Survey of Sixteen Lakes in Antigonish, Guysborough and Digby Counties, Nova Scotia, 1977

D. M. Richard and P. G. Swan

Freshwater and Anadromous Division
Resource Branch
Fisheries and Marine Service
Department of Fisheries and the Environment
Halifax, Nova Scotia
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SURVEY OF SIXTEEN LAKES IN ANTIGONISH, GUYSBOROUGH AND DIGBY COUNTIES NOVA SCOTIA, 1977

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ABSTRACT

Richard, D.M. and P.G Swan. 1979. Survey of sixteen lakes in Antigonish, Guysborough and Digby counties, Nova Scotia, 1977. Fish. Mar. Serv. Data Rep. No.122, 31 p.

In 1977, fourteen lakes in Antigonish and Guysborough counties, and two in Digby County, Nova Scotia, were surveyed as part of a continuing lake-inventory program in the Maritimes Region. The sixteen surveys found in this report include data on certain physical parameters and a bathymetric map for each lake. Field tests for turbidity, water temperature, dissolved oxygen, pH and conductivity were carried out; and a resulting morphoedaphic index, or indicator of productivity, was determined. Fish species were sampled by gill net.

Key words: Lake survey, conductivity, morphoedaphic index, potential fish yield, potential angling yield, dissolved oxygen, temperature, pH.

RESUME

Richard, D.M. and P.G. Swan. 1979. Survey of sixteen lakes in Antigonish, Guysborough and Digby counties, Nova Scotia, 1977. Fish Mar. Serv. Data Rep. No. 122, 31 p.

En 1977, en continuation du programme d'inventaire des lacs de la région des Maritimes, l'auteur a explore quatorze lacs des comtés d'Antigonish et de Guysborough, et deux dans le comtés de Digby en Nouvelle-Ecosse. Les seize etudes figurant dans le présent rapport comprennent, pour chaque lac, des données sur certains paramètres physiques ainsi qu'une carte bathymétrique. A l'aide de mesures de la turbidité, de la température de l'eau, de l'oxygène dissous, du pH et de la conductivité, l'auteur a établi pour chacun des lacs l' index morphoédaphique, ou indicateur de la productivité. L'échantillonnage des espèces de poisson s'est fait avec un filet maillant.

Mots clés: Etude des lacs, conductivité, index morphoédaphique, possibilité de production de poissons, possibilité de rendement de la pêche à la ligne, oxygéne dissous, température, pH.

INTRODUCTION

In 1977, fourteen lakes in Antigonish and Guysborough counties, and two lakes in Digby County were surveyed in the continuing lake inventory system of the Freshwater and Anadromous Division, Resource Branch. These surveys are summarized in this report.

Selection of lakes to be surveyed in Antigonish and Guysborough counties was based partly on the ease of access to them and on their proximity to a field camp established at Giant Lake, Guysborough County. In addition, lakes were selected because they were identified as being headwater lakes less than 25 ha in surface area. Lakes having these basic characteristics may prove to be suitable for chemical reclamation or hybrid stocking in broodstock development and stock assessment projects.

The two lakes surveyed in Digby County were Tedford and Boarback. These were reclaimed in 1936 (Smith 1938) with copper sulfate treatment. The 1977 surveys provided more recent information on productivity values as well as an indication of the fish species now inhabiting the two lakes.

METHODS AND MATERIALS

For each lake surveyed, a shoreline map – suitable for both field work and report purposes – was produced by enlarging existing outline maps (N.S. Dept. of Lands and Forests, Crown Land Forestry Series, 1964; 1:1,320 scale) to fit 8.5 x 11 in. paper. Suitable enlargement was achieved using a "Map-O-Graph" machine. For each map produced, the enlargement scale was calculated and is shown on all maps included in this report.

Many of the physical parameters recorded for each lake – including maximum length, maximum effective length, maximum width and maximum effective width – were determined by direct measurement from the enlarged maps. Area values were determined by planimetry, and shoreline lengths by using a map measurer. Shoreline development (degree of irregularity of shoreline) was calculated by the following formula:

$$\frac{S}{2\sqrt{a\pi}}$$, (Welsh, 1948),

where S = shoreline length
a = area of lake.

The precision of the physical parameters recorded is limited by both the method of map enlargement and by the mechanical measurements. Subsequent calculations, such as volume, are further limited by the precision of field instruments such as the echo sounder. Consequently, the values recorded have been rounded off to reduce exaggeration of significant digits to a level that was judged to be within reasonable limits for the instrument precision.

Field activities included depth determination for each lake, by using a Furuno Mark II echo sounder. Depth soundings were recorded along transects run by an outboard motor boat, moving at slow and reasonably constant speed between identifiable points on opposite shores of the lake. Recorded depths were subsequently transferred to the transects drawn on the map enlargements, and contours were drawn at one-meter intervals to produce a bathymetric map.

Lake volume was taken as the sum of the volumes of all horizontal strata between contours on the bathymetric map. Volume of each stratum was calculated using the planimeter to determine area, and by inserting these values in the formula provided by Welsh (1948):

$$V = \frac{h}{3}\left(a_1 + a_2 + \sqrt{a_1 a_2}\right)$$

where V = volume
h = vertical depth of each horizontal stratum
a_1 = area of stratum upper surface
a_2 = area of stratum lower surface

Mean depth was calculated by dividing volume of the lake by water surface area.

Several characteristics of the water column were determined at one or more locations on each lake surveyed. One water sample location was selected in a relatively deep area, as determined by the raw data available from depth sounding. The location of each sample station is indicated by a triangular-shaped symbol (Fig.) on the bathymetric maps.

At each sample station, turbidity (light penetration) was determined using a secchi disc (Lagler 1956). Although much of the variation in secchi disc readings between lakes is undoubtedly a result of the variable wind and light conditions encountered, this should still be considered a useful parameter for Maritime lakes, where water varies from very clear to water that appears almost black in colour.

Water temperature and dissolved oxygen content were determined at one-meter vertical intervals using a YSI Model 51A dissolved oxygen/temperature meter. Determinations of pH were made by using a portable Accumet meter for water samples from several depths, including one in each thermal layer when stratified lakes were encountered. Sub-surface samples were collected with a one-litre Kemmerer sample bottle. Surface conductivity values were determined by using a YSI Model 9-325 conductivity/salinity/temperature meter.

Total dissolved solids (TDS) were calculated by conversion from the average conductivity of all surface-water samples collected for a given lake. Where conductivity was within the range 15-50 µmhos/cm, a conversion formula provided by Kerekes (1973) was used:

$$Y = -1.262 + 0.603X$$

where Y = Salinity = TDS,
X = Conductivity.

Where conductivity was greater than 50 µmhos/cm, conversion was made by using a formula derived from data provided by Hayes (1963):

log TDS = 1.091 log conductivity -0.252

Dividing TDS by mean depth produces a morphoedaphic index (MEI) used as an indicator of productivity (Ryder 1965). In this report, MEI has been modified by using a mean depth of not less than two meters. This modification has been suggested by Kerekes (pers. comm.)[1] in order to avoid artificially high productivity values in shallow lakes.

The formula

yield = 0.966 $\sqrt{MEI}$ (Ryder et al. 1974)

provides an estimate of potential fish yield in an opportunistic fishery. However, because sport fisheries in Nova Scotia are highly selective for salmonids, "potential yield to angling" has been determined by comparison with trout waters in Ontario (Ryder et al. 1974) by using a graphical method (Appendix D). Both values are recorded in this report. Although the MEI is considered to be a good indicator of yield to angling, the yield realized has been shown to deviate as much as ten-fold from the calculated potential yield (Ryder et al. 1974).

The fish population of each lake was sampled by using experimental, monofilament gill nets set on bottom. Two net lengths were available. The nets used most commonly measured 106.7 m (350 ft) on the float line, 1.8 m (6 ft) in depth and incorporated seven panels of equal length. Square-mesh sizes of the seven panels were: 1.3 cm (½ in.), 1.9 cm (3/4 in.), 2.5 cm (1 in.), 3.2 cm (1¼ in.), 3.8 cm (1½ in.), 5.1 cm (2 in.) and 7.6 cm (3 in.), with mesh size increasing progressively from one end of the net. Three shorter nets, measuring 30.5 m (100 ft) on the float line and 1.8 m (6 ft) in depth and each incorporating two panels of equal length, were also employed. These three separate nets included square-mesh sizes joined as follows: 1.3 cm (½ in.) to 1.9 cm (3/4 in.); 2.5 cm (1 in.) to 3.2 cm (1¼ in.); and 3.8 cm (1½ in.) to 5.1 cm (2 in.). All nets were equipped with polycore float line and lead-core bottom line.

Length of each fish collected from one or more nets (depending on sample size) was recorded for each lake. Weight was also recorded for each salmonid collected, and a scale sample was collected for age determination at a later date.

In this report, fish species are referred to by common name. A list of corresponding scientific names is provided (Appendix A).

"Stocking History" was summarized from the records of distribution from federal hatcheries. Abbreviations or codes used (Appendix B) are those commonly used by the hatcheries.

RESULTS

For the lakes surveyed, potential productivity for all species in an opportunistic fishery averaged 2.8 kg/ha/yr, and ranged from 1.4 kg/ha/yr in Loch Katrine to 4.6 kg/ha/yr in Unnamed Lake (45°22'N; 61°58'W). In a more selective fishery, salmonids only, potential yield ranged from 0.3 kg/ha/yr to 3.8 kg/ha/yr and averaged 1.4 kg/ha/yr. Productivity data have been summarized in tabular form for all sixteen lakes (Appendix C).

Common sucker was the fish species most frequently netted, followed by brook trout, yellow perch, golden shiner, white perch, brown trout, brown bullhead and gaspereau. Species occurrence in fish samples collected from these lakes is also summarized in tabular form (Appendix E).

Five of the lakes considered may have potential for chemical reclamation. These are McKinnon Lake, Kimbal Lake, Unnamed Lake (45°21'N; 61°55'W), Duggans Lake and Unnamed Lake (45°22'N; 61°58'W). However, there may be public objections to reclaiming McKinnon Lake, due to the presence of brown trout which are popular with anglers. Also Kimbal Lake was chosen for a special study on its brook trout population.

McKinnon, Margaret, Horahan and Kimbal lakes were chosen to be used in hybrid-trout stocking experiments and were stocked with hybrid and domestic brook trout in the fall of 1977.

Detailed survey results are recorded on the following pages for each of the lakes in alphabetical order.

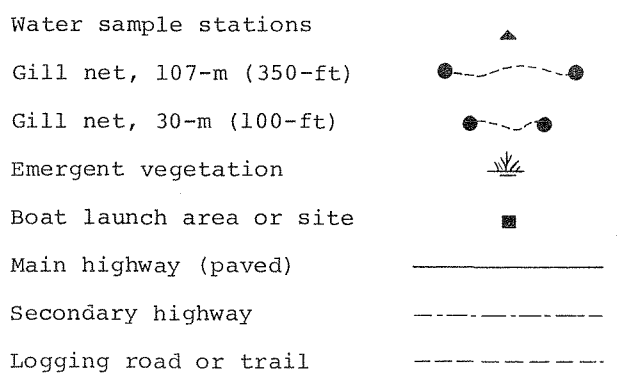

FIG. Map reference, common to all maps in this report.

[1]Kerekes, Joseph. Canadian Wildlife Service, c/o Biology Department, Dalhousie University, Halifax, Nova Scotia.

Boarback Lake

County: Digby

Location: 44°09'N; 65° 57'W

Drainage System: Tusket River

Survey Date: August 2, 1977

Surface Elevation: 46 m

Lake Surface Area: 26.8 ha

Number of Islands: 0

Island Area: 0.0 ha

Water Surface Area: 26.8 ha

Maximum Length: 1,260 m

Maximum Effective Length: 1,020 m

Maximum Width: 430 m

Maximum Effective Width: 430 m

Maximum Depth: 9.0 m

Mean Depth: 2.4 m

Volume of Lake: 64.6 x 10^4 m^3

Shoreline Length: 3,020 m

Shoreline Development: 1.6

Conductivity: 45.0 µmhos/cm

Secchi Disc Reading: 0.7 m

Morphoedaphic Index: 10.7

Potential Fish Yield: 84.8 kg/yr, 3.2 kg/ha/yr

Potential Angling Yield: 45.6 kg/yr, 1.7 kg/ha/yr

Access: A road runs along the southern shore of Boarback Lake, but access from it to the lake shore is impossible. However, there is a private road along the northern shore which leads to several cottages. A boat could be launched with permission from the owner of one of these cleared areas.

Use: Recreational activities, such as swimming, boating and fishing, are expected since cottages are present. This lake is stocked with yearling brook trout, so some angling should take place.

Physical Characteristics: Boarback Lake is bordered with a mixture of approximately 50% hardwood and 50% softwood. Emergent and submergent vegetation is medium dense, and visible bottom type is a mixture of bedrock, detritus, mud and gravel.

Streams: There are two inlets and one outlet but, due to insufficient time, these were not examined during the survey.

Lake Water Characteristics: In August, Boarback Lake was thermally stratified, with a temperature of 21.5°C at the surface, 17.4°C at the thermocline and 12.4°C at a depth of 8 m.

Dissolved oxygen values ranged from 7.5 mg/l at the surface, to 2.3 mg/l at the thermocline. Below the thermocline, very little oxygen was present.

The pH value was 5.0 at the surface, dropping to 4.5 at and below the thermocline. A secchi disc reading of 0.8 m was recorded and water color was brown.

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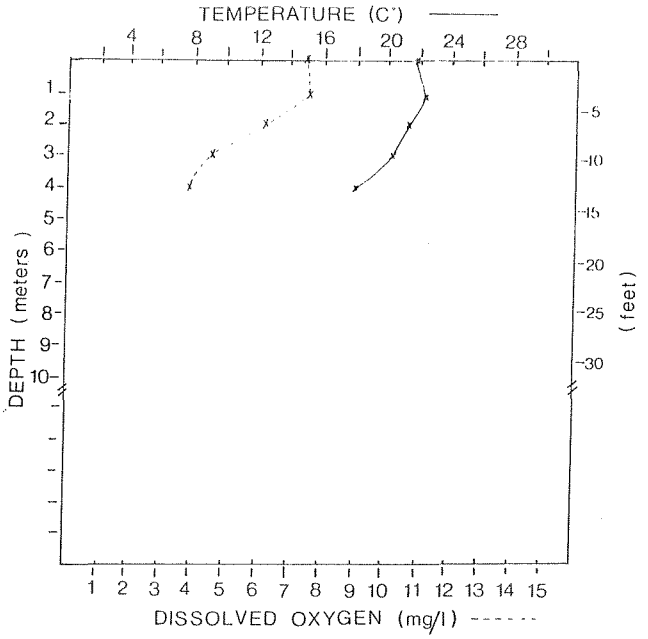

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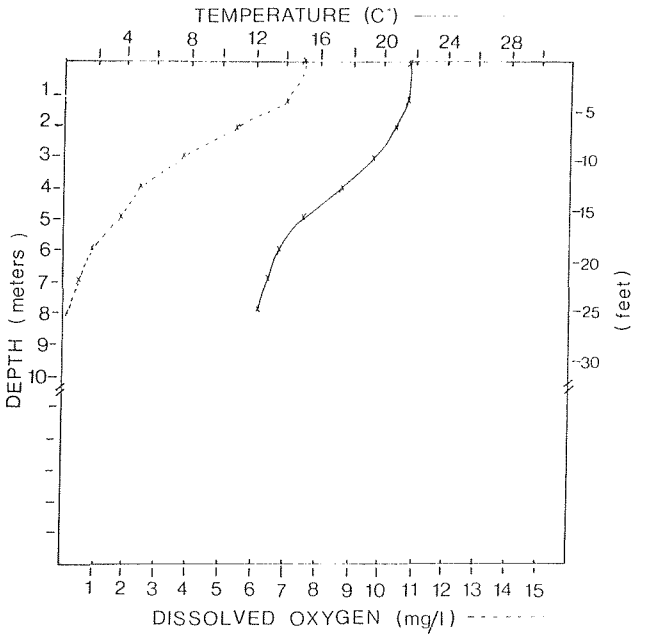
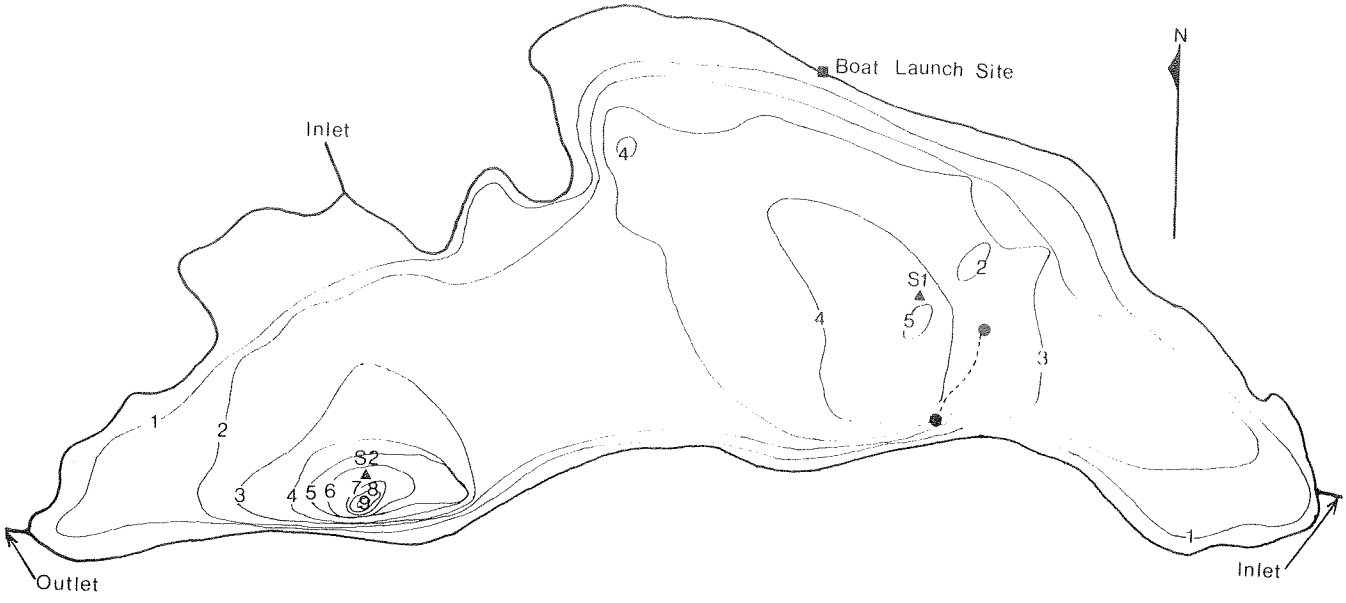


Fish Collection: A 107-m survey gill net was set for one night and no fish were captured.

Stocking History:

April 6, 1976	696 Sf
April 7, 1975	796 Sf
April 19, 1974	999 Sf



BOARBACK LAKE

Duggans Lake

County: Guysborough

Location: 45°20'N; 61°47'W

Drainage System: Salmon River

Survey Date: June 29, 1977

Surface Elevation: 122 m

Lake Surface Area: 5.4 ha

Number of Islands: 0

Island Area: 0.0 ha

Water Surface Area: 5.4 ha

Maximum Length: 580 m

Maximum Effective Length: 490 m

Maximum Width: 150 m

Maximum Effective Width: 150 m

Maximum Depth: 8.4 m

Mean Depth: 2.9 m

Volume of Lake: 15.6×10^4 m^3

Shoreline Length: 1,260 m

Shoreline Development: 1.5

Conductivity: 20.0 µmhos/cm

Secchi Disc Reading: 3.0 m

Morphoedaphic Index: 3.5

Potential Fish Yield: 9.8 kg/yr, 1.8 kg/ha/yr

Potential Angling Yield: 2.4 kg/yr, 0.5 kg/ha/yr

Access: Duggans Lake is not easily accessible by vehicle. A dirt road runs near the southwest shore, yet the lake must be reached via a trail running from this road. A four-wheel-drive vehicle is needed and, depending on the amount of recent rainfall, this vehicle may not be able to reach the lake shore.

Use: Its only probable use is for recreational fishing.

Physical Characteristics: This lake is relatively isolated and is completely surrounded by a mixture of hardwood and softwood. Emergent vegetation is scarce and submergent vegetation is medium dense. The bottom type appears to be a mixture of 50% silt and 50% gravel.

Streams: The outlet was approximately 6 m wide at the lake, but this was due mainly to an obstruction of logs holding back the flow. The width approximately 100 m from the lake was 2.0 m, with an average depth of 0.15 m and an estimated velocity of 0.5 m/sec. Aquatic vegetation was sparse and the stream bed was composed mainly of rock and gravel. The dissolved oxygen reading was 10.5 mg/l and the pH 6.0. Approximately 70% of this stream afforded fish shelter, composed of 30% logs, 20% roots, 15% overhanging banks and 5% aquatic vegetation. This stream runs down a gradual slope and appears to have some potential for migration-barrier construction.

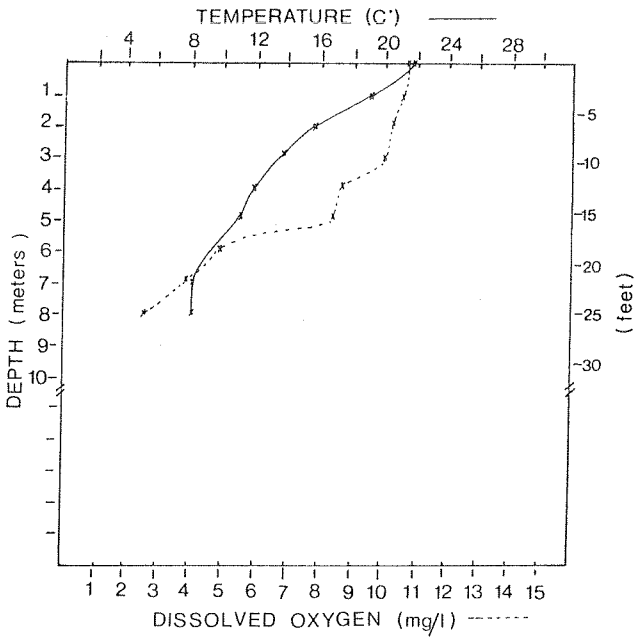
The inlet was approximately 3.0 m wide at the lake. Its average depth was approximately 0.5 m and the flow velocity was estimated to be 0.1 m/sec. Further upstream, the depth decreased to 0.2 m, the width remained at 3.0 m and velocity increased to 0.5 m/sec. Aquatic vegetation was sparse and the stream bed was composed of rock and gravel. Dissolved oxygen was 9.9 mg/l and the pH was 5.5. There was approximately 80% fish shelter, composed of 40% logs, 20% roots and 20% overhanging banks.

Lake Water Characteristics: On June 29, Duggans Lake was thermally stratified, with a temperature of 21.5°C at the surface, 13.4°C at 3 m and 8.0°C at the bottom.

Dissolved oxygen varied from 10.6 mg/l at the surface to 8.4 mg/l in the thermocline to near 2.0 mg/l at the bottom.

The pH ranged from 5.5 to 6.0. A secchi disc reading of 3.0 m was recorded and the water color was yellow-brown.

STN #1



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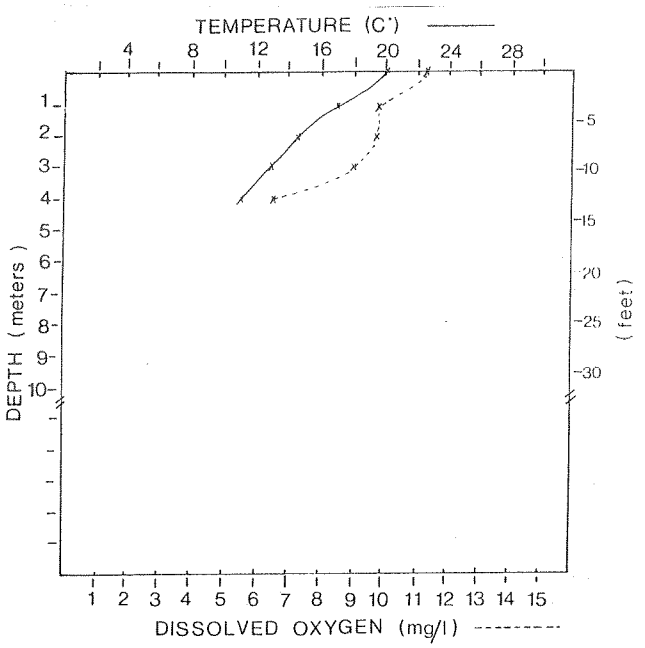


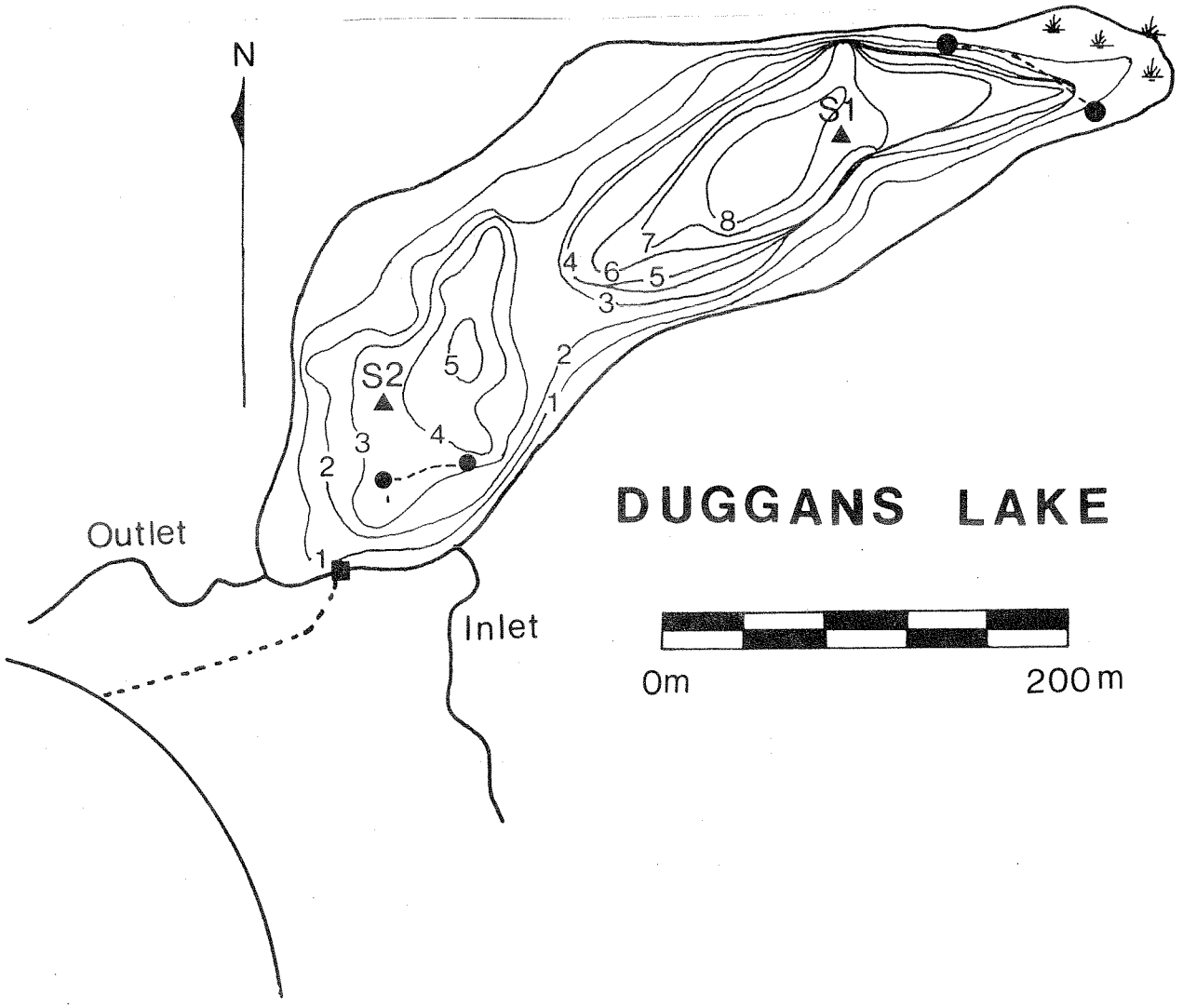
Fish Collection: A 107-m gill net was set for one night. It collected 13 golden shiner, 1 brook trout, 1 common sucker and 27 yellow perch.

A 30-m gill net set for the same period of time collected 7 brook trout, 2 common sucker, 4 yellow perch and 1 golden shiner.

Fish measurements are summarized in the following table.

Species	No.	Fork length (cm) Max.	Min.	Mean	SD	Mean weight (g)
Golden shiner	14	11.6	9.2	9.9	0.6	14
Brook trout	8	16.3	13.2	17.0	2.1	54
Common sucker	3	24.8	11.5	18.3	6.7	92
Yellow perch	31	12.5	9.3	10.6	0.7	12

Stocking History: None.



Garry Lake No. 2

County: Guysborough

Location: 45°20'N; 61°41'W

Drainage System: Isaac's Harbour River

Survey Date: August 23, 1977

Surface Elevation: 136 m

Lake Surface Area: 9.3 ha

Number of Islands: 1

Island Area: 0.4 ha

Water Surface Area: 8.9 ha

Maximum Length: 855 m

Maximum Effective Length: 485 m

Maximim Width: 300 m

Maximum Effective Width: 300 m

Maximum Depth: 2.2 m

Mean Depth: 1.0 m

Volume of Lake: 8.5×10^4 m^3

Shoreline Length: 1,960 m

Shoreline Development: 1.9

Conductivity: 20.0 µmhos/cm

Secchi Disc Reading: Visible to bottom (2.2 m)

Morphoedaphic Index: 11.2

Potential Fish Yield: 28.7 kg/yr, 3.2 kg/ha/yr

Potential Angling Yield: 15.5 kg/yr, 1.8 kg/ha/yr

Access: To gain access to Garry Lake No. 2, it is necessary to cross Garry Lake No. 3 (above) by small boat or canoe and proceed down its outlet (Inlet No. 2 on this lake) as far as possible. At this point on the stream, it is necessary to portage approximately 60 m to a point on the northern shore just west of Inlet No. 2.

Use: The lake is probably used only sparingly for recreational purposes due to its remoteness and difficulty of access.

Physical Characteristics: The land bordering this lake constitutes a mixture of 50% hardwood, 40% softwood and some marshland. Emergent vegetation was scarce. However, submergent vegetation was medium dense and the bottom was composed of mostly gravel and boulders.

Streams: From the lakeshore to a point approximately 100 m upstream, Inlet No. 1 narrowed from 1 m to about 0.3 m. Within this area of stream, average depth varied from 0.2 m to 0.15 m. Overhanging banks and aquatic vegetation provided fish shelter in about 90% of this total area. Inlet No. 2 is less than 100 m long and flows from Garry Lake No. 3. It was 1.5 m in width and aquatic vegetation, which was abundant on this stream, provided most of the fish shelter. There were some natural obstructions to fish passage.

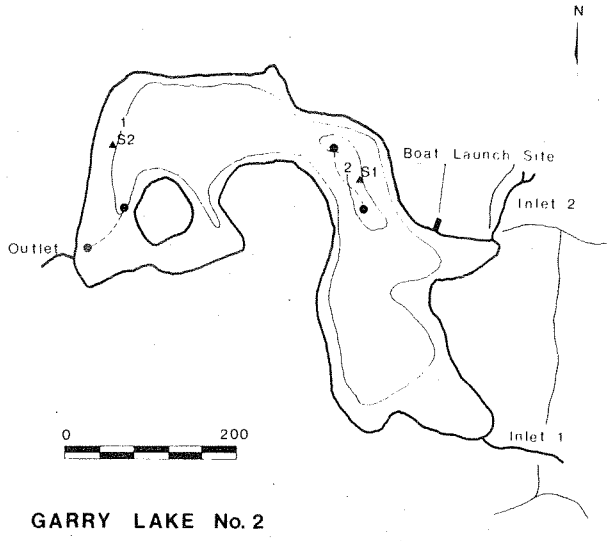
Lake Water Characteristics: In August 1977, the water temperature was 22°C at both the surface and at 1 m for Station No. 2. The dissolved oxygen levels at Station No. 1 were 7.9 mg/l at the surface, 8.4 mg/l at 1 m and 8.7 mg/l at 1.8 m. At Station No. 2 the dissolved oxygen levels were 8.1 mg/l at the surface and 8.3 mg/l at 1 m. The pH was 6 and the conductivity was 20 µmhos/cm at both stations.

Fish Collection: Two 107-m survey gill nets were set for one night, and 30 common sucker plus 4 brook trout were captured. Two 30-m survey gill nets were also set for one night, and 2 brook trout plus 19 common sucker were captured.

Fish measurements are summarized in the following table.

Species	No.	Fork length (cm) Max.	Min.	Mean	SD	Mean weight (g)
Brook trout	6	30.0	15.2	23.6	6.4	198.0
Common sucker	49	40.6	10.8	28.8	7.09	320.4

Stocking History: None.



GARRY LAKE No. 2

Garry Lake No. 3

County: Guysborough

Location: 45°20'N; 61°41'W

Drainage System: Isaac's Harbour River

Survey Date: August 23, 1977

Surface Elevation: 136 m

Lake Surface Area: 8.8 ha

Number of Islands: 0

Island Area: 0.0 ha

Water Surface Area: 8.8 ha

Maximum Length: 620 m

Maximum Effective Length: 620 m

Maximum Width: 370 m

Maximum Effective Width: 370 m

Maximum Depth: 5.5 m

Mean Depth: 1.5 m

Volume of Lake: 13.2×10^{6} m^3

Shoreline Length: 1,840 m

Shoreline Development: 1.8

Conductivity: 20.0 µmhos/cm

Secchi Disc Reading: Visible to bottom (5.5 m)

Morphoedaphic Index: 7.2

Potential Fish Yield: 22.7 kg/yr, 2.6 kg/ha/yr

Potential Angling Yield: 9.2 kg/yr, 1.1 kg/ha/yr

Access: An old trail or logging road passes within 80 m of a possible boat-launch site. However, a four-wheel-drive is necessary to travel on this road most of the year.

Use: Due to difficulty of access, this lake is probably used to a limited extent for recreational fishing.

Physical Characteristics: The land bordering this lake is totally forested, being evenly divided between hardwood and softwood. Emergent vegetation appeared to be scarce and there was a medium dense growth of submergent vegetation.

Streams: The inlet was 1.5 m wide at the lake shore, with an average depth of 0.1 m. Dissolved oxygen at this point was 7.8 mg/l, temperature was 22.5°C and pH was 6.0. Abundant aquatic vegetation and large boulders provided most of the fish shelter in this area.

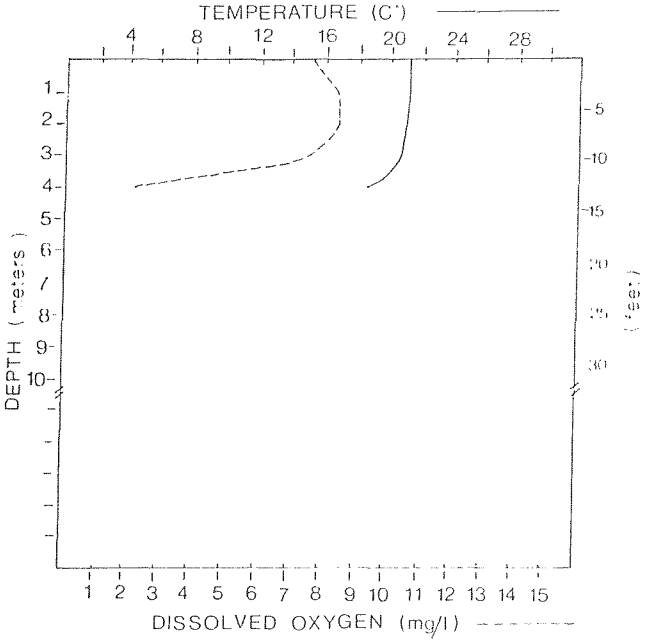
The outlet was 1.5 m wide at the lakeshore, with an average depth of 0.15 m. The water temperature was 21°C, dissolved oxygen 7.6 mg/l and pH 6.0.

Aquatic vegetation was abundant in this stream and, along with overhanging banks, should provide excellent shelter for fish.

Lake Water Characteristics: Water temperature varied from 21.1° to 18.5°C. Dissolved oxygen varied from 8.4 mg/l to 2.0 mg/l at the bottom. The pH was 6.0 and conductivity was 20.0 µmhos/cm.

The secchi disc was visible to the bottom at 4.5 m and the water was clear.

STN #1

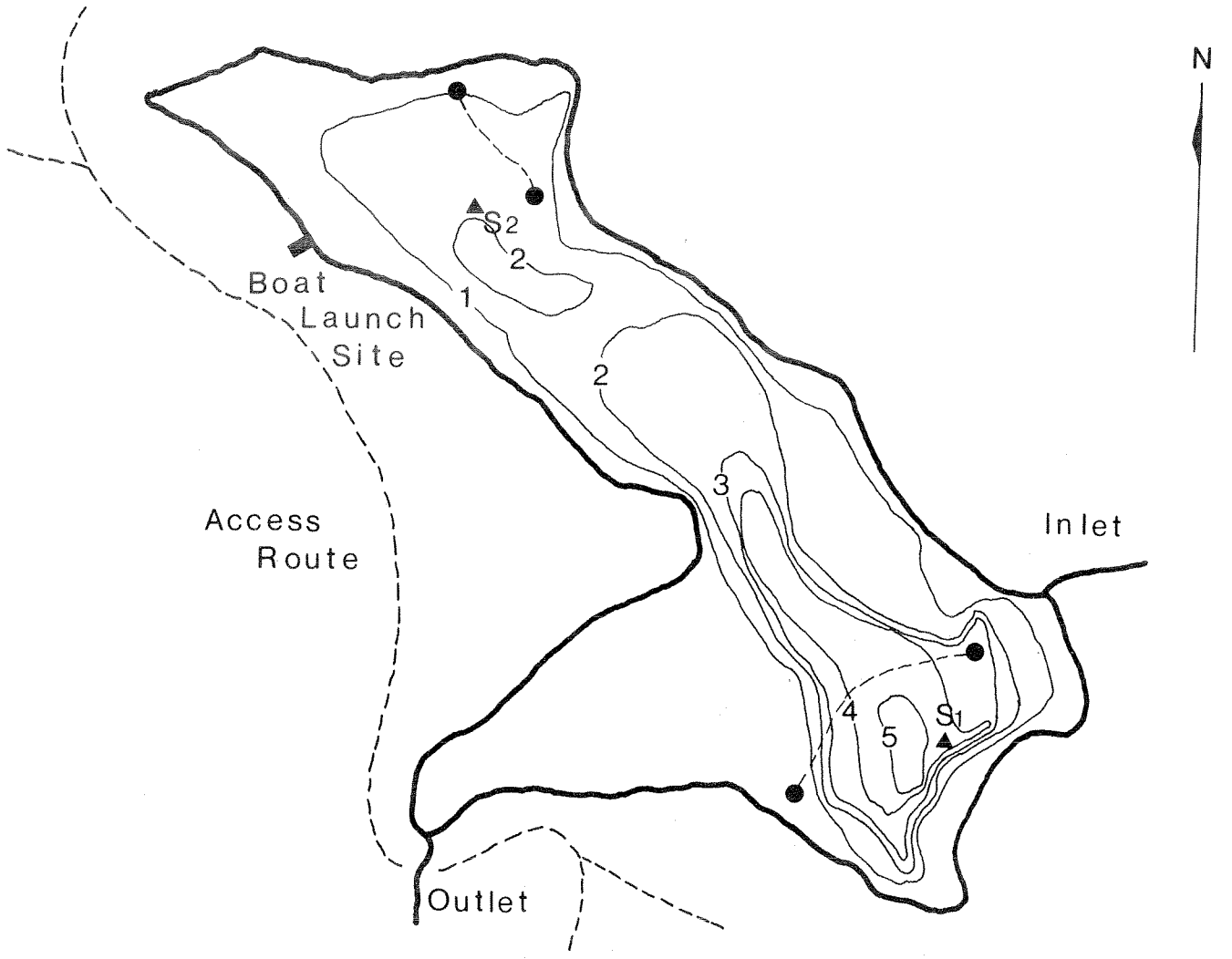


Fish Collection: Two 107-m gill nets and one 30-m gill net set for one night captured 16 brook trout and 53 common sucker.

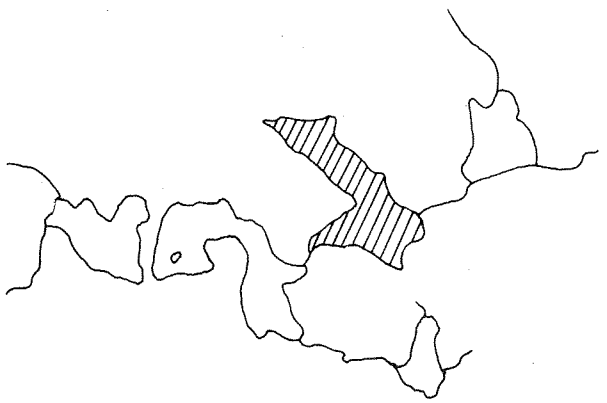
The measurements are summarized in the following table.

Species	No.	Fork length (cm) Max.	Min.	Mean	SD	Mean weight (g)
Brook trout	16	27.8	18.1	21.2	3.1	137.9
Common sucker	53	42.3	10.8	30.0	9.2	409.2

Stocking History: None.



GARRY LAKE No. 3



Horahan Lake

County: Guysborough

Location: 45°22'N; 61°56'W

Drainage System: Country Harbour River

Survey Date: June 24, 1977

Surface Elevation: 107 m

Lake Surface Area: 7.3 ha

Number of Islands: 0

Island Area: 0.0 ha

Water Surface Area: 7.3 ha

Maximum Length: 455 m

Maximum Effective Length: 455 m

Maximum Width: 280 m

Maximum Effective Width: 280 m

Maximum Depth: 3.0 m

Mean Depth: 1.3 m

Volume of Lake: 95.5 x 10^3 m^3

Shoreline Length: 1,430 m

Shoreline Development: 1.5

Conductivity: 18.0 µmhos/cm

Secchi Disc Reading: 2.5 m

Morphoedaphic Index: 4.8

Potential Fish Yield: 15.5 kg/yr, 2.1 kg/ha/yr

Potential Angling Yield: 4.6 kg/yr, 0.6 kg/ha/yr

Access: Horahan Lake is accessible by car. A road runs directly to the lake shore at a point where a boat may be launched.

Use: This lake is probably used by anglers and has a past stocking history.

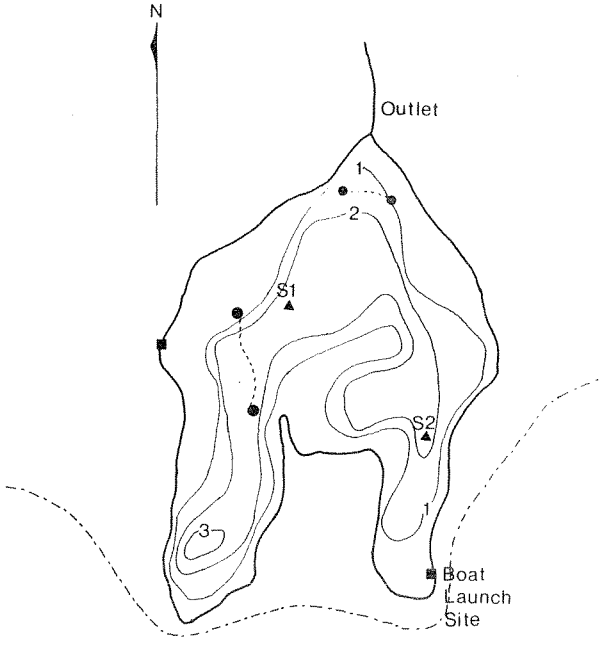
Physical Characteristics: This headwater lake is bordered completely by forest composed of a mixture of 70% hardwood and 30% softwood. Both emergent and submergent vegetation are scarce. Bottom type appears to be mainly gravel and bedrock.

Streams: The only stream is an outlet, which flows very slowly over a bed of gravel and silt. Aquatic vegetation was medium dense and 50% of the stream afforded fish shelter. This was composed of logs, roots, overhanging banks and aquatic vegetation. Dissolved oxygen was 9.6 mg/l and pH was 6.5.

Lake Water Characteristics: The water of Horahan Lake was very clear and the secchi disc was visible to a depth of 2.5 m. Dissolved oxygen values ranged between 9.1 and 9.6 mg/l. Temperature was 16.5°C at the surface and 15.0°C at 2.5 m. All pH readings were 6.5.

Fish Collection: A 107-m survey gill net set for one night captured one male brook trout weighing 1,050 g, with a fork length of 41.7 cm. A 30-m survey gill net set during the same time period was empty. Six days later a 33-m survey gill net set for one night was also empty.

Stocking History: Oct 6, 1977 275 S3 (Domestic)
275 S3 (Hybrid)



HORAHAN LAKE

0m 200m

Johnsons Lake

County: Guysborough

Location: 45°23'N; 61°58'W

Drainage System: South River

Survey Date: June 14, 1977

Surface Elevation: 91 m

Lake Surface Area: 4.8 ha

Number of Islands: 0

Island Area: 0.0 ha

Water Surface Area: 4.8 ha

Maximum Length: 300 m

Maximum Effective Length: 300 m

Maximum Width: 265 m

Maximum Effective Width: 265 m

Maximum Depth: 11.8 m

Mean Depth: 3.7 m

Volume of Lake: 17.7 x 10^4 m^3

Shoreline Length: 1,130 m

Shoreline Development: 1.4

Conductivity: 40.0 µmhos/cm

Secchi Disc Reading: 2.5 m

Morphoedaphic Index: 6.2

Potential Fish Yield: 11.6 kg/yr, 2.4 kg/ha/yr

Potential Angling Yield: 4.0 kg/yr, 0.8 kg/ha/yr

Access: Access to Johnsons Lake is difficult and a four-wheel-drive is necessary to proceed directly to the lake shore. Permission must be obtained from the owner of the cultivated land surrounding the lake.

Use: Recreational activities such as boating, swimming and angling are known to occur.

Physical Characteristics: The land bordering this headwater lake is composed of approximately 80% softwood, 10% hardwood, 5% marshland and 2.5 % each of fields and recently cleared land. Emergent vegetation is scarce and submergent vegetation is medium dense. The visible bottom type appears to be a mixture of detritus, muck and rock.

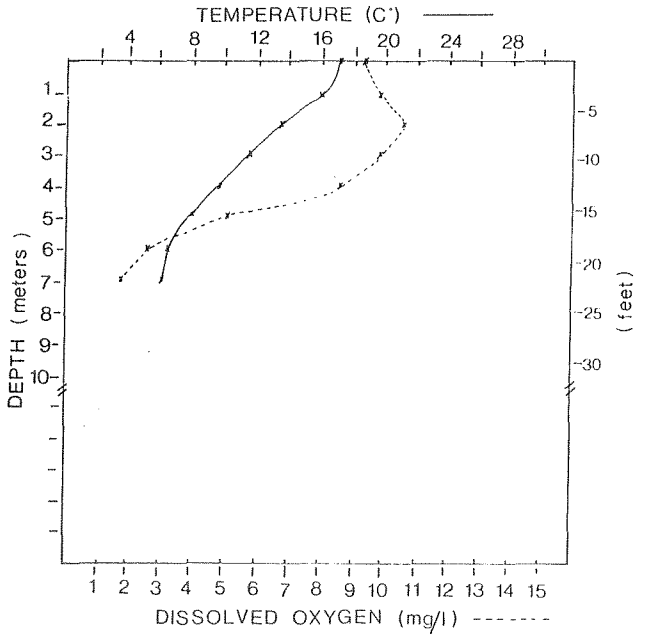
Streams: During this survey, the only stream, an outlet, flowed very slowly over a bed of rock. It was approximately 4 m wide at the lake shore, narrowing to 0.6 m at a point 100 m downstream.

There were a few natural obstructions created by logs and trees. Aquatic vegetation was medium dense. Dissolved oxygen was 9.5 mg/l and pH was 7.0.

Lake Water Characteristics: In June, Johnsons Lake was thermally stratified, with a surface temperature of 17.2°C, dropping to 8.0°C at the lower end of the thermocline.

Oxygen values ranged from 8.6 to 10.6 mg/l in the first 4 m, and dropped to 1.8 mg/l at the bottom. The pH ranged between 6.5 and 7.5. The water of Johnsons Lake had a brown tint and a secchi disc reading of 2.6 m.

STN #1

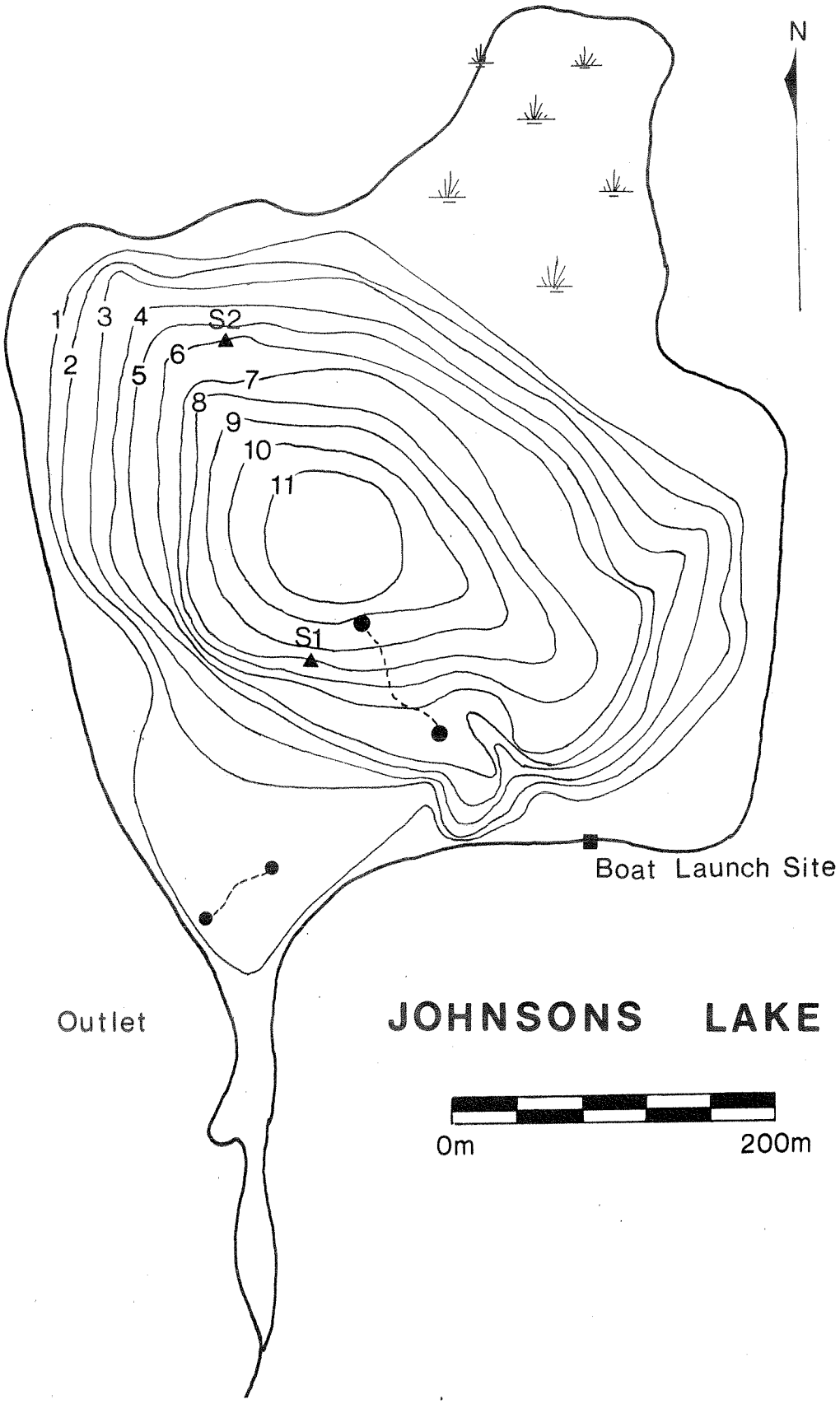


Fish Collection: A 107-m survey gill net set for one night captured 2 gaspereau, 4 yellow perch and 1 white perch. Fragments of brook trout were also recovered. A 30-m survey gill net set for one night captured 31 common sucker.

Fish measurements are summarized in the following table.

Species	No.	Fork length (cm) Max.	Min.	Mean	SD	Mean weight (g)
Gaspereau	2	26.4	26.3	26.3	–	210
Yellow perch	4	14.2	9.1	10.7	–	11
White perch	1	15.8	15.8	15.8	–	–
Common sucker	31	29.8	21.2	25.2	2.9	–

Stocking History: None.


N
1
2
3
4
5
6
7
8
9
10
11
S2
S1
Boat Launch Site
Outlet
JOHNSONS LAKE
0m
200m

Kimbal Lake

County: Guysborough

Location: 45°24'N; 61°57'W

Drainage System: South River

Survey Date: June 8, 1977

Surface Elevation: 76 m

Lake Surface Area: 2.8 ha

Number of Islands: 0

Island Area: 0.0 ha

Water Surface Area: 2.8 ha

Maximum Length: 220 m

Maximum Effective Length: 220 m

Maximum Width: 205 m

Maximum Effective Width: 205 m

Maximum Depth: 7.5 m

Mean Depth: 2.6 m

Volume of Lake: 72.9 x 10^3 m^3

Shoreline Length: 715 m

Shoreline Development: 1.2

Conductivity: 35.0 µmhos/cm

Secchi Disc Reading: 5.8 m

Morphoedaphic Index: 7.7

Potential Fish Yield: 7.5 kg/yr, 2.7 kg/ha/yr

Potential Angling Yield: 3.1 kg/yr, 1.1 kg/ha/yr

Access: Access by road to Kimbal Lake is through private farmland and permission must be obtained from the owner. A four-wheel-drive vehicle is necessary to launch a boat from the lake shore.

Use: Kimbal Lake is used for swimming, boating, and some fishing. However, use of the lake is restricted by the owner of the surrounding land. Fisheries and Marine Service, Resource Branch, is conducting a study of the brook trout population of this lake.

Physical Characteristics: The lake is bordered by a mixture of 20% hardwood and 55% softwood. Approximately 25% of the surrounding land is field. Emergent and submergent vegetation are medium dense and bottom type appears to be a mixture of boulders, muck and gravel. Kimbal Lake is a headwater lake.

Streams: The outlet was approximately 2 m wide at the lake, narrowing to approximately 0.4 m further downstream. The depth decreased from 0.3 m to 0.09 m. The velocity increased from near 0 m/sec to 0.2 m/sec. A road crossing in an adjacent field probably constitutes a fish migration barrier.

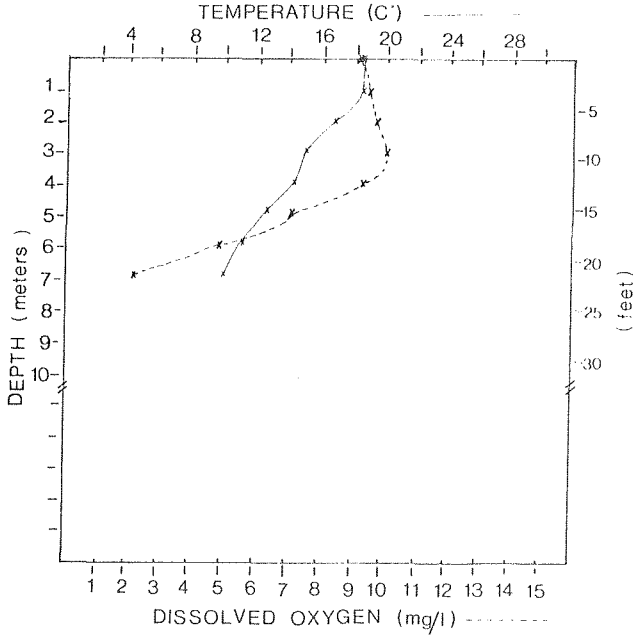
Aquatic vegetation is sparse and the bottom appears to be composed mainly of gravel.

Dissolved oxygen level was 9.0 mg/l and pH was 7.0.

Lake Water Charcteristics: Kimbal Lake was thermally stratified in June. Water temperature was 18.5°C at the surface, 15.1°C at 3 m and 10.0°C at the bottom (7 m).

Dissolved oxygen values were 9.1 mg/l at the surface, 10.0 mg/l within the thermocline and 4.8 mg/l at 6 m.

STN #1

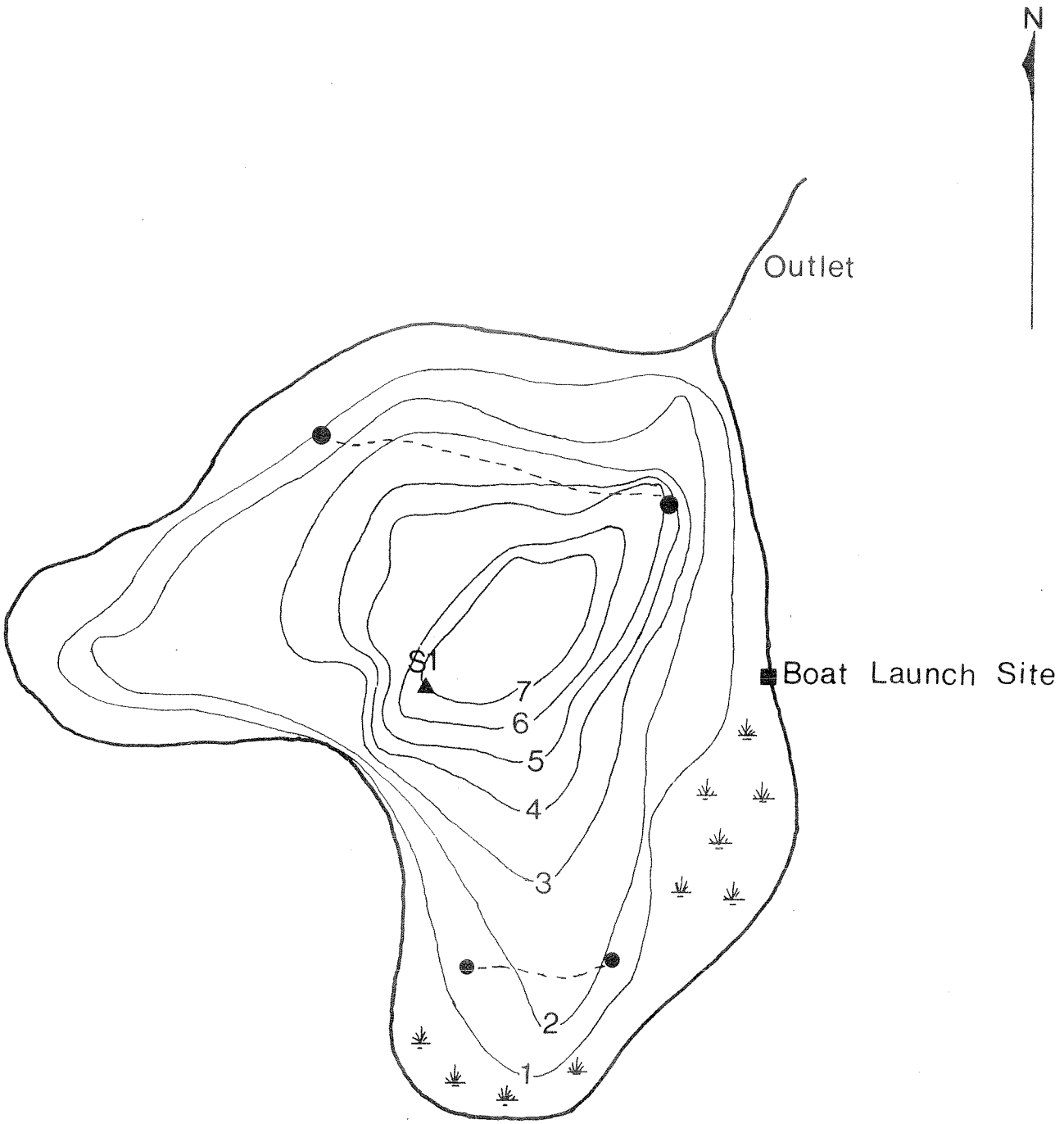


Fish Collection: A 107-m survey gill net set for one night captured 21 brook trout. A 30-m net set for the same time period captured 9 brook trout.

Fish measurements are summarized in the following table. Total catch included 16 males and 14 females.

Species	No.	Fork length (cm) Max.	Min.	Mean	SD	Mean weight (g)
Brook trout	30	29.2	15.5	23.1	5.0	184

Stocking History: Oct 26, 1977 125 S4(Domestic)
125 S4(Hybrid)



KIMBAL LAKE

Loch Katrine

County: Antigonish

Location: 45°25'N; 61°56'W

Drainage System: South River

Survey Date: August 18, 1977

Surface Elevation: 61 m

Lake Surface Area: 112.1 ha

Number of Islands: 0

Island Area: 0.0 ha

Water Surface Area: 112.1 ha

Maximum Length: 3,420 m

Maximum Effective Length: 2,770 m

Maximum Width: 645 m

Maximum Effective Width: 645 m

Maximum Depth: 27 m

Mean Depth: 10.0 m

Volume of Lake: 11.2×10^6 m^3

Shoreline Length: 8,550 m

Shoreline Development: 2.3

Conductivity: 40.3 µmhos/cm

Secchi Disc Reading: 2.2 m

Morphoedaphic Index: 2.3

Potential Fish Yield: 163.1 kg/yr, 1.4 kg/ha/yr

Potential Angling Yield: 30.3 kg/yr, 0.3 kg/ha/yr

Access: This lake is easily accessible by car. A secondary road runs very close to the eastern shore, and there are several points where a boat can be launched directly from this road.

Use: There are several cottages and homes along the shores of Loch Katrine. This lake is probably used for boating, swimming, fishing and other recreational activities. Its outlet, South River, is the main water supply for the Antigonish Hatchery.

Physical Characteristics: Loch Katrine is bordered by approximately 25% hardwood, 35% softwood and 40% fields or cleared land. Emergent and submergent vegetation are medium dense and the bottom seems to be mainly composed of gravel.

Streams: There are four inlets and one outlet on Loch Katrine. Unfortunately, due to lack of time, only three inlets were surveyed.

The main inlet (Inlet No. 1 — South River) was approximately 100 m wide at the lake shore, narrowing to 30 m further upstream. Aquatic vegetation was abundant and the bottom type appeared to be silt. Dissolved oxygen was 8.3 mg/l and pH was 6.5. Aquatic vegetation comprised the only fish shelter.

Inlet No. 2 (Hattie Millstream) flows into Loch Katrine on the western shore. It was approximately 10 m wide and 1.5 m deep and flowed rapidly over a bed of gravel. Aquatic vegetation was sparse and most fish shelter was provided by logs and overhanging banks. Dissolved oxygen was 7.7 mg/l and pH was between 6.5 and 7.0.

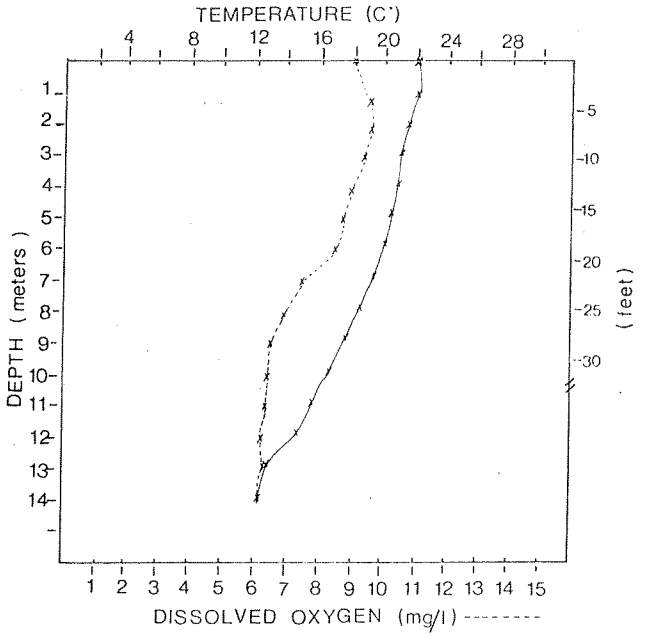
Inlet No. 3 (McNaughton Brook) flows into Loch Katrine on the eastern shore. It was approximately 8 m wide at the lake shore, narrowing to 4 m further upstream, and with an average depth of 0.75 m. Aquatic vegetation was abundant and the bottom was composed of gravel. Dissolved oxygen level was 9.6 mg/l and pH, 7.0.

Fish shelter was composed of 40% overhanging banks, 10% roots and 10% aquatic vegetation.

Lake Water Characteristics: In August, Loch Katrine showed a thermal gradient ranging from 22°C at the surface to 12.0°C at 14 m, although no true thermocline was discernable to this depth. Dissolved oxygen ranged from 9.0 mg/l at the surface to 6.3 mg/l at 14 m. The pH ranged from 6.5 to 7.0 and the secchi disc was visible to a depth of 2.2 m.

Temperature and dissolved oxygen values recorded at Stations No. 2 and 3 were similar to values recorded at Station No. 1 which are presented in graphical form.

STN #1

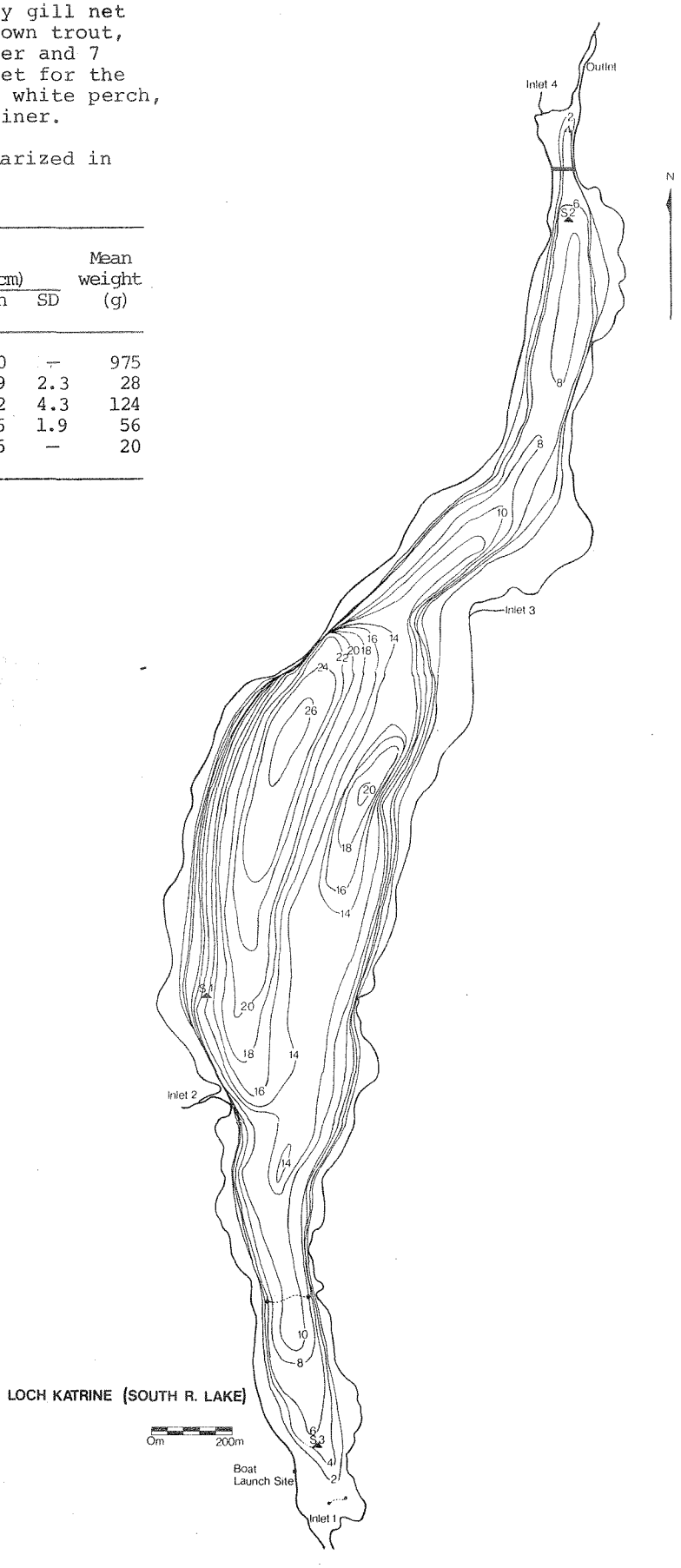


Fish Collection: A 107-m survey gill net set for one night captured 2 brown trout, 12 yellow perch, 22 common sucker and 7 white perch. A 30-m gill net set for the same amount of time captured 71 white perch, 10 yellow perch and 1 golden shiner.

Fish measurements are summarized in the following table.

Species	No.	Fork length (cm) Max.	Min.	Mean	SD	Mean weight (g)
Brown trout	2	46.7	41.2	44.0	–	975
Yellow perch	22	16.6	9.2	11.9	2.3	28
Common sucker	22	31.7	14.7	21.2	4.3	124
White perch	78	18.3	9.2	15.6	1.9	56
Golden shiner	1	11.5	11.5	11.5	–	20

Stocking History: None.



McKinnon Lake

County: Guysborough

Location: 45°24'N; 61°57'W

Drainage System: South River

Survey Date: June 16, 1977

Surface Elevation: 46 m

Lake Surface Area: 5.7 ha

Number of Islands: 0

Island Area: 0.0 ha

Water Surface Area: 5.7 ha

Maximum Length: 645 m

Maximum Effective Length: 410 m

Maximum Width: 110 m

Maximum Effective Width: 110 m

Maximum Depth: 9.5 m

Mean Depth: 3.0 m

Volume of Lake: 17.4×10^4 m^3

Shoreline Length: 1,560 m

Shoreline Development: 1.8

Conductivity: 44.0 µmhos/cm

Secchi Disc Reading: 1.8 m

Morphoedaphic Index: 8.4

Potential Fish Yield: 16.0 kg/yr, 2.8 kg/ha/yr

Potential Angling Yield: 7.4 kg/yr, 1.3 kg/ha/yr

Access: McKinnon Lake is accessible by car, but preferably by four-wheel-drive vehicle, via an old logging road running near the northern shore.

Use: This lake is probably used for boating and recreational fishing.

Physical Characteristics: McKinnon Lake is bordered by a mixture of 75% softwood and 25% hardwood.

Emergent vegetation is scarce and submergent vegetation medium dense. The bottom type is mainly gravel.

Streams: McKinnon Lake has two outlets which combine to form one not far from the lake shore. One outlet is man-made and is obstructed by a beaver dam. The natural outlet is obstructed by a man-made barrier including some additions by beaver.

This stream is approximately 2 m wide with a mean depth of 0.5 m. It begins with little flow velocity, and gradually increases to 0.4 m/sec.

Aquatic vegetation is sparse and the bottom appears to be composed mainly of silt. Dissolved oxygen was 9.9 mg/l and pH was 7.0.

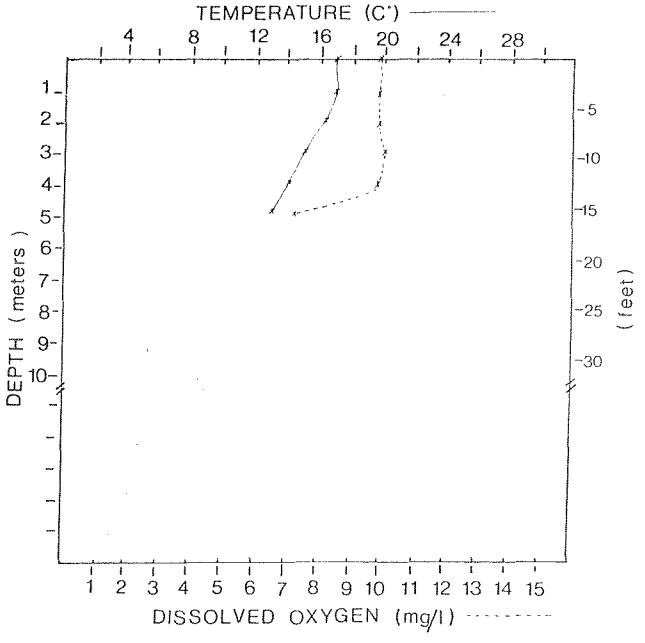
The gradient within 100 m is quite steep and the potential for migration-barrier construction is excellent.

Three small streams (Inlets No. 2, 3 and 4 join to form Inlet No. 1 to McKinnon Lake. It is 3 m wide where it enters the lake, with an average depth of 0.5 m. In all three streams, aquatic vegetation is sparse and the bottom type mainly gravel. Dissolved oxygen was recorded as 9.8 mg/l and the pH was 6.5.

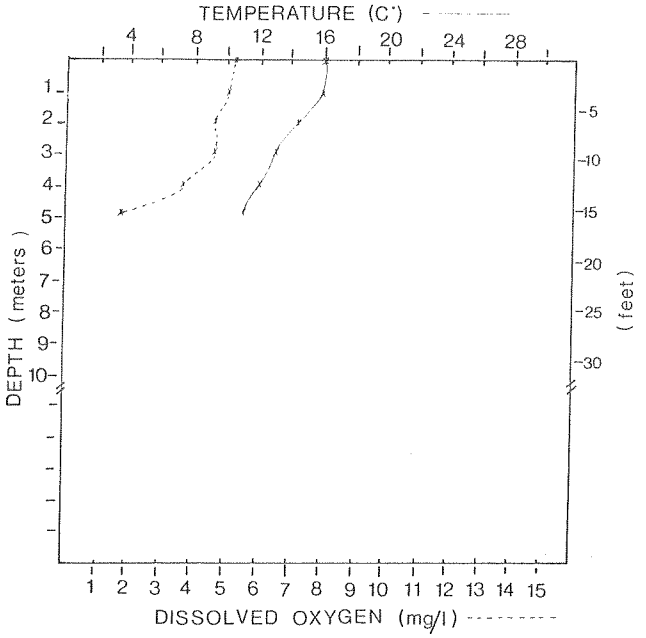
Inlet No. 5 enters the lake as a small stream and results from seepage.

Lake Water Characteristics: In June, McKinnon Lake had an average surface temperature of 16.5°C, gradually decreasing to an average of 12.0°C at 4.5 m. Dissolved oxygen varied from 10.3 mg/l near the surface to 3.4 mg/l at 4.5 m. The pH ranged from 6.5 to 7.5. A secchi disc reading of 1.8 m was recorded.

STN #1



STN #2



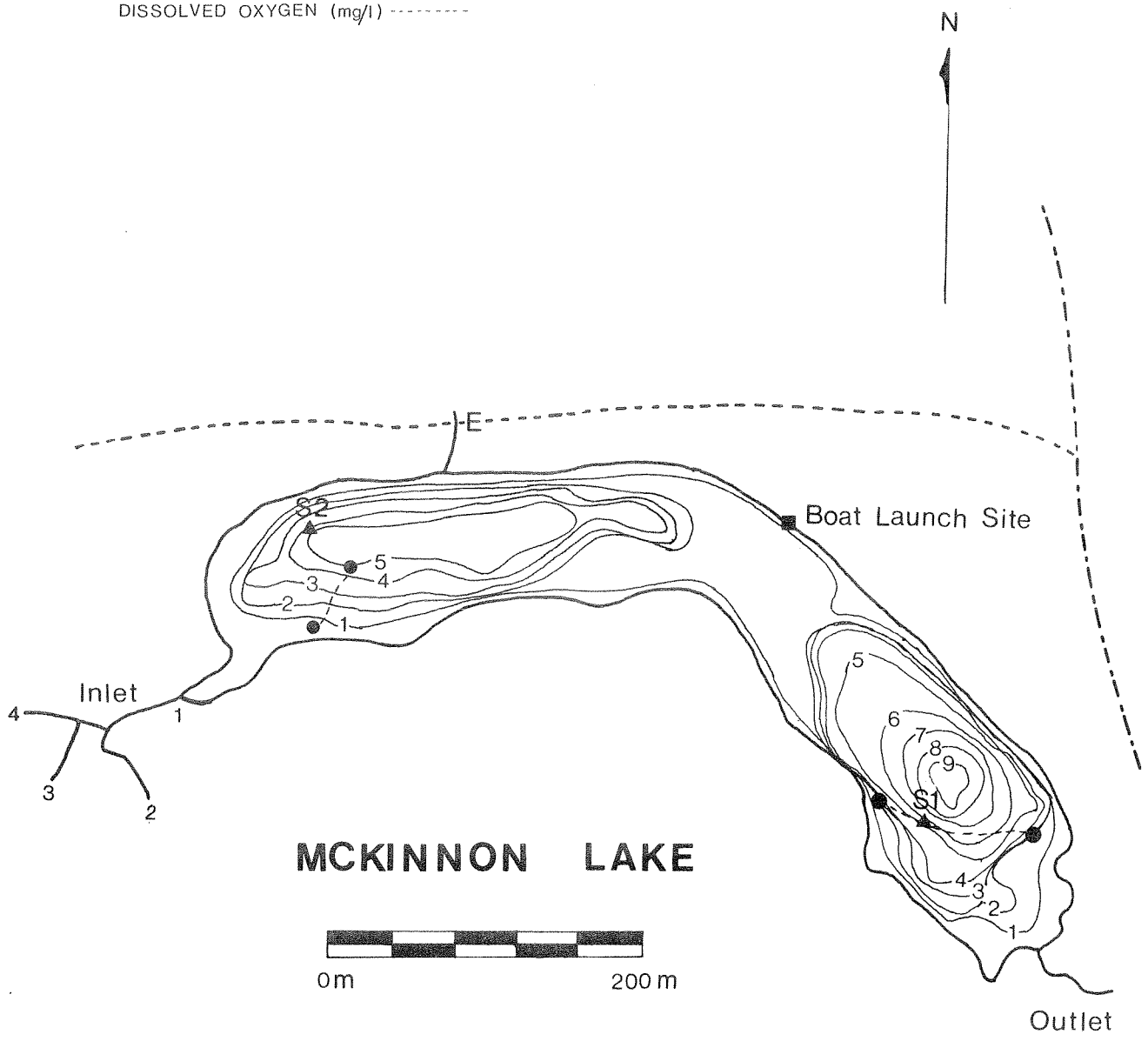
Fish Collection: A 107-m survey gill net set for one night captured 3 brown trout.

A 30-m survey gill net captured 2 golden shiner and 3 common sucker. These fish were identified by fragments and were unmeasurable.

The brown trout measurements are summarized in the following table.

Species	No.	Fork length (cm) Max.	Min.	Mean	SD	Mean weight (g)
Brown trout	3	47.2	28.8	39.7	9.6	663
Golden shiner	2	(fragments only)				
Common sucker	3	(fragments only)				

Stocking History: Sep 23, 1977 275 S3(Domestic)
275 S3(Hybrid)



Margaret Lake

County: Guysborough

Location: 45°24'N; 61°56'W

Drainage System: South River

Survey Date: June 22, 1977

Surface Elevation: 91 m

Lake Surface Area: 4.1 ha

Number of Islands: 0

Island Area: 0.0 ha

Water Surface Area: 4.1 ha

Maximum Length: 280 m

Maximum Effective Length: 280 m

Maximum Width: 240 m

Maximum Effective Width: 240 m

Maximum Depth: 2.5 m

Mean Depth: 1.3 m

Volume of Lake: 51.4 x 10^3 m^3

Shoreline Length: 810 m

Shoreline Development: 1.1

Conductivity: 31.0 µmhos/cm

Secchi Disc Reading: Visible to bottom at 2.5 m

Morphoedaphic Index: 8.7

Potential Fish Yield: 11.7 kg/yr, 2.9 kg/ha/yr

Potential Angling Yield: 5.7 kg/yr, 1.4 kg/ha/yr

Access: Margaret Lake is accessible to within approximately 1,000 m by car via a logging road. The lake shore can then be approached only by foot.

Use: This lake is probably used for only a limited amount of recreational fishing.

Physical Characteristics: Margaret Lake is a headwater lake to the South River system. The shores are bordered by a mixture of 68% softwood, 30% hardwood and 2% recently cleared or logged land. Emergent and submergent vegetation are scarce and the bottom appears to be a mixture of gravel, silt and detritus.

Streams: The outlet is approximately 4 m wide at the lake shore with an average depth of 0.3 m. Further downstream it narrows to approximately 1 m, with average depth of 0.15 m. At this point, the velocity of flow is approximately 0.3 m/sec.

Aquatic vegetation is medium dense and the bed appears to be silty. Dissolved oxygen was 10.0 mg/l and the pH, 6.5. The gradient is very flat and, therefore, construction of a migration barrier to fish is next to impossible.

Lake Water Characteristics: The water temperature of Margaret Lake was near 15°C at all depths. Dissolved oxygen ranged from 10.2 mg/l at the surface to 9.2 mg/l at 2.5 m.

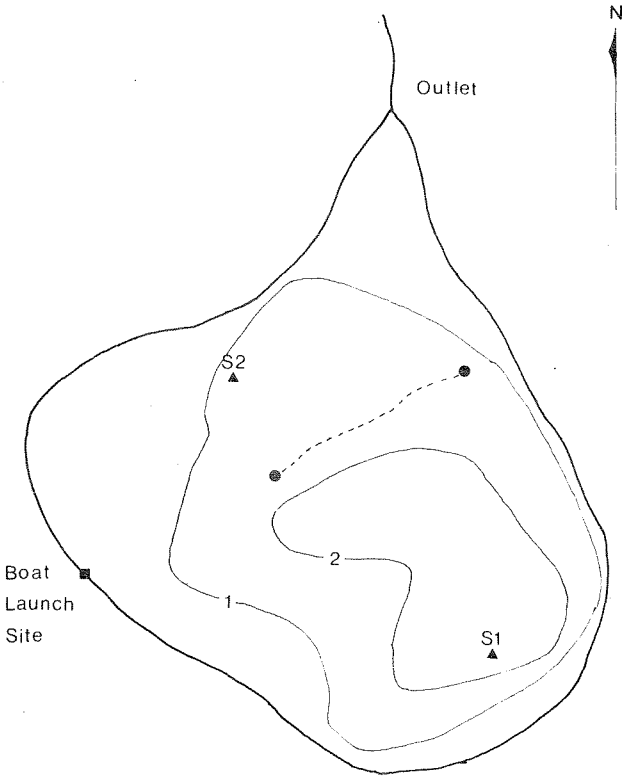
The pH remained constant at 6.5. The secchi disc was visible to the bottom, at 2.5 m.

Fish Collection: A 107-m survey gill net set for one night captured 6 brook trout and 50 common sucker.

Fish measurements are summarized in the following table.

Species	No.	Fork length (cm) Max.	Min.	Mean	SD	Mean weight (g)
Brook trout	6	27.2	21.5	24.4	—	168
Common sucker	50	35.8	10.6	26.4	4.3	194

Stocking History: Sep 28, 1977 150 S3(Domestic)
150 S3(Hybrid)



MARGARET LAKE

0m 200m

Tedford Lake

County: Digby

Location: 44°06'N; 66°01'W

Drainage System: Salmon River

Survey Date: August 3, 1977

Surface Elevation: 61 m

Lake Surface Area: 82.2 ha

Number of Islands: 4

Island Area: 5.0 ha

Water Surface Area: 77.2 ha

Maximum Length: 1,630 m

Maximum Effective Length: 1,630 m

Maximum Width: 865 m

Maximum Effective Width: 865 m

Maximum Depth: 4.8 m

Mean Depth: 1.9 m

Volume of Lake: 14.4×10^5 m^3

Shoreline Length: 6,555 m

Shoreline Development: 2.0

Conductivity: 47.3 µmhos/cm

Secchi Disc Reading: –

Morphoedaphic Index: 13.6

Potential Fish Yield: 275.3 kg/yr, 3.6 kg/ha/yr

Potential Angling Yield: 171.6 kg/yr, 2.1 kg/ha/yr

Access: This lake is easily accessible by car via a secondary road running near its southern end. A boat may be launched from the lake shore.

Use: Several cottages are located along the eastern shore. Consequently, this lake is probably used for such recreational activities as swimming, boating and fishing.

Physical Characteristics: The bottom of Tedford Lake is littered with many large boulders, which occasionally break the surface and create a hazard to boating. Both emergent and submergent vegetation are abundant. The shores are bordered by an equal amount of hardwood and softwood with the occasional clearing for a cottage.

Streams: This lake has an inlet and outlet but, due to insufficient time, they were not examined during this survey.

Lake Water Characteristics: Temperature values at three stations ranged from 23.5°C at the surface to 22.0°C at a depth of 4.0 m. Dissolved oxygen values showed a maximum of 10.8 mg/l and a minimum of 8.0 mg/l. These values were quite uniform for all three stations. The pH ranged from 6.75 to 7.0 at all stations.

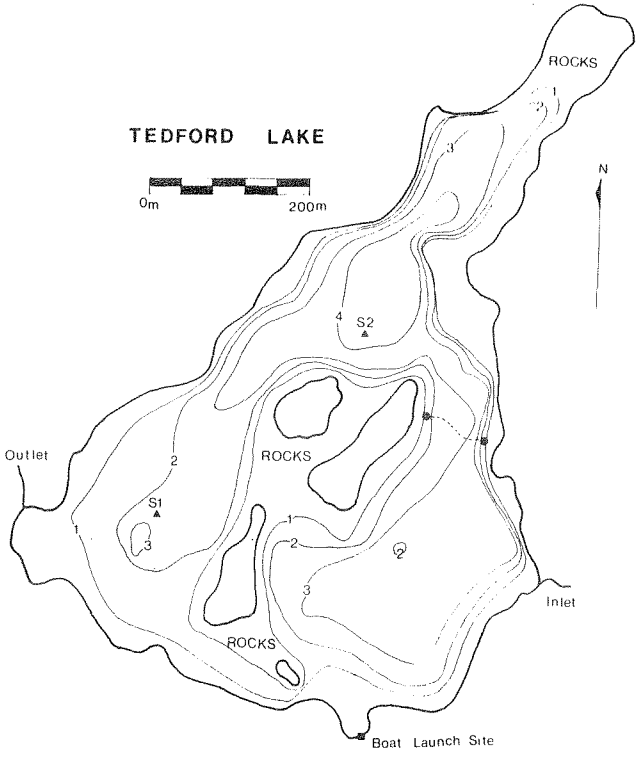
Fish Collection: A 107-m survey gill net was set for one night, capturing 42 white perch and 11 brown bullhead.

Fish measurements are summarized in the following table.

Species	No.	Fork length (cm) Max.	Min.	Mean	SD	Mean weight (g)
White perch	42	31.8	10.2	18.2	5.6	111
Brown bullhead	11	25.5	14.0	16.5	3.8	66

Stocking History:

Nov 10, 1976	300 Sf
Apr 1, 1976	696 Sf
Apr 7, 1975	796 Sf
Apr 18, 1974	1,000 Sf



Unnamed Lake (45°22'N; 61°58'W)

County: Guysborough

Location: 45°22'N; 61°58'W

Drainage System: Country Harbour River

Survey Date: July 14, 1977

Surface Elevation: 61 m

Lake Surface Area: 7.1 ha

Number of Islands: 0

Island Area: 0.0 ha

Water Surface Area: 7.1 ha

Maximum Length: 605 m

Maximum Effective Length: 605 m

Maximum Width: 190 m

Maximum Effective Width: 165 m

Maximum Depth: 4.0 m

Mean Depth: 1.3 m

Volume of Lake: 94.9 x 10^3 m^3

Shoreline Length: 1,440 m

Shoreline Development: 1.5

Conductivity: 55.0 µmhos/cm

Secchi Disc Reading: 2.5 m

Morphoedaphic Index: 22.2

Potential Fish Yield: 32.8 kg/yr, 4.6 kg/ha/yr

Potential Angling Yield: 19.3 kg/yr, 2.7 kg/ha/yr

Access: This lake is accessible via the paved highway running between Goshen and Country Harbour. After proceeding through a field adjacent to this highway, a boat may be launched directly from the lake shore.

Use: Most probable use of the lake is for recreational fishing.

Physical Characteristics: Emergent and submergent vegetation are medium dense. Visible bottom type appears to be a mixture of 50% gravel, 25% detritus, 15% muck and 10% sand. The shores are bordered by approximately 80% softwood forest and 20% marshland.

Lake Water Characteristics: The surface temperature was 21.0°C, dropping gradually to 16.0°C at 3.8 m, or bottom.

Dissolved oxygen varied from 8.3 mg/l at the surface to 7.9 mg/l at 2 m and 0.5 mg/l at the bottom. The pH averaged 7.0, and the secchi disc reading was 2.5 m.

Fish Collection: A 107-m survey gill net set for one night captured 2 brook trout, 55 gaspereau, 38 white perch, 20 common sucker, 6 yellow perch and 13 golden shiner.

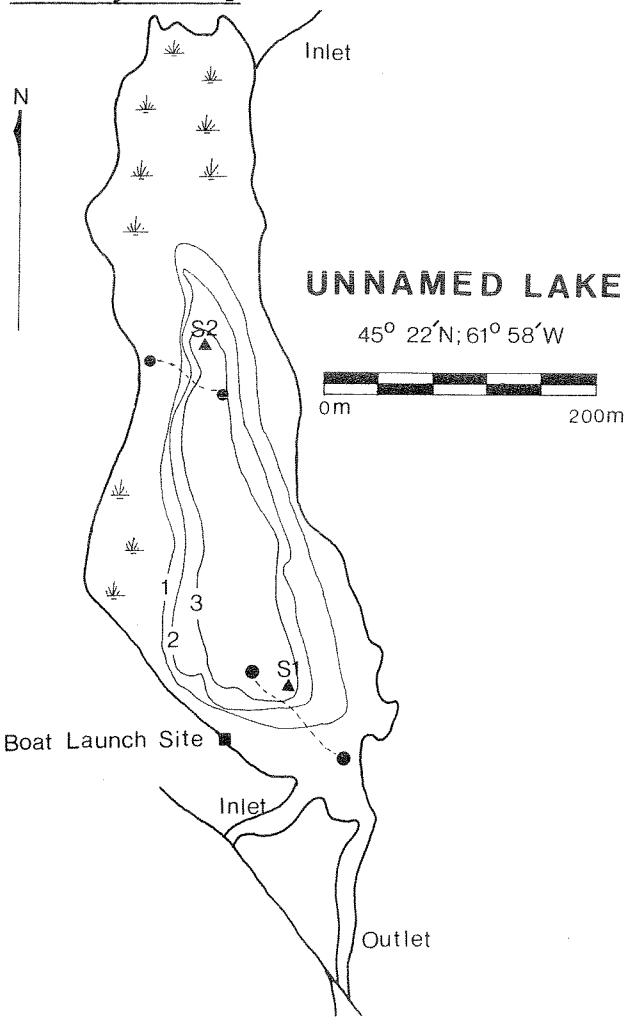
A 30-m survey gill net set for one night captured 17 white perch, 27 yellow perch, 13 golden shiner, 6 common sucker, and 5 brown bullhead.

Fish measurements are recorded in the following table.

Species	No.	Fork length (cm) Max.	Min.	Mean	SD	Mean weight (g)
Brook trout	2	40.4	36.3	38.4	—	725
Gaspereau*	55	31.9	27.4	29.3	1.4	167
White perch*	55	26.8	13.5	19.3	3.3	92
Common sucker*	26	32.5	12.0	22.6	5.4	127
Yellow perch*	33	18.0	9.9	11.6	2.3	17
Golden shiner*	26	12.6	9.7	11.0	0.7	11
Brown bullhead*	5	20.3	18.5	17.7	2.2	85

*For these particular species, the total length and not fork length were recorded.

Stocking History: None.



Unnamed Lake (45°24'N; 61°57'08"W)

County: Guysborough

Location: 45°24'N; 61°57'08"W

Drainage System: South River

Survey Date: June 20, 1977

Surface Elevation: 76 m

Lake Surface Area: 2.1 ha

Number of Islands: 0

Island Area: 0.0 ha

Water Surface Area: 2.1 ha

Maximum Length: 240 m

Maximum Effective Length: 240 m

Maximum Width: 145 m

Maximum Effective Width: 145 m

Maximum Depth: 4.7 m

Mean Depth: 2.4 m

Volume of Lake: 50.3×10^3 m^3

Shoreline Length: 615 m

Shoreline Development: 1.2

Conductivity: 44.0 µmhos/cm

Secchi Disc Reading: 4.1 m

Morphoedaphic Index: 10.8

Potential Fish Yield: 6.7 kg/yr, 3.1 kg/ha/yr

Potential Angling Yield: 3.8 kg/yr, 1.8 kg/ha/yr

Access: This lake is accessible with a four-wheel-drive vehicle via a logging road.

Use: Its only probable use is for recreational fishing.

Physical Characteristics: This small lake is a headwater lake of the South River system. Emergent and submergent vegetation are scarce. The bordering land is forested with a mixture of 50% hardwood and 50% softwood. The visible bottom type is a mixture of detritus and mud.

Streams: The outlet is approximately 2 m wide at its beginning with an average depth of 0.08 m. Further downstream, it narrows to 0.8 m with an average depth of 0.07 m. Aquatic vegetation was medium dense and the bottom type appeared to be a mixture of mud and gravel.

Dissolved oxygen was 9.1 mg/l and pH was 6.5.

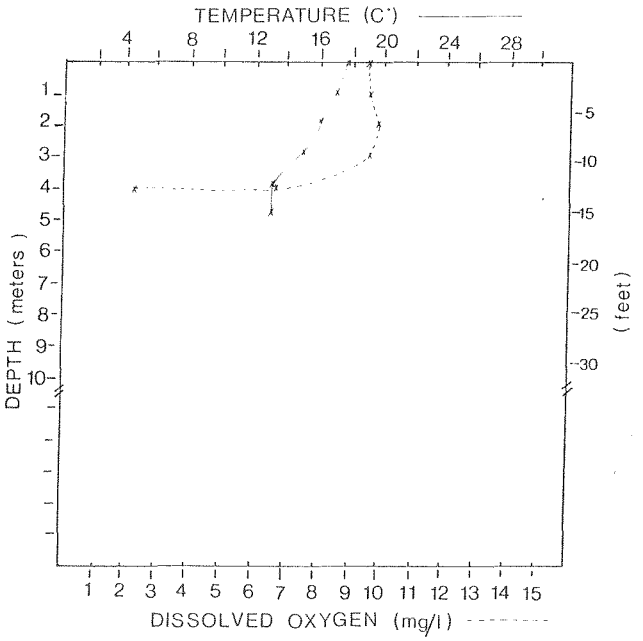
The gradient of this stream is very flat, and the potential for construction of a migration barrier to fish is poor.

Lake Water Characteristics: The surface temperature was 17.5°C, dropping gradually to 13.0°C near the bottom (4.5 m).

Dissolved oxygen averaged around 9.7 mg/l until a depth of 4 m, where it dropped to 6.7 mg/l.

The pH ranged from 6.5 to 7.0, and the secchi disc reading was 4.0 m.

STN #1

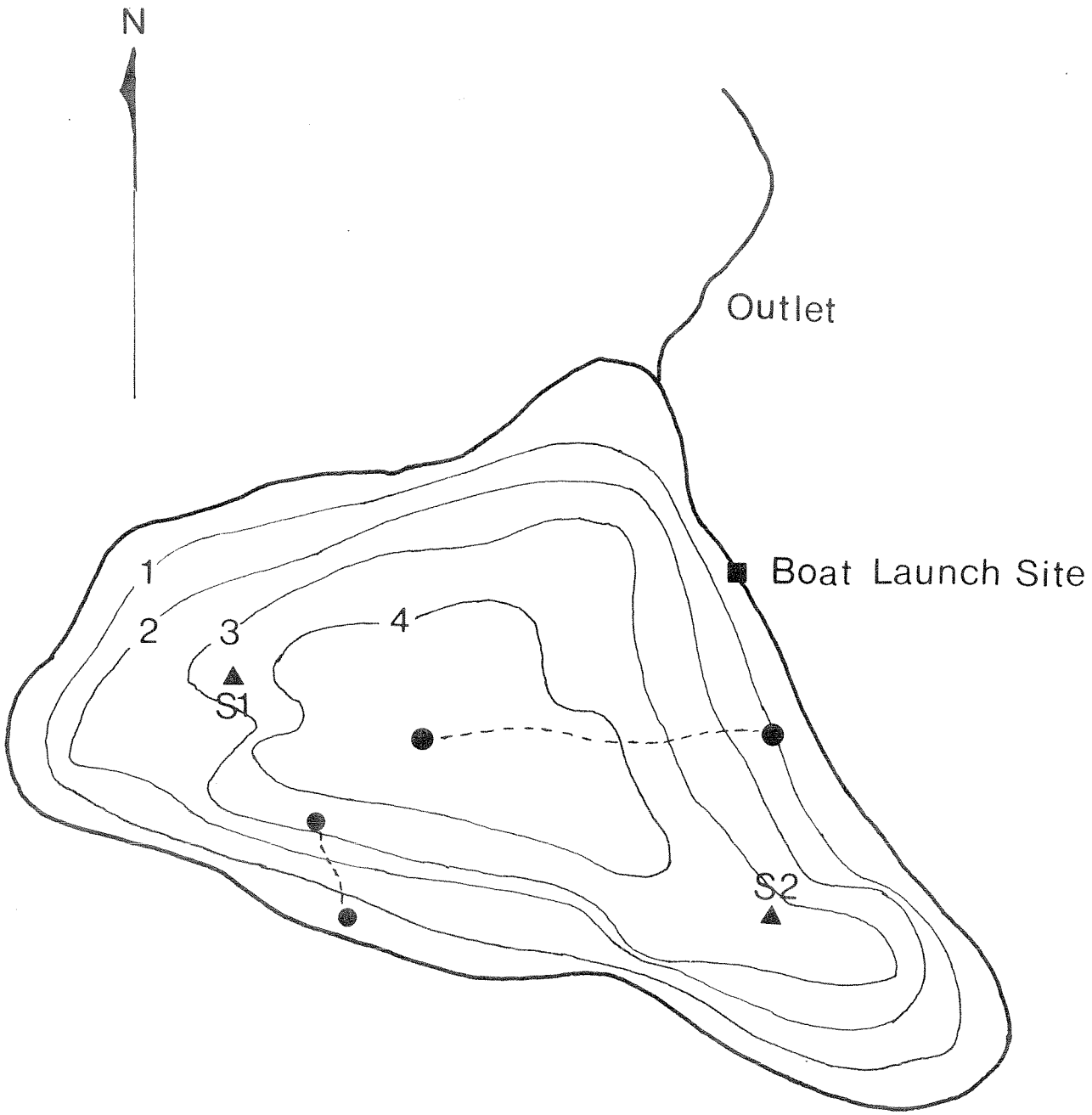


Fish Collection: A 107-m gill net set for one night captured 23 common sucker and 3 brook trout. A 30-m gill net set for the same time period captured 15 common sucker and 5 brook trout.

Fish measurements are summarized in the following table.

Species	No.	Fork length (cm) Max.	Min.	Mean	SD	Mean weight (g)
Common sucker	38	34.4	12.2	20.7	5.2	89
Brook trout	8	24.1	10.8	15.8	4.5	59

Stocking History: None.



UNNAMED LAKE

45°24′N; 61° 57′ 08″W

0m 200 m

Unnamed Lake (45°21'N; 61°55'W)

County: Guysborough

Location: 45°21'N; 61°55'W

Drainage System: South River

Survey Date: July 25, 1977

Surface Elevation: 107 m

Lake Surface Area: 4.9 ha

Number of Islands: 0

Island Area: 0.0 ha

Water Surface Area: 4.9 ha

Maximum Length: 450 m

Maximum Effective Length: 450 m

Maximum Width: 180 m

Maximum Effective Width: 180 m

Maximum Depth: 6 m

Mean Depth: 2.8 m

Volume of Lake: 13.8×10^4 m^3

Shoreline Length: 1,085 m

Shoreline Development: 1.4

Conductivity: 22.0 µmhos/cm

Secchi Disc Reading: 3.8 m

Morphoedaphic Index: 4.2

Potential Fish Yield: 9.7 kg/yr, 2.0 kg/ha/yr

Potential Angling Yield: 2.6 kg/yr, 0.5 kg/ha/yr

Access: This small lake is accessible by car via an old logging road. However, during wet weather, it would be preferable to launch a boat from the lake shore with a four-wheel-drive vehicle.

Use: Its only probably use is recreational fishing.

Physical Characteristics: This lake is surrounded by approximately 70% softwood, 25% hardwood and 5% recently cleared land. Emergent and submergent vegetation are scarce, and the bottom type is mainly mud with a small amount of detritus and gravel.

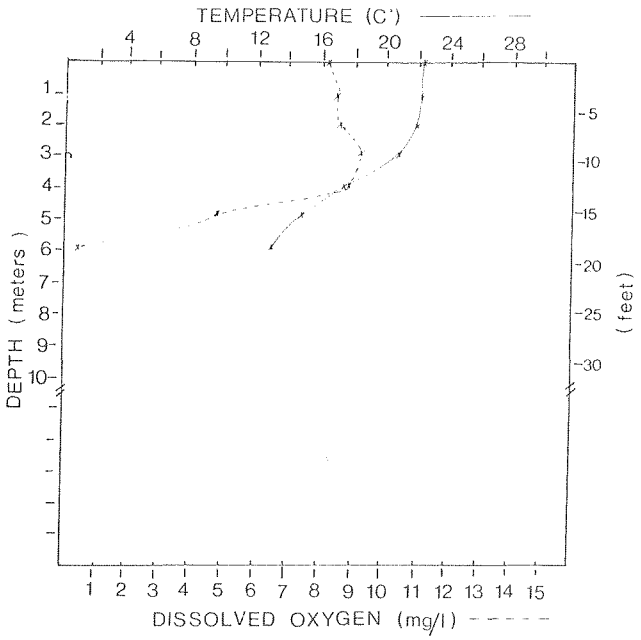
Streams: The outlet was approximately 4 m wide at the lake shore, narrowing to 1.5 m further downstream. Aquatic vegetation was abundant and the bed was composed mainly of gravel.

Dissolved oxygen was 8.4 mg/l and pH, 6.8. There are no obstructions and there is good potential for construction of a migration barrier to fish.

The inlet was approximately 1 m wide with an average depth of 0.25 m. Aquatic vegetation was abundant and the bed appears to be composed of mud. Dissolved oxygen was 6.7 mg/l and pH, 6.0.

Lake Water Characteristics: In July, this lake had a thermal gradient, with a surface temperature of 22.5°C, decreasing to 13.2°C at 6 m (bottom). Dissolved oxygen values were high (8.2-9.2 mg/l) until a depth of 5 m, where they dropped to 4.8 mg/l. The pH varied between 6.5 and 7.0. A secchi disc reading of 3.8 m was recorded.

STN #1



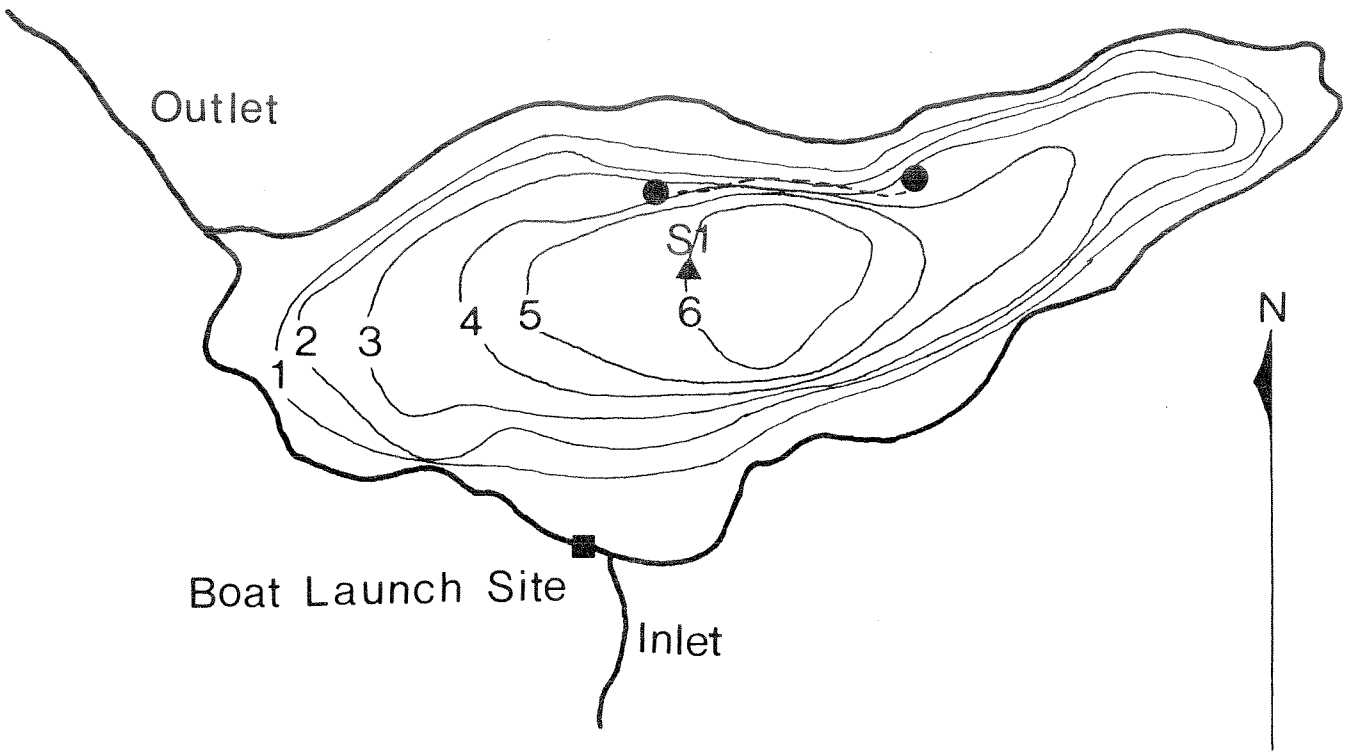
Fish Collection: A 107-m survey gill net set for one night captured 7 yellow perch, 88 common sucker, 4 golden shiner and 7 brook trout.

A 30-m survey gill net set for one night captured 39 common sucker, 11 yellow perch, 5 golden shiner, 1 brown trout and 1 brook trout.

Their measurements are summarized in the following table.

Species	No.	Fork length (cm) Max.	Min.	Mean	SD	Mean weight (g)
Brook trout	8	29.5	17.2	21.5	4.5	126
Brown trout	1	52.5	52.5	52.5	—	—
Golden shiner	9	11.9	9.5	10.8	0.7	15
Yellow perch	18	19.0	9.5	14.4	3.1	34
Common sucker	127	34.7	14.8	20.5	5.5	104

Stocking History: None.



UNNAMED LAKE

45°21′N; 61°55′W

Unnamed Lake (45°22'N; 61°56'W)

County: Guysborough

Location: 45°22'N; 61°56'W

Drainage System: South River

Survey Date: June 28, 1977

Surface Elevation: 107 m

Lake Surface Area: 3.5 ha

Number of Islands: 0

Island Area: 0.0 ha

Water Surface Area: 3.5 ha

Maximum Length: 320 m

Maximum Effective Length: 320 m

Maximum Width: 175 m

Maximum Effective Width: 175 m

Maximum Depth: 1.5 m

Mean Depth: 1.1 m

Volume of Lake: 36.8 x 10^3 m^3

Shoreline Length: 835 m

Shoreline Development: 1.3

Conductivity: 22.0 µmhos/cm

Secchi Disc Reading: 1.3 m

Morphoedaphic Index: 6.0

Potential Fish Yield: 8.3 kg/yr, 2.4 kg/ha/yr

Potential Angling Yield: 2.9 kg/yr, 0.8 kg/ha/yr

Access: This lake is accessible with a four-wheel-drive vehicle via an old logging road. It is possible to launch a boat directly from the lake shore.

Use: This lake is probably used only for recreational fishing.

Physical Characteristics: The bordering land is forested, with a mixture of approximately 75% hardwood and 25% softwood. Emergent and submergent vegetation are medium dense and the bottom appears to be a mixture of detritus and mud.

Streams: The outlet is approximately 3 m wide at the lake shore, with an average depth of 0.3 m and a velocity of approximately 0.1 m/sec. Further downstream it narrows to approximately 3 m with an average depth of 0.4 m. Its bed is composed of a mixture of silt and gravel. Aquatic vegetation is abundant, and approximately 80% fish shelter is afforded by it and a mixture of overhanging banks, logs and roots.

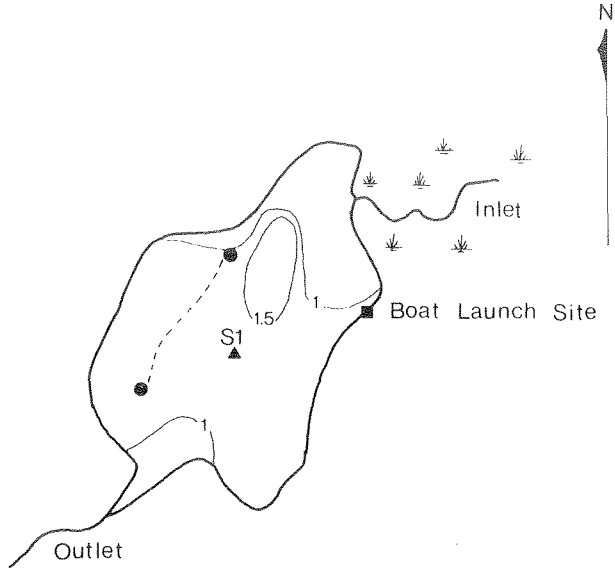
There are two beaver dams near the lake shore which provide partial barriers to the flow of this stream. The potential for construction of a barrier to prevent fish migration is good.

Lake Water Characteristics: The surface water temperature was 15.4°C with a dissolved oxygen reading of 8.0 mg/l. At 1 m depth, the water temperature was 15.0°C with a dissolved oxygen reading of 7.5 mg/l.

The pH was 5.5 and the secchi disc was visible to the bottom, at 1.5 m.

Fish Collection: A 107-m gill net set for one night failed to capture any fish.

Stocking History: None.



UNNAMED LAKE

45° 22'N; 61° 56'W

0m 200m

Unnamed Lake (45°30'N; 61°55'W)

County: Antigonish

Location: 45°30'N; 61°55'W

Drainage System: South River

Survey Date: August 31, 1977

Surface Elevation: 45 m

Lake Surface Area: 2.4 ha

Number of Islands: 0

Island Area: 0.0 ha

Water Surface Area: 2.4 ha

Maximum Length: 205 m

Maximum Effective Length: 205 m

Maximum Width: 166 m

Maximum Effective Width: 166 m

Maximum Depth: 4.5 m

Mean Depth: 2.4 m

Volume of Lake: 5.7×10^4 m^3

Shoreline Length: 608 m

Shoreline Development: 1.1

Conductivity: 65.0 µmhos/cm

Secchi Disc Reading: 1.9 m

Morphoedaphic Index: 22.2

Potential Fish Yield: 10.9 kg/yr, 4.6 kg/ha/yr

Potential Angling Yield: 9.1 kg/yr, 3.8 kg/ha/yr

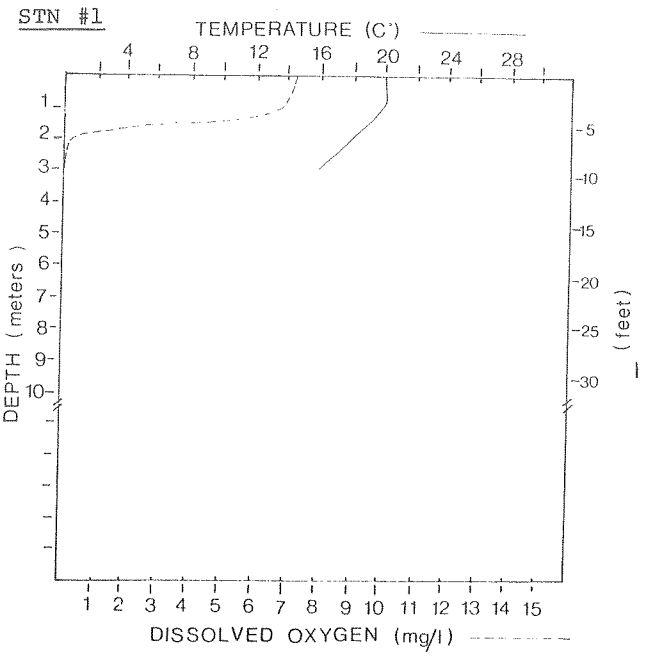
Access: Access to this lake is from a paved highway, and permission must be obtained to cross private land to a convenient boat launch site. A car-top boat or canoe must be used on this lake as it is necessary to walk approximately 30 m from the nearest parking location to a launch site.

Use: This lake did not appear to have much use, since it is very small and the surrounding land is marshy.

Physical Characteristics: The land surrounding this lake is predominantly marshland (90%), with some agricultural land (10%). Emergent and submergent vegetation vary from medium dense to abundant and the bottom is predominantly detritus, with some muck and silt being observed.

Streams: The outlet varied from 1.5 m wide at its mouth to 0.8 m approximately 100 m from the lake. The depth decreased from 0.24 to 0.18 m over the same distance. Aquatic vegetation was sparse and the bottom was composed mainly of rocks, with some gravel and rubble being observed.

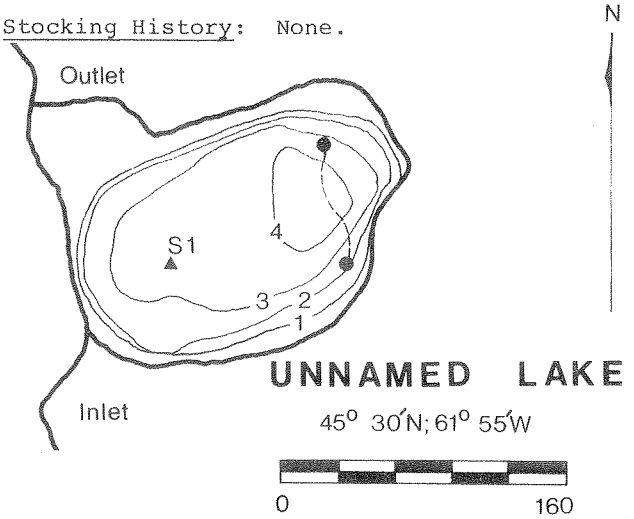
Lake Water Characteristics: The water of this lake was brown in colour and the secchi disc reading was 1.85 m. The temperature was recorded at 1-m intervals from the surface to 3 m, giving readings of 20°, 20°, 18° and 16°C. The dissolved oxygen was also recorded in this manner, giving readings of 7.2, 6.9, 0.2 and 0.0 mg/l. The pH varied from 7.0 at the surface to 5.5 at 3 m, and the conductivity was 65 µmhos/cm.



Fish Collection: Two 30-m and two 107-m gill nets set for one night captured 9 yellow perch and 19 common sucker.

Species	No.	Fork length (cm) Max.	Min.	Mean	SD	Mean weight (g)
Yellow perch	9	25.2	11.6	17.1	5.4	76.7
Common sucker	19	34.0	22.9	27.9	3.2	213.2

Stocking History: None.



APPENDIX A

LIST OF COMMON AND SCIENTIFIC NAMES OF FISH SPECIES CAPTURED DURING LAKE SURVEYS

Common name	Scientific name
Eastern brook trout (Speckled trout)	*Salvelinus fontinalis* (Mitchill)
Brown trout	*Salmo trutta* (Linnaeus)
Common (white) sucker	*Catostomus commersoni* (Lacépède)
Yellow perch	*Perca flavescens* (Mitchill)
White perch	*Morone americana* (Gmelin)
Brown bullhead	*Ictalurus nebulosus* (LeSueur)
Golden shiner	*Notemigonus crysoleucas* (Mitchill)
Gaspereau	*Alosa pseudoharengus* (Wilson)

APPENDIX B

LIST OF CODES AND ABBREVIATIONS USED IN REFERENCE TO HATCHERY-PRODUCED TROUT

Code or abbreviation	
	Species
S	Brook (speckled) trout
R	Rainbow trout
B	Brown trout
	Stage of Development
c	Fry
d	Advanced fry (first 2 weeks after absorption of yolk sac)
1	#1 fingerlings (2-8 weeks after absorption of yolk sac)
2	#2 fingerlings (8-14 weeks after absorption of yolk sac)
3	#3 fingerlings (14-20 weeks after absorption of yolk sac)
4	#4 fingerlings (20-26 weeks after absorption of yolk sac)
5	#5 fingerlings (26-52 weeks after absorption of yolk sac)
f	Yearlings (1-2 years from hatching)
g	Two to three years from hatching
h	Three or more years from hatching

APPENDIX C

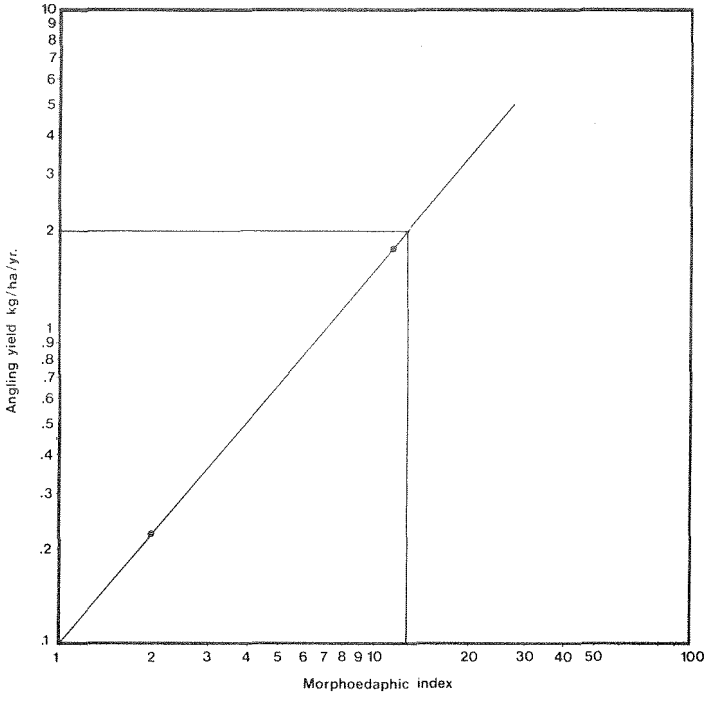
COMPONENT DATA AND RESULTANT PRODUCTIVITY ESTIMATES FOR SIXTEEN NOVA SCOTIA LAKES SURVEYED DURING 1977

Lake	Water area (ha)	Mean depth (m)	Conductivity (µmhos/cm)	MEI	Potential fish yield			
					Total		Angling	
					(kg/ha/yr)	(kg/yr)	(kg/ha/yr)	(kg/yr)
Boarback	26.8	2.4	45.0	10.7	3.2	84.8	1.7	45.6
Duggans	5.4	2.9	20.0	3.5	1.8	9.8	0.5	2.4
Gary (No. 2)	9.3	1.0[1]	20.0	11.2	3.2	28.7	1.8	15.5
Gary (No. 3)	8.8	1.5[1]	20.0	7.2	2.6	22.7	1.1	9.2
Horahan	7.3	1.3[1]	18.0	4.8	2.1	15.5	0.6	4.6
Johnsons	4.8	3.7	40.0	6.2	2.4	11.6	0.8	4.0
Kimbal	2.8	2.6	35.0	7.7	2.7	7.5	1.1	3.1
Loch Katrine	112.1	10.0	40.3	2.3	1.4	163.1	0.3	30.3
McKinnon	5.7	3.0	44.0	8.4	2.8	16.0	1.3	7.4
Margaret	4.1	1.3[1]	31.0	8.7	2.9	11.7	1.4	5.7
Tedford	77.2	1.9[1]	47.3	13.6	3.6	275.3	2.1	171.6
Unnamed (45°22'N; 61°58'W)	7.1	1.3[1]	55.0	22.2	4.6	32.8	2.7	19.3
Unnamed (45°24'N; 61°57'08"W)	2.1	2.4	44.0	10.8	3.1	6.7	1.8	3.8
Unnamed (45°21'N; 61°55'W)	4.9	2.8	22.0	4.2	2.0	9.7	0.5	2.6
Unnamed (45°22'N; 61°56'W)	3.5	1.1[1]	22.0	6.0	2.4	8.3	0.8	2.9
Unnamed (45°30'N; 61°55'W)	2.4	2.4	65.0	22.2	4.6	10.9	3.8	9.1

[1]Mean depth of 2.0 m used in productivity calculations.

APPENDIX D

ANGLING YIELD RELATED TO THE MORPHOEDAPHIC INDEX



APPENDIX E

FISH SPECIES COLLECTED BY GILLNET FROM SIXTEEN NOVA SCOTIAN LAKES SURVEYED DURING 1977

Lake	Brook trout	Brown trout	Common sucker	Yellow perch	White perch	Brown bullhead	Golden shiner	Gaspereau
Boarback								
Duggans	X		X	X			X	
Gary No. 2	X		X					
Gary No. 3	X		X					
Horahan	X							
Johnsons			X	X	X			X
Kimbal	X							
Loch Katrine		X	X	X	X		X	
McKinnon		X	X				X	
Margaret	X		X					
Tedford					X	X		
Unnamed (45°22'N; 61°58'W)	X		X	X	X	X	X	X
Unnamed (45°24'N; 61°57'08"W)	X		X					
Unnamed (45°21'N; 61°55'W)	X	X	X	X			X	
Unnamed (45°22'N; 61°56'W)								
Unnamed (45°30'N; 61°55'W)			X	X				

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