APPENDIX 16

Maynard Lake

Surveyed July 16, 19 & 20, 1971

LOCATION	:	44°40'15"N; 63°33'10"W Halifax County
SURFACE ELEVATION	:	161 feet
SURFACE AREA	:	19 acres (approximate)
AREA LESS THAN 20 FEET DEEP	:	
SHORE LINE LENGTH	:	5,500 feet (approximate)
MAXIMUM DEPTH	:	47 feet (approximate)

ACCESS:

The city of Dartmouth owns a strip of land that includes the entire lake shore. Boats can be launched from several roads ending on the lake.

USE:

The lake was formerly used to supply water to the N. S. Hospital but has long been abandoned for this purpose. At present the lake is used for swimming from a city operated beach at the south-east end of the lake, as well as for boating and fishing. The lake has frequently been stocked with hatchery trout and has been used to hold fish derbies.

PHYSICAL CHARACTERISTICS:

Maynard Lake has one intermittent tributary stream at its north end and receives the discharge from storm sewers in addition to surface run-off. There was no visible outlet stream, but water could be heard running through an underground pipe from the south westerly shore. Presumably this pipe is screened and discharges into the sewer system.

The shore line beyond the city owned land is entirely developed as a residential area and no new land disturbances, as the result of construction, are expected.

LAKE WATER CHARACTERISTICS:

On July 16, 1971 the water was found to be thermally stratified with temperature between 21.5°C at the surface and 8.5°C at the 35 foot depth. pH was between 6.5 and 7.5 in all samples tested and dissolved oxygen concentration was above 7 ppm in all samples. In a sample taken from the 12 meter depth on August 4, by students from Dalhousie University however, dissolved oxygen was 0 ppm.

Conductivity of the surface water was 320 and total alkalinity 22 ppm. At the 12.5 meter depth conductivity was 495, total alkalinity 68 ppm and Ca 18 ppm. These are among the highest values found during the survey work.

BIOLOGICAL STUDIES:

Maynard Lake was previously surveyed in 1958 and stocking with speckled trout fingerlings was recommended.

During the past three years, Maynard Lake received 2,000 speckled trout yearlings from the provincial ponds in 1969 and 2,500 in 1970, but none in 1971. In the fall of 1971, 200 tagged speckled trout from Antigonish station surplus brood stock were planted under the metro fisheries program. If these fish survive over winter, they should be taken in the 1972 Spring fishery.

In one over-night sample with gill nets, one yellow perch and one speckled trout were the only fish captured. The speckled trout (age 3+) is presumed to be a survivor of a previous planting. Two smallmouth bass were also seen in an anglers creel.

MAYNARD LAKE - SAMPLE STATION

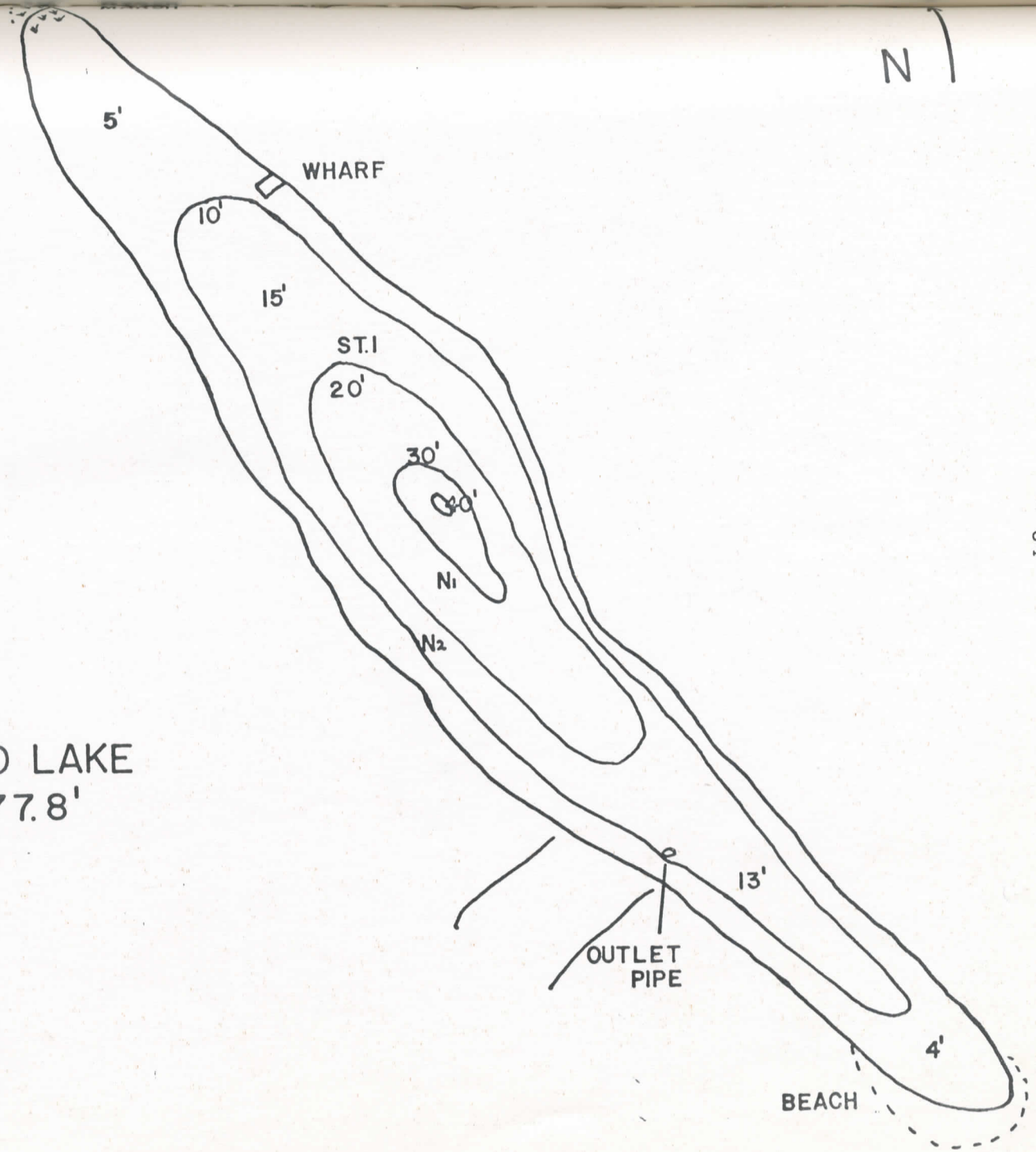
STATION 1 - JULY 16th, 1971

DEPTH (ft)	TEMP (^{o}C)	pH	O_2 (ppm)	CO_2 (ppm)
0	21.5			
2½	21			
5	21	7.5	11	5
7½	21			
10	21			
12½	21			
15	21			
17½	21			
20	17	7.5	12	5
22½	13			
25	12			
27½	10.5			
30	9.5	6.5	7	10
32½	9			
35	8.5			

JULY 19th & 20th, 1971

Gill Netting: 1/2" 1" 1 1/2" mesh gill nets were set overnight between July 19 & 20th.

One Speckled Trout 38.3 cm FL - 36.7 cm FL age 3+
One Yellow Perch
Small Mouth Bass were seen in an anglers creel.



MAYNARD LAKE
1" = 277.8'

APPENDIX 17

Micmac Lake

Surveyed July 19, 20 & 21, 1971

LOCATION	:	44°41'30"N; 63°33'15"
SURFACE ELEVATION	:	67 feet
SURFACE AREA	:	269.3 acres
AREA LESS THAN 20FT. DEEP	:	269.3 acres
SHORE LINE LENGTH	:	19,200 feet
MAXIMUM DEPTH	:	20 feet

ACCESS:

The city of Dartmouth presently owns two pieces of land on the eastern lake shore and has proposed aquisition of all land along the western shore. All of this land however is presently classified as undeveloped. These areas can all be reached on foot.

Access to most of the eastern shore is restricted by private residential properties but boats can be launched from a dock along the Waverley Road, located at the junction of Red Bridge Pond. Power boats and canoes can pass under the Circumferential Highway between Banook and Micmac Lakes, but there is presently no boat passage between Micmac and Lake Charles.

USE:

Micmac Lake receives intensive recreational use for boating, canoeing, water skiing, sailing, swimming and some fishing. Much of this activity is organized by local canoe clubs.

PHYSICAL CHARACTERISTICS:

Micmac Lake receives water from Charles Lake, Juniper Lake, Spectacle Lake and Frenchman's Lake and drains into Banook Lake. The entire lake is situated within the city limits and although public access is not ideal, public use for recreation is intensive.

Construction of a new highway and operation of a stone quarry on the western lake shore has caused siltation in the lake. The northern end of the lake is extremely shallow with extensive emergent vegetation. At times this portion of the lake is virtually dry, as when repairs were being carried out on the Banook dam which controls the surface level of both lakes.

STREAMS:

Near Micmac Lake, the inlet stream from Lake Charles forms a small harbour used to dock boats from an aquatic club. Water enters this harbour by falling 12- 15 feet over the old lock system from the main stream bed. In July the stream water temperature was 19°C and pH 6.5 with an estimated discharge of 2-3 cfs. Under those flow conditions there appeared to be no spawning area suitable to salmonids except at the base of the falls. Several fish that appeared to be either bass or white perch were observed in the harbour area.

The inlet from Juniper Lake, known as Grassy Brook, was observed to be a multi-channelled seepage through thick brush near the Micmac shore. Further upstream, the water was found to be flowing through one main channel with silt 6-18" deep on bottom. Many small non-salmonid fish were observed in this channel but the stream appears unsuitable for spawning or rearing of trout.

The inlet from Spectacle and Frenchman's Lakes had a discharge of 2-3 cfs, but the channel is extremely steep and inaccessible to fish at its entrance to Micmac Lake. The stream bottom is either sandy or bare rock and the stream empties onto a sand delta.

The outlet to Banook Lake flows through a large channel with no appreciable current.

LAKE WATER CHARACTERISTICS:

Micmac Lake showed no thermal stratification in July when water temperature remained near 22°C. Dissolved oxygen levels were 9 ppm or above in all samples and pH was 7. Conductivity of the surface water was 98 and total alkalinity 14 ppm.

BIOLOGICAL STUDIES:

The following catches were made in one over-night sample with a series of gill nets.

Species	No.	Fork Length (cm)		
		Max.	Min.	Mean.
White Perch	42	30	16.5	20.2
Common Suckers	12	41	32	35.6
Smallmouth Bass	6	25	20.5	22.6

Micmac Lake was last surveyed in August 1943. The fish fauna found at that time was: perch, stickleback, minnows and brook trout. The management recommendation was for stocking with smallmouth bass. This was carried out in 1944 when 61 bass were transferred to Micmac from Trout Brook, Lake Utopia, Charlotte County, New Brunswick.

Micmac Lake has not been stocked with trout for at least three years. Residents report that trout are seldom if ever caught and that there was no sport fishing in the lake before the appearance of bass. Anglers are often seen on the lake during the summer but the total catch, catch composition and catch per unit effort is unknown.

MICMAC LAKE - SAMPLE STATIONS

STATION 1 JULY 21/71 AIR TEMP. 26°C

Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	22			
2½	22			
5	22			
7½	21.5			
10	21.5	7	11	5
12½	21			
15	21			
17	21			

STATION 2 JULY 21/71

Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	22			
2½	22			
5	22			
7½	22			
10	22	7	9	10
12½	22			
13	22			

STATION 3 JULY 21/71

Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	22			
2½	22			
5	22	7	9	5
7½	22			
10	22			
12½	22			
15	22			
17½	21.5	7	10	5
20	21.5			
22	21.5			

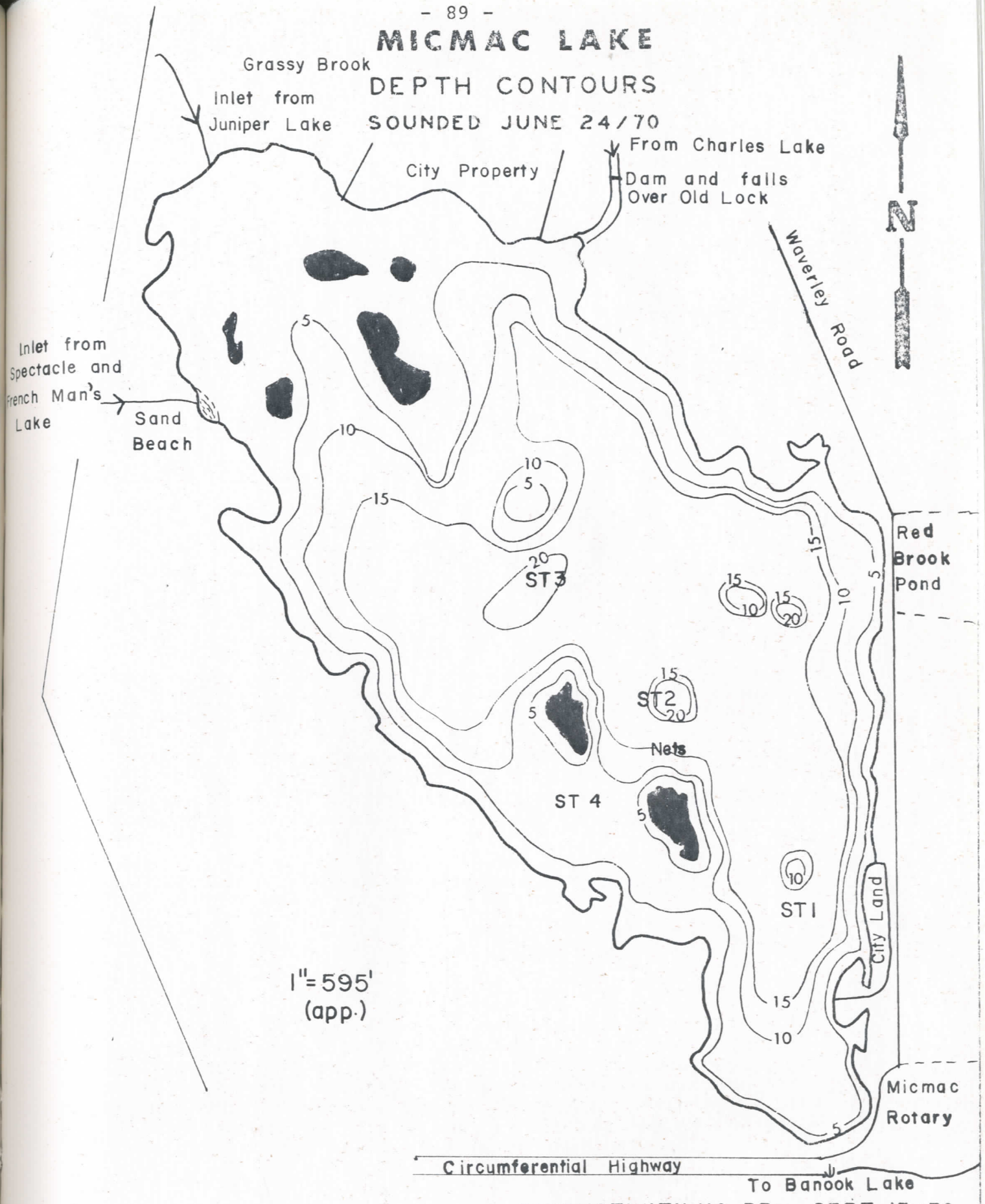
STATION 4 JULY 21/71

Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	23			
2½	22.5			
5	22			
7½	22			
10	22	7	10	5
12½	21.5			
15	21.5			
17½	21.5			
19	21.5			

MICMAC LAKE

DEPTH CONTOURS

SOUNDED JUNE 24/70



CONDUCTIVITY 110 PPM. SEPT. 17/70.
TEMP. SURFACE 65° F. " .

APPENDIX 18

Morris Lake

Surveyed August 16th, 17th & 18th, 1971

LOCATION	:	44°39'15"N; 63°30'00"W Halifax County
SURFACE ELEVATION	:	93 feet
SURFACE AREA	:	434.6 acres
AREA LESS THAN 20 FT. DEEP	:	404.7 acres
SHORE LINE LENGTH	:	35,200 feet
MAXIMUM DEPTH	:	42 feet

ACCESS:

For the purpose of the survey, a boat was conveniently launched from a private road passing through the Imperial Oil storage fields. The general public is excluded from the use of this road.

The lake may be reached by travelling northward on a gravel road, along the south-west shore, leading to a pumphouse and beach owned by, and restricted to the use of, the Department of National Defence.

The lake may also be reached by a dirt road from the Cole Harbour road. The entrance to both branches of this road are obscure however, and pass through private property. A bridge is washed out on the branch crossing the stream between Russel and Morris Lakes.

The public has access to the lake by walking through bush and fields on the eastern shore.

USE:

Imperial Oil uses Morris Lake as a water supply and the Department of National Defence uses it for recreation and for training of divers working from helicopters. Several children were seen swimming near the eastern shore and two young fishermen had caught perch. Fishing is not discouraged on the lake but a resident at the oil company pumphouse reports only infrequent trout catches.

PHYSICAL CHARACTERISTICS:

The lake shore has only very limited development. There is one home at the oil company pumphouse and two or three more near shore at the south-east end of the lake. The recreational beach is about 100 yards long and is maintained by the Department of National Defence. At the time of the survey, workmen were replacing sod and sand at this location following hurricane Beth.

Bottom material in shallow water over most of the lake is bare rock. There was extensive submergent and emergent vegetation with deep silt deposits at the mouth of the tributary from Russel Lake.

An earth dam at the south-east end of the lake had been partially breached by the storm and the outlet stream had a discharge of about 50cfs.

INLET STREAMS:

One stream entering the lake near the oil company pumphouse had an estimated discharge of 20 cfs, but under normal summer conditions this stream, flowing from swampy headwaters, may be intermittent. The stream bed contains gravel that appears suitable for trout spawning. Water temperature was 15°C and pH was 6.

The tributary stream from Russel Lake was flooded to between 25 and 50 cfs and had pH 6.5. This stream appears to be completely accessible to fish with many suitable spawning areas and abundant cover, but it was not examined for resident fish. A secondary stream, from the direction of Topsail Lake joins this stream, but had a flow of only about ½ cfs when examined in October. Seepage from a pig farm manure pile and a salt pile was observed flowing to this branch of the stream near the Cole Harbour Road.

A third small tributary enters from Bell Lake. When examined in October, this stream was found to flow through several dense alder patches as well as open fields and coniferous bush. Bottom type is primarily rocks over 6" diameter with little silting. In many locations the stream disappears underground for distances of up to 100 feet and there were several falls 2-3 feet high.

No fish were observed in the stream but several dozen small eastern banded killifish were observed at the stream mouth. This stream appears unsuitable for trout spawning but there may be limited spawning on shore near the stream mouth.

LAKE WATER CHARACTERISTICS:

The water was observed to be extremely silted but this was primarily the result of the recent hurricane.

The lake was thermally unstratified in August with only a slight temperature change between 23°C at the surface and 18.5°C in the deepest areas. Again, this may have been influenced by the hurricane. Dissolved oxygen determinations ranged from 6 to 8 ppm and pH was 6.5 at all depths tested. Conductivity of the surface water was 125 ppm with sodium and chloride levels of 19.2 and 34 ppm respectively.

BIOLOGICAL STUDIES:

Many small snails and clams were taken in bottom samples.

In two consecutive nights of gill netting on August 15 and 16, the following fish were captured:

Species	No.	Fork Length (cm)		
		Max.	Min.	Mean
Common Sucker	26	44	22.5	33.9
White Perch	38	19.2	13.5	16.0
American Eel	1			76

No trout were captured in nets although they are reportedly angled and divers reported seeing trout in early summer but not in August. Eastern banded killifish were observed but not captured.

Morris Lake has not been stocked from Federal or Provincial sources in at least the past three years.

STATION 1 AUGUST 17, 1971

Depth (ft)	Temp (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	21.5			
2½	21.5			
5	21.5	6.5	8	10
7½	21			
10	21			
12½	20			
15	19.5			
17½	19	6	6	10
20	19			
22½	19			

STATION 2

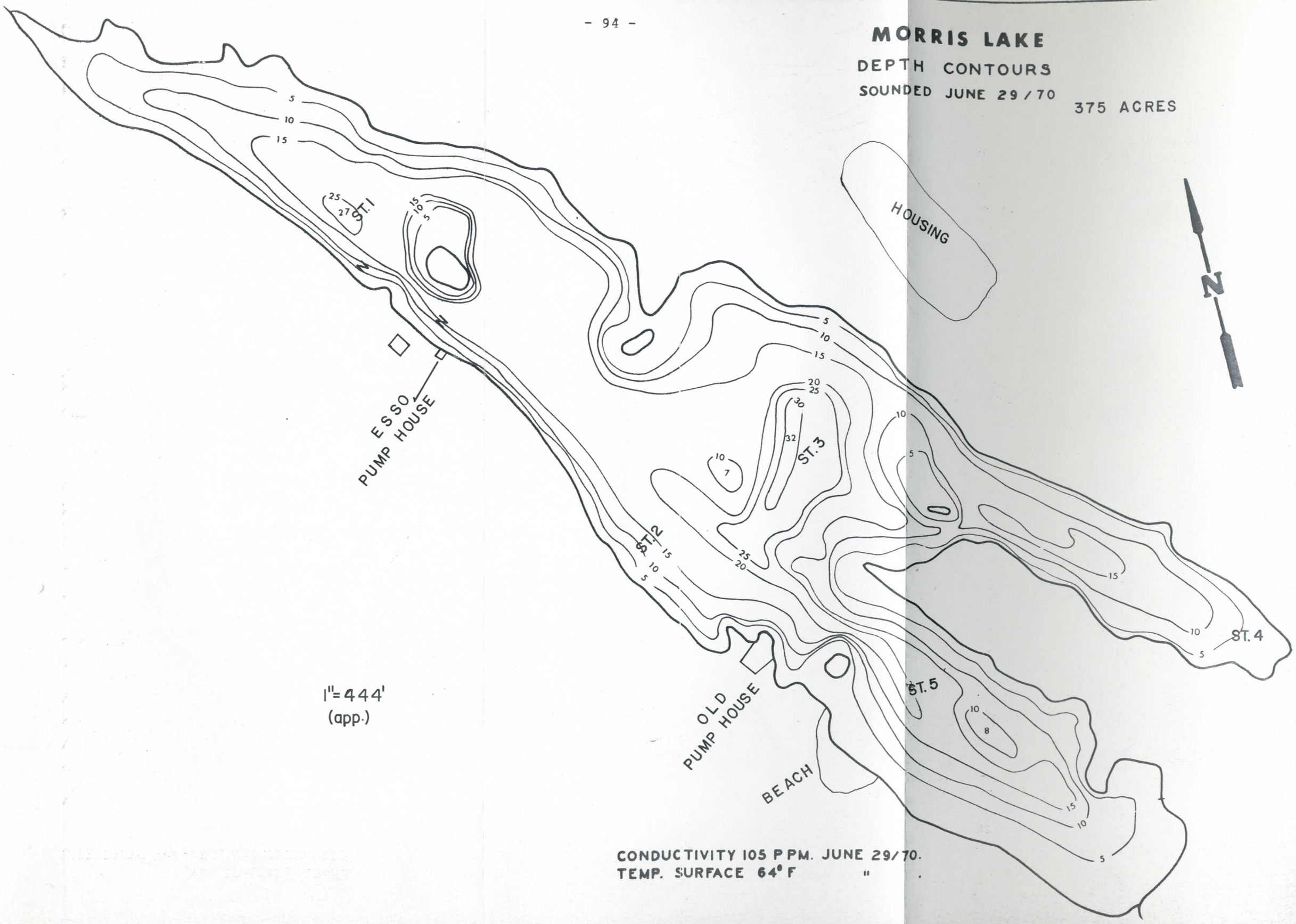
Depth (ft)	Temp (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	23			
2½	22.5			
5	22.5	6.5	8	10
7½	22			
10	21.5			
12½	21.5			
15	21			
17½	20.5			
20	20	6.5	6	10
22½	20			
25	20			
27½	20			
30	20			
32½	20			
35	20	6.5	6	10
37½	19			
40	18.5			
42½	18			

MORRIS LAKE

DEPTH CONTOURS

SOUNDED JUNE 29/70

375 ACRES



1"=444'
(app.)

CONDUCTIVITY 105 PPM. JUNE 29/70.
TEMP. SURFACE 64° F "

APPENDIX 19

Oat Hill Lake

Surveyed August 19 & 20, 1971

LOCATION	:	44°40'25"N; 63°33'00"W
SURFACE ELEVATION	:	148 feet
SURFACE AREA	:	11.7 acres (approximate)
AREA LESS THAN 20 FT. DEEP	:	10 acres
SHORE LINE LENGTH	:	3,600 feet
MAXIMUM DEPTH	:	28 feet

ACCESS:

Oat Hill Lake is located within the city of Dartmouth. The city presently owns the bordering land between the streets and the western lake shore. Access to the lake along this shore is therefore unrestricted. The remaining lake shore is presently undeveloped and privately owned. Most of this shore can be reached by walking through bush.

USE:

The lake is used by local residents for unsupervised swimming, canoeing and some fishing.

PHYSICAL CHARACTERISTICS:

The land on the western side of the lake is developed as a residential area. The remaining shore is undeveloped and either marsh land or dry and bush covered. The lake bottom consists of deep black muck with some submergent and emergent vegetation particularly at the southern tip of the lake.

There is one small inlet stream at the south end of the lake in addition to storm sewers discharging into the lake. A small outlet stream at the north end of the lake disappears into the sewer system under Fairfield Avenue.

LAKE WATER CHARACTERISTICS:

Oat Hill Lake showed some thermal stratification in August with temperature ranging between 22°C at the surface and 12°C at the 24 foot depth. Dissolved oxygen was 8ppm in the epilimnion but as low as 3 ppm in the thermocline with pH between 6 and 6.5. Conductivity of the surface water was 255 and total alkalinity 16 ppm.

BIOLOGICAL STUDIES:

Oat Hill Lake has not been stocked from either Federal or Provincial sources within the past three years. Local residents report that many small bass are angled and that eels are also present.

Two gill nets were set for two nights. In the first set no fish were taken but this is believed to be because nets were set too deep on the muck bottom. Nets were set in this manner in order to avoid hazzards to swimmers. The second set was made in shallower water, avoiding the prime swimming areas. Eight smallmouth bass, between 16.4 and 20.3 cm. with a mean fork length of 18.4 cm. were the only fish captured.

OAT HILL LAKE - SAMPLE STATIONS

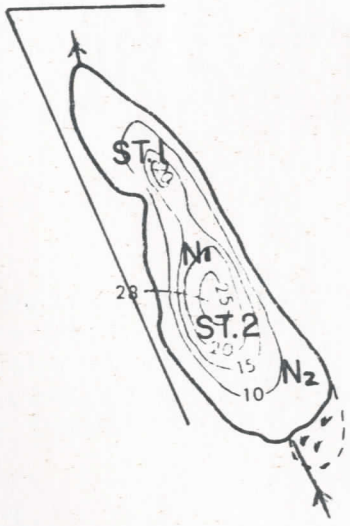
STATION 1 AUGUST 19/71
AIR TEMP. 20°C

Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)	Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	21.5				0	22			
2½	21.5				2½	22			
5	21.5	6.5	8	10	5	22	6.5	8	10
7½	21.5				7½	22			
10	20				10	20.5			
12½	20				12½	20.5			
15	20				15	20.5			
17½	19				17½	18.5			
20	16.0	6	3	10	20	15	6	4	10
22½	15.5				22½	13			
					24	12			

OATHILL LAKE

DEPTH CONTOURS

SOUNDED JULY 4 / 70



1"=591'
(app.)

CONDUCTIVITY 134 PPM. JULY 4 / 70.
TEMP. SURFACE 78° F. " .

APPENDIX 20

Otter Lake

Surveyed August 24, 25, 26 and 27, 1971

LOCATION	:	44°37'35"N; 63°43'35"W Halifax County
SURFACE ELEVATION	:	290 feet
SURFACE AREA	:	158 acres
AREA LESS THAN 20FT. DEEP	:	114 acres
SHORE LINE LENGTH	:	20,300 feet
MAXIMUM DEPTH	:	38 feet

ACCESS:

Public access to Otter Lake is prohibited. For the purpose of the survey, the lake was reached by using a rough road between the lake and highway 103.

USE:

Otter Lake serves as a reserve water supply in the system supplying the city of Halifax. The watershed area surrounding this lake is completely owned by the Halifax Public Service Commission and recreational use of the lake and land is therefore prohibited.

PHYSICAL CHARACTERISTICS:

There is no residential development in the immediate lake area. The water is highly coloured, with most sampling gear disappearing from view at a depth of about 5 feet. The bottom type is primarily bare rock or muck with many submerged logs and a few areas of submergent and emergent vegetation.

STREAMS:

There were no streams found to be tributary to Otter Lake.

The outlet stream flows over a concrete dam and has a fall of about 6 feet. This dam acts as a barrier to fish migration. The stream appears to be suitable for resident trout and has good spawning gravel but no fish were seen.

LAKE WATER CHARACTERISTICS:

In August, the lake was found to have only a few small "pockets" of cold water below the 25 ft. depth. The main body of water varied between 19 and 20°C with pH 5.5 - 6.0 and dissolved oxygen near 8 ppm. Dissolved oxygen in the cold water was 3 ppm or less and ph was 5.5.

In September, conductivity in the surface water was 20 and total alkalinity 7 ppm.

BIOLOGICAL STUDIES:

In two consecutive night sets with gill nets, golden shiner was the only fish species caught. There was also evidence of eels having passed through the nets.

Fred Mason who patrols the water supply lakes, reported that anglers fishing in Otter Lake illegally in the past, occasionally caught record size speckled trout, but never small trout. These fish may have been from a hatchery planting not noted or they may have been remnants of an outlet spawning stock that existed prior to the dam construction. There appears to be no trout in the lake at present.

Three loons and one muskrat were also observed on the lake during the study.

OTTER LAKE SAMPLE STATIONS

STATION 1 AUGUST 24, 1971

Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	20			
2½	20			
5	20	5.5	8	5
7½	20			
10	19.5			
12½	19.5			
15	19	5.5	8	5
17½	19			
20	19			
Bottom 22½	19			

STATION 2 AUGUST 24, 1971

Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	20			
2½	20			
5	20	6	8	5
7½	20			
10	20			
12½	19.5			
15	19.5			
17½	19			
20	19			
22½	19			
25	19			
27½	19			
30	15	5.5	2	5
32½	13.5			
Bottom 35	13			

STATION 3 AUGUST 27, 1971

Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	20			
2½	20			
5	20			
7½	20			
10	20	6.5	8	10
12½	19.5			
15	19.5			
17½	19			
20	19			
22½	19			
25	19			
27½	16	6	3	10
30	14			
32½	13.5			

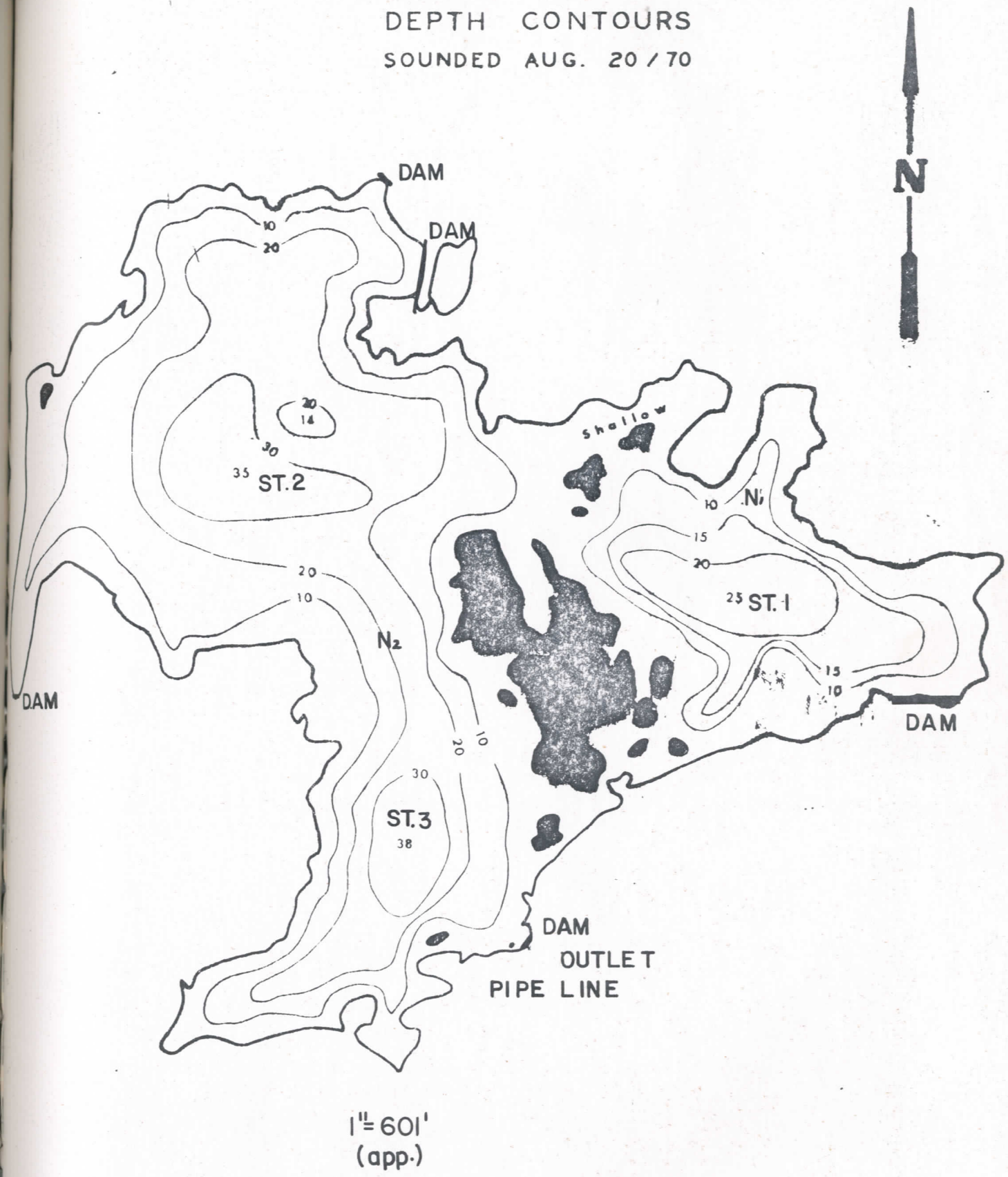
RESULTS FROM GILL NETTING:

½", 1", 1½", 2", & 3 3/8" gill nets were all set on two consecutive nights. Thirty-five golden shiners with a mean fork length of 10.7 cm., were the only fish captured. The small gill-nets also appeared to have a great deal of fresh eel slime on them.

OTTER LAKE

DEPTH CONTOURS

SOUNDED AUG. 20 / 70



1" = 601'
(app.)

CONDUCTIVITY 36 PPM. AUG. 20/70.
TEMP. SURFACE 72° F. "

APPENDIX 21

Papermill Lake

Surveyed September 23 & 24th, 1971

LOCATION	:	44°42'55"N; 63°41'25"W Halifax County
SURFACE ELEVATION	:	72 feet (±)
SURFACE AREA	:	58 acres (approximate)
AREA LESS THAN 20 FT. DEEP	:	58 acres
SHORE LINE LENGTH	:	23,400 feet
MAXIMUM DEPTH	:	20 feet

ACCESS:

Papermill Lake can be reached most easily by using any one of a number of trails extending from the Hammonds Plains Road. There is no boat launch, but light canoes can easily be carried the short distance from the road to the lake.

USE:

Papermill Lake was formerly used as a headpond, to supply water through a flume to the Moirs' candy factory. The flume is no longer in use and the lake level has been allowed to fall to the base of the concrete dam.

At present the lake is used primarily for unsupervised swimming and some fishing. The surrounding land has been designated for construction of housing in the near future.

PHYSICAL CHARACTERISTICS:

Papermill Lake is the lowest lake in a system that drains Jack Lake (pond) and Kearney Lake, which in turn drains several other lakes and ponds. The lake level can be regulated through use of a dam on the outlet stream, giving a potential level 12-15 feet higher than at present. The water passage through this dam is screened and creates an effective barrier to both upstream and downstream migrating fish, even under the present circumstances.

The lake is shallow and most bottom areas are covered with a dense growth of submergent vegetation. This constitutes excellent habitat for invertebrate communities and should produce a relatively large amount of natural fish food.

STREAMS:

At the time of the survey, four streams were found to be tributary to Papermill Lake (see map).

Kearney Run had a discharge of 10-15 cfs with water temperature 17°C and pH 6.5. Bottom material is a mixture of large rocks and gravel that appears to provide both resident and spawning habitat for trout. This stream is completely accessible to fish and although none were seen on September 23, speckled trout and brown bullheads were observed earlier in the summer.

Stream # 2 had a flow of less than 1 cfs, temp. 12°C and pH 6. This stream appears to have a spring origin but the flow is spread over the surface of the shore and provides no trout habitat.

Stream # 3 also had a flow of less than 1 cfs, with temperature 16°C and pH 5.5. This stream orginates in a marsh area, flows through large rocks and provides no habitat for either resident or spawning trout. A small algae bloom was observed at the mouth of this stream.

Stream # 4 drains Jack Lake and on September 23rd had a flow of less than 1 cfs passing through a culvert under the Hammonds Plains Road. Water temperature was 13°C and pH 6. This stream may provide some spawning material for trout but has low accessibility.

The outlet from Papermill Lake had an estimated discharge of 15 cfs, temperature 18°C and pH 6.5. When the flume is not in use, this stream provides suitable habitat for both resident and spawning trout, but fish passage through the dam is prevented.

LAKE WATER CHARACTERISTICS:

The lake water was found to be thermally unstratified with a uniform temperature near 19°C. Dissolved oxygen concentration was 9 ppm with pH 6.5 in all samples tested. The water is very clear and the lake bottom was visible in most areas.

In August, conductivity of the surface water was determined to be 33 and total alkalinity 10 ppm.

BIOLOGICAL STUDIES:

The records show that Papermill Lake has not been stocked with trout from either Federal or Provincial sources within the past three years.

In one over-night set with gill nets, two common suckers, three brown bullheads and four speckled trout were captured. American eels were also observed in the lake.

PAPERMILL LAKE - SAMPLE STATIONS

STATION #1 SEPTEMBER 23, 1971

AIR TEMP. 19.5°C

Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	18			
2½	18			
5	18	6.5	9	10
7½	18			
10	18			
12	18			

STATION #2 SEPTEMBER 23, 1971

Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	19			
2½	19			
5	19	6.5	9	15
7½	19			
10	18			
12½	18			

STATION #3 SEPTEMBER 23, 1971

Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	20			
2½	20			
5	19	6.5	9	10
7½	18.5			
10	18			
11	18			

Results from Gill Net ting - September 23-24, 1971
1/2", 3/4" & 1" gill nets were set on bottom in
7 to 15 feet of water near the Kearney Run inlet.

COMMON SUCKERS (FL cm)
39 cm 32 cm

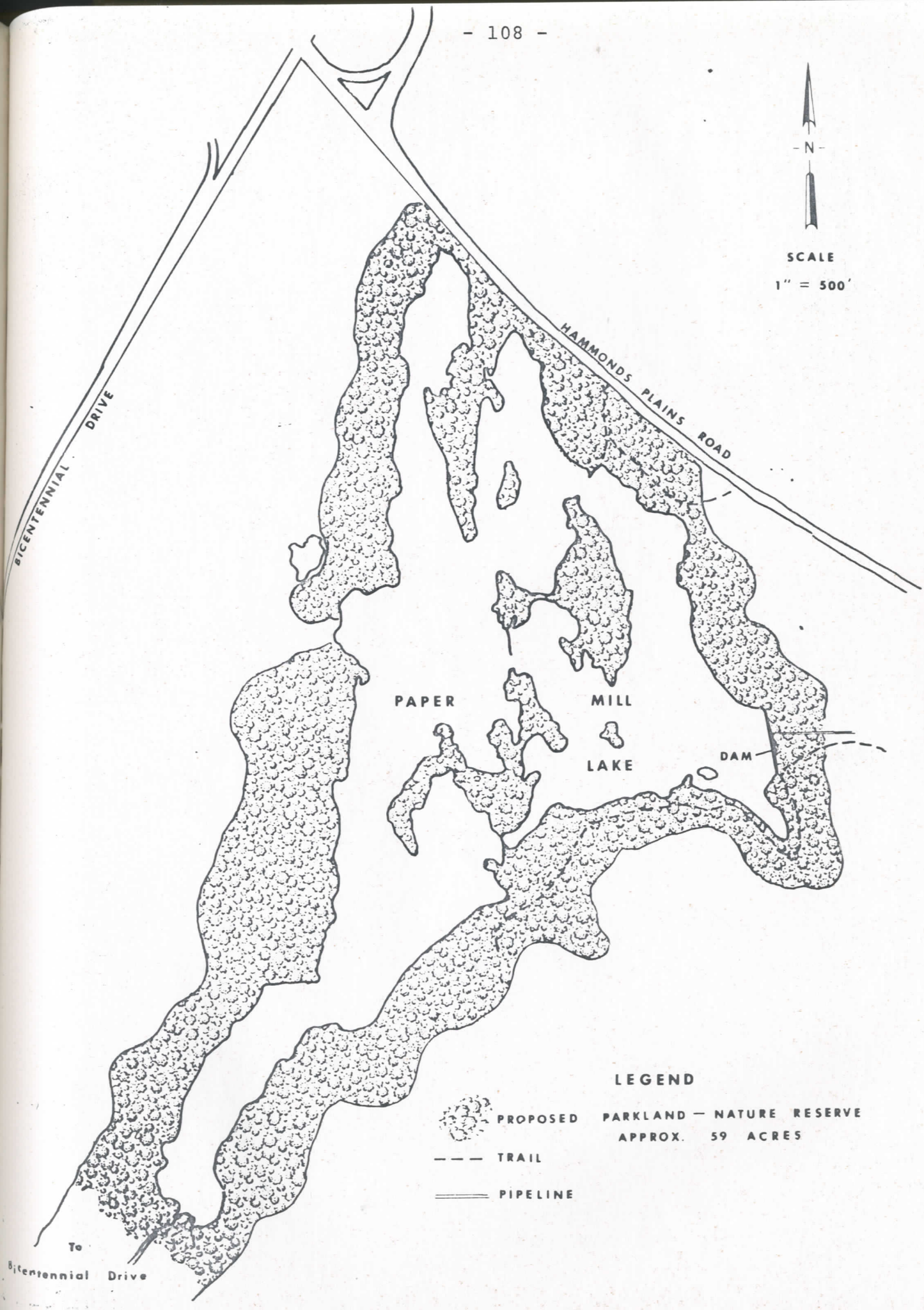
BROWN BULLHEADS
12.8 19.7 18.8

AMERICAN EELS were observed in the lake but not caught .

SPECKLED TROUT

TL	FL	SEX	AGE
29.1	28.2	M	3+
18.5	17.5	F	2+
29.5	28.3	M	3+

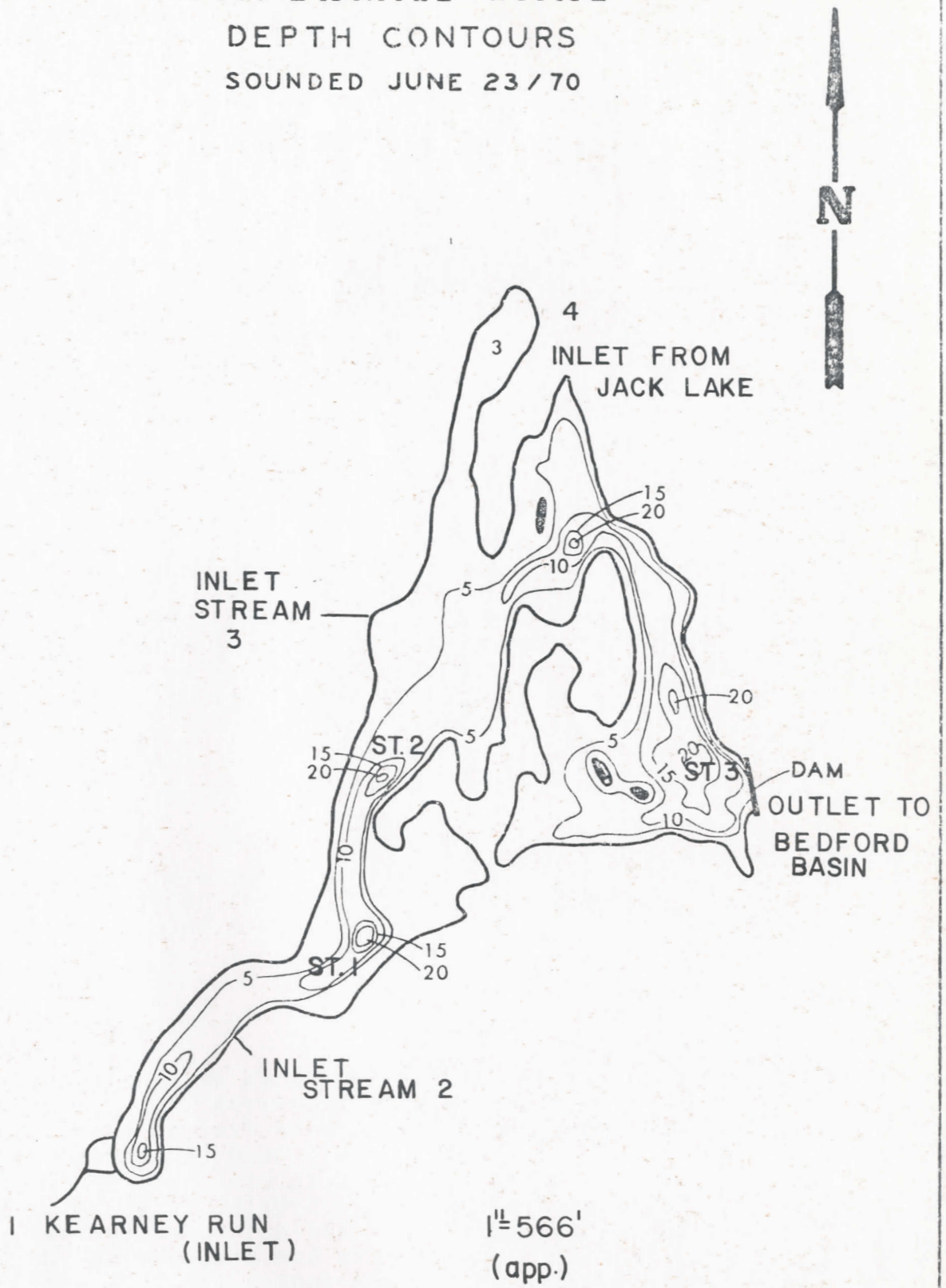
28 approximate - molested by eels


N
SCALE
1" = 500'
BICENTENNIAL DRIVE
HAMMONDS PLAINS ROAD
PAPER
MILL
LAKE
DAM
LEGEND
PROPOSED PARKLAND — NATURE RESERVE
APPROX. 59 ACRES
TRAIL
PIPELINE
To
Bicentennial Drive

PAPERMILL LAKE

DEPTH CONTOURS

SOUNDED JUNE 23/70



CONDUCTIVITY 58 PPM. SEPT. 17/70.
TEMP. SURFACE 64° F. "

APPENDIX 22

Penhorn Lake

Surveyed July 22nd, 1971

LOCATION	:	44°40'30"N; 63°32'25"W Halifax County
SURFACE ELEVATION	:	172 feet
SURFACE AREA	:	9.8 acres
AREA LESS THAN 20 FT. DEEP	:	9.3 acres
SHORE LINE LENGTH	:	3,200 feet
MAXIMUM DEPTH	:	29 feet

ACCESS:

The city of Dartmouth owns a strip of land bordering the entire lake shore and operates a surpervised beach on the eastern shore. Except for the beach area the shore line is undeveloped and access from adjacent roads is unhindered. There is no boat launch, but the lake is too small for power boats and canoes can easily be carried to the lake.

USE:

Penhorn Lake is used primarily for swimming but has also been used for fishing, following hatchery planting with speckled trout.

PHYSICAL CHARACTERISTICS:

The land along the north and eastern shores of Penhorn Lake is fully developed as a residential area. The western shore is bush covered and undeveloped but the southern shore has been cleared of trees. Development of this land has been initiated but has apparently been abandoned or at least delayed, leaving the bare earth exposed. Surface water run-off from this area has caused siltation in the southern end of the lake. Most of the lake shore includes a rock and gravel mixture with much broken glass creating hazardous conditions for swimmers.

STREAMS:

Penhorn Lake has no inlet streams. One storm sewer was observed flowing into the lake at its northern end.

The outlet stream bed, at the southern end of the lake, was dry during the survey. When flowing, water passes under the circumferential highway and is then emptied into the sewer system. This stream could provide some trout spawning habitat but any juvenile fish moving downstream would be lost.

LAKE WATER CHARACTERISTICS:

On July 22, the lake was found to be partially thermally stratified with temperature ranging between 23°C at the surface and 14.5°C at the 27 foot depth. Dissolved oxygen varied between 6 and 9 ppm with pH between 6.5 and 7.

Conductivity of the surface water was 320 and total alkalinity 28 ppm. Conductivity of a sample of water from the 9 meter depth was 700 and total alkalinity 33 ppm. These values are much higher than most lakes in the area and the high sodium (164 ppm), calcium (26 ppm) and chloride (223 ppm) levels in the deep water, indicate that this may be the result of road salts being carried into the lake.

BIOLOGICAL STUDIES:

During the past three years, Penhorn Lake received 1200 speckled trout yearlings from the provincial ponds in 1970 and 1,000 in 1971. The angling returns from these plantings are unknown. Local residents report that fishing was good for a few days after stocking, but that some anglers took many times their legal limit.

During the survey, gill nets were set for only a few hours. One speckled trout and two smallmouth bass were the only fish captured. Banded killifish were observed along the shore and large eels are reported to be present.

The capture of a speckled trout as late in the summer as July 22 indicates that at least some trout should survive over summer.

In the fall of 1971, 50 tagged surplus brood stock speckled trout from the Antigonish Station were stocked under the present program.

PENHORN LAKE - SAMPLE STATIONS

STATION 1 JULY 22nd, 1971

Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	23			
2½	23			
5	23	7	9	10
7½	23			
10	22.5			
12½	22.5			
15	22			
17½	22			
20	19	6.5	6	15
22½	17			
25	14.5			
27	14.5			

STATION 2 JULY 22nd, 1971

Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	23			
2½	23			
5	23			
7½	22.5			
10	22.5			
12½	22.5			
15	22.5	7	9	10
17½	22.5			
20	19			
22	18.5			

A 1" mesh gill net was set for four hours during the day only since it was felt that nets could be hazardous to the large number of children swimming in the lake.

Speckled Trout 21.4 cm FL

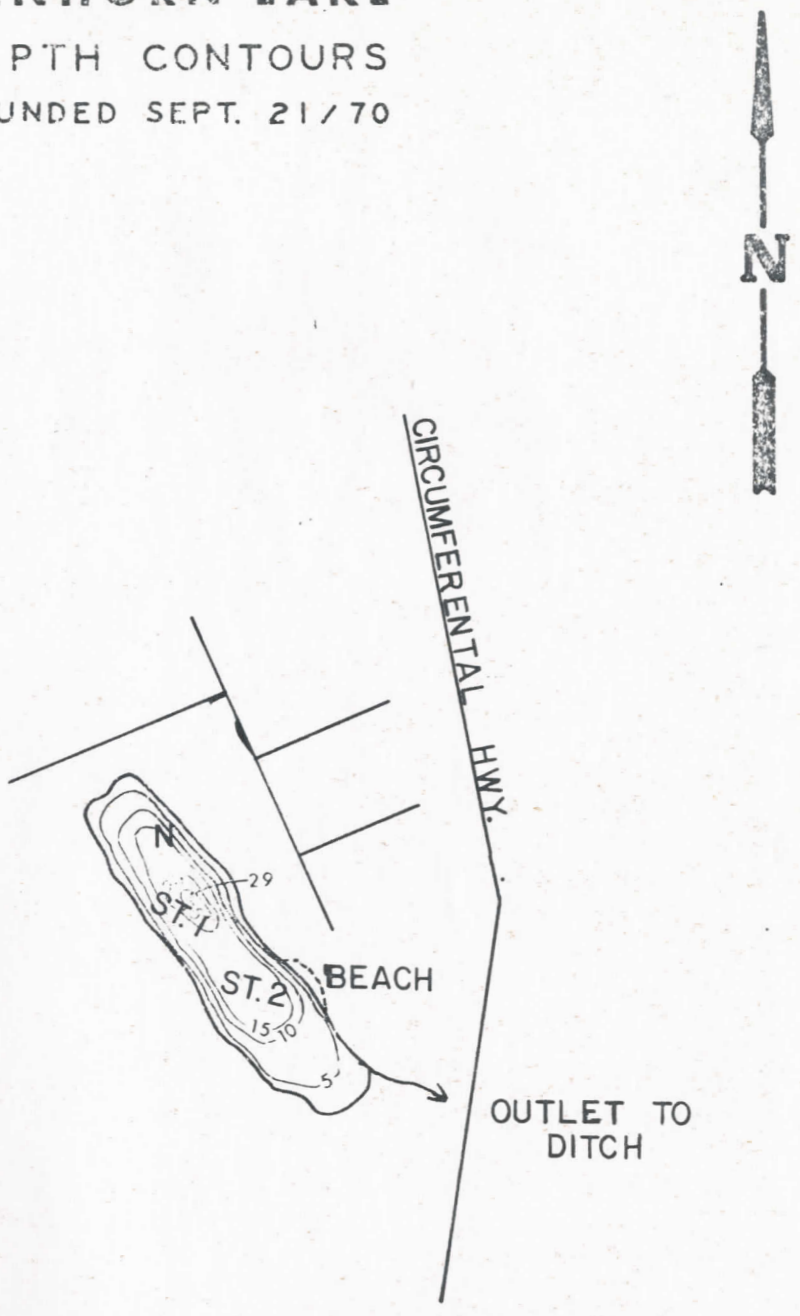
Smallmouth Bass 19.8 - 18.7 cm

24.1 cm FL.

PENHORN LAKE

DEPTH CONTOURS

SOUNDED SEPT. 21/70



1"= 773'
(app.)

CONDUCTIVITY 150 P PM. SEPT. 21/70.
TEMP. SURFACE 67° F. "

APPENDIX 23

Russel Lake

Surveyed September 7th and 8th

LOCATION	:	$44^{o}39'50"N$; $63^{o}31'30"W$ Halifax County (Dartmouth)
SURFACE ELEVATION	:	123 feet
SURFACE AREA	:	85.1 acres
AREA LESS THAN 20 FT. DEEP	:	81 acres
SHORE LINE LENGTH	:	11,837 feet
MAXIMUM DEPTH	:	30 feet

ACCESS:

The lake is accessible on foot through open fields and bush on private property. There is one road leading to the lake from the Cole Harbour Road, through the Eisner Farm property. Access via this road is hindered by permanent fences and a washed out bridge. A canoe was launched for the survey through open fields on the Krause farm.

USE:

At present the lake receives only very light use for swimming and fishing and perhaps for canoeing. Local farm stock is also watered at the lake.

There are no buildings on the immediate lake shore except for an abandoned log cabin at the south end of the lake and an abandoned pumphouse on the Krause farm.

PHYSICAL CHARACTERISTICS:

Most of the lake is very shallow with some sand bottom on the south and south west lake shores. The north end of the lake is shallow marsh with extensive submergent, emergent and floating vegetation. The eastern and western shores of the lake have steep slopes on predominantly open fields of pasture land.

INLET STREAMS:

One inlet stream at the south end of the lake had a discharge of approximately 2 cfs, pH 7 and temperature of 13°C. The stream bottom included gravel that appeared suitable for trout spawning and there appeared to be sufficient stream cover to provide suitable habitat for resident trout. Rubble obstructions near the stream mouth may be enough to prevent trout passage under low water conditions. No fish were observed in the stream.

Maps show a second inlet in the marsh area at the north end of the lake, but this was not found.

OUTLET:

The outlet to Morris Lake had a discharge of 5-10 cfs with some gravel bottom and estensive cover provided by vegetation. Temperature is dependent on the surface temperature of Russel Lake. The stream appears to contain extensive spawning and rearing areas for trout. The small bay on Russel Lake from which this stream flows contains dense emergent vegetation.

LAKE WATER CHARACTERISTICS:

The lake was partially thermally stratified with temperature ranging from 20.5°C at the surface to 12°C at the 30 ft. depth. Dissolved oxygen was found to be near 0 ppm in the deep water and pH varied between 6.5 and 7.5. Conductivity of the surface water sample was 198, with total alkalinity of 26 ppm and chemical oxygen demand of 9.5 ppm. Free ammonia was .215 ppm, sodium 23.9 ppm, potassium 2.34 ppm, chloride 46.5 ppm and phosphate .58 ppm. This is the highest phosphate level recorded for the surface waters in any lakes surveyed in the area.

From a sample of water collected near the deepest spot in the lake, conductivity was found to be 224 and total alkalinity 65 ppm. This is the highest alkalinity value found during the lake surveys. Also in this sample free ammonia was found to be 2.17ppm, sodium 38.3 ppm, chloride 50.5 ppm and phosphate 1.38 ppm. This is the highest phosphate level found in any water sample during the lake surveys.

This data indicates that Russel Lake should be one of themost productive lakes in the metro area. The lake undoubtedly receives road salts from the Cole Harbour Road area and it appears that the lake has been fertilized from the steep surrounding agricultural land and chicken farms.

BIOLOGICAL STUDIES:

In the past three years, Russel Lake has been stocked only in 1969 when it received 1,000 speckled trout yearlings from the Moser River Ponds.

In one overnight sample with gill nets, the following fish were captured.

Species	No.	Fork Length (cm)		
		Max.	Min.	Mean
White Perch	120	19.2	12.4	16.2
Common Suckers	8	41.3	16.6	27.7
Yellow Perch	59	19.3	12.8	15.4
Golden Shiner	1			14.3
American Eel	1			50.5

No smallmouth bass were taken then though they are reported to be angled from the lake. It became evident during the surveys however, that some anglers do not distinguish between smallmouth bass and white perch. This may be the case in Russel Lake.

SUGGESTED STOCKING:

First spring following reclaimation: 1,000 speckled trout yearlings.

In the fall of the same year: 2,000 speckled trout fingerlings.

These stockings should be accompanied by a study program on growth and over winter survival of trout in the lake. Management recommendations and stocking rates should then be reconsidered.

RUSSEL LAKE

SAMPLE STATION #1
SEPTEMBER 7, 1971

Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	19.5			
2½	19			
5	18	6.5	6	15
7½	17.5			

SAMPLE STATION #2
SEPTEMBER 7, 1971

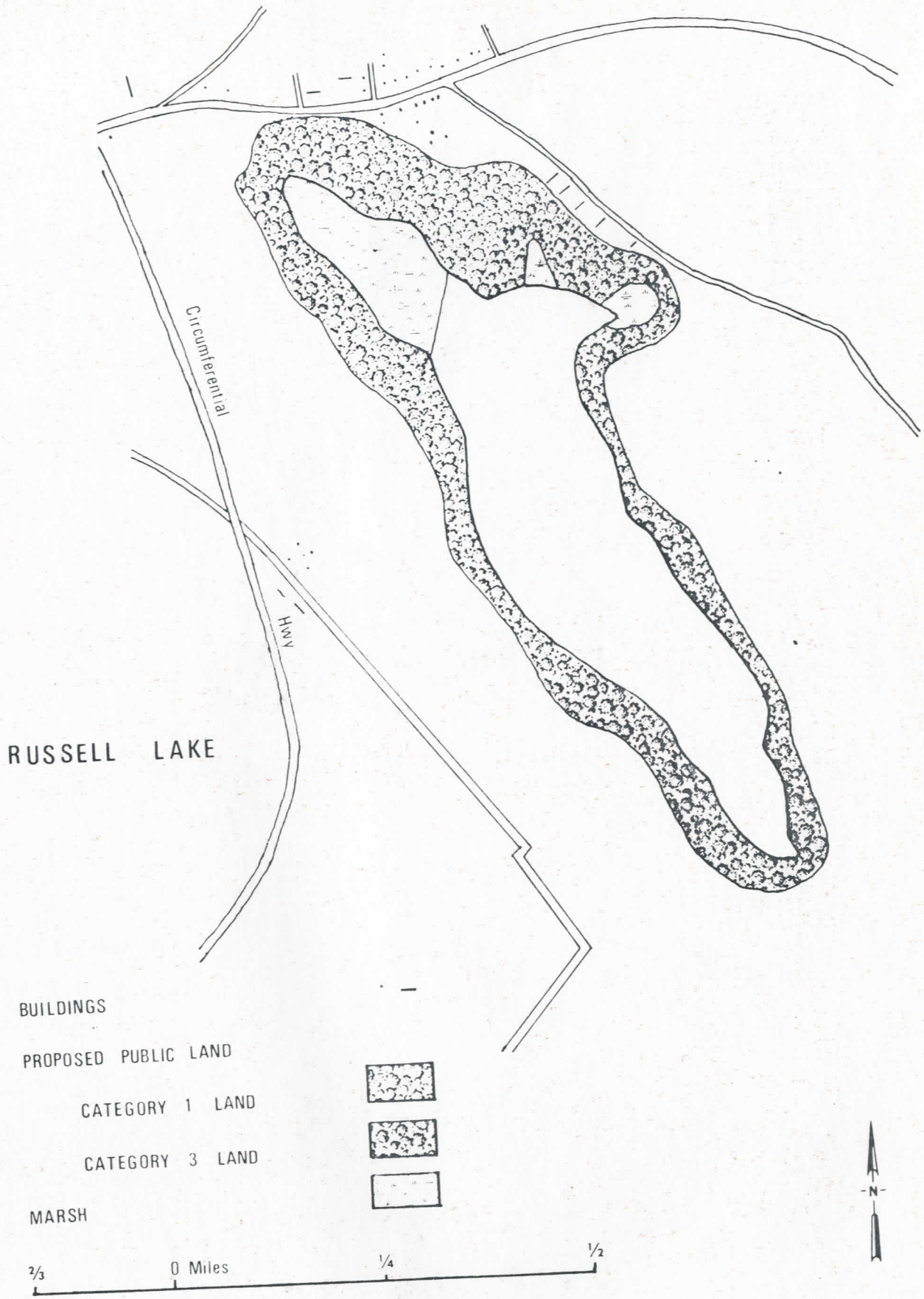
Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	20.5			
2½	20.5			
7½	20	7.5	9	10
10	20			
12½	20			
15	20			
17½	19.5			
20	19	6.5	6	10
22½	18.5			
25	15	7	0	30
27½	13			
30	12			

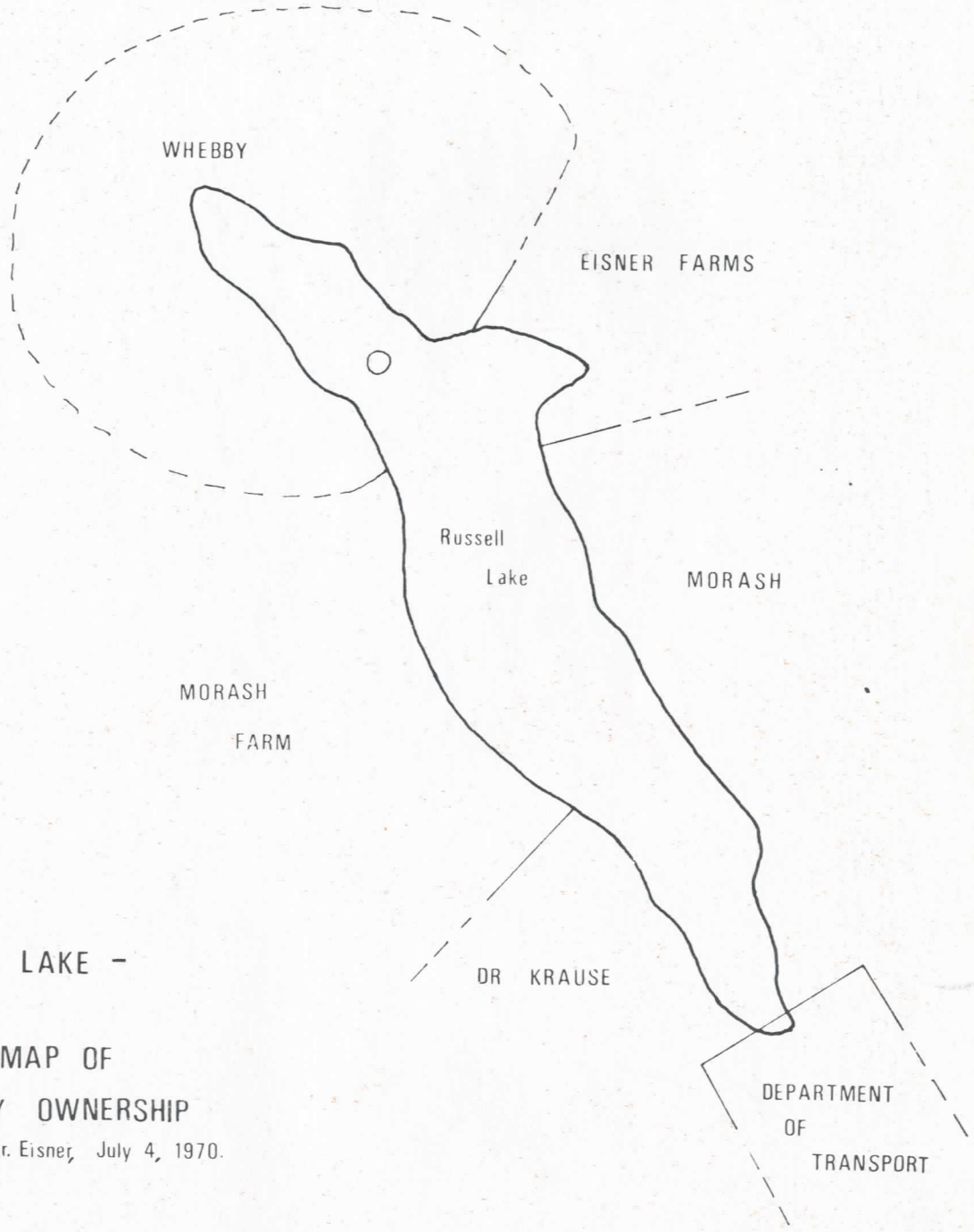
SAMPLE STATION #3
SEPTEMBER 7, 1971

Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	21.5			
2½	21.5	7.5	8	10
5	21			
7½	21			

SAMPLE STATION #4
SEPTEMBER 7, 1971

Depth (ft)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	20.5			
2½	20.5			
5	20			
7½	20			
10	20	7.0-7.5	6	10
12½	19.5			
15	19.5			


Circumferential
Hwy
RUSSELL LAKE
BUILDINGS
PROPOSED PUBLIC LAND
CATEGORY 1 LAND
CATEGORY 3 LAND
MARSH
2/3
0 Miles
1/4
1/2
N



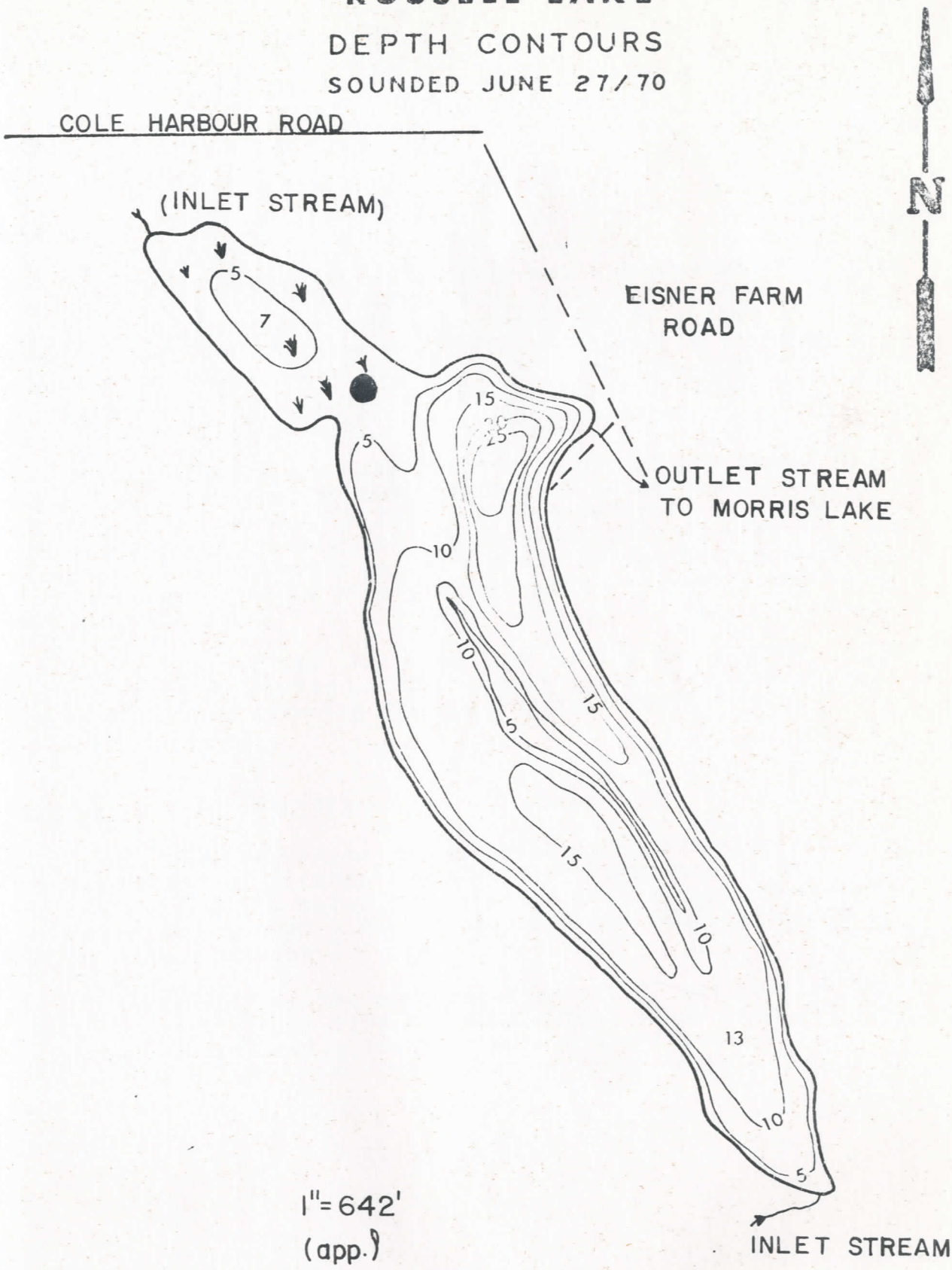
RUSSELL LAKE -

SKETCH MAP OF
PROPERTY OWNERSHIP
as given by Mr. Eisner, July 4, 1970.

RUSSELL LAKE

DEPTH CONTOURS

SOUNDED JUNE 27/70



CONDUCTIVITY 142 PPM. SEPT. 17/70.
TEMP. SURFACE 62° F. "

The north-western lake shore has a sandy beach area but this appears to receive little use because of limited access.

STREAMS:

The outlet stream to Marsh Lake had a discharge of between 2 and 5 cfs when examined in July. The stream included wide shallow still-waters with deeply silted bottom as well as steep narrow riffle areas which appeared suitable for trout spawning. Water temperature, however, is dependent on the surface temperature of the lake and may at times be unfavourable to trout residence.

The inlet stream at the north-west end of the lake had a discharge of only about 1 cfs with temperature 15°C and pH 5 when examined in July. Bottom material is primarily rubble and large rocks which appear unsuitable to trout spawning. Some spawning may take place at the stream mouth but the stream appears unsuited for summer residence and no fish were observed.

The inlet, at the south-west end of the lake, could not be observed flowing at the time of the survey, but may provide some spawning area during fall conditions.

LAKE WATER CHARACTERISTICS:

Sandy Lake was found to be thermally stratified in its main basin with temperature ranging between 21°C at the surface and 7°C below the thermocline. Dissolved oxygen determinations showed 9 ppm or above in all samples tested and pH varied between 5.5 and 6.

Conductivity of the surface water was 37 and total alkalinity 10 ppm. These values indicate that Sandy Lake is relatively unproductive but it should support trout.

BIOLOGICAL STUDIES:

In one overnight sample with gill nets, 2 common suckers with fork lengths of 18 and 24 cm, one American eel 70cm in length, one speckled trout with an approximate fork length of 17 cm and 28 yellow perch with fork lengths ranging from 9.7 to 12 cm with a mean of 10.7 cm, were captured. A seine net haul captured large numbers of eastern-banded killifish.

SANDY LAKE SAMPLE STATIONS

STATION 1 JUNE 6, 1971

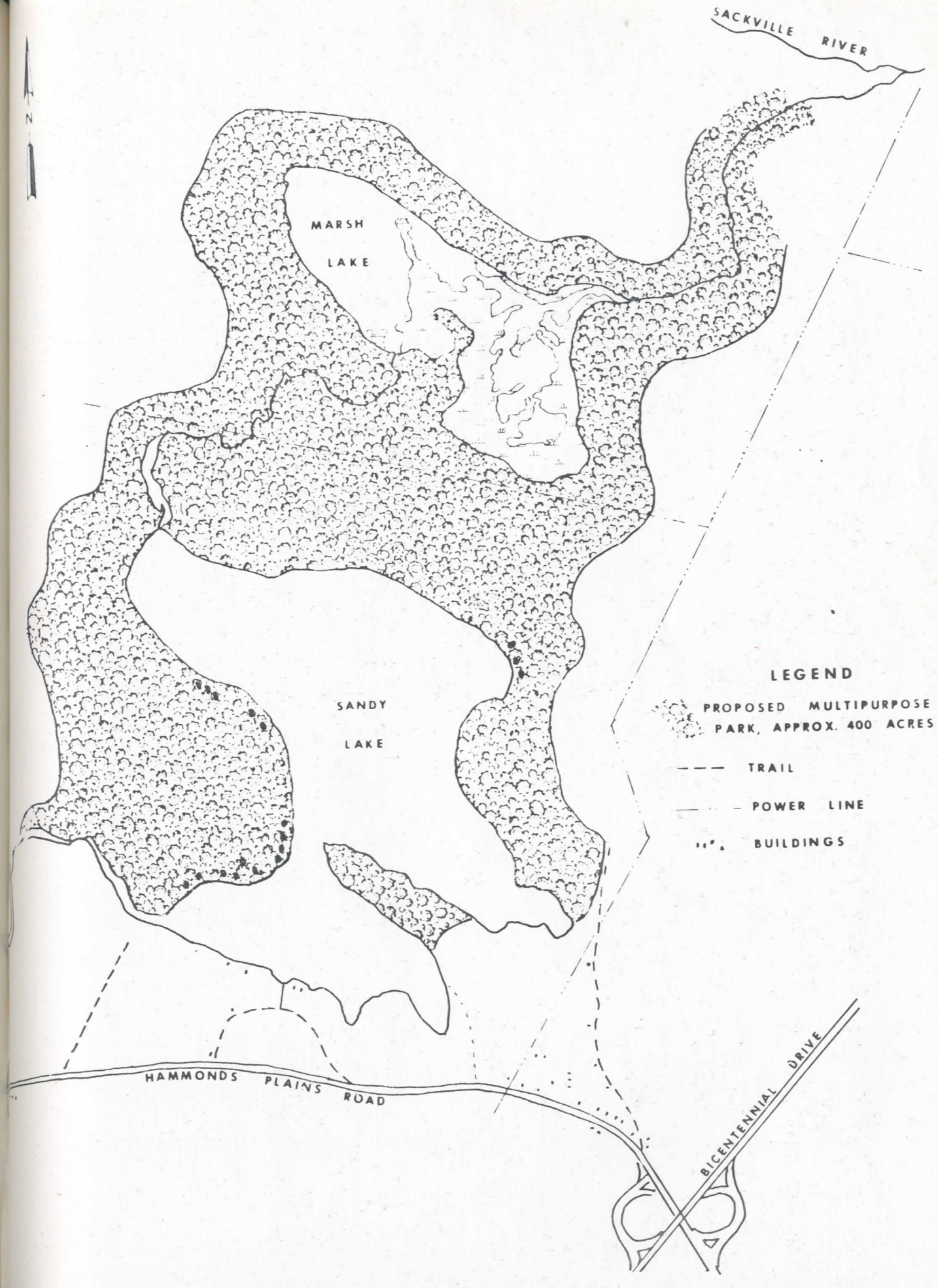
Depth (ft)	Temp. (^{o}C)
0	21
2½	21
5	21
7½	21
10	20.5
12½	20
15	19
17½	15
20	13.5
22½	10.5
25	10
27½	9.5

STATION 2 JUNE 6, 1971

Depth (ft)	Temp. (^{o}C)	pH	O_2 (ppm)	CO_2 (ppm)
0	21			
2½	21			
5	21	6	10	5
7½	21			
10	21			
12½	20			
15	19			
17½	15.5			
20	13	5.5	10	10
22½	11.5			
25	10.5			
27½	9.5			
30	9			
32½	9			
35	8.5			
37½	8.5			
40	8			
42½	8			
45	8			
47½	7.5			
50	7.5	5.5	9	10
52½	7.5			
55	7			
57½	7			

STATION 3 JUNE 6, 1971

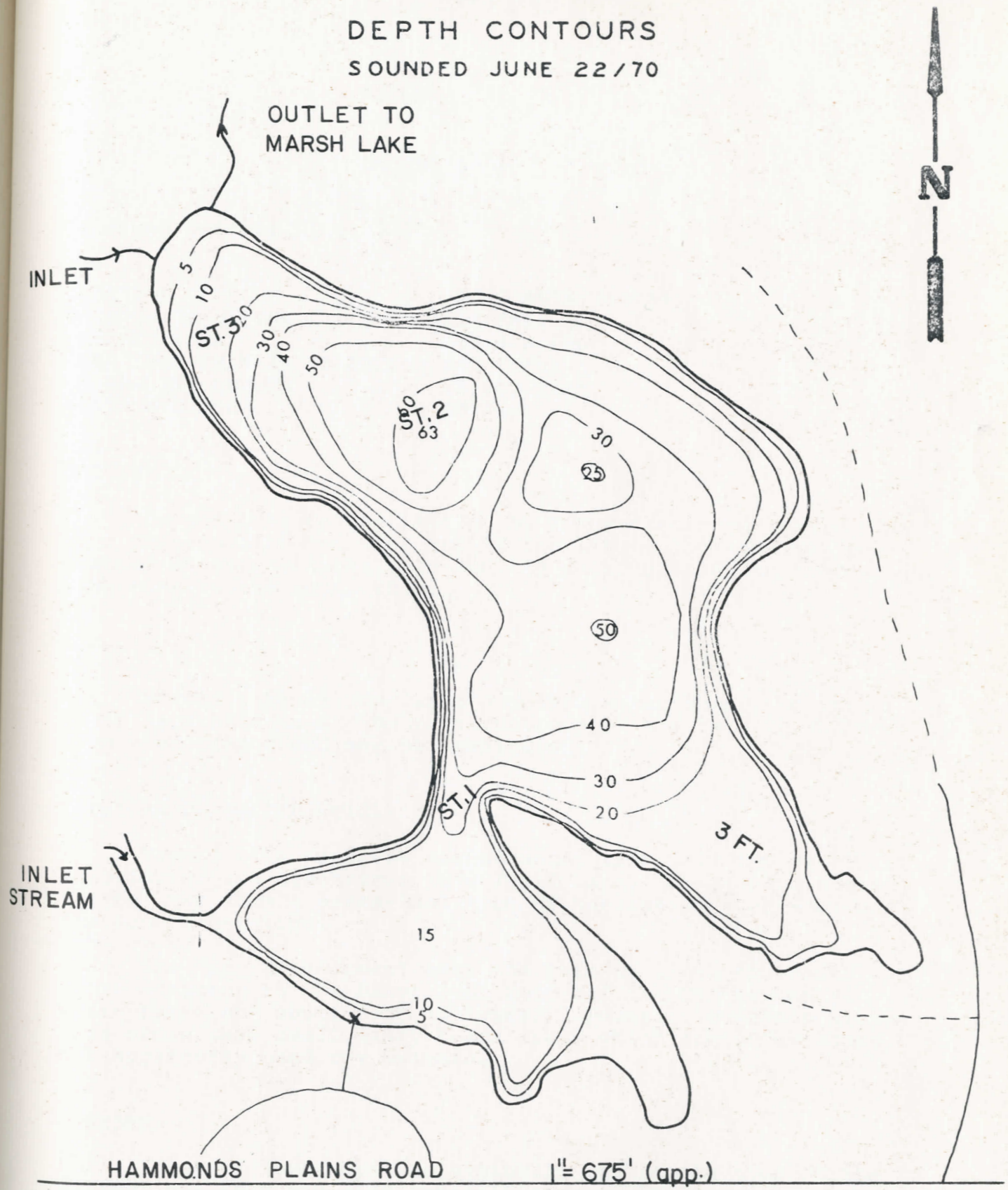
Depth (ft)	Temp (^{o}C)	pH	O_2 (ppm)
0	20.5		
2½	20.5	6	10
5	20.5		
7½	20.5		
10	20		
12½	20		
15	19		
16	18.5		


SACKVILLE RIVER
N
MARSH LAKE
SANDY LAKE
LEGEND
PROPOSED MULTIPURPOSE PARK, APPROX. 400 ACRES
TRAIL
POWER LINE
BUILDINGS
HAMMONDS PLAINS ROAD
BICENTENNIAL DRIVE

SANDY LAKE

DEPTH CONTOURS

SOUNDED JUNE 22/70



CONDUCTIVITY 50 PPM. SEPT. 17/70.
TEMP. SURFACE 68° F. "

APPENDIX 25

Second Lake

Surveyed October 21 & 22/71

LOCATION	:	44°46'50"N; 63°39'10"W
SURFACE ELEVATION	:	117 feet
SURFACE AREA	:	305.4 acres
AREA LESS THAN 20 FT DEEP	:	243 acres
SHORE LINE LENGTH	:	29,200 feet
MAXIMUM DEPTH	:	40 feet

ACCESS:

Second Lake can be reached by a new dirt road leading to a pumphouse at the west end of the lake. The lake can be reached most conveniently on foot by walking from the Beaverbank Road to the north shore.

USE:

Second Lake is used as a domestic water supply to the Lower Sackville area. Recreational use of the lake is therefore discouraged and may be prohibited.

PHYSICAL CHARACTERISTICS:

Second Lake receives ground water from only two small tributaries and discharges into Third Lake. Many shore areas on the lake form a marsh-land type of habitat with extensive emergent vegetation.

The only development near the lake is along the north shore adjacent to the Beaverbank road and the CNR tracks where there are about 6 or 10 houses. Several locations along this shore have small sandy beach areas which are undeveloped, but apparently used for swimming.

STREAMS:

Inlet #1 (see map) was virtually dry at the time of the survey, but sand and silt deposits over marsh vegetation, near

shore, at the mouth of this stream, indicate intermittent flooding of the stream. The sand and silt deposits have undoubtedly increased as a result of road construction for the pumphouse. The stream is now little more than a ditch and provides no suitable trout spawning habitat.

Stream #2 flows through a marsh area at its entrance to the lake and was not followed upstream. At the time of the survey, the stream had a discharge of about 1 cfs, but the stream mouth was so congested with vegetation as to be inaccessible to fish. This stream may provide some trout spawning habitat.

The outlet stream passes completely underground from the lake shore and flows under the CNR tracks and the Windsor Junction Road. After passing under the road it flows through a steep rapids to a meandering portion which flows to Third Lake. This stream appears to provide no trout spawning habitat for fish in Second Lake.

LAKE WATER CHARACTERISTICS:

In October, thermal stratification of the lake was found to be incomplete with temperature ranging from 15.5°C at the surface to 12°C in deeper areas. Dissolved oxygen was found to be 10 ppm in most samples with pH 7.

In August, students from Dalhousie University found the surface water conductivity to be 32 and the total alkalinity to be 8 ppm. At that time, dissolved oxygen concentration in water from the deepest point in the lake was found to be 7 ppm.

BIOLOGICAL STUDIES:

Second Lake has not been stocked with hatchery fish in recent years but receives little or no fishing pressure because of its water supply status.

In one overnight set with gill nets 15 common suckers, 8 brown bullheads, 77 white perch, 8 yellow perch, 2 smallmouth bass, 3 American eels, and two golden shiners were captured. No trout were captured although one resident in the area reports that trout are angled in the lake.

SAMPLE STATIONS SECOND LAKE

STATION 1 - October 22/71

DEPTH (ft)	TEMP (°C)	pH	O_2 ppm	CO_2 ppm
0	15.5			
2 1/2	15.5			
5	15	7	10	10
7 1/2	15			
10	14.5			
12 1/2	14			
15	14			
17 1/2	14			
20	14			
22 1/2	14			
25	14			
27 1/2	13.5	7	10	10
30	13.5			
32 1/2	13.5			

STATION 2 - October 22/71

DEPTH (ft)	TEMP (°C)	pH	O_2 ppm	CO_2 ppm
0	13			
2 1/2	13			
5	13			
7 1/2	12.5			
10	12	7	11	11
12 1/2	12			
15	12			
17 1/2	12			
20	12			
22 1/2	12			

RESULTS FROM GILL NETTING IN SECOND LAKE

1/2", 3/4", 1 1/2", 2", 2 3/8" gill nets were set on bottom at depths between 10 and 20 feet on the night between October 13 and 14.

15 Common Suckers
FL 30-37.5 cm mean 32.7 cm
WT 350-600 g mean 442 g

8 Brown Bullheads
17.3-29 cm mean 24.2 cm

77 White Perch
FL 8.6-13.5 cm mean 11.8 cm

8 Yellow Perch
FL 11.3-15.5 cm mean 12.5 cm

2 Smallmouth Bass
FL 30-33.6 cm
WT 400-575 g

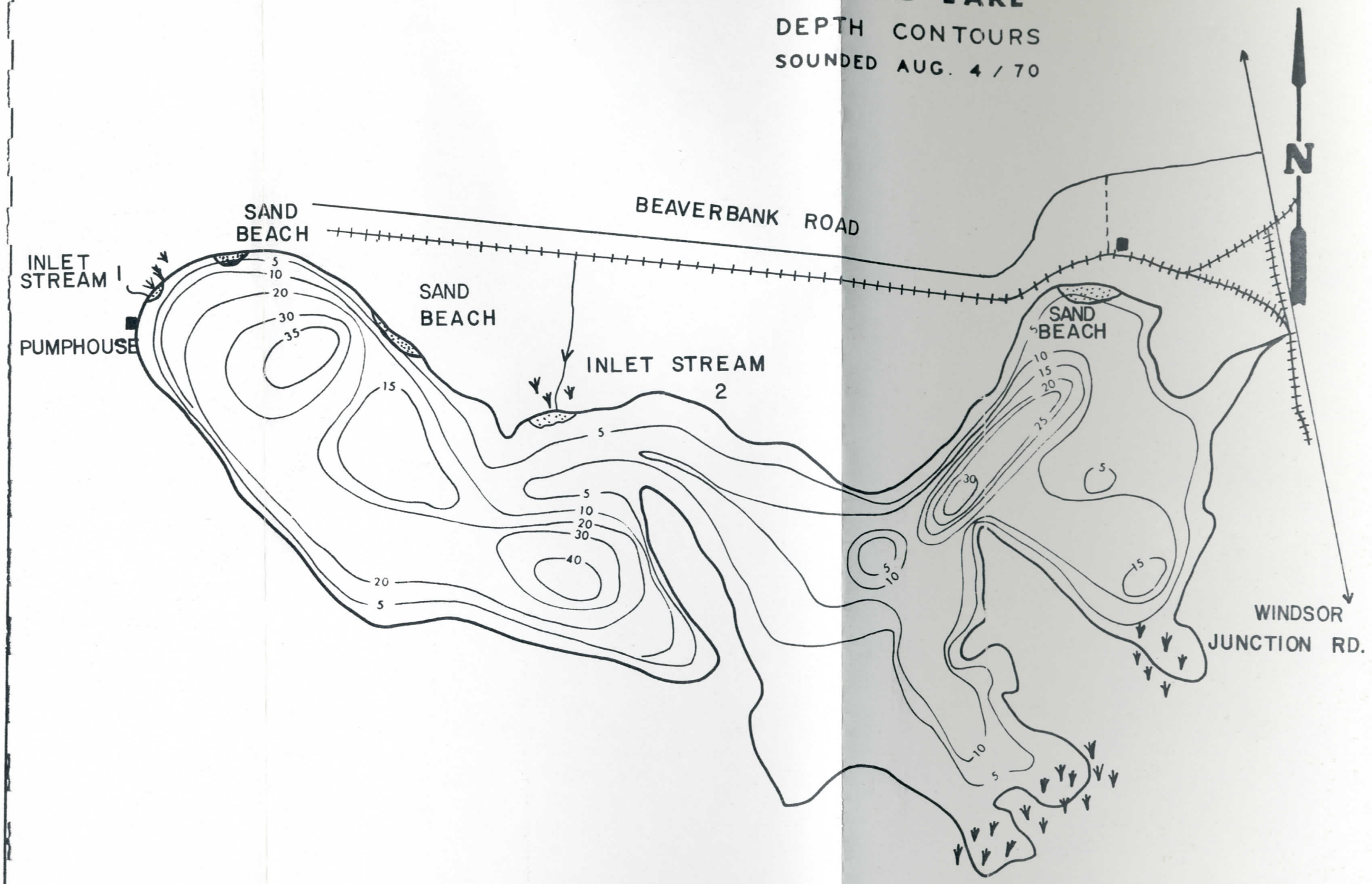
3 American Eels
65, 59 and 43 cm

2 Golden Shiners
approx. 11 cm FL

SECOND LAKE

DEPTH CONTOURS

SOUNDED AUG. 4 / 70



1"=803'
(app.)

CONDUCTIVITY 51 PPM. AUG. 4/70.
TEMP. SURFACE 77° F. "

APPENDIX 26

Spruce Hill Lake

Surveyed September 15 & 16, 1971

LOCATION	:	44°34'45"N; 63°39'20"W Halifax Co.
SURFACE ELEVATION	:	362 feet
SURFACE AREA	:	252.2 acres
AREA LESS THAN 20 FEET DEEP	:	217 acres
SHORE LINE LENGTH	:	27,700 feet
MAXIMUM DEPTH	:	42 feet

ACCESS:

Public access to Spruce Hill Lake is prohibited. For the purpose of the survey, access to the lake was gained by a partially paved road between the Sambro Road and a pumphouse owned by the Public Service Commission of Halifax. The boat was conveniently launched and an outboard motor was used by permission.

USE:

Spruce Hill Lake serves as a water supply for the high elevation areas of the city of Halifax. Public use of the lake and its surrounding watershed area for fishing or other forms of recreation, is prohibited.

PHYSICAL CHARACTERISTICS:

There is no residential development in the immediate lake area. The lake level is maintained by a dam on its outlet toward Fish Brook. Several secondary dams prevent flooding of surrounding lowland areas. The lake bottom is primarily large boulders with many of them just breaking the surface.

INLET STREAMS:

Four tributary streams were observed at the time of the survey.

Stream A (see map) had a discharge of 1-2 cfs following heavy rains on the previous day. The water was highly coloured, with the appearance of tea. Temperature was 15°C and pH less than 4. This stream would provide little or no spawning area for trout.

Stream B had a discharge of less than 1/2 cfs and was likely intermittent. pH was less than 4.

Stream C had a discharge of about 2 cfs, flowing through dense brush. Temperature was 16°C and pH 5.5. This stream may provide limited spawning and possibly rearing areas for trout, although none were observed.

Stream D having a discharge of 3-4 cfs flows only about 100 feet from a marsh area. Temperature was 18°C and pH less than 4. The bottom was mostly bare bedrock with no suitable spawning areas. An abandoned beaver lodge was observed in the lake near the stream mouth.

LAKE WATER CHARACTERISTICS:

The lake water was found to be thermally unstratified except for a small "pocket" of cold water at the bottom of the deepest spot recorded. The main body of water was found to be 19-20°C with oxygen levels at 8 ppm and pH 6. Conductivity of the surface water was 22 ppm in August and total alkalinity was 10 ppm.

BIOLOGICAL STUDIES:

One plankton sample indicated 2.78 cc/m^3. This was among the lowest values of all lakes sampled.

The lake has a history of stocking with hatchery fish, including rainbow fry in their initial introduction to Nova Scotia in 1899.

The most recent stocking was in 1967 when 1,000 speckled trout fingerlings were supplied from the Grand Lake fish culture station.

In two nights of gill netting, only two speckled trout were captured. The largest trout (38 cm Fl) may have been a survivor from the 1967 planting but the smaller fish was almost certainly the result of natural reproduction.

Two loons were observed on the lake during the survey.

STATION 1 September 16/71

DEPTH (ft)	TEMP (°C)	pH	O_2 ppm	CO_2 ppm
0	20			
2 1/2	20			
5	19.5	6	8	10
7 1/2	19			
10	19			
12 1/2	19			
15	19			
17 1/2	19			
20	19			
22 1/2	19			
25	19			
27 1/2	19			
30	19	6	8	10
32 1/2	19			
35	19			
37 1/2	19			
40	19			
42 (bottom)	14.5			

STATION 2 September 16/71

DEPTH (ft)	TEMP (°C)	pH	O_2 ppm	CO_2 ppm
0	20			
2 1/2	20			
5	19.5			
7 1/2	19.5			
10	19.5	6	9	10
12 1/2	19.5			
15	19			
16	19			

RESULTS FROM GILL NETTING:

1/2" 3/4" 1 1/2" 2" 2 3/8" gill nets set on bottom in 15 feet of water between September 15 & 16 - no fish were caught (N-1).

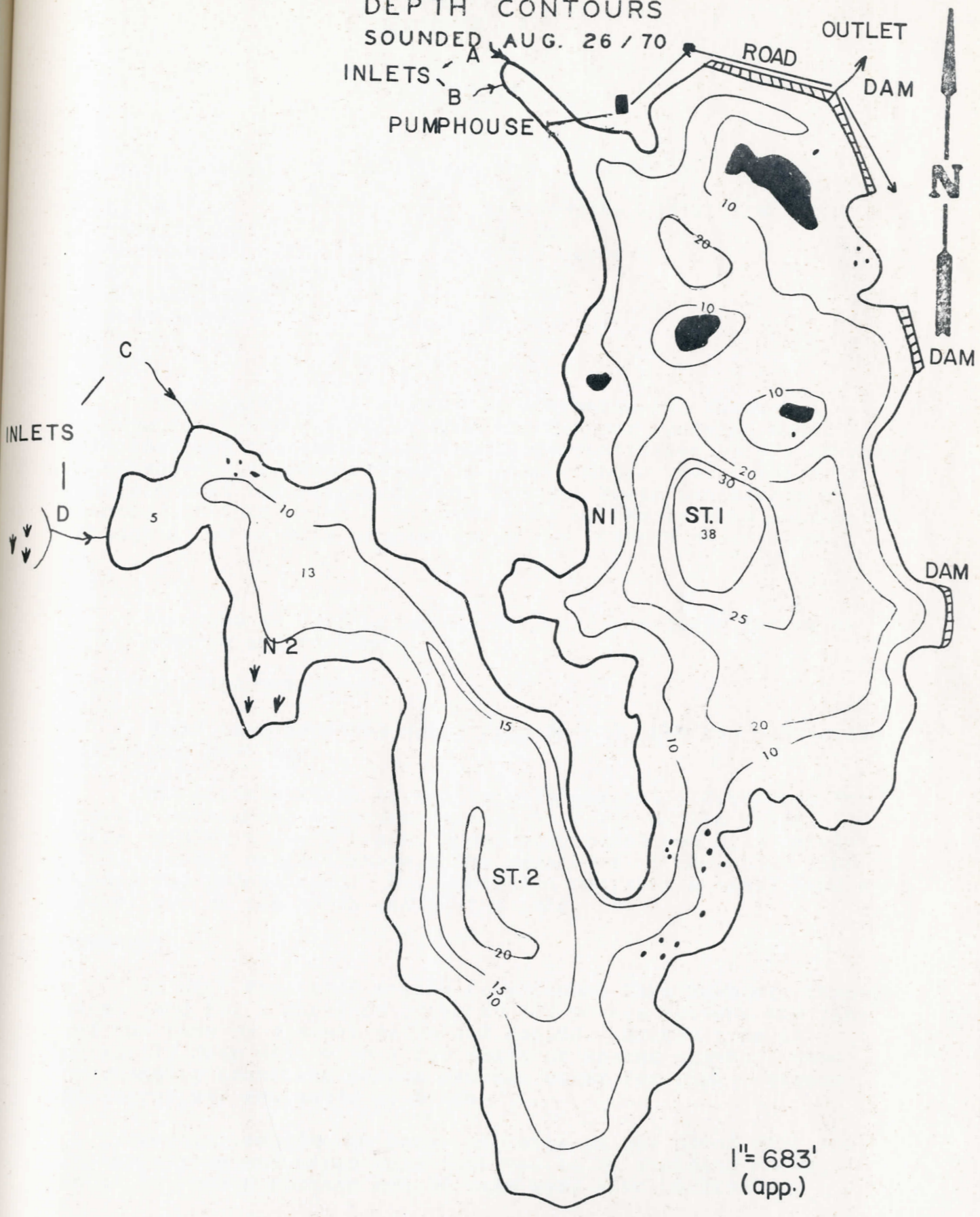
All five nets were reset between September 16 & 17 in 10-15 feet of water near a weed bed (N-2).

One trout head from a trout probably about 8" long and one whole trout was also taken in this set.

TL 39.3 cm FL 38.0 cm AGE 3+ or 4+

some eel slime on nets.

SPRUCE HILL LAKE



CONDUCTIVITY 43 PPM. SEPT. 21 / 70.
TEMP. SURFACE 72° F. AUG. 26 / 70.

APPENDIX 27

THIRD LAKE

Surveyed June 15, 16 & 17/71 and Oct. 25 & 26/71

LOCATION	:	44°47'35"N; 63°38'05"W
SURFACE ELEVATION	:	102 ft.
SURFACE AREA	:	209.5 acres
AREA LESS THAN 20 FT. DEEP	:	97.9
SHORE LINE LENGTH	:	18,100
MAXIMUM DEPTH	:	80 ft.

ACCESS:

Third Lake can be reached at its north end through a private dirt road extending from the Windsor Junction Road. This road and its associated beach are controlled by Mr. Lawrence Robertson who appears willing to allow public use of the area provided that the people do not litter. Boats can easily be launched at this point. The remainder of the lake is accessible through a few private properties on the western shore or on foot.

USE:

The lake is used primarily by local residents for swimming, boating and fishing.

PHYSICAL CHARACTERISTICS:

Third Lake receives water from Second Lake and discharges into Three Mile Lake.

The western shore of the lake is partially developed for housing with about 17 houses within 50 yards of the water. There is also a small beach, apparently developed by a service club, located on this shore. The remainder of the shore line is wooded and undeveloped. Mr. Robertson operates a small sand and gravel pit at the north end of the lake.

STREAMS:

Inlet: The inlet stream from Second Lake meanders through marsh land for a distance of about 400 meters between the lake and the base of a small falls and rapids. Bottom type is primarily deep silt with a few areas of sparse gravel. Some overhanging banks and bushes provide cover for fish. Stream discharge was estimated at 5 cfs.

Several smallmouth bass, as large as one pound were seen in the stream and three were observed to be guarding nests. About 50 common suckers and 10 eels were also observed.

This stream could supply some spawning habitat for salmonids but none were observed.

Outlet: The outlet stream to Three Mile Lake was 2-3 feet deep and 3-4 feet wide with an estimated discharge of 6-8 cfs on June 16. This straight channel has near vertical sides and appears to be man made. The swift current flows over large rocks and there are few pools to provide resident habitat. This stream is easily accessible to fish and may provide some spawning material at the upper and lower ends.

LAKE WATER CHARACTERISTICS:

In June, Third Lake was found to be thermally stratified with temperature ranging between 18°C at the surface and 8°C below the thermocline. Dissolved oxygen was 9 ppm or above in all samples tested and pH ranged from 6.5 to 7.

In August, conductivity of the surface water was 45 and total alkalinity was 13 ppm.

In October, the water continued to be thermally stratified with temperature ranging between 14°C at the surface and 8.5°C in deep water. Dissolved oxygen had fallen to 5 ppm below the thermocline and pH was between 6 and 7.

BIOLOGICAL STUDIES:

Third Lake has not been stocked with hatchery fish within the past three years.

In a total of three overnight sets with gill nets the following fish were captured:

Species	Number	Fork length (cm)		
		Max.	Min.	Mean
White Perch	173	23.7	9.3	14.8
Common Suckers	26	38.5	22	32.3
Yellow Perch	6	17.3	12.5	15
American Eel	4	15	39	51
Smallmouth Bass	2	31	15.9	23.5

Residents report that fishing was good for landlocked salmon until two or three years ago but that few have been caught in the past year.

Two loons were observed to be nesting on the island.

THIRD LAKE SAMPLE STATIONS

STATION 1 June 16/71

Depth (ft.)	Temp. (°C)	O_2 (ppm)	CO_2 (ppm)	pH
0	18			
5	18	9	5	7
10	17	10		7
15	16.5			
20	16	11		7
25	13			
30	11	11		6.5
35	9.5			
40	8	12	5	6.5
45	8			
50	8			
55	8			

STATION 2 June 16/71

0	18.5			
5	17.5	11	5	7
10	17			
15	16.5			
20	15.5			
25	11.5			
30	10			
35	9			
40	8.5	11	5	6.5
45	8			
50	8			

Eckman dredge samples taken from several locations greater than 20 ft. deep showed only deep black muck with no living macro-organisms.

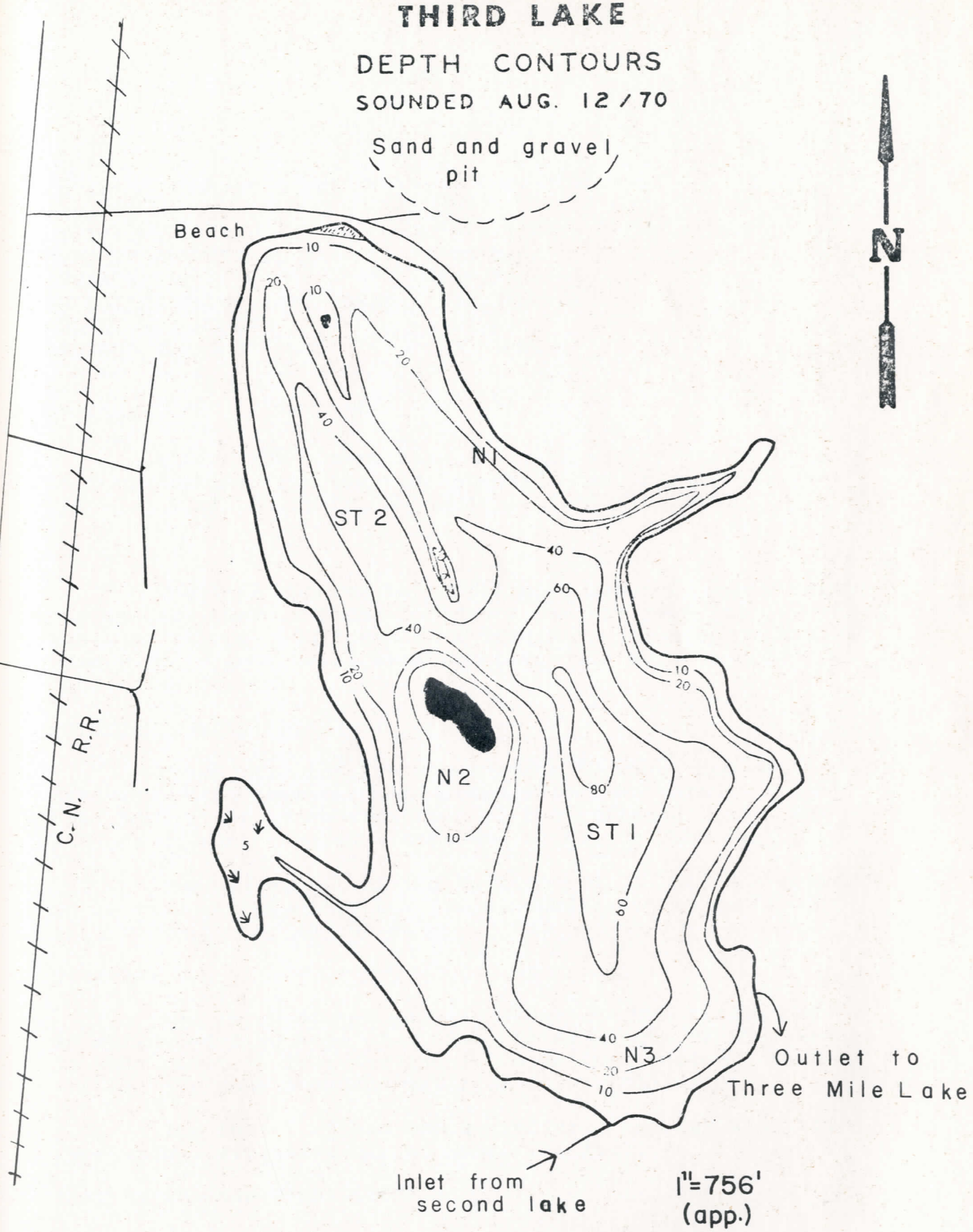
STATION 1 Oct. 25/71 Air Temp. 14°C

Depth (ft.)	Temp. (°C)	O_2 (ppm)	pH
0	14		
5	14		
10	13.5	11	7
15	13.5		
20	13		
25	13		
30	13		
35	13		
40	13		
45	11		
50	9	5	6
55	8.5		
60	8.5		

THIRD LAKE

DEPTH CONTOURS

SOUNDED AUG. 12/70



CONDUCTIVITY 51 PPM. AUG. 12/70.
TEMP. SURFACE 76° F. "

APPENDIX 28

Three Mile Lake

Surveyed June 17 & 18, 1971

LOCATION:	44°46'55"N; 63°37'35"W
SURFACE ELEVATION:	97 feet
SURFACE AREA:	49.2 acres
AREA LESS THAN 20 FT. DEEP:	37.2 acres
SHORE LINE LENGTH:	10,100
MAXIMUM DEPTH:	37 feet

ACCESS:

Almost the entire lake shore is easily travelled on foot by walking from the Old Cobequid Road or from the CNR tracks. Samll boats can be launched from the road.

USE:

The lake appears to supply some water to homes along the western shore. Local residents use the lake for swimming and some fishing and travellers frequently stop along the road to swim and picnic although there are no developed facilities for this.

PHYSICAL CHARACTERISTICS:

Three Mile Lake receives water flowing from Second Lake and Third Lake through a pond which was part of Three Mile Lake prior to construction of the railroad line. The lake discharges through a pond and stream to Fish Lake.

The gravel pit at the eastern end of the lake appears to be used infrequently but the exposed earth is contributing to siltation in the lake.

STREAMS:

The inlet stream passing under the CNR tracks had an estimated discharge of 8 cfs. Total length of the channel is only about 50 feet and has a course rock bottom. This may provide some spawning material for salmonids.

The outlet stream had a similar discharge and bottom type with a similar width of about ten feet.

LAKE WATER CHARACTERISTICS:

In June, the lake water was thermally stratified with temperature ranging between 19°C at the surface to

7.5°C at a depth of 33 feet. Dissolved oxygen concentration was near 9 ppm and pH 6.5 in all samples tested.

In August, conductivity of the surface water was 45 and total alkalinity was 13 ppm.

BIOLOGICAL STUDIES:

Gill nets were set for one night and white perch and common suckers were the only fish species capture Three small fish nests were observed in shallow water along the northern shore.

Smallmouth bass and on rare occasions, landlocked salmon are reportedly angled.

THREE MILE LAKE

Station #1 - June 18/71

Depth (ft.)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	19	6.5	10	10
5	18.5			
10	18			
15	15			
20	11.5	6.5	9	
25	8.5			
30	8			
33	7.5			

Station #2 - June 18/71

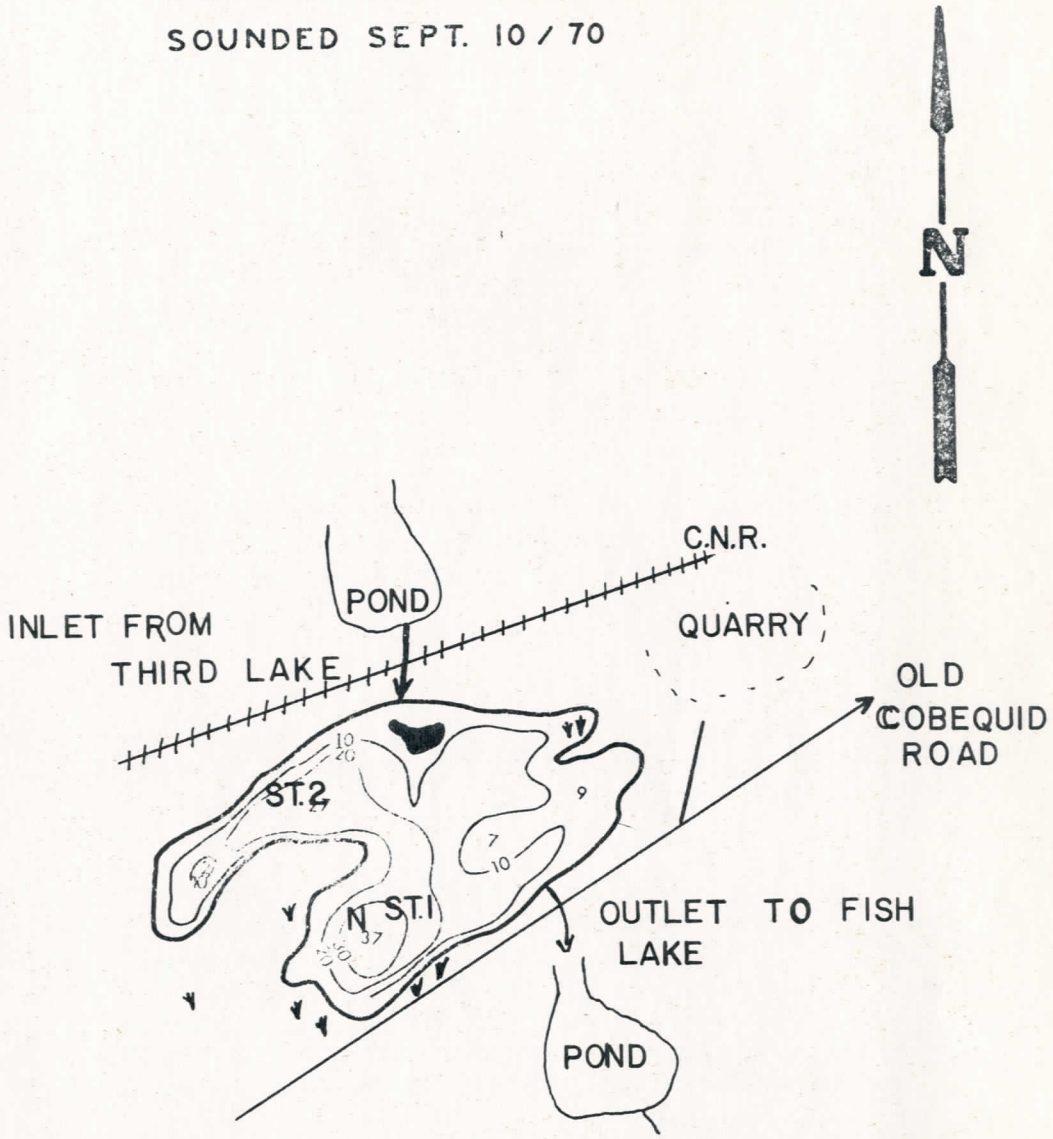
Depth (ft.)	Temp. (°C)	pH	O_2 (ppm)
0	19		
5	18.5	6.5	10
10	17		
15	14.5		
20	12		
23	10.5		

Gill Nets set between June 17 & 18: common suckers and white perch were the only species of fish taken.

THREE MILE LAKE

DEPTH CONTOURS

SOUNDED SEPT. 10 / 70



1" = 945'
(app.)

CONDUCTIVITY 62 P.P.M. SEPT. 10/70.
TEMP. SURFACE 65° F. "

APPENDIX 29

Webber Lake

Surveyed October 14 & 15, 1971

LOCATION:	44°46'25"N; 63°43'35"W
SURFACE ELEVATION:	230 feet (approximate)
SURFACE AREA:	96.5 acres
AREA LESS THAN 20 FEET DEEP:	59.5 acres
SHORE LINE LENGTH:	16,300 feet
MAXIMUM DEPTH:	55 feet

ACCESS:

Webber Lake is accessible only on foot by walking through bushland along the shore or by canoeing upstream from the Lucasville Road bridge which crosses the Sackville River.

USE:

The lake receives no regular use for any purpose although it could be used for swimming and fishing.

PHYSICAL CHARACTERISTICS:

Webber Lake is part of the Sackville River system and receives water from McCabe Lake which drains the following lakes and streams: Tomahawk L., Beaver L., Drain L., Little Springfield L., Lewis L., Horse Pond, Duck Pond, Yellow Lily L., Pentz L., Beaver L., Bottle L., Half-way L., Thompson Run and Culvert Brook. In addition to this, Webber Lake receives ground water from three additional tributaries.

The lake level was formerly maintained by a log dam on the outlet stream but this has been washed away causing a fringe of lake bottom up to 100 feet wide to be exposed.

STREAMS:

On October 15, the inlet from McCabe Lake had an extimated discharge of 100 cfs with a temperature of 17.5°C and pH6. The substrate was composed of coarse gravel and rubble with many areas suitable for salmonid spawning although there is no overhead cover and no pools in that area.

Stream #1 (see map) had an estimated discharge of 2 cfs with a temperature of 13.5°C and pH 6. Fish access to this stream appears poor because of a shallow flow over hard steep bottom near the stream mouth. One speckled trout

(6" long) was seen in a small pool near the lake shore but no fish were seen further upstream.

Stream #2 had an estimated discharge of 2 cfs, pH 6 and temperature of 14°C. The stream contains some vegetation and gravel areas with cover provided by logs in the stream. There are also a few small pools near the stream mouth. Log barriers in the stream may limit fish access during low water conditions.

Four speckled trout having total lengths near 15 inches were observed in pools near the mouth of this stream. Several more speckled trout, six inches or less in total length were observed further upstream. The large fish were undoubtedly entering the stream to spawn and the presence of smaller fish upstream demonstrated past success of spawning in this stream.

Stream #3 is actually formed by the junction of several smaller streams. Total estimated discharge at the lake shore was 10 cfs. The main stream branch had an average width of 15 ft. and depth of 8" with abundant spawning gravel, some pools, and shade provided by trees on the bank. Only one speckled trout, about four inches long was observed in this stream.

LAKE WATER CHARACTERISTICS:

The lake was not found to be thermally stratified in October although samples were not taken at the deepest point. No contour map was available on the day of the survey. Dissolved oxygen concentration was 9 ppm in the two samples tested and pH was 6.

In August, conductivity of the surface water was 22 and total alkalinity was 10 ppm. The chemical oxygen demand was 12.8 ppm, representing the second highest value for surface water during this study.

BIOLOGICAL STUDIES:

Webber Lake has not been stocked with hatchery produced fish within the past three years although some lakes further up the Sackville system have been. The Sackville River supported a population of Atlantic Salmon in the past but these have all but disappeared with only rare sightings since closure of the Bedford Hatchery in 1961.

After one overnight sample with gill nets in Webber Lake, 7 common suckers and one American eel were the only fish captured. Speckled trout were observed in tributary streams as previously mentioned.

WEBBER LAKE SAMPLE STATIONS

Station 1 October 15/71

Depth (ft.)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	17			
2 1/2	17			
5	16.5			
7 1/2	16.5			
10	16.5	6.0	9	15
12 1/2	16			
15	16			
17 1/2	15.5			
20	15.5			
22 1/2	15			

Station 2 October 15/71

Depth (ft.)	Temp. (°C)	pH	O_2 (ppm)	CO_2 (ppm)
0	16			
2 1/2	15.5			
5	15.5			
7 1/2	15.5			
10	15	6.0	9	-
12 1/2	15			
15	15			
17 1/2	15			
20	15			
22 1/2	15			

RESULTS FROM GILL NETTING:

3/4" 1 1/2" 2" gill nets were set on bottom in water from 10 to 20 feet deep near the inlet from McCabe Lake, between October 14 and 15.

COMMON SUCKERS (FL cm)

35 cm 30 cm 17.5 16.5 13.8 15.2 16

plus three more which had been partially eaten by eels.

ONE AMERICAN EEL

51 cm

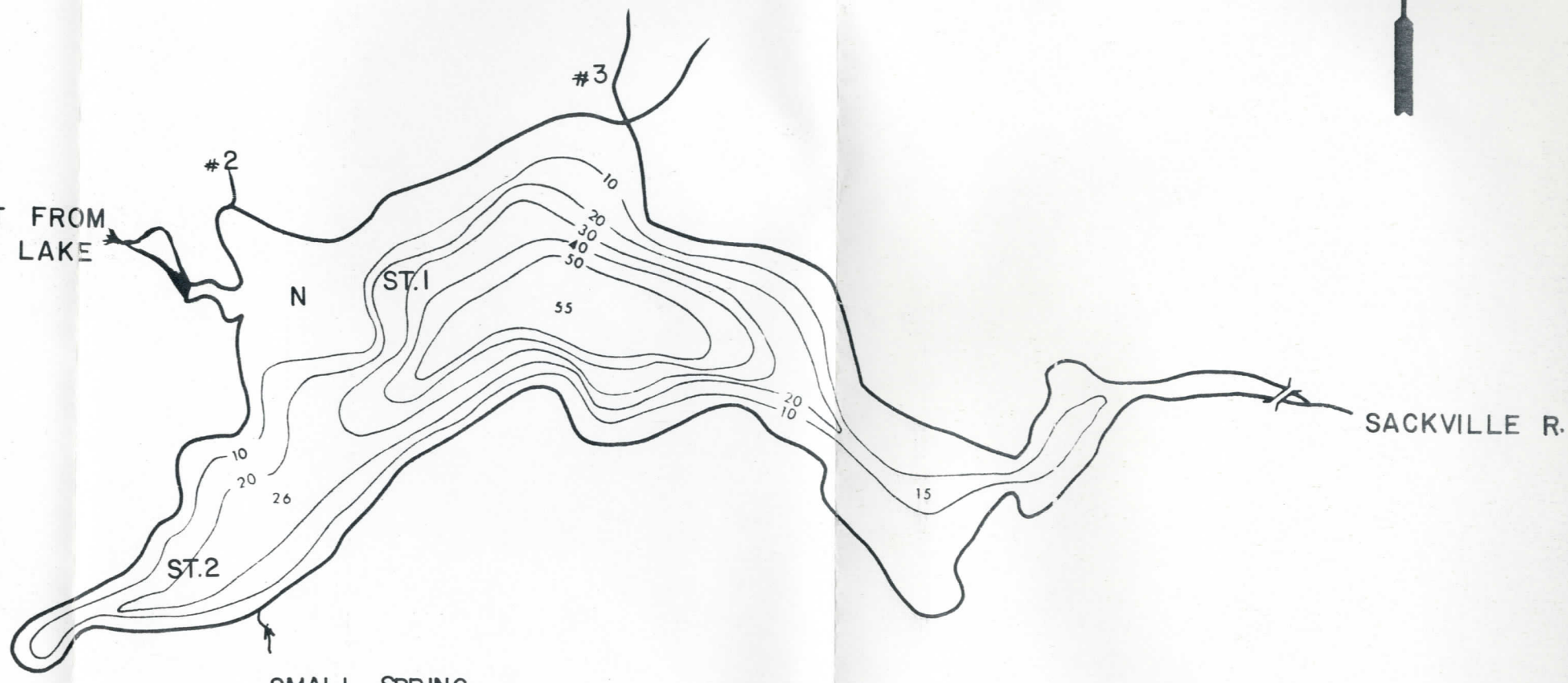
Three speckled trout 12 - 15" were seen at the mouth of the small stream entering near the inlet from McCabe Lake. Several smaller fish were seen farther upstream.

One small trout 6" were seen in a pool at the mouth of a small spring fed stream.

WEBBER LAKE

DEPTH CONTOURS

SOUNDED AUG. 17/70



1"=694'
(app.)

CONDUCTIVITY 40 PPM. AUG. 17/70.
TEMP. SURFACE 76° F. " .

APPENDIX 30

Lake William (Dartmouth)

Surveyed August 2, 3 & 4, 1971

LOCATION	:	44°46'05"N, 63°35'10"W.
SURFACE ELEVATION	:	64 feet
SURFACE AREA	:	800 acres
AREA LESS THAN 20 FEET DEEP	:	208 acres
SHORE LINE LENGTH	:	47,800 feet
MAXIMUM DEPTH	:	93 feet

ACCESS:

The west shore of the lake is paralleled by the CNR tracks, but otherwise undeveloped and accessible only on foot. Much of the east shore is developed for homes where there is sufficient land between the water and the Waverley Road. The lake can be reached directly from the road in many locations but there are few areas to park cars. The only public boat access is through the Provincial Lands and Forests property situated on this shore.

USE:

Lake William is used as a landing strip for amphibious aircraft belonging to Lands and Forests and private owners.

The north end of the lake is used for canoeing and swimming, organized by an aquatic club and the remainder of the lake is used primarily by local residents for boating, swimming and some fishing.

PHYSICAL CHARACTERISTICS:

Lake William receives water from several small streams but its main tributaries flow from Fish Lake and from the north end of Lake Charles. The outlet is from the north end of the lake and flows to Lake Thomas.

STREAMS:

The tributary streams were examined only briefly and most were found to have discharges of less than 2 cfs,

providing little or no spawning and rearing area for salmonids.

The inlet from Fish Lake flows through a pond between the lakes and the discharge under the CNR tracks was estimated at 12-15 cfs. This channel is suitable for trout spawning for a distance of about 25 feet from the shore of Lake William.

Marshall Brook, flowing from an area of blueberry fields, had a water temperature of 24°C and pH 5.5. This stream appears unsuitable for trout spawning or rearing.

The inlet from Lake Charles forms part of the abandoned Shubenacadie canal system. Workers had obviously been clearing refuse and rebuilding the banks of the channel during the summer, but much of the bottom is heavily silted as a result of road construction between Lake Charles and Lake William. This stream contains suitable trout spawning material but resident habitat is poor and water temperature is dependent on the surface temperature in Lake Charles.

The outlet to Lake Thomas forms a channel which may provide some spawning habitat for salmon and trout. Schools of fish believed to be gaspereau were observed in the channel earlier in the year.

LAKE WATER CHARACTERISTICS:

Lake William was found to be thermally stratified in August with temperatures between 25.5°C at the surface and 10°C below the thermocline. Dissolved oxygen concentration was 8 ppm or above in all locations and depths sampled and pH was 7.5 at the surface and 6 in the hypolimnion.

In July, conductivity of the surface water was 28 and total alkalinity 9 ppm. This water is not highly productive but fish distribution would be limited only by temperature.

BIOLOGICAL STUDIES:

During the past 3 years, Lake William received 2,100 hatchery produced yearling speckled trout in 1969, 2,365 in 1970 and 2,000 in 1971. There is no detailed information available concerning the return of these fish to the angler, but staff in the Lands and Forests office report that the fish schooled in the planting area for approximately

two weeks and during that time provided a fishery for anglers who knew of the planting.

Two overnight samples with gill nets caught the following fish:

Species	Number	Fork Length (cm)		
		Max.	Min.	Mean
Smallmouth bass	25	31.7	19	22.2
Common suckers	22	36	24	31.9
White perch	14	27.5	16	21.5

Gill netting was discontinued because of high wind conditions on the lake.

STATION 1 August 2/71

DEPTH (ft)	TEMP (°C)	pH	O_2 ppm	CO_2 ppm
0	25.5			
2 1/2	25.5			
5	25.5	7.5	9	5
7 1/2	25			
10	25			
12 1/2	24.5			
15	23.5			
17 1/2	23			
20	21.5			
22 1/2	19			
25	17.5	6.5	9	10
27 1/2	16.5			
30	15			
32 1/2	14			
35	13			
37 1/2	12			
40	11			
42 1/2	11			
45	10.5			
47 1/2	10.5			
50	10	6	8	10
52 1/2	10			
55	10			
57 1/2	10			

STATION 2 August 2/71

DEPTH (ft)	TEMP (°C)	pH	O_2 ppm	CO_2 ppm
0	26			
2 1/2	25.5			
5	25.5	7	9	5
7 1/2	25.5			
10	25			
12 1/2	24.5			
15	24			
17 1/2	23			
20	21.5			
22 1/2	19			
25	17.5			
27 1/2	16			
30	15	6.5	8	10
32 1/2	14			
35	13			
37 1/2	12			
40	11.5			
42 1/2	11			
45	10.5			
47 1/2	10.5			
50	10	6.5	8	10
52 1/2	10			
55	10			
57 1/2	10			

STATION 3 August 2/71

DEPTH (ft)	TEMP (°C)	pH	O_2 ppm	CO_2 ppm
0	26			
2 1/2	25.5			
5	25.5	7	9	5
7 1/2	25			
10	24.5			
12 1/2	24.5			
15	24			
17 1/2	21.5			
20	20.5			
22 1/2	18.5			
25	17.5			
27 1/2	16			
30	14.5	7	8	10
32 1/2	14			
35	13			
37 1/2	13			

APPENDIX 31

William's Lake
Halifax County

Surveyed September 9 & 10, 1971; October 6 & 7, 1971

LOCATION	:	44°37'15"N; 63°36'00"W
SURFACE ELEVATION	:	62 feet
SURFACE AREA	:	97.9 acres
AREA LESS THAN 20 FEET DEEP	:	59.7 acres
SHORE LINE LENGTH	:	24,700 feet
MAXIMUM DEPTH	:	65 feet

ACCESS:

Canoes can be easily carried to William's Lake from several roads, but there is no visible public boat launch. Most of the undeveloped shore is sufficiently open to allow convenient access on foot.

USE:

The lake is used for swimming, boating and a limited amount of fishing.

PHYSICAL CHARACTERISTICS:

William's Lake is the lower lake in a two lake system (William's and Colbart).

Approximately 1/4 of the lake shore, primarily on the north-west side is presently developed as residential area. Many of these private properties extend to the water, restricting public access and use in those areas.

The west end of the lake is shallow with dense bottom vegetation and some areas silted as a result of construction. The east end of the lake is deep with rock and silt or muck bottom. A small concrete and stone dam on the outlet stream helps to maintain the lake level. The south shore is entirely undeveloped.

STREAMS:

Only one inlet stream, from Colbart Lake, was found at the time of the survey. This stream had an estimated discharge of 1-2 cfs, temperature 18°C and pH 5.5. The stream flows underground through large boulders for almost its entire course and is not accessible to fish except perhaps during peak discharge. There appeared to be no gravel suitable for trout spawning at the stream mouth.

The outlet stream had a discharge of about 2 cfs and pH 7. Most of the water flows over the small dam but there is also a small by-pass stream. This stream may limit but not necessarily prevent fish passage and may provide a small spawning area for trout.

LAKE WATER CHARACTERISTICS:

In September, William's Lake was found to be thermally stratified with temperatures ranging from 22°C at the surface to 6.5°C below the thermocline. Dissolved oxygen levels were high enough to support fish throughout the entire temperature range. pH varied between 6 and 7.

In August, conductivity of the surface water was 260 and total alkalinity 18 ppm. Conductivity at the 20 meter depth was found to be 600 ppm with chloride levels of 229.5 ppm and sodium 146 ppm.

William's Lake appears to have a higher production potential than most lakes in the area.

BIOLOGICAL STUDIES:

In two nights of gill netting, one in September and one in October, 12 speckled trout, one American eel and approximately 40 eastern banded killifish were captured. There was no evidence of perch, bass or suckers in the lake. All trout appeared to be in excellent condition and were between 24 and 38 cm fork length. These fish should have pleased any angler.

One housing developer claims that the lake is annually stocked with trout, but there is no record of trout distributions to William's Lake from either Federal or Provincial sources in the past 3 years. Two residents interviewed while swimming, stated that there are virtually no fish in the lake.

STATION 1 September 9, 1971

Surface Sample

Temp.	20°C
O_2	7 ppm
CO_2	10 ppm
pH	6.5

STATION 2 September 9, 1971

DEPTH (ft)	TEMP (°C)	pH	O_2 ppm	CO_2 ppm
0	22			
2 1/2	22	7	8	10
5	21			
6	21			

STATION 3 September 9, 1971

DEPTH (ft)	TEMP (°C)	pH	O_2 ppm	CO_2 ppm
0	22			
2 1/2	21.5			
5	21	7	8	10
7 1/2	21			
10	21			
12 1/2	21			
15	20.5			
17 1/2	20			
20	20			
22 1/2	20			
25	19.5	7	7	5
27 1/2	19			
30	18			
32 1/2	12			
35	11			
37 1/2	10			
40	9			
42 1/2	7.5			
45	7	6	2	15
47 1/2	7			
50	6.5			
52 1/2	6.5			
55	6.5			
57 1/2	6.5			

STATION 4 September 9, 1971

DEPTH (ft)	TEMP (°C)	pH	O_2 ppm	CO_2 ppm
0	22			
2 1/2	21.5			
5	21.5			
7 1/2	21			
10	21	7	9	10
12 1/2	21			
15	21			
17 1/2	20.5			
20	20			
22 1/2	20			
25	19.5			
27 1/2	19			
30	17	7	8	10
32 1/2	12.5			
35	11	6	6	10
37 1/2	9			
40	8	6	5	10
42 1/2	7			
45	6.5			
47 1/2	6			
50	6			
52 1/2	6			

Inlet from Colbart Lake

September 9, 1971

pH 5.5
Temp. 18°C
Flow 1-2 cfs

STATION 3 October 6, 1971

DEPTH (ft)	TEMP (°C)	pH	O_2 ppm	CO_2 ppm
0	16			
2 1/2	16			
5	16			
7 1/2	16			
10	16	6.5	10	
12 1/2	16			
15	16			
17 1/2	16			
20	16			
22 1/2	15.5			
25	15.5			
27 1/2	15.5			
30	15.5	6.5	9	
32 1/2	15			
35	15			
37 1/2	14.5			
40	10			
42 1/2	8			
45	8	6	4-5	
47 1/2	7.5			

Results from Gill Netting in William's Lake

Night 1.

September 9 & 10 - Mesh sizes 1/2" 3/4" 1 1/2" 2" 2 3/8" . All nets set near bottom in 15-25 feet of water.

Fish Species Taken:

One speckled trout of about 8" and one of about 10" were the only fish caught and both had been badly damaged by eels.

Night 2.

October 6 & 7 - Mesh sizes 1/2" 3/4" 1 1/2" 2" 2 3/8". All nets were set near the surface with maximum depth of 12 feet.

Fish Species Taken:

Approximately 40 Eastern Banded Killifish of about 10 cm in size were taken overnight.

SPECKLED TROUT

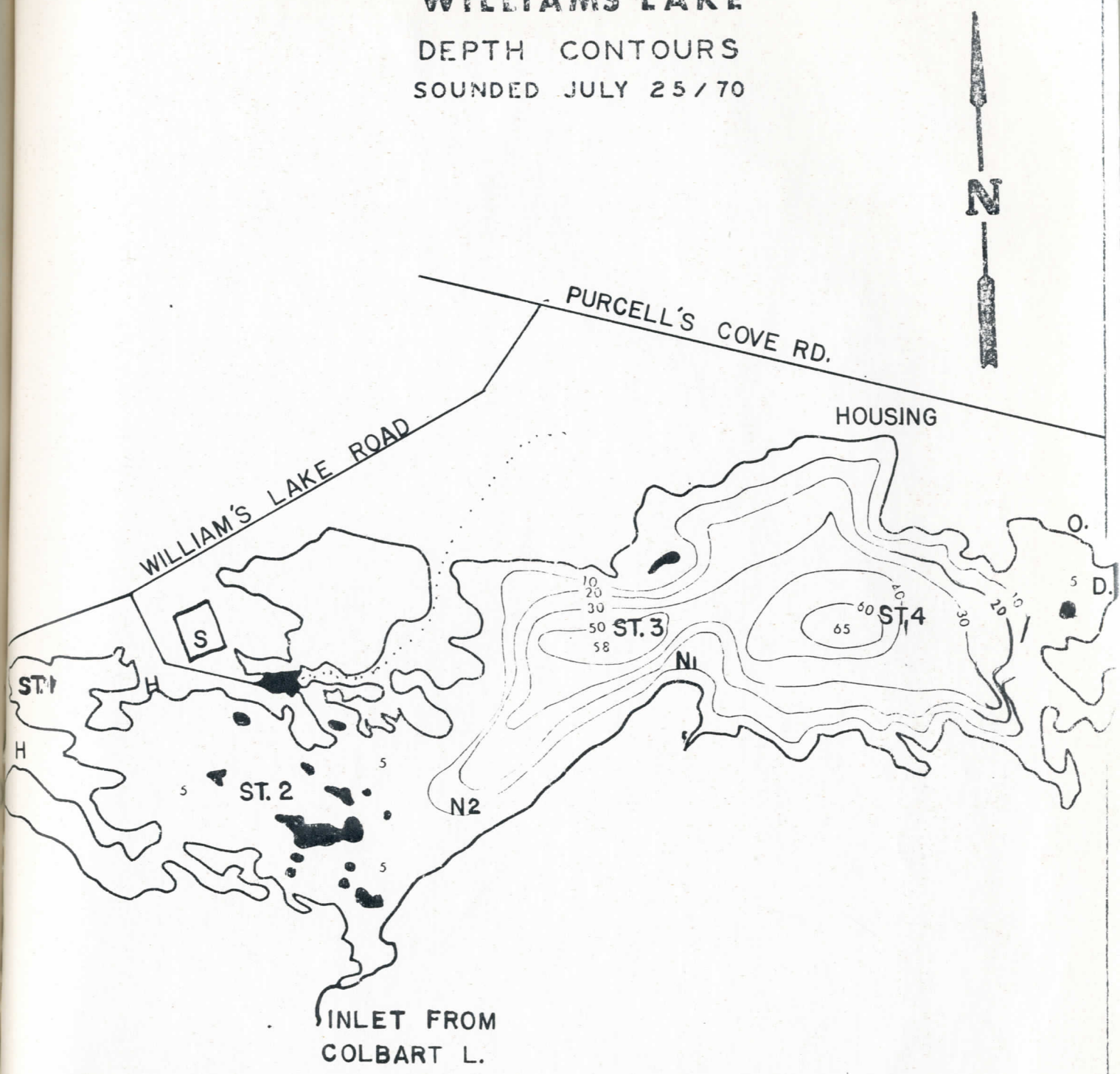
TL	FL	SEX	WT	AGE
30.4 cm	29.3	F	275 gm	3+
29.0	27.4	M	260	3+
26.5	26	M	200	3+
39.4	37.8	M	650	4+
30.3	29.3	F	300	3+
31.5	30.2	M	325	4+
24.6	23.5	F	155	2+
25.0	24.2	F	160	2+
29.2	27.7	M	250	2+

One additional trout had been badly molested by an American eel which had become tangled in the net. There was also a great deal of slime on the nets caused by eels passing through it.

WILLIAMS LAKE

DEPTH CONTOURS

SOUNDED JULY 25/70



D DAM
H HOUSING
S SCHOOL
O OUTLET

1"=627'
(app.)

CONDUCTIVITY 193 PPM. JULY 25/70.
TEMP. SURFACE 74° F. "