to designate streams and lakes which would open to rainbow fishing the second

Saturday in April. Test of a six-inch limit on brook trout in a cold stream of slow growth yielded questionable benefits. Tests of higher size limits (8; 9-and 10-inch minimums) are being conducted on portions of five streams and on two trout lakes. Restrictions to the use of artificial flies are applied in two of these streams and lower creel limits (2 or 5 trout daily) are also imposed in three of these experimental areas. Preliminary results indicate an increase in trout populations under the nine-and ten-inch limits, less fishing initially and lowered catches but generally greater angler interest and enthusiasm as the experiments progress. More action even though most trout must be returned as under-size seems to satisfy an increasing number of trout fishermen. One northern lake has been opened to rainbow trout fishing throughout the year to determine if fishing through the ice will increase the recreation afforded by these fish sufficiently to justify continued planting.

The experimental stream and lake program has provided sound facts from research useful to the legislature in judging the Department's requests for changes in regulations. It is needed to test other laws now in effect or which may be required in the future to insure perpetuation of recreational fishing in Michigan.

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By amendment to Section 3 of Act 230 of P.A. 1925, known as the Discretionary Power Act, the legislature, in 1945, gave to the Conservation Commission "the authority to establish seasons, size limits, creel limits and methods of taking fish in certain designated inland lakes not to exceed 20 in number and not more than 1 lake in any county, during the 5 year period of research work, and streams or portions of streams not to exceed 10 in number and not more than 1 stream in any county, during the 5 year period of research work during the time when special fisheries research is being carried on."

This act was further amended^{effective} in 1952 to remove the limitation of 1 lake or stream to a county and the 5 year restriction.

The above authority was requested of the legislature because current research was indicating that certain restrictions imposed by law might not be needed or might even be harmful to fish life; also that other regulations might not be sufficiently restrictive and that additional protective legislation might be desirable especially on trout waters.

*A complete list of waters, their locations and regulations imposed will be found at the end of this report.

Following is a record of the researches which have been or are being conducted under this authority and a brief summary of the results and the application of the findings:

1) Test of effects of fishing for species not protected by closed season (perch, crappies, rock bass, bullheads, suckers etc.)

Lakes north of highway M-46 were opened to year-around fishing for such species effective in 1946. Up to that time all inland lakes had been closed to any kind of fishing from April 1 to June 25. Before recommending that the entire state be opened to such fishing it was considered desirable to check the effects on a group of experimental waters.

Six lakes were opened only to fishing throughout the year for species not protected by closed seasons. Records of the amount of fishing and the catch by anglers were taken by a creel census clerk on a regular sampling schedule and the quality of fishing was determined at various seasons of the year. Seining was done to learn if reproduction of game and pan fish had been affected by the presence of fishermen on the lakes during the spawning season or by the accidental capture of bluegills, sunfish, bass and other fish during periods when they were protected by law and which had to be returned to the water. Lake shores were examined at intervals for possible evidence of such hooking losses.

Records for the period 1946 to 1950 showed a slight increase (6.7 percent) in the amount of angling due to the open season in the spring (2.6 percent of the years catch was made then) but heavy pressure did not develop until the opening of the bass and bluegill season on June 25. Observation and seining along the shores in late August gave evidence of ample reproduction of bass, bluegills, perch, sunfish etc. Shore patrols showed very little spring mortality which could be attributed to hooking and return of bass and other fish protected by closed seasons.

As a result of these findings the Conservation Department recommended to the legislature that all except designated trout waters be open to fishing throughout the year for species not protected by closed seasons. Such a law was enacted in 1951 and made effective January 1, 1952.

- 2) Test of need for six inch size limit on bluegills, sunfish, perch and calico bass (crappie) and need for closed season during the spring spawning period.

Six lakes were opened to taking such pan fish of any length at any time of year effective in 1946. Also on two of these lakes one could take an unlimited number of pan fish under six inches. Three other lakes were added under similar regulations during the next few years. Similar creel census, and studies of the fish populations including success of reproduction and growth rate were conducted on these lakes.

Results showed a marked increase in fishing (21.6 percent of the years fishing and about 22 percent of the annual catch occurred in the spring) due to the spring open season and the fact that bluegills and sunfish could be taken as well as other pan fish. However no decline in the average catch or the fishing quality (catch per hour per angler) can be noted for these lakes. Checks on the population and success of reproduction show no ill effects.

As it became evident that these lakes were holding up well in spite of no size limits, it was recommended that the legislature remove these restrictions on pan fish and this was done effective September 23, 1949. By 1951 we were also quite sure that long closed seasons in the spring were not needed for the protection of bluegills and sunfish. Again the legislature acted favorably on the Department's recommendation for liberalization and set the opening date for taking these fish on the last Saturday in April. This results in a closed season on these fish

from April 1 to the last Saturday of the month. Since our records for the experimental lakes show very little fishing during early April when the weather and water are generally too cold for enjoyable or productive angling and since no ill effects are evident on lakes where bluegills and sunfish could be taken, ^{throughout the year} it is recommended that the present closed season for bluegills ~~throughout the year~~ and sunfish be abolished.

3) Test of May 15 opening of season for taking rainbow trout in a Michigan lake (Birch Lake, Cass County).

At the time this test was started (Jan. 1, 1946) all lakes south of M-46 were closed to fishing on April 1 and did not reopen until June 25. This meant that fishing for trout, which were being planted in an increasing number of southern Michigan lakes, could not start until June 25. By this date surface waters commonly are too warm for trout and deep water fishing for rainbows is generally not so productive. A May 15 opening seemed logical to permit rainbows to recover from spawning conditions but still allow surface trolling and fly fishing. Designation for fall rainbow fishing (to Dec. 1) was also made under legislative authority.

The season provided by these means was found to be proper for rainbow trout and resulted in increased use of the lake and a better harvest of the planted fish.

Opening all lakes (except a limited number of small lakes mostly in the north which are designated as "trout lakes") to year-around fishing (first effective in 1952) now permits trout to be taken in these lakes the last Saturday in April. Stream trout and rainbow trout in lakes are not in good condition by this date. Delay of the opening of the trout season everywhere in the state (except in the Great Lakes and on the lower courses of streams tributary thereto) until the second Saturday in May has been recommended but so far has not met with legislative approval.

4) Test of spearing season for carp, dogfish and garpike

Prior to 1950 spearing of these so-called "noxious fishes" was permitted in inland lakes only ^{under} supervision of law enforcement personnel. Certain fishermen enjoy spearing these fish and many feel that the lakes benefit by their removal. Obviously many requests for supervised spearing parties had to be refused because of limitations on the conservation officers time for such work.

To determine how much spearing would be done and how much violation might occur by allowing unsupervised parties to spear at will other lakes to the limit allowed by law were added to the list of thirteen already being used for the experiments previously referred to. Spearing was permitted during 1948 with or without artificial light on all these lakes for taking carp, dogfish and garpike only from May 15 to May 31 and from July 15 to August 15. Regular creel census clerks and the local conservation officers checked these lakes on a random schedule. Reports of both groups showed that relatively little spearing was done and that there was no evidence of taking protected species.

The Department made a recommendation to the legislature in the 1949 session that the director of conservation be permitted to designate the lakes where spearing might be permitted under the same conditions tested by experimental authority. Act 165 P.A. 1929 was amended as requested and effective in 1950 such spearing was permitted. No unfavorable results have been reported to date; on the contrary, concern about the number of "noxious" fish seems to have lessened and lakes can be readily added to or subtracted from the list in response to local interest.

5) Earlier opening of rainbow trout season in the Great Lakes and tributaries thereto.

The opening of the regular trout season (last Saturday in April) commonly finds most of the rainbow (or steelhead) trout from the Great Lakes except Superior through spawning and returned to these waters where they are seldom caught by anglers. In certain streams their progeny may overcrowd the waters to the extent that few reach the legal size of 7 inches before going to the Great Lakes. Opening the lower courses of these streams to fishing for rainbow trout from the close of the regular trout season through the month of November as now permitted by authority granted to the director of Conservation permits some additional harvest of these rainbows at a time when they are in excellent condition. However, the open hunting season lures away many anglers and the harvest was still considered inadequate on many waters and this led to the following test.

Starting in 1947 approximately the lower three miles (i.e., down from the Peters truck trail crossing) of the Black River, Mackinac County was opened to fishing for rainbow trout on April 15 and continued open through November. This liberal season lasted through 1951. A partial creel census was conducted of the fishing and some checks were made to determine if spawning occurred and if there might be other evidence of over-fishing.

It was found that the early season attracted several hundred anglers each week (mostly on week ends) and resulted in a rather low catch of approximately 0.1 trout per hour of fishing. The trout averaged about two pounds apiece and were generally in good condition. The majority of fish were immature or had not spawned prior to capture.

The regular spring and summer season saw a rapid drop in interest in the stream but when fresh-run rainbows from Lake Michigan began to enter the Black River (usually early in September) fishing again increased and some nice fish were taken. The catch per hour was usually somewhat

lower than in the special spring season but the trout were commonly a little larger and all were in splendid condition.

Checks on the spawning grounds revealed that a number of trout had escaped the anglers and completed the reproductive act. Later sampling with the electric shocker yielded a goodly number of fingerling rainbows.

At the end of the five-year period it was concluded that the long season permitted on the Black River had resulted in greater sport for fishermen and a larger harvest of trout from Lake Michigan without any apparent harm to the future supply. At the request of the Department authority was granted by the legislature (effective in 1952) to designate, from the list of waters open to fall fishing for rainbows, the streams and lakes which should open for the taking of rainbow trout starting the second Saturday in April.

6) Test of a six-inch size limit on brook trout.

In certain cold streams trout grow slowly and there is a heavy mortality between the six and seven-inch size due to natural losses and to injuries from hooking. To determine whether a six-inch size limit would be more suitable on such streams the Commission ordered that effective in 1946 Sections C and D of Hunt Creek and in a portion of Fuller Creek, all located within the Institute's experimental area, be open to fishing under the six-inch limit.

Complete records of the trout catch were secured for the five-year period of the order and the results compared with those taken under the seven-inch limit on the same waters from 1939 to 1945. A marked increase in the total number and poundage of trout resulted under this order but there was a progressive decline in the number of trout above seven inches.

For 1950 (the last year the order was ⁱⁿeffect) 318 seven-inch and over trout were taken weighing 61.6 pounds and in addition 221 brook trout were caught in the 6-7 inch class with a weight of 20.05 pounds. It was concluded that, although a six-inch limit on streams with slow growth would permit a larger harvest of small trout, fewer trout of sporting size would be available to the angler in later years. Since a trout must be at least seven inches and preferably larger in order to give the fisherman any sport even on light tackle it was questioned whether a wider application of the six-inch limit should be considered in Michigan waters. Results under higher than the seven-inch limit on the better waters of the state suggest that a general raising rather than lowering of the size limit may be better conservation.

7) Test of a 10-inch size limit on trout and restriction to artificial flies on the North Branch of the Au Sable River, Crawford County.

Studies of the trout and trout fishing in this stream have been conducted by the Institute since 1931. They indicated a decline in numbers of brook trout and in the quality of the fishing in recent years. Research also showed growth rate to be rapid in this stream and that a 10-inch size limit would be needed to protect most of the females through the first year of reproductive life. It was believed that the results of such an experiment might have application to other good trout waters. Accordingly the Commission was asked to place a portion of the North Branch under a ten-inch size limit and to restrict the daily catch to five brook trout.

Population counts with the electric shocker and analysis of the age composition of the trout stock were to be used to determine changes resulting from these restrictions. After the first season, a creel

census clerk was employed who spends equal time on the ten-inch and seven-inch water. No trout were to be stocked in the ten-inch water but the customary planting schedule was to be continued on the seven-inch water using marked trout.

The order for 1949 covered the stream from the Lovell's Bridge to the Crawford-Otsego County line and specified a 10-inch size limit and a creel limit of five for brook trout only.

To improve law enforcement possibilities the size limit was applied to all trout in the renewal of this order for 1950, and in addition at the insistence of the Lovells Hook and Trigger Club, artificial flies only were specified. Also from 1950 the water under these special regulations was extended downstream to Eamon's Landing.

Counts of brook trout larger than five inches taken per hour with the electric shocker in the section upstream from the Twin Bridges near the center of the ten-inch water have shown a five-fold increase in the period 1949-1952. This increase is mainly in the 7 to 10-inch size range. Brown trout have also increased in number in recent years.

The creel census, though not strictly quantitative, indicates that the catch per hour has remained very low (about 0.1) and has not varied in the ten-inch water but has stayed at a fairly high level (about 0.5) with some fluctuation in the seven-inch water. However, more anglers are being contacted by the clerk each year in the ten-inch section (60 percent greater in 1952 than in 1950) and the total number of brook and brown trout ten inches and over taken by anglers has increased. There seems to be a fairly general approval by most fishermen of the results to date even though they admit that they can keep few of the trout hooked. Continuation for two more seasons (as provided by the present order) is considered desirable in order to fully evaluate the changes in trout population and fishing quality on the ten-inch water in comparison with the seven-inch control portion. It was unfortunate that size

limit and fishing methods were included in the same experiment since the effects of the two may be difficult to separate. The five trout per day limit has had no significance because very few approach this number of legal trout in the ten-inch water.

8) Test of a 9-inch size limit and 2 daily limit on trout in the Pigeon River, Otsego County.

Part of the experimental stream (Section C and D) in the Pigeon River Trout Research Area for which previous records of population and catch were known and where all fishing is under permit was placed under this Commission order effective with the 1951 season.

Creel census showed a marked drop in the fishing pressure and the catch especially in 1952 when no trout were stocked in Section C. Population checks with the shocker demonstrated a marked increase in the number of brook trout larger than seven inches in these sections and anglers reported good sport though few creelable trout in the 1952 season. Several more years will be required before the full effects of these limitations will be evident.

9) Test of an 8-inch size limit and 10 trout daily limit on a portion of the Rifle River, Ogemaw County.

First established by Commission order in 1948 this regulation has been continuously in effect on that portion of the Rifle River within the boundaries of the Rifle River Experimental Area where complete records of the fish and game yields have been kept since 1945. Since 1952 10 trout have been the general daily limit on streams. It has had little effect on fishing on the Area since few fishermen ever took more than ten trout per day. The effect of the 8-inch limit has not been fully evaluated but the chances are that it is of little importance since few female brown trout spawn below this size.

10) Test of 10-inch limit on a portion of the Pine River, Lake County.

Effective with the 1952 season this limit was established by Commission order on the Pine River from Lincoln Bridge to Poplar Creek.

A partial creel census was conducted in 1952 with equal time devoted to the 10-inch water and to the section of the Pine River from Lincoln Bridge to Walker Bridge, which was under a 7-inch limit. Fewer trout were taken by fewer fishermen in the 10-inch water. Checks with the shocker showed the population to be very similar in each section. Studies of brook trout scales revealed a growth rate comparable to that of the North Branch of the Au Sable and the need to continue the size limit at 10 inches if the majority of females are to spawn at least once.

11) Test of 10-inch limit and restriction to flies on South Branch of the Au Sable.

The initial Commission order provided that from April 26 to May 19 a minimum size limit of 10 inches should be in effect on this stream from 300' below Chase Bridge to the mouth. A second order cancelling the first and covering a period of five years became effective on May 20, 1952. This provided for a 10-inch limit on trout from 300' downstream from Steckerts' Bridge to the mouth and flies only from 300' downstream from Steckerts' Bridge to Smith Bridge.

A partial creel census was in operation on this stream devoting equal time in so far as possible to each part of the river (Steckerts' to Smith and Smith to mouth). Relatively few records could be secured because of the character of the fishing and the restricted nature of access by the public. Both this census and that on the Pine will be discontinued in 1953 and reliance placed on population checks and age composition of the trout. A fine number of good-sized brown trout in both sections were revealed by the shocker in sampling during October 1952.

12) Test of 10-inch size limit and 5 trout daily limit on East Fish Lake and Fuller Creek Pond, Montmorency County.

These waters in the Hunt Creek Experimental Area were placed under Commission order starting in 1952 to determine if the additional protection afforded to these fast-growing brook trout populations would ultimately result in higher or lower yields. Records are available on these waters for a number of years previously.

13) Test of closing to all fishing the immediate area of the state weir on the East Branch of the Au Gres River.

To prevent illegal and unsportsmanlike capture of lake-run rainbow trout at this site the stream was closed to all fishing effective in 1952 for a distance of 150' upstream and 50' downstream from the center of the walk on top of the weir which holds adult rainbow from Lake Huron upstream for greater harvest by anglers. A creel census and sampling of the angler's catch for growth rate and condition were conducted and the impounding weir was maintained in place from April 26 to June 30 inclusive. This order was considered in effect only during the time that the weir grates were in place. Apparently violations by snagging and capture with landing nets were discouraged by this order and it should be kept in effect but considered as under Section 1 rather than Section 3 of Act 230 since in the future the aim is to prevent depletion rather than for research purposes.

14) Test of opening a lake to year-around fishing for rainbow trout.

Effective Dec. 1, 1952, Big Twin Lake, Kalkaska County was opened to the taking of rainbow trout throughout the year.

This order was requested to determine if a better return from rainbow trout plantings can be secured by permitting fishing through the ice. It

is known that trout can be taken this way by the same methods and tackle employed in ice fishing for bluegills and other pan fish. It is believed that there is good survival of these rainbows in some lakes but that anglers cannot or at least do not catch enough during spring, summer and fall to justify continued plantings. A random sample of the fishing results is being secured through creel census.

INSTITUTE FOR FISHERIES RESEARCH

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Report approved by:

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List of Experimental Lakes and Streams
under P. A. 230, Section 3, 1929, as revised

Lakes

<u>Lake and County</u>	<u>Dates Effective</u>	<u>Provisions</u>
Bear Blair Lake, Hillsdale Co.	June 25, 1945- March 15, 1946	Legal to take bluegills, sunfish, perch, rock bass and crappies of any size during statutory open season, for period of five years.
Birch Lake, Cass Co.	Jan. 1, 1946- Dec. 31, 1950	Legal to take all species except large- mouth bass, smallmouth bass, bluegills and sunfish from May 15 to June 24, for a period of three years.
Bear Lake, Hillsdale Co., Saddle Lake, Van Buren Co.	March 15, 1946- March 14, 1951	Legal to take an unlimited number of blue- gills, sunfish, perch, rock bass and crappies less than six inches long in addition to the statutory creel limit for fish over six inches long, for a period of five years.
Big Portage Lake, Jackson Co., Fife Lake, Grand Traverse & Kalkaska counties; Minnewaukon Lake, St. Joseph Co., Sugarloaf Lake, Washtenaw Co.	March 15, 1946- March 14, 1951	Legal to take bluegills and sunfish at any time, for a period of five years.
Craig Lake, Branch Co., Duck Lake, Calhoun Co., Fine Lake, Barry Co., Lobdell Lake Genesee & Livingston counties; Pontiac Lake Oakland Co.	March 15, 1946- March 14, 1951	Legal to fish at any time for any species on which season is not closed, for a period of five years.

<u>Lake and County</u>	<u>Dates Effective</u>	<u>Provisions</u>
Whitmore Lake, Washtenaw & Livingston counties	April 1, 1946- March 31, 1951	Legal to fish at any time for any species on which season is not closed, for a period of five years.
Turk Lake, Montcalm Co.	June 25, 1947- June 24, 1952	Legal to take an unlimited number of blue-gills, sunfish, perch, rock bass and crappies less than six inches long, in addition to the statutory creel limit for fish over six inches long, for a period of four years during the statutory open seasons.
Big Twin Lake, Kalkaska Co.	Dec. 1, 1952- Nov. 30, 1957	Legal to take rainbow trout at any time for a period of five years.
Craig Lake, Branch Co.; Duck Lake, Calhoun Co.; Stone Lake, Cass Co.; Lobdell Lake, Genesee & Livingston counties; Bear Lake, Hillsdale Co.; Lake Lansing, Ingham Co.; Big Portage Lake, Jackson Co.; Austin Lake, Kalamazoo Co.; Reeds Lake, Kent Co.; Lake Nepessing, Lapeer Co.; Devil's Lake, Lenawee Co.; Whitmore Lake, Washtenaw & Livingston counties; Pontiac Lake, Oakland Co.; Minnewaukon Lake, St. Joseph Co.; Murphy Lake, Tuscola Co.; Saddle Lake, Van Buren Co.	1948	Legal to spear carp, dogfish and garpike with or without the aid of artificial light from May 15 to June 15 and from July 15 to August 15, for period of one year.

<u>Lake and County</u>	<u>Dates Effective</u>	<u>Provisions</u>
Hess Lake, Newaygo Co.	June 25, 1949- June 24, 1954	Legal to take at any time of year an unlimited number of bluegills, sunfish, perch, rock bass, and crappies less than six inches long, in addition to the statutory creel limit for fish over six inches long, for a period of five years.
Devil's Lake, Lenawee Co.	Jan. 1, 1950- Dec. 31, 1954	Legal to take at any time of year an unlimited number of bluegills, sunfish, perch, rock bass, crappies and warmouth bass less than six inches long, in addition to the statutory creel limit for fish over six inches long, for a period of five years.
Big Twin Lake, Kalkaska Co.	Dec. 1, 1952- Nov. 30, 1957	Legal to take rainbow trout at any time for a period of five years.
East Fish Lake, Montmorency Co.	1952-1956	Ten-inch size limit and 5 daily limit on trout.
Fuller Creek Pond, Montmorency Co.	1952-1956	Ten-inch size limit and 5 daily limit on trout.

Streams

<u>Stream and County</u>	<u>Dates Effective</u>	<u>Provisions</u>
Black River, Mackinac Co.	1947-1951	Open to fishing for rainbow trout on April 15 each year for a five year period.
Hunt Creek, Montmorency Co.	1946-1950	Six-inch size limit in effect on trout for a period of five years. Section C and D of Hunt Creek and that portion of its tributary, Fuller Creek west of the revolving weir.
Rifle River, Ogemaw Co.	1948-1953	Eight-inch size limit and 10 trout daily creel limit (the latter dropped from order in 1952 when state-wide limit for stream reduced to 10).
North Branch, Au Sable River, Crawford Co.	1949 trout season	Ten-inch size limit and daily creel limit of five brook trout from Lovells to Crawford-Otsego Co. line for one year.
Same	1950-1954	Ten-inch size limit on all trout and daily creel limit of five brook trout from Eamon's Landing to Crawford-Otsego Co. line. Present order effective through 1954 trout season.
Pigeon River, Otsego Co.	1951-1953	Nine-inch size limit and two trout daily creel limit (artificial flies only included in order by error but not enforced), effective through 1953.
Pine River, Lake Co.	1952-1956	Ten-inch size limit from Lincoln Bridge to Poplar Creek.
South Branch, Au Sable River, Crawford Co.	April 26- May 19, 1952	Ten-inch size limit on trout from 300' below Chase Bridge to the mouth. Five year order replaced on May 20, 1952, by the one which follows.

<u>Stream and County</u>	<u>Dates Effective</u>	<u>Provisions</u>
South Branch, Au Sable River, Crawford Co.	May 20, 1952- May 19, 1957	Ten-inch size limit on trout from 300' below Steckert's Bridge to mouth. Artificial flies only from 300' below Steckert's Bridge to 300' above Smith's Bridge.
East Branch, Au Gres River, Iosco Co.	1952-1954	Closing East Branch Au Gres River to all fishing from 150' upstream to 50' down- stream of center of footbridge at state weir.