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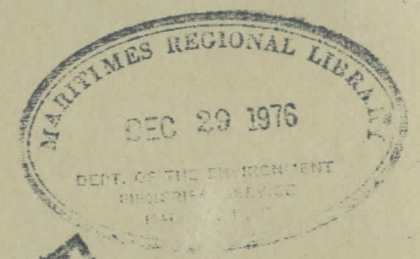


Environment Canada Environnement Canada

# RESOURCE DEVELOPMENT BRANCH

## MANUSCRIPT REPORT

No. 55-7



Tobique River salmon survey.

by

K. Smith & J. Ingram

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Fisheries Service  
Halifax, N.S.

## TOBIQUE RIVER SALMON SURVEY

By K. Smith and J. Ingram

### ABSTRACT

Many good salmon spawning areas were observed on the Tobique River system, particularly along the upper 15 miles of the main river, and on the Right Hand Branch, Serpentine River and Little Tobique River. Less extensive spawning areas were found also along the middle and lower parts of the main river and on several other tributaries; such as, Mamozekel, Gulquac and Wapskehegan Rivers.

Suitable salmon nursery area was found in most of the main river, except in the flowage areas of the Tobique Narrows Dam, and the mill dam at Plaster Rock. Also, much suitable nursery area is found throughout most of the tributaries.

No serious pollution sources are present, and few predators were observed.

Several barriers are present on the tributaries. However, considering the suitable spawning and nursery areas presently available, those located above the barriers are considered to be of minor importance.

## LOCATION

The Tobique River flows approximately from north-east to wouthwest and empties into the Saint John River about 2½ miles above the town of Perth. The main river lies in Victoria County, with the upper parts of some of the tributaries extending into Northumberland and ~~Westmorland~~ Counties, N. B.

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## TIME AND EXTENT OF SURVEY

This survey was carried out during the period July 22nd to September 21, 1955. In this survey, the main river was covered from just above the Tobique Narrows flowage area to the headwaters, a distance of approximately 50 miles. All of the main tributaries and several smaller ones were also covered in the survey. This river system embraces a drainage area of more than 1600 square miles.

## GENERAL DESCRIPTION OF RIVER

The headwaters of the main river are made up of several branches, which converge just above the settlement of Nictau. These branches will be listed and described below under the heading of "Tributaries."

The uppermost section of main river, extending from Nictau downstream about 15 miles, consists mostly of gentle to medium swift riffles, with short stretches of quiet water alternating. The bottom along this section consists mostly of fine to medium gravel, with a smaller percentage of coarse gravel and occasional ledges present. Approximately 15 suitable rest pools, 5 - 10 feet deep, were observed here. Roughly, 75% of the shoreline here consists of woods, and 25% of cultivated fields and bushes. Ample shade and shelter are provided by marginal vegetation, coarse gravel and rocks on the river bottom.

The next 4 - 5 mile section of river is much the same, except that quiet water areas, 1 - 4 feet deep, are more numerous and longer. However, suitable spawning areas are still quite plentiful in the rips and tails of some pools.

From here downriver to a point about 4 miles below the entrance of the Gulquac River, quiet water areas are still more numerous and larger. However, occasional small suitable spawning areas are still found in a few of the alternating riffle areas.

From this point down to the Fraser Companies' mill dam at Plaster Rock, the river consists almost entirely of deep, fast-moving water, and a long stillwater immediately above the dam. This section of the river is considered mostly unsuitable for salmon spawning, but may provide fairly good nursery area. However, few parr were observed along this section. This was at least partly due to deep, turbid water caused by heavy rains before and during the survey.

In the next section of river, extending from Plaster Rock downriver 4 - 5 miles, most of the river bottom consists of poorly sorted gravel and much coarse material. This section is mostly quite unsuitable for salmon spawning. Here, a few gentle riffle areas alternate with long quiet water areas. Suitable spawning conditions are found along a riffle area just above and below the entrance of the Wapskehegan River.

Along the next section of river, extending from a short distance above the entrance of Three Brooks, almost to the bridge at Arthurette, abundant suitable spawning area was observed in shallow riffles. Here, the river bottom consists mostly of fine to medium gravel in the riffles, and poorly sorted gravel and rocks in the pools and quiet areas. Three large rest pools, 8 - 10 feet deep, and a few smaller ones, were observed in this section.

Just above the highway bridge at Arthurette, steep rapids are found flowing over rock ledges and boulders. The river bottom below the bridge also consists mostly of ledges and boulders. Gentle to medium riffles here extend downriver a few hundred yards to the head of the flowage area of the Tobique Narrows dam. No good spawning areas were observed in this section. However, it may be quite suitable as a nursery, although only a few parr were observed. The reasons so few parr were observed were probably due to the dark colour of the water and the difficult seining conditions.

The flowage area, which extends from just below Arthurette to the Tobique Narrows Dam, is more than five miles in length. This section is considered unsuitable for either salmon spawning, or as a nursery.

TRIBUTARIES.

The headwaters of the main Tobique River are made up of four main branches, which join just above the Nictau Air Field. These branches are Sisson River, Little Tobique River, Mamozekel River and Right Hand Branch of Tobique River (Campbell River). These main tributaries will be described first in the following, and the remaining tributaries, in order, from source to mouth:-

Sisson River. This river flows approximately from northwest to southeast. About 8 miles above the mouth, a barrier falls and hydro storage dam are located. The flowage area above this dam extends for approximately 15 miles, and is nearly 10 miles wide at the widest point. The only part of this river that might be used by salmon is the lower 8 miles below the falls.

From the foot of the falls downriver, approximately 500 yards of very steep rapids are found flowing over rock ledges and boulders, and through a deep, narrow canyon. Below here for about one mile, the rapids become less steep and the river meanders sharply between steep hills, with 4 - 5 deep /pools

pools on the sharper bends.

From this point to the river's mouth, fairly steep rapids continue, broken only by 2 - 3 deep rocky pools. The river bottom here consists predominately of large rocks, ledges and very coarse gravel. A small percentage of finer material is interspersed amongst the coarse gravel, but only enough to provide a very few small possible spawning areas. No salmon, young or adult, were observed in this river. The food supply appears to be quite poor and the river is not considered to be very suitable as a salmon nursery.

The water in Sisson River is very dark brown in colour and has a strong odor of H<sub>2</sub>S gas, possibly caused by the large amount of decaying vegetation in the flowage area above the dam. This may cause a slight amount of pollution in this branch. The pH here was approximately 7.

The shorelines of this river are wooded, with abundant bushes and grass along the banks. The outside shoreline on several sharp bends consists of steep, high rock cliffs, with gentler banks on the inside of the turns.

Little Tobique River. This branch flows approximately from northeast to southwest, and drains Nictau Lake. From Nictau Lake downriver 6 -7 miles, the river consists mostly of gentle riffles, alternating with short, quiet areas and a few small pools. The bottom is composed mostly of fine to coarse gravel, with a few large rocks and ledges present. Approximately three miles below the lake a small fall and steep rapids are found, with a total drop of 4 - 5 feet. Abundant aquatic vegetation was present along this part of the river.

From this point downriver to a point about three miles above the mouth, numerous pools, 3 - 10 feet deep, were observed. Along this section, much sand and very fine gravel are found in the pools and gentler riffles. Coarse gravel and ledges are abundant in the steeper rapids and a few of the pools. However, in many of the gentle to medium riffles, abundant suitable spawning area is present.

The bottom along the lower 3 - 4 miles of the river is predominately composed of coarse gravel, large rocks and ledges, with much less suitable spawning area than above. Most of the shoreline is wooded, with many bushes and grass present in several spots.

Shade, shelter and food were ample along most parts of this river, and salmon parr were very abundant. A few merganser ducks were observed along this river and its tributaries. Other than Atlantic salmon, fish fauna found here include speckled trout, Notropis minnows, sticklebacks, chub, whitefish, cusk and sculpin. No sources of pollution were observed on the Little Tobique River, or its tributaries.

TRIBUTARIES OF LITTLE TOBIQUE RIVER

Surveys were carried out on two tributaries of this /river

river - Little Cedar Brook and Big Cedar Brook. Other tributaries were considered to be too small to be of importance to salmon spawning, although the lower sections of some provide small possible nursery areas.

Big Cedar Brook. This brook enters the Little Tobique River on the true right bank about ten miles below the dam at Nictau Lake. Several good pools, 4 - 5 feet deep, are found alternating with finely gravelled riffles along the lower mile of the brook. Several possibly good spawning areas were observed here. From here upstream, the bottom varies from fine to coarse gravel, with occasional ledges and a small percentage of sand present. Most of the upper section consists of gentle to medium riffles, which alternate with a few deep pools and shallow quiet areas. A small fall, 3 - 4 feet high, is located about two miles above the mouth. The lower 5 - 6 miles of the brook flows through woodland. Above this, much of the surrounding country is burnt land with bushes along the banks, providing good shade and shelter for young fish.

Little Cedar Brook. This brook enters the Little Tobique River on the true right bank about 9 - 10 miles above the mouth. Most of the bottom of this brook consists of coarse gravel, rocks and ledges. Approximately 90% of the brook consists of gentle to medium riffles. The remainder consists of quiet, shallow areas and small pools, 2 - 5 feet deep. Four small falls, (one - 1½ feet high) were observed along the lower four miles. The shoreline consists of woods and bushes, with ample shade and shelter for small fish. Salmon parr were observed all along the brook, as far as 5 miles above the mouth. Approximately six miles above the mouth, the remnants of an unused wooden dam are located. Above this, the brook is quite swampy and too small to be of much importance to salmon.

Mamozekel River. This river flows approximately from northeast to southwest and empties into the head of the main Tobique River. About 15 miles above the mouth of the river an unused wooden dam is located. This dam is approximately 10 feet high and 150 feet wide. The gates are open, but most of the water seeps through amongst the rotted timbers, and the dam is thought to be a barrier to adult salmon. A few parr may use the river above here as a nursery, but most of this upper section is too small and swampy to be of great importance to salmon.

From this dam down river about 3 miles, to the entrance of the South Branch, the river is small and consists of gentle riffle areas alternating with small pools, 1 - 2 feet deep, and 5 - 15 feet wide. The river bottom along this section is composed mostly of fine to medium gravel. Shade and shelter are amply supplied by marginal vegetation, windfalls and larger rocks in some riffles.

About ¼ mile above the entrance of the South Branch, a one-foot high beaver dam is located. Below this point for a distance of about 3 miles, the bottom is composed /of a

a greater percentage of coarse gravel, with several large rocks present. This section of river consists of about 50% gentle riffles, alternating with quiet water areas up to two feet in depth. Below the entrance of Everett Brook, occasional small pools, 4 - 6 feet deep, are found.

From the lower end of this section to the mouth, the river bottom is composed mainly of fine to medium gravel. In a few spots coarse gravel predominates, and several scattered rock ledges are present along the lower 4 - 5 miles of river. However, all along this section, between the small ledge areas, abundant suitable spawning area is found. Also several rest pools, 3 - 6 feet deep, were observed along the lower 8 - 10 miles of the river.

The country through which the Mamozekel River flows is mostly gently sloping, and the shorelines consist of woods and bushes with fairly high hills a short distance back.

Other fish fauna observed in this river were speckled trout (very abundant), Notropis minnows, sticklebacks and chub. A few merganser ducks were observed on the river, but no sources of pollution were present. The pH readings were in the vicinity of 6.5 - 7.

TRIBUTARIES OF MAMOZEKEL RIVER

Surveys were carried out on only two tributaries. Others were too small to be of importance for salmon, except the lower sections of which may be used to a limited extent as nurseries.

South Branch Mamozekel River. This branch enters the main river on the true left bank, approximately 12 miles above the mouth. The lower three miles flow through slightly steeper country than the main Mamozekel River, with swifter riffles and fewer quiet water areas. The bottom consists mainly of large rocks and coarse gravel. A small area of suitable spawning gravel is located about 1/3 mile above the mouth. Here, gentle riffles alternate with a few small shallow pools. Above this small section the river again becomes very coarse, and unsuitable for spawning. A series of beaver dams, embracing a large flowage area, is found about 4 - 5 miles above the mouth. Above this, the brook is small and, at best, would provide a small possible nursery, if the parr were able to ascend the river this far. Good nursery conditions are present along most of the lower part of this branch.

Everett Brook. This brook flows into the Mamozekel River on the true right bank about 1/2 mile below the entrance of the South Branch. This brook is too small to be of use to spawning salmon; but, for some distance above the mouth, provides good nursery conditions. Several salmon parr were observed here, as well as speckled trout, sticklebacks and Notropis minnows.

Right Hand Branch of Tobique River (Campbell River).

This river is the largest of the four which make up the main Tobique River headwaters. It flows from south to north throughout more than half its length, and then flows generally from east to west for the lower 8 - 10 miles. The headwaters of this river are made up of two main branches, which join about 18 - 20 miles above the mouth. These are the River Dee, draining Trousers Lake; and the River Don, draining Long and Square Lakes. These branches will be described below as tributaries.

Near the upper end of the Right Hand Branch, three good rest pools are found; one at the junction of the Rivers Dee and Don, and two a short distance below. The upper section of this river, down to a point about one mile below the entrance of the Serpentine River, consists mostly of gentle to fairly swift riffles, with occasional small quiet water areas present. The bottom is composed mostly of poorly sorted gravel, predominately coarse. In the swifter rapids, large rocks and ledges are quite numerous. Abundant suitable spawning area is also found along this section. The river is quite wide and shallow, with few pools. One good angling pool is located at the mouth of Jummet Brook and two smaller pools are located 2 - 3 miles downriver.

(Most of)

The next section of this river has in general a coarser bottom than above. For nearly one mile, the bottom consists of flat-lying rock ledges, partially covered with poorly sorted gravel. Here, the river is very wide and shallow. At the lower end of this section a large rocky pool, 7 - 8 feet deep, is located. For the next two miles the river consists of gentle to quite swift rapids; and a few small pools, 3 - 4 feet deep. The bottom along this section is composed mainly of coarse gravel and rocks, although a few small scattered areas are considered suitable for spawning. At the lower end of this section, Right Hand Branch Falls are found. The fall has a total height of about four feet in two steps, and is not a barrier. At the foot of the falls a large angling pool, 7 - 8 feet deep, is located. From here downriver about one mile, the river bottom is coarser than above with more ledges, large rocks and swift rapids present.

From here to the river mouth, the bottom is composed predominately of poorly sorted gravel and a few large rocks. Several scattered sections along this lower part of the river provide suitable spawning conditions. Approximately 90% of this section consists of gentle to medium swift riffles, and the remainder of quiet water, 1 - 2 feet deep, and a few small pools. A large angling pool is located a short distance above the mouth, where the highway bridge crosses the river.

The pH readings were all approximately 6. Several merganser ducks were observed along the river, but no sources of pollution were present. The water was clear but quite brown in colour.

/Tributaries

### TRIBUTARIES OF RIGHT HAND BRANCH

Surveys were carried out on only three of the larger tributaries. The others were considered to be too small to be of importance for salmon spawning, although the lower ends of a few may provide small nursery areas.

River Dee. This is one of the branches which make up the headwaters of the Right Hand Branch. At the head of this river, which drains Trousers Lake, a storage dam, ~~a storage dam~~ (12 - 15 feet high) is located. From here down river about 8 miles, the river consists mostly of fairly swift riffles, with a bottom composed mainly of coarse gravel and rocks, and very little good spawning area. The lower 2 -3 miles of river have a greater percentage of fine material on the bottom and several small areas may be useful for spawning. However, the bottom here is also composed mainly of quite coarse gravel and rocks.

River Don. This river drains Long and Square Lakes, and joins the River Dee, to make up the headwaters of the Right Hand Branch. Most of the river is fairly swift with several steep rapids. The bottom is predominately coarse gravel, rocks and ledges with a small percentage of finer material interspersed. Ample shade, shelter and food are found along most of the river.

Serpentine River. This is the largest tributary to the Right Hand Branch, and enters it on the true right bank about ten miles above the mouth. This river drains Serpentine Lake. From the lake downriver 3 - 4 miles, the river consists predominately of fairly swift riffles, alternating with a few small pools and quiet water areas. The bottom consists mostly of coarse gravel and rocks, with several ledges and a small percentage of fine material present. Most of this section is considered unsuitable for salmon spawning but, apparently, provides fairly good nursery conditions.

The next one-mile section of river bottom grades out into finer material. The upper end consists of medium to coarse gravel and rocks, and the lower end is practically all very fine gravel. Here, the river consists mostly of gentle to medium riffle areas, alternating with several small pools along the shore. A few, small possible spawning areas and abundant good nursery area are found here. From the lower end of this section, at the entrance of McNair Brook, a deadwater extends downriver about one mile, almost to the entrance of Vandine Brook. In this deadwater the bottom consists mostly of fine to coarse sand, with a few scattered boulders. Abundant aquatic vegetation is present.

At the lower end of the deadwater, swift rapids are found flowing over large boulders and ledges, and a small rocky pool is located below these rapids. From here downriver to a point just below Salmon Hole Brook, the river bottom consists predominately of fine to medium gravel, with several large rocks interspersed. Most of this section is composed of fairly gentle riffles alternating with short, quiet areas and

a few small pools. Abundant suitable spawning and nursery areas are present along this part of the river.

A large pool, Salmon Hole, is located just below the entrance of Salmon Hole Brook. The bottom of this pool consists mostly of fine gravel and sand. Small possible spawning areas are found at the foot of the pool and in the riffles for a short distance below. A short distance down river from Salmon Hole, the bottom is composed mostly of coarse gravel and large rocks, with little suitable spawning area. This section extends downriver about two miles, where another pool (4-5 feet deep) is located. The pool bottom is composed of ledges with rocky riffle areas above and below. A short distance below this pool is Pup Falls, consisting of two drops, 1- and 3 feet in height. Down river from the falls, swift rapids are present with a bottom of large rocks and boulders. From here down to Big Falls, approximately 90% of the river consists of rapids, with a bottom of poorly sorted gravel, large rocks and boulders, with little suitable spawning area present. Only a few small pools and quiet water areas are found in this section. Big Falls consists of two sloping drops; the upper about 5 feet high, and the lower, 6 - 7 feet high. The falls are not a barrier to salmon.

From Big Falls to the mouth, the river consists predominately of gentle to quite swift rapids. A few small pools and shallow quiet areas alternate. The bottom is composed mostly of large rocks and boulders, with very few suitable spawning areas. Food, shade and shelter appeared ample, and most of the river is considered to provide fairly good nursery.

Tributaries to the Serpentine River are too small to be of importance to spawning salmon. However, the lower parts of a few may be useful as small nurseries.

Several merganser ducks were observed along the river, but no sources of pollution were present. The pH of the river was approximately 6, and the water temperatures varied from 18°C - 21°C (64.4° - 69.8°F). The water was slightly brown in colour, but not turbid.

Riley Brook. This brook enters the Tobique River on the true left bank about 7 miles below Nictau, the head of the main river. A wooden mill dam, about 8 feet high, is located about 200 feet above the mouth. This brook is considered to be too small for salmon spawning, but would provide a small suitable nursery if stocked with fingerlings.

Haley Brook. This brook enters the Tobique River on the true right bank about 4 miles below Riley Brook. A wooden storage dam, about 5 feet high, and used by Haley Brook Rearing Ponds, is located about 2 miles above the mouth. From the dam to the mouth, the brook consists of gentle riffles and a few small pools alternating. This part of the brook provides good nursery conditions. The brook above the dam also provides possible nursery areas. This brook is considered to be too small/ to

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to be of importance to spawning salmon, although small possible spawning areas are found along the lower mile.

Blue Mountain Brook. Enters the Tobique River on the true left bank about  $1\frac{1}{2}$  miles below Haley Brook. The upper 4 - 5 miles of this brook consist of well over 75% rapids, with only short sections of quiet water and a few small pools. Here the bottom is composed mostly of coarse gravel and rocks. Little suitable spawning area is found, but nursery conditions appear to be good. The next 3 miles of river have a coarse bottom of ledges, boulders and coarse gravel. The brook here is very steep; with several small falls, 1 - 3 feet high, and many steep rapids present. A few small pools are present among the rocks. This part of the brook is also unsuitable for spawning, but nursery conditions are fairly good.

From this section to the mouth, a distance of about two miles, the brook becomes less steep, and fewer ledges and rocks are found. The river bottom still contains much coarse gravel, but enough finer material is present to provide small possible spawning areas along most of this section. Several salmon parr were observed along this lower part of the river, and it is considered to be a good nursery.

The pH of this brook was approximately 7, and water temperatures averaged about  $13^{\circ}\text{C}$ . No sources of pollution were found on this brook.

Two Brooks. Enters the Tobique River on the true right bank about 4 miles below Blue Mountain Brook. Left Two Brooks has a bottom consisting mostly of poorly sorted gravel and rocks. The lower two miles contain a greater percentage of coarse material than above. About 75% of the brook consists of gentle riffles. A few small pools (1 - 3 feet deep) were found; and, one larger pool (about 6 feet deep) was located at the entrance of Padget Brook. A few small possible spawning areas are found along the lower 2 - 3 miles of the brook. Several salmon parr and fish of the year were observed along the lower 4 - 5 miles, and practically all of the brook is considered to be a good nursery.

The pH of this branch is approximately 7, and water temperatures averaged about  $16^{\circ}\text{C}$ . No predators or sources of pollution were observed here. Beaver dams are located immediately above and below the entrance of Padget Brook, and another about 4 miles above the mouth.

Right Hand Two Brooks is the larger of the two branches. It joins with Left Hand Two Brooks about  $1\frac{1}{2}$  miles above the highway. The lower 6 - 7 miles of this branch have a bottom composed of poorly sorted gravel and several large rocks. Gentle to medium riffles alternate with small pools and quiet water areas. Abundant fine gravel is found in several riffles and the foot of some pools, providing several small suitable spawning areas along this section. From here on upstream, more fine material is present

present, with a few small possible spawning areas along the first 1 - 2 miles. Practically all of this branch is considered to be a good nursery, although parr were observed only along the lower 3 - 4 miles.

A two-foot beaver dam is located just above the mouth of the brook. The pH of this branch was also approximately 7, and the temperature readings averaged about 15°C. No predators or no sources of pollution were observed on this branch.

From the junction of Right Hand and Left Hand Two Brooks to the mouth, the main brook consists predominately of gentle to medium riffles, with several small pools alternating. The bottom is composed mostly of coarse gravel and quite large rocks. However, several small suitable spawning areas are found in some of the riffles and tails of the pools. Food, shade and shelter are also ample, providing good nursery area.

Gulquac River. This river enters the Tobique River on the true left bank about 8 miles below the entrance of Two Brooks. The lower 6 - 7 miles of the Gulquac River, from the mouth to a point a short distance above Fraser Companies' road, have a bottom composed mostly of poorly sorted gravel, with occasional ledges present. Approximately 70% of this section consists of gentle to medium swift riffles, which alternate with shallow quiet areas and numerous pools, 3 - 5 feet in depth. Most of the bottom is composed of fairly coarse gravel, but numerous good spawning areas are also present.

Much driftwood and many blow-downs form partial dams along this section, and the river divides several times into small branches, which again join into one main stream. The river and these small branches meander greatly, and many small pools are located on the bends. Ample food, shade and shelter were present to provide much good nursery.

A short distance above Fraser Companies' road, the river becomes swifter with fewer quiet areas and pools. The bottom here is composed mostly of coarse gravel, large rocks and ledges. The river continues much the same up to the entrance of Lakes Branch. Small scattered patches of finer material are found in the gentler riffles and foot of some pools, providing a few possible spawning areas. Several small rocky pools, 5 - 10 feet deep, were observed. Three adult salmon were seen in the pools along this section.

From the entrance of the Lakes Branch upriver about 3 miles, the river is mostly very swift. Over 90% of this section consists of steep rapids and many small falls, 2 - 4 feet high. Here the bottom is mostly composed of boulders and ledges, with a small percentage of finer material.

At the upper end of this section, the river again becomes less steep with several gentle to medium riffles present. The bottom is composed mostly of coarse gravel and rocks in the swifter riffles, but a few sections of finer material provide small possible spawning areas. Ample food, shade and shelter /provide

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provide much suitable nursery along most of the river. Several salmon fish of the year were observed in this upper section. Because of the swift rapids and small falls below, it is apparent that these fish were hatched in this upper section of the river, since it had not been stocked by the hatchery.

Water temperatures taken on this river ranged from 12°C - 16°C (53.6° - 60.8°F), and the pH readings were approximately 6. A few merganser ducks were observed along the river, but no sources of pollution were present here, or on the tributaries.

#### TRIBUTARIES OF GULQUAC RIVER

Surveys were carried out on only two tributaries, since the others were considered to be too small for salmon spawning. However, a few may provide small suitable nurseries along their lower sections.

Lake Branch of Gulquac River. This branch drains Gulquac Lake and enters the main Gulquac River on the true right bank about 12 miles above the mouth. This branch consists of approximately 90% medium to quite swift riffles, with a few quiet areas and small pools alternating. The stream bottom is composed mostly of large rocks, boulders and coarse gravel. Only a very few small areas could be used for spawning, although most of the stream is considered suitable as a nursery. The pH readings here were also 6, and the water temperature about 15°C (64.4°F).

North Branch of Gulquac River. This branch enters the Gulquac River on the true right bank about 1/2 mile above the mouth. The lower three miles of this branch consist of about 90% gentle to medium swift riffles. A few steep rapids and small pools alternate. The river bottom is composed mainly of poorly sorted gravel, a large percentage of which provides good spawning areas all along this section. In the swifter rapids and in several quiet areas, the bottom is composed mostly of coarse gravel and rocks. In some quiet areas, quite thick deposits of sand partially cover the coarse material. A few rock ledges are also found along this section. Shade, shelter and food are ample and most of this stream is considered to be suitable as a nursery.

A two-foot high beaver dam is located about 1/2 mile above the mouth, but is not considered to be an obstruction. The water level was very high during the survey of this branch, and much water was flowing over the dam. In a few places along this section, the river divides up into two or three branches, which again join into one main stream. Another small beaver dam is located on one of these branches about one mile above the mouth.

From this section upriver, almost to the entrance of Stewart Brook, the riffle areas become steeper and the bottom coarser with only a few scattered possible spawning areas. The next 3 - 4 miles of river above consist almost entirely of swift rapids and many small falls, 1 - 3 feet in height. A few very small pools were located at the foot of some of the falls.

The bottom here is composed mostly of large rocks, boulders and ledges. This part of the stream is not considered to be suitable for salmon spawning. Shade is fair and shelter good along this section, and fairly good nursery conditions are provided.

About 1 1/2 miles below the point where Fraser Companies' road crosses the stream, a log sluice and natural fall about 8 feet high are found. At the top of this fall, the stream is nearly 20 feet wide and, at the bottom, the water is funneled through a 5 - 6 foot slot in the rock ledges at a high velocity. This fall is at least a partial and, possibly, a total obstruction to salmon. Nearly one mile above this fall are the remnants of an old driving dam and two small falls, 2 and 3 feet in height. These are not obstructions to salmon.

From this point upstream, the bottom gradually grades out into finer material again. Abundant coarse material is still present in the swifter riffles, but fine gravel and sand are found in the gentle riffles and some pools. A few small suitable spawning areas are present here, and most of this upper section provides good nursery conditions.

Little Gulquac River. Enters the Tobique River on the true left bank about 3/4 mile below the entrance of the main Gulquac River. The lower two miles of this river consist of approximately 90% gentle riffles, alternating with a few small pools. The bottom is composed mainly of poorly sorted gravel, with occasional rocky areas and ledges. A few small possible spawning areas were observed along this section. At the time of the survey, the water was exceptionally high; but, during average conditions, the river would be too small to be of much spawning importance.

Shade, shelter and food appeared ample, and most of this brook is considered to be suitable as a nursery. However, no parr were observed due to the extremely high water.

A two-foot high beaver dam is located about one mile above the mouth, but is not a barrier. The pH of this river was 6; the water temperature 8°C (46.4°F) and air temperature, 9°C (48.2°F) on the day of the survey. No predators or sources of pollution were observed.

Burnt Land Brook. Enters the Tobique River on the true right bank, about four miles below the entrance of the Little Gulquac River. This brook consists of about 60% gentle riffles, alternating with small pools and shallow quiet water areas. The bottom varies greatly, from sand and gravel to large rocks and ledges in a few spots. In gentle riffles, fine to medium gravel is quite abundant. A few small possible spawning areas are present along the lower two miles. However, abundant food, shade and shelter are present, and the whole brook is considered suitable as a nursery.

Remnants of an old wooden dam are present just above the highway bridge, about 3/4 mile above the mouth; and

and four beaver dams, 1 - 3 feet high, are found a short distance upstream. None of these is considered to be complete barriers. Many salmon parr were observed below the dams and also a few above. Notropis minnows and speckled trout were also very abundant in this brook.

The pH of Burnt Land Brook was 7; the water temperature, 15°C (59°F), and the air temperature 25°C (77°F). No predators or sources of pollution were found here.

Wapskehegan River. Enters the Tobique River on the true left bank about 1½ miles below the town of Plaster Rock. The lower 6 - 7 miles of river consist mostly of gentle riffles alternating with small pools and shallow quiet areas. Steep rapids are found about 300 yards above the mouth of the river. Much coarse gravel, large rocks and ledges are present on the river bottom. However, abundant suitable spawning area is present also in many of the gentler riffles and at the foot of several pools.

From here upstream approximately three miles, the river becomes slightly steeper, with more riffles and fewer pools. The bottom here is composed predominately of coarse gravel and rocks, with occasional ledges present. However, several scattered spawning areas are found also in this section. Two beaver dams, each about two feet in height, are found on this section. One is located just above the entrance of Oven Rock Brook, and the other a few hundred yards below the entrance of the Little Wapskehegan River.

Abundant suitable spawning area was found along the next three-mile section of river. However, much coarse gravel, rocks and ledges are also present in the swifter rapids and in some pools. This section of river consists of about 50% riffles, alternating with a few pools, 3 - 5 feet in depth, and shallow, quiet water areas.

From the upper end of this section to the head of the main river, the bottom is composed mostly of poorly sorted gravel, mostly coarse, with many large rocks and occasional ledges. A smaller percentage of finer material is also found, which provides a few small possible spawning areas. This upper section consists mostly of gentle to medium riffle areas with occasional pools, 3 - 4 feet deep, and shallow quiet areas alternating. Food, shade and shelter are ample throughout most of the river, providing abundant good nursery areas. Atlantic salmon fish of the year, parr and adults were found in the river. Also, numerous speckled trout, Notropis minnows and chub were found.

The pH readings of the river averaged approximately 6. The water temperature was about 13°C (55.4°F), and the air temperature, 14°C (57.2°F). No sources of pollution were present on this river, or its tributaries.

Tributaries of Wapskehegan River. The headwaters of the Wapskehegan River are formed by the junction of two of the largest tributaries: Right Hand and Left Hand River De Chute, about 18 miles above the mouth. Surveys were carried out also /on

on three other tributaries.

Right Hand River De Chute. This river consists of approximately 90% gentle to medium riffles, with a few small pools alternating. The river bottom is composed mostly of coarse gravel, large rocks and a few ledges. A small percentage of finer material provides only a few small possible spawning areas although most of the river provides suitable nursery conditions. The pH of this river was approximately 6; the water temperature, 7°C. (44.6°F.) and the air temperature, 8°C. (46.4°F.)

Left Hand River De Chute. This river is very similar to Right Hand River De Chute. It consists of more than 90% gentle to quite swift riffles, with a few small pools alternating. Several small falls, 1 - 2 feet high, are also present. The bottom is composed mainly of coarse gravel, rocks and ledges. Only a very small amount of suitable spawning area is present. Ample food, shade and shelter provide fairly good nursery conditions along most of this river. The pH of the river was approximately 6.5; the water temperature, 10°C. (50°F) and the air temperature, 12°C. (53.6°F.)

Little Wapskehegan River. This branch enters the Wapskehegan River on the true right bank about nine miles above the mouth. Approximately the lower 1/2 mile of this river has a bottom composed mostly of coarse gravel, with a small percentage of finer material interspersed. Most of this section consists of gentle to medium riffles, with a few small pools alternating. Above this section for about 1/4 mile, a greater percentage of suitable spawning area is present. From this point upstream about four miles, many beaver dams and much swampy land are found. Short riffles between flowage areas may provide small possible spawning areas. The bottom here is composed mostly of poorly sorted gravel and sand, with much mud and silt in the flowage areas.

Most of this river appears quite suitable as a nursery. The pH readings averaged approximately 6.5; the water temperature, 12°C. (53.6°F) and the air temperature, 16°C. (60.8°F.)

Oven Rock Brook. Enters the Wapskehegan River on the true left bank about seven miles above the mouth. The brook consists of about 60% gentle to medium riffles, alternating with small pools and quiet, shallow water areas. The bottom is composed mainly of fine to medium gravel, with scattered areas of larger rocks and ledges. A few suitable spawning areas are found along the lower one mile of the brook. Food, shade and shelter are ample, and most of the brook provides good nursery for salmon. Many salmon parr and fish of the year were observed in this brook. The pH here was about 7; the water temperature, 14°C. (57.2°F) and the air temperature, 17°C. (62.6°F.) Notropis minnows, chub and speckled trout were observed also in this brook.

Beaver Brook. Enters the Wapskehegan River on the true left bank about one mile below the entrance of Oven Rock Brook. Approximately 80% of this brook consists of medium to gentle riffles, with a few small pools and shallow, quiet water/areas

areas alternating. The bottom is composed mostly of coarse gravel and rocks. A small percentage of finer material in some riffles provides a few small possible spawning areas. However, the brook is too small to be of much importance to spawning salmon.

Food, shade and shelter were abundant and most of the brook is considered to be a good nursery. Several salmon parr were observed. The pH of the brook was 7; the air temperature, 15°C (59°F.) and the water temperature, 14°C. (57.2°F)

Three Brooks. Enters the Tobique River on the true right bank about five miles below the town of Plaster Rock. Along the lower one-mile section of this brook, the bottom is composed mostly of coarse gravel, large rocks and a few ledges. Here, only a few small possible spawning areas are present. Approximately 85% of this section consists of gentle riffles. Short quiet areas and a few small pools alternate.

The next one-mile section of this brook has a bottom composed mostly of fine to medium gravel, with abundant suitable spawning area present. Large rocks and coarse gravel are still abundant in the swifter riffles and in some pools. About 60% of this section consists of gentle to medium swift riffles, alternating with shallow, quiet areas and a few small pools up to 2½ feet in depth.

From here upstream, the bottom is composed mostly of poorly sorted gravel, predominately coarse. Small suitable spawning areas are also present. This upper part of the brook consists of approximately 50% gentle riffles, and 50% quiet water and a few small pools. Nursery conditions were good and salmon parr and fish of the year were abundant throughout most of the brook. A small beaver dam is located about six miles above the mouth. The pH of this brook was 7; the water temperature about 12°C. (53.6°F) and the air temperature, 18°C. (64.4°F.)

Near the mouth of one of the small tributaries, an artificial trout pond is located. This brook is too small to be of importance to salmon. Other small tributaries are only slightly important as nurseries. No sources of pollution were present on this brook, or its tributaries.

Odell River. Flows into the Tobique River on the true left bank about nine miles below Plaster Rock. From the mouth upriver about five miles, the river consists of approximately 50% gentle to medium swift riffles, 50% long, shallow, quiet areas, and several pools, 3 - 4 feet deep. Abundant suitable spawning areas are present in the gentler riffles and at the foot of several pools. Numerous rock ledges and coarse gravel are also found in the swifter riffles and in some pools.

From here up to the forks, the river becomes much swifter and the bottom very coarse. This section consists almost entirely of riffle areas, many quite swift, with only 2 - 3 pools,

2 - 5 feet deep. The bottom is composed mostly of large rocks, boulders and ledges, with a very small percentage of fine material interspersed.

Ample food, shade and shelter are present throughout most of the river, and good nursery area is abundant. The pH readings of the river and its branches were approximately 6.5. The water temperature was 8°C. (46.4°F.) and the air temperature, 12°C. (53.6°F.) No barriers or sources of pollution were present on the river.

#### TRIBUTARIES OF ODELL RIVER

Only two tributaries are large enough to be of importance to salmon. These are Left Hand Branch and Right Hand Branch, which join to form the headwaters of the main Odell River.

Left Hand Branch of Odell River. The lower two miles of this river consist mostly of fairly steep rapids and several small falls, , 1 - 6 feet high, with only a few small pools present. The bottom is composed mostly of large rocks, boulders and ledges. This section is unsuitable for salmon spawning, but fairly good nursery conditions are present in most places. About 1/2 mile above the mouth, a series of falls is found. The first three are each, approximately, six feet in height; and the fourth, a broken fall of about ten feet. About 1½ miles upstream, a broken fall is located, with drops of about 6, 2 and 5 feet. A short distance above these falls, the stream becomes less steep with more gentle riffles, and a finer bottom. Here a few small possible spawning areas are found. Although the falls are not considered to be complete barriers to adult salmon, no salmon of any age were observed along the upper section. It may be that salmon do not ascend the river this far, because of the falls and the scarcity of suitable spawning areas above.

Right Hand Branch of Odell River. The lower 1/4 mile of this stream consists mostly of medium to steep rapids, with the bottom composed mainly of large rocks, boulders and ledges. At the upper end of this section a broken fall, about 12 feet high, is located. This fall is considered to be at least a partial barrier. Approximately, the next 1/2 mile of this stream is less steep with about 60% gentle to medium riffle areas. The bottom here is composed of poorly sorted gravel, with a few large rocks and boulders present. This section provides several small possible spawning areas, and is also considered to be suitable as a nursery, although no salmon parr were observed above the falls. The stream bottom along the next two miles has a bottom composed mostly of coarse gravel and rocks. Very little suitable spawning gravel is found here, but nursery conditions appear to be quite good.

At the upper end of this section, about three miles above the mouth, another fall is located. This fall is a complete obstruction and has a near vertical drop of approximately 35 feet.

Odellach River. Flows into the Tobique River on the true left bank about four miles below the entrance of Odell River. A wooden mill dam is located about 1/4 mile above the mouth. This dam is approximately 10 feet high with very little water flowing over, and is considered to be a complete obstruction. Below the dam, the bottom is composed of poorly sorted gravel and rocks. Ample food, shade and shelter provide small possible nurseries below and above the dam, but the river is considered to be too small to be of importance to spawning salmon.

Trout Brook. Enters the Tobique River on the true left bank about two miles below the Odellach River. The lower one-mile section of this brook consists of about 70% gentle to medium riffles, and about 30% shallow, quiet water areas and a few small pools, 1 - 2 feet deep. The bottom is composed mainly of poorly sorted gravel, and large rocks. A small percentage of finer material is present also in the quiet water areas. A few small possible spawning areas are found along the lower 1/2 mile of the brook. Food, shade and shelter were abundant throughout most of the brook, but salmon parr and fish of the year were found only along the lower one mile.

Windfalls and driftwood form partial barriers in several spots, and the brook divides into several small branches, which again converge. Above the lower one-mile section, the bottom becomes coarser with many large rocks and much coarse gravel present. Finer material is still abundant in the quiet water areas. The upper part of this brook provides good nursery conditions, but is too small for spawning salmon. The water temperature of this brook was 11°C. (51.8°F.) and the air temperature was 14°C. (57.2°F.) No sources of pollution were present. Other than Atlantic salmon; speckled trout, suckers, and Notropis minnows were also present.

SPAWNING AREAS

Main Tobique River S-1. This section extends from the head of the river at Nictau to a point about 15 miles downriver. This is considered to be the best spawning area on the main river.

S-2. Extends from near the entrance of Two Brooks downriver 4 - 5 miles. Many good spawning beds are present along this section.

S-3. Extends from S-2 downriver to a point about four miles below the entrance of the Gulquac River. Several good spawning beds are present, separated by long, quiet water areas and a few pools.

S-4. Extends from a point just above the entrance of the Wapskehegan River, downriver 200 - 300 yards.

S-5. Several suitable spawning areas are found in this section, which extends from a short distance above the entrance of Three Brooks to about one mile above the bridge at Arthurette.

Sisson River. S - 6. Only a very few small possible spawning areas are found in this river. They are located at the /foot



MEMORANDUM    NOTE DE SERVICE

DATE    December 20, 1976

FROM:    T. G. Carey  
DE:      Head, Fish Culture

Our file    Notre référence    2000-1-5

TO:      H. S. Leonard  
A:      Senior Classification Officer

Your file    Votre référence

SUBJECT:    CONVERSION OF TERM POSITION TO CFT  
SUJET:      CONVERSION OF TERM POSITION TO CFT

A managerial decision has been made to convert term position No. DOE 430 - 9608 Biological Technician, Fish Cutting Section to a permanent position. I am, therefore, attaching the position description with previous classification rating forms, and an OLAS form. It is my intention to request that the present incumbent, Mr. T. Henderson, be appointed to the permanent position, subject to appeal.

I would therefore request assignment of a permanent position number for the attached description so that I can proceed with staffing action.

T. G. Carey

c.c. A. Foda

foot of 2 - 3 pools and a few small riffles along the lower 4 - 5 miles of the river.

Little Tobique River. S-7. Extends from Nictau Lake downriver 6 - 7 miles. Several small suitable spawning areas are located along this section.

S-8. This section extends from S-7 down to a point about three miles above the mouth. The better spawning areas of the Little Tobique River are located in the riffles and tails of some pools along this section.

Big Cedar Brook. S-9. Abundant suitable spawning area is found along the lower one-mile section of this brook. Small possible spawning areas are found also in several scattered localities, as far as ten miles above the mouth.

Little Cedar Brook. S-10. Only a few small possible spawning areas were observed on this brook. These were located mostly along the lower two-mile section.

Mamozekel River. S-11. The better spawning areas on this river are located along the lower 4 - 5 miles. Smaller possible spawning areas are also found as far as 10 - 12 miles above the mouth, and for a short distance up the South Branch.

Right Hand Branch of Tobique River (Campbell River). S-12. Several possible spawning areas were observed from the head of the river down to a point about one mile below the entrance of the Serpentine River. Most of the river bottom is very coarse, and the spawning areas were found in the gentler riffles and tails of a few pools.

S-13. A few small scattered possible spawning areas are found along the section extending from Right Hand Branch Falls upriver nearly two miles.

S-14. Several suitable spawning areas are located along the lower five-mile section of the Right Hand Branch.

River Dee. S-15. Abundant suitable spawning area is present along the lower three miles of this river. A few small suitable spawning areas are also present along the upper 7 - 8 miles.

River Don. S-16. A few small possible spawning areas are found along the lower two miles of this river.

Serpentine River. S-17. Extends from the entrance of McNair Brook upriver about one mile. Abundant suitable spawning area is present along most of this section.

S-18. Extends from the entrance of Vandine Brook downriver a little more than 1½ miles. This section is considered to be the best spawning area on the Serpentine River.

S-19. Extends from a short distance below Salmon Hole to the river's mouth. Most of this section is very rocky and /quite



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quite swift. Only a few small scattered areas here would be suitable for salmon spawning.

Haley Brook S-20. A small amount of suitable spawning area is present, mostly along the lower one mile. This brook is too small to be of great importance to spawning salmon.

Blue Mountain Brook S-21. Several suitable spawning areas are present along the lower two miles of this brook.

Two Brooks S-22. Several small possible spawning areas are found in the riffles and tails of a few pools, along most of the main brook.

Left Hand Two Brooks. S-23. A few small possible spawning areas are present along the lower 2 - 3 miles of this brook.

Right Hand Two Brooks. S-24. Abundant suitable spawning area is found in many riffles and a few pools along the lower 6 - 7 miles of this brook.

Gulquac River. S-25. Several good spawning areas are present in the gentler riffles and the tails of some pools along the lower 6 - 7 miles of the river.

S-26. Extends from S-25 upriver to the entrance of the Lake Branch. Most of this section is very rocky, but a few small possible spawning areas are found in some of the gentler riffles and the tails of a few pools.

S-27. A few small possible spawning areas are also found, approximately, 3 - 4 miles above the entrance of the Lake Branch.

Lake Branch of Gulquac River. S-28. The river bottom here is mostly very coarse. Only a few small possible spawning areas were found in the gentler riffles.

North Branch of Gulquac River. S-29. Extends from the mouth upriver about three miles. Abundant suitable spawning area is found along this section, and a few smaller possible spawning areas are present as far upriver as the entrance of Stewart Brook.

S-30. This section is located between three and four miles above the entrance of Stewart Brook. A few small possible spawning areas are found in the riffles and tails of some pools.

Burnt Land Brook S-31. A few small possible spawning areas are present along the lower two miles of this brook.

Wapskehegan River S-32. Abundant suitable spawning area is found in many places along the lower 6 - 7 miles of the /main river

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river, and for short distances along the lower sections of Oven Rock and Beaver Brooks.

S-33. Extends from S-32 upriver, approximately, 6 miles. Several suitable spawning areas are found in the gentler riffles and the tails of several pools along this section.

S-34. Extends from S-33 to the head of the main river. A few small scattered possible spawning areas are present in this section.

Right Hand River de Chute S-35. A few small possible spawning areas are located along the lower 2 - 3 miles of the river.

Left Hand River de Chute S-36. A very few small areas provide possible spawning beds along the lower 2 - 3 miles of the river.

Little Wapskehegan River S-37. Suitable spawning area is found along much of the lower 3/4 mile section of this branch. A few small possible spawning areas are also found above this section, in the riffles between beaver dam flowages.

Three Brooks S-38. A few small possible spawning areas are present along the lower one-mile section of this brook. From this point upstream about one mile, much suitable spawning area is present. Along the next 2 - 3 miles, only a few small possible spawning areas were observed.

Odell River S-39. Numerous suitable spawning areas were observed along most of the lower five-mile section of this river.

Left Hand Branch of Odell River S-40. A few small possible spawning areas are located between two and three miles above the mouth.

Right Hand Branch of Odell River S-41. Extends from about 1/4 mile above the mouth upstream, about two miles. Here, a few small possible spawning areas are found in the gentler riffles.

Trout Brook S-42. A small amount of suitable spawning area is located along the lower 1/2 mile of this brook.

NURSERY AREAS

Main Tobique River N-1. Extends from the headwaters at Nictau, downriver to a point 3 - 4 miles below the entrance of the Gulquac River. Abundant suitable nursery area is present in this section.

N-2. Extends from the town of Plaster Rock downriver to the head of the flowage area of the Tobique Narrows Dam. Suitable nursery areas are abundant along much of this section, especially in the riffle areas.

/Sisson River

Sisson River N-3. The lower 6 - 7 miles of this river may provide small possible nursery areas, although no young salmon were observed during the survey. Reasons for the scarcity or absence of parr may be the small amount of natural food observed, and possible pollution.

6-7?

Little Tobique River N-4. Excellent salmon nursery areas are abundant throughout most of the river's length, except for a few sections of shallow water, with poor shade and shelter. Natural fish food was ample in most places, and many parr were observed along most of the river.

32

Big Cedar Brook N-5. Excellent nursery conditions are present along this brook as far as 15 miles above the mouth, and several parr were observed as far as ten miles above the mouth. Natural food, shade and shelter are abundant in most places

15

Little Cedar Brook N-6. Extends from the mouth upstream 5 - 6 miles. Numerous parr were observed as far as 4 - 5 miles above the mouth. Natural food, shade and shelter appear to be quite abundant.

4

Mamozekel River N-7. Numerous salmon parr were observed along most sections of this river as far as 15 miles above the mouth. However, the natural food supply was only fair. Shade and shelter were abundant, except for a few small open areas.

15

South Branch of Mamozekel River N-8. Good nursery conditions are abundant along most of the lower 4 - 5 miles of this branch. Small possible nurseries may also be provided farther upstream, above the beaver dam flowages.

5

Everett Brook N-9. Small, but suitable nursery area present along the lower 2 - 3 miles of this brook.

3

Right Hand Branch of Tobique River (Campbell River) N-10. Extends from the head of the river down to a point about one mile below the entrance of the Serpentine River. Good nursery conditions are abundant along most of this section.

10

N-11. Extends from about two miles below the entrance of the Serpentine River down to the mouth. Here, many suitable nursery areas are present. Food, shade and shelter are abundant in most places. In a few scattered places, shade and shelter are quite poor, where ledge rocks are present on bottom.

9

River Dee N-12. Suitable nursery areas are quite abundant throughout most of the length of this river.

9

River Don N-13. Ample food, shade and shelter are found along most of this river, providing several suitable nursery areas. Shade and shelter are scarce in a few small areas, where rock ledges are present on bottom.

5

Serpentine River N-14. Extends from Serpentine Lake down to the entrance of McNair Brook. Most of this section appears to be suitable as a nursery, and several parr and fish of the year were observed.

5

N-15. Extends from the entrance of Vandine Brook to the mouth of the river. Most of this section is considered to be good nursery, except for a few areas of rock ledge bottom, where shade and shelter are scarce. 15

Riley Brook N-16. Provides suitable nursery throughout most of its length. Hatchery stocking above the dam at the mouth would be required to utilize this nursery area. 7?

Haley Brook N-17. Provides good nursery conditions from the mouth upstream about two miles to the dam. Also, there are possible nursery areas above the dam, if stocked. 2+4?

Blue Mountain Brook N-18. Fairly good nursery conditions are present throughout most of the length of this brook, although parr were observed only along the lower 2 - 3 miles. 6

Two Brooks N-19. Suitable nursery conditions are present throughout most of the main brook and the two main branches. Parr were observed as far as five miles above the mouth of Left Hand Two Brooks. Suitable nursery conditions are present on Right Hand Two Brooks as far as 8 - 9 miles above the mouth, but parr were observed only along the lower 3 - 4 miles. 14

Gulquac River N-20. Good nursery conditions appear to be abundant throughout most of this river. Parr were observed along most of the river, and a few fish of the year were observed about 15 miles above the mouth. 12

Lake Branch of Gulquac River N-21. Much suitable nursery area is found along the lower four to five miles of this branch. 5

North Branch of Gulquac River N-22. Abundant suitable nursery areas are found along most of this branch, up to 10 - 12 miles above the mouth. However, parr were observed only along the lower half of this section. 12

Little Gulquac River N-23. Suitable nursery conditions are present along most of this river. However, no parr were observed due to extremely high water. 5

Burnt Land Brook N-24. Suitable nursery conditions are present along most of this brook. Numerous parr were observed along the lower 3/4 mile of the brook, but only a few above the beaver dams. 1

Wapskehegan River N-25. Suitable nursery areas were abundant throughout most of the length of this river. 17

Right Hand River De Chute N-26. Fair nursery conditions are present throughout most of the river's length. However, no parr were observed. 6

Left Hand River De Chute N-27. Suitable nursery conditions were also found along most of this branch, although no young salmon were observed. 5

✓ Little Wapskehegan River N-28. Suitable nursery areas were found along the lower 3/4 mile of this river and in several scattered areas between the beaver dam flowages above. 2

✓ Oven Rock Brook N-29. Numerous salmon parr were observed, and this brook is considered to be a suitable nursery throughout most of its length. 4

✓ Beaver Brook N-30. Ample food, shade and shelter are present to provide suitable nursery areas throughout most of this brook. 5

✓ Three Brooks N-31. Numerous parr and fish of the year were observed. Food, shade and shelter were abundant. Most of the main brook and its larger tributaries are considered suitable as nurseries. 12

✓ Odell River N-32. Most of this river is considered suitable as a salmon nursery, and parr were observed along most of its length. 6

Left Hand Branch of Odell River N-33. Suitable nursery areas are found along most of this branch, but no salmon parr were observed. 3

Right Hand Branch of Odell River N-34. Suitable nursery areas are abundant throughout most of this branch, although salmon parr were observed only along the lower 1/4 mile, below the falls. 2

\* Odellach River N-35. This brook is considered to provide suitable nursery conditions throughout most of its length, but may require stocking above the mill dam. 1

✓ Trout Brook N-36. Food, shade and shelter were ample throughout most of this brook, providing good nursery conditions. However, salmon parr were observed only along the lower one mile. 6

#### OBSTRUCTIONS

The Tobique Narrows Hydro Dam is located about 1 1/2 miles above the mouth of the main river. This dam has a concrete fishway around it, which is working satisfactorily, and is not a barrier to salmon.

A mill dam at Plaster Rock, owned by Fraser Companies, is also equipped with a fishway. This fishway is working satisfactorily, and the dam is not an obstruction to salmon.

Sisson River B-1. A total barrier falls and a hydro storage dam are located about eight miles above the river mouth.

Little Tobique River B-2. A wooden dam is located on the outlet of Nictau Lake, at the head of the Little Tobique River. This dam is considered to be at least a partial barrier and, possibly, a total barrier.

Little Cedar Brook B-3. Remnants of an unused wooden dam are located approximately six miles above the mouth of this brook. These dam remnants are considered to be only a partial barrier, since a small channel has been eroded around the end of the dam.

Mamozekel River B-4. Remnants of an unused wooden dam were also found on the Mamozekel River about 15 miles above the mouth. This is considered to be at least a partial and, possibly, a total barrier under low-water conditions.

South Branch of Mamozekel River B-5. Three log chutes and remnants of an unused wooden dam are located between  $2\frac{1}{2}$  - 3 miles above the mouth. These are considered to be partial barriers and, possibly, total barriers under low-water conditions.

Serpentine River B-6. A hydro storage dam is located at the head of the river on the outlet of Serpentine Lake. This is a total obstruction.

River Don B-7. Remnants of an unused wooden dam are located at the head of the river on the outlet of Square Lake. This dam is considered to be only a partial barrier.

B-8. A hydro storage dam is located above Square Lake on the outlet of Long Lake. This dam is considered to be a complete barrier.

River Dee B-9. A hydro storage dam is also located at the head of this river on the outlet of Trousers Lake. This dam is also a complete barrier.

Riley Brook B-10. A wooden mill dam is located about 200 feet above the mouth of this brook. The dam is about eight feet high, and is thought to be a total barrier. However, this brook is not considered important for salmon spawning.

Haley Brook B-11. A small wooden dam is located about two miles above the mouth. It is considered to be at least a partial barrier and, possibly, a total barrier.

North Branch of Gulquac River B-12. A log sluice and natural fall, about 8 feet high, are located approximately  $1\frac{1}{2}$  miles below the point where Fraser Companies' road crosses the stream. This is considered to be at least a partial and, possibly, a total barrier.

Burnt Land Brook B-13. Remnants of an unused wooden dam and four beaver dams are located just above the highway bridge. These are only partial barriers, but their removal would make it easier for salmon to reach the nurseries above.

Left Hand Branch of Odell River B-14. A series of natural falls is located about  $1/2$  mile above the mouth of this branch. The lower three falls are each, approximately, six feet in height; and, the fourth, a broken fall of about ten feet. These are considered to be only partial barriers, but may be total barriers under low-water conditions.

Right Hand Branch of Odell River B-15. A broken fall, about 15 feet high, is located approximately 1/4 mile above the mouth. This fall is at least a partial and, possibly, a total barrier.

B-16. A natural, near vertical fall, about 35 feet high, is located approximately three miles above the mouth. This is a complete obstruction.

Odellach River B-17. A wooden mill dam, about ten feet high, is located about 1/4 mile above the mouth of the river. This is considered to be a complete obstruction.

Pekiook Brook B-18. A wooden mill dam, with power wheel, is located just above the mouth of this brook. This dam is considered to be a total barrier and the brook is unimportant to Atlantic salmon. Stocking above this brook is not recommended, because of danger of the power wheel to descending smolt.

POLLUTION

Sisson River P-1. A possible source of pollution exists at the flowage area of Sisson Dam. The large amounts of decaying vegetation on the bottom of the flowage area may be causing a depletion in the oxygen content of the water. At the outlet, which leads from the foot of the dam, a very strong odor of H<sub>2</sub>S gas is present. However, the water from this river is greatly diluted on reaching the main Tobique River. Therefore, if pollution does exist, it would be only of importance in the Sisson River itself.

Tobique River P-2. A possible source of pollution is present also in the dumping of raw sewage in the river at the town of Plaster Rock. However, this is not considered to be of much importance at present.

PREDATION

Several merganser ducks were observed along the main river and several of the tributaries during the survey. However, no large numbers were found in any particular area.

FISH FAUNA

Other than Atlantic salmon, fish fauna observed in the Tobique River and its tributaries included speckled trout, white fish, suckers, eels, sticklebacks, chub, Notropis minnows, cusk and sculpins.

Tobique Narrows Fishway. Working satisfactorily.

<u>Year</u>	<u>Number of Salmon &amp; Grilse using Fishway.</u>	<u>Rough Estimates of Lamprey Eels removed from Fishway.</u>
1953	4,656	6,000
1954	4,986	3,000
1955	3,775	2,900

/Species

Species of fish using the Tobique Narrows Fishway were Atlantic salmon, (*Salmo salar*); speckled trout, (*Salvelinus fontinalis*); suckers, (*Catostomus commersonii*); eels, (*Anguilla bostonii*); and lampreys, (*Petromyzon marinus*).

Fraser Companies' Mill Dam Fishway, Plaster Rock.  
Working satisfactorily. However, no counting trap has been installed to record the number of salmon passing this point.

#### DISCUSSION

During the survey, salmon parr and/or fish of the year were observed throughout most of the main river and in practically all of the tributaries of significant size. However, in the upper sections of a few tributaries, young salmon were absent or scarce. This is considered to be due to some barrier, or partial barrier, located farther downstream. Since the accessible nursery areas are so abundant, and the nursery areas above these barriers usually quite small; in most cases, the barriers do not warrant the expense of removal. However, a salmon stocking program might be arranged for these upper tributaries, especially those that are easily accessible.

Also, during the survey, ample suitable spawning areas were observed on the main river and on the larger tributaries. In low-water conditions during the spawning season, many salmon spawn in the main river, which would spawn in the tributaries if the water were higher. Thus, in years of low water, a certain amount of overcrowding may exist on the spawning beds of the main river. Also the nurseries, located near these spawning beds, may be somewhat overcrowded. If some sort of water control could be arranged, salmon could more easily reach the spawning areas on the upper tributaries. This would bring about a more even distribution on the spawning beds and, eventually, in the nurseries and the young salmon would probably have a greater rate of survival and growth.

Water control may be beneficial also to the angler by inducing the salmon to ascend the tributaries (angling streams) during natural low-water periods. In 1955, an exceptionally low-water season, salmon angling on the Right Hand Branch and the Serpentine River was quite poor. According to local opinion, few salmon ascended these branches, due to low water. Instead, most remained in the holding pools in the main river, particularly in the large pool at the head of the river. Because of continuing low water during the spawning season of 1955, many of these salmon did not ascend these branches, but spawned in the main river, possibly, under overcrowded conditions. As noted above, a more even distribution may be possible through water control. A number of hydro storage dams are already located on the Tobique River system. Possibly, a more satisfactory arrangement of water control than now exists, could be made with the Hydro Company.

At least one additional storage dam has been proposed for the main Tobique River. If this dam is constructed, its flowage area will cover a large percentage of the good spawning and nursery area on the main river. Then, water control may be

more useful in helping the salmon reach the remaining spawning areas found in the upper branches.

SUGGESTIONS

If additional storage dams eliminate much of the suitable spawning and nursery areas, it is recommended that some sort of water control be attempted, in order to aid the salmon to reach those areas which remain.

Also, it is suggested that a stocking policy be carried out on nursery areas, which the salmon cannot normally reach by themselves. This would eliminate the danger of overstocking areas, which are used already as nurseries. During the survey, salmon parr were either scarce or absent in most of the following waters:

- East Branch of Mamozekel River - upper waters.
- Riley Brook - above mill dam.
- Haley Brook - above hatchery dam.
- Blue Mountain Brook - upper waters.
- Right Hand Two Brooks - upper waters.
- Burnt Land Brook - upper waters.
- North Branch of Gulquac River - upper waters.
- Left Hand River De Chute - upper waters.
- Right Hand River De Chute - upper waters.
- Left Hand Branch of Odell River - upper waters.
- Right Hand Branch of Odell River - upper waters.
- Odellach River - above mill dam.

It is recommended that as many of these waters as possible be stocked, so as to make better use of the available nursery areas. Many of these waters are easily accessible at present by vehicle.

It may prove beneficial also to remove several beaver dams and the remnants of unused driving dams and log sluices, listed under "Barriers". In some cases, this should eliminate the necessity of hatchery stocking above these points.

SISCON RIVER

Sisson River

Sisson River flowage area above B-1

B-1 Sisson River (Right side)

## ANGLING REPORT

Atlantic SalmonSpeckled Trout

<u>Year</u>	<u>Rod Days</u>	<u>No. Fish</u>	<u>Weight</u>	<u>Rod Days</u>	<u>No. Fish</u>	<u>Weight</u>
1950	4,882	1,772	12,319	8,939	10,058	4,294
1951	3,814	2,206	18,361	11,490	17,515	6,770
1952	5,717	1,422	14,399	13,621	16,965	5,775
1953	2,786	1,802	19,553	1,725	5,270	1,580
1954	1,105	1,521	17,602	8,665	2,540	700
1955	5,961	984	12,594	20,925	4,650	1,070

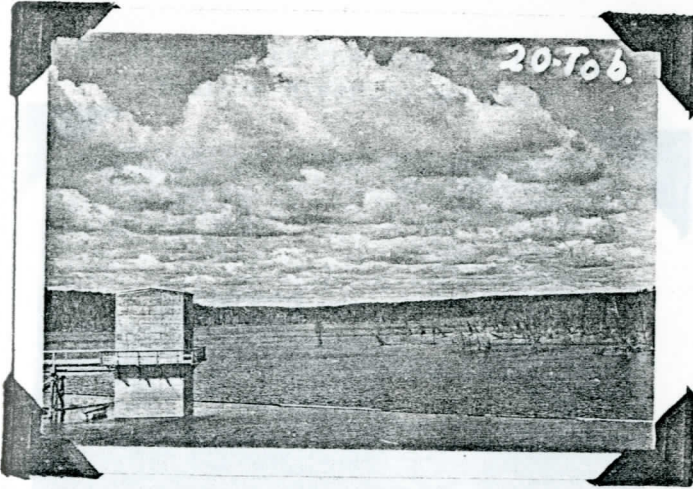
Natural falls on Sisson River

Sisson River below B-1

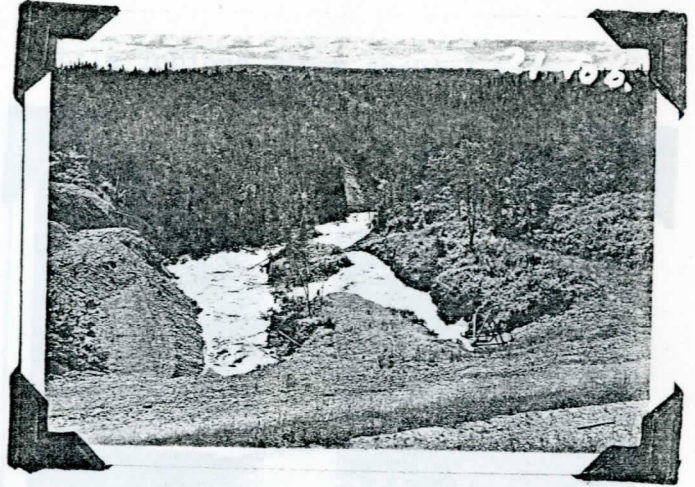
TOBIQUE RIVER

Sisson River

Sisson River flowage area above B-1



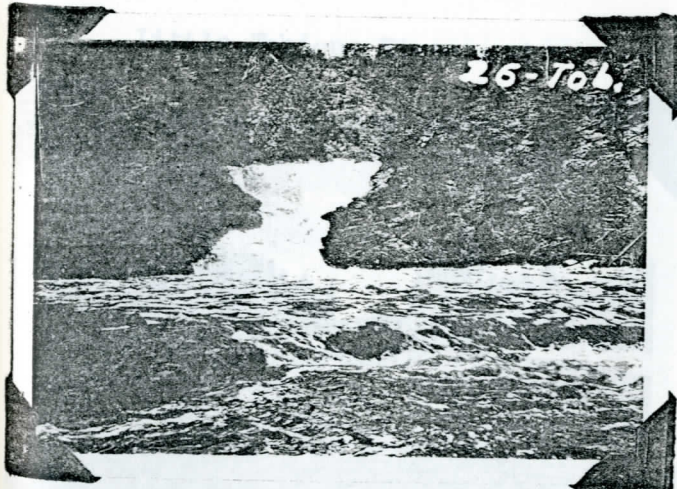
B-1 Sisson River (Right side)



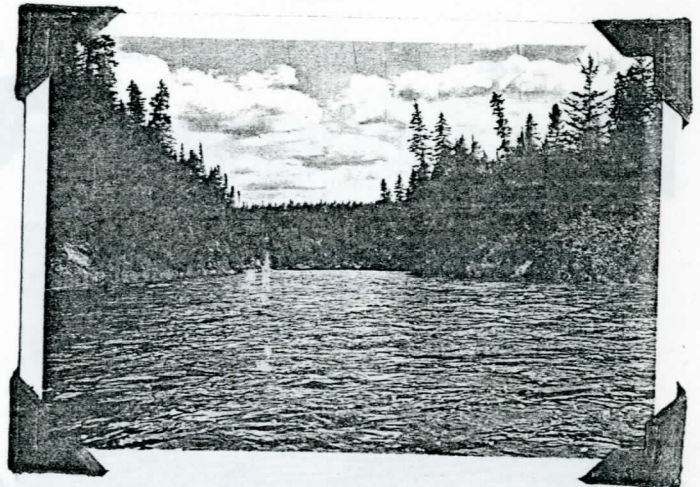
B-1 Sisson River (Left side)



B-1 natural falls on Sisson River



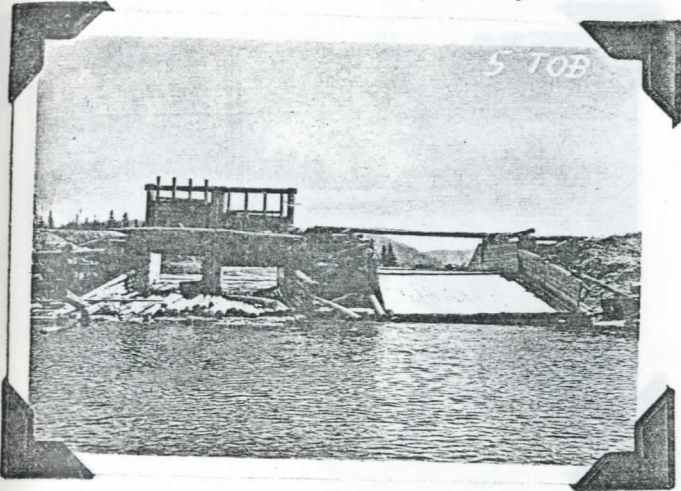
Sisson River below B-1



TOBIQUE RIVER

Little Tobique River

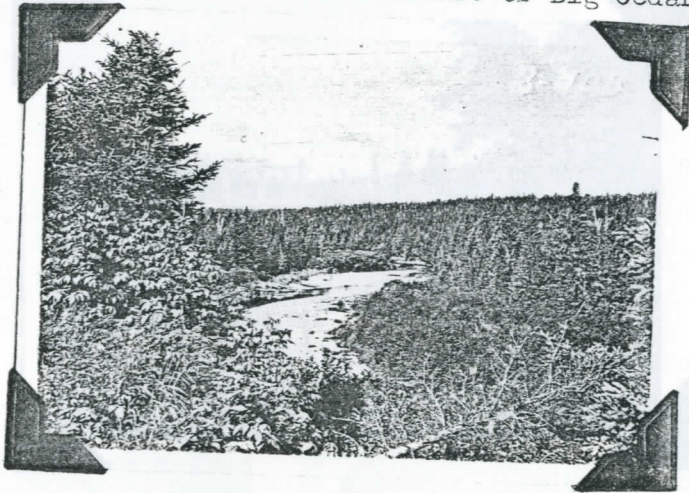
B-2 Driving Dam at the head of Little Tobique River - *NICTAU LAKE*



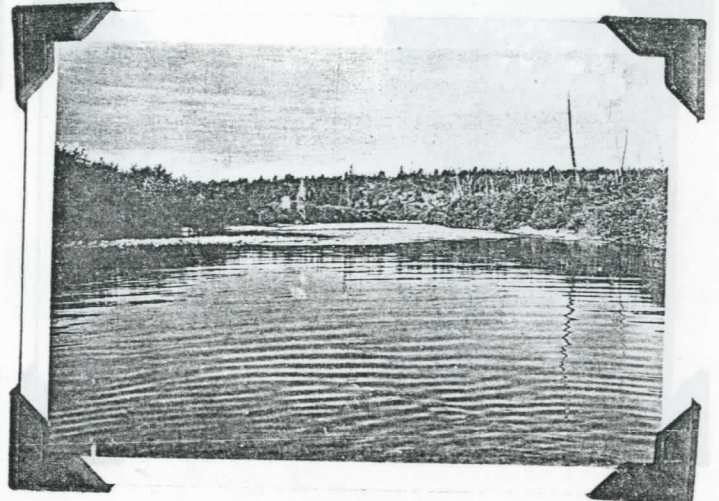
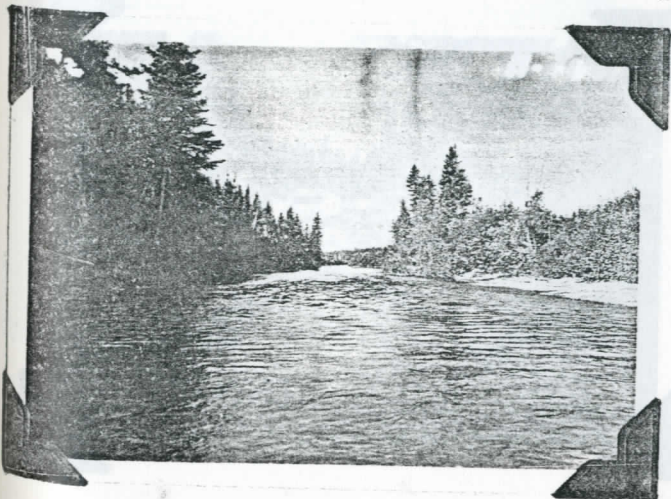
Little Tobique River about 1 mile below B-2



Little Tobique River below entrance of Big Cedar Brook



Little Tobique River a short distance below entrance of Big Cedar Bk.

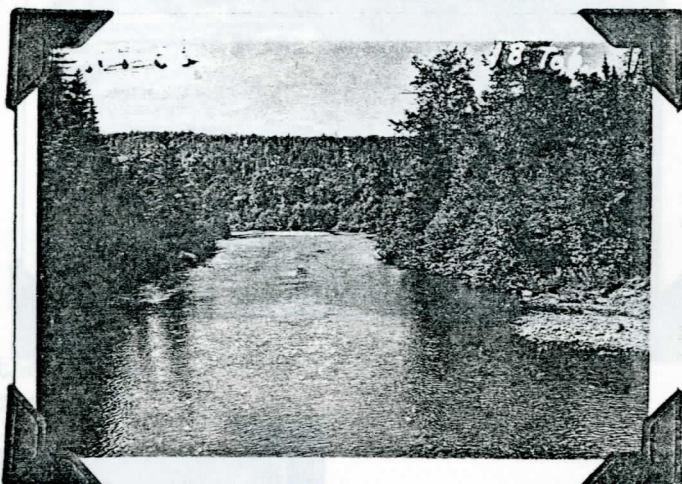
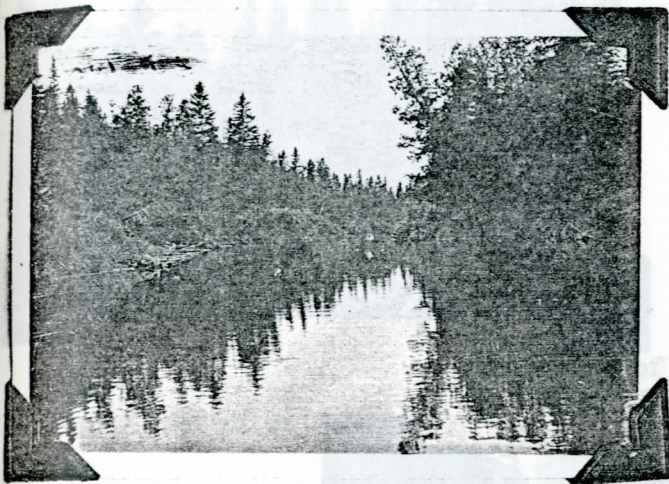


TOBIQUE RIVER

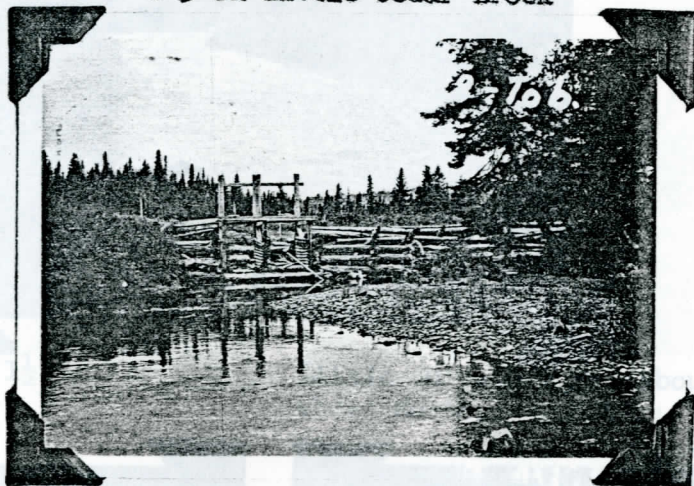
Little Tobique R. & Little Cedar Bk.

Little Tobique River about 5 miles below mouth of Big Cedar Brook

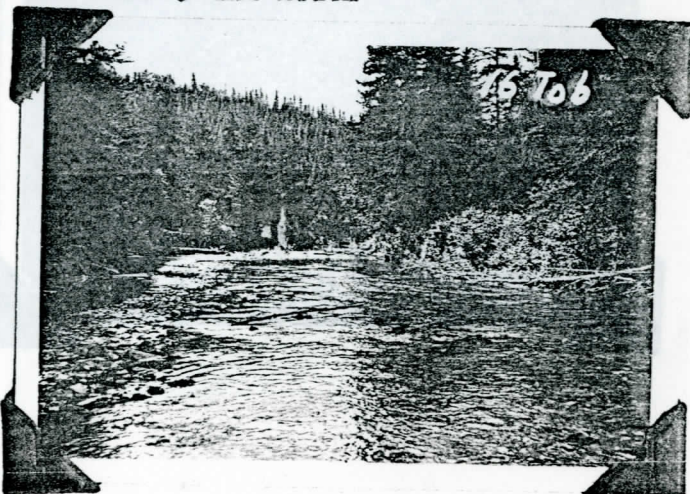
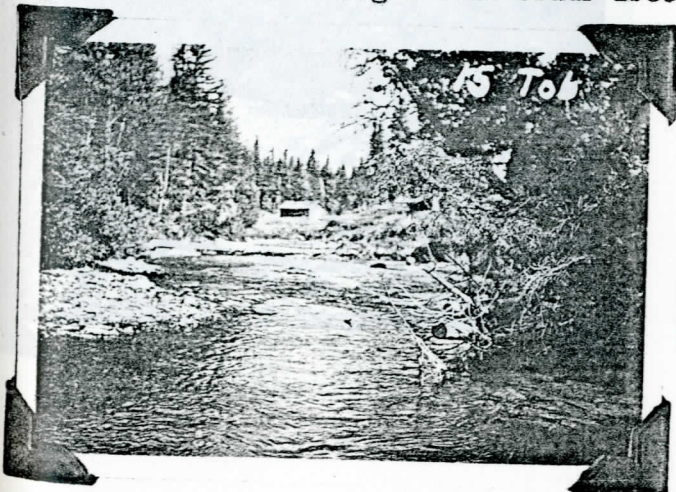
Little Tobique River just below entrance of Little Cedar Brook



B-3 on Little Cedar Brook



Along Little Cedar Brook between B-3 and mouth



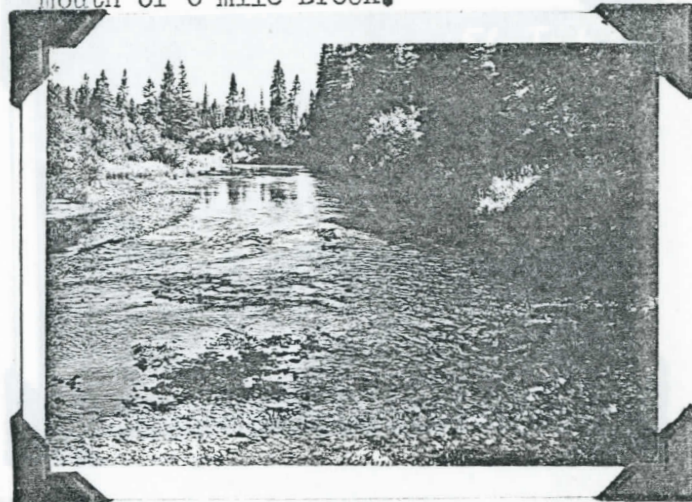
TOBIQUE RIVER

Mamozekel R. & Little Gulquac R.

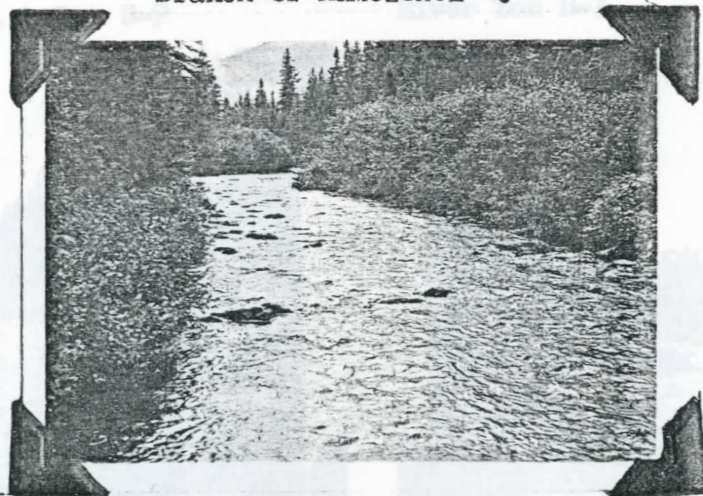
Mamozekel R. at entrance of South Branch.



Mamozekel R. about  $\frac{1}{4}$  mile above the mouth of 8 mile Brook.



The mouth of the South Branch of Mamozekel R.



Little Gulquac River about  $1\frac{1}{2}$  miles above mouth.

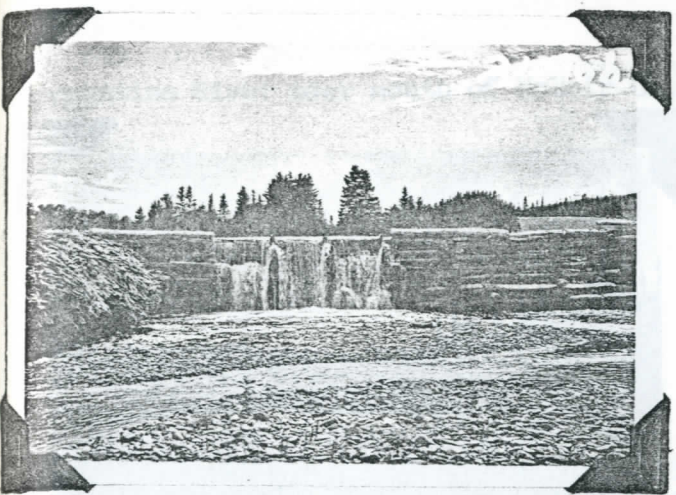


Little Gulquac River about 1 mile above Mouth.

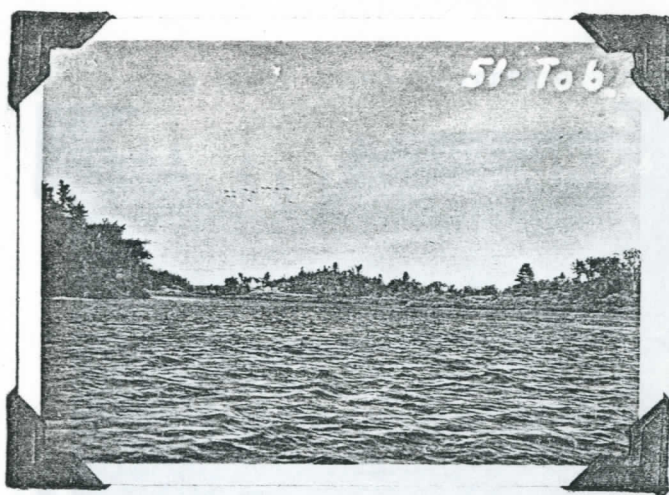


TORIQUE RIVER

B-10 Mill dam at mouth of Riley Bk.

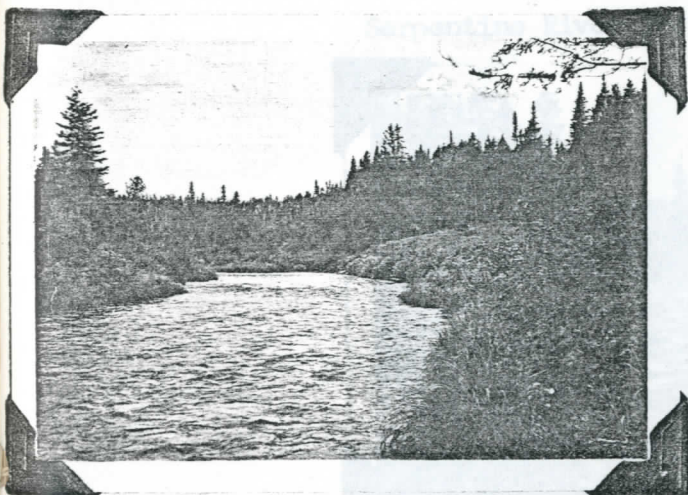


Main river below entrance of Wapskehagan R.

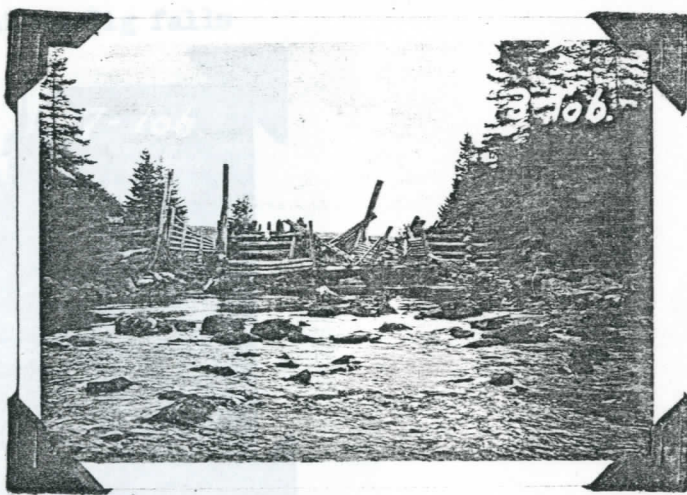


River Dee & Don

River Dee about  $1\frac{1}{2}$  mi. below B-9



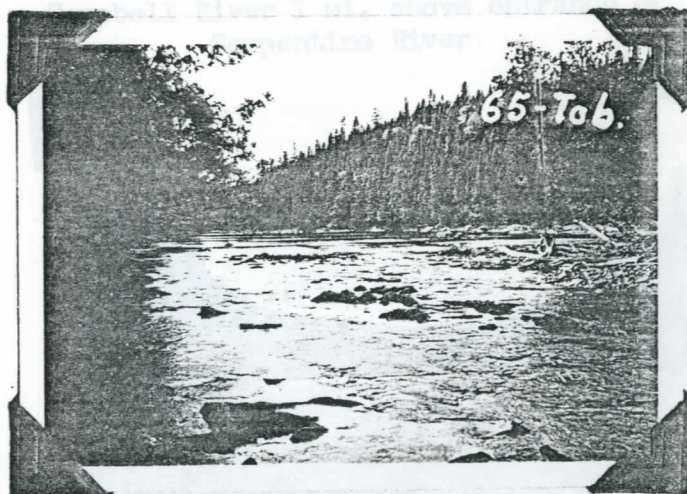
River Don B-7



River Don about 1 mi. below B-7



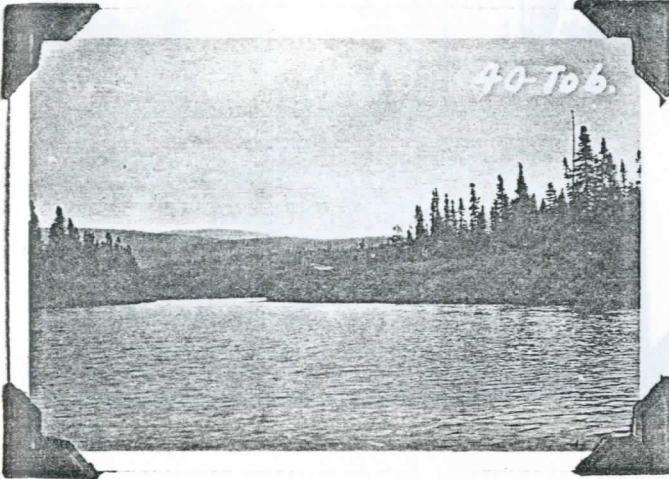
River Don about  $1\frac{1}{2}$  mi. below B-7



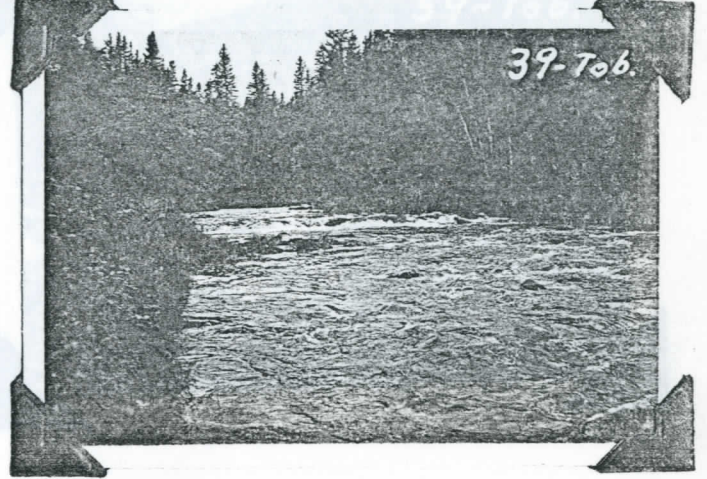
TOBIQUE RIVER

Serpentine R. & Campbell R.

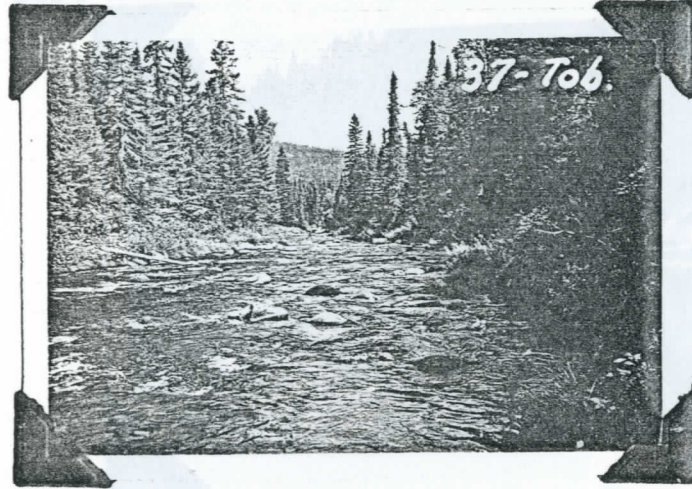
Serpentine River near mouth of Mc Lair Bk.



Serpentine River above entrance of Anvil B



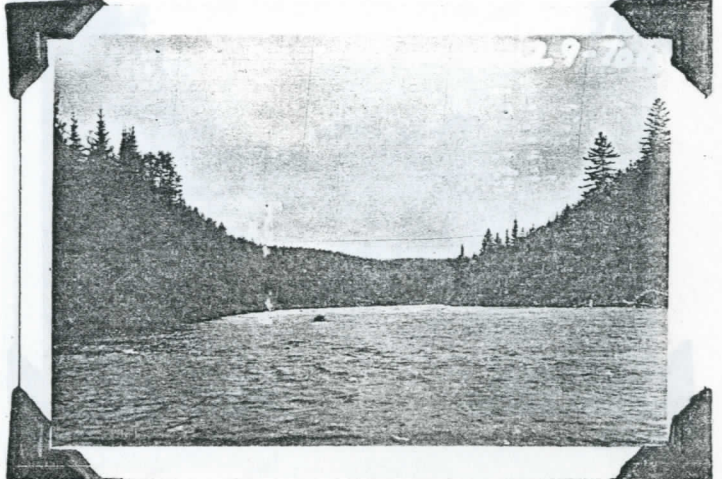
Serpentine River just above Big falls



Serpentine River Big falls



Campbell River 1 mi. above entrance of Serpentine River



TOBIQUE RIVER

Wapskehegan R. & River de Chute

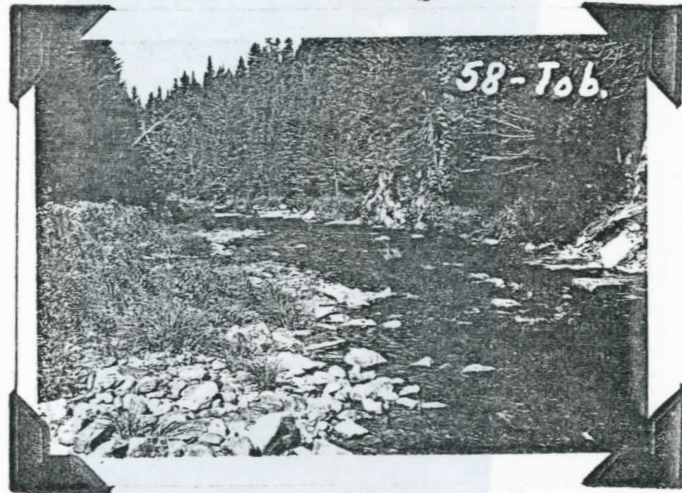
Left hand River de Chute about  
3 miles above mouth.



Left hand River de Chute  
about 1 mile above mouth



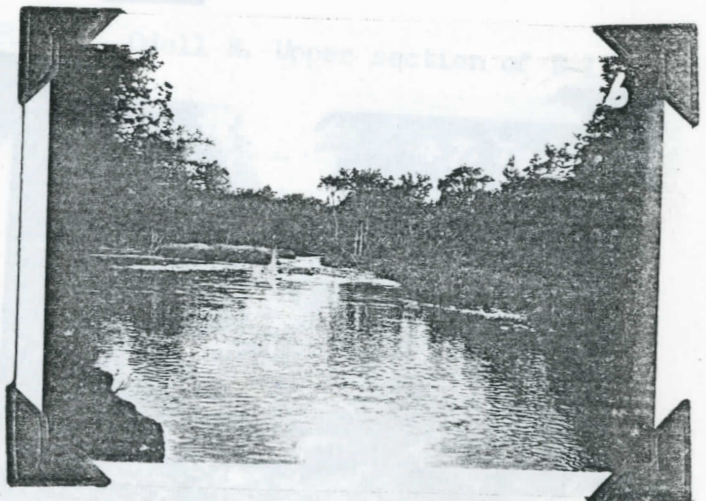
Left hand River de Chute  $\frac{1}{2}$  mi. above mouth.



Right hand River de Chute about  
1 mile above mouth.



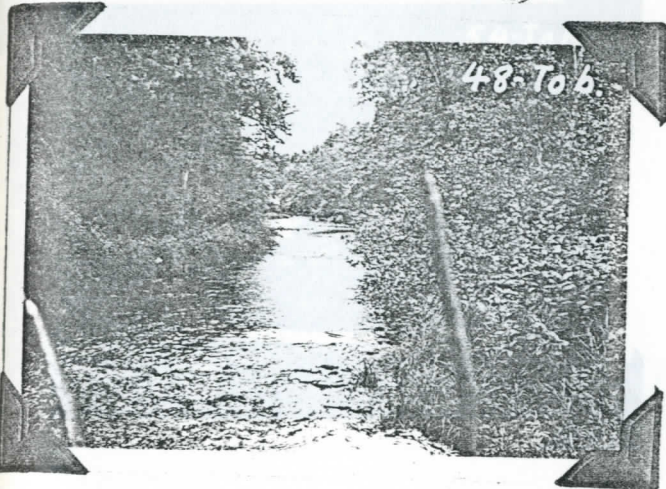
Wapskehegan River at  
the Poplar Camps.



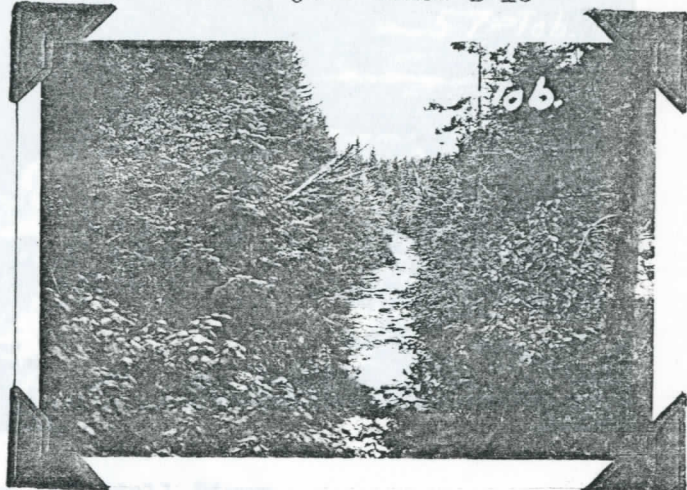
TOBIQUE RIVER

Right hand branch of Odell River

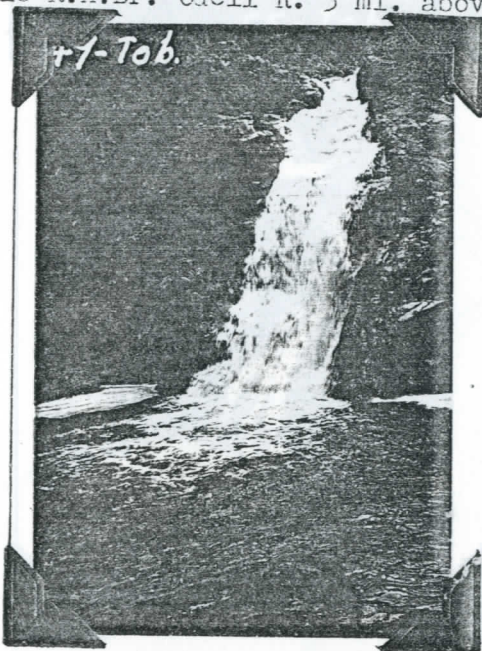
R.H.Br. Odell R. 1 mi. above B-15



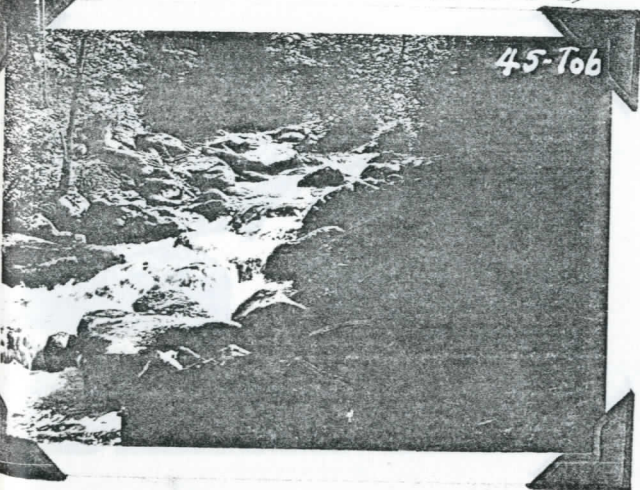
R.H.Br. Odell R. just below B-16



B-16 R.H.Br. Odell R. 3 mi. above mouth



R.H.Br. Odell R. Lower section of B-15



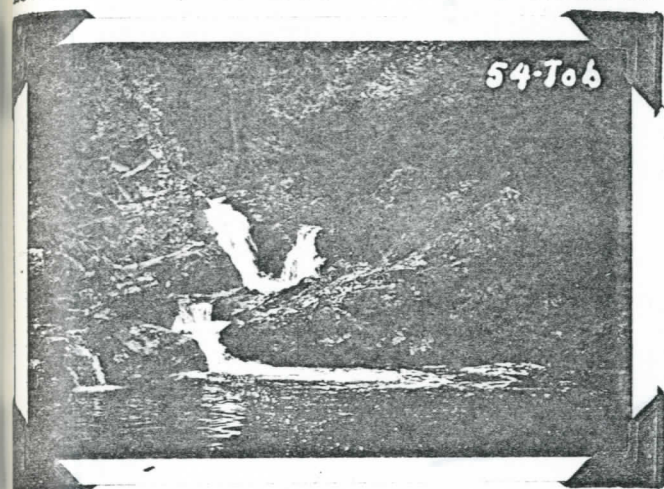
R.H.Br. Odell R. Upper section of B-15



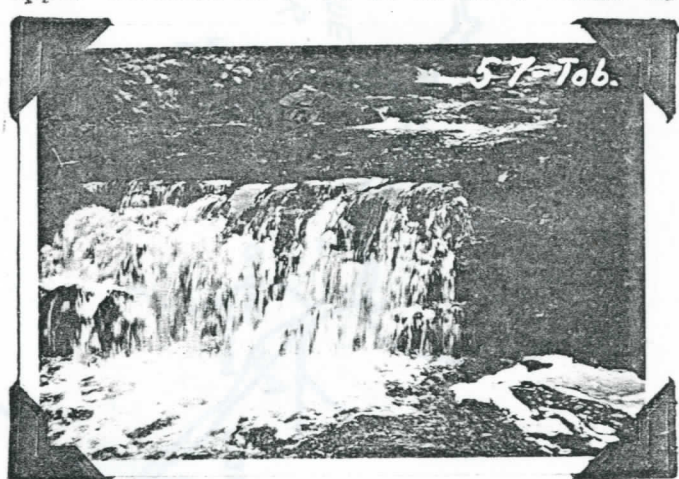
TOBIQUE RIVER

Left hand branch of Odell R.

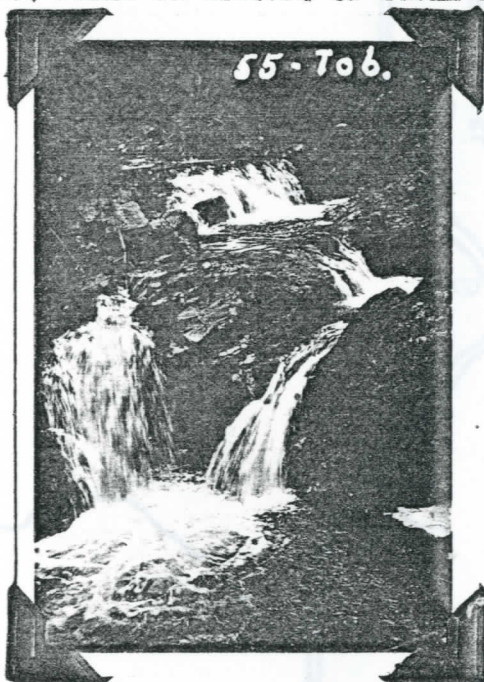
Lower section of B-14 on L.H.Br. Odell R.



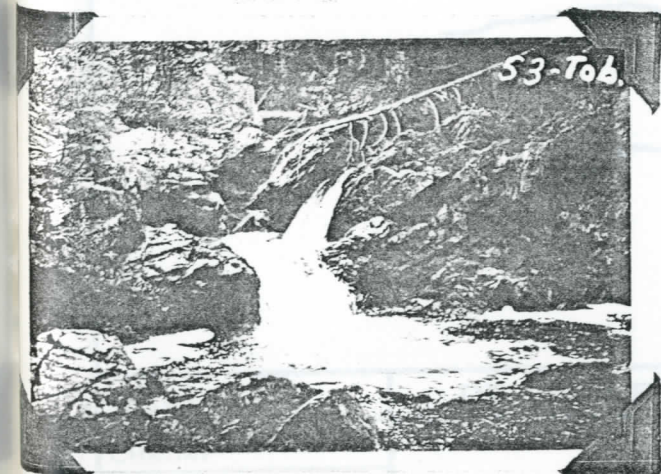
Upper section of B-14 on L.H.Br. Odell R.



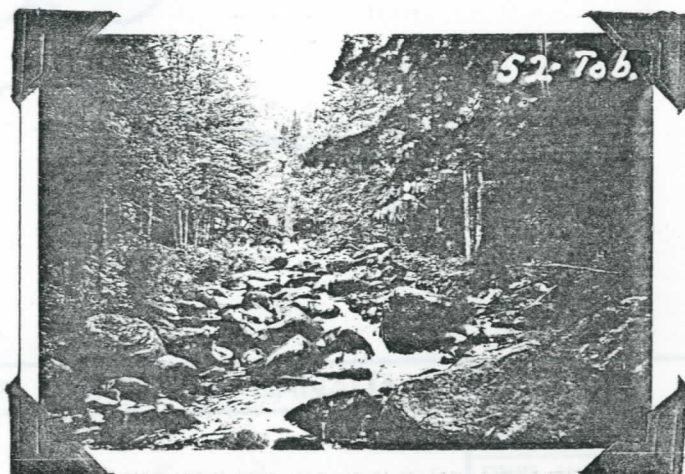
B-14 Falls on L.H.Br. of Odell River

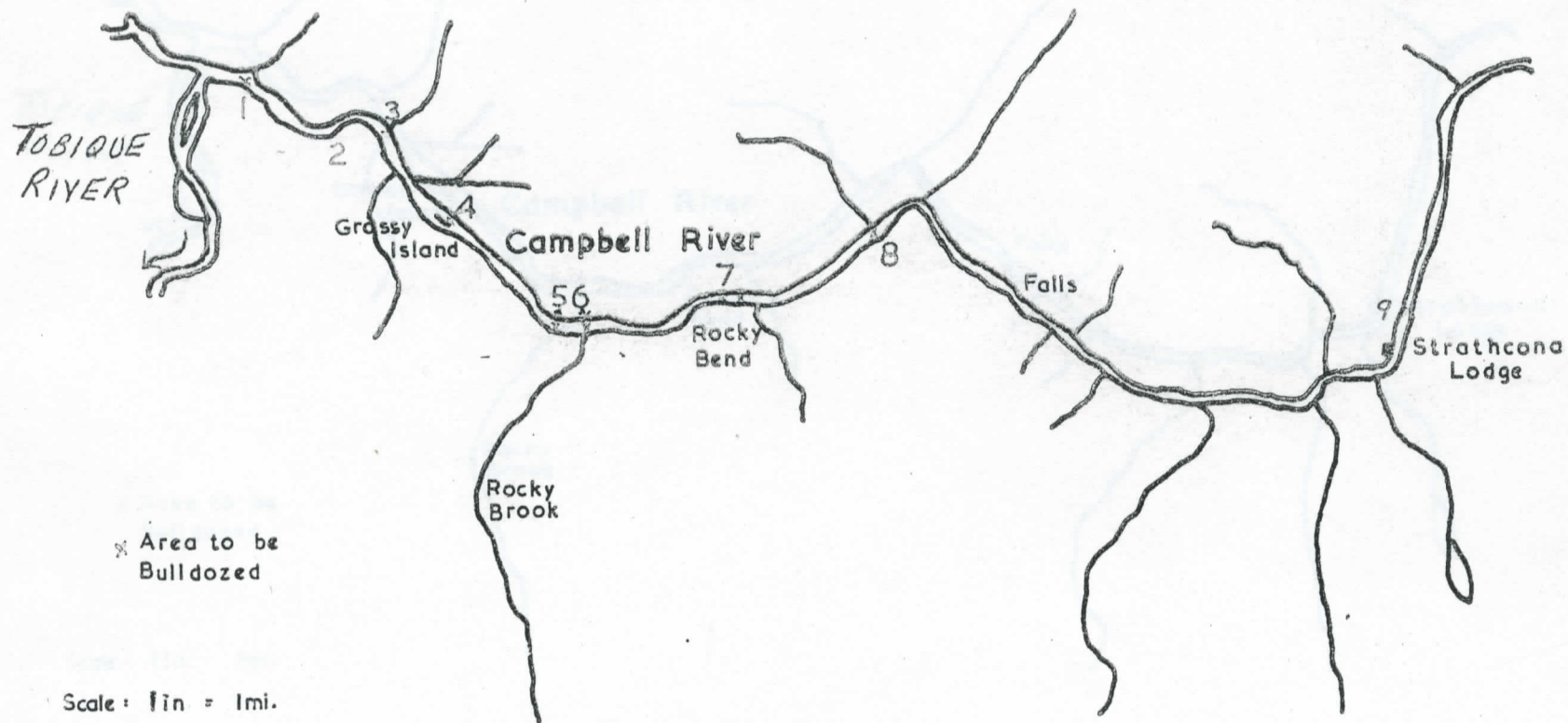


L.H. Br. of Odell R. about 1 mi. above mouth



L.H.Br. Odell R. about  $\frac{1}{2}$  mi. above mouth.

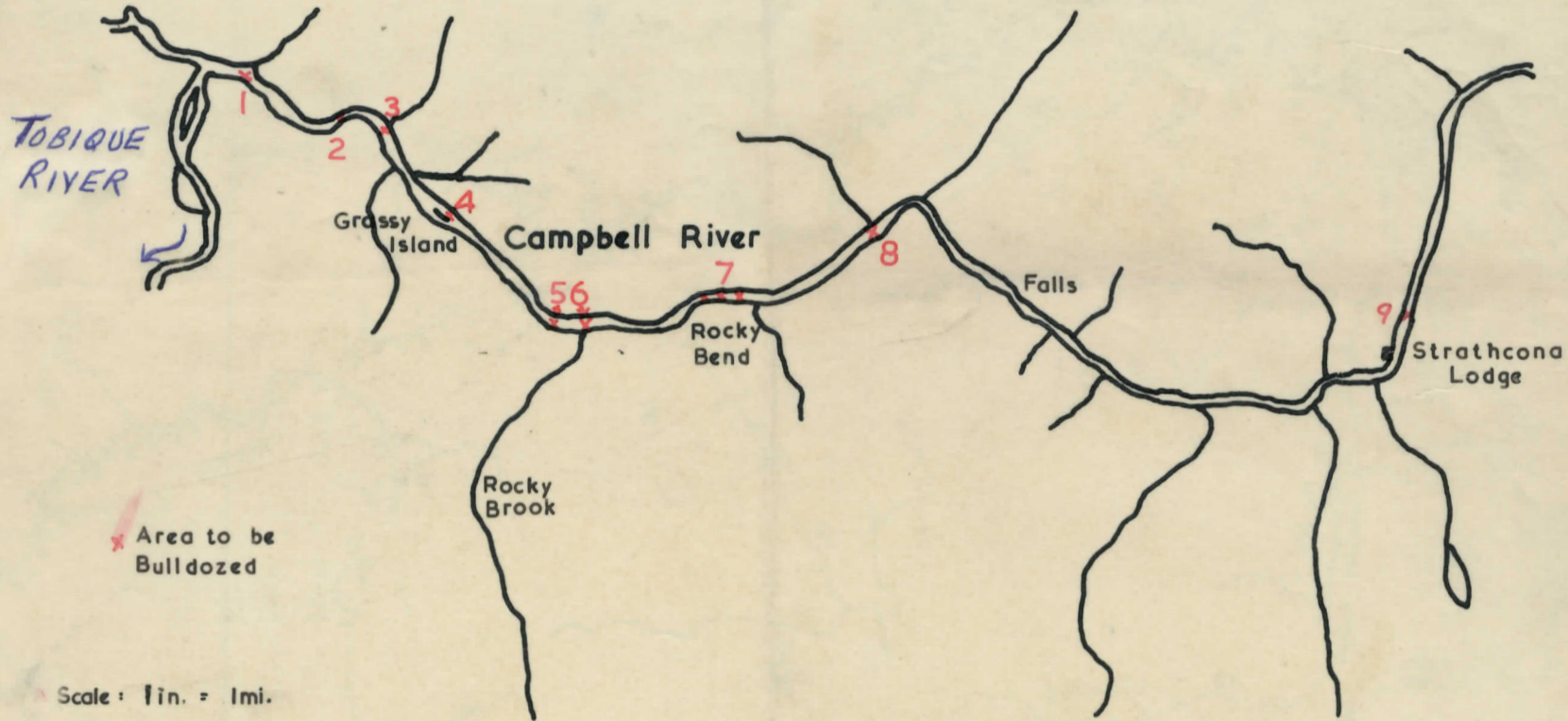




\* Area to be Bulldozed

Scale: 1 in = 1 mi.

DRAWN:	DEPARTMENT OF FISHERIES, CANADA		DATE:
	CHECK:	APPROVED:	SCALE:
DWG. No.:			



DRAWN:	DEPARTMENT OF FISHERIES, CANADA		DATE:
	CHECK:	APPROVED:	SCALE:
DWG. No.:			