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RESOURCE DEVELOPMENT BRANCH

MANUSCRIPT REPORT

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DEPT. OF THE ENVIRONMENT
FISHERIES SERVICE
HALIFAX, N.S.

Report
Sissiboo River
Digby County
Nova Scotia

by
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FISHERIES SERVICE
DEPARTMENT OF FISHERIES AND FORESTRY OF CANADA
HALIFAX, N.S.

Introduction

During the summer of 1960 a survey was conducted on the Sissiboo River, Digby County, Nova Scotia. The primary objectives of this survey were to determine whether or not fishways should be installed at the major obstructions along the river; and how important the sport fishery was in that area.

Description of the Sissiboo River System

The Sissiboo River is approximately 40 miles long and drains into St. Marys Bay at Weymouth. The river starts at Ninth Lake, flowing through Eighth, Seventh etc., and Sissiboo (sometimes called "Grand") Lakes. The river drains a total of approximately 230 square miles, with principal tributaries being Mc Donald Brook from Andrews Lake, Mistake River and Lake, Wallace River and Lake, Maclaskie Lake, Chub Brook and Lakes, Sporting Lake Stream and Lake, and White Sand Stream and Lake.

Along the lower system, in addition to several stretches of rapids, there are two major obstructions. The lower is Weymouth Falls at Weymouth Mills. It is situated about 5.5 miles from the mouth of Weymouth harbor. At the time of completion of this survey (Sept. 9), work was nearing completion on an earth-fill dam which will replace the old timber dam built on a natural rock falls. The new dam is being constructed upstream from the natural falls.

The second obstruction is at Sissiboo Falls, about 5 miles upriver from Weymouth Mills. Until 1959 the Sissiboo Falls power station had used a timber dam built on a natural falls. A new concrete dam is nearly completed at the old dam site and will be completed by the fall of 1960. The new dam will have a head of approximately 90 feet; the headpond will be approximately 4 miles in length. The width of the river near this development will increase to

approximately 550-600 feet, from the original 100 feet.

Note: (At the time of completion of this survey some difficulty was being encountered at both dam sites. The problem in both cases dealt with a small break-through in the dams.)

The water supply required for the operation of the new power installations will be mainly controlled from the Fourth and Fifth lake headpond or reservoir.

Under natural conditions Fourth and Fifth lakes are practically separate units except for a narrow channel joining the two lakes.

At Fourth lake the major dam has been completed. This is an earth-filled dam with a total length of 1500 feet and a height of 80 feet.

Near the existing low lying areas, wing-dams have been constructed to maintain the water level in the headpond.

Some timber has been cleared from the flowage area, but, it appears that a great deal of vegetation, including: fir, spruce, maple, poplar etc. will be partially

submerged.

Fisheries Along The Lower Sissiboo River
(Grand Lake to Weymouth Harbour)

Atlantic salmon (Salmo salar)

According to all reports there does not appear to have been any salmon caught in the river within the last 50-60 years. Local residents made some mention about a few salmon which were observed jumping below Weymouth Falls some 40 years ago. Little information could be collected regarding the accuracy of these observations and, therefore the writer is not prepared to make any further comments. However, it does appear unlikely that any salmon could ascend Weymouth Falls even before construction of the present power dam. Furthermore, the river bed, both, above and below Sissiboo Falls does not appear to be suitable ~~for~~

for spawning and reaving of salmon.

Striped bass (Roccus saxatilis)

Local anglers indicated that there has never been good bass fishing near the mouth of this river. During the summer of 1960 only three striped bass were caught at Weymouth. These fish did not exceed five pounds. It was difficult to determine what populations of bass the river might have been supporting. At no time during the angling season was there more than one person fishing; usually there were no anglers.

Speckled Trout (Salvelinus fontinalis)

During the early spring small numbers of sea-trout were caught below Weymouth Mills. The fishing lasted for a period not exceeding ten days, and nothing was reported later in the season.

Considerable trout fishing is carried out along the river from Sissiboo Falls to Fourth and Fifth Lakes. The tributary streams and brooks running into the system are the primary attractions to the anglers in the area.

Anglers reported that fishing was fair during the early season (May), and very poor during the summer. Most trout taken from the main river were of a good size; averaging about 12-14 inches. The yellow perch, Perca flavescens is a very serious competitor in these waters.

It is felt that the carrying capacity of the whole system, tributaries included, is low. This

can be attributed to:

a) the presence of a competitive species, *Perca flavescens*.

b) geological characteristics. (granite).

Mistake River

This river drains Mistake Lake and flows approximately 3.5 miles before draining into the Sissibo o River. The maximum width is 50 feet. Near the outlet from Mistake Lake there is an extensive dead water area which carries a good trout population. The remainder of the river consists of riffle areas and pools not exceeding six feet in depth. Granite boulders are very common along the river.

Yellow perch are very scarce in this stream and are not competitive to any great extent with the speckled trout. Other species present in the river are:

a). Golden shiner (*Notemoginus crysoleucas*)

b) Creek chub (Semotilus atromaculatus)

c) White sucker (Catostomus catostomus)

d) American eel (Anguilla rostrata)

The trout population in this river is probably maintained in two ways:

a) Natural reproduction:- several small streams run into the Mistake river and provide suitable spawning grounds for trout. Throughout the summer trout fry could be observed in these areas.

b) Introduced trout:- Mistake lake is popular as a resort area. Stocking practices have been carried out for a number of years in this lake. Reports from local residents indicated that the fishing has been very poor for many years. It is strongly felt that the bulk of these hatchery trout move from the lake into the stream or river.

Wallace River

The Wallace River is one of the major streams running into the Sissiboo River system. It is a larger river than the Mistake, and, possesses deeper pools, more extensive dead water etc. Considerable granite is also found in this river. Coarse gravel is very common along the river bed.

A considerable amount of angling is done on the river during the early spring. Local fishermen reported very poor catches during 1960. The writer fished this river several times during the early spring and summer, and, the results were not encouraging. Yellow perch were very abundant at all times. The presence of these species discourages a great number of fishermen who would otherwise fish in this river.

Sissiboo Lake or Grand Lake

Reports from local residents indicate that fishing is poor in this lake.

Uniacke Lake

All reports indicate that this lake is very good for speckled trout fishing. This lake is difficult to reach and guide services are necessary. Consequently, very few fishermen go into this lake.

Chub Lake and Brook

Probably the best fishing area in the district. is located along chub brook. On several occasions the writer observed excellent catches of trout taken from these waters. The difficulties encountered in reaching this fishing area discourage most fishermen.

Chub brook runs through a swampy area. For the most part, the brook is mainly mud.

Fourth and Fifth Lakes

The combination of these two lake systems encompasses a very extensive body of water. Fishing in these lakes is very poor. However, the major streams which run into this lake system carry substantial populations of speckled trout. The major streams in this area are Whitesand and Sporting Lake. However, the yellow perch population is high and does present a problem with regard to sport fisheries.

Fifth Lake

Maximum length ... 3.8 miles
Maximum width .... 1.2 "
Maximum depth ... 17 feet.
Average depth .... 9-10 " .

pH ..... 6.2 - 6.4
O_2 ..... 6 ppm.
Turbidity ..... 3 feet
Plankton ..... few in numbers
Aquatic organisms (Insects etc.) - very scarce. (Sta. #1 and #2)
" " " (shoreline) - Trichoptera, Ephemeridae, Plecoptera, Odonata, Gerridae, Dytiscidae,

Note: Little work was done with regard to studying the

abundance of aquatic organisms along the shoreline. During July some random sampling was conducted on rocks not exceeding one pound.

The following insects were recorded from 50 stones observed.

a) Tricopteva .... 67 .... 1.34/stone.
b) Ephemevidae 93 .... 1.86/stone.
c) Plecopteva 28 .... .56/stone.

Representative species of the other previously mentioned families of insects were not observed.

Vegetation:-

Broad-leaved arrowhead, Sagittaria latifolia
Narrow-leaved cat-tail, Typha angustifolia
Broad- " " " Typha latifolia
Water-lilies Nymphaeaceae

Tempevatuves:

Daily vecovds of the tempevatuve were kept in Fifth Lake. Stations were estabished in vepvesentative aveas in the lake. Theve was no noticable diffevence in tempevatuve veadings between the two stations. Observations with vespect to tempevatuve showed that Fifth Lake was a "wavm watev" lake.

eg. June 29 Time: 10:05 A.M. Air Temp: 29°C.

Surface .. 22.5 °C.
2.5' ... 22.3 °C
4.5' ... 22.1 °C.
7.5' ... 22.1 °C.
10.5' ... 22.1 °C
13.5' ... 21.9°C

eg. August 2 Surface ... 22.0°C
4.5' ... 21.6°C.

10·5 . . . . 21·5 °C
13·5 . . . . 21·4 °C.

eg. September 2 Time: 12:55 P.M. Air Temp. 23·5°C
Surface . . . . . 24°C.
4·5 . . . . . 23·5°C.
7·5 . . . . . 22·5°C.
10·5 . . . . . 22·0°C.
13·0 . . . . . 21·9°C.

Fish species:

Yellow perch	Perca	flavescens
Golden shiner	Notemogonus	crysoleucas
Longnose sucker	Catostomus	catostomus
American eel	Anguilla	rostrata
Speckled trout	Salvelinus	fontinalis

Characteristics of Lake:

a) Numerous small islands. Mostly wooded. (spruce)
b) Large granite boulders scattered throughout.
c) Considerable amount of submerged vegetation along western shore.
d) Shoreline mostly rocky especially along north side.
e) Gravel beaches quite numerous.
f) Considerable amount of partially decomposed organic matter.
g) Bottom consists mostly of black muck with partially decomposed O.M. suspended in it.

Netting Operations:

Net settings were made in Fifth Lake periodically from June to September. All likely trout

waters were netted, including inlets and outlet. The results were not satisfactory with respect to trout. During the whole netting period not no trout captures were made. The most common species of fish to be taken during the summer was the yellow perch. Most of these fish appeared to be of a stunted growth - 3"- 4". Occassionally a large perch would be netted - 1 lb.

A typical example of what constituted a capture from nets during summer -

eg. June 23.

150	yellow perch	Perca flavescens
2	Northern black bullheads	Ictalurus melas melas
2	longnose suckers	Catostomus catostomus
NO	trout	

Considerable angling was done throughout the summer. The presence of yellow perch made trout fishing very difficult.

Early in May several trout were caught near the outlet of Fifth Lake. No captures were made later in the season.

Local residents indicated that good fishing occurs along the major inlets to Fifth Lake in early spring. However, during the past two or three years the catches have dropped off considerably. This can probably be attributed to the increase in the no. of anglers who are able to gain access to these waters quite easily as a result of the new road to Fifth Lake.

Fourth Lake

A narrow channel joins Fifth and Fourth Lakes. The total length of this channel is approximately 1.5 miles. Vegetation along the channel is sparse with only scattered

trees existing. There has been no attempts to clear existing timber in the flowage area.

Practically the same conditions exist in this lake as the one previously mentioned with regard to fish present, environmental chavacteristics etc.

It was not possible to spend as much time on this lake and consequently only some of the basic information was obtained.

Two net settings were made, and, yellow perch were the dominant species present. No trout were captured.

Temperatures during early September were as follows:

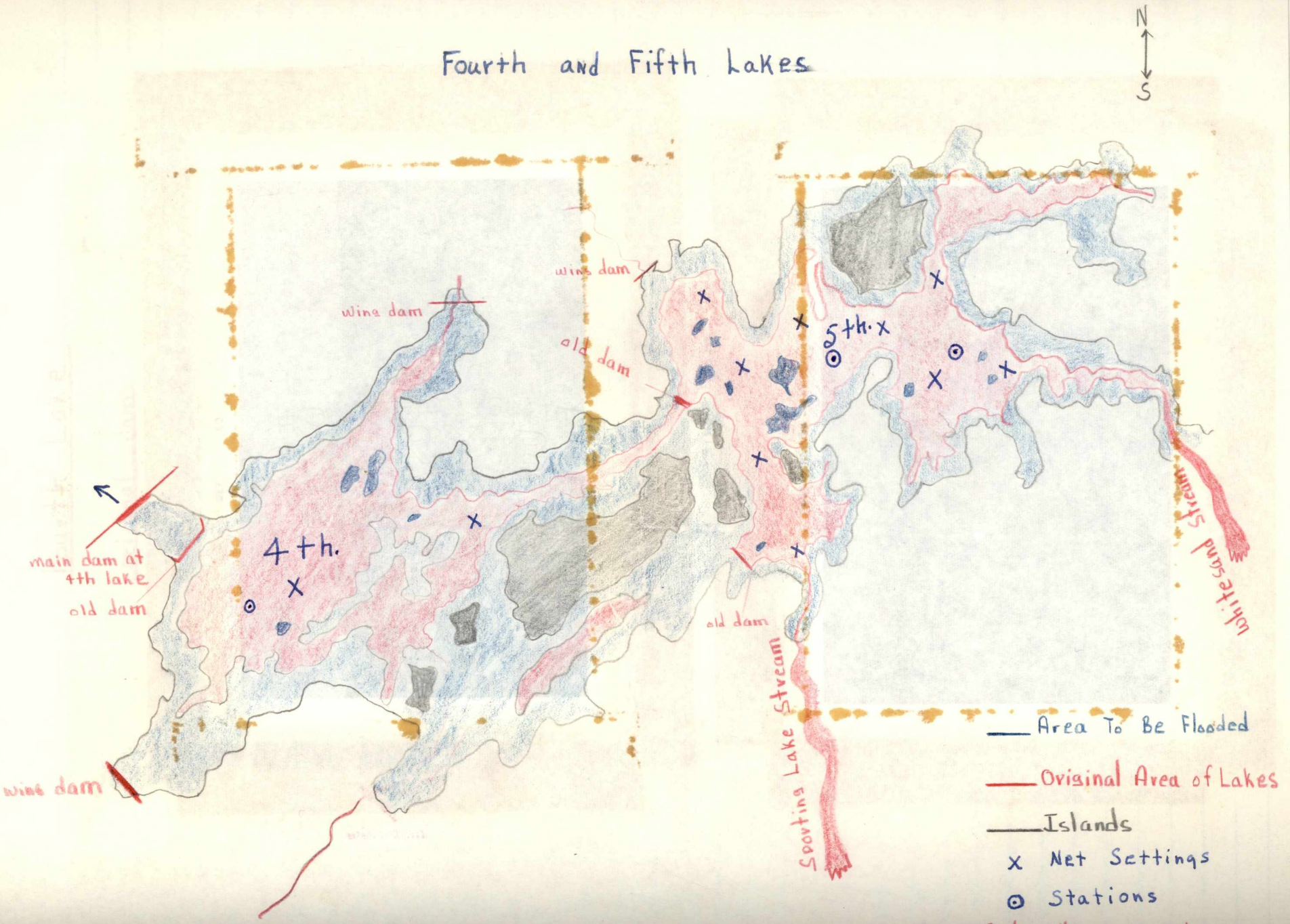
Surface	23.5°C.
3.5'	23.2°C.
8.5'	23.2°C
10.0'	23.1°C

PH 6.3

Very few organisms around the shore line.

Average depth 9 feet.

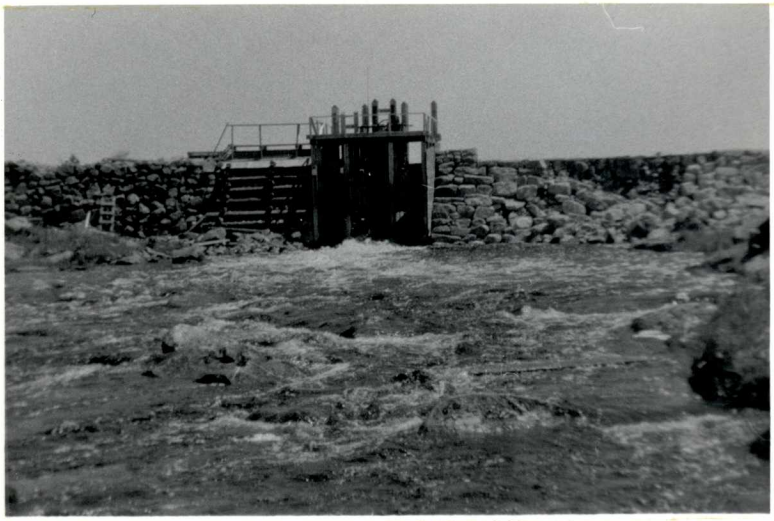
Fourth and Fifth Lakes



Fourth Lake

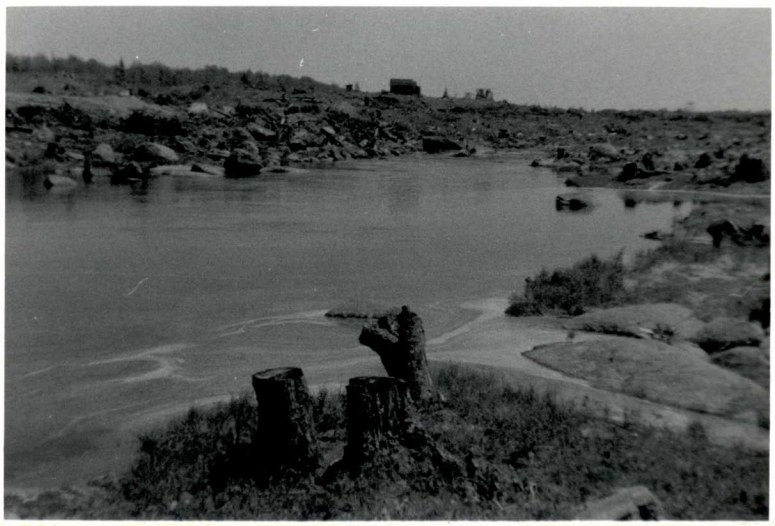
original dam

SEP · 60



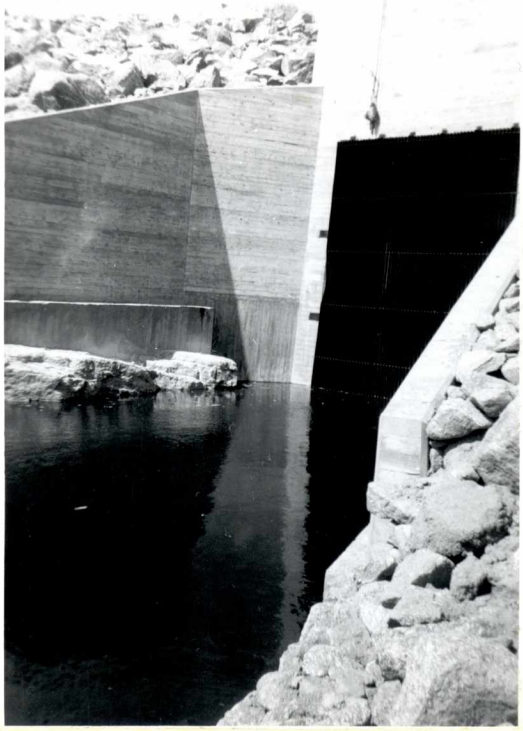
below original dam

SEP · 60



Fourth Lake

new dam



regulating dam

Fourth Lake

• OCT • 60

low water conditions

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Fifth Lake

Discussion

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SEP · 60

Discussion

As a result of the present development, access to the lakes affected will be greatly improved. At the time of this survey a very good gravel road extended to Fifth Lake. Having access to these areas could eventually result in the development of a hunting and guiding industry.

Fishing pressures will undoubtedly increase in these areas. In order to cope with this situation some attempts must be made to improve existing conditions with respect to fisheries.

Lake areas will be larger and possibly able to support larger fish populations or other attractive species of sport fish. Conditions are very good for transporting hatchery fish into desired lakes. It should be noted, however, that the road beyond Sissiboo Lake is owned by the Mersey Paper Company. It is understood that a gate will be in operation at all times, thus preventing any fishermen

from using this road to transport equipment such as boats motors, tents etc.

Recommendations For Improvement

There appears to be no reason for considering fish ladders at the obstructions below Fourth Lake. The river is not suitable for salmon even under natural conditions; and, with the present flooding of the river bed, any thought of improving this fishery is eliminated.

Trout fishing is not popular along this section of river. This is due primarily to the lack of fish. If the area were stocked with a desirable species of sport fish there is no doubt but what fishing would increase considerably.

Probably the best species of fish to introduce into this area would be brown trout, Salmo trutta. The decision is based entirely on conditions as the writer observed them during the course of this survey.

a) Suitable forage species available. (perch and chub)
b) Temperature during August 70-72°F
c) Suitable spawning streams
d) Few bottom organisms in most areas.

The previously mentioned conditions favor the habits of brown trout more than those of brook trout. Brown trout are more tolerant of adverse environmental conditions including higher water temperatures. They are predators and would undoubtedly do very well, considering the abundance of yellow perch and creek chub. Adequate spawning areas are available on the Mistake and Wallace rivers. Probably most of the other smaller streams running into the area are also suitable for spawning.

Certain disadvantages of a brown trout population must also be considered.

a) Most literature referring to brown trout indicates that this species is more difficult to catch than speckled trout.

b) If this species were introduced into the main river it would eventually reach some of the tributary streams such as the Mistake etc. It would likely compete severely with the speckled trout in that area.

The writer recommends yearling brown trout for ~~that~~ area between Fourth Lake and Sissiboo dam. Fry or

fingerlings will not be suitable. This decision has been made for the following reasons:-

a). Scarcity of bottom organisms. - Young brown trout, including fingerlings and fry depend almost entirely on aquatic insects for survival.

b) Abundance of yellow perch. - If small trout were introduced it would mean having the greater percentage of them consumed by these predatous.

Fourth and Fifth Lakes

This water system undoubtedly requires the most attention with respect to improvement of the sport fishery.

Conditions in these lakes will probably change as a result of the flooding. Water levels will increase approximately 10-12-feet. This is a considerable change from the original condition. Results obtained during 1960 could be altered considerably within the next few years as a result of the increased water level. This creates some problem with regards to making a recommendation for improvement.

Considering results obtained this year, it seems reasonable to assume that the present lake conditions are not suitable for speckled trout. Temperature records and the presence of undesirable species indicate that speckled trout would not do well in the lake.

Three possibilities exist with regard to improvement:

a) Poison the water system to get rid of undesirable species. It does not seem likely that this could be done with good results. The system is to large and a great number of small streams flow into it. The expense would be great.

b) Population of smallmouth bass, Micropterus dolomieui

It appears likely that bass would do well in these waters. Temperatures are suitable, and yellow perch and golden shiners provide excellent forage for these fish.
Most of the anglers in the district prefer a trout fishery if possible.

c) Population of rainbow trout, Salmo gairdneri

The writer would prefer a rainbow trout fishery in this area. If such a fishery were to become successful in these waters it probably would provide some income for the local residents.
Present conditions appear to be favorable for

~~favorable for~~ rainbow trout. Good spawning areas are available in Whitesand and Sporting Lake streams. Forage species are abundant; this should result in good growth rates.

The rainbow trout thrives best in temperatures ranging from 38°F in the winter to 70°F in the summer. According to Lagler 1956, the rainbow trout can withstand higher and lower temperatures if it is acclimated gradually.

There would probably be some competition with this species and brook trout. However, fishing has not be good enough in these streams to present any argument in favor of speckled trout.

Spawning is usually accompanied by at least some upstream migration. The nest site is often located at the tail of a pool where the water is swift and the gravel clean. Whitesand and Sporting Lake streams have ideal spawning areas which could be utilized by these species.

Yearling trout would be the recommended size. These fish would be large enough to utilize the forage species, and, would also be free from competition.

The recommended number of fish to stock would be 500/acre.

Summary

The results of the survey indicated that:—

① No fishways were required at any of the obstructions along the Sissiboo River. This included the wing dams along Fourth and Fifth Lakes.

② Fishing was generally poor throughout this whole area. Speckled trout were the only species of sport fish available to the angler; these were few in numbers.

③ In order to improve the fisheries in that area a species of fish must be introduced which will compete satisfactorily with the yellow perch.

④ Granite is the most common mineral in the area. Waters are soft, (low in salts) a characteristic feature of all granite waters. Carrying capacity of all areas is low, due to this factor.

⑤ Fourth and Fifth Lakes possess very high maximum temperatures. (21-24°C).
Conditions are not particularly favorable for speckled trout.

⑥ Brown trout would probably be the best species to introduce in the area between Fourth Lake and Sissiboo Falls.

⑦ Rainbow trout should be quite successful in Fourth and Fifth Lakes.