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STATE OF ALASKA

Jay S. Hammond, Governor

Annual Performance Report for

COLLECTION AND INTERPRETATION OF INFORMATION NEEDED TO SOLVE SPECIAL MANAGEMENT PROBLEMS

by

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TABLE OF CONTENTS

Page

Job No. G-I-S Collection and Interpretation of Information Needed to Solve Special Management Problems
By: Artwin E. Schmidt

Abstract 50

Section I 52
Objective 52
Background 52
Recommendations 53
Techniques Used 53

Section II 53
Objective 53
Background 53
Recommendations 53
Techniques Used 55
Findings 55
Brood Source 55
Port Walter Trout 58
Borodino Lake 61
Brentwood Lakes 61
Davidof Lake 61
Deer Lake 61

TABLE OF CONTENTS (Cont'd.)

Page

Elfendahl Lake 62
Fawn Lake 62
Goulding Lake 62
Larry Lake 63
Osprey Lake 63
Rezanof Lake 63
Upper Rostislaf and Lower Rostislaf Lakes 63
Round Lake 64
Sashin Lake 64
Summary 65

Section III 65
Objective 65
Background 65
Recommendations 65
Techniques Used 65
Findings 67
Morphometry 67
Physical and Chemical Considerations 67
Plankton 67
Fish 88

Literature Cited 107
Backnotes 108

LIST OF FIGURES

Figure 1. Index map of Inventory and Cataloging operations, southeast Alaska, 1980 51
Figure 2. Location of eight small lakes studied on Prince of Wales Island, 1980 66
Figure 3. Bathymetric map of Balls Lake 68
Figure 4. Bathymetric map of Holgrem Lake 69
Figure 5. Bathymetric map of Km 49 Lake 70
Figure 6. Bathymetric map of Loon Lake 71
Figure 7. Bathymetric map of Loop Lake 72
Figure 8. Bathymetric map of Naukati Lake 73
Figure 9. Bathymetric map of Rabbit Ear Lake 74
Figure 10. Map showing location of sampling stations, Balls Lake, 1980 75
Figure 11. Map showing location of sampling stations, Holgrem Lake, 1980 76
Figure 12. Map showing location of sampling stations, Km 49 Lake, 1980 77
Figure 13. Map showing location of sampling stations, Loon Lake, 1980 . 78
Figure 14. Map showing location of sampling stations, Loop Lake, 1980 . 79
Figure 15. Map showing location of sampling stations, Naukati Lake, 1980 80
Figure 16. Map showing location of sampling stations, Landlocked and Pass Lakes, 1980 81

TABLE OF CONTENTS (Cont'd.)

Page

Figure 17. Map showing location of sampling stations, Rabbit Ear Lake, 1980 82
Figure 18. View northwest across Holgrem Lake 93
Figure 19. View of Landlocked Lake from road access 96
Figure 20. View of Loon Lake from access road 98
Figure 21. Access to Loop Lake 99
Figure 22. Loop Lake outlet slough and beaver dam 100
Figure 23. View of inlet and outlet of Naukati Lake 101
Figure 24. View of inlet to Naukati Lake from road bridge 101

LIST OF TABLES

Table 1. List of common and scientific names 54
Table 2. Thermal and conductivity data from lakes studied, Prince of Wales Island, 1980 83
Table 3. Water quality analysis from lakes studied, Prince of Wales Island, 1980 85
Table 4. Plankton composition, density, and weight from Prince of Wales Island lakes as collected with No. 153 Nitex plankton nets, 1980 86
Table 5. Summary of fish sampling effort and catch data from lakes studied, Prince of Wales Island, 1980 89
Table 6. Condition factors of cutthroat trout and Dolly Varden from lakes studied, 1980 90
Table 7. Length, weight, and age of cutthroat and rainbow trout from Balls Lake, 1980 91
Table 8. Length, weight, and age of cutthroat trout from Curve Lake, 1980 93
Table 9. Length, weight, and age of cutthroat trout from Holgrem Lake, 1980 94
Table 10. Length, weight, and age of cutthroat trout from Km 49 Lake, 1980 96
Table 11. Length, weight, and age of cutthroat trout from Loon Lake, 1980 99
Table 12. Length, weight, and age of cutthroat trout and Dolly Varden from Loop Lake, 1980 100
Table 13. Length, weight, and age of cutthroat trout and Dolly Varden from Naukati Lake, 1980 103
Table 14. Length, weight, and age of cutthroat trout and Dolly Varden from Pass Lake, 1980 104
Table 15. Length, weight, and age of cutthroat trout and Dolly Varden from Rabbit Ear Lake, 1980 105

RESEARCH PROJECT SEGMENT

State: ALASKA Name: Sport Fish Investigations of Alaska

Project No.: F-9-13

Study No.: G-I Study Title: INVENTORY AND CATALOGING

Job No.: G-I-S Job Title: Collection and Interpretation of Information Needed to Solve Special Management Problems

Cooperator: Artwin E. Schmidt

Period Covered: July 1, 1980 to June 30, 1981

ABSTRACT

Due to the specialized nature of the investigations being carried on under Job No. G-I-S, a separate section is devoted to each of the job objectives. An index map of 1980 operations is shown in Figure 1.

Section I

Personnel from the Alaska Department of Fish and Game (ADF&G) and other State and Federal agencies were contacted for survey information on individual lakes, streams, and selected saltwater areas of southeast Alaska.

Information obtained was filed in the master water file in the Juneau regional office and the duplicate file in the Sitka district office.

Section II

A review of rainbow trout, *Salmo gairdneri* Richardson, introductions to Baranof and Chichagof Island lakes, southeast Alaska, was conducted in an attempt to locate a brood source for potential stock development. The most likely stock located to date is that deriving from Sashin Lake, Baranof Island. As old records show, this stock was successfully introduced to several other lakes in 1938.

Four lakes of the Sashin Lake stocking have been tested for disease. Of these, Blue, Fawn, Jetty, and Sashin lakes still have pure Sashin stock; i.e., no other plantings have been made to these systems. Other lakes with pure Sashin stock which have not been disease tested include Davidof Lake, the Rezanof Lake chain, and Round Lake.

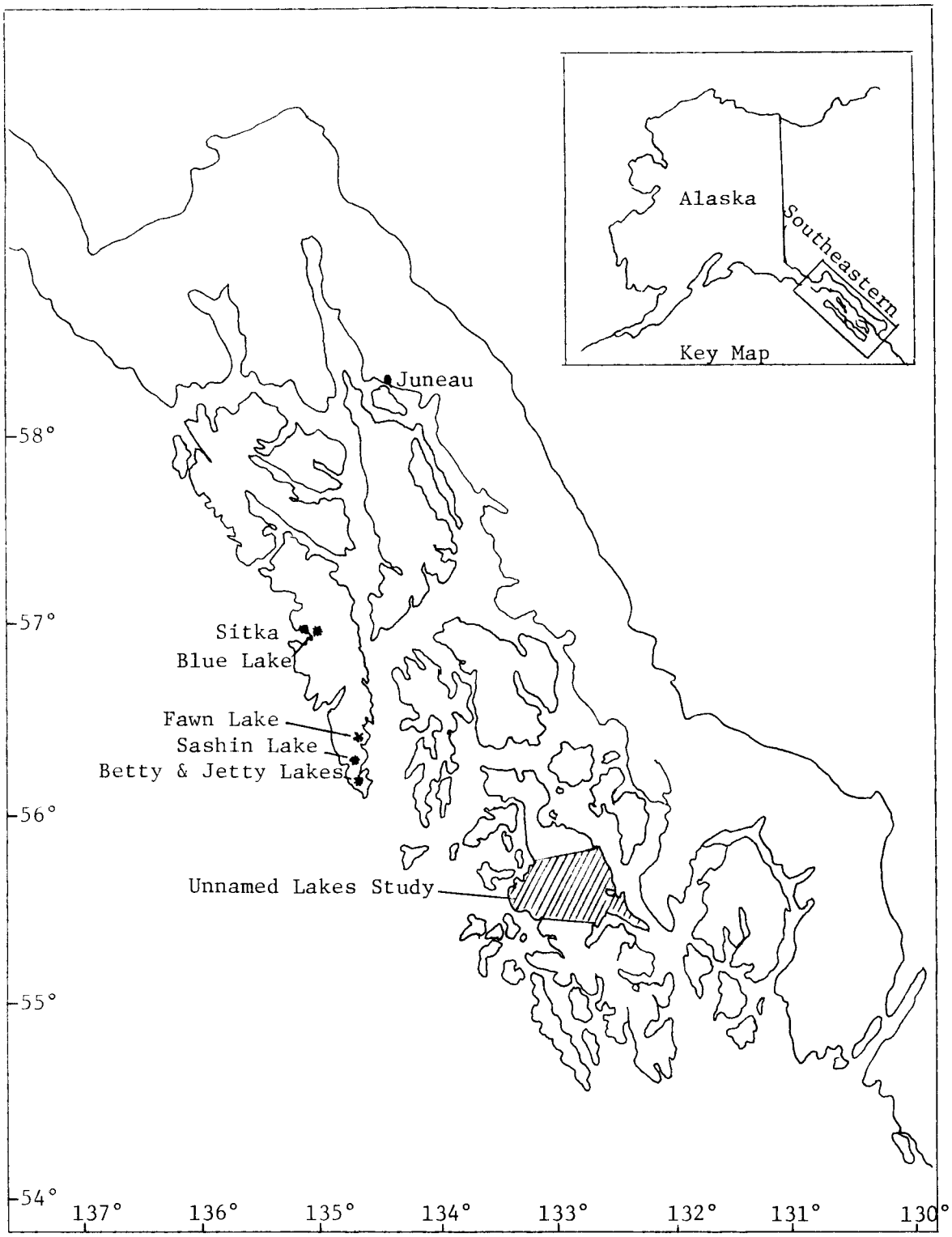

Fig. 1. Index map of Inventory and Cataloging operations, southeast Alaska, 1980.

If a brood stock is to be developed for this area, further investigation of these lakes should be done.

All of the above listed lakes could be considered as brood donor sites. The Sashin stock is native to Baranof Island and appears to be disease free.

Section III

Eight lakes on the Prince of Wales road system were investigated to determine fish species present and age and growth, size and depth of lakes, and water quality of each lake system. Less extensive investigations were conducted on two additional lakes.

All lakes studied are small but are open to anadromous migrations. Some of the less accessible systems have more numerous and larger cutthroat trout, Salmo clarki Richardson, available. This may be a function of lower fishing pressure.

Preliminary limnological analyses indicate several of these systems may be quite productive when compared to other southeast Alaska lakes. This is evidenced by near neutral pH, high specific conductance, and shallow depth.

SECTION I

OBJECTIVE

1. To continue collection, analysis and organization of all available and new information on sport fish resources of individual lakes, streams and saltwater areas in southeast Alaska.

BACKGROUND

The Inventory and Catalog File was created to provide a library for the collection of reports of management actions, research data, development plans, and other information of interest for each aquatic system in southeast Alaska. This file is maintained in duplicate in Juneau and Sitka Alaska Department of Fish and Game (ADF&G) offices.

The Inventory and Catalog filing system was revised in 1980 to increase ease of information retrieval. Both the Juneau and Sitka files were organized numerically to match the anadromous stream numbers.

Information on lakes was more difficult to file in as simple a manner. The first five digits of the stream numbers were used as filing units. All lakes lying in a statistical subarea (i.e., 113-81) are filed in a numbered unit. Each lake in a given unit has its own file folder and is identified by proper name or latitude-longitude coordinates.

RECOMMENDATIONS

1. Collection and analysis of all available information on sport fish resources in southeast Alaska should be continued. All information should be filed in duplicate files in Juneau and Sitka offices.

2. Field office files in Ketchikan and Petersburg should be updated and revised to the new system established this year.

TECHNIQUES USED

Personnel from ADF&G and other State and Federal agencies were contacted for survey information on individual lakes, streams, and selected saltwater areas of southeast Alaska.

New information obtained was filed in the master water file in the Juneau regional office and the duplicate file in the Sitka district office. Files for the Ketchikan and Petersburg offices were not updated due to lack of time and money.

SECTION II

OBJECTIVE

2. To begin evaluation of rainbow trout populations for potential brood stock development.

BACKGROUND

Rainbow trout have been introduced into several lakes in southeast Alaska beginning in 1926. The early introductions were derived from stock from streams at Little Port Walter. In recent years brood stock from Ennis, Washington; Winthrop, Washington; and Williamette, Oregon, have been used. At this time we have no resident southeast Alaska brood stock and policy dictates no further introduction of nonresident stocks. If any further rainbow trout stocking is to be done, a brood stock must be found and developed. It would be best to select a stock which is genetically adapted to the area where it will be used.

A listing of common and scientific names of fish species referred to is included in Table 1.

RECOMMENDATIONS

The Sashin Lake rainbow trout stock is recommended as a candidate for brood stock development. This stock is resident to Baranof Island, and the four lakes tested are disease free. Further investigation, i.e., population size and egg take sites, need to be done before final selection of brood source.

Table 1. List of common and scientific names.

Common Name	Scientific Name and Author	Abbreviation
Rainbow Trout	*Salmo gairdneri* Richardson	RT
Dolly Varden	*Salvelinus malma* (Walbaum)	DV
Prickly Sculpin	*Cottus asper* Richardson	PSc
Cutthroat Trout	*Salmo clarki* Richardson	CT
Chinook Salmon	*Oncorhynchus tshawytscha* (Walbaum)	KS
Rainbow Trout	*Salmo gairdneri* Richardson	RT
Coho Salmon	*Oncorhynchus kisutch* (Walbaum)	SS
Steelhead	*Salmo gairdneri* Richardson	SH
Sockeye Salmon	*Oncorhynchus nerka* (Walbaum)	RS
Sculpin	Cottidae	Sc

TECHNIQUES USED

Information available on rainbow trout populations on Baranof and Chichagof Islands was analyzed in an attempt to identify a suitable brood source. Information evaluated included source of brood, age and growth relationships, disease history, size of population, and proximity to desired planting site.

FINDINGS

Brood Source

A review of all rainbow trout stocking records for Baranof and Chichagof Islands (Schmidt, 1978) revealed the use of four brood sources for all plantings done to date. The most successful of these four appeared to be the stock derived from Sashin Lake on south Baranof Island. The other three brood sources were Ennis, Washington; Winthrop, Washington; and Williamette, Oregon.

Non-Alaskan Stocks:

Only four known lakes have been planted with three nonresident stocks in the Sitka Management Area. Each of the four lakes is discussed briefly. Other lakes have been planted in recent years but planting records are incomplete. Stock of unknown origin was planted in Avoss, 1957; Deer, 1967; Pass, 1967; and Suloia, 1965.

Biorka Lake, actually a small pond, has been repeatedly stocked with Ennis, Washington, fish on a put-and-take basis. Lack of spawning area and a restricted population eliminate this site as a brood source.

Blue Lake received a supplementary plant of fish from Williamette, Oregon, fish. These fish were exposed to various diseases in the Alaska hatcheries they came through. The main population of rainbow trout in Blue Lake is probably from Sashin Lake and will be discussed later.

Lake Dianna was planted with Winthrop, Washington, stock in 1969. No test netting has been done since.

Swan Lake, Sitka, has been planted with all three non-Alaskan stocks. This is a put-and-take fishery and population is limited.

Sashin Lake Stock:

The most successful rainbow trout introductions on Baranof Island are those which were done by the U.S. Forest Service (USFS) in 1938-1939. These fish came from Sashin Lake. A chronological accounting of this operation follows.

Records indicate that the Sashin Lake rainbow trout originally came from the streams at Little Port Walter (Anon, 1939).

IN 1934 THE stream and lake survey parties of the U.S. Bureau of Fisheries working out of the biological field station at Little Port Walter, Alaska, made an interesting and important discovery in Sashin Lake on Baranof Island. During the course of the lake survey an abundant trout life was found existing in this large lake which is totally isolated by many high water falls from the trout and salmon runs that enter the lower tributaries of the watershed. Information obtained from people who had worked in the cannery at Little Port Walter revealed that in 1926 a number of the cannery employes collected small trout from the streams at Little Port Walter and carried them overland in cans to stock the lake. They inferred that up to that time Sashin Lake had been barren of any fish life and that the sole purpose of the undertaking was to establish a recreational fishery in the near vicinity. Upon further investigation it was definitely determined that only one species of trout was present in the lake; this being the very desirable rainbow trout (Salmo gairdnerii)[sic]. All the lakes in the near vicinity which appear to possess similar fundamental characteristics were found barren of any fish life.

Facts concerning the presence of this large population of rainbow trout in Sashin Lake were turned over to the Forest Service, which has direct jurisdiction over the area. With the ever increasing number of sport fishermen in Alaska, more requests are pressed for the stocking of barren lakes and streams in all sections of the territory. Methods for handling and transporting rainbow trout stock from Sashin Lake to other watersheds were discussed and it was deemed advisable and the least expensive to attempt distribution by aeroplane.

On July 22, 1938, Mr. W. A. Chipperfield, directing the trout planting activities for the Forest Service, and Mr. S. J. Hutchinson, a biologist for the Bureau of Fisheries, undertook the first transplanting of trout with the aid of a plane. One thousand large rainbow trout from 8 to 16 inches long, and capable of maintaining themselves and spawning the first season after planting, had previously been selected and held in a confined area of the lake. Mr. Hutchinson studied the conditions to which the trout were subject and their reactions. It was evident that the survival was inversely proportional to the size of the fish and the number per can, and that far better results are forthcoming when each container carries only a few trout. From these observations only 15 trout, averaging 11 inches in length, and 8 gallons of water were placed in each can.

On the first trip out from Little Port Walter the plane carried six milk cans, 90 fish in all, the pilot and Mr. Hutchinson, who operated an automobile tire pump which forced air into each can to help maintain the oxygen supply in a limited water capacity. Immediately after taking off in the plane it was found that the

trout became plane-sick, perhaps because of the change in altitude and undue vibrations. This sickness lasts for only a short period, after which the fish right themselves and become accustomed to the new environment. Temperature readings were taken at Sashin Lake (52°) during the flight (50.5°) and at the point of liberation (47°) thus indicating no extreme temperature changes were encountered during the whole procedure. This was the only lake planted that day due to the time consumed in preparing the first lot for shipment and the scientific checking of the experiment. The trip took 45 minutes by air to reach Blue Lake, Alaska, where the first consignment of adult trout were released under very satisfactory conditions.

With this experimental setup aboard the plane and favorable results from the first planting, word was radioed ahead to Juneau that a small number of trout would be flown that evening to Juneau and transferred to the commercial plane for a continued trip to Fairbanks, Alaska. Five of the original number of trout were still alive when the plane reached Fairbanks, thus indicating that long distance transplantings by plane are not impossible.

Mr. Chipperfield and the plane furnished by the Forest Service returned to Sashin Lake on July 24, and flew out a number of plantings to Deer Lake, Upper and Lower Brentwood Lakes, Davidof Lake, and Rezanof Lake. These plantings mark the first step toward a concentrated effort of trout rehabilitation in Southeastern Alaska and the development of new watersheds and areas which in the past have been only barren wastes of water.[1]

The next planting of rainbow trout done with Sashin Lake rainbow was in July 1938. W. A. Chipperfield, District Ranger-Tongass, recorded the following information in a "memo for files" July 30, 1938.

Reference is made to Memo for Files of July 12.

On July 22, 24 and 25 the following lakes were stocked with rainbow trout from Sashen [sic] Lake:

Lake Osprey	50	trout	2 cans	Baranof Island
Upper unnamed lake at Port Armstrong	50	"	2 "	" "
Lake Borodina	50	"	2 "	" "
Upper Lake Rostislaf	50	"	2 "	" "
Fawn Lake	50	"	2 "	" "
Davidof Lake	50	"	2 "	" "
Rezanof Lake	50	"	2 "	" "
Deer Lake	60	"	2 "	" "
Blue Lake	60	"	6 "	" "
Upper Lake Goulding	30	"	5 "	Chichagof Island
Elfendahl Lake	29	"	4 "	" "
Fairbanks	11	"	4 "	

> Considerable difficulty was experienced the first day of transplanting due to the fact that the airplane could not take off Sashen [sic] Lake with more than two cans and the trout were ferried in small amounts to Little Port Walter where they were reshipped. The water temperature at Little Port Walter was approximately 60°F which proved too warm to carry the fish for any distance without trouble from suffocation.
>
> The total cost for plane hire for this job was around $600.00. However, approximately $200.00 of this amount was directly changeable to the stocking of Blue Lake which was the first lake stocked and before the plans were thoroughly organized.
>
> The fish planted averaged from 11" to 13" but ranged in size 8" to 20".
>
> During this work 1100 fish were caught, 540 fish transplanted, 147 died in transit and 413 of the smaller fish caught escaped through 3/4" mesh netting used on one of the holding ponds.[2]

On August 22, 1938, Mr. Russel at Little Port Walter reported additional rainbow trout plants in a memo to W. A. Chipperfield, District Ranger.

> I have planted 35 trout in the lake that we built the Shelter Cabin on and 40 in a lake across The Channel from New Port Walter it [sic] the lake that the local people call Island lake.[3]

On August 30, 1938, W. A. Chipperfield recorded the following information in a memo to the Regional Forester.

> On August 24 eighty medium to large size cutthroat trout were caught at the head of the lower lake at Goulding Chain and transplanted to the second lake of the chain. This work was done by Chipperfield, Judge and Sarvela.
>
> On August 22, Mr. R. B. Russel, of Camp A-30 at Little Port Walter, reported that he transplanted eighty-five Rainbow trout from Sashin Lake to the small lake located on the north fork of the Sashin Creek Lake drainage. Also forty Rainbow trout were put in one of the small lakes opposite the new Port Walter Cannery.[4]

The next major development concerning the Sashin Lake rainbow trout stock was development of an eyeing station at Port Walter. The following notes were recorded by B. Frank Heintzleman, Regional Forester, on March 10, 1938.

PORT WALTER TROUT

Notes on Conversation with Dr. Davidson:

> (1) Sam Hutchinson who left here for Port Walter last week, on the "Crane", will direct work on trout eying. CCC to supply labor under a capable leader.

(2) Eying station to be built near the residence of the Bureau of Fisheries plant at Port Walter (not up at the lake where the fish are to be caught). The present domestic water supply can be used for the eying troughs (10 gals. per standard trough per minute) but may have to be somewhat enlarged or at least the present small dam heightened. This dam is on a side stream, not the main creek. To give assurance that the water supply for the troughs will not fail, a Forest Service fire pump should be installed as a standby.

(3) The Bureau has two troughs now at Port Walter that can be used for the eying operations. They can be set directly on the ground, if necessary to improve the gravity flow of the water for them. The CCC should build a rough shelter for the troughs. The present F. S. hatchery baskets from Yes Bay can be used. Will need about 2 dozen. Each trough is about 14' long and will accomodate [sic] around 8 baskets. Each basket will carry around 50,000 eggs. Two hatchery buckets with partially screened top will have to be supplied by the Forest Service; also 10 four-gallon buckets to pack eggs from the lake to the eying station on the beach.

(4) Davidson and Foster say the fish should preferably be taken from the lake rather than using wild stock steelheads that run in the creek. Catch the fish with a seine along the lake shores (night is the best time) or in fact with a seine or rack in the creek at the head of the lake. Protect the fish against harm so that they can be used to supply eggs year after year. The Bureau has seines at Port Walter. The eggs should be fertilized when taken and transferred in buckets to the eying station at once. They will require 30 buckets approximately in the eying troughs.

(5) Foster says the fish will be ready to spawn about 3 weeks after the ice goes out of the lake. They do not spawn under the ice. There is no set date and the time varies with the fluctuations of the season etc., but Foster has observed that the spawning starts soon after the ice melts. This will have to be watched very carefully until we learn the situation at this particular lake.

(6) After the eggs are eyed this spring we can ship some of them to our Ketchikan hatchery for rearing or we can dump all of them into barren lakes where they will not be exposed to the depredations of other fish. When so dumped, the eggs have to be placed in the gravel.[5]

Plantings done subsequently with Sashin Lake rainbow trout included the below listed plants in Blue Lake. These plantings were recorded in a memo to W. A. Chipperfield, District Ranger, from R. M. Tate, December 22, 1939:

June 29, 1939	59	rainbow trout
July 17, 1939	50,000	steelhead eggs
August 11, 1939	5,000	rainbow trout fry
September 12, 1939	4,000	rainbow trout fry

One other planting may have been done with Sashin Lake stock, but the records do not definitely state that the stock used was Sashin Lake. This planting involved 200,000 eyed eggs shipped from southeast Alaska to Harding Lake near Fairbanks. This plant failed, however, and no one has ever caught a rainbow trout from Harding Lake (George Van Wyhe, pers. comm., January 15, 1981).

Each of the lakes which received fish from the Sashin Lake stocking program is discussed below and applicability as a brood source is evaluated.

Betty Lake (56°17'30" N, 134°42'00" W) and Jetty Lake (56°18' N, 134°40' W). Originally planted with 50 fish in 1938, Betty Lake has no further recorded planting history. Success of this plant was documented by W. A. Chipperfield, Forester, on July 7, 1947.

> Upper Port Armstrong Lake, at the south end of Baranof Island, was stocked with 50 rainbow trout from Lake Sashin in 1938. Fishing conditions at both ends of this lake were examined by Harry Sperling and the writer on June 29, 1947. No fish were observed at the upper end, although it appeared to be a good place for fish. Several rainbow 6 and 7 inches long were caught at the foot of the rapids below the lake. These drain into Lower Port Armstrong Lake, which is only a few feet less elevation than the upper lake, but is not as large.
>
> It is reported that there are five to seven pound rainbow trout in both lakes. Some fishing is done on the lakes by employees at the Port Armstrong reduction plant. There is a boat on the lower lake.[6]

ADF&G has checked the population four times since. The most recent investigation was done in 1980 by the ADF&G Fisheries Rehabilitation, Enhancement, and Development Division. Sixty-one fish from Jetty Lake were captured on July 10-11, 1980, ranging in length from 119 to 525 mm (Brad Sele, pers. comm., January 16, 1981). These fish were tested by the ADF&G pathological laboratory and found free of bacterial kidney disease.

Betty and/or Jetty Lakes may be a potential brood source site but needs further evaluation of population size and egg take site.

Blue Lake (57°04'30" N, 135°10'00" W). Blue Lake was planted in 1938 and 1939 with Sashin Lake stock. On September 9, 1976, 8,800 rainbow trout from Williamette, Oregon, were planted in the lake. These fish were approximately 70 per pound.

Fishermen success in Blue Lake was very good in the early 1960's but seemed to decline in later years. Several complaints were received from local fishermen from 1973 to 1976. The only fish being caught were a few large individuals. The acidification of the watershed by stack wastes from the local pulp mill and subsequent loss of reproduction have been theorized as the problem (Schmidt and Robards, 1975).

In recent years sport fishing has improved and angler success is high.

Northern Southeast Regional Aquaculture Association (NSRAA) collected fish in 1979 and 1980 for disease testing. Fish ranged from 115-520 mm length. Fish tested were free of fluorescing bacteria and viral agents.

Borodino Lake (56°22' N, 134°44' W). W. A. Chipperfield reported the following concerning Borodino Lake in 1947:

> Lake Borodina, located at the head of Big Port Walter, was stocked with 50 rainbow trout from Sashin Lake in 1938. It is reported to have had some landlocked Dolly Varden previous to that time.
>
> Fishing conditions were examined by Harry Sperling and the writer on June 29, 1947. The lake is about 2 miles long by 1/2 mile wide, area 365 acres, elevation 480 feet. Shores for the most part are precipitous, and there are no extensive shoal areas except at the head of the lake, where fair size gravel bars have been built up. The weather was decidedly overcast and unsettled. Time was not available for trying out the fishing except at the upper end of the lake. No evidence of fish was observed here. This should not be construed to mean that there were no fish, and further investigation is needed.
>
> This lake is only a short distance from Sashin Lake, is about twice the size of Sashin and at the same elevation. There are no apparent reasons why the 1938 stocking of rainbow should not have been successful.

Brentwood Lakes (56°37' N, 134°45' W). Brentwood Lakes may have been planted from Sashin Lake in 1938 but records vary. Test netting and fishing by NSRAA in 1980 yielded no fish. If this lake was planted, no evidence remains.

Davidof Lake (56°36'40" N, 134°50'30" W). Davidof Lake was planted with Sashin Lake rainbow trout in 1938. Test fishing in 1964 and 1967 confirmed the population exists. Fish captured ranged from 122 to 510 mm in length. The population size is unknown.

Deer Lake (56°31' N, 134°43' W). In 1947 W. A. Chipperfield reported the following concerning Deer Lake:

> Deer Lake, located just south of Deep Cove on Baranof Island was stocked with 50 rainbow trout from Lake Sashin in 1938. Fishing conditions were investigated in connection with other lakes herein reported. The lake was also examined by James L. Wilding, Ph.D., Junior Aquatic Biologist, U.S. Bureau of Fisheries, in 1939.
>
> No fish life was observed during each of the examinations. However, fishing conditions were unfavorable when examined by

> the writer. Weather was decidedly overcast and unsettled, and there was a light rain. Fishing was tried at both the upper and lower ends of the lake, as well as the side stream on the north side below the head. While there were no signs of fish, this should not be taken as conclusive evidence that the lake is entirely barren of fish.
>
> It is recommended that a thorough examination be made under favorable conditions. Spawning grounds appear to be quite limited and confined to rather steep gravel bars which have been built up at the head of the lake, or possibly underneath the large log jam at the outlet. The streams at the head of the lake discharge underneath the gravel bars and only flow over the top of them during periods of high water. Side streams are all steep and have no spawning areas. The lake might be more suitable for brook trout, as it is reported that they do not necessarily require a stream for spawning.[7]

Test fishing by ADF&G in 1966 and 1967 produced no fish. The lake was again planted with rainbow trout in 1967 with fish of unknown origin. Test netting in 1975 and 1980 confirmed success of the 1967 planting. Fish captured in 1980 ranged from 97 to 514 mm and represented five age classes. The oldest fish was 6 years old. Size of this population is not known.

Elfendahl Lake (57°51' N, 136°18' N). Elfendahl Lake was stocked with rainbow trout from Sashin Lake in 1938. Test netting by ADF&G in 1967 and NSRAA in 1979 captured no rainbows. Dolly Varden and prickly sculpin are the only fish inhabiting the lake.

Fawn Lake (56°30'30" N, 134°41'00" W). Fawn Lake was stocked with rainbow trout from Sashin Lake in 1938. Test fishing by NSRAA in 1979 documented the presence of rainbows. In 1980 ADF&G collected 30 rainbows for disease analyses. Fish tested were free of kidney disease, *Renibacterium salmoninarum*; enteric redmouth, *Yersinia ruckeri*; and furnuculosis, *Aeromonas salmonicida*.

Rainbow trout were the only fish species captured in Fawn Lake. Spawning takes place in a limited area of outlet, but excellent rearing area in the outlet seems to allow for a high survival rate. The outlet and the logjam area in the outlet end of the lake support a large concentration of rainbow trout up to 200-mm fork length. Fry traps in the outlet fished amazingly well. One 4-minute set yielded 62 rainbows, and one 3-minute set held 44 rainbows.

This population should be further studied as a potential brood stock site. A population estimate of rearing fish in the outlet should be attempted.

Goulding Lake (57°49' N, 136°09' W) and Otter Lake (57°48'30" N,136°08'00" W). Goulding Lake was stocked with rainbow trout from Sashin Lake in 1938. Test fishing in 1964 and 1977 captured no rainbows. Only cutthroat trout and Dolly Varden were found in Goulding and Otter Lakes.

Larry Lake or Island Lake (56°23' N, 134°39'23" W). On August 22, 1938, Mr. R.B. Russel of Little Port Walter reported planting 40 rainbow trout in "a lake across the channel from New Port Walter...the lake that the local people call Island Lake."[3] This lake, also known as Larry Lake, received a second planting of rainbows from Sashin Creek by Jerry Olsen in 1946 or 1947. This lake was treated with rotenone in August of 1968 or 1969, and a few large rainbow trout were recovered (Bill Heard, pers. comm., January 16, 1981). In 1978, 10,000 microwire tagged chinook salmon were planted in Larry Lake as part of an ongoing research program at Little Port Walter.

Osprey Lake (56°24' N, 134°40' W). Osprey Lake was planted with Dolly Varden in 1918. Rainbow trout were introduced from Sashin Lake in 1938. Extensive test fishing in 1974 and 1975 captured over 3,000 Dolly Varden but no rainbow trout.

Rezanof Lake (56°32'30" N, 134°50'00" W). In 1947 W. A. Chipperfield reported the following concerning Rezanof Lake:

> Rizanof [sic] Lake is the upper of a chain of five large lakes draining into Sandy Bay on the west coast of Baranof Island. It is about 3 1/2 miles long, area 1025 acres, elevation 650 feet. Maksoukof Lake, the lower one of the chain, has an elevation of 575 feet. Thus it is assumed that fish can pass quite freely from one lake to the other throughout the entire chain.
>
> Rizanof [sic] Lake was stocked with 50 rainbow trout from Lake Sashin in 1938. Fishing conditions were examined by Harry Sperling and the writer on June 29, 1947. An 18" rainbow was caught at the head of the lake, and another one was seen about half way down the west side. The fish caught weighed 2-1/4 pounds and was in good condition. The annual scale growth revealed that it was five or six years old.
>
> The stream entering the head of the lake flows through a rather flat and narrow valley, and has excellent spawning grounds. It can be assumed with reasonable accuracy that this entire chain of lakes has been naturally stocked from the planting made in 1938.
>
> This lake is about 45 miles via plane from Sitka, and the group of lakes will probably become one of the best rainbow fishing places in southeast Alaska. It is quite probable that excellent rainbow trout fishing is already available in the various streams connecting this chain of lakes.[7]

Investigations by ADF&G in 1978 (Schmidt, 1979) documented the presence of a viable rainbow trout population throughout the Rezanof Lake chain. The fish captured ranged from 70 to 573 mm. Number of fish in the system is not known. This system is quite popular with sport fishermen.

Upper Rostislaf and Lower Rostilaf Lakes (56°28'30" N, 134°41'30" W). W. A. Chipperfield reported the following concerning Rostilaf Lakes in 1947:

> Upper Rostislof [sic] Lake, located a few miles south of Deer Lake and Fry Cove, was stocked with 50 rainbow trout from Sashin Lake in 1938. This lake drains into Lower Rostislof [sic] Lake. The elevation of the Upper Lake is 1050 and the Lower Lake is 610 feet.
>
> Fishing conditions in the Lower Lake were investigated by Harry Sperling and the writer on June 29, 1947. Fishing was tried at both the upper and lower ends of the lake, but no evidence of fish was observed. There are fair spawning grounds at the upper end of the lake, and the stream entering the lake at this place has a gravelly bottom with a gentle slope. There was considerable moss growth on the bottom of the creek bed. The outlet of the lake has a few good holes with considerable moss growth. The stream from the Upper Lake discharges into the lower lake a short distance above its outlet. The general impression gained from examining the lake was that trout should thrive in it. It may be that the falls between the two lakes is so great that fish cannot survive a descent. At the time of investigation, I had the impression that the Lower instead of the Upper Lake had been stocked, but a recheck of the records show the opposite. In view of this, it is recommended that both lakes be re-examined for trout. If none are found in the lower lake, I definitely recommend that it be stocked with either mature native or rainbow trout. Should fish be found in the Upper Lake and none in the Lower Lake, this would show that the falls between the two were too vicious for trout to negotiate and survive.

Lower Rostislaf Lake was again test netted in 1966 by ADF&G. No fish were found and rainbow trout of undocumented origin were planted in 1967. Test netting of Lower Rostislaf in 1968 and again in 1980 documented the presence of rainbows. Fish caught in 1980 were of two age classes and length range was 204-425 mm.

No one has ever test netted Upper Rostislaf Lake to determine if the original 1938 planting of rainbow trout was successful. This should be done.

Round Lake (56°22'10" N, 134°42'00" W). On August 22, 1938, Mr. R. B. Russel of Little Port Walter reported transplanting 85 rainbow trout from Sashin Lake to the small lake located on the north fork of the Sashin Creek drainage.

This lake has never been test netted, but personnel at Little Port Walter have been sport fishing Round Lake with good success in recent years.

Sashin Lake (56°21'30" N, 134°41'30" W). Twenty-seven rainbow trout were collected from Sashin Lake on June 11, 1979. No fluorescing bacteria or viral agents were found from these fish.

Summary. Four lakes of the Sashin Lake stocking have been tested for disease. These include Blue, Fawn, Jetty, and Sashin. Of these, Fawn, Jetty, and Sashin still have pure Sashin stock; i.e., no other plantings have been made to these systems. Other lakes with pure Sashin stock which have not been disease tested include Davidof Lake, the Rezanof Lake chain, and Round Lake.

If a brood stock is to be developed for this area, further investigation of these lakes should be done.

All of the above listed lakes could be considered as brood donor sites. The Sashin stock is native to Baranof Island and appears to be disease free.*

SECTION III

OBJECTIVE

3. To determine fish species present and conduct preliminary limnological analyses of eight unnamed lakes on the Prince of Wales Island road system.

BACKGROUND

Access to several small lakes on Prince of Wales Island has been opened by extension of logging roads. These small lake systems had not been surveyed previously due to their inaccessibility and relative unimportance.

The current easy access and sport fishery potential of these small lakes led to this study. Eight lakes were investigated to determine fish species present and age and growth, size and depth of lakes, and water quality of each lake system. Less extensive investigations were conducted on two additional lakes.

RECOMMENDATIONS

No management or research recommendations are warranted at this time. All lakes studied are small but are open to anadromous migrations. Some of the less accessible systems have more numerous and larger cutthroat trout available. This may be a function of lower fishing pressure.

TECHNIQUES USED

Limnological relationships and fishery populations of eight small lakes on Prince of Wales Island were investigated (Figure 2). Lake names are Balls, Holgrem, Km 49, Loon, Loop, Naukati, Pass, and Rabbit Ear. Partial information was collected on two additional lakes--Curve Lake and Landlocked Lake.

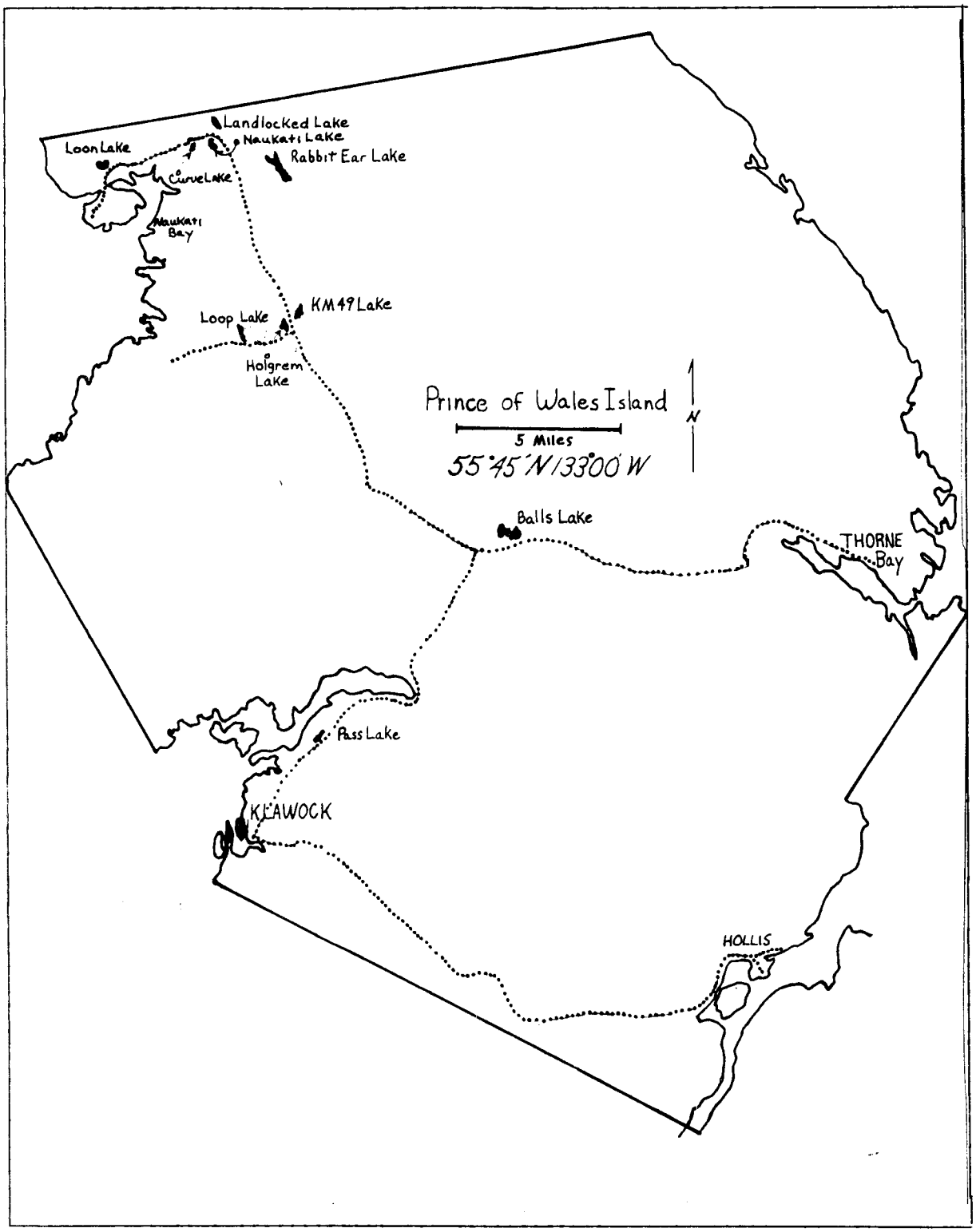

Fig. 2. Location of eight small lakes studied on Prince of Wales Island, 1980.

One sample collection trip was made to each lake during August. Sampling stations were established at approximately the deepest portion of each lake. Vertical profiles of temperature and specific conductance were recorded at each station. Field chemical analysis including alkalinity, hardness, conductivity, pH, and dissolved oxygen were conducted according to Standard Methods (1971).

A recording fathometer was used to record depth contours on transects crossing each lake. The depth contours were transferred to bathymetric maps, and morphometric data were calculated from these maps.

Zooplankton were collected by making duplicate vertical tows from the lake bottom with a net 0.5 m diameter and 3 m long. Straining cloth of the No. 153 Nitex net had aperture of 153 microns and 45% open area. Plankton were identified and counted. Dry and ash weight of plankton were determined gravimetrically. Efficiency of nets was not accounted for in calculations. Thermal profiles and Secchi disc readings were taken in conjunction with plankton tows.

Adult and juvenile fish were collected by hook and line, gill nets, and fry traps. Age, growth, and food habits of fish in the lakes were determined from fish collected throughout the study period.

FINDINGS

Morphometry

Maximum depths of lakes studied are as follows: Balls, 22.3 m; Holgrem, 27.4 m; Km 49, 24.0 m; Landlocked, 8.0 m; Loon, 10.0 m; Loop, 20.0 m; Naukati, 10.6 m; Pass, 7.0 m; and Rabbit Ear, 35.0 m. Bathymetric maps of Balls, Holgrem, Km 49, Loon, Loop, Naukati, and Rabbit Ear are presented in Figures 3 through 9.

Physical and Chemical Considerations

Observations of temperature, Secchi disc visibility, pH, conductivity, alkalinity, hardness, and dissolved oxygen were made during the study period. Locations of sampling stations on all lakes are shown in Figures 10 through 17. Thermal data and conductivity of lakes are shown in Table 2. Water quality information is presented in Table 3.

Plankton

Plankton composition and density from each lake was sampled once during August. Counts and identifications are presented in Table 4.

Although a standing crop of plankton does not measure production, net plankton samples may show some distinction between oligotrophic and euthrophic lakes. Rawson (1953) stated that the standing crop of No. 20 net plankton measured by total vertical hauls exhibits this distinction in western Canada. He gives this range as 10 to 40 kg/ha dry weight for alpine and large oligotrophic lakes, while mesotrophic and moderately eutrophic lakes have up to 100 kg/ha.

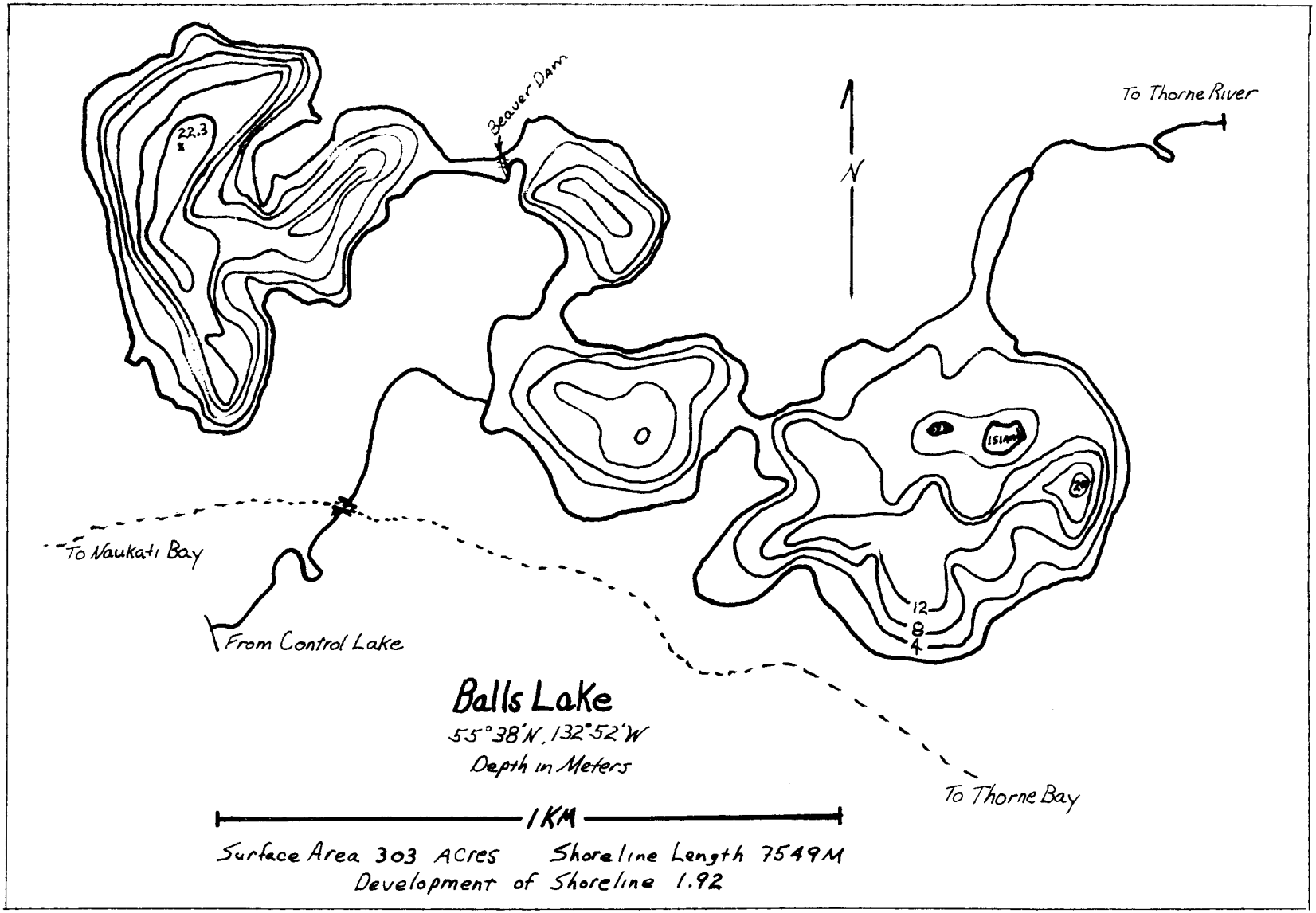

Fig. 3. Bathymetric map of Balls Lake.

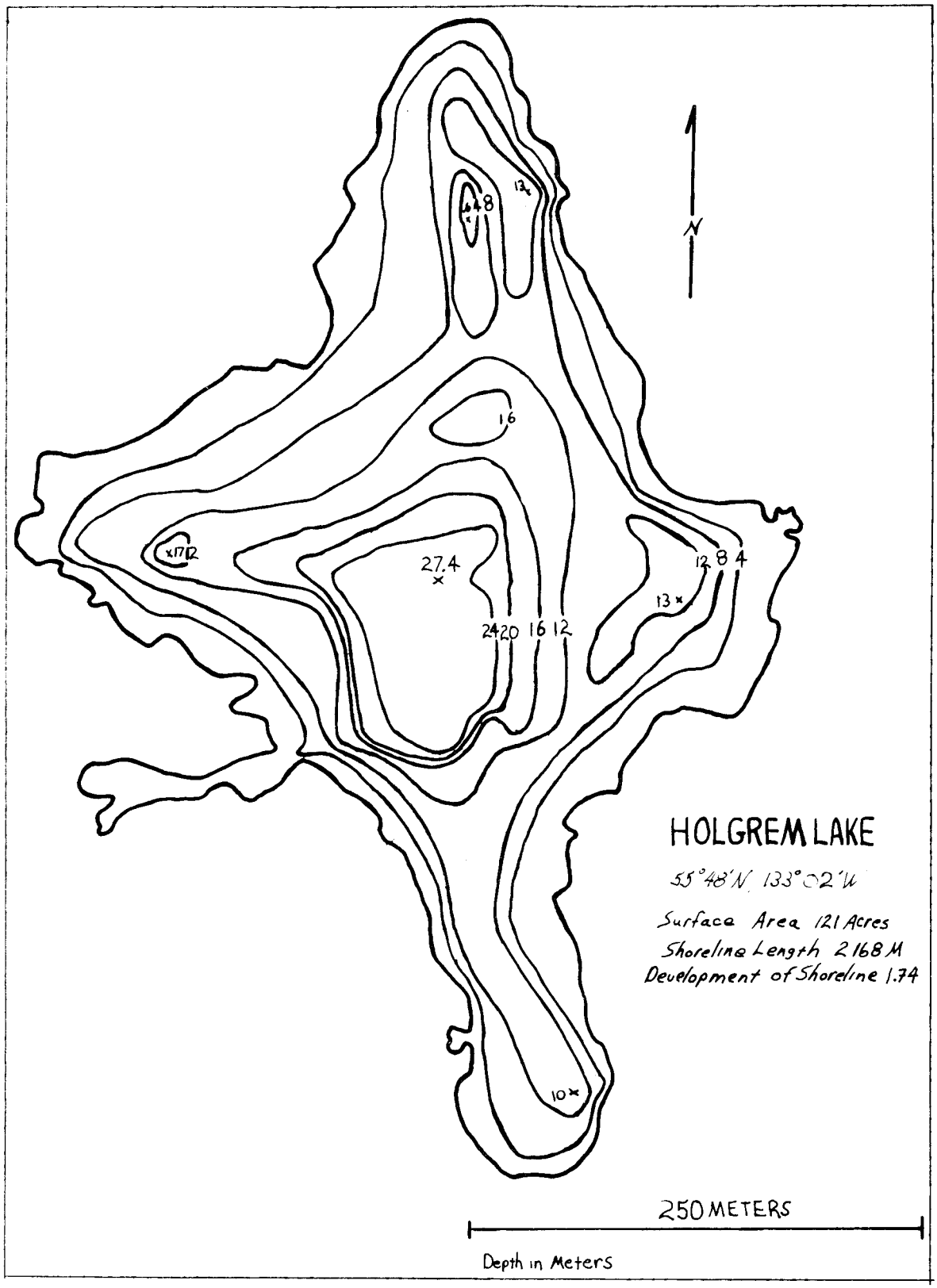

Fig. 4. Bathymetric map of Holgrem Lake.

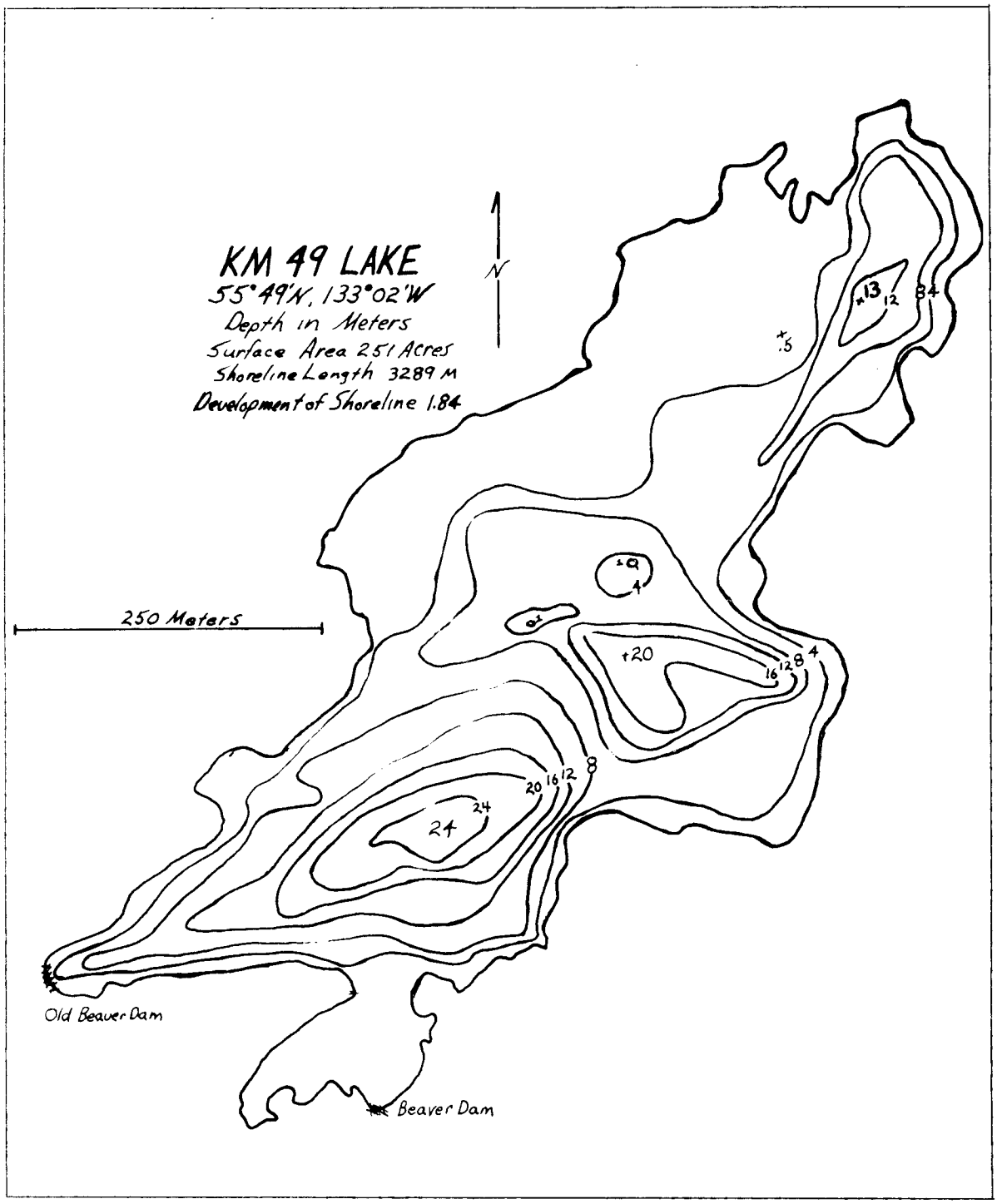

Fig. 5. Bathymetric map of Km 49 Lake.

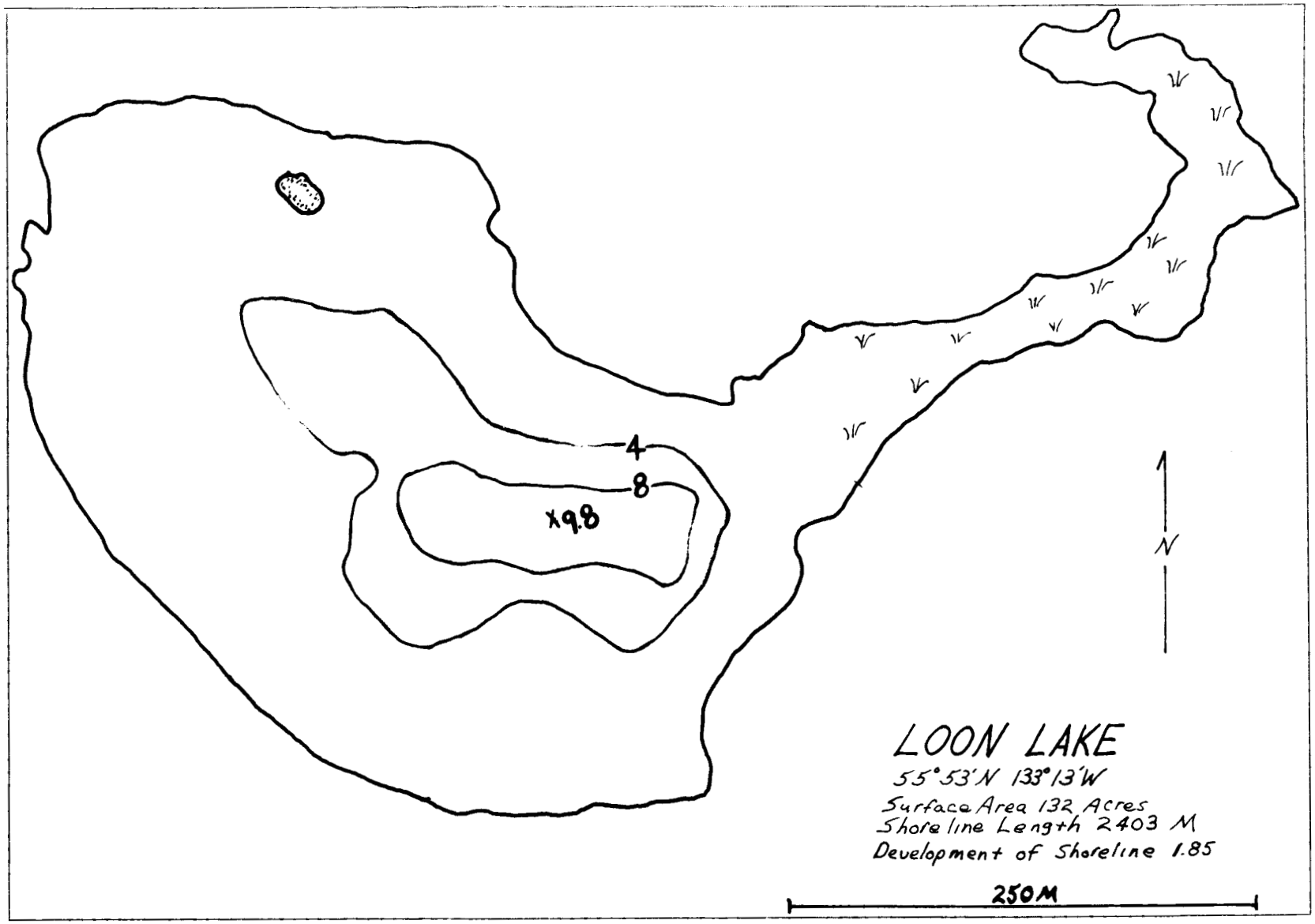

Fig. 6. Bathymetric map of Loon Lake.

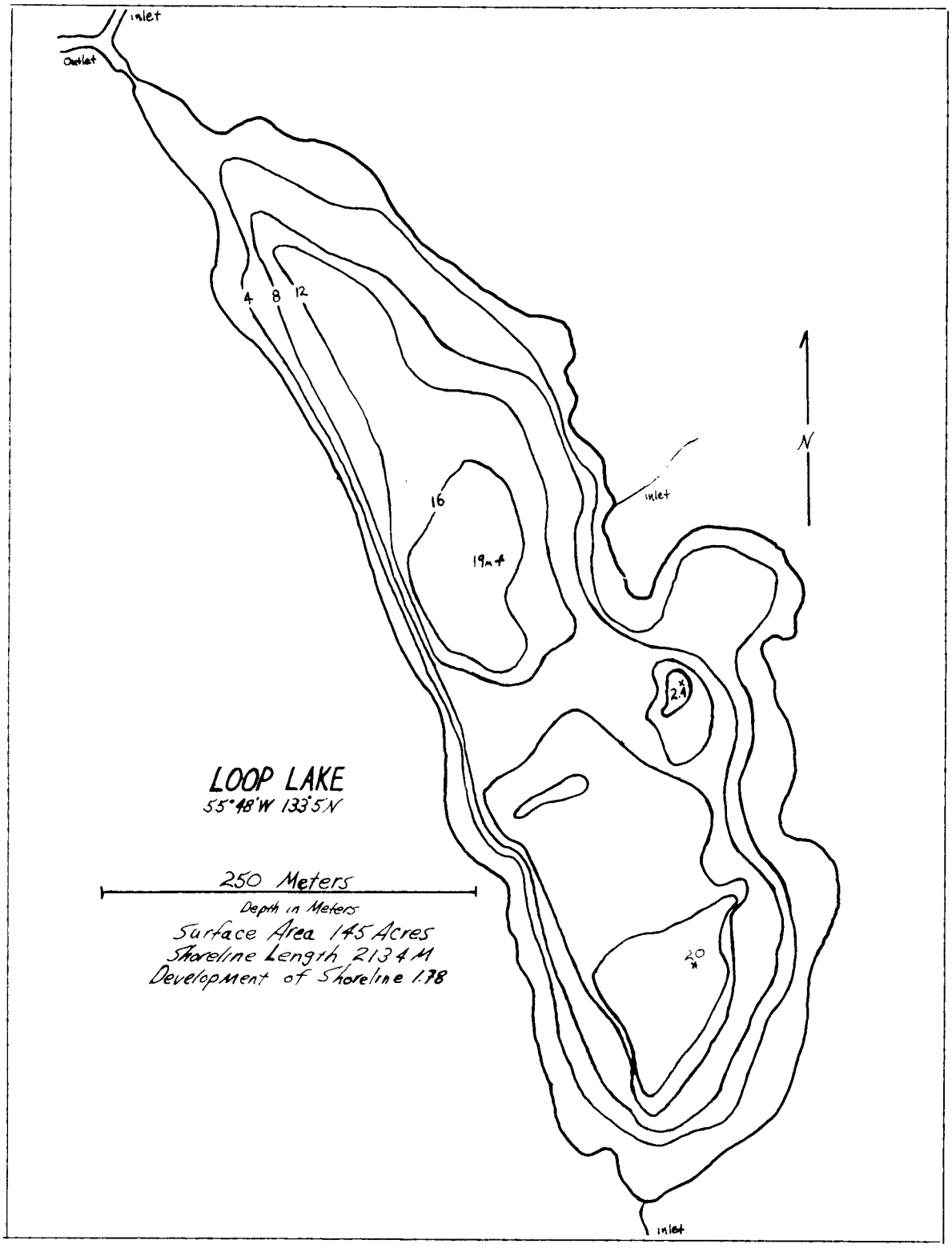

Fig. 7. Bathymetric map of Loop Lake.

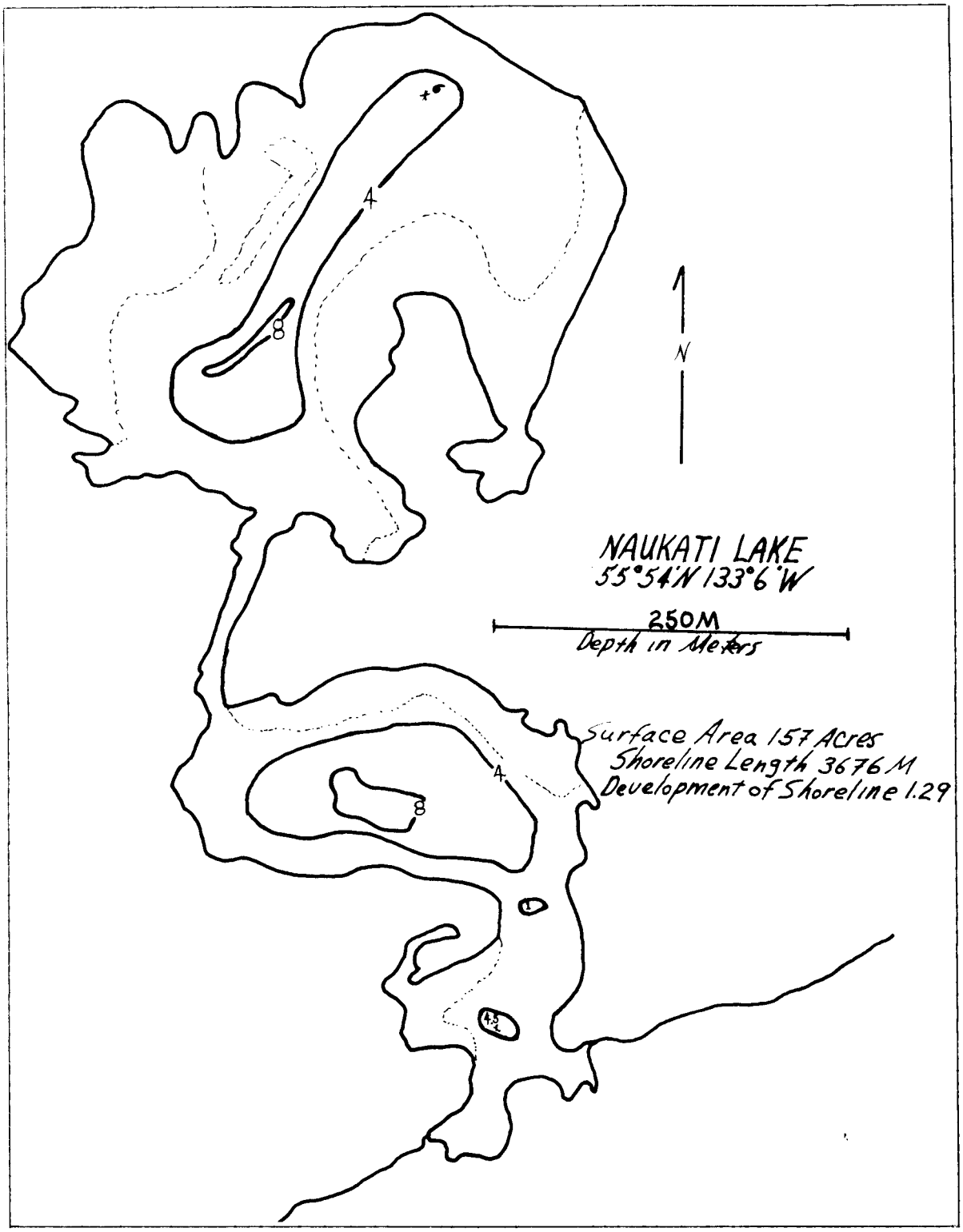

Fig. 8. Bathymetric map of Naukati Lake.

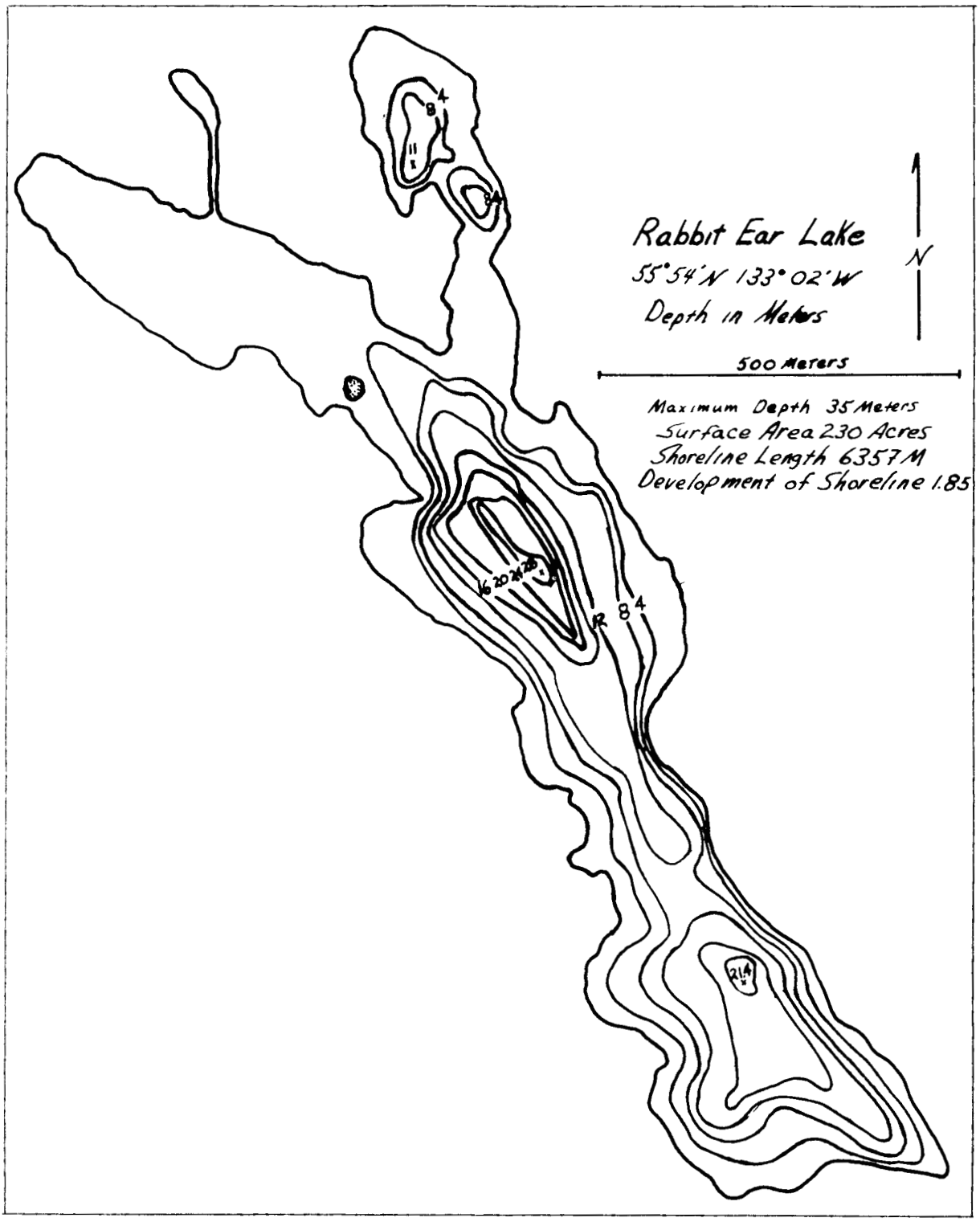

Fig. 9. Bathymetric map of Rabbit Ear Lake.

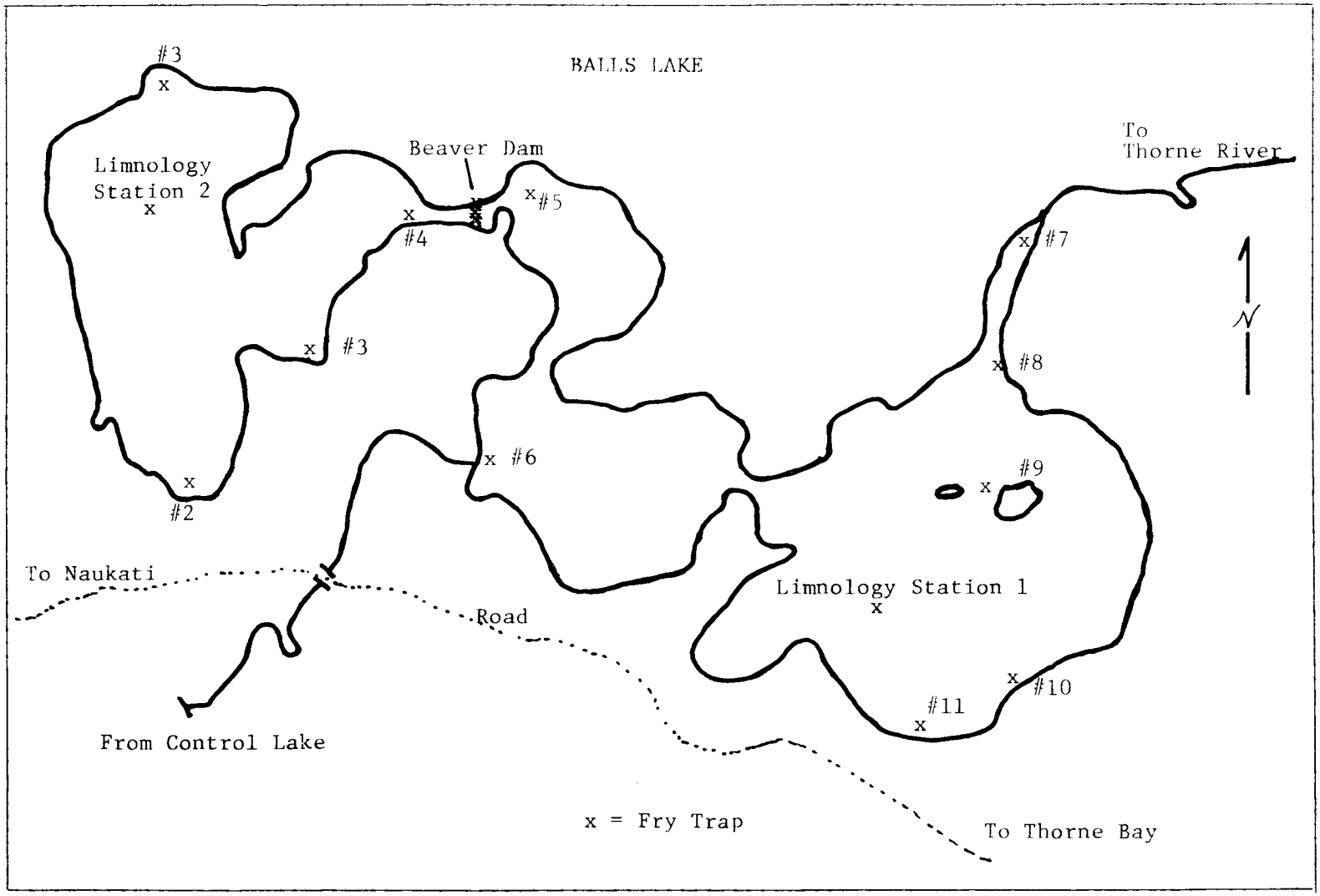

Fig. 10. Map showing location of sampling stations, Balls Lake, 1980.

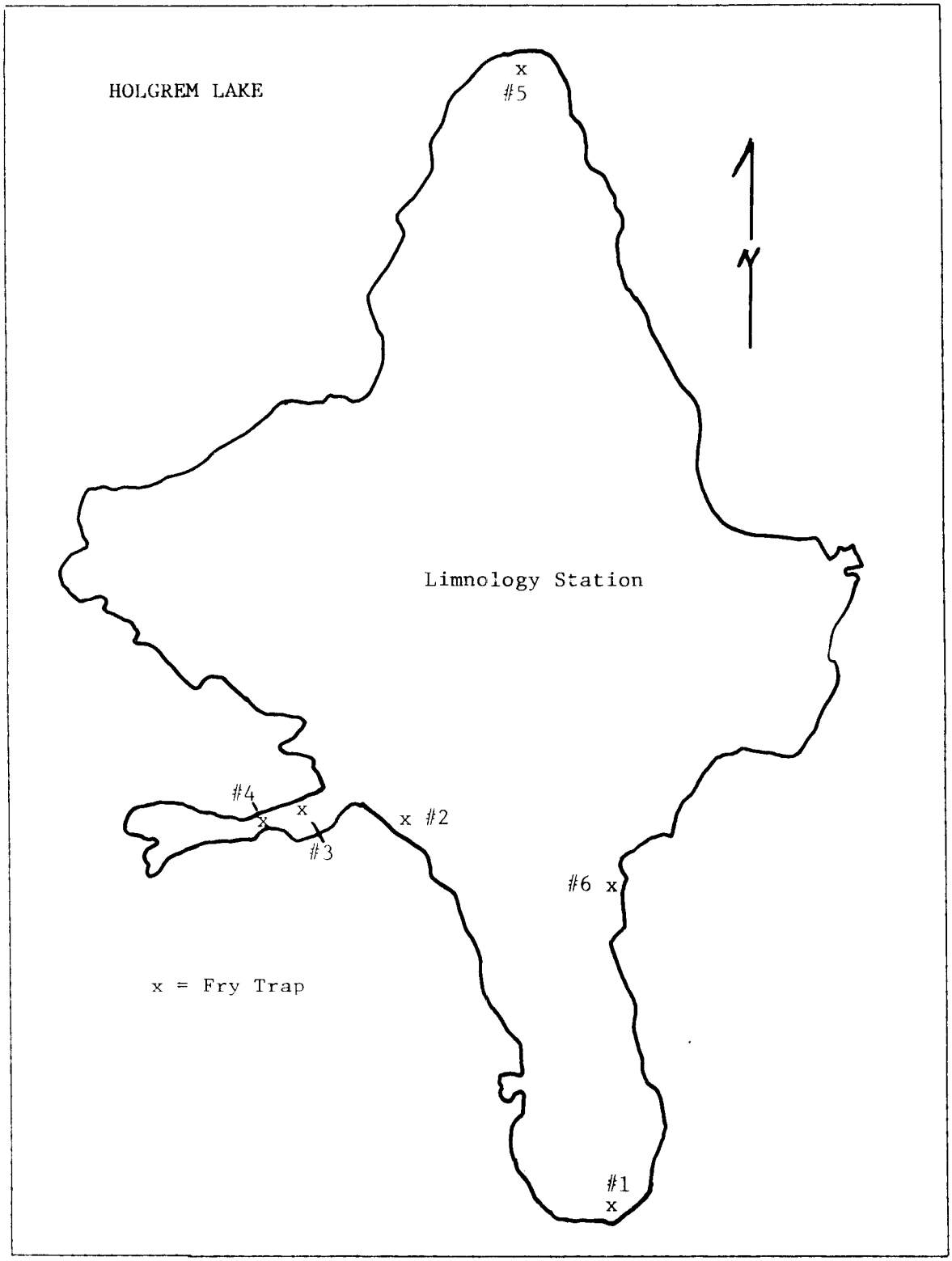

Fig. 11. Map showing location of sampling stations, Holgrem Lake, 1980.

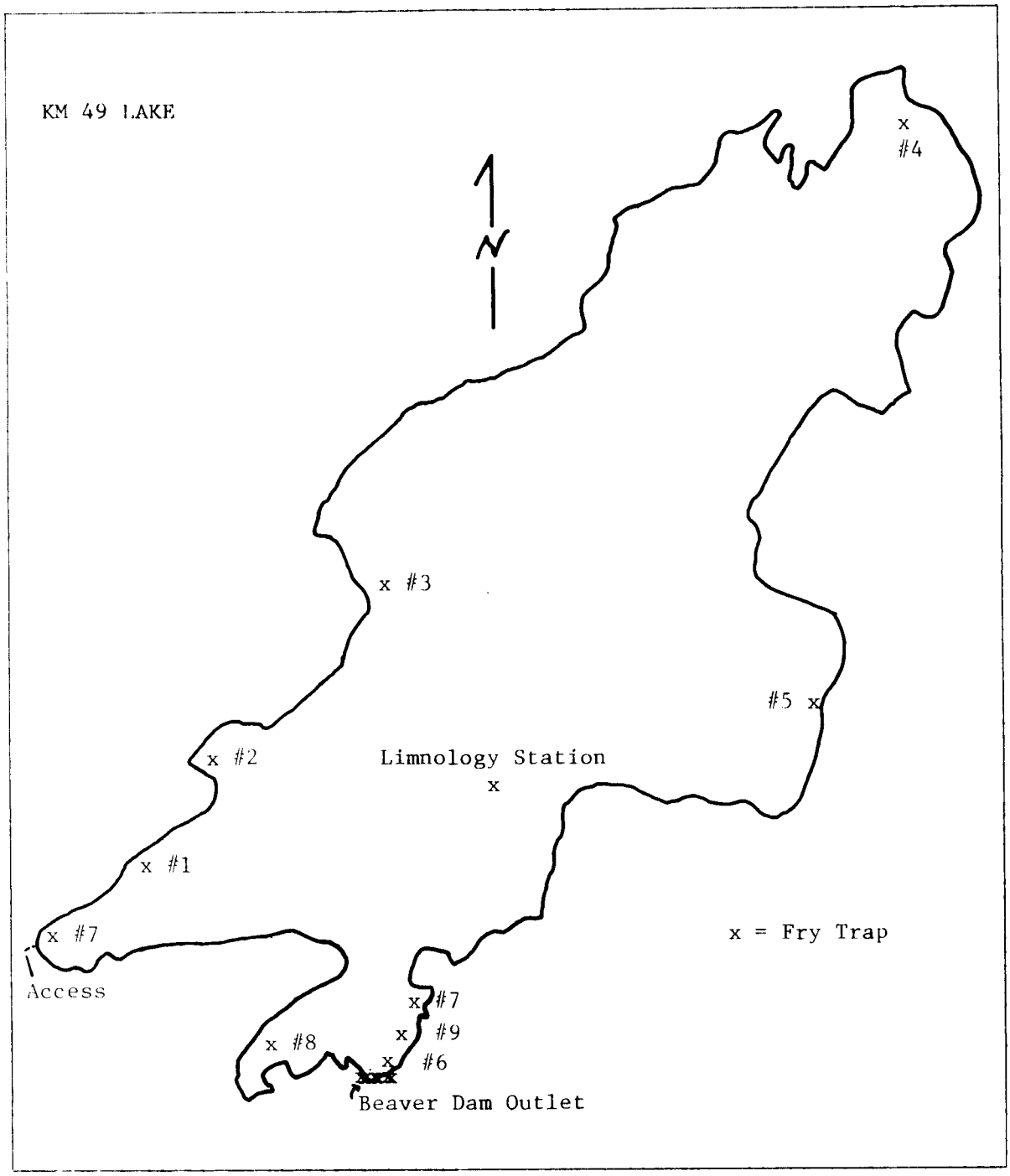

Fig. 12. Map showing location of sampling stations, Km 49 Lake, 1980.

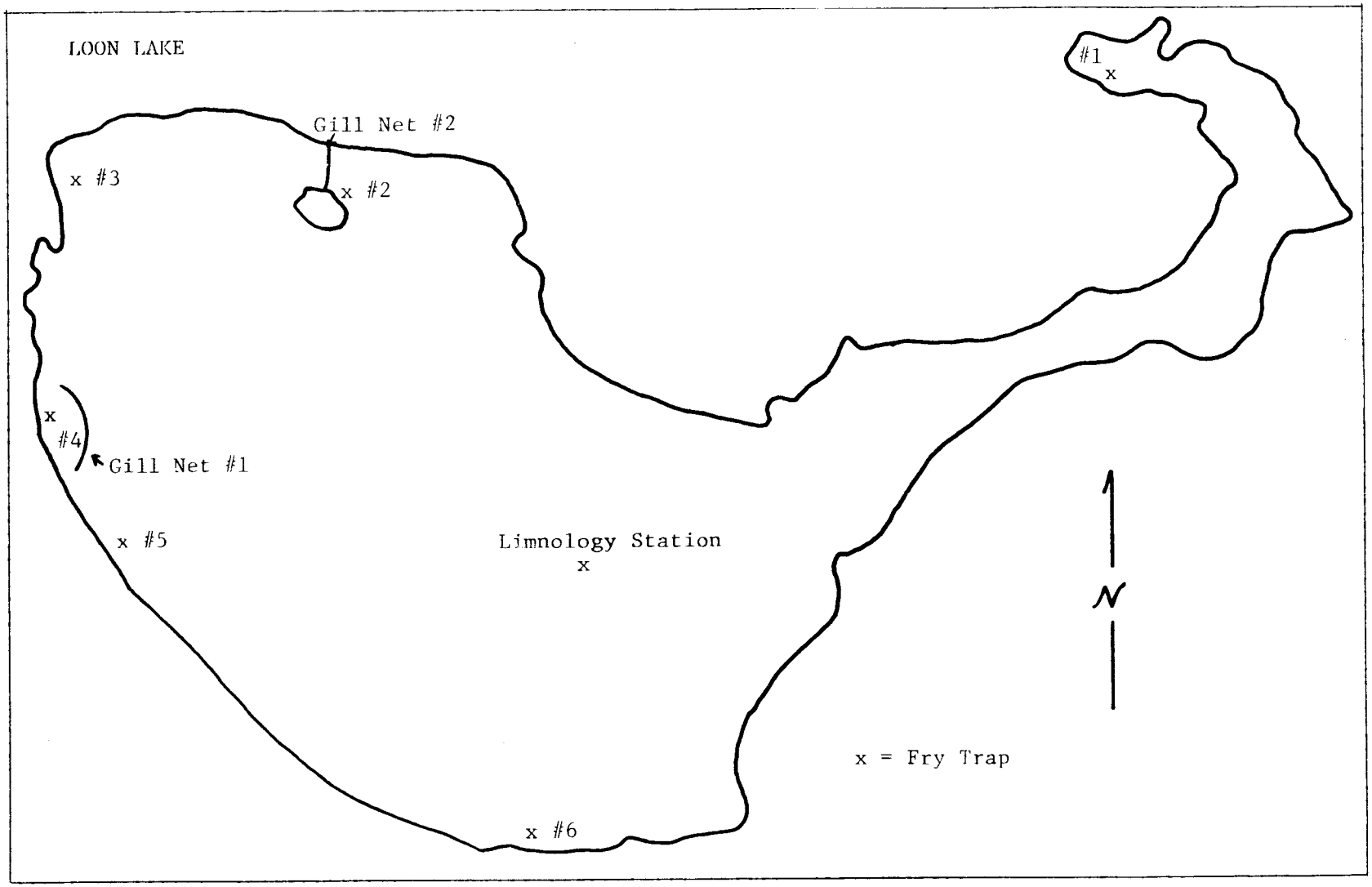

Fig. 13. Map showing location of sampling stations, Loon Lake, 1980.

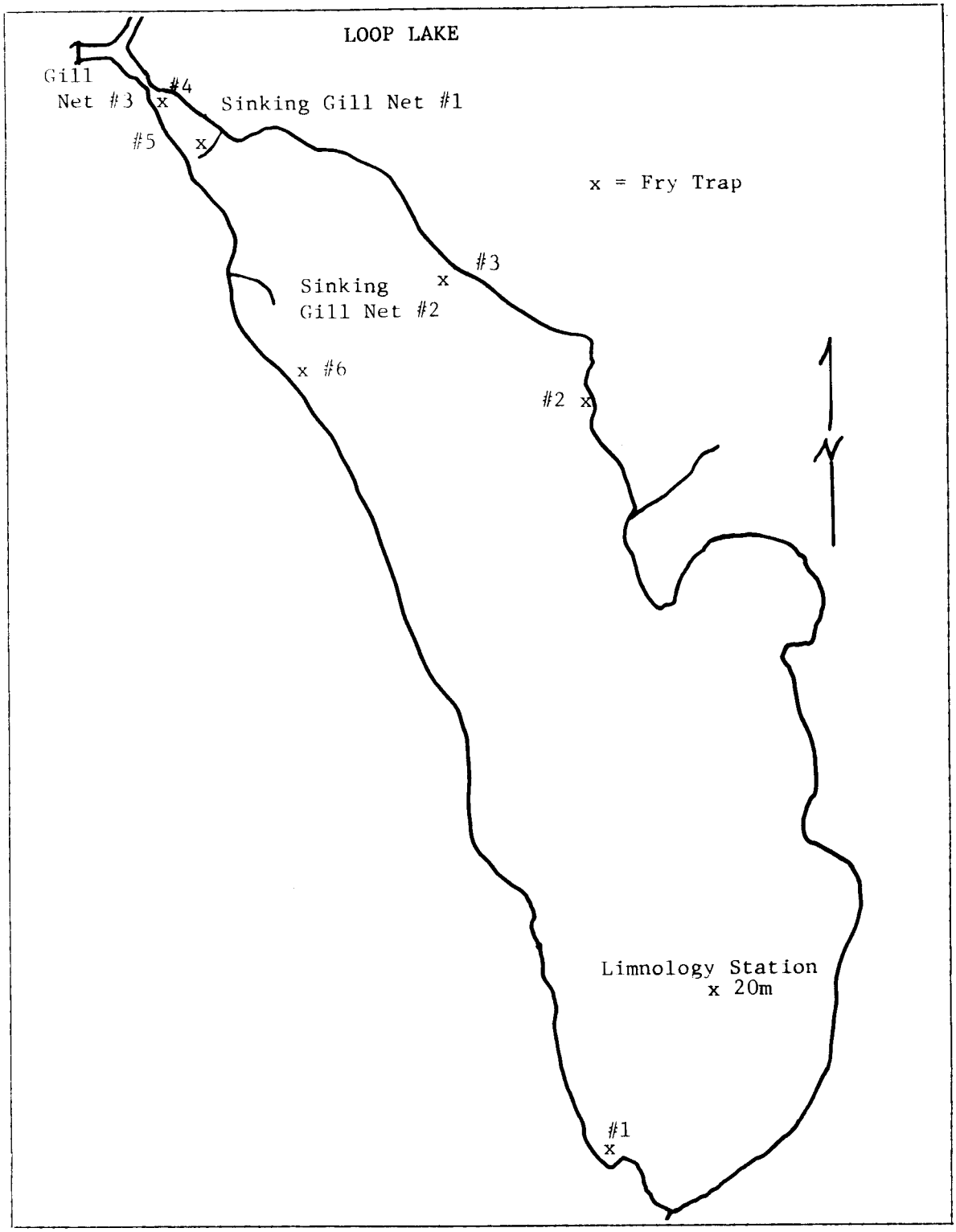

Fig. 14. Map showing location of sampling stations, Loop Lake, 1980.

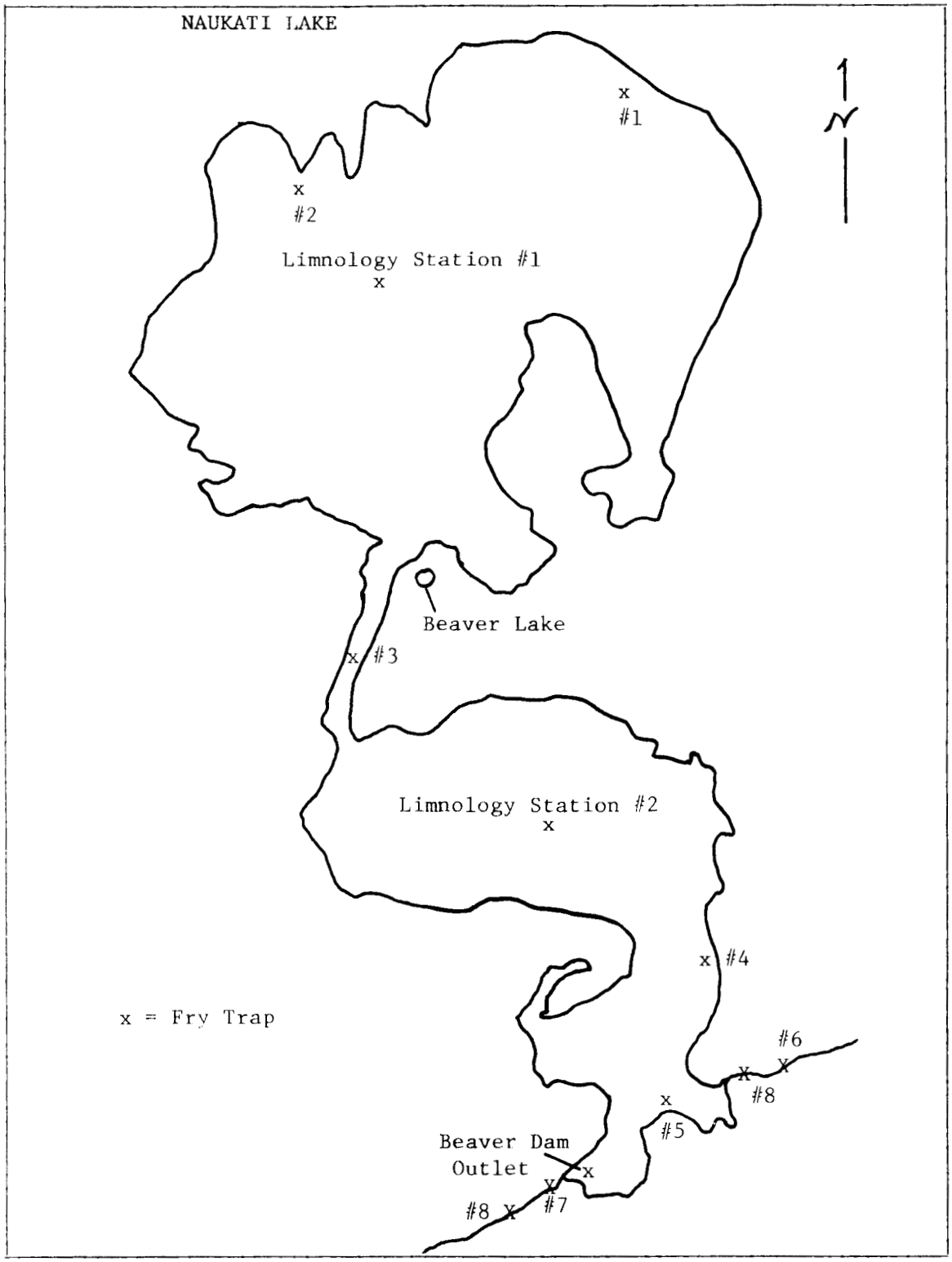

Fig. 15. Map showing location of sampling stations, Naukati Lake, 1980.

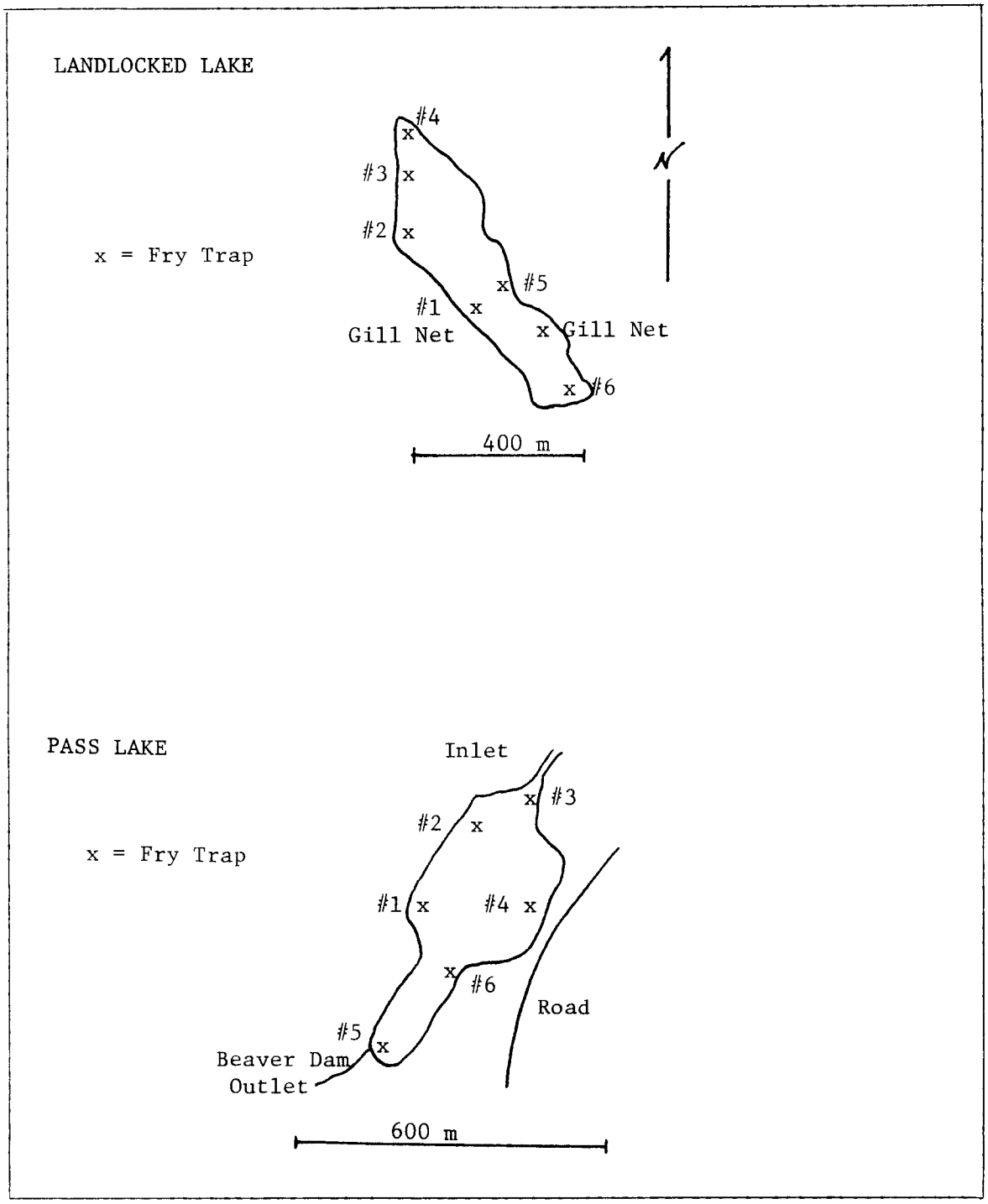

Fig. 16. Map showing location of sampling stations, Landlocked and Pass Lakes, 1980.

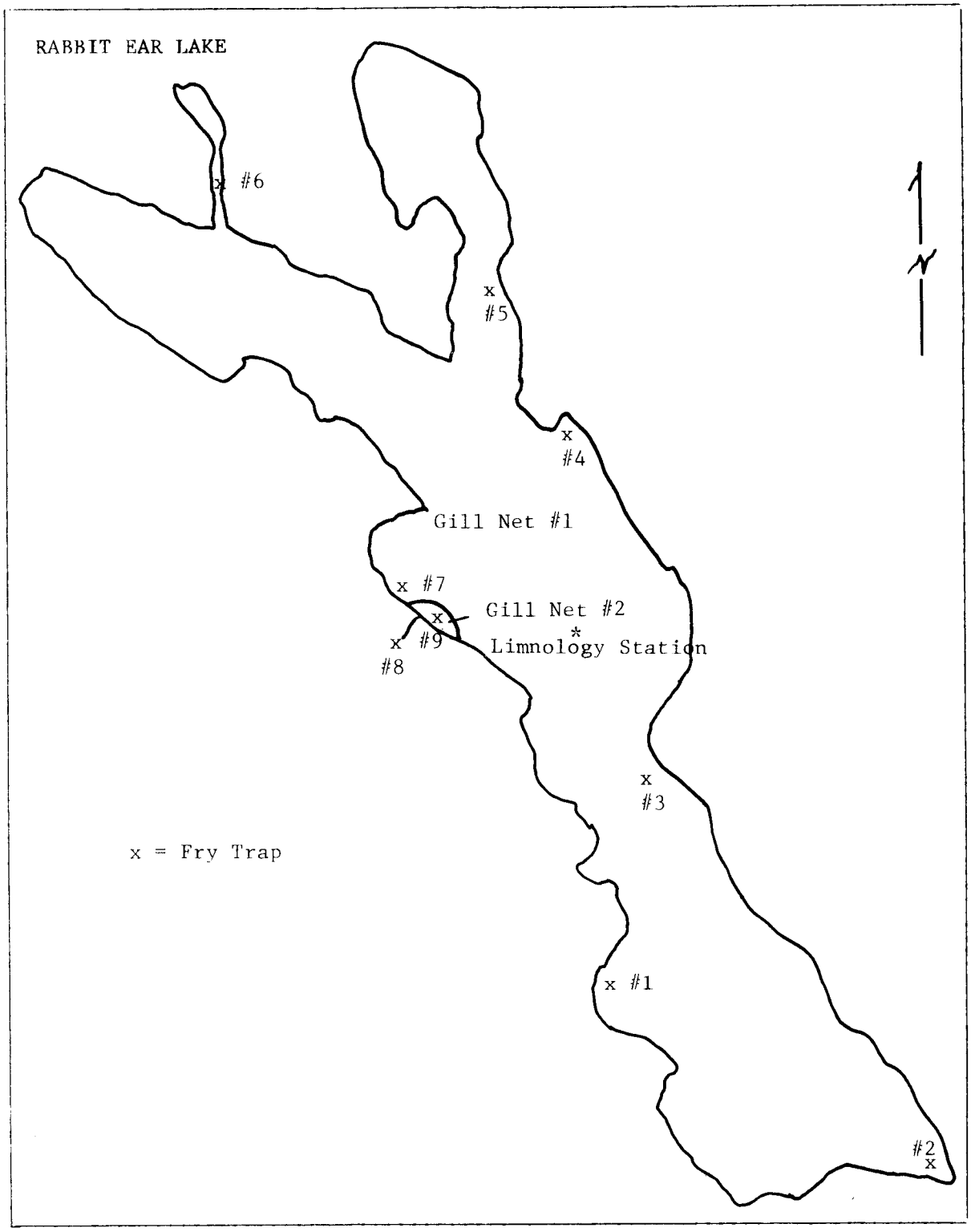

Fig. 17. Map showing location of sampling stations, Rabbit Ear Lake, 1980.

Table 2. Thermal (°C) and conductivity (µ mhos) data from lakes studied, Prince of Wales Island, 1980.

	Pass		Balls Sta. 1		Balls Sta. 2		Holgrem		Km 49	
Depth (m)	°C	µ mhos	°C	µ mhos	°C	µ mhos	°C	µ mhos	°C	µ mhos
Surface	18.0	32	18.0	38	18.5	61	19.0	67	18.0	27
1	16.0	31	16.0	35	18.5	61	18.0	67	18.0	27
2	15.0	30	15.0	35	15.5	60	14.0	70	16.0	28
3	14.0	30	14.5	34	15.5	65	12.5	60	14.5	29
4	11.5	25	13.5	34	12.0	51	9.5	45	11.8	25
5	9.0	21	12.0	32	10.0	49	7.5	42	11.0	24
6	8.0	21	10.0	30	9.8	49	6.8	42	8.0	24
7	7.5	41	8.5	30	8.5	49	6.3	42	7.5	24
8	. . .	. . .	8.0	30	7.5	49	6.0	42	7.0	24
9	. . .	. . .	7.5	30	7.0	50	6.0	45	6.5	24
10	. . .	. . .	7.0	30	7.0	52	5.8	45	6.2	26
11	. . .	. . .	7.0	30	6.5	60	5.5	42	6.0	27
12	. . .	. . .	7.0	30	6.5	80	5.5	42	5.5	28
13	. . .	. . .	7.0	30	6.5	80	5.5	42	5.5	28
14	. . .	. . .	. . .	. . .	6.5	69	5.2	42	5.5	28
15	. . .	. . .	. . .	. . .	6.5	65	5.2	48	5.5	25

Table 2. (cont.) Thermal (°C) and conductivity (μ mhos) data from lakes studied, Prince of Wales Island, 1980.

	Naukati		Rabbit Ear		Loop		Landlocked		Loon	
Depth (m)	°C	μ mhos	°C	μ mhos	°C	μ mhos	°C	μ mhos	°C	μ mhos
Surface	16.0	152	18.0	75	20.0	85	16.0	140	16.5	135
1	15.5	130	17.5	75	20.0	80	15.8	141	16.8	138
2	13.0	80	16.5	75	17.0	75	15.8	141	16.8	139
3	12.5	92	15.5	85	15.0	65	14.8	140	16.5	141
4	11.5	105	14.5	82	13.5	50	14.0	135	14.5	145
5	10.5	105	12.0	70	11.0	49	12.5	128	11.8	138
6	8.8	115	10.0	69	10.0	49	10.2	118	9.2	138
7	6.8	120	8.5	69	8.0	49	9.5	113	7.8	138
8	6.2	121	8.0	69	7.5	49	8.5	112	7.0	141
9	. . .	. . .	8.0	69	7.5	49	8.0	112	7.0	145
10	. . .	. . .	7.8	69	7.0	49	8.0	113	. . .	. . .
11	. . .	. . .	7.5	69	7.0	50	7.8	118	. . .	. . .
12	. . .	. . .	7.5	69	7.0	50	7.8	115	. . .	. . .
13	. . .	. . .	7.5	69	5.8	50	7.8	118	. . .	. . .
14	. . .	. . .	7.5	69	5.5	50	7.8	118	. . .	. . .
15	. . .	. . .	7.0	69	5.5	50	7.8	118	. . .	. . .

Table 3. Water quality analyses (mg/l) from lakes studied, Prince of Wales Island, 1980.

Lake	Depth	Alkalinity	Hardness		pH	D.O.	Secchi Disc (m)
			Calcium	Total			
Pass	1 m	14.1	11.0	13.0	6.5	9	2.0
	Bottom	10.0	8.0	9.0	6.0	8	. . .
Balls Sta. 1	1 m	22.2	15.3	17.2	6.8	9	2.5
	Bottom	15.7	23.0	26.3	6.4	6	. . .
Sta. 2	1 m	37.4	29.0	34.0	7.1	10	3.0
Holgrem	1 m	37.6	31.0	37.2	7.0	9	2.1
	Bottom	26.5	26.0	32.2	6.5	6	. . .
Km 49	1 m	14.5	7.0	24.0	6.5	9	2.0
	4 m	9.7	9.0	*	5.9	8	. . .
	8 m	5.1	19.0	26.0	5.9	7	. . .
	Bottom	5.9	8.0	12.0	5.8	5	. . .
Loop	1 m	44.6	39.0	54.0	7.1	9	2.5
	8 m	27.9	25.0	37.0	6.5	9	. . .
Naukati Sta. 1	1 m	97.2	97.2	102.0	7.5	9	4.0
Sta. 2	1 m	95.7	87.0	92.0	7.3	9	2.0
Rabbit Ear	1 m	41.9	40.0	41.0	7.1	9	2.8
Loon	1 m	65.4	15.0	25.0	7.1	9	3.5
Landlocked	1 m	91.8	22.0	20.0	7.3	9	5.0
Curve	1 m	108.0	22.0	25.5	7.4	10	. . .

*Not titratable.

Table 4. Plankton composition, density (organisms per square meter), and weight (milligrams per square meter) from Prince of Wales Island lakes as collected with No. 153 Nitex plankton nets, 1980.

Lake	Balls	Holgrem	Km 49	Landlocked	Loon
Date	August 6	August 7	August 8	August 20	August 19
Depth of Tow (m)	15	20	18	7	8
Cladocera					
Bosminidae	8,456	36,678	1,707	3,057	41,136
Daphnidae	357	27,509	9,424	18,034	3,821
Holopadidae	0	0	841	0	0
Cladocera eggs	1,528	5,390	688	1,324	13,627
Copepoda					
Cyclopoid	14,263	22,124	5,604	47,886	60,749
Calanoid	3,719	1,493	764	3,770	8,532
Nauplii	1,375	0	0	1,324	7,641
Copepod eggs	0	346	0	0	0
Rotifera					
Kellicottia longispina	14,111	1,951	3,388	14,264	0
Asplancha	0	0	0	0	0
Keratella	0	0	0	0	0
Conochilus	0	0	0	0	99,847
Conochiloides	357	0	3,133	306	0
Other	0	0	0	0	891
Dry Weight	89.1	487.0	379.5	194.6	254.2
Organic Weight	82.0	447.3	354.6	172.7	228.7
Ash Weight	7.1	39.7	24.9	21.9	25.5

Table 4. (cont.) Plankton composition, density (organisms per square meter), and weight (milligrams per square meter) from Prince of Wales Island lakes as collected with No. 153 Nitex plankton nets, 1980.

Lake	Loop	Naukati	Pass	Rabbit Ear
Date	August 9	August 18	August 4	August 14
Depth of Tow (m)	18	9	6	20
Cladocera				
Bosminidae	50,952	173,662	3,662	4,585
Daphnidae	23,306	0	2,038	8,940
Holopadidae	0	0	306	0
Cladocera eggs	13,118	86,653	1,019	993
Copepoda				
Cyclopoid	3,439	116,607	30,871	62,888
Calanoid	13,118	0	15,282	7,412
Nauplii	1,656	6,062	0	0
Copepod eggs	0	0	0	0
Rotifera				
Kellicottia longispina	0	8,201	4,788	9,934
Asplancha	0	9,628	0	0
Keratella	0	0	0	764
Conochilus	1,274	0	0	0
Conochiloides	30,183	0	72,643	2,521
Other	0	0	0	0
Dry Weight	517.6	431.5	227.2	741.2
Organic Weight	488.6	387.7	209.4	694.8
Ash Weight	29.0	43.8	17.8	46.4

The standing crop of No.-10 net plankton was calculated using an assumed net efficiency of 25%. Standing crop of net plankton was: Balls, 3.3; Holgrem, 17.9; Km 49, 14.2; Landlocked, 6.9; Loon, 9.1; Loop, 19.5; Naukati, 15.5; Pass, 8.4; and Rabbit Ear, 27.8.

Fish

A summary of fish catch and effort information for lakes studied is presented in Table 5. Condition factors of fish caught are presented in Table 6. A discussion of each lake and the fish in each follows.

Balls Lake (55°38' N, 132°52' W):

Balls Lake is a chain lake composed of four sections, three of which are connected by narrow necks. The fourth (upper) lake is separated by a beaver dam. Maximum depth of the upper lake is 22.3 m. The lower lake has a maximum depth of 20 m.

There are no facilities present at the lake. It is accessible by road from Klawock. To get to Balls Lake, drive north from Klawock on the airport road until the Thorne Bay-Naukati road is reached. Turn right and drive approximately 3 km. Balls Lake is on the left side of the road. Total distance from Klawock is 24 km. There is ample parking across the road from the lake as well as at turnouts on the lake side.

The lake is accessible by walking down the inlet stream about 400 m from the road bridge. Persons not having access to a boat may do this, as the best fishing in the lake is where the inlet empties into the lake. Hip boots are advised but not mandatory.

Cutthroat and rainbow trout, Dolly Varden, and coho and sockeye salmon are present in Balls Lake. Sport fishing with flies at the inlet produced mainly cutthroat trout to 317 mm in length. Length, weight, and age of cutthroats sampled are presented in Table 7.

A 278-mm rainbow trout was caught. It appears that the outlet of Balls Lake (a tributary of the Thorne River) is important for steelhead trout rearing. Sport fishing the outlet produced rainbows to 300 mm, but the average size was considerably smaller. Fishing was fair to good at the inlet and down the outlet for several hundred meters. The upper lake was not fished but fish were observed.

Beavers, geese, spotted sandpipers, and loons were present. Bear sign was observed along the outlet banks. Several hundred spawning sockeye salmon were concentrated below the inlet that flows from Control Lake.

Curve Lake (55°54' N, 133°08' W):

Curve Lake is located 56.6 km from Klawock on the Naukati road on Prince of Wales Island. The lake is approximately 0.4 km long and 0.13 km wide.

Table 5. Summary of fish sampling effort and catch data from lakes studied, Prince of Wales Island, 1980.

Date	Location	Gear Type	Total Hours Set	Catch
		Balls Lake		
August 5	Lake Shore	12 Fry Traps	26.0	118 Cottids, 21 SS, 9 CT, 2 RB
6	Below Inlet	Rod and Reel	3.0	10 CT
6	In Outlet	Rod and Reel	2.0	13 RB
		Curve Lake		
August 20	Lake Shallows	Rod and Reel	3.0	10 CT
		Holgrem Lake		
August 7	Lake Shore	6 Fry Traps	12.0	16 Cottids, 19 Cottids, 10 CT
7	Shallows Around Lake Shore	Rod and Reel	4.0	7 CT
		Km 49 Lake		
August 8	Lake Shore	9 Fry Traps	12.5	5 CT, 2 Cottids, 1 RS, 5 SB
8	Near Outlet	Sinking Gill Net	3.0	5 CT
		Landlocked Lake		
August 20	Lake Shore	6 Fry Traps	12.0	46 Cottids
20	Inlet	Sinking Gill Net	2.0	0
20	Outlet	Sinking Gill Net	2.0	0
		Loon Lake		
August 19	Lake Shore	6 Fry Traps	12.5	59 Cottids, 10 SS, 1 CT
19	Behind Island	Sinking Gill Net	3.0	5 CT
19	Lake Shallows	Rod and Reel	2.0	5 CT
		Loop Lake		
August 9	Lake Shore	6 Fry Traps	9.2	11 Cottids, 1 SB, 2 SS, 27 CT
9	Outlet Slough	Sinking Gill Net	1.0	3 CT
9	Along Shore	Sinking Gill Net	1.0	0
23	Outlet Slough	Sinking Gill Net	2.0	5 CT, 2 DV
		Naukati Lake		
August 15	Lake Shore	7 Fry Traps	7.8	12 Cottids, 80 SS, 5 SB, 19 DV, 6 CT, 6 RB
22	Lake Shore	2 Fry Traps	2.5	4 SB, 22 SS, 2 CT, 2 DV
22	Outlet Pool	Rod and Reel	2.0	8 CT, 4 DV
		Pass Lake		
August 4	Lake Shore	6 Fry Traps	12.0	5 CT, 18 DV
4	Shallows Around Lake Shore	Rod and Reel	2.0	5 CT
25	Shallows Around Lake Shore	Rod and Reel	1.0	3 CT
		Rabbit Ear Lake		
August 17	Lake Shore	9 Fry Traps	16.5	43 Cottids, 67 SS, 8 DV, 2 CT
17	Beaver Dam	Sinking Gill Net	3.5	4 CT

Table 6. Condition factors (K)* of cutthroat trout and Dolly Varden from lakes studied, 1980.

Lakes and Species	Number	Condition Factor (K)* $\bar{x}$	Range	Standard Deviation
Pass,				
Cutthroat Trout	10	1.09	0.91-1.26	0.11
Dolly Varden	8	1.08	0.84-1.20	0.10
Balls,				
Cutthroat Trout	9	0.94	0.72-1.16	0.13
Holgrem,				
Cutthroat Trout	10	0.99	0.85-1.28	0.12
Km 49,				
Cutthroat Trout	7	1.01	0.95-1.09	0.07
Loop,				
Cutthroat Trout	11	1.00	0.85-1.11	0.12
Naukati,				
Cutthroat Trout	9	0.93	0.77-1.06	0.10
Dolly Varden	10	0.92	0.83-0.95	0.09
Rabbit Ear,				
Cutthroat Trout	6	0.98	0.87-1.07	0.08
Dolly Varden	2	0.89	0.74-1.05	0.22
Loon,				
Cutthroat Trout	5	0.98	0.96-1.03	0.02
Curve,				
Cutthroat Trout	7	0.98	0.87-1.03	0.05

$$*K = \frac{100 \times \text{Weight (gm)}}{\text{Fork Length (cm)}}$$

Table 7. Length (mm), weight (gm), and age of cutthroat and rainbow trout from Balls Lake, 1980.

Date	Length	Weight	Age
		Cutthroat Trout	
August 5	317	231	9
	279	213	5
	250	163	5
	190	71	6
	174	51	5
	157	39	5
	140	32	3
August 6	224	97	5
	210	93	6
		Rainbow Trout	
August 5	300	. . .	6
	210	. . .	4
	208	. . .	3
	178	. . .	3
	175	. . .	2
	158	. . .	2
	158	. . .	2
	148	. . .	2
	146	. . .	2
	143	. . .	2
	136	. . .	2
	120	. . .	1
August 6	278	. . .	6
	229	. . .	5
	209	. . .	4

Curve Lake is a scenic lake just in sight of the road with a heavily forested shoreline. Access from the road is fairly easy, requiring just a short walk down the road bank. Fishing from the shore is possible, and a boat is not necessary.

According to local sport fishermen, this lake and the next little lake approximately 1 km down the road (towards Naukati) offer some of the best sport fishing in the area. This is attributed to the light angling pressure these lakes receive. Sport fishing Curve Lake seemed to prove this statement correct, as we were successful in catching cutthroat trout to 346 mm without much difficulty. Fish are fairly well distributed throughout the lake with major concentrations occurring around submerged snags. Length, weight, and age of cutthroat trout sampled are presented in Table 8.

Holgrem Lake (55°48' N, 133°02' W):

Holgrem Lake is located on Prince of Wales Island 43 km north of Klawock on the Naukati road. The lake is approximately 0.64 km long and 0.48 km wide. Maximum depth recorded is 27.4 m. The shoreline is composed of tall grasses and is marshy in most places.

The shore of Holgrem Lake has been extensively logged (Figure 18), which makes access difficult. Easiest access is down the streambed. There are no facilities present at the lake.

Driving to Holgrem Lake is accomplished by heading north from Klawock on the main north road until the Naukati-Thorne Bay road is reached. Turn left and drive approximately 8 km to the fork that leads left to the Halfway House Camp (south road) and right to Naukati. Turn right and drive 11 km. The road branches at this point. Lake access is approximately 100 m further along the right branch at the culvert. A Boy Scout troop started work on an access trail to the lake but never completed it, as the troop was disbanded.

Sport fishing at Holgrem Lake produced cutthroat trout to 278 mm. Length, weight, and age of cutthroats are presented in Table 9. The most productive areas were in the outlet arm and around submerged snags which line the shore. Coho salmon fry were caught in traps. Fishing success was fair. Angler interviews indicated moderate use of the lake by local fishermen.

Wildlife observed at Holgrem Lake included geese, mallard ducks, beaver, and loons. Bear sign was noted along the outlet shore.

Km 49 Lake (55°49' N, 133°02' W):

Km 49 Lake is located approximately 1 km north of Holgrem Lake on Prince of Wales Island. The entrance access from the road is at the Km 49 marker on the Naukati road. Km 49 Lake is approximately 1 km long and 0.4 km wide. Maximum depth recorded was 24 m.

Table 8. Length (mm), weight (gm), and age of cutthroat trout from Curve Lake, 1980.

Date	Length	Weight	Age
August 20	346	427	8
	297	242	5
	213	85	6
	203	84	5
	202	81	4
	177	57	4
	167	46	5

Fig. 18. View northwest across Holgrem Lake.

Table 9. Length (mm), weight (gm), and age of cutthroat trout from Holgrem Lake, 1980.

Date	Length	Weight	Age
August 7	269	194	6
	238	115	6
	208	87	5
	194	66	4
	171	50	4
	152	38	4
	135	26	3
	114	19	4
August 23	278	200	6
	255	155	6

The area surrounding Km 49 Lake is low and marshy with hemlock forests predominating. Access to Km 49 Lake requires a short hike of approximately 300 m through brushy forest and marsh. The trail is unmarked, but the lake is not hard to find if walked perpendicular to the road from Km 49 marker to an opening through the trees that leads to the lake. Rubber footwear is advised.

Interviews with local fishermen indicated that very few people know of the lake, probably because it isn't visible from the road and there is no apparent outlet across the road system.

No facilities are present at the lake. Km 49 Lake supports a population of cutthroat trout, although they are not of great abundance. Sampling with fry traps and gill nets produced cutthroat trout to 250 mm. Length, weight, and age of cutthroats are presented in Table 10. Coho and sockeye salmon fry were also present. The most concentrated numbers of fish were found to be near the outlet beaver dam, which eventually flows into Logjam Creek.

Wildlife observed included geese, loons, and beavers.

Landlocked Lake (55°55' N, 133°06' W):

Landlocked Lake is located 56 km north of Klawock on Prince of Wales Island. The lake is approximately 0.8 km long and 0.2 km wide. Soundings with a lead line indicate an approximate maximum depth of 8 m.

The southeast shore of Landlocked Lake has been logged for several hundred feet, but old-growth timber surrounds the remaining perimeter of the lake (Figure 19).

Access to Landlocked Lake is gained by driving up a logging spur road approximately 200 m south of Naukati Lake, turning left at the branch, and continuing up for several hundred meters. The lake is visible from the end of the road at the top of the spur. Foot access is down the hill through a clearcut area (fairly difficult walking).

Landlocked Lake was gillnetted and fry trapped. Forty-six sculpins were captured. One small (approximately 90 mm) Dolly Varden was observed near the outlet.

Anadromous fish are blocked from reaching Landlocked Lake because the outlet stream flows underground for some distance immediately upon leaving the lake. The outlet eventually flows into Naukati Lake.

Loons and beavers were observed at Landlocked Lake as were very large concentrations of small toads.

Loon Lake (55°33' N, 133°13' W):

Loon Lake is located 2.4 km east of Naukati Bay logging camp on Prince of Wales Island, 63 km north of Klawock. The lake is approximately 0.4 km long and 0.4 km wide. Bathymetric soundings indicate a maximum depth of 10 m.

Table 10. Length (mm), weight (gm), and age of cutthroat trout from Km 49 Lake, 1980.

Date	Length	Weight	Age
August 8	152	32	4
	134	25	3
August 9	261	194	7
	243	140	7
	217	109	5
	210	88	6
	190	75	4

Fig. 19. View of Landlocked Lake from road access.

The best access to Loon Lake is a logging spur road approximately 300 m past the lake on the right side when approached from Klawock. The logging spur road shoulders directly on the lake (Figure 20). A private canoe is kept at the lake near road access.

Cutthroat trout to 256 mm were caught in the lake (Table 11). They are not particularly plentiful. Loon Lake gets fairly heavy fishing pressure from people living at Naukati. There is a small private cabin being constructed on the island near the far side of the lake. The highest concentration of fish occurs in close proximity of the island.

Wildlife observed included loons and geese.

Loop Lake (55°48' N, 133°05' W):

Loop Lake is located 44 km north of Klawock and 3.2 km west of Holgrem Lake on Prince of Wales Island. The lake is approximately 0.62 km long and 0.30 km wide. Maximum depth recorded was 20 m.

Access to the lake from the road is difficult at best as Loop Lake lies in the middle of an extensive clearcut area (Figure 21). The Loop road passes within 0.25 km of the lake, but foot access should be undertaken with care. A possible alternative is to walk the outlet stream up from where the road passes close to it, approximately 1 km west of the lake. The best way to get to the lake requires a sturdy inflatable canoe or boat to work down the inlet on the northeast end of the lake from a logging spur road. This route requires several portages around logs and beaver dams.

There are no boat or cabin facilities present at the lake. Loop Lake contains a good population of cutthroat trout. The largest cutthroat sampled was 254 mm long. Dolly Varden were taken up to 189 mm in length. Rainbow trout fry were taken in traps at the outlet below the beaver dam. Length, weight, and age from fish sampled are presented in Table 12. The best fishing was in the outlet slough area (Figure 22), which is most conveniently fished by boat as the shore is undercut with beaver runs and covered with tall grass. Evidently the good population of fish is due to the excellent habitat and the difficult accessibility of the lake.

Wildlife observed included eagles, kingfishers, beaver, and waterfowl. Bear sign was also present.

Naukati Lake (55°54' N, 133°06' W):

Naukati Lake is located 56 km north of Klawock on Prince of Wales Island on the Thorne Bay-Naukati road. The lake is approximately 1 km long and 0.4 km wide and consists of two sections connected by a narrow canal. The main inlet stream flows from Rabbit Ear Lake, and the outlet flows to Naukati Creek (Figure 23). A secondary inlet flows from Landlocked Lake (1 km north) into Naukati Lake at the road access point (Figure 24). Maximum recorded depth was 10.6 m. Aquatic plants occupy a major portion of the surface as well as the subsurface area of the lake.

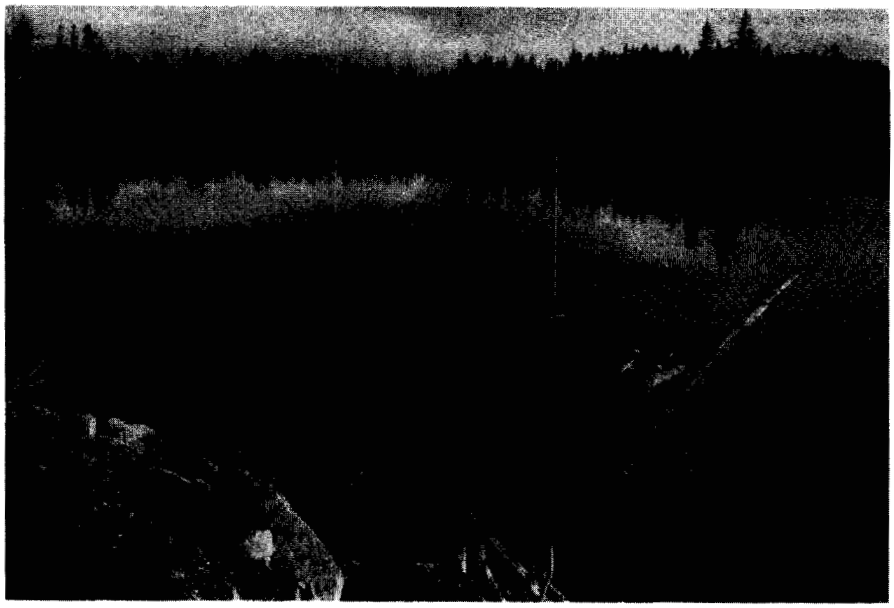

Fig. 20. View of Loon Lake from access road.

Table 11. Length (mm), weight (gm), and age of cutthroat trout from Loon Lake, 1980.

Date	Length	Weight	Age
August 19	256	174	7
	203	81	5
	202	80	7
	180	58	5
	153	35	4

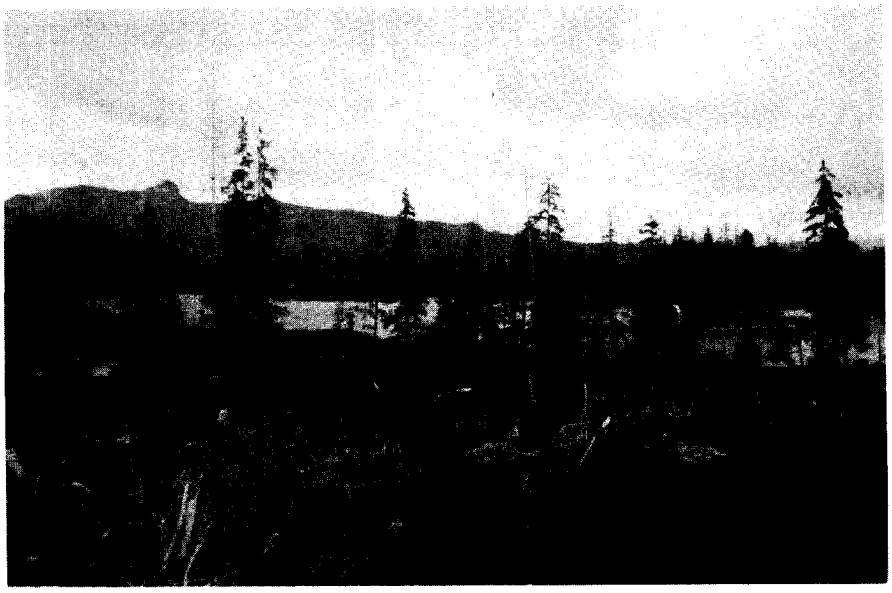

Fig. 21. Access to Loop Lake.

Table 12. Length (mm), weight (gm), and age of cutthroat trout and Dolly Varden from Loop Lake, 1980.

Date	Length	Weight	Age
	Cutthroat Trout		
August 9	208	99	5
	175	46	3
	169	47	3
	140	32	3
	123	20	3
	108	14	2
August 23	254	141	6
	220	104	5
	218	110	5
	218	94	5
	187	69	4
	Dolly Varden		
August 23	189	67	5
	180	57	5

Fig. 22. Loop Lake outlet slough and beaver dam.

Fig. 23. View of inlet (left top) and outlet (beaver dam) of Naukati Lake.

Fig. 24. View of inlet to Naukati Lake from road bridge.

There are no facilities at Naukati Lake. The road passes in close proximity to the lake, and an established trail approximately 100 m long leads to the lake. Naukati Lake attracts moderate fishing pressure. Fishing was found to be slow in the lake but fair-to-good below the beaver dam at the outlet. A boat or canoe is recommended for fishing the outlet, as foot access would be difficult. Cutthroat trout and Dolly Varden were present in the 200-260-mm range. Rainbow trout and coho salmon fry were caught in traps. Spawning sockeye salmon were present above the beaver dam and in the inlet stream. Length, weight, and age from fish sampled are presented in Table 13.

Wildlife observed included beaver, grouse, loons, and a sharp-shinned hawk. Bear sign was also present along the inlet-outlet shore.

Pass Lake (55°36' N, 133°01' W):

Pass Lake is a small beaver lake located 7.64 km from Klawock on the airport road. The lake is 1.2 km long and 0.32 km wide, consisting of a main body of water connected to two smaller ponds by a slough. Maximum depth is approximately 7 m.

There are no cabin or boat facilities at the lake. The road from Klawock north to the Thorne Bay-Naukati Bay road passes along the shore of the lake. The gravel road is used by logging trucks and is kept in good shape although due to rain or heavy use it can get rough in places. Driving time from Klawock is approximately 15 minutes.

There is a campsite for one small tent next to the lake, but parking space is at a minimum. Persons fishing at Pass Lake should use a turnout approximately 200 m north or south to avoid blocking traffic.

Cutthroat trout and Dolly Varden are present in the lake; however, the size of both species is rather small. Sport fishing produced cutthroats to 229 mm and Dolly Varden to 177 mm. Length, weight, and age of fish sampled are presented in Table 14. Best fishing was found just above the beaver dam at the outlet, using flies in the evening.

This is the first conspicuous lake along the road from Klawock, so people tend to stop and fish at Pass Lake before heading to the northern lakes on the island. Fishing pressure is moderate seasonally.

Bear sign was present at the outlet. Beavers, loons, and kingfishers were observed early in the mornings.

Rabbit Ear Lake (55°54' N, 133°02' W):

Rabbit Ear Lake is located 53.5 km from Klawock on Prince of Wales Island. The lake is 1.6 km long and 0.4 km wide. Maximum depth is 35 m. Rabbit Ear Lake derives its name from its shape, which is roughly that of a rabbit's head from the air.

Table 13. Length (mm), weight (gm), and age of cutthroat trout and Dolly Varden from Naukati Lake, 1980.

Date	Length	Weight	Age
	Cutthroat Trout		
August 15	178	56	5
	165	47	4
	145	27	3
	117	17	5
August 18	264	172	5
August 22	258	152	6
	233	98	7
	129	22	3
	124	16	4
	Dolly Varden		
August 15	200	67	6
	172	47	4
	168	43	3
	125	18	3
	120	15	4
	98	9	2
	80	6	2
August 22	215	90	4
	211	83	3
	188	58	3
	93	2	2

Table 14. Length (mm), weight (gm), and age of cutthroat trout and Dolly Varden from Pass Lake, 1980.

Date	Length	Weight	Age
	Cutthroat Trout		
August 4	228	128	5
	193	91	5
	185	70	4
	167	51	6
	152	38	4
	115	18	3
	108	16	3
August 25	161	45	6
	155	34	5
	130	20	5
	Dolly Varden		
August 4	177	64	5
	172	56	6
	165	38	5
	164	48	4
	164	48	4
	145	34	3
	79	79	6
	110	14	2

Table 15. Length (mm), weight (gm), and age of cutthroat trout and Dolly Varden from Rabbit Ear Lake, 1980.

Date	Length	Weight	Age
	Cutthroat Trout		
August 17	249	141	8
	225	116	8
	220	114	8
	180	62	5
	170	50	4
	138	23	6
	Dolly Varden		
August 17	95	7	3
	78	5	3

Road access to the lake can be a challenge for those unfamiliar with the area because it is located on a logging spur road, several winding miles from the main thoroughfare. To drive to Rabbit Ear Lake, go north from Klawock on the main road to the Naukati road (straight on past Holgrem Lake) and turn right. There is a "Thorne Bay-Naukati" sign post at the spur's intersection with the main road. Drive approximately 4 km staying on the main spur road; all the others are short dead ends. The lake is near the end of the road, visible through the trees across a clearcut on the left side. The easiest foot access is down a streambed approximately 0.25 km from the end of the road.

Cutthroat trout and Dolly Varden are present although not in any great numbers. Gill nets captured cutthroats to 249 mm, while fry traps caught small (95 mm) Dolly Varden and coho salmon. Length, weight, and age of fish sampled are presented in Table 15.

Largest concentrations of fish occur just above the outlet beaver dam system on the road side of the lake.

Rabbit Ear Lake is one of the most scenic lakes in the area, primarily because timber has been left standing along its shores. Wildlife observed included kingfishers, loons, hawks, and geese.

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