A PRELIMINARY REPORT ON THE AU SABLE INVESTIGATIONS OF 1 9 2 4.

by

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INTRODUCTORY

This report is prepared before the completion of the AuSable survey, and is subject to later modification when more complete date are at hand. It contains recommendations based on our findings to date. We present these at the present time, so that the results of our work may be available as for as possible for the Spring plantings and other operations in 1925.

We give below an outline of the areas covered in our investigations, and the problems studied by each party in the field.

Dr. Metzelaar made several trips alone to the Au Sable basin (Dec. 19-22, 1923; March 20-27, May 8-11 and Aug. 13-16, 1924 and Feb. 1-2, 1925.) On these trips he worked at the Grayling Hatchery in an effort to improve conditions and check some of the diseases which have been destroying many of the stock trout; attending, with the rest of us, a field meeting on conservation at Mio, and conferred with Reuben Babbitt, H. Hanson, Phil Zalsman and others regarding fishing conditions. On the last trip he discussed the closing of nursery streams in Crawford and Roscommon County with Mr Babbitt and Mr Hanson. Several reports by Dr. Metzelaar refer to his work at the Grayling Hatchery.

Metzelaar and Hubbs, from June 17 to 30, worked the main stream above and just below Grayling, the East Branch, the North Branch and Big Creek of the North Branch, some of the Tributaries of these streams, and various lakes at and near the head waters of the AuSable system. Attention was paid to the general character and temperatures of the waters examined, with particular reference to the trout population, and to the relations ofthe headwaters lakes and the lake-fishes to the trout of the streams. Considerable time was also devoted to work at the Grayling hatchery and to consultations with local officials and englers regarding water and fishing conditions.

Dr. Creaser and Mr Langlois, from June 8 to July 16, worked on the main stream from the Foote Dam to the Mio Pond, and in some of its tributaries, including the Pine River System in Alcona County, They studied the relation of the ponds to the river, and of the pond fish, particularly pike, to the trout; some time was also given to an examination of the fishways in the ponds, and to other associated problems.

Hubbs and Langlois worked from July 16 to August 16; first, in the Mio Pond and all its tributaries near Mio; second, in St. Helens Lake and its outlet, the South Branch of the AuSable; Third, in the AuSable proper, from Grayling to its mouth at Oscoda. They continued and extended the studies begun by Creaser and Langlois on the relation of the dams and pond and the pond fish, especially pike, to the river and river fish, especially the trout. They studied St. Helens Lake in reference both to local problems and to the effect of the lake on the South Branch, and in the latter connection examined the SouthBranch at several points through out its course. They also briefly studied the death of trout in Big Creek near Luzerine, submitting a special report in this study on August 3, 1924.

The work of Prof. Hankinson was begun on August 6, first alone, then later with the help of Mr. Langlois; they continued the study until September 9. In 1916 Mr. Hankinson had already done some similar work at and near Grayling. Hankinson and Langlois worked the AuSable proper in Crowford County and the East, North and South Branches, and especially the feeder streams. They also examined some of the headwater lakes not reached by Metzelaar and Hubbs, and made a brief examination also of Higgins Lake. They studied especially the relation of the nursery streams to the main reiver and branches, particularly as regards the population of the three species of trout.

Hubbs and Metzelaar returned to the work from October 21 to November 2. They were along the river just above and below the Mio dam; Perry Creek below Mio; East Branch at and near Grayling Hatchery; North Branch and its tributaries. Three main points were considered; first, the efficiency of the fish chute in the dam at Mio (Mr. John Speck, District Warden had been carrying on this work before our arrival and continued it for some time later, under our direction;) second, the spawning run and spawning habits of the brook trout and brown trout in the streams and at the Grayling Hatchery, and also the relation of other fishes and stream conditions to the spawning of the trout and possible destruction of the eggs and fry; third, the closing of nursery streams in Alcona and Oscoda Counties, this point being taken u p in conference with Mr. Speck, the District Warden.

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RECOMMENDATIONS FOR THE CLOSING OF NURSERY STREAMS IN AUSABLE REGION.

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Our work on the trout of the state has already impressed us strongly with the insufficiency of artifical propagation alone. We must not only hatch and plant a tremendous number of healthy fry, but we must also afford them some protection in the streams during their early and relatively helpless stages. They must be protected from their natural enemies, as far as possible, by being put into the best available nursery waters. They must also be protected as far as possible from being taken or injured by anglers. To this end the nursery streams should be closed to fishing. Keeping fishermen out of the little creeks will also help to preserve the aquatic vegatation and overlying brush, which are essential to the production of food for the fry and for their protection. The closing of the nursery streams, including among these some creeks of monerate size in the lower courses, will also provide some measure of relief from overfishing.

It is not practical at this time to state the exact location where the warning signs should be posted, because of the lack of sufficiently accurate maps, and because our work has not been complete. Recommendations for Iosco and Ogemaw Counties are withheld untill their small streams have been explored. The recommendations for parts of Alcona County are incomplete.

1. Alcona County.

Township 25 N.; Range 7 E. - Close all tributaries of South Branch of Pine River, including those emptying into the streams about a mile below Kurtz, and also the two main branches whish head in this township but flow into the South Branch in T. 25 N., R 8 E.

T. 25 N., R. 8 E. - Close all the feeders of the South Branch of

Pine River, including the larger one coming in from the north in Section 8. and the one from the South in Section 9. Close all the tributaries of Pine River, entering this township from the west (in sections 23 and 24).

T. 26 N., R 5 E. - Close Blockhouse Creek from mouth.

T. 26 N., R 6 E. - Close the two forks of Pine River everywhere in this township. and any other nursery streams within the township limits.

T. 26 N., R 7 E. - Close all streams, including Backus Creek from the township line and the tributaries of the South Branch of Pine River, except Pine River itself below the Railroad Grade Road in western part of township; close both forks of Pine River above this road.

T. 26 N., R. 8 E. - Close the tributaries of Backus Creek (but not the creek itself). especially the feeder coming in from sections 7. 18, 17, and 20.

T. 28 N., R 5 E. - Close McGinn Creek and its tributaries above the old dam in or near section 28 (this stream is in the Thunder Bay System).

2. Oscoda County.

Close every southern feeder and tributary of the Au Sable from their mouths, with the exception of Lost Creek and Big Creek. "Whitewater" Creek is to be included among those closed.

Big Creek (of the main Au Sable). - Close all the tributaries of the main creek and its two branches. Close the West Branch above the point where it crosses Sections 15 and 22. Close the two upper forks of the East Branch above the road running about one mile east of the western edge of T 25 N., R 2 E.

Close all feeders coming into the Au Sable from the north, above the backwater of Mio Pond.

Close from the main river up all the tributaties entering the Au Sable from the north between Mio and the County line, including all small feeders and Cherry Creek , Comins Creek and Glennie Creek, but excluding Perry Creek, Close the Tributaries of Perry Creek flowing in from east and west in Section 21. Close Blockhouse Creek from mouth in Alcona County.

Tributaries of Big Creek of the North Branch.- Close the headwaters of the East Branch, and the tributaries of the Middle Branch (which leads from west Twin Lake). north of the east-west road about one mile north of the southern border of T. 26 N., R 1 E., and east of the north south road running across the middle of said township.

Headwaters of Thunder Bay system in Oscoda County. -, Close the tributaries of Rhoads Lake (near Comins) and also that tributary of the Upper South Branch which arises in Flat Lake.

3. Otsego County.

No recommendations are ready for tributaries of Sturgeon River or of the Manistee.

Close all nursery feeders of the North Branch in Sections 21 to 24, 25 to 28, 33, to 36, with the exception of Crapo Creek. There is no point in closing the upper forks of the North Branch (which meet in Section 20). such as Rangeline Creek, Chub Creek, etc., for these are rather warm lake outlets.

4. Crawford County.

Main stream above Grayling. - Close the East fork (the outlet of Bradford Lake) but keep open the west fork (outlet of Linn

Lake). Close any nursery feeders between the junction of these forks and the pond of the Electric Light plant near Grayling.

East Branch- Keep main stream open, but close all feeders below Jones Lake, including the one near Alexander and the first one above the hatchery.

Main Stream. - Close all feeders from north between mouths of East Branch and of North Branch (not inclusive). Close all southern feeders from Grayling down to County Line. with the exceptions of the South Branch and the outlet of Mud Lake and the outlet of a lake about 2 1/2 miles southeast of Grayling.

South Branch. - Close all the tributaries in Crawford County with the exception of Beaver Creek. Close this creek and all its feeders above the M.C. Railroad.

5. Roscommon County

Close Backus Creek abouve M. 14.

Close all headwaters of Wolf Creek in T. 21 N., R. 3 W.

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111. RECOMMENDATIONS REGARDING THE GRAYLING HATCHERY.

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The Grayling hatchery is in a decidedly favorable position with regards to the available water supply for the stock fish; no other state hatchery in Michigan can compare with it in this respect. It is, however, far behind the other hatcheries in that it has no spring water whatever and nothing but pumped water from one well instead.

At the time of our visit there was a kind of light epidemic of what may have been furunculosis, which killed the adult fish in small numbers in very hot weather. The ponds are certainly overstocked. There is water enough for two or three times the present length of ponds. If these additional ponds could be made it would probably cut down the mortality, which is already lower than at Paris or Harrietta.

Our planting recommendations for the AuSable call for more brown and also rainbow trout. Brown trout should not be raised here at the expense of brook trout; it is advisable to increase the number of troughs which are now crowded above the danger line. Extension of the building is neccessary to this end. More races will be required to take care of the advanced fry. It is deplorable that there is no spring water to supply these races and the only practical way to compensate for this is making a pipe line to a little tributary to the East Branch 2500 feet above the hatchery.

From conversation with Mr Hanson we understand that the Grayling club is prepared to share to a large extent in the cost of improving the present hatchery. This improvement may be called urgently necessary.

We want to commend Mr Phillip Zalsman for the fine lot of fingerlings of brook, brown and rainbow trout which he has raised this summer and which rank among the best anywhere in Michigan. We do not at all share the opinion of those who claim that the Grayling hatchery has outlived its usefulness. On the Contrary, if the proper extensions are made and proper care exercised we look forward to the taking of a large quantity of brown trout and rainbow trout eggs at this station, but it would be ridioulous to consider the present small establishment as satisfactory to meet the demands of the entire Au Sable River.

IV. PLANTING RECOMMENDATIONS FOR STREAMS OF AU SABLE SYSTEM.

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Our planting recommendations are given in detail under the headings of the stream; following this we give a summary by species. Our recommendations call for a larger proportion of brown and rainbow trout than are now being planted. There are places and conditions under which these species have shown themselves better able than the brook trout to hold up under conditions of overfishing.

Main Stream above Grayling.

The main stream above the pond of the Electric Light Plant at Grayling should be maintained for brook trout, as this water seems well suited to the species, and as other trout have not become well established here. Therefore only brook trout should be planted. Liberal plants should be made each year in the east fork (outlet of Bradford Lake) and in any protected spring fed nursery streams tributary to this fork, or to the main stream within three miles of Frederick (north or south).

No trout should be planted in the ponds of the Electric Light Plant nor of the lumber plant at Grayling; Nor in the river between the dams of these plants, or between the lower dam and the mouth of the east Branch. Furthermore, none should be planted in any feeders tributary to the waters listed in this paragraph.

East Branch

This stream from the hatchery dam up should be maintained as far as possible as a brook trout stream. Plantings should be generous and should be made only in nursery feeders and done in the stream or its feeders above Jones Lake.

In the stream below the hatchery a moderate number of fingerlings of rainbow and brown trout (if available) may well be slowly liberated but no brook trout should be planted in this way.

Main stream between East and South Branches.

All three species of trout are well established here and an effort should be made to maintain them in abundance.

The brook trout should be planted abundantly and every year in most of the numerous feeders which enter this stretch of the river from the north, Henry Stephan's Creek, Barker Creek, and the outlet of Mud Lake and the outlet of the lake about 2 miles south east of Grayling should be passed by in planting brook trout.

Brown trout should be planted in fewer numbers in Henry Stephan's and Barker Creeks.

Rainbow trout should be planted in the cold spring holes at the sides of the main stream and in the mouths of the nursery feeders. The best scheme for planting rainbow here would be to load the fry or fingerlings on a boat at the hatchery and sprinkle them along the stream in suitable situations from the hatchery down to or below Wakeley's Bridge. We understand that Mr. Malsman has already constructed a fine boat for this purpose, and we wish to commend him for doing so.

South Branch

We do not recommend planting trout in the South Branch or its

tributaries above Roscommon.

The feeders of Robinson Creek and the Headwaters of Beaver Creek should be planted with a considerable number of brook trout each year. Some brook trout should be planted in the smaller colder brushlined feeders below Roscommon.

The tributaries of the South Branch below Roscommon (Except any planted to brook trout) ought to be planted with brown trout.

The lower portions of some of the larger tributaries below Roscommon, but not the main stream itself (because young pike are plentiful) should be planted with rainbow ~~planted with brown trout~~. fry, or better with fingerlings.

North Branch

We recommend that brook trout be maintained if possible in this fine stream and its tributaries, including Big Creek and its branches. A moderate number of rainbow trout may be planted in spring and in feeders below Kelloggs, but brown trout should not be planted in these waters, at least at present.

The brook trout should be planted only in the nursery streams in the upper parts of the Big Creek System, and those entering the North Branch above Dam Four. None should be planted however, in Crapo Creek, Chub Creek, Rangeline Creek nor other such lake outlets in Otsego County, nor in the feeders to such creeks. These creeks get fairly warm in summer and abound in large shiners and chubs.

River and tributaries in Oscoda County above Mio.

We do not recommend brook trout for this region, except in the East and West Branches of Big Creek above the point crossed by M 33. A generous plant should be made yearly in the headwater feeders of both of these branches.

Big Creek and its branches below the M 33 bridge and Whitewater Creek, or rather their feeders should be planted with a large number of brown trout each year.

A good plant of rainbow trout should be made each year in several of the small feeders which enter the AuSable between the North Branch and the Mio Pond, particularly on the North side of the river.

No trout should be put in Lost Creek, nor in the tributaries to the Mio Pond.

Au Sable and Tributaries between Mio and Bamfield Ponds

Owing to the daily fluctuation in the level of the river below the Mio Dam, no trout should be planted in the river, itself, nor in lagoons or springs at the sides of the river, nor in the lower half mile of the tributaries. Moderate plants of the three species of trout should be made tributary waters as follows;

Cherry Creek: rainbow fry in upper waters.

Perry Creek: rainbow fry below Kneeland, Brown trout fry in tributaries, brown trout in headwater feeders.

Comins Creek: brook trout.

Other tributaries: mostly brown trout fry (but some bushlined nursery creeks may be planted with brook trout.)

AuSable and minor affluents below Bamfield.

We recommend that no trout be planted in these waters.

Lower South Branch (Ogemaw County) and Pine River.

(Alcona County) and tributaries.

We have not thoroughly studied these waters but know that they have a very fair reputation as brook trout streams. This is especially true of the Pine system. We recommend that moderate plants of brook trout be alloted these waters, and that no brown trout be introduced. Some rainbow trout should be planted in the lower waters of the Pine System. At present we can not point out the particular streams best suited to the planting of esch kind of trout in these waters.

Summery for Brook Trout

(For details see preceding recommendations by localities.)
Only brook trout should be planted in the following waters. Large numbers of fry or fingerlings must be introduced, to enable the species to hold its own in the face of the strenuous over fishing of the present time.

1. The east fork (outlet of Bradford Lake) and feeders of this fork or of main stream within three miles of Frederick.
2. The east Branch above the Grayling Hatchery.
3. Feeders of main stream between East Branch and South Branch excepting Henry Stephan's Creek, Barker Creek, outlet of Mud Lake and outlet of lake about 8 miles southeast of Grayling.
4. Beaver and Robinson Creeks.
5. Feeders of North Branch above Dam Four, and of its tributary Big Creek, but not the outlet creek of lakes in Otsego County.
6. Both branches of Big Creek (of main stream) in headwaters above M 33
7. Comins Creek and perhaps some other tributaries between Mio and Bamfield.
8. Nursery streams in system of Lower South Branch in Ogemaw County.
9. Pine River system in Alcona County,

Summary for brown trout.

(For details see recommendations by localities.)
1. East Branch below the hatchery (moderate number, fingerlings only).
2. Henry Stephan's and Barker Creeks
3. Tributaries of South Branch below Roscommon.
4. Whitewater Creek.
5. Tributaries of Big Creek (of main stream) below M 33 bridge.
6. Tributaries of Perry Creek.
7. Other tributaries between Mio and Bamfield.

Summary for rainbow trout.

(For details see recommendations by localities).
1. East Branch below hatchery.
2. Springs and mouths of feeders of main river between East and South Branches.
3. Near mouth of larger feeders of South Bracnch, below Roscommon.
4. Springs and feeders along North Branch below Kelloggs.
5. Small feeders of main stream beween North Branch and Mio Pond especially on north side of river.
6. Upper waters of Cherry Creek.
7. Perry Creek below Kneeland.

No trout should be planted in the following waters.

1. Main river, at, above, or within threee miles of Linn Lake.
2. Ponds of Grayling Light Plant, ponds of lumber mills at

Grayling; river between these ponds, or between lower pond and mouth of East Branch; any feeders to these waters.

3. East Branch near or above Jones Lake.
4. Outlet of Lake 2 miles southeast of Grayling.
5. Outlet of Mud Lake.
6. South Branch or tributaries, above Roscommon (Robinson Creek, however, to be planted).
7. Crapo Creek, Chub Creek, Rangeline and other such lake outlet in Otsego County.
8. Lost Creek near Mio.
9. Any feeders leading into Mio Pond.
10. River or side springs below Mio, or lower half mile of feeder here
11. AuSable or minor tributaries at or below Bamfield Pond (the Lower South Branch of Ogemaw County and the Pine River system of Alcona County are to be planted.)

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V. REMOVAL OF OBSTRUCTIONS IN STREAM.

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We recommend the removal of old dams and jams and other obstructions to the normal flow of the trout streams in the AuSable system. We have particularly in mind Dam Two and Dam Four on the North Branch, and an old dam on the Manistee at Deward, and the jam at Lovells. These obstructions hold back the water so that it warms up some (the North Branch during a hot spell in June became almost too warm for brook trout) and produce ponds or deep holes where ~~almost~~ pike and other fish hold out. They also hold up the upstream passage of trout and decrease the area of spawning beds. It seems to us quite important that these and like obstructions no longer of use as dams, be removed in the near future.

VI. HOLDING ENEMIES IN CHECK.

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Many englers point their finger at the heron (crane) kingfisher, merganseraand other ducks, pike, dace, shiners, suckers, ets., as serious enemies of the trout. Doubtless all of these birds and fishes are harmful to some extent, but we do not believe the facts warrant any general killing of the birds or seining out or spearing the supposedly obnoxious fishes.

Of the birds the case is clear only against the Marganser in trout waters. Permits might be given to certain wardens to shoot mergansers on trout streams but care should be exercised in selecting the men, to insure that the permits are not misused.

We are vigorously opposed to the killing of any other birds as trout enemies. The know facts do not warrant this being done, and the value of the birds in other ways is sufficient to offset any damage they are know to do. Especially do we urge that protection be afforded the heron (Crane)

Among the fishes of the AuSable system the pike is probably the most dangerous enemy of the trout. In the ponds and lakes the pike warrants encouragement for here it is a fine food and game fish; in the trout waters it is pest, and should be removed. We do not favor

general permission being granted by law or othwise for the spearing of pike in trout or regions. The best method in the granting of limited permits to trustworthy men, allowing them to spear pike at certain places.

Other predaceous fishes are not abundant in the AuSable system or do not descend from the lakes into the trout waters in any large number. Some of the smaller fishes, as suckers, dace, shiners and muddlers may eat trout eggs, but we found no evidence of them doing so during our work in the fall. Some of these fishes probably eat some trout fry in the spring. This seems unavoidable.

The best methods of protecting the trout fry from both bird and fish enemies isto plant them in waters largely beyond the reach or chosen habitat of the enemies (man included as often the worst enemy) That is the idea behind our recommendations of closing nursery stream and planting the trout fry in proper situations.

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Vll. RESTRICTIONS AS TO SIZE, BAG LIMIT, AND SEASON.

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Many ides are current as to the best way of protecting the trout by restrictive legislation. Some of these ideas as the closing of all trout streams in the state for a period of years are not warranted. at least at present. The often expressed idea that forcing the engler to keep the first 10, 15, 20 or 30 trout he catches, regardless of size, should be a law, is not in harmony with the policy of closing nursery streams and in our opinion is not sound conseration, and should be opposed by the Department.

In the present state of our ignorance of the rate of growth of our trout in nature, and of other points in their life history, we are not prepared to suggest any changes ih the eize limit nor in the season. Work should oe started on these problems so that if the improvements in the hatcheries and in planting methods we are now making and the closing the nursery streams do not hold up the trout population, we will have the biological knowledge necessary to any sound restrictive legislation.