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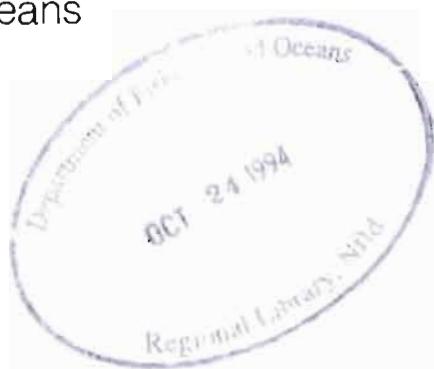
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# Fish Resource Data from the Snare River, Northwest Territories

E.F. Jessop, K.T.J. Chang-Kue and  
G. MacDonald

Central and Arctic Region  
Department of Fisheries and Oceans  
Winnipeg, Manitoba R3T 2N6

1994



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by

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## ABSTRACT

Jessop, E.F., K.T.J. Chang-Kue, and G. MacDonald. 1994. Fish resource data from the Snare River, Northwest Territories. Can. Data Rep. Fish. Aquat. Sci. 930: v + 48 p.

Fish populations were sampled, from May to July 1977, in five sections of the Snare River influenced by hydroelectric development. The biweekly catch composition in experimental gillnets for each study area and the catch per gillnet mesh size are presented for walleye (*Stizostedion vitreum*), lake trout (*Salvelinus namaycush*), lake whitefish (*Coregonus clupeaformis*), lake cisco (*Coregonus artedi*), northern pike (*Esox lucius*), white sucker (*Catostomus commersoni*) and longnose sucker (*Catostomus catostomus*). Age-specific data on length, weight, age, sex and maturity are also included. We also released 530 tagged fish, comprising mainly walleye (31%), northern pike (22%), longnose suckers (19%) and lake trout (11%).

**Key words:** Snare River; Strutt Lake; Judd Lake; Bigspruce Lake; hydroelectric reservoirs; fishery surveys; gillnetting; walleye; *Stizostedion vitreum*; lake trout; *Salvelinus namaycush*; lake whitefish; *Coregonus clupeaformis*; lake cisco; *Coregonus artedi*; longnose suckers; *Catostomus catostomus*; white sucker; *Catostomus commersoni*.

## RÉSUMÉ

Jessop, E.F., K.T.J. Chang-Kue, and G. MacDonald. 1994. Fish resource data from the Snare River, Northwest Territories. Can. Data Rep. Fish. Aquat. Sci. 930: v + 48 p.

De mai à juillet 1977, on a échantillonné les populations ichtyologiques de cinq parties de la rivière Snare subissant l'influence d'aménagements hydro-électriques. Dans chacune des zones à l'étude, on a fait deux prélèvements par semaine au moyen de filets maillants expérimentaux; on donne la composition des captures pour chaque zone et les prises par grandeur de maille en considérant les espèces suivantes : doré (*Stizostedion vitreum*), touladi (*Salvelinus namaycush*), grand corégone (*Coregonus clupeaformis*), cisco de lac (*Coregonus artedi*), grand brochet (*Esox lucius*), meunier noir (*Catostomus commersoni*) et meunier rouge (*Catostomus catostomus*). On présente également diverses données en fonction des classes d'âge : longueur, poids, âge, sexe et stade de maturation. On a lâché 530 poissons étiquetés et plus précisément des dorés (31 %), des grands brochets (22 %), des meuniers rouges (19 %) et des touladis (11 %).

**Mots-clés:** rivière Snare; lac Strutt; lac Judd; lac Bigspruce; réservoirs de barrages hydro-électriques; recensement des populations ichtyologiques; filet maillant; doré; *Stizostedion vitreum*; touladi; *Salvelinus namaycush*; grand corégone; *Coregonus clupeaformis*; cisco de lac; *Coregonus artedi*; meunier rouge; *Catostomus catostomus*; meunier noir; *Catostomus commersoni*.



## INTRODUCTION

The Snare River provides the Yellowknife region (Fig. 1) with hydroelectric power at three dams currently on line. The first power plant was constructed in 1948 at Snare Rapids, located 1.6 km below the outlet of Bigspruce Lake (Fig. 2). The second power plant was built at Snare Falls, 12.8 km downstream from the first plant. Each facility produces 7 MW (megawatts) of electricity. In 1974-1975 a third dam and power plant, with a capacity of 10 MW, was constructed 14.5 km further downstream at a site called Snare Forks. All three developments were constructed and operated by the Northern Canada Power Commission (NCPC).

The preliminary plan for the Snare Forks development proposed the creation of a reservoir at Judd Lake from which water was to be diverted to a powerhouse on Strutt Lake; this plan was referred to as the Strutt Lake Hydro Project (Northern Canada Power Commission 1973). The Department of Fisheries and Oceans (DFO) conducted a two-week survey (6-16 September 1973) in Strutt Lake, Judd Lake and Snare Falls reservoir to collect data for an initial impact assessment (Weagle and Cameron 1974). In the final pre-construction engineering report (January 1974), plans for the Strutt Lake facility had been abandoned and the Snare Forks area was designated instead as the best site for a dam and powerhouse (W. F. Kelly Associates 1974).

We returned to the region in 1977 to conduct a more extensive fish sampling and tagging program. The purpose was to collect baseline data on the fish populations in sections of the river altered by hydroelectric projects. We had previously collected data in 1976 on the fish in Indin Lake, an upstream lake not influenced by any hydroelectric structures (Jessop et al. 1993). This report presents the data collected in 1977 in areas of the Snare River influenced by the cumulative series of hydroelectric developments.

## DESCRIPTION OF STUDY AREA

The Snare River ( $63^{\circ} 07'N$ ,  $115^{\circ} 53'W$ ) originates above the treeline and flows southwards for 470 km before entering into the north arm of Great Slave Lake (Fig. 1). Several large lakes such as Snare, Indin, Whitewolf and Bigspruce provide natural storage in the river system. The conservation reservoir behind

the Snare Rapids hydroelectric plant (Bigspruce Lake) creates artificial storage of approximately 220 000 acre feet (Northern Canada Power Commission 1973). There are many shallow lakes in the watershed and old water courses are evident. Although the river appeared to break up temporarily into two separate channels at a site known as Snare Forks, the main discharge was through the east fork (Fig. 2). This flow was diverted through the west fork during the construction of the Snare Forks dam/powerhouse which was eventually built on the east fork in 1974-1975.

The rugged terrain in the area reflects the watershed's Precambrian shield location. There are deposits of glacial drift in sheltered areas and glacial material is common in the river bed. Sporadic beach-like formations containing sand, fine gravel and some water-sorted cobble are common throughout the area. The terrain bordering Strutt Lake and the east bank of the Snare River, from Slementon Rapids to Snare Cascades, is very hilly with exposed outcroppings of metamorphic rock. Hills around Judd Lake rise 152 m above the river bed. The west bank of this section of river has low but very rugged relief. The relief north of Snare Cascades is low although outcrops are still common. Ice scouring around the shoreline of Bigspruce Lake is very noticeable and zones of submerged trees are still evident along a shoreline that was first inundated in 1949.

The study area in 1977 encompassed Bigspruce Lake and extended downstream as far as Slementon Rapids (Fig. 2). Strutt Lake, separated by a shallow rock shelf from the main river course, was also included. Sampling was conducted in five sub-areas determined mainly by the presence or influence of old and recent hydroelectric structures:

- Bigspruce Lake: - a 29 year old storage reservoir,
- Judd Lake: - now incorporated as part of the new storage reservoir created in 1974/75 for the Snare Forks hydroelectric plant,
- Strutt Lake: - located below Snare Forks. This lake's water levels may be altered if water levels in the lower Snare River are reduced by the additional removal of controls in the river channel,
- Upper Snare River: - the reach of river between

Snare Cascades and Snare Forks dam (Judd Lake excluded); this section became part of the storage reservoir for the Snare Forks project,

**Lower Snare River:** - the reach of river between Snare Forks dam and Slemon Rapids.

The reach between Snare Rapids dam and Snare Cascades was not studied because our resources and logistics in the upper study area were focused only on Bigspruce Lake.

#### METHODS AND MATERIALS

##### EXPERIMENTAL GILLNETS

Multi-mesh gillnet gangs were used to obtain a representative sample of the various fish populations within each sub-area during the open water season. Two types of gillnet gangs were used: a light weight gillnet 60 m in length (manufactured in Sweden) and a standard commercial grade gillnet 137 m in length. Both gangs consisted of equal length panels of 38, 51, 76, 102, 127, and 140 mm (stretched measure) multi-filament nylon mesh. Nets were set on the bottom at depths ranging from 1.0 to 32.0 m for approximately 24 hours per set. This experimental fishing program was conducted at 39 sites (Fig. 3 and 4). River locations were sampled more intensively in May while other locations throughout the study area were sampled in June and July (Table 1). The study was conducted by a two-man crew operating from a field camp set up near the Snare Forks plant.

##### FISH TAGGING

Fish were tagged throughout the period from 17 May to 24 July to determine any local movements from fish recaptured by our own fishing efforts or by NCPC personnel. Serially numbered vinyl anchor tags, made by Floy Manufacturing Inc., were used. A Dennison tagging gun was used to insert a tag at the base of the dorsal fin. The tag's t-bar was anchored between the pterigiophores to minimize tag loss. Gillnets 23 m and 46 m in length (mesh size: 76mm and 38mm stretched measure, respectively) were used occasionally for fish capture. Most of the fish selected

for tagging came from the experimental gillnets whenever fish were found alive and in good condition. Angling was also used to capture Arctic grayling for tagging at location 28 on the upper Snare River.

##### SMALL FISH CAPTURE

Minnow traps, a fry trap, dipnet and a beach seine were used to determine the species composition and abundance of juvenile and small fish species at eight sites in the study area (Fig. 5). The beach seine was 9.1 m long by 1.1 m deep and made of 6.4 mm oval delta mesh. The minnow traps were the standard commercial type made of galvanized wire mesh with funnel openings at each end. These traps were set at depths of up to one meter at river locations and on the creek bed at two inlet stream locations. The fry trap at location S<sub>a</sub> consisted of a small wooden box constructed with flow-through mesh side panels and with internal baffles to create a holding area for the trapped fish. A plastic pipe and hose clamp connected the box to a funnel, made with 6.4 mm oval delta mesh, that opened to a 60 cm square wood-framed mouth. The fry trap was generally set in a riffle area with the funnel tied in place between metal rods anchored in the substrate. The trap box was held in place with rocks or sand bags.

Fry and minnow traps were checked whenever gillnets were retrieved in the vicinity. All fish were identified, counted and released. On some occasions a dipnet or beach seine was used to capture other small fish or fry observed in the area. Seining efforts were generally ineffective because of the boulder substrate or submerged vegetation along flooded shorelines.

##### FISH SAMPLING

All fish collected from gillnets were enumerated and identified using the keys in McPhail and Lindsey (1970). Fish were either sacrificed for analysis or released. We minimized the sample of fish sacrificed for biological analysis by releasing any fish that were still alive during retrieval from gillnets. As a result, many uninjured walleye and lake trout were tagged and released. Fork length ( $\pm 1.0$  mm) and round weight ( $\pm 1.0$  g) were taken for all fish sampled and for most of the tagged fish. Scales were collected for ageing of walleye, lake whitefish, lake cisco, white sucker and northern pike. Otoliths were removed from

sampled lake trout for ageing. Fish stomachs were collected and preserved in 10% formalin for content analysis later in the laboratory. Gonad maturity and the sex of fish were determined through examination of gonads and recorded according to the following scale:

Female	Male	Maturity
0	0	unknown
1	6	immature
2	7	maturing
3	8	mature
4	9	ripe
5	10	spent

#### LABORATORY AND DATA ANALYSIS

Scales were prepared for aging by first cleaning in a water and bleach solution followed by mounting between glass slides. Ages were determined by viewing the magnified image of scales on a Leitz trichinoscope. Otoliths were prepared for aging by hand grinding on a carborundum stone to reduce the thickness prior to clearing with a 3:1 solution of benzyl benzoate:methyl salicylate. Ages were obtained by viewing the otolith through a stereo dissection microscope. In both procedures only completed annuli were counted.

Data was analyzed with a Micro Vax II computer system at the Freshwater Institute in Winnipeg, Manitoba. The Statistical Analysis System (SAS Institute Inc. 1985) was used to generate length, weight, age and maturity summaries. Length-weight relationships were described by the following equation:

$$\log_{10} W = a + b (\log_{10} L)$$

where:

W = weight (g)

a = Y-intercept

b = slope of the regression line

L = fork length (mm)

Condition factor (K) was calculated for individual fish using the formula:

$$K = (W \times 10^5) / L^3$$

where:

W = weight (g)

L = fork length (mm)

Stomach contents were identified using a dissection microscope. Where possible, organisms (food items and parasites) were identified only to order. Frequency and percent occurrence of these items were recorded.

#### WATER CHEMISTRY

A field water test kit (Hach: Model AL36B) was used to measure dissolved oxygen, alkalinity, total hardness, dissolved CO<sub>2</sub> and pH at eight locations in the Snare River study area (Fig. 6). Conductivity was measured with a Yellow Springs Instrument (YSI) Model 33 conductivity/temperature meter. A water sample was taken at the surface and near the bottom for analysis at each site.

#### RESULTS

##### CATCH SUMMARY AND SPECIES COMPOSITION

Fourteen fish species were recorded during the study (Table 2). The biweekly catch composition and number of individual gillnet fishing efforts in each sampling area are presented in Table 3. The total catch of fish taken by the experimental gillnetting crew was 3 035. Lake whitefish, northern pike and walleye were the most abundant species with overall totals of 1 294, 576 and 511, respectively, making up 42.6%, 19.0% and 16.8% of the catch. The other species captured were lake trout (8.8%), lake cisco (5.3%), longnose sucker (3.9%), white sucker (3.2%), Arctic grayling (0.2%), and burbot (0.07%). Arctic grayling was poorly represented because this species inhabited the fast water reaches where effective sampling with gillnets was not possible.

The overall gillnet catch composition of fish among the five areas varied. Strutt Lake had the greatest species diversity with ten species while Bigspruce Lake had only five. While walleye was absent in Bigspruce Lake, Judd Lake and upper Snare River (Table 3), it was the second most abundant species in Strutt Lake (18.2%) and the dominant species in the lower Snare River (50.6%). The large catch of walleye in late May in the lower Snare River coincided with the spawning period of this species. Lake whitefish, present in all areas, was the most abundant species in Strutt Lake (49.7%), Bigspruce Lake

(63.0%) and Judd Lake (41.7%). Northern pike was also present in all five areas, especially in the upper Snare River, lower Snare River and Strutt Lake.

The gillnet catch data are also summarized in Tables 4 to 8 where the number of fish caught, and the data on fork length, weight and age of each species taken per mesh size are presented for each area.

A total of 6 779 fish was taken with fry trap, minnow traps, dipnet and beach seines (Table 9). Spottail shiner and coregonid fry were the most abundant species, comprising 69.5% and 28.4% of the total catch. Other species present were trout perch, lake chub, ninespine stickleback, slimy sculpin, northern pike, white sucker, and lake whitefish. The large number of spottail shiners taken in late June at one stream in Strutt Lake (Location S<sub>a</sub>) most likely represented an aggregation associated with spawning.

#### TAGGED FISH

The total number of fish tagged and released in the study area was 530 (167 walleye, 131 northern pike, 104 longnose suckers, 69 lake trout, 44 lake whitefish, 12 white suckers, two Arctic grayling and one burbot). Nine walleye, five northern pike, four lake trout, and three longnose suckers were recaptured in our survey nets (Table 10). We observed that location 7 in the lower Snare River was an aggregation site during May for walleye in spawning condition. Recaptured fish showed that the summer habitats of walleye released at this site were located downstream within the river (Location 34) as well as upstream in Strutt Lake (Location 13 and 21). Data for lake trout and northern pike indicated little net movement for individual fish from their original release site even when recaptured 24-61 days later. Data on all fish tagged and released in this study can be obtained by contacting the senior author, or Mr. Blair Dunn at:

Department of Fisheries and Oceans  
Freshwater Institute  
501 University Crescent  
Winnipeg, Manitoba  
Canada, R3T 2N6

#### BIOLOGICAL DATA

Length-frequency histograms are presented by area for walleye, lake whitefish, northern pike, long-

nose sucker, white sucker, lake trout, and lake cisco in Figures 7 to 12. Age-frequency and age specific data on length, weight, sexual maturity and condition factor are presented for all major species in each area (Appendix 1). Length-weight relationships for walleye, lake whitefish, northern pike, longnose sucker, white sucker, lake trout and lake cisco are presented by area in Appendix 2. Tables summarizing the frequency and percent occurrence of food items in stomachs of lake whitefish are presented in Appendix 3. There was insufficient data on the diet of other species.

#### WATER CHEMISTRY

Water chemistry data at eight locations in the study area are summarized in Table A4.1.

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Table 1. Number of gillnet sets and total hours fished per biweekly interval at locations in the Snare River, 1977.

Gillnetting	Lower Snare River															Upper Snare River													
	1	2	2	3	5	7	7	8	8	9	10	11	19	34	35	4	6	6	16	17	18	26	27	28	29	36			
<b>Biweekly Period</b>																													
May 6 - May 19	1	4	1	4	2	2	1	1																					
May 20 - June 2		1				15		1		1	2	1																	
June 3 - June 16			1		1							1	1																
June 17 - June 30		1		1	1	1						1	1	1	1														
July 1 - July 14							1																						
July 15 - July 28		1		1	1	1							1		1	1													
TOTAL HOURS	21	156	21	181	93	388	18	42	6	24	45	101	40	59	57		21	21	91	92	94	94	44	77	72	24	48		
Gear	A	A	C	A	A	A	C	A	D	A	A	A	A	A	A	B	A	B	A	A	A	B	A	A	A	A			

Gillnetting	Strutt Lake									Judd Lake					Bigspruce Lake						Angling: Upper Snare River				
	12	12	13	13	14	15	20	21	39	22	23	24	25		30	31	32	33	37	38	28				
<b>Biweekly Period</b>																									
May 6 - May 19																									
May 20 - June 2	1		1		1	1																			
June 3 - June 16		1		1			1	1			1	1	1	1											
June 17 - June 30		1		1						1	1	1	1					1	1	1	1				
July 1 - July 14						1	1			1	1	1	1				1	1	1	1					
July 15 - July 28		2		1			1	1	1		1	1	1				1	2	1	2	1	1			
TOTAL HOURS	17	97	18	81	19	19	74	68	29	74	79	73	52		67	90	60	57	24	27		3			
Gear	A	B	A	B	A	A	B	B	B	B	B	B	B		B	B	B	B	B	B					

A 60m swedish gang. Six panels, 10m each. Meshes: 38mm, 51mm, 76mm, 102mm, 127mm, 140mm. Set Overnight.  
 B 137m standard gang. Six panels, 22.9m each. Meshes: 38mm, 51mm, 76mm, 102mm, 127mm, 140mm. Set Overnight.  
 C 46m net of 38mm mesh. Set Overnight.  
 D 23m net of 76mm mesh. Day set.

Table 2. Scientific and common names of fish species captured in the Snare River, 1977.

Family and Species <sup>1</sup>	Common Name	Species Code <sup>2</sup>
<b>FAMILY SALMONIDAE</b>		
<i>Coregonus artedi</i> Lesueur, 1818	Lake cisco	LKCS
<i>Coregonus clupeaformis</i> (Mitchill, 1818)	Lake whitefish	LKWT
<i>Salvelinus namaycush</i> (Walbaum, 1792)	Lake trout	LKTR
<i>Thymallus arcticus</i> (Pallas, 1776)	Arctic grayling	ARGR
<b>FAMILY PERCIDAE</b>		
<i>Stizostedion vitreum</i> (Mitchill, 1818)	Walleye	WALL
<b>FAMILY GADIDAE</b>		
<i>Lota lota</i> (Linnaeus, 1758)	Burbot	BRBT
<b>FAMILY ESOCIDAE</b>		
<i>Esox lucius</i> Linnaeus, 1758	Northern pike	NRPK
<b>FAMILY COTTIDAE</b>		
<i>Cottus cognatus</i> Richardson, 1836	Slimy sculpin	SLSC
<b>FAMILY CATOSTOMIDAE</b>		
<i>Catostomus catostomus</i> (Forster, 1773)	Longnose sucker	LNSK
<i>Catostomus commersoni</i> (Lacepède, 1803)	White sucker	WTSK
<b>FAMILY CYPRINIDAE</b>		
<i>Couesius plumbeus</i> (Agassiz, 1850)	Lake chub	LKCH
<i>Notropis hudsonius</i> (Clinton, 1824)	Spottail shiner	STSH
<b>FAMILY PERCOPSIDAE</b>		
<i>Percopsis omiscomaycus</i> (Walbaum, 1792)	Trout perch	TPCH
<b>FAMILY GASTEROSTIDAE</b>		
<i>Pungitius pungitius</i> (Linnaeus, 1758)	Ninespine stickleback	NSSB

<sup>1</sup> From Robins et al. (1991)<sup>2</sup> Species codes used in tables 3, 9 and 10

Table 3. Total catch and species composition, per biweekly period, of fish captured in five Snare River study areas, 1977.

	SPECIES									TOTAL	NO. OF SETS			
	WALL	LKWF	NRPK	LKTR	ARGR	ROWF	LKCS	WTSK	LNSK	BRBT	A	B	C	D
<u>LOWER SNARE RIVER</u>														
MAY 6 - MAY 19	70	35	60	1				22	2		190	14		2
MAY 20 - JUNE 2	163	39	51					11			264	21		
JUNE 3 - JUNE 16	10	8	14					9			41	4		
JUNE 17 - JUNE 30	46	14						1			81	8		
JULY 1 - JULY 14	1	24						1			28			1
JULY 15 - JULY 28	30	2	13					3			48	7		
TOTAL	319	99	162	1				46	3		630	54	2	1
<u>UPPER SNARE RIVER</u>														
MAY 6 - MAY 19	8	8		4				3			23		2	
JUNE 3 - JUNE 17	43	33	8	8 *			1	2	24		115	10	2	
JULY 1 - JULY 14	26	60	2	4 *					17		109	6	-2	
JULY 15 - JULY 28	23	16		1 *					13		53	6	1	
TOTAL	100	117	8	15			1	2	57		300	22	7	
<u>STRUTT LAKE</u>														
MAY 20 - JUNE 2	1	14	11					3			29	4		
JUNE 3 - JUNE 18	14	114	41	33	1	2	37	24	6		272		4	
JUNE 17 - JUNE 30	4	92	3	22		1	22	3	1		148		2	
JULY 1 - JULY 14	90	40	21	2				5		1	159		2	
JULY 15 - JULY 28	83	264	26	28			31	13	2		447		6	
TOTAL	192	524	102	85	1	3	90	48	9	1	1055	4	14	
<u>BIGSPRUCE LAKE</u>														
JUNE 17 - JUNE 30	92	8	42				23			1	166	4		
JULY 1 - JULY 14	80	4	34				8				126	3		
JULY 15 - JULY 28	208	21	45				37				311	8		
TOTAL	380	33	121				68			1	603	15		
<u>JUDD LAKE</u>														
JUNE 3 - JUNE 18	66	63	28	1	2			20			186	4		
JULY 1 - JULY 14	61	67	18			2		16			164	4		
JULY 15 - JULY 28	64	32	6					6			108	3		
TOTAL	191	162	52	1	2	2		48			458	11		
GRAND TOTAL	511	1294	576	267	17 **	5	181	96	117	2	3046 **			

\* Arctic grayling, taken with angling gear at Snare Cascades.

\*\* These eleven grayling are included in the grand totals.

A 60 m Swedish gillnet gang

C 46 m gillnet (38 mm mesh, stretched measure)

B 137 m standard gillnet gang

D 23 m gillnet (76 mm mesh, stretched measure)

Table 4. Length, weight and age summary by mesh size for fish captured by gillnets in the lower Snake River, 1977.

Species	Mesh (mm)	Length (mm)			Weight (g)			Age (years)					
		n	Mean	SD	n	Mean	SD	n	Mean	SD			
walleye	38	22	357	75.5	249-455	22	579	350.9	149-1175	22	8.7	3.9	3-14
	51	99	383	61.5	189-521	99	706	278.8	70-1550	96	10.6	3.0	3-17
	76	131	407	39.5	291-570	131	801	219.9	260-1400	120	11.3	2.5	5-20
	102	49	419	39.5	268-541	49	883	235.4	200-1600	49	12.0	2.3	9-17
	127	14	447	21.6	415-484	14	1069	185.1	790-1440	14	12.5	2.3	9-17
	140	4	483	52.2	433-548	4	1205	424.5	900-1825	3	15.7	5.5	12-22
	Totals	319			189-570	319			70-1825	304			3-22
lake whitefish	38	27	305	93.5	174-426	27	547	440.8	65-1190	27	5.7	3.1	1-10
	51	13	364	76.9	210-449	13	772	403.0	110-1300	12	6.8	2.4	2-9
	76	30	386	52.8	249-493	30	901	347.6	200-1980	30	8.0	1.7	5-12
	102	21	417	25.6	368-455	21	1101	203.3	725-1430	20	9.0	1.6	7-13
	127	5	391	26.6	345-414	5	1120	263.9	930-1550	5	7.0	0.7	6-8
	140	4	427	9.8	419-440	4	1081	170.0	850-1250	4	7.3	1.0	6-8
	Totals	100			174-493	100			65-1980	98			1-13
northern pike	38	29	445	153.5	235-754	29	865	810.1	100-3210	29	5.4	2.4	2-11
	51	37	465	169.7	200-850	37	990	1051.4	160-3590	37	5.5	2.4	3-11
	76	46	555	115.2	296-740	46	1315	687.5	200-2820	43	7.0	1.9	4-10
	102	34	689	101.6	498-935	34	2353	1074.6	975-5900	32	8.5	2.2	1-13
	127	14	716	85.0	615-950	14	2825	1346.1	1560-7000	14	9.0	2.1	6-13
	140	2	748	137.9	650-845	2	3088	1431.9	2075-4100	2	9.5	0.7	9-10
	Totals	162			200-950	162			100-7000	157			1-13
white sucker	38	10	237	64.2	180-400	10	222	241.9	80-880	9	4.3	1.5	3-8
	51	10	217	48.8	100-291	10	160	66.6	100-320	7	3.7	0.8	3-5
	76	18	266	72.0	220-488	18	772	432.0	135-1740	17	6.4	1.7	3-9
	102	6	398	70.4	270-487	6	993	473.1	250-1690	6	6.7	2.3	4-11
	127	1	410			1	1245			1	7.0		
	140												
	Totals	45			100-488	45			80-1740	40			3-11
longnose sucker	51	1	414			1	940			0			
	76	1	500			1	1800			0			
	102	1	500			1	1475			0			
	Totals	3				3				0			

Table 5. Length, weight and age summary by mesh size for fish captured by gillnets in Strutt Lake, 1977.

Species	Mesh (mm)	Length (mm)				Weight (g)				Age (years)			
		n	Mean	SD	Range	n	Mean	SD	Range	n	Mean	SD	Range
walleye	38	17	387	65.5	251-490	17	650	290.4	160-1320	16	9.9	3.7	4-16
	51	66	367	71.5	288-497	66	561	294.8	160-1280	63	9.5	3.7	3-17
	76	64	408	44.3	286-555	64	724	203.5	310-1440	62	11.3	2.4	4-16
	102	41	446	34.0	338-520	41	913	174.7	475-1350	38	12.0	1.9	9-16
	127	4	499	56.5	435-570	4	1244	317.8	975-1700	4	12.5	3.5	12-18
	Totals	192			251-570	192			160-1700	183			3-18
lake whitefish	38	65	285	96.7	161-467	65	431	404.3	50-1490	60	4.9	2.2	2-9
	51	142	286	69.8	180-439	142	369	309.0	70-1325	134	4.8	1.6	2-9
	76	148	342	50.5	228-451	148	584	290.4	140-1440	144	5.9	1.7	3-10
	102	107	383	34.1	275-470	107	793	235.8	360-1520	103	6.8	1.6	3-11
	127	40	408	25.7	350-493	40	1001	203.8	690-1800	39	7.1	0.7	6-10
	140	22	437	28.6	395-514	22	1236	218.0	995-1800	21	8.0	1.0	7-9
northern pike	Totals	524			161-514	524			50-1800	501			2-11
	38	21	560	192.5	292-958	21	1699	1731.6	155-6700	20	6.2	2.9	2-13
	51	31	526	165.6	280-940	31	1404	1605.7	160-7200	30	6.2	2.5	3-11
	76	30	592	120.3	382-845	30	1549	880.5	425-4500	30	7.0	2.1	4-12
	102	15	704	91.3	608-960	15	2380	1162.0	1480-6000	15	9.1	1.9	6-14
	127	2	875	76.4	821-929	2	4905	1124.3	4110-5700	2	10.5	2.1	9-12
lake trout	140	3	727	299.1	460-1050	3	3420	3991.8	680-8000	3	8.7	4.0	5-13
	Totals	102			280-1050	102			155-8000	100			2-14
	38	13	576	61.2	482-683	13	2330	1057.0	1200-5250	7	21.4	8.3	10-32
	51	17	603	48.5	510-674	17	2622	628.6	1640-3760	12	23.9	10.9	10-40
	76	18	634	90.1	439-840	18	3134	1771.0	875-7900	10	26.6	10.4	10-38
	102	24	628	90.2	528-875	24	3258	2408.9	1215-10250	14	23.1	8.1	11-38
lake cisco	127	8	602	33.0	552-660	8	2526	383.0	1855-3060	5	27.4	5.6	23-36
	140	5	629	71.6	560-745	5	3086	1156.5	2000-5000	2	23.0	5.7	19-27
	Totals	85			439-875	85			875-10250	50			10-40
	38	48	187	19.6	150-240	48	72	28.7	30-170	40	4.7	1.2	2-6
	51	41	219	12.8	192-245	41	123	23.1	80-190	40	6.3	1.2	4-9
	76	1	213		150-245	1	115		30-190	1	12.0		2-9
white sucker	Totals	90				90				81			
	38	6	193	36.9	158-244	6	112	66.0	45-205	5	3.4	0.9	3-5
	51	27	249	39.7	215-399	27	222	173.3	115-960	26	4.4	1.2	3-9
	76	15	328	36.5	240-400	15	539	179.0	200-935	15	5.9	1.2	4-9
longnose sucker	Totals	48			158-400	48			45-960	46			3-9
	76	4	388	25.1	352-410	4	643	240.7	323-895	0			
	102	5	471	72.7	422-600	5	1373	541.9	960-2310	0			
		Totals	9		352-600	9			323-2310	0			

Table 6. Length, weight and age summary by mesh size for fish captured by gillnets in the upper Snare River, 1977.

Species	Mesh (mm)	Length (mm)				Weight (g)				Age (years)			
		n	Mean	SD	Range	n	Mean	SD	Range	n	Mean	SD	Range
lake whitefish	38	14	351	82.8	182-486	14	713	404.6	280-1400	13	4.6	1.7	2-8
	51	17	404	73.8	298-540	17	1055	604.0	390-2280	16	5.5	2.0	3-9
	76	15	409	58.4	317-502	15	1087	435.5	440-1800	13	6.2	1.7	4-10
	102	16	441	45.4	358-510	16	1321	406.8	670-1900	15	7.1	1.5	5-10
	127	6	449	24.7	405-475	6	1422	255.0	990-1755	6	8.5	1.1	7-10
	140	9	454	19.4	425-485	9	1467	147.1	1215-1680	9	6.9	0.9	5-8
Totals		77			182-540	77			280-2280	72			2-10
northern pike	38	22	438	125.8	235-594	22	718	526.0	100-1580	22	4.3	1.6	2-7
	51	30	457	101.1	322-692	30	728	466.9	250-1975	27	4.8	1.3	3-7
	76	25	556	72.7	450-685	25	1216	443.0	590-2015	25	5.9	1.4	4-9
	102	11	632	112.8	354-793	11	1873	856.6	300-3600	11	7.0	2.1	4-11
	127	7	655	71.9	588-775	7	1917	669.8	1200-3200	7	8.0	1.4	6-10
	140	5	815	72.3	747-900	5	3620	918.3	3010-5100	5	11.2	1.3	10-13
Totals		100			235-900	100			100-5100	97			2-13
lake trout	38	1	552			1	2000			1	16.0		
	51	2	541	15.6	530-552	2	1950	268.7	1760-2140	1	13.0		
	102	2	554	51.6	517-590	2	2065	784.9	1510-2620	2	22.5	7.8	17-28
	127	3	559	35.2	520-588	3	2022	220.6	1775-2200	0			
	Totals	8			517-590	8			1510-2620	4			17-28
longnose sucker	38	5	434	71.9	360-535	5	1244	719.2	605-2250	0			
	51	4	462	70.9	415-567	4	1459	753.0	855-2560	0			
	76	8	425	52.7	330-491	8	1166	465.7	413-1735	0			
	102	14	482	42.2	430-565	14	1681	441.4	1200-2525	0			
	127	9	504	47.9	450-580	9	1804	532.6	1250-2650	0			
	140	4	500	36.2	460-540	4	2023	324.8	1660-2450	0			
Totals		44			330-580	44			413-2650				

Table 7. Length, weight and age summary by mesh size for fish captured by gillnets in Judd Lake, 1977.

Species	Mesh (mm)	Length (mm)				Weight (g)				Age (years)			
		n	Mean	SD	Range	n	Mean	SD	Range	n	Mean	SD	Range
lake whitefish	38	26	288	110.8	159-460	26	495	487.6	40-1560	26	4.2	2.3	1-8
	51	42	343	87.4	205-491	42	732	591.3	110-2325	40	5.1	2.0	2-9
	76	61	376	61.3	270-512	61	823	436.0	275-2040	61	5.8	1.7	3-10
	102	31	409	53.9	318-551	31	1025	454.5	330-2400	29	6.8	1.8	4-12
	127	12	413	84.8	184-478	12	1127	470.1	65-1790	11	7.1	2.5	2-12
	140	19	459	24.6	420-507	19	1463	207.2	1100-1790	18	7.8	0.9	6-9
	Totals	191			159-551	191			40-2400	185			1-12
northern pike	38	49	430	146.1	240-813	49	778	922.5	100-4100	49	4.5	2.3	2-11
	51	56	437	34.6	285-665	56	639	434.6	200-2200	54	4.2	1.2	3-9
	76	41	528	101.0	342-707	41	1135	700.5	250-2830	40	5.5	1.7	3-9
	102	11	615	80.3	390-670	11	1749	537.8	395-2520	9	7.1	2.2	3-11
	127	3	761	88.3	700-862	3	2693	971.1	1750-3890	3	9.7	0.6	9-10
	140	2	935	91.9	870-1000	2	6507	2252.0	4915-8100	2	11.0	4.2	8-14
	Totals	162			240-1000	162			100-8100	157			2-14
lake trout	38	3	582	63.0	519-645	3	2542	1063.1	1500-3625	2	17.5	13.4	8-27
	51	11	527	96.8	400-640	11	1909	1052.7	655-3490	6	11.8	6.2	6-24
	76	11	527	57.6	425-607	11	1825	622.2	790-2780	8	11.9	3.6	9-19
	102	14	525	48.6	449-610	14	1697	512.1	1130-2750	11	10.4	1.2	8-12
	127	9	556	32.6	515-620	9	2098	462.8	1575-3045	7	19.7	7.5	12-32
	140	4	560	29.8	530-599	4	2058	283.2	1845-2460	3	15.3	6.7	8-21
	Totals	52			400-645	52			655-3625	37			6-32
longnose sucker	38	1	161			1	45			0			
	51	7	364	135.4	215-528	7	905	820.9	115-1975	0			
	76	3	379	55.6	340-443	3	820	418.7	530-1300	0			
	102	9	443	49.3	397-560	9	1304	468.9	900-2450	0			
	127	15	510	41.2	448-580	15	2024	520.7	1400-3200	0			
	140	13	503	36.9	438-555	12	1815	370.1	1290-2610	0			
	Totals	48			215-580	48			115-3200				

Table 8. Length, weight and age summary by mesh size for fish captured by gillnets in Bigspruce Lake, 1977.

Species	Mesh (mm)	Length (mm)				Weight (g)				Age (years)			
		n	Mean	SD	Range	n	Mean	SD	Range	n	Mean	SD	Range
lake whitefish	38	44	429	60.3	217-514	44	1203	402.4	105-1775	43	7.0	1.5	2-10
	51	64	387	98.4	200-553	64	928	592.6	85-2140	61	5.8	2.2	2-10
	76	99	418	58.7	282-535	99	1037	423.3	255-2140	92	6.8	1.4	3-11
	102	80	325	56.7	275-545	80	1063	425.0	275-2210	79	7.0	1.4	4-11
	127	41	457	34.1	375-580	41	1265	275.7	640-2160	40	7.7	0.9	6-10
	140	52	486	30.0	430-555	52	1536	242.7	1135-2200	48	8.2	1.1	6-10
	Totals	380			200-580	380			85-2210	363			2-11
northern pike	38	5	503	102.0	358-612	5	831	409.5	345-1310	5	6.2	1.9	4-9
	51	8	554	122.3	454-824	8	1302	1203.5	675-4215	8	6.8	1.9	5-11
	76	16	526	40.7	460-609	16	849	161.0	630-1275	15	6.3	1.0	4-8
	102	4	582	71.0	494-665	4	1256	429.2	665-1670	4	8.3	1.5	7-10
	Totals	33			358-824	33			345-4215	32			4-11
lake trout	38	14	619	58.8	496-725	14	2697	727.0	1525-4550	12	25.8	11.1	8-40
	51	26	635	109.0	310-898	26	3017	1957.6	300-9500	21	30.9	10.1	6-56
	76	29	617	81.4	443-792	29	2558	1289.4	1110-6500	27	29.5	9.0	8-51
	102	34	635	88.4	505-923	34	3015	1910.1	1470-10500	32	26.6	9.1	7-41
	127	12	622	69.6	545-765	12	2606	994.3	1500-4600	9	32.3	8.0	12-39
	140	6	642	90.5	572-823	6	3194	1994.1	2110-7250	6	29.3	9.8	11-39
	Totals	121			310-923	121			300-10500	107			6-56
lake cisco	38	44	180	10.6	160-206	44	51	11.9	45-80	43	5.3	1.2	3-7
	51	23	221	23.2	166-260	23	117	38.4	40-185	23	6.7	1.2	3-8
	76	1	213			1	95			1	5.0		
	Totals	68			160-260	68			40-185	67			3-8

Table 9. Numbers and distribution of fish caught with fry traps, dipnets, seines and minnow traps in the Snare River, 1977.

Location	S <sub>a</sub>	S <sub>a</sub>	S <sub>a</sub>	S <sub>a</sub>	S <sub>b</sub>	S <sub>c</sub>	S <sub>d</sub>	S <sub>e</sub>	S <sub>f</sub>	7	7	28						
Date <sup>1</sup>	10-6 to 24-6	24-6 to 30-6	30-6 to 11-7	11-7 to 26-7	26-7 to 24-6	24-6 to 30-6	24-6 to 30-6	11-7 to 26-7	27-6	27-6	27-6	27-6	30-6	30-6	30-6	12-7	14-7	Total
<b>SPECIES<sup>2</sup></b>																		
STSH	-	-	-	-	-	450	1	-	4000	-	-	200	40	-	20	-	-	4711
TPCH	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	2
LKCH	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-	-	-	20
NRPK	-	-	-	2	-	-	-	-	2	-	-	1	7	4	4	-	-	20
WTSK	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	3
SLSC	-	1	-	2	-	-	-	2	2	-	-	2	15	-	-	-	-	24
NSSB	-	-	-	-	12	-	-	-	20	-	-	20	20	-	-	-	-	72
LKWF	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	2
Coregonid Fry	-	-	-	-	-	-	-	-	-	100	1800	-	10	-	-	5	10	1925
<b>GEAR :</b>	Fry Trap	Fry Trap	Fry Trap	Fry Trap	Dip Net	Min- now Trap	Dip Net	Min- now Trap	Seine	Dip Net	Seine	Seine	Seine	Dip Net	Seine	Dip Net	Dip Net	
<b>NUMBER OF SETS</b>	3	3	3	3	1	3	1	3	3	1	3	3	3	1	3	1	1	

<sup>1</sup> Day of single sampling event (dipnet or three hauls with seine), or duration of sampling during which traps were checked on three occasions (3 sets).

<sup>2</sup> See species code list in Table 2.

Table 10. Data on tagged fish recaptured in the Snake River study, 1977.

Tag Number	Species	Date Capture	Date Recapture	Capture Location	Recapture Location	Distance From Release Site (km)
C03463	WALL	17-5-77	29-6-77	7	13	6.5
C03470	WALL	19-5-77	25-5-77	7	7	0
C03482	WALL	19-5-77	23-5-77	7	7	0
C03500	NRPK	19-5-77	19-7-77	8	5	0.6
C03510	NRPK	19-5-77	2-7-77	8	8	0
C03532	WALL	20-5-77	21-5-77	7	7	0
C03534	WALL	20-5-77	26-5-77	7	7	0
C03536	WALL	20-5-77	21-7-77	7	21	10
C03596	WALL	23-5-77	25-5-77	7	10	0.6
C03598	WALL	23-5-77	27-6-77	7	34	11.5
C03605	WALL	23-5-77	26-5-77	7	7	0
C03650	NRPK	26-5-77	4-6-77	7	7	0
C03698	NRPK	2-6-77	20-7-77	13	13	0
C03720	LNSK	3-6-77	9-6-77	18	23	6.2
C03747	LKTR	6-6-77	19-7-77	12	12	0
C03749	LKTR	6-6-77	22-7-77	12	12	0
C03751	LKTR	6-6-77	22-7-77	12	39	0.2
C03772	NRPK	7-6-77	1-7-77	20	20	0
C03804	LNSK	9-6-77	24-7-77	22	22	0
C03894	LKTR	22-6-77	17-7-77	31	31	0
C03913	LNSK	29-6-77	19-7-77	12	12	0

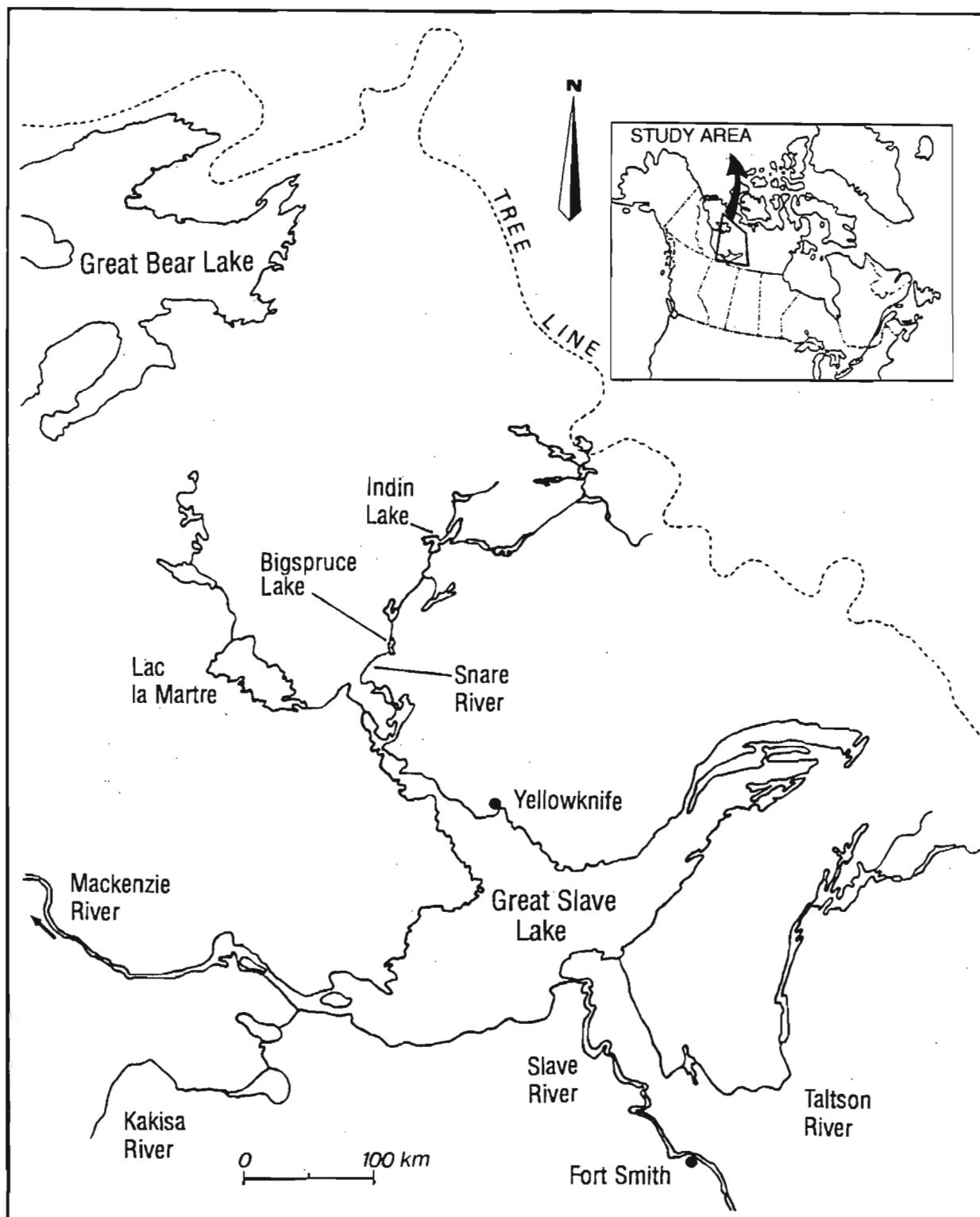


Fig. 1. Location map of the Snare River drainage in the Great Slave Lake region.

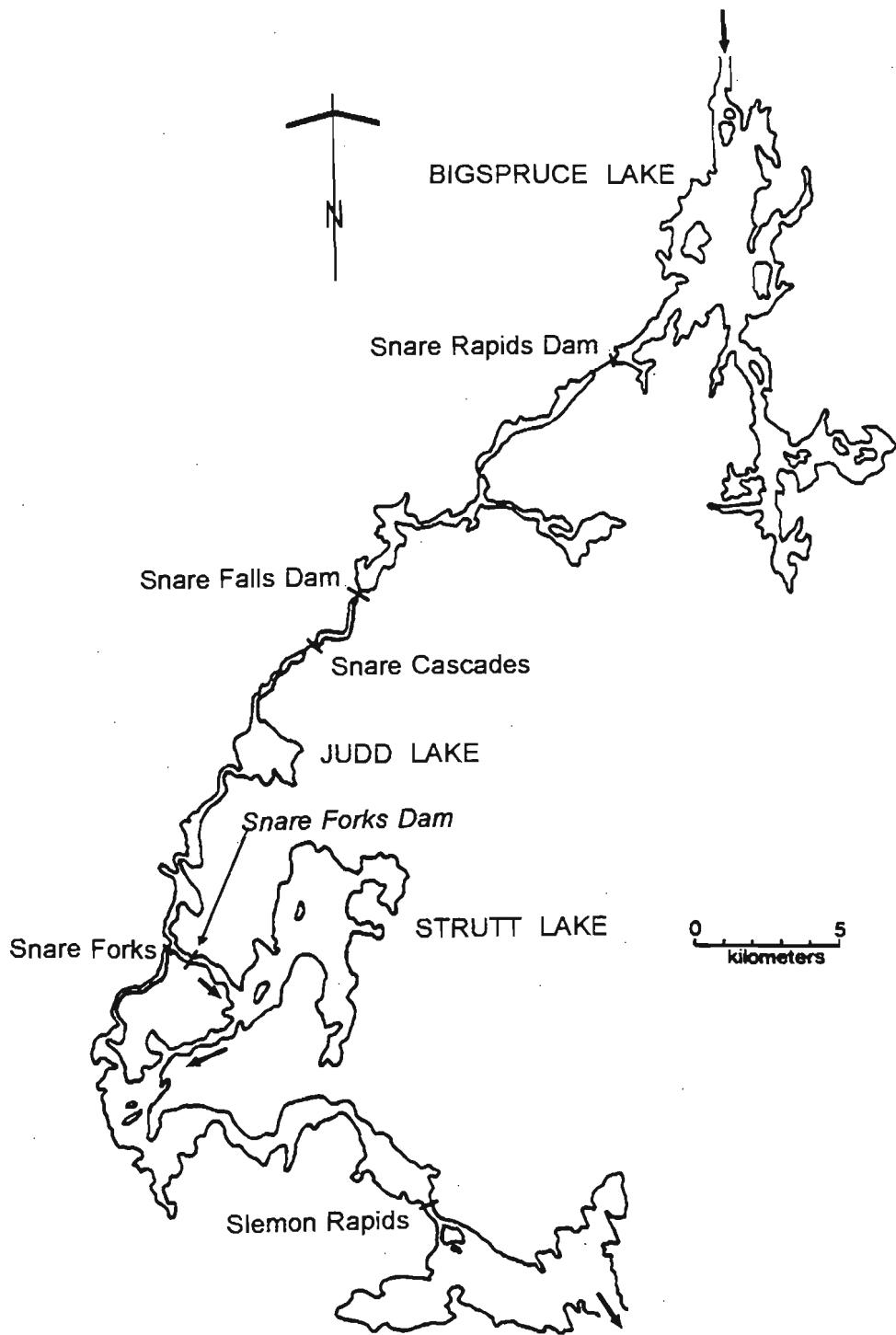


Fig. 2. Map of the Snare River study area, 1977.

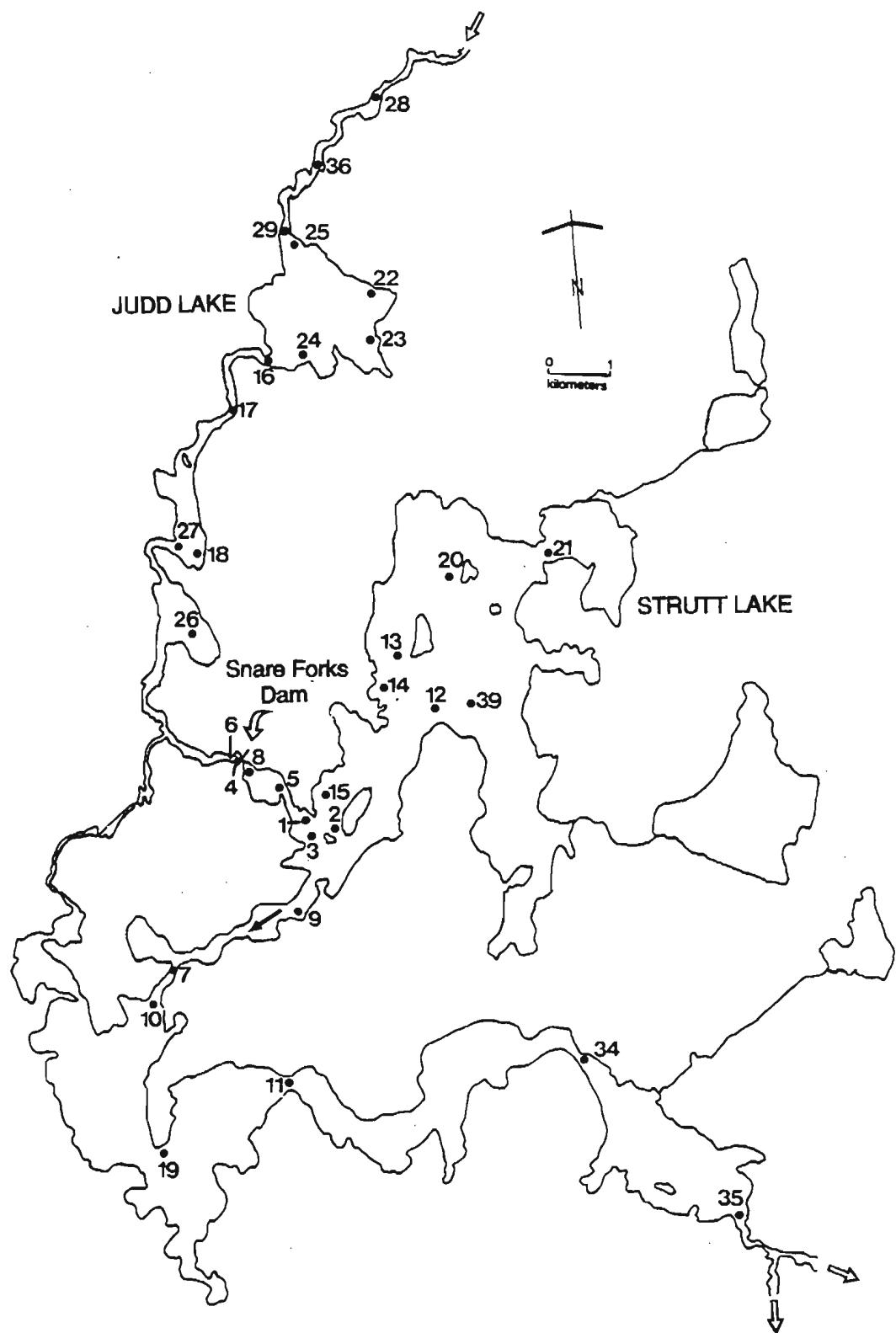


Fig. 3. Gillnet sites in the lower Snare River, Strutt Lake, upper Snare River, and Judd Lake, 1977.

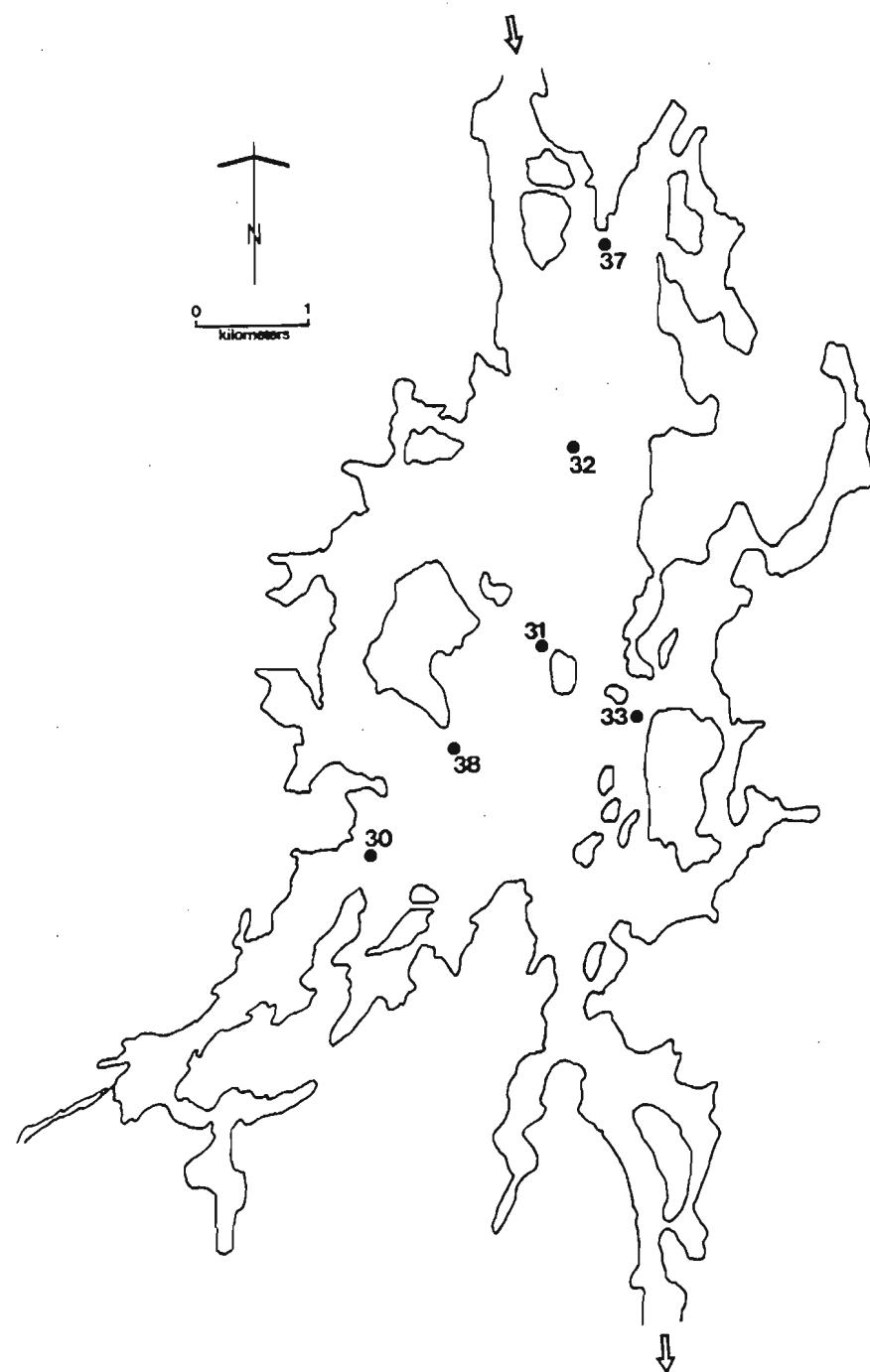


Fig. 4. Gillnet sites in Bigspruce Lake, 1977.

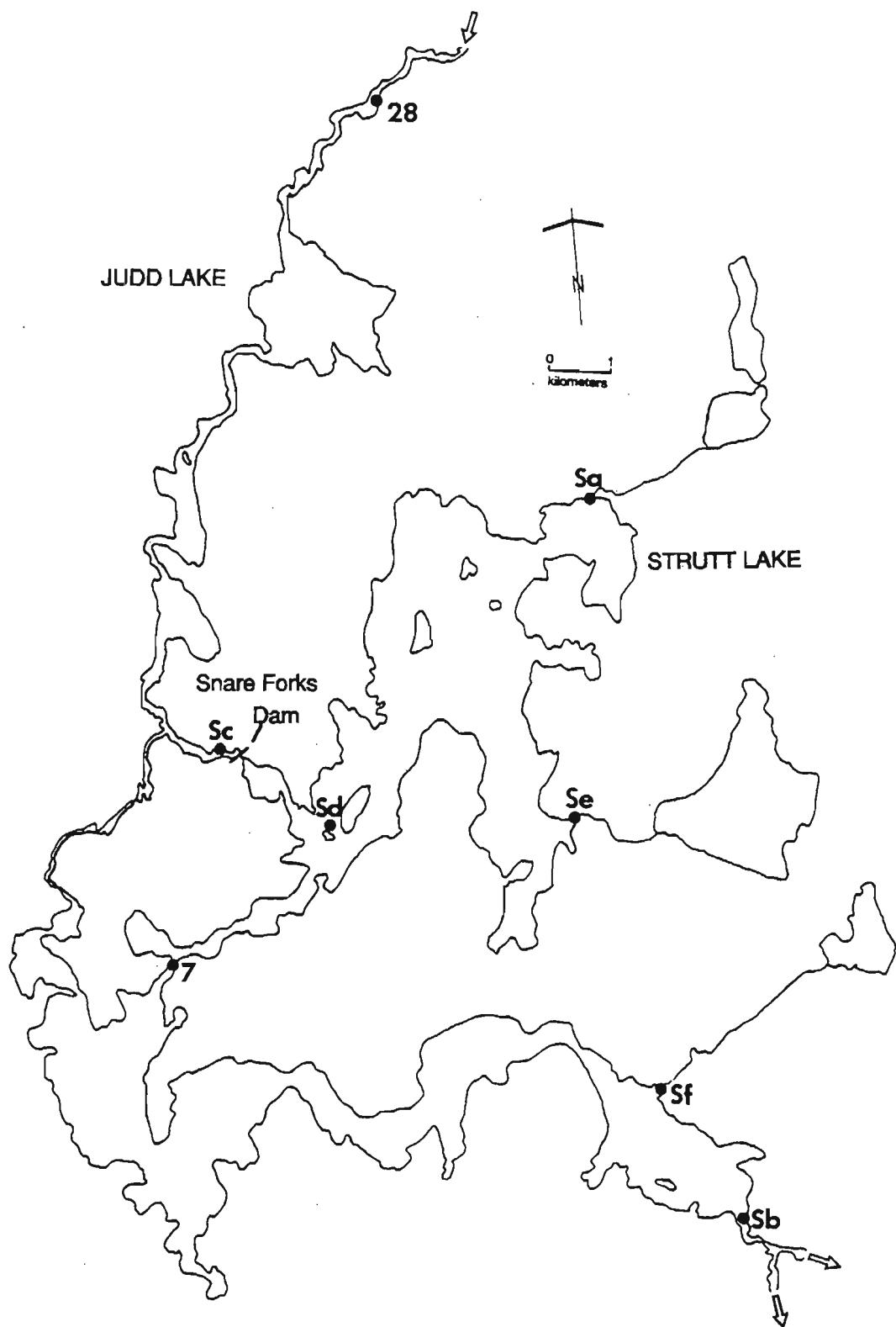


Fig. 5. Sampling sites for small fish and juvenile fish in the Snare River study area, 1977.

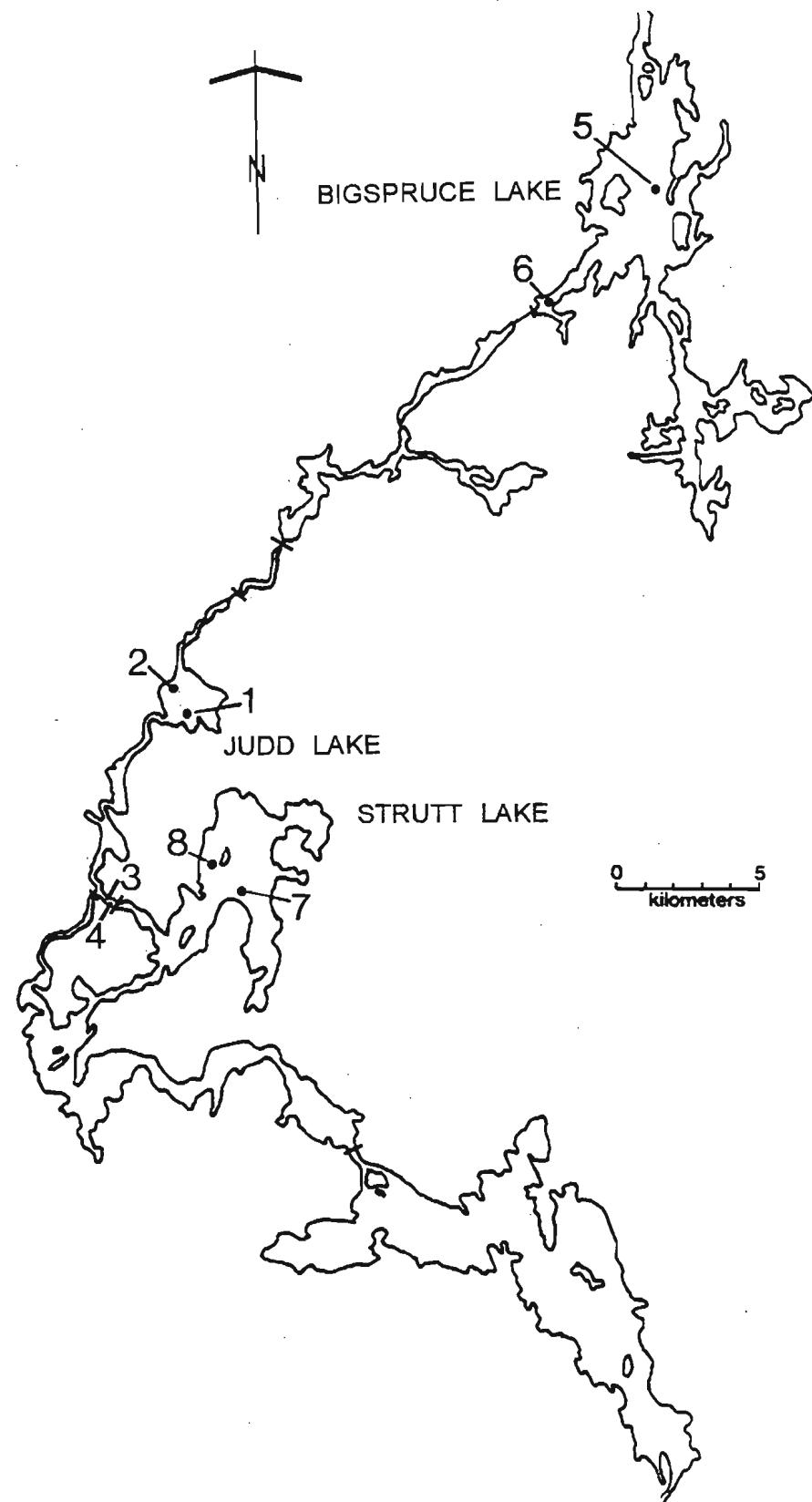


Fig. 6. Water chemistry stations in the Snare River study area, 1977.

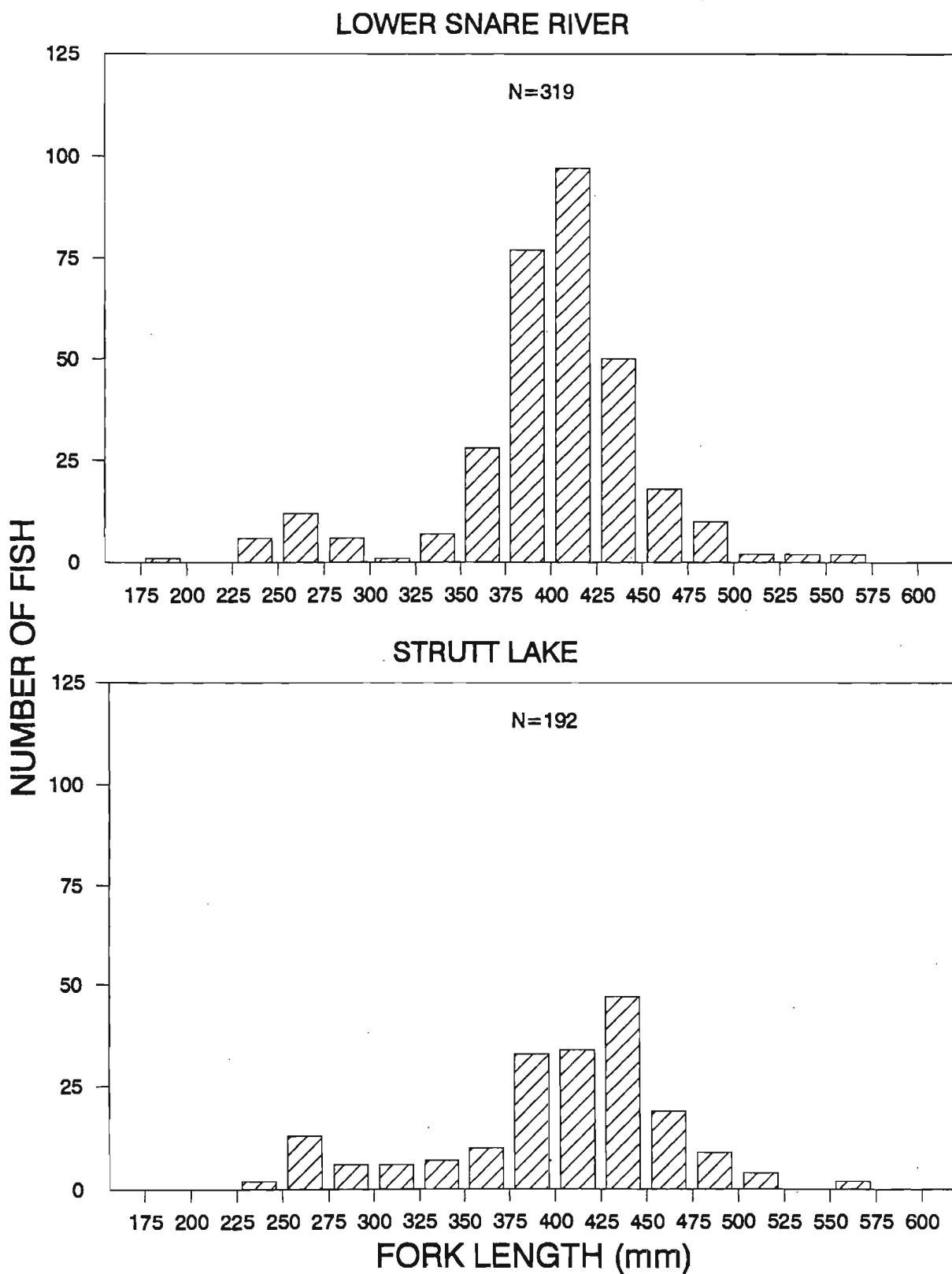


Fig. 7. Length-frequency histograms by area for walleye in the Snare River, 1977.

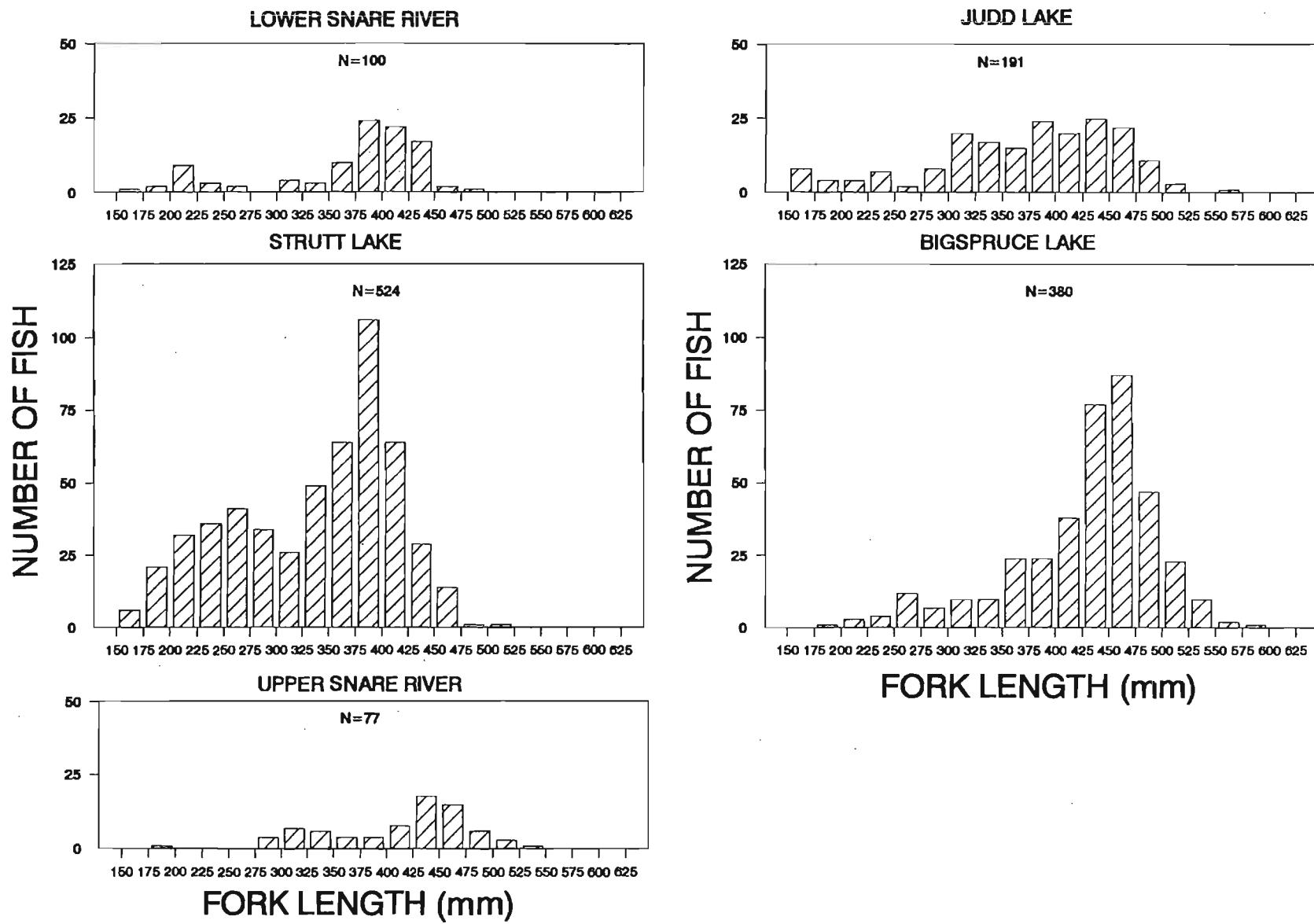


Fig. 8. Length-frequency histograms by area for lake whitefish in the Snare River, 1977.

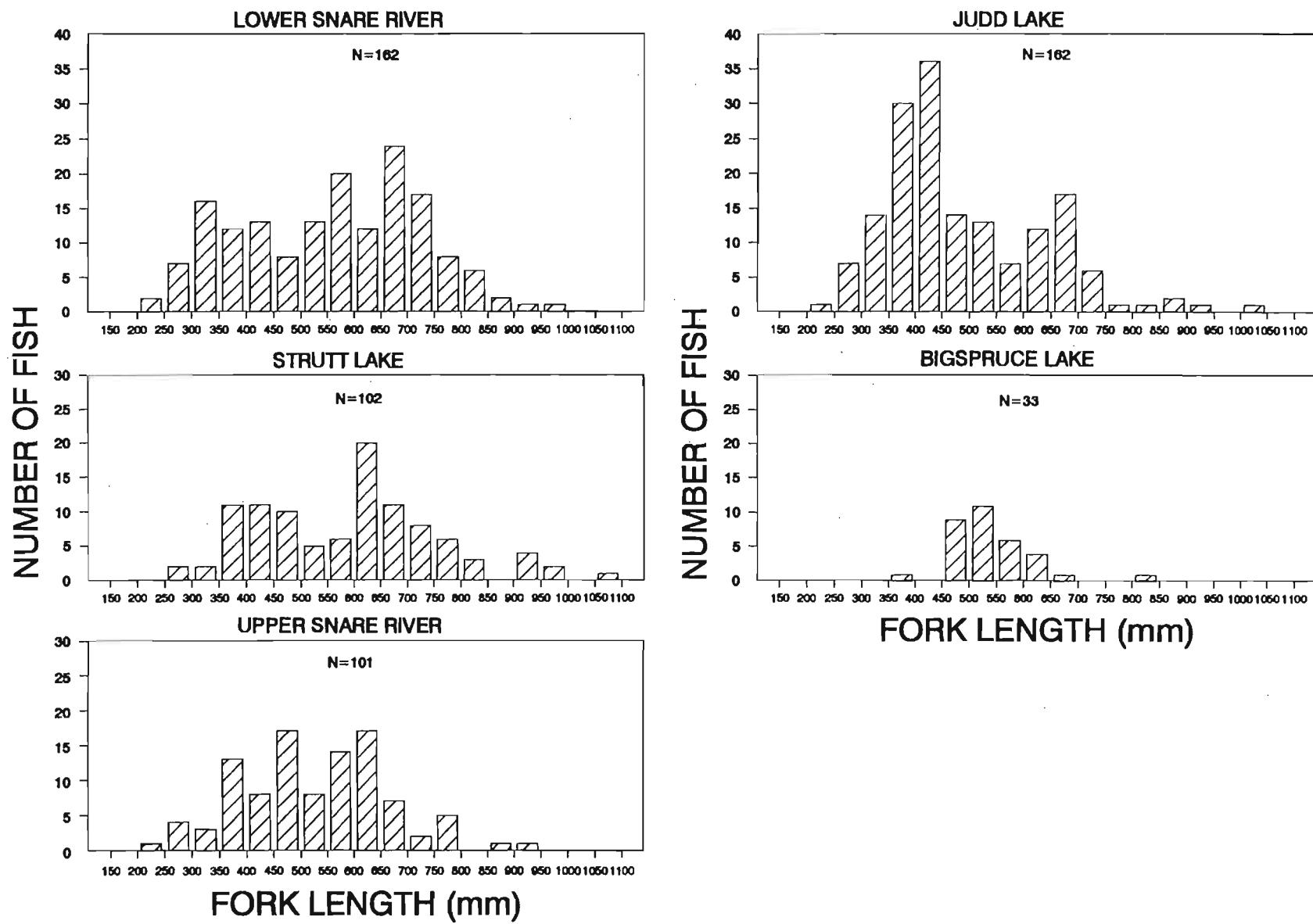


Fig. 9. Length-frequency histograms by area for northern pike in the Snare River, 1977.

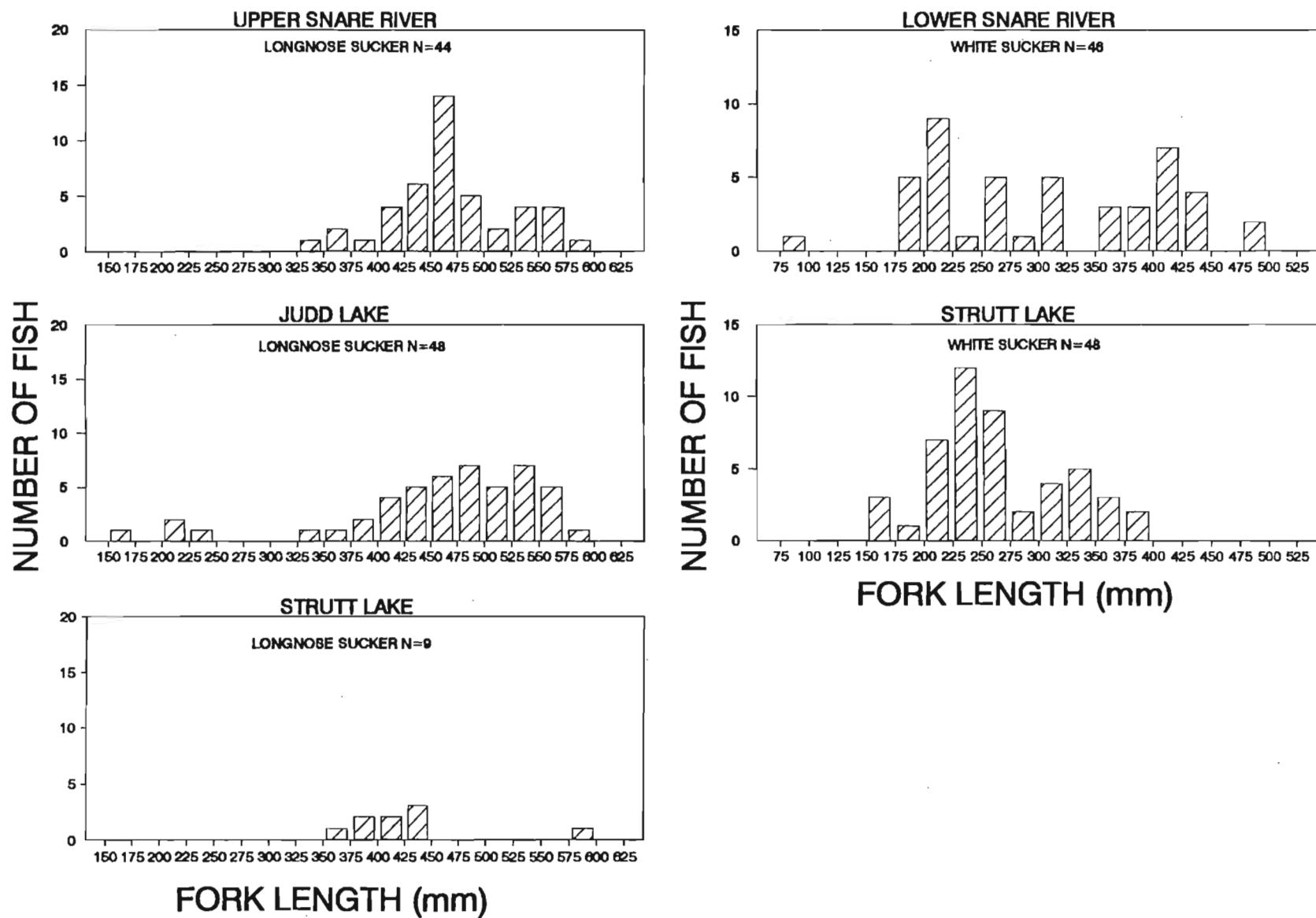


Fig. 10. Length-frequency histograms by area for longnose sucker and white sucker in the Snare River, 1977.

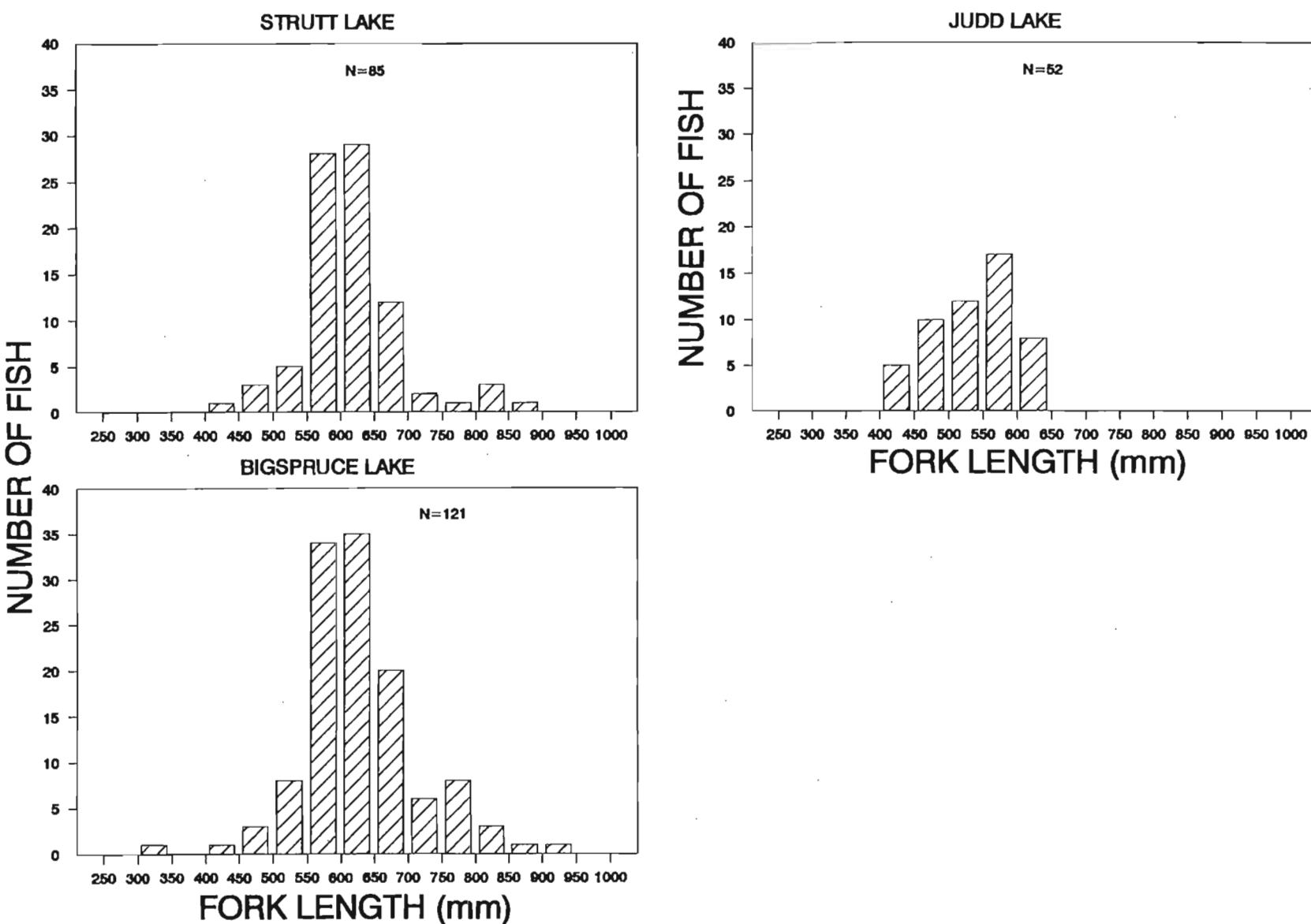


Fig. 11. Length-frequency histograms by area for lake trout in the Snake River, 1977.

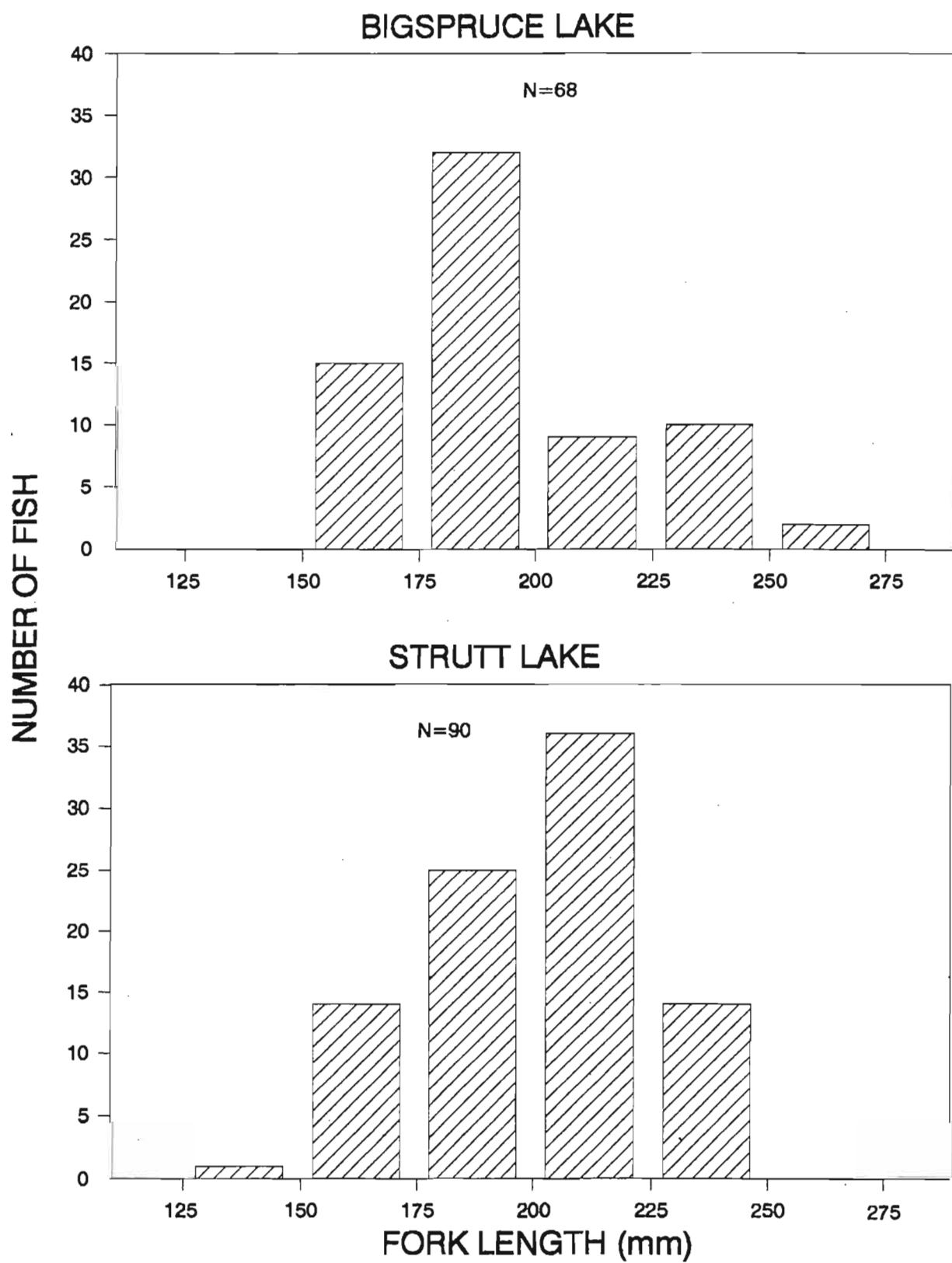


Fig. 12. Length-frequency histograms by area for lake cisco in the Snare River, 1977.

Table A1.1. Age-specific length, weight, condition factor and maturity data for walleye in the lower Snake River, 1977.

AGE (yr)	MALE				FEMALE				NUMBER	COMBINED									
	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD		K	% MAT	SEX UNKNOWN	N	LENGTH (mm) MEAN	SD	RANGE	MEAN	SD	RANGE
3						3	259	5.6	1.06	0	3	8	246	28.6	189-285	154	44	70-190	1.01
4						5	286	18.1	0.97	0	2	7	258	19.8	233-278	173	39	120-225	0.98
5						6	270	23.2	0.99	0	3	9	285	22.2	232-295	189	46	130-260	1.00
6	2	313	68.5	1.00	0	2	345	70.0	1.07	0		4	329	58.6	286-394	393	191	175-600	1.04
7	1	396	-	1.43	0	2	338	10.8	1.03	0		3	357	34.6	330-396	560	288	390-890	1.17
8						3	349	22.5	1.10	0		3	348	22.5	324-367	470	71	390-525	1.10
9	11	391	21.8	1.25	82	7	404	79.6	1.09	14		18	398	50.6	343-565	745	230	415-1380	1.19
10	41	394	21.1	1.21	98	18	409	32.4	1.10	42	1	81	398	28.7	341-472	745	145	445-1150	1.17
11	37	399	17.9	1.20	100	23	417	40.8	1.12	57		80	406	30.0	271-480	791	181	195-1440	1.17
12	34	405	18.6	1.17	91	18	429	29.2	1.19	53		52	414	25.4	387-484	641	189	580-1430	1.17
13	25	420	27.5	1.17	96	8	445	36.1	1.28	38		33	428	31.6	382-521	932	218	645-1550	1.20
14	17	427	26.9	1.24	100	6	437	23.8	1.20	50	2	25	430	25.0	380-489	971	199	550-1440	1.21
15	5	421	38.5	1.21	100	2	442	9.2	1.17	100		7	427	33.3	380-463	937	191	585-1160	1.20
16	3	471	82.2	1.18	87	3	448	18.1	1.19	100		8	460	42.5	422-541	1144	248	830-1600	1.17
17	4	439	52.8	1.10	100						1	5	446	47.7	382-480	1004	271	540-1215	1.11
18	1	428	-	1.04	100	2	496	8.9	1.02	100		3	473	38.9	428-503	1103	282	815-1325	1.03
20											1	1	483	-	-	1200	-	-	1.08
22						1	548	-	1.11	100		1	548	-	-	1825	-	-	1.11
TOTAL	181		1.19	94	110		1.12		13	304				189-565		70-1825		1.16	

Table A1.2. Age-specific length, weight, condition factor and maturity data for walleye in Strutt Lake, 1977.

AGE (yr)	MALE				FEMALE				SEX UNKNOWN	COMBINED							K		
	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD		N	LENGTH (mm) MEAN	SD	RANGE	WEIGHT (g) MEAN	SD	RANGE			
3						2	257	2.8	1.05	0				255-258	178	4	175-180	1.05	
4	1	258	-	1.08	0	8	281	12.8	1.07	0	2	11	287	14.4	248-288	210	45	160-310	1.09
5						5	291	37.5	0.84	0	1	8	285	38.2	257-348	212	51	160-310	0.87
6	1	318	-	1.09	0	2	312	33.9	1.03	0		3	314	24.3	288-338	330	82	240-400	1.05
7	1	291	-	1.01	0	4	334	20.9	1.08	25	2	7	317	29.9	270-358	344	106	190-510	1.05
8	1	383	-	1.09	0	1	349	-	1.08	0		2	358	9.9	349-363	490	42	460-520	1.08
9	3	365	25.2	1.15	0	3	391	68.8	1.08	33		6	378	48.5	313-442	608	201	345-935	1.11
10	14	394	17.0	1.00	38	18	413	28.3	1.10	58		30	404	25.4	353-455	694	138	475-970	1.05
11	8	394	20.3	0.99	50	17	418	35.8	1.02	65	8	31	407	32.8	349-469	700	176	450-1050	1.02
12	13	418	22.0	1.04	54	18	424	24.2	1.05	81	3	34	422	22.5	380-481	795	134	525-1100	1.05
13	4	425	21.4	0.98	0	6	450	17.2	1.03	50	4	14	438	23.7	400-474	861	127	670-1110	1.02
14	4	435	34.5	1.03	50	7	446	41.4	0.97	43	1	12	447	38.8	378-518	911	232	560-1320	1.00
15	5	434	38.4	1.00	40	8	487	39.0	0.85	25	1	14	481	47.9	385-555	974	252	600-1440	0.98
16						5	454	28.5	0.98	33	3	8	460	28.1	426-497	969	183	640-1280	0.99
17						1	443	-	1.04	0		1	443	-	-	900	-	-	1.04
18						2	540	43.1	0.91	100		2	540	43.1	509-570	1450	354	1200-1700	0.91
TOTAL	55		1.02	38	105		1.03			23	183				248-570			160-1700	1.03

Table A1.3. Age-specific length, weight, condition factor and maturity data for lake whitefish in the lower Snare River, 1977.

AGE (yr)	MALE			FEMALE			NUMBER	COMBINED												
	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD	K	% MAT	SEX UNKNOWN	N	LENGTH (mm) MEAN	SD	RANGE	MEAN	SD	RANGE	K	
1												1	1	174	-	-	65	-	-	1.23
2						1	210	-	1.30	0	3	4	200	12.8	183-210	100	18	80-120	1.24	
3	1	220	-	1.31	0	1	202	-	1.40	0	8	8	217	10.3	202-234	129	19	105-180	1.27	
4						1	250	-	0.70	0	2	3	273	28.0	250-301	235	123	110-355	1.09	
5	1	305	-	1.48	0	1	249	-	1.30	0	1	3	269	31.5	249-305	273	127	200-420	1.34	
6	3	358	58.8	1.55	67	2	358	17.7	2.60	50	2	7	355	41.2	303-420	837	378	425-1550	1.87	
7	5	408	11.9	1.47	40	8	392	24.0	1.42	25	1	14	394	28.0	337-427	881	155	520-1080	1.44	
8	7	403	19.0	1.48	29	12	401	24.3	1.48	58	8	27	399	22.3	351-442	903	168	680-1250	1.50	
9	4	415	28.7	1.48	0	9	411	28.8	1.48	.78	2	15	410	28.1	353-454	1027	190	580-1400	1.47	
10	4	409	25.0	1.58	75						7	11	412	25.4	380-440	1140	202	800-1430	1.62	
11	1	443	-	1.37	100	1	455	-	1.49	100	1	3	447	7.2	442-455	1285	117	1185-1400	1.42	
12											1	1	403	-	-	1980	-	-	1.65	
13											1	1	440	-	-	1310	-	-	1.54	
TOTAL	26			1.49	35	36			1.49	50	38	96			174-493			65-1880	1.48	

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Table A1.4. Age-specific length, weight, condition factor and maturity data for lake whitefish in Strutt Lake, 1977.

AGE (yr)	MALE			FEMALE			NUMBER	COMBINED											
	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD	K	% MAT	SEX UNKNOWN	N	LENGTH (mm) MEAN	SD	RANGE	MEAN	SD	RANGE	K
2						6	206	12.1	1.08	0	10	16	190	21.1	181-230	78	27	50-140	1.12
3	8	228	28.4	1.24	0	16	221	23.5	1.14	0	10	34	216	24.8	165-275	126	58	50-360	1.17
4	27	252	32.0	1.17	4	37	260	34.6	1.22	0	8	72	255	32.3	200-375	211	102	85-750	1.19
5	44	307	33.2	1.24	2	36	312	34.8	1.28	3	2	84	308	35.3	232-395	384	148	120-820	1.26
8	49	362	29.0	1.38	16	41	365	23.9	1.41	20	4	94	361	29.8	230-421	875	188	130-1325	1.39
7	66	395	21.9	1.40	66	59	394	19.2	1.41	32	2	127	395	20.7	340-480	877	175	425-1410	1.41
8	19	409	28.2	1.48	53	22	412	54.8	1.41	32	3	44	410	43.1	232-470	1026	267	135-1800	1.44
9	9	423	48.8	1.33	56	12	428	30.2	1.51	58	2	23	429	37.0	344-514	1144	272	515-1550	1.43
10	1	418	-	1.73	0	4	426	58.8	1.48	75	1	8	425	45.7	355-493	1183	407	600-1800	1.49
11						1	417	-	1.24	0	1	1	417	-	-	900	-	-	1.24
TOTAL	223			1.34	22	238			1.34	19	42	501			181-514			50-1800	1.33

Table A1.5. Age-specific length, weight, condition factor and maturity data for lake whitefish in the upper Snare River, 1977.

AGE (yr)	MALE			FEMALE			SEX UNKNOWN	COMBINED											
	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD	RANGE	MEAN	SD	RANGE	K	
2											1	1	182	-	-	330	-	-	5.47
3	4	311	25.2	1.43	0	1	278	-	1.30	0	1	6	312	30.0	278-350	445	157	280-840	1.42
4	5	360	54.4	1.84	20	4	314	8.8	1.38	0	9	340	45.8	298-420	643	357	360-1300	1.51	
5	6	376	36.1	1.52	33	3	417	37.5	1.31	0	9	390	39.6	316-440	877	288	430-1410	1.45	
6	5	417	48.6	1.50	40	6	375	45.2	1.42	33	11	394	49.5	322-475	955	439	420-1680	1.46	
7	13	450	29.1	1.49	77	4	450	19.1	1.58	100	17	450	28.5	390-486	1389	308	830-1900	1.51	
8	8	454	29.7	1.51	50	2	433	4.2	1.59	0	2	12	452	27.1	415-520	1418	242	1025-1995	1.53
9	1	475	-	1.64	0	1	464	-	1.45	100	1	3	468	6.6	458-475	1535	192	1400-1755	1.52
10	3	489	22.7	1.40	33	1	456	-	1.53	100	4	481	24.9	456-510	1591	183	1450-1850	1.43	
TOTAL	45			1.51	44	22		1.44	38	5	72			182-520			280-1995	1.54	

Table A1.6. Age-specific length, weight, condition factor and maturity data for lake whitefish in Judd Lake, 1977.

AGE (yr)	MALE			FEMALE			SEX UNKNOWN	COMBINED											
	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD	RANGE	MEAN	SD	RANGE	K	
1	1	170	-	0.82	0						1	170	-	-	45	-	-	0.92	
2	1	300	-	1.52	0	4	171	10.7	1.14	0	7	12	183	36.1	159-300	88	103	40-410	1.14
3	8	274	28.7	1.28	0	6	282	51.3	1.32	0	7	19	280	35.2	205-330	239	117	110-525	1.25
4	10	318	41.3	1.37	10	6	302	28.5	1.24	0		16	312	36.8	249-410	423	192	180-1025	1.32
5	23	340	19.1	1.47	9	7	342	25.8	1.37	0		30	340	20.4	307-398	590	277	370-1970	1.45
6	19	365	20.3	1.38	83	5	388	37.0	1.47	20	2	26	385	23.4	348-444	808	207	500-1340	1.39
7	27	421	29.1	1.48	83	13	422	23.8	1.51	85		40	421	27.2	325-483	1130	238	455-1835	1.49
8	18	457	17.4	1.48	83	11	463	25.7	1.53	100		29	459	20.7	418-512	1489	235	1100-2040	1.51
9	5	483	17.9	1.37	100	1	495	-	1.34	100	1	7	484	15.6	458-507	1586	153	1370-1785	1.38
10						2	509	60.1	1.57	100		2	509	60.1	468-551	2063	477	1725-2400	1.57
11						1	525	-	1.50	100		1	525	-	-	2185	-	-	1.50
12	2	483	-	1.16	100							2	483	0.0	463-483	1150	0	1150-1150	1.16
TOTAL	112			1.43	48	56		1.42	48	17	185				159-551			40-2400	1.40

Table A1.7. Age-specific length, weight, condition factor and maturity data for lake whitefish in Bigspruce Lake, 1977.

AGE (yr)	MALE				FEMALE				NUMBER	COMBINED									
	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD		K	% MAT	SEX UNKNOWN	N	LENGTH (mm) MEAN	SD	RANGE	MEAN	SD	WEIGHT (g) RANGE
2	2	226	12.7	1.06	0	2	204	5.7	1.03	0	1	5	215	13.1	200-235	105	18	85-130	1.04
3	5	287	38.2	1.24	0	6	254	10.2	1.15	0	3	14	270	31.3	238-340	245	114	150-525	1.18
4	8	290	18.8	1.24	0	8	296	38.2	1.18	13		14	293	29.2	268-376	320	143	200-750	1.21
5	11	333	15.2	1.28	9	11	344	23.2	1.31	0		22	339	19.8	308-384	505	79	380-895	1.30
6	14	405	38.3	1.31	43	28	389	28.5	1.32	45		43	394	31.3	351-463	825	237	520-1555	1.31
7	58	441	28.1	1.37	84	67	435	30.1	1.39	48		128	438	28.8	367-543	1173	277	640-2200	1.38
8	50	485	23.1	1.35	78	42	470	21.0	1.37	67		92	488	22.2	428-530	1398	239	710-2030	1.38
9	13	505	25.2	1.29	77	19	488	38.6	1.39	74		32	494	34.6	375-555	1582	258	1110-2210	1.35
10	2	505	21.2	1.24	100	11	512	21.3	1.25	37		13	511	20.5	475-553	1863	215	1310-1980	1.25
11	1	520	-	1.26	100	1	457	-	1.31	0		2	489	44.6	457-520	1513	364	1255-1770	1.29
TOTAL	183			1.33	60	198			1.34	47	4	363			200-555			85-2210	1.33

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Table A1.8. Age-specific length, weight, condition factor and maturity data for northern pike in the upper Snare River, 1977.

AGE (yr)	MALE				FEMALE				NUMBER	COMBINED									
	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD		K	% MAT	SEX UNKNOWN	N	LENGTH (mm) MEAN	SD	RANGE	MEAN	SD	WEIGHT (g) RANGE
2	2	281	4.2	0.72	0	1	300	-	0.85	0		3	287	11.4	278-300	185	13	150-175	0.70
3	5	317	44.9	0.92	0	3	363	14.2	0.89	33	1	9	323	51.4	235-379	271	88	100-380	0.83
4	9	429	64.1	0.71	22	10	413	45.2	0.69	10	1	20	423	53.2	343-508	557	204	295-880	0.71
5	11	498	58.4	0.70	55	6	500	58.9	0.71	50		17	497	58.7	401-589	900	324	445-1450	0.70
6	9	559	47.0	0.71	100	4	578	71.0	0.68	50	3	16	568	52.0	473-628	1317	335	710-1850	0.71
7	9	615	28.8	0.69	100	3	625	15.4	0.66	67	5	17	629	30.7	580-892	1645	218	1190-2015	0.68
8	3	638	48.5	0.64	100						2	5	640	39.1	588-685	1695	333	1200-1975	0.64
9	1	629	-	0.62	100						2	3	688	78.7	629-775	2183	888	1550-3200	0.64
10						3	795	81.9	0.87	100	1	4	783	71.1	730-887	3393	1178	2390-5100	0.69
11						1	793	-	0.72	100	1	2	786	10.8	778-793	3313	407	3025-3800	0.68
12						1	785	-	0.88	100		1	785	-		3025	-	-	0.68
13						1	900	-	0.54	100		1	900	-		3940	-	-	0.54
TOTAL	40			0.72	61	33			0.68	48	18	98			235-900			100-5100	0.70

Table A1.9. Age-specific length, weight, condition factor and maturity data for northern pike in Strutt Lake, 1977.

AGE (y)	MALE					FEMALE					NUMBER	COMBINED							K
	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD	K	% MAT		N	LENGTH (mm) MEAN	SD	RANGE	MEAN	SD	WEIGHT (g) RANGE	
2	1	292	-	0.62	0							1	292	-	-	155	-	-	0.62
3	2	362	44.6	0.84	0	2	320	58.6	0.74	0		4	341	48.0	280-393	321	113	160-425	0.79
4	10	407	27.5	0.72	0	6	408	47.3	0.69	33	2	18	410	38.1	349-471	508	183	285-845	0.71
5	5	488	26.6	0.70	20	2	431	55.2	0.71	0	1	8	461	35.8	392-500	708	186	410-940	0.71
6	4	479	87.8	0.71	50	5	540	72.3	0.85	40	3	12	517	79.1	382-630	991	400	425-1840	0.68
7	5	597	68.4	0.88	60	5	672	72.0	0.65	60	6	16	629	63.0	481-785	1745	433	750-2850	0.69
8	5	629	37.8	0.63	100	7	690	59.5	0.66	88	2	14	658	60.0	570-746	1902	423	1325-2700	0.67
9	2	673	3.5	0.88	100	3	713	111.0	0.59	87	4	9	713	76.8	587-821	2419	801	1400-4110	0.68
10	3	662	25.8	0.85	67	2	835	38.2	0.84	50	2	7	660	40.5	608-730	1873	287	1480-2350	0.65
11	1	782	-	0.73	0	2	883	80.6	0.72	100	3	6	861	82.0	758-940	5094	1819	3075-7200	0.77
12						1	929	-	0.71	100	1	2	887	59.4	845-929	5100	849	4500-5700	0.73
13											2	2	1004	65.1	958-1050	6325	2369	4650-8000	0.61
14						1	960	-	0.88	100		1	960	-	-	8000	-	-	0.68
TOTAL	38			0.69	40	38			0.67	57	26	100			280-1050			155-8000	0.69

Table A1.10. Age-specific length, weight, condition factor and maturity data for northern pike in the lower Snare River, 1977.

AGE (y)	MALE					FEMALE					NUMBER	COMBINED							K
	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD	K	% MAT		N	LENGTH (mm) MEAN	SD	RANGE	MEAN	SD	WEIGHT (g) RANGE	
2	1	235	-	0.77	0							1	235	-	-	100	-	-	0.77
3	4	325	33.9	0.72	0	2	280	84.9	1.30	0	5	11	269	45.5	200-375	188	70	100-355	0.82
4	12	364	60.7	0.70	17	11	374	54.0	0.67	0	2	25	370	54.1	261-470	379	181	125-750	0.70
5	8	455	89.9	0.68	50	4	432	70.6	0.74	0	5	17	459	86.3	335-858	759	458	230-2050	0.71
6	10	531	49.2	0.71	50	5	538	92.6	0.89	20	1	16	534	81.4	437-680	1100	415	630-2300	0.70
7	6	595	66.1	0.69	84	7	632	93.0	0.83	88	5	16	605	90.9	378-720	1777	598	750-3050	0.84
8	11	601	60.2	0.67	100	4	638	110.3	0.88	100	7	22	619	87.0	498-785	1665	627	975-3500	0.68
9	6	633	30.7	0.72	100	8	726	35.1	0.69	88	5	19	887	49.9	582-794	2258	553	1410-3500	0.69
10	2	705	83.6	0.77	100	10	747	71.6	0.67	100	6	18	737	68.7	630-850	2846	1003	1820-5900	0.69
11						3	765	60.9	0.65	100	2	5	739	68.5	644-601	2784	612	1900-3250	0.68
12	1	692	-	0.72	100							1	692	-	-	2380	-	-	0.72
13						2	876	102.5	0.67	100	1	3	843	94.3	773-950	4275	2387	2730-7000	0.67
TOTAL	81			0.70	59	58			0.73	80	39	158			200-950			100-7000	0.72

Table A1.11. Age-specific length, weight, condition factor and maturity data for northern pike in Judd Lake, 1977.

AGE (yr)	MALE			FEMALE			NUMBER	COMBINED														
	LENGTH (mm)			K	% MAT	LENGTH (mm)			K	% MAT	SEX UNKNOWN	LENGTH (mm)			MEAN	SD	RANGE	MEAN	SD	RANGE	K	
	N	MEAN	SD	N	MEAN	SD		N	MEAN	SD	RANGE	MEAN	SD	RANGE	MEAN	SD	RANGE	MEAN	SD	RANGE		
2	1	299	-	0.73	0	1	240	-	0.72	0		2	270	41.7	240-299	148	68	100-195	0.73			
3	18	352	41.8	0.66	6	18	343	33.4	0.69	0	2	38	348	36.6	268-428	293	90	125-535	0.68			
4	29	419	41.4	0.69	14	20	446	43.0	0.68	30	8	55	428	42.0	335-540	547	152	240-1025	0.68			
5	5	473	53.1	0.66	40	10	441	71.5	0.81	40	5	20	485	68.7	285-580	740	277	415-1400	0.74			
8	4	574	80.3	0.70	75	4	612	55.3	0.69	50	2	10	595	51.1	502-683	1487	371	880-2175	0.69			
7	6	831	36.4	0.67	83	1	626	-	0.81	100	1	8	631	30.8	592-682	1893	245	1450-2100	0.68			
8	3	656	7.9	0.75	67	3	756	99.7	0.69	67	6	12	688	68.3	610-870	2478	923	1800-4915	0.74			
9	2	636	36.1	0.82	100	2	748	184.1	0.82	100	3	7	685	83.4	612-882	2279	725	1575-3890	0.71			
10	1	720	-	0.71	100	2	757	79.9	0.64	50	2	5	704	77.8	595-813	2463	1007	1575-4100	0.68			
11						1	754	-	0.73	100		1	754	-	-	3150	-	-	-	0.73		
14											1	1	1000	-	-	8100	-	-	-	0.81		
TOTAL	87			0.69	30	62		0.70	31	28	157		240-1000				100-8100		0.70			

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Table A1.12. Age-specific length, weight, condition factor and maturity data for northern pike in Bigspruce Lake, 1977.

AGE (yr)	MALE			FEMALE			NUMBER	COMBINED														
	LENGTH (mm)			K	% MAT	LENGTH (mm)			K	% MAT	SEX UNKNOWN	LENGTH (mm)			MEAN	SD	RANGE	MEAN	SD	RANGE	K	
	N	MEAN	SD	N	MEAN	SD		N	MEAN	SD	RANGE	MEAN	SD	RANGE	MEAN	SD	RANGE	MEAN	SD	RANGE		
4	1	358	-	0.75	0	1	470	-	0.64	100		2	414	79.2	358-470	503	223	345-660	0.69			
5	3	498	71.1	0.68	100	1	489	-	0.65	100		4	491	59.8	454-580	803	252	630-1175	0.87			
6						11	521	29.0	0.57	100		11	521	29.0	470-587	813	100	635-960	0.57			
7	5	544	58.5	0.61	80	4	544	82.9	0.58	75		9	544	58.5	451-635	987	298	540-1440	0.80			
8	1	520	-	0.64	0	1	558	-	0.52	100		2	538	25.5	520-558	900	0	900-900	0.58			
9						2	639	37.5	0.57	100		2	639	37.5	612-885	1490	255	1310-1870	0.57			
10	1	600	-	0.68	100						1	600	-	-	1435	-	-	-	0.68			
11						1	824	-	0.75	100		1	824	-	-	4215	-	-	-	0.75		
TOTAL	11			0.65	84	21		0.59	95	0	32		358-824				345-4215		0.61			

Table A1.13. Age-specific length, weight, condition factor and maturity data for lake trout in Strutt Lake, 1977.

AGE (yr)	MALE			FEMALE			NUMBER	COMBINED											
	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD	K	% MAT	SEX UNKNOWN	N	LENGTH (mm) MEAN	SD	RANGE	MEAN	WEIGHT (g) SD	RANGE	K
10	3	477	35.8	1.14	100							3	477	35.8	439-510	1270	383	875-1640	1.14
11	2	531	58.0	1.03	50	1	572	-	1.13	0		3	545	47.3	490-572	1753	486	1200-2110	1.06
12						1	630	-	1.19	0		1	630	-	-	2970	-	-	1.19
13											0								
14						1	612	-	1.10	100		1	612	-	-	2520	-	-	1.10
15	1	558	-	1.15	100	2	593	9.2	1.23	100		3	580	22.1	558-599	2383	385	1980-2750	1.20
16						1	614	-	1.11	100		1	614	-	-	2560	-	-	1.10
17						1	638	-	1.15	100		1	638	-	-	2950	-	-	1.15
18											0								
19	2	598	64.4	1.10	100							2	598	64.4	550-641	2398	923	1745-3050	1.10
20	1	560	-	1.11	0							1	580	-	-	1950	-	-	1.11
21	3	577	33.3	1.04	100							3	577	33.3	552-615	2005	289	1700-2275	1.04
22	2	597	10.6	1.19	100	1	618	-	1.05	100		3	603	13.5	589-618	2503	81	2450-2570	1.14
23	2	588	28.2	1.24	100	1	633	-	1.38	100		3	603	32.1	589-633	2837	582	2410-3500	1.29
24	3	606	20.5	1.17	100	1	588	-	1.32	100		4	602	19.0	588-627	2620	181	2350-2800	1.21
25	1	528	-	0.83	0							1	528	-	-	1220	-	-	0.83
26	1	624	-	1.09	100							1	624	-	-	2645	-	-	1.09
27	1	587	-	1.16	100	1	559	-	1.08	100		2	573	19.8	559-587	2130	354	1880-2380	1.13
28	1	572	-	1.58	100							1	572	-	-	2985	-	-	1.58
29						1	811	-	1.09	100		1	611	-	-	2480	-	-	1.09
30	1	572	-	1.12	100							1	572	-	-	2100	-	-	1.12
31						2	727	62.7	1.27	100		2	727	62.7	688-785	5135	2838	3270-7000	1.27
32	1	618	-	1.16	100							1	618	-	-	2730	-	-	1.16
33											0								
34	2	687	4.2	1.30	100							2	687	4.2	684-670	3859	755	3325-4392	1.30
35	1	830	-	1.81	100							1	830	-	-	9200	-	-	1.81
36	2	593	19.6	1.15	100							2	593	19.8	579-607	2413	268	2225-2600	1.15
37						1	655	-	1.34	100		1	655	-	-	3760	-	-	1.34
38	2	598	102.5	1.32	100	2	743	137.2	1.16	100		4	670	129.7	525-840	4151	2700	1775-7900	1.24
39											0								
40						1	811	-	1.51	100		1	611	-	-	3450	-	-	1.51
TOTAL	32		1.17	91	18			1.21	89	0	50				439-840			875-9200	1.19

Table A1.14. Age-specific length, weight, condition factor and maturity data for lake trout in Judd Lake, 1977.

AGE (yr)	MALE					FEMALE					NUMBER	COMBINED							K
	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD	K	% MAT		N	LENGTH (mm) MEAN	SD	RANGE	MEAN	SD	WEIGHT (g) RANGE	
6	1	409	-	1.13	0							1	409	-	-	775	-	-	1.13
8	3	515	31.7	1.12	100							3	515	31.7	482-545	1540	287	1275-1845	1.12
9	2	479	1.4	1.38	50	1	545	-	1.17	100		3	501	38.1	478-545	1833	387	1190-1900	1.30
10	3	511	58.0	1.17	67	6	500	62.7	1.14	67		9	504	57.7	400-570	1546	568	655-2250	1.15
11	2	514	12.7	1.11	100	4	511	55.8	1.18	50		6	512	43.7	449-573	1570	348	1130-2070	1.16
12	2	542	33.9	1.20	100	2	580	28.3	1.20	100		4	566	37.7	518-610	2199	453	1840-2750	1.20
14						1	578	-	1.28	100		1	578	-	-	2475	-	-	1.28
16	1	607	-	1.24	100							1	607	-	-	2780	-	-	1.24
17						1	530	-	1.26	100		1	530	-	-	1875	-	-	1.26
19						1	571	-	1.27	100		1	571	-	-	2370	-	-	1.27
21						2	610	14.9	1.21	100		2	610	14.9	599-620	2753	414	2480-3045	1.21
22	1	533	-	1.25	100							1	533	-	-	1900	-	-	1.25
24	1	622	-	1.21	100							1	622	-	-	2920	-	-	1.21
25	1	560	-	1.31	100							1	560	-	-	2300	-	-	1.31
27	1	645	-	1.35	100							1	645	-	-	3825	-	-	1.35
32	1	552	-	1.10	100							1	552	-	-	1850	-	-	1.10
TOTAL	19			1.20	64	18			1.19	78	0	37			400-845			655-3625	1.19

Table A1.15. Age-specific length, weight, condition factor and maturity data for lake trout in Bigspruce Lake, 1977.

AGE (yr)	MALE			FEMALE			NUMBER	COMBINED												
	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD	K	% MAT	SEX UNKNOWN	N	LENGTH (mm) MEAN	SD	RANGE	MEAN	SD	RANGE	K	
6	1	310	-	1.01	0							1	310	-	-	300	-	-	1.01	
7	1	515	-	1.18	100							1	515	-	-	1625	-	-	1.19	
8	2	483	18.4	1.18	50							2	483	18.4	470-496	1343	258	1180-1525	1.18	
9						1	505	-	1.09	0		1	505	-	-	1400	-	-	1.09	
10						1	540	-	1.43	100		1	540	-	-	2250	-	-	1.43	
11						2	579	9.2	1.07	50		2	579	9.2	572-585	2070	57	2030-2110	1.07	
12						5	571	38.0	1.15	100		5	571	38.0	543-628	2154	397	1710-2750	1.15	
13						1	585	-	1.09	0		1	585	-	-	2185	-	-	1.09	
14	1	443	-	1.28	0							1	443	-	-	1110	-	-	1.28	
15						1	655	-	1.21	0		1	655	-	-	3400	-	-	1.21	
16	2	552	18.3	1.14	100							2	552	18.3	540-563	1893	202	1750-2035	1.14	
19	1	579	-	1.01	100							1	579	-	-	1970	-	-	1.01	
21	1	580	-	0.87	0							1	580	-	-	1700	-	-	0.87	
23						1	580	-	0.97	100		1	580	-	-	1900	-	-	0.97	
24	2	589	2.1	0.92	0	2	601	1.4	1.05	50		4	595	7.4	587-602	2071	255	1750-2300	0.98	
25	2	601	43.8	0.93	50	1	805	-	0.99	0		3	602	31.1	570-632	2078	247	1795-2250	0.95	
26	1	505	-	1.14	100	1	620	-	1.08	0		2	563	81.3	505-820	2025	785	1470-2580	1.11	
27	1	678	-	0.45	100	3	600	50.0	0.85	0		4	620	58.4	589-678	1768	601	1310-2625	0.75	
28						3	636	25.7	1.02	67		3	636	25.7	606-652	2613	327	2350-2980	1.02	
29	2	597	9.9	0.88	50	2	625	94.8	1.01	50		4	611	57.3	558-692	2145	428	1675-2775	0.95	
30	5	622	34.4	1.05	80	4	641	60.6	1.02	75		9	631	45.6	576-721	2857	858	1810-4810	1.03	
31	5	595	63.8	1.09	80	6	733	115.5	1.18	67		11	670	116.2	500-923	3881	2671	1525-10500	1.14	
32	2	719	51.6	1.10	50	4	599	24.3	0.92	25		6	639	68.8	581-755	2698	1408	1720-5400	0.98	
33	3	628	9.8	1.08	100	3	663	10.0	1.00	0		8	645	22.5	620-671	2792	468	2245-3440	1.04	
34	5	662	104.5	1.18	100	2	628	2.6	1.01	50		7	651	67.1	585-785	3385	1982	1825-7100	1.12	
35	5	597	36.3	1.05	40	4	710	87.4	1.10	50		9	648	84.0	585-823	3134	1764	1800-7250	1.07	
36						3	734	65.0	1.09	67		3	734	65.0	670-800	4475	1838	2825-6100	1.09	
37	1	687	-	1.08	100	2	638	19.8	0.98	0		3	653	32.6	622-687	2813	612	2325-3500	1.00	
38	3	702	98.1	1.09	33							3	702	98.1	589-765	3850	1290	2360-4600	1.09	
39	2	619	12.0	0.98	0	2	633	17.7	0.62	0		4	626	14.8	610-645	2198	394	1710-2575	0.90	
40						1	725	-	1.19	100		1	725	-	-	4550	-	-	1.19	
41						1	628	-	0.92	0		1	628	-	-	2285	-	-	0.92	
45						1	681	-	1.01	0		1	681	-	-	2925	-	-	1.01	
51	1	792	-	1.31	100							1	792	-	-	6500	-	-	1.31	
58	1	585	-	1.02	0							1	585	-	-	2050	-	-	1.02	
TOTAL	50			1.08	68	57			1.05	46	0	107				310-923			300-10500	1.05

Table A1.16. Age-specific length, weight, condition factor and maturity data for lake cisco in Strutt Lake, 1977.

AGE (yr)	MALE				FEMALE				NUMBER SEX UNKNOWN	COMBINED								
	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD	RANGE	MEAN	SD	RANGE	K
2						2	171	14.9	1.08	50	2	171	14.9	180-181	53	11	45-80	1.08
3	2	185	7.1	0.98	0	3	188	14.6	1.00	33	5	186	10.9	150-178	45	13	30-85	0.88
4	5	189	13.7	1.10	80	5	174	18.1	1.10	60	1	185	19.5	183-222	74	28	45-130	1.11
5	8	194	21.7	1.10	67	13	199	16.3	1.08	54	19	198	19.0	157-225	86	28	45-130	1.08
6	12	218	14.8	1.20	84	17	213	16.8	1.11	100	29	214	15.6	182-245	118	29	55-170	1.15
7	4	221	13.7	1.20	75	3	230	5.0	1.17	100	7	225	11.3	210-240	138	32	105-190	1.19
8	2	233	3.5	1.05	100	3	224	14.4	1.15	100	1	223	15.1	200-240	128	19	110-160	1.15
9	1	215	-	1.01	0						1	215	-	-	100	-	-	1.01
12	1	223	-	1.04	100						1	223	-	-	115	-	-	1.04
TOTAL	33			1.13	73	48			1.10	78	2	81		150-245			30-190	1.12

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Table A1.17. Age-specific length, weight, condition factor and maturity data for lake cisco in Bigspruce Lake, 1977.

AGE (yr)	MALE				FEMALE				NUMBER SEX UNKNOWN	COMBINED								
	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD	K	% MAT	N	LENGTH (mm) MEAN	SD	RANGE	MEAN	SD	RANGE	K
3						5	171	11.1	0.97	60	5	171	11.1	180-184	48	4	45-55	0.97
4	2	191	21.9	0.83	50	5	171	10.9	0.97	80	7	176	15.9	180-208	51	14	40-80	0.93
5	8	185	17.5	0.87	50	8	188	18.9	0.95	50	1	188	18.7	165-225	62	28	40-140	0.91
6	9	198	29.2	0.94	100	11	188	14.4	0.89	100	1	192	22.0	172-253	67	39	40-185	0.87
7	8	213	25.2	1.00	88	5	214	22.4	0.98	80	1	211	23.1	178-240	97	42	45-150	0.98
8	1	220	-	1.03	100	5	233	17.9	0.98	60	6	231	16.9	218-260	126	35	90-180	0.99
TOTAL	26			0.94	81	37			0.94	78	3	66		180-260			40-185	0.92

Table A1.18. Age-specific length, weight, condition factor and maturity data for white sucker in the lower Snare River, 1977.

AGE (yr)	MALE				FEMALE				NUMBER	COMBINED										
	N	LENGTH (mm)	K	% MAT	N	LENGTH (mm)	K	% MAT		SEX UNKNOWN	N	LENGTH (mm)	MEAN	SD	RANGE	MEAN	SD	RANGE	K	
3					1	318	-	1.37	0	6	7	207	64.5		100-318	155	127	80-440	2.51	
4					1	218	-	1.35	0	8	9	224	23.9		185-270	147	49	100-250	1.27	
5	1	275	-	1.49	0	1	281	-	1.30	0	2	4	294	15.0		275-310	353	50	310-420	1.38
6	5	387	21.0	1.44	100	2	310	7.1	1.25	0	1	6	369	40.1		305-410	726	238	385-950	1.38
7	3	405	9.2	1.88	100	2	432	18.3	1.34	100		5	415	18.0		384-443	1109	203	875-1280	1.55
8	2	420	0.0	1.51	100	1	400	-	1.38	100	2	5	433	33.5		400-488	1204	320	880-1740	1.48
9	1	426	-	1.42	100					1	2	432	8.5		426-438	1140	57	1100-1180	1.41	
11					1	487	-	1.48	100		1	487	-	-		1690	-	-	1.46	
TOTAL	12		1.51	92	9		1.34	44	20	41			100-488				80-1740	1.58		

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Table A1.19. Age-specific length, weight, condition factor and maturity data for white sucker in Strutt Lake, 1977.

AGE (yr)	MALE				FEMALE				NUMBER	COMBINED									
	N	LENGTH (mm)	K	% MAT	N	LENGTH (mm)	K	% MAT		SEX UNKNOWN	N	LENGTH (mm)	MEAN	SD	RANGE	MEAN	SD	RANGE	K
3	1	230	-	1.48	0				8	7	203	28.7		158-230	109	49	45-180	1.23	
4	1	254	-	1.40	0	9	232	16.8	1.23	0	6	234	14.7		215-263	166	38	115-230	1.28
5	5	283	41.2	1.34	0	6	289	39.7	1.39	0	1	284	37.6		244-340	331	143	195-570	1.37
6	2	348	7.8	1.53	0	3	337	28.5	1.42	0	2	335	22.5		300-384	568	142	400-775	1.48
7	1	356	-	1.45	0				1	2	378	31.1		358-400	795	198	655-835	1.46	
9	1	300	-	1.65	0				1	2	350	70.0		300-399	730	325	500-960	1.68	
TOTAL	11		1.45	0	18		1.31	0	17	48		156-400	313	232		45-960	1.35		

Table A2.1. Length-weight relationships for walleye from the Snare River, 1977.

Area	Sex	N	Fork Length Range (mm)	Y-Intecept (a)	Slope (b)	$S_b$
Lower Snare River	F	113	235-565	-5.3566	3.1555	0.1521
	M	193	266-570	-4.2423	2.7372	0.2654
	C	319	189-570	-5.2854	3.1332	0.1123
Strutt Lake	F	109	248-570	-4.5079	2.8487	0.1853
	M	58	285-479	-4.6735	2.8779	0.2485
	C	193	248-570	-4.6174	2.8571	0.1496

C = Combined male, female and unsexed fish.

 $S_b$  = Standard error of estimate.

Table A2.2. Length-weight relationships for lake whitefish from the Snare River, 1977.

Area	Sex	N	Fork Length Range (mm)	Y-Intecept (a)	Slope (b)	$S_b$
Upper Snare River	F	26	278-540	-5.5519	3.2709	0.5318
	M	46	287-520	-4.7930	2.9876	0.3409
	C	77	182-540	-3.9927	2.6808	0.2925
Lower Snare River	F	36	202-455	-5.4874	3.2523	0.4742
	M	27	220-443	-5.0274	3.0770	0.2677
	C	101	174-493	-5.5177	3.2665	0.4713
Bigspruce Lake	F	203	200-580	-5.2918	3.1578	0.1445
	M	173	217-548	-5.1994	3.1222	0.1227
	C	376	200-580	-5.3035	3.1428	0.0921
Strutt Lake	F	244	182-493	-5.7555	3.3480	0.0699
	M	230	193-514	-5.8257	3.3738	0.0908
	C	524	161-514	-5.7210	3.3567	0.0452
Judd Lake	F	57	159-551	-5.6972	3.3315	0.1231
	M	116	170-507	-5.5494	3.2712	0.1529
	C	191	159-551	-5.6804	3.3222	0.0769

C = Combined male, female and unsexed fish.

 $S_b$  = Standard error of estimate.

Table A2.3. Length-weight relationships for northern pike from the Snare River, 1977.

Area	Sex	N	Fork Length Range (mm)	Y-Intecept (a)	Slope (b)	$S_b$
Upper Snare River	F	35	300-900	-4.9335	2.1950	0.1348
	M	50	257-685	-4.5584	2.7795	0.2212
	C	101	235-900	-4.6824	2.8241	0.1241
Lower Snare River	F	62	200-950	-4.3722	2.7189	0.2504
	M	66	235-750	-5.0597	2.9638	0.1288
	C	170	200-950	-4.7746	2.8619	0.1206
Bigspruce Lake	F	22	469-824	-5.4758	3.0893	0.4277
	M	11	358-609	-4.1687	2.6223	0.5010
	C	33	358-824	-4.7870	2.8419	0.3601
Strutt Lake	F	38	280-960	-4.9793	2.9301	0.1689
	M	39	292-782	-4.7592	2.8510	0.1610
	C	104	280-1050	-4.9687	2.9304	0.1030
Judd Lake	F	63	240-870	-4.7444	2.8424	0.1906
	M	70	268-720	-5.2821	3.0437	0.1586
	C	162	240-1000	-5.1212	2.9847	0.1039

C = Combined male, female and unsexed fish.

 $S_b$  = Standard error of estimate.

Table A2.4. Length-weight relationships for longnose sucker from the Snare River, 1977.

Area	Sex	N	Fork Length Range (mm)	Y-Intecept (a)	Slope (b)	$S_b$
Upper Snare River	F	13	330-567	-5.0322	3.0741	0.5974
	M	12	430-540	-4.8319	2.9984	0.8367
	C	44	330-580	-5.4068	3.2115	0.3266
Judd Lake	F	18	397-580	-4.5390	2.8884	0.5408
	M	10	434-535	-3.3736	2.4520	0.8816
	C	47	161-580	-4.3451	2.2333	0.1190

C = Combined male, female and unsexed fish.

 $S_b$  = Standard error of estimate.

Table A2.5. Length-weight relationships for white sucker from the Snare River, 1977.

Area	Sex	N	Fork Length Range (mm)	Y-Intecept (a)	Slope (b)	$S_b$
Lower Snare River	F	9	218-487	-5.1327	3.1018	0.2479
	M	12	275-426	-5.0286	3.0799	0.2548
	C	46	100-488	-4.1512	2.7196	0.3237
Strutt Lake	F	18	215-364	-5.6781	3.3277	0.3814
	M	12	230-356	-5.6718	3.3349	0.5751
	C	48	215-364	-5.7812	3.1774	0.2418

Table A2.6. Length-weight relationships for lake trout from the Snare River, 1977.

Area	Sex	N	Fork Length Range (mm)	Y-Intecept (a)	Slope (b)	$S_b$
Bigspruce Lake	F	58	505-923	-5.8182	3.2978	0.4869
	M	52	310-792	-4.9126	2.9748	0.4808
	C	121	310-923	-5.2295	3.1596	0.0347
Strutt Lake	F	18	559-840	-6.1993	3.4563	0.7672
	M	34	439-830	-6.5041	3.5672	0.5077
	C	85	439-875	-6.1861	3.4469	0.3911
Judd Lake	F	19	400-620	-5.8295	3.3309	0.2580
	M	20	409-645	-5.7378	3.2988	0.5172
	C	52	400-645	-5.7648	3.3059	0.2782

Table A2.7. Length-weight relationships for lake cisco from the Snare River, 1977.

Area	Sex	N	Fork Length Range (mm)	Y-Intecept (a)	Slope (b)	$S_b$
Bigspruce Lake	F	39	160-260	-5.5149	3.2135	0.3186
	M	26	165-253	-7.0822	3.8925	0.3279
	C	68	160-260	-6.1226	3.4767	0.2614
Strutt Lake	F	53	150-245	-5.6097	3.2811	0.3257
	M	35	157-240	-5.9415	3.4284	0.3819
	C	90	150-245	-5.7577	3.3474	0.2468

C = Combined male, female and unsexed fish.

$S_b$  = Standard error of estimate.

Table A3.1. Stomach contents of lake whitefish from the lower Snare River, 1977.

Food Item or Parasite	Occurrence		Number of Organisms	
	N	%	N	Avg. per fish
<b>Insecta</b>				
Diptera				
Chironomidae larvae	11	73.3	37	3.4
Unidentified larvae	4	26.7	6	1.5
Trichoptera larvae	4	26.7	16	4.0
Ephemeroptera larvae	7	46.7	78	11.1
Hemiptera				
Corixidae adult	10	66.7	60	6.0
Coleoptera	1	6.7	1	1.0
Crustacea				
Amphipoda	10	66.7	736	73.6
Cladocera	1	6.7	1	1.0
Mollusca				
Pelecypoda	9	60.0	126	14.0
Gastropoda				
Planorbidae	6	40.0	130	21.7
Lymnaeidae	1	6.7	4	4.0
Arachnoidae				
Hydracarina	3	20.0	15	5.0
Cestoda	3	20.0	14	4.7
Cysts (stomach wall)	10	66.7	85	8.5
Spruce needles	1	6.7	1	1.0
Fish eggs	2	13.3	5	2.5
No. stomachs with food	14			
No. stomachs examined	15			

Table A3.2. Stomach contents of lake whitefish from Strutt Lake, 1977.

Food Item or Parasite	Occurrence		Number of Organisms	
	N	%	N	Avg. per fish
<b>Insecta</b>				
Diptera				
Chironomidae larvae	28	50.9	2499	89.3
Chironomidae pupae	26	47.3	484	18.6
Unidentified larvae	6	10.9	15	2.5
Trichoptera larvae	11	20.0	22	2.0
Ephemeroptera larvae	3	5.5	118	39.3
Hemiptera				
Corixidae adult	6	10.9	15	2.5
Crustacea				
Amphipoda	20	36.4	400	20.0
Mollusca				
Pelecypoda	18	32.7	449	24.9
Gastropoda	6	10.9	310	51.7
Arachnoidae				
Hydracarina larvae	10	18.2	44	4.4
Cestoda				
Cysts (stomach wall)	17	30.9	160	9.4
<b>Surface food items</b>				
Hymenoptera	1	1.8	100	100.0
Arachnida	1	1.8	1	1.0
No. stomachs with food	48			
No. stomachs examined	55			

Table A3.3. Stomach contents of lake whitefish from the upper Snare River, 1977.

Food Item or Parasite	Occurrence		Number of Organisms	
	N	%	N	Avg. per fish
<b>Insecta</b>				
Diptera				
Chironomidae larvae	17	73.9	1760	103.5
Chironomidae pupae	14	60.9	277	19.8
Unidentified larvae	7	30.4	208	29.7
Trichoptera larvae	4	17.4	5	1.3
Ephemeroptera larvae	1	4.4	1	1.0
Odonata larvae	1	4.4	3	3.0
Hemiptera				
Corixidae adult	15	65.2	595	39.7
Coleoptera				
Unidentified family	2	8.7	3	1.5
Dytiscidae	7	30.4	32	4.6
Crustacea				
Amphipoda	4	17.4	7	1.8
Mollusca				
Pelecypoda	19	17.4	14	3.5
Gastropoda				
Planorbidae	7	30.4	208	29.7
Arachnoidae				
Hydracarina	15	69.4	3637	294.9
Nemertea	1	4.4	2	2.0
Nematoda	3	13.0	3	1.0
Spruce needles	2	8.7	3	1.5
Seeds	2	8.7	23	11.5
No. stomachs with food	48			
No. stomachs examined	55			

Table A3.4. Stomach contents of lake whitefish from Judd Lake, 1977.

Food Item or Parasite	Occurrence		Number of Organisms	
	N	%	N	Avg. per fish
<b>Insecta</b>				
Diptera				
Chironomidae larvae	35	77.8	3667	104.8
Chironomidae pupae	16	35.6	511	31.9
Trichoptera larvae	10	22.2	25	2.5
Odonata larvae	1	6.7	3	3.0
Ephemeroptera larvae	1	2.2	1	1.0
Unidentified larvae	6	13.3	9	1.5
Coleoptera	5	31.1	14	2.8
Hemiptera	21	46.7	460	21.9
Crustacea				
Amphipoda	12	26.7	511	42.6
Mollusca				
Pelecypoda	24	53.3	566	23.6
Gastropoda				
Planorbidae	20	44.4	926	46.3
Lymnaeidae	2	4.4	13	6.5
Arachnoidae				
Hydracarina larvae	11	24.4	2063	187.6
Hydracarina adult	10	22.2	116	11.6
Nematoda	2	4.4	4	2.0
Cestoda				
Cysts (stomach wall)	15	33.3	95	6.3
Fish eggs	1	2.2	36	36.0
Spruce needles	7	15.6	46	6.6
Seeds	5	11.1	52	10.4
No. stomachs with food	45			
No. stomachs examined	45			

Table A3.5. Stomach contents of lake whitefish from Bigspruce Lake, 1977.

Food Item or Parasite	Occurrence		Number of Organisms	
	N	%	N	Avg. per fish
<b>Insecta</b>				
Diptera				
Chironomidae larvae	21	58.4	3624	172.6
Chironomidae pupae	1	2.8	1	1.0
Trichoptera larvae	4	11.1	58	14.5
Hemiptera				
Corixidae	3	8.3	82	27.3
Crustacea				
Amphipoda	28	77.8	1242	44.4
Mollusca				
Pelecypoda	21	58.4	333	23.6
Gastropoda	3	8.3	25	8.3
Arachnoidae				
Hydracarina	2	5.6	2	1.0
Nemertea	24	66.7	677	28.2
Nematoda	4	11.1	11	2.8
Fish eggs	1	2.8	65	65.0
No. stomachs with food	33			
No. stomachs examined	36			

Table A4.1. Summary of water chemistry data from the Snare River, 1977.

Station No. <sup>1</sup>	1				2				3				4				5		6		7		8	
	Date	12-6	26-7	12-6	26-7	12-6	26-7	12-6	26-7	12-6	26-7	22-6	22-6	28-6	26-7	28-6	26-7	28-6	26-7	28-6	26-7	28-6	26-7	
Depth <sup>2</sup> (m)	1	21	1	21	1	7	1	8	1	14	1	14	1	4	1	4	1	53	1	13	1	46	1	45
Water Temperature (°C)	12.0	6.2	17.9	7.3	13	9.8	18.9	17.9	13.3	8.4	18.8	12.8	13.7	13.0	18.9	18.1	12.8	6.9	13.2	6.9	14.9	5.2	18.7	6.1
Dissolved O <sub>2</sub> (mg·L <sup>-1</sup> )	11.5	11.0	10	8	11	11	9	9	11	10	9	9	11	11	9	9	11	11	11	11	10	10	11	10
Alkalinity (mg·L <sup>-1</sup> )	17-34	17-34	17-34	17-34	17-34	17-34	17-34	17-34	17-34	17-34	17-34	17-34	17-34	17-34	17-34	34-51	34-51	34-51	34-51	34-51	34-51	34-51	34-51	
Conductivity (μS·cm <sup>-1</sup> )	22	19	27	28	23	23	27	28	23	26	28	35	23	23	30	30	21	18	21	27	42	26	38	28
Hardness (mg·L <sup>-1</sup> )	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	17-34	17-34	<17	<17	17-34	<17	<17	17-34
CO <sub>2</sub> (mg·L <sup>-1</sup> )	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17
pH	7.8	7.4	7.6	6.9	7.5	7.5	7.5	7.5	7.5	7.0	7.6	7.3	7.4	7.4	7.4	7.4	8.0	7.3	7.5	7.4	8.0	7.4	7.7	7.4
Secchi Disc (m)	3.0	3.0	2.5	2.5	2.3	2.5	2.3	2.5	2.3	2.3	2.5	2.5	5.0	5.0	3.0	2.5	3.0	2.5	3.0	2.5	3.0	2.5	3.0	2.5
Water Color	Light Silt	Color-less	Light Silt	Light Silt	Light Silt	Color-less	Color-less	Green																
Time	1245	1000	1515	1145	1630	1400	1730	1500	1100	1400	1120	1600	1330	1100	100	5	100	100	5	100	100	5	100	1
Cloud Cover (%)	0	10	0	10	0	10	0	10	0	10	0	10	0	100	100	100	100	100	100	100	100	100	100	1

<sup>1</sup> Stations are shown in Figure 6.

<sup>2</sup> On each sampling date, water samples taken near the surface and at the bottom of the station were analysed.