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RESOURCE DEVELOPMENT BRANCH

MANUSCRIPT REPORT

No. 56-1

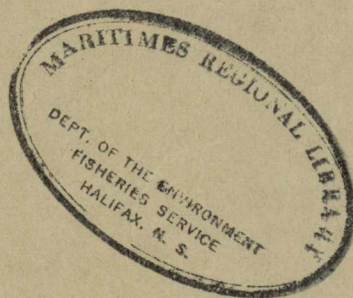
Jordan River

Shelburne Co., N.S.

1956

by

N.E. MacEachern



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

JORDAN RIVER

SHELBURNE CO., N.S.

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Department of Fisheries
Halifax, N. S.

JORDAN RIVER

A preliminary survey to check on salmon nursery and spawning areas was carried out on the Jordan River in October 1955. Water levels were high at that time, so the survey was continued during July 1956 when water levels were much lower.

GENERAL DESCRIPTION

Jordan River is located in Shelburne County, Nova Scotia. The drainage area covers approximately 168 square miles, including the Jordan Lake area. The watershed is characterized by low, flat country, partly wooded and partly barren.

The main river from tidewater to Jordan Lake measures 18 miles. Lake John, 5 miles in length, is located on the main river 15 miles above tidewater. The west branch enters the main river on the true right bank about 3 miles above Lake John.

The river flows southerly from the headwaters at Jordan Lake and empties into the Atlantic Ocean at Jordan Bay. The upper half of the river is comprised of stillwater stretches with short, rocky rapid areas between them. On the lower half of the river, the stillwater areas are limited and the riffle areas predominate. In the stillwater sections, the bottom is composed of mud, sand, rocks and emergent boulders. The riverbed in the riffle areas is made up of rock and rubble on the upper portion of the river gradually changing to gravel and sand on the lower part. The water is brown in colour.

In 1928, the outlet of Jordan Lake was dammed, and the water was diverted through a canal to the Mersey River system. Jordan Lake covers approximately 3,130 acres. By damming Jordan Lake, 27 square miles of the drainage area was lost to the Jordan River system, resulting in a reduced flow of water on the main river.

Accessibility to Jordan River is fair. A tractor road runs from Jordan up to Lake John, but it is situated about $\frac{1}{2}$ to $1\frac{1}{2}$ miles from the river. Above Lake John, the best means of travel is by canoe and trails.

NURSERY AREAS

The quality of the nursery areas on the Jordan River vary from fair to very good. Many areas on the Jordan River have a reduced value as nursery areas because of the large stillwater sections which are suitable habitats for predatory fish. The riffle areas of the river provide good nursery potential, but they are hampered by low water levels during the summer months. The nursery areas of the river are described below and marked on the map as N-1, N-2, etc.

N-1 The lower 5 miles of Jordan River from tidewater to the mouth of Four Mile Brook provide good nursery area for salmon. This section has an average width of 75 feet and an average depth of 7 inches. The riverbed has an average width of 105 feet. The gradient is slight and the water velocity varies from gentle to moderate. The riverbed is composed of gravel interspersed with rocks, boulders and sand. Pools are wide and intermediate in depth. Shelter is provided by rocks and numerous small pockets and channels. Shade conditions were poor. Fish food was present but not in abundance. The types of aquatic insects found included mayfly nymphs (Ephemera), caddis fly larvae (Trichoptera), midge larvae (Diptera), damsel and dragon fly nymphs (Odonata) and stonefly nymphs (Plecoptera). Numerous salmon fry were found on this section of the river but salmon parr were caught. The nursery area was estimated to be 220,000 square yards.

N-2 A one mile section, from Big Fall Dam up to the mouth of Six Mile Brook, is considered only a fair nursery area. This area is a long deep stillwater, and its suitability as a predatory fish habitat reduces its nursery value. The average width is 75 feet and average depth is 4 feet. The gradient is slight and the velocity is sluggish. The bottom of the river is composed of mud, rock and sand. Shade conditions are poor. The size of the nursery area was 44,000 square yards.

N-3 One of the best nursery areas on the river was found on the 3 mile section from the mouth of Six Mile Brook up to the mouth of Eight Mile Brook. The average width of the river-bed is 110 feet. The water velocity varies from moderate to rapid. Good shelter was provided by the bottom composition of rocks and gravel. Pools in this area were of the stillwater type. Shade conditions were fair. Fish food was abundant in this area and similar to the types observed in area N-1. This section provides 174,000 square yards of nursery area.

N-4 The 4 Mile area from the mouth of Eight Mile Brook up to Lake John was classed as only fair in quality for a salmon nursery area. The section is comprised of 60% stillwater area and 40% riffle area. The average width of the riffle area is 65 feet and the average depth is 7 inches while the stillwater sections are twice as wide and 3 to 4 feet in depth. The rock and rubble bottom of the riffle area changes to mud, sand and rocks in the stillwater areas. The velocity varies from sluggish in the stillwaters to moderate and rapid in the running areas. Rocks and boulders in the riffle areas furnish shelter for salmon parr. Shade conditions varied from good to fair. Caddis fly larvae (Trichoptera) and mayfly nymphs were abundant, and stonefly nymphs (Plecoptera), beetle larvae (Coleoptera), damsel and dragon fly nymphs (Odonata) and fish flies (Sialidae) were also present. The nursery area was estimated to be 154,000 square yards.

N-5 Eight Mile Brook provides limited nursery area. The brook enters the main river on the true left bank about 4 miles below Lake John. The stream measures 6 miles in length and alternates between long stillwater areas and rocky runs. The average width of the runs is 20 feet and the average depth is 4 inches. Shade and shelter were good. Fish food was abundant on the rocky riffle area. The brook provides approximately 63,000 square yards of nursery area.

N-6 Stoney Brook, entering the main river on the true right bank about one mile below Lake John, is similar to Eight Mile Brook. Stillwater area alternates with rocky riffle areas. The brook is approximately 12 miles long and has an average width of 20 feet. Approximately nursery area is 126,000 square yards including the stillwater sections.

N-7 The main river extends up above Lake John for 3 miles where it divides into the East and West Branches. Suitable nursery area was found on the $\frac{1}{2}$ mile section below the Forks which is riffle area. The remaining $2\frac{1}{2}$ miles down to Lake John is stillwater area. The average width of the riffle section is 50 feet, and the average depth is 5 inches. It provides a potential nursery area of 15,000 square yards. The upper half of the section has a rocky riverbed gradually changing to gravel and sand on the lower part. Caddis larvae, stonefly nymphs and chironomids were abundant.

N-8 West Branch enters the main river about 3 miles above Lake John and is approximately 10 miles in length. The stream has alternating riffle areas and stillwater areas. Riffle areas have an average width of 17 feet with moderate to rapid velocity flowing over a rock and cobble riverbed. The nursery area of the stream is estimated to be 70,000 square yards.

SPAWNING AREAS

Spawning areas on the Jordan River are found only on the main river below Lake John. The areas found are described below and listed as S-1, S-2, etc. on the attached map.

S-1 From tidewater up to Four Mile Brook, a distance of five miles, the river bottom has a composition suitable for spawning purposes. The riverbed is made up of gravel, sand, rock and boulders with gravel predominating. The average width of the river is 90 feet. Deep stillwater pools on the section of the river provide holding areas for salmon. This section provides approximately 200,000 square yards of spawning area.

S-2 The three sections of main river between Six Mile Brook and Eight Mile Brook provide suitable spawning bottom with a potential of 70,000 square yards. This section alternates between rock and gravel. Pools in this section are limited, but there is a long deep stillwater below Six Mile Brook and large stillwater areas above the mouth of Eight Mile Brook. This section has an average width of 80 feet. The velocity is moderate.

S-3 A small spawning area was found near the lower end of Eight Mile Brook. The area extends for about $\frac{1}{4}$ of a mile and the average width of the stream is 17 feet and provides a potential of 2,600 square yards. The velocity is moderate. There are no holding pools on this section of the stream except at the mouth of the river there is a large stillwater pool.

CONCLUSION

The main nursery area on the Jordan River was found on the 15 mile section of river between tidewater and Lake John. This section of river is comprised of approximately 60% riffles and 40% stillwater. Stillwater areas predominate on the upper section and riffle areas are more abundant on the lower half of the river. The stillwater areas, although classed as nursery, are considered only fair in value because of their suitability as a predatory fish habitat. This fifteen miles of the river provides 592,000 square yards of nursery area varying in quality from fair to very good. The tributary streams and the river section above Lake John provide 274,000 square yards of nursery area.

The riffle areas on the river provide good nursery habitats for young salmon but they are reduced in value because of low water conditions. As the water levels in the river drop during dry summer periods, the nursery habitat is diminished and food producing areas are lost. Extremely low water conditions on the river force young salmon into the stillwater areas where predation and competition from coarse fish is greater than in the riffle areas.

At the time of the survey, water levels were low but they had not reached the danger areas. There was sufficient water flowing over the riffle to provide a suitable habitat for salmon, but the areas were diminished in width. One exception was a $\frac{1}{4}$ mile section of river with an average width of 135 feet; the water was spread so thin over the riverbed that it was not suitable as a nursery for young salmon.

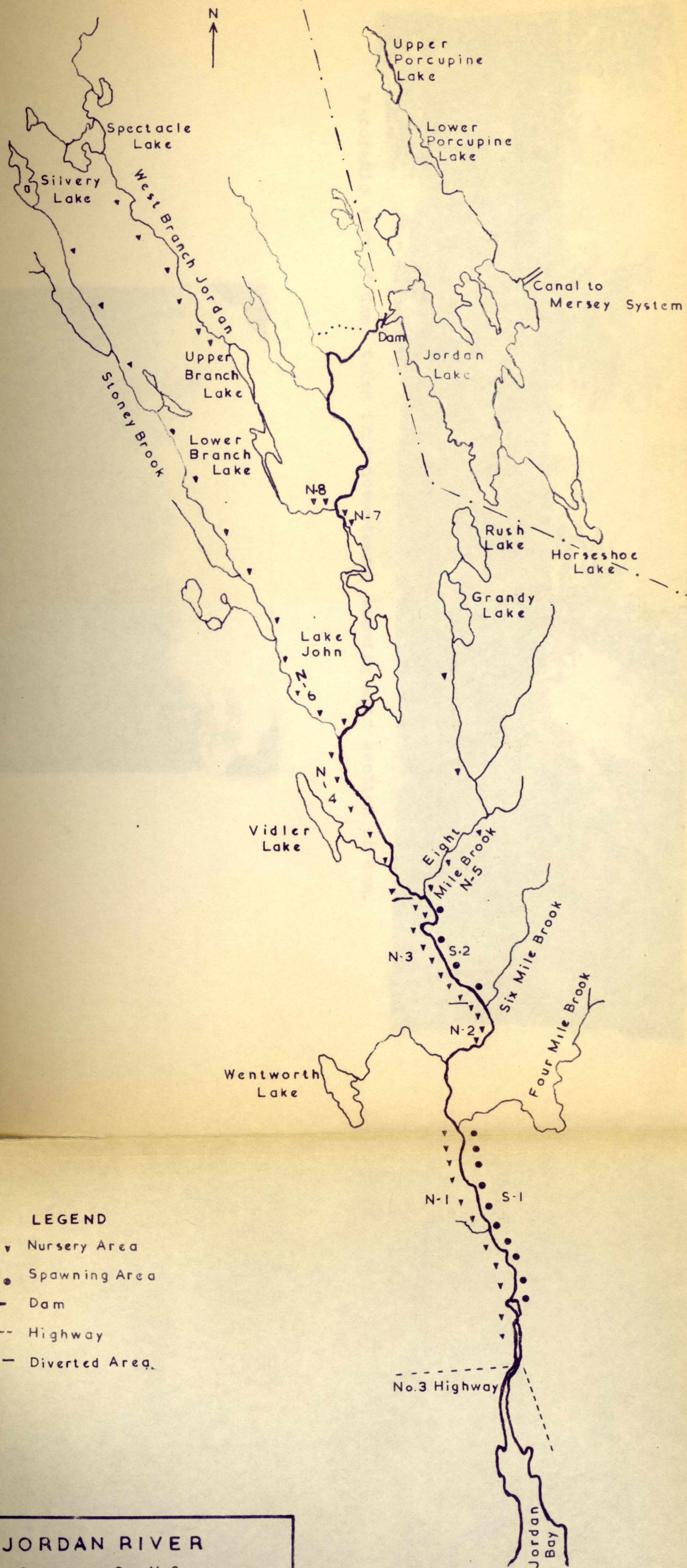
Local residents also claim that during late spring, summer, and early fall, water levels are too low most of the time to allow adult salmon to enter the river.

One cause of the low water levels on the river was the damming of the headwaters at Jordan Lake and diverting this water into the Mersey River system. This area covers approximately 27 square miles of drainage area or about 16 per cent of the total watershed. This dam is now owned by the Nova Scotia Power Commission.






RECOMMENDATIONS

1. A minimum flow requirement from Jordan Lake of 25 c.f.s. during summer and early fall would help maintain better salmon nursery areas on the main river. It is doubtful if this amount of water would be sufficient to attract adult salmon into the river.

2. Consideration should also be given to building a storage dam at Lake John. By using an automatic gate arrangement, excessive water could be stored during wet weather and gradually released over the river to help maintain a higher level of water on the main river. If a minimum requirement cannot be obtained from Jordan Lake, it is suggested that the Nova Scotia Power Commission be responsible for building storage areas on the main river.



LEGEND

-  Nursery Area
-  Spawning Area
-  Dam
-  Highway
-  Diverted Area

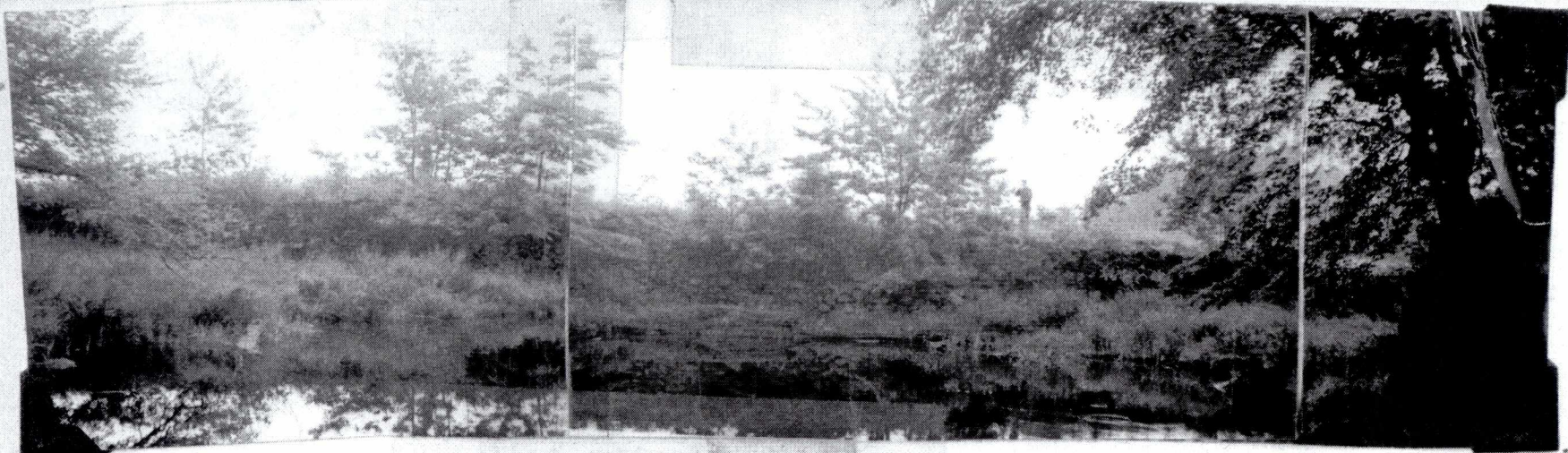
JORDAN RIVER

Shelburne Co. N. S.

Scale: 1 in. = 2 mi.

Date: July 1956

JORDAN LAKE DAM



Panoramic view of dam, taken from downstream, showing main section of dam.



Approx. same section as above, taken from lake showing front of dam.

JORDAN LAKE DAM



Above: Close up view taken from below showing type of construction.

Below: General view taken below dam, showing part of stillwater and and main section of dam.

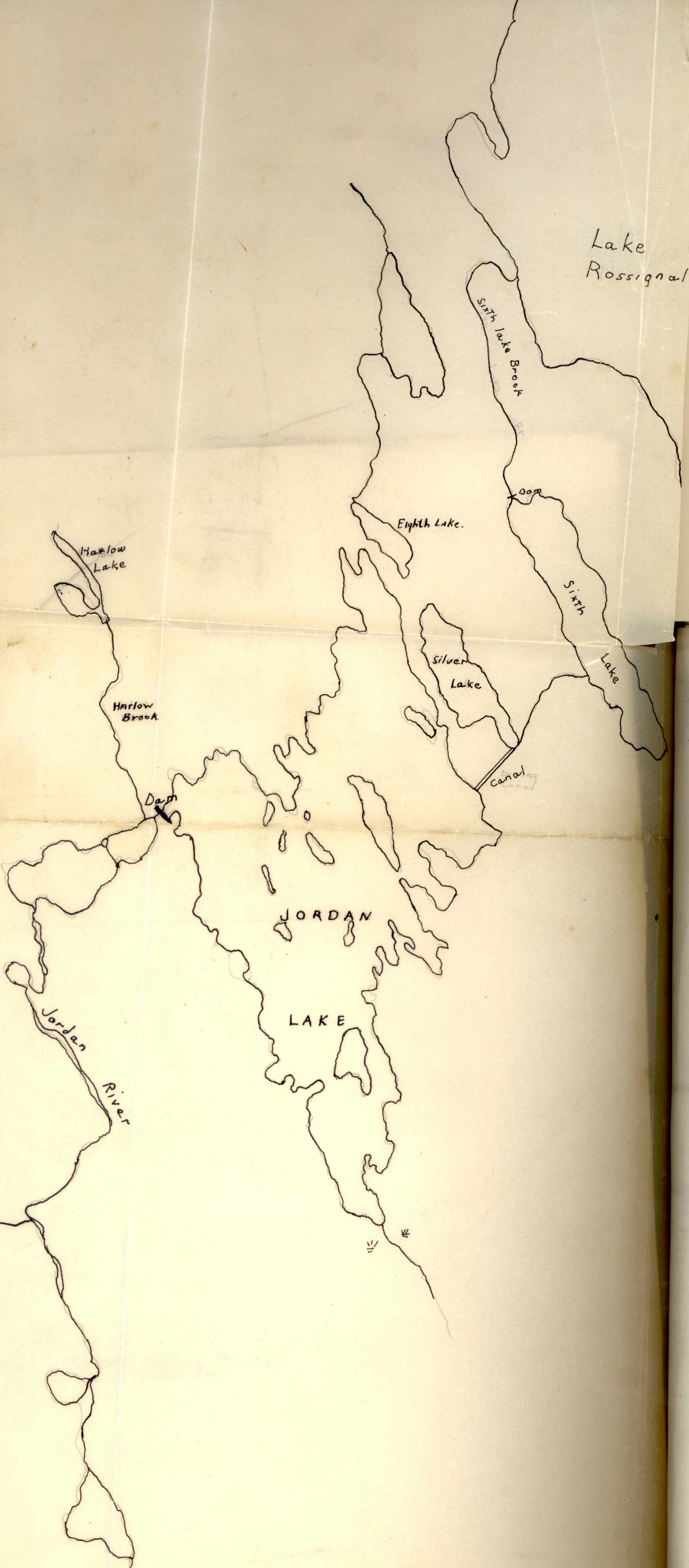


Above: View from below dam, showing stillwater formed below dam.

Below: Stillwater below dam, taken from top of dam.



Lake
Rossignal



Harlow
Lake

Harlow
Brook

Dam

Jordan
River

JORDAN

LAKE

Eighth Lake.

Silver
Lake

Sixth Lake Brook

Sixth
Lake

Canal

Jordan River System.
Shelburne Co., N.S.