1995 Colville Delta Fish Habitat Study

June 10, 1996

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Prepared for:
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EXECUTIVE SUMMARY

The 1995 fish studies consisted of sampling a variety of fish habitats in and around the potential development area and pipeline corridor for an oilfield within the Colville Delta. Habitats sampled included both major and minor river channels, tapped lakes, and perched lakes. Perched lakes were further divided into low and high classifications based on their frequency of flooding. Sampling was primarily conducted with fyke nets during the summer and gill nets during the fall.

Perched lakes within the delta portion of the 1995 study area exceeded 2 m in water depth, thus providing the opportunity for fish to overwinter. Tapped lakes were less than 2 m deep, thus diminishing chances for successful overwintering. Several deep areas within the Sakoonang Channel that provided some opportunity for overwintering were identified, but successful overwintering would depend on winter water suitability.

Most of the fish within the Sakoonang Channel were young-of-the-year or juveniles, few mature fish were caught. Fish within the Sakoonang Channel appeared to be moving downstream towards Harrison Bay during the early summer study period (July 8 to August 5). By the end of the fyke net monitoring, few fish remained in the river channel and tapped lakes, with most of the remaining fish being young-of-the-year.

River channel and tapped lake habitats produced similar species composition, although broad whitefish were more abundant in tapped lakes than in channels.

Perched lakes contained mostly least cisco, broad whitefish, Alaska blackfish and ninespine stickleback, with sporadic catches of other species commonly caught within the delta.

Least cisco populations in low perched lakes exhibited growth patterns similar to the anadromous population found in channels, while those in high perched lakes exhibited a wide range of growth rates. Approximately 42% of the high perched lakes contained fast-

growing least cisco, 15% contained stunted populations, with the remaining lakes exhibiting growth rates similar to the anadromous population.

Male least cisco from populations inhabiting both high and low perched lakes had higher survival rates than males in the anadromous population. This finding was based on a higher average age and greater percentage of males in perched laked populations as compared to the anadromous population.

The Miluveach and Kachemach rivers within the pipeline corridor provided spawning for Arctic grayling and provide feeding areas for both grayling and round whitefish.

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INTRODUCTION

ARCO Alaska Inc. has increased exploration activities in the Colville Delta, Alaska and is planning an oil field development within the delta. Field development would lead to the crossing of delta channels and lakes ice roads and pipelines. Water would be withdrawn from lakes to support both industrial and domestic needs.

During review of both exploration and development permits, information will be required on the biological sensitivity of delta channels and lakes. Lakes of interest include both lakes connected to river channels during the open water period, often called tapped lakes, and lakes isolated from regular connection with the river, called perched lakes. Perched lakes often lack well-defined connections, however, some are of such low elevation that river water floods them every spring during break-up, while others are flooded infrequently during unusually high water. Perched lakes with depths greater than 7 or 8 feet often support fish populations while the most critical use of tapped lakes is by anadromous fish that use these lakes for feeding during the summer.

The most critical use of delta channels is by anadromous fish that move into these channels in the fall and remain through the winter. The channels are also used to move between the various habitats used at different seasons. A substantial body of information exists for the major channels of the Colville Delta (Kogl and Schell 1974, Bendock and Burr 1986, George and Kovalsky 1986, Fawcett et al. 1986, Moulton et al. 1992). These areas support substantial fisheries in the fall and fish use of these channels is well documented. Less information is available for the minor channels that lie between the Main (Kupigruak) Channel on the east and the Nechelik (Nigliq) Channel on the west.

The study was designed to provide physical and biological information on these habitat types

to understand their use by various fish species. In addition, the results of the survey can be used, in concert with previous surveys within the area, to direct any future investigations that may be needed.

The objectives of the study are to document fish presence and habitat use in both minor delta channels and lakes. Lakes include both isolated and tapped lakes that have not been previously surveyed. Selected lakes are those that may be included in an eventual field development.

METHODS

Sampling Methods

The study consisted of 2 sampling periods, one during the summer, July 8 to August 4, and a second in the fall after ice formation, October 28 to November 6. During summer, fyke nets were the primary sampling gear and were supplemented with minnow traps, set lines and occasional seining. In the fall, gill nets were the only gear utilized. During 1995, information was collected from 47 lakes and 10 river channel stations within the Colville Delta, with additional observations from the Miluveach and Kachemach rivers (Figures 1-4).

The lake numbering system used for the study contains several pieces of information, including the code of the initial sampler and the year of sampling. The codes are as follows:

Sampler Code:

MC = McElderry and Craig (1981); sampling in 1979

B = Bendock and Burr (1986); sampling in 1985

L = Lobdell; water quality sampling in 1991-1994

M = Moulton; fish sampling in 1991-1993 and 1995

First Two Numerals:

Year of Initial Sampling

(if Moulton sampled a lake previously sampled by Bendock, then the Bendock lake number is used)

Last Two Numerals:

Numbers from 01 to 99 used to identify the individual lake sampled within a given year.

For McElderry and Craig (1981) and Bendock and Burr (1986) sites, the number reported by the original investigator is placed behind the sampler code and year. River channel stations are identified by the initial letter C, as in C9501.

Fyke nets used during the summer sampling had an opening 0.9 m deep by 1.1 m wide, the trap end was 4.9 m long, made of 9.5 mm mesh. The wings (5 m long) and lead (15 m long) were made of 12.7 mm mesh. The fyke nets were placed along the edge of lakes where depths permitted, usually the entire lead was not used because of steep bottom contours. Two baited minnow traps and a set line with 15 baited hooks were set in each lake near the fyke net. The gear was fished overnight, unless weather prevented access.

Three long-term stations in the Sakoonang Channel (C9501) and connected tapped lakes (M9521 and M9523) were fished during the summer; at these stations, the fyke nets were set to utilize the full length of the lead.

The variable mesh gill nets used in the fall sampling program consisted of a set of two nets, each with three 1.8 m (6 ft) x 6.1 m (20 ft) panels. One net contained small meshes: 25 mm (1.00"), 32 mm (1.25"), and 41 mm (1.63"), the other net contained large meshes: 52 mm (2.06"), 70 mm (2.75") and 89 mm (3.50"). The nets were set in pairs at each sample location.

Seining was conducted in two small tundra streams along the potential pipeline route -- the Miluveach and Kachemach rivers. The streams were surveyed visually and samples were taken when fish were sighted. A limited amount of additional seining was conducted within

some of the lakes within the study area, but the seine was relatively inefficient in the lakes encountered because of steep bottom contours near the shore.

Catches were separated by gear type, and mesh size if appropriate, and enumerated by species; fork lengths were taken for all specimens except ninespine stickleback and fourhorn sculpin. Duration of each set was recorded to allow calculation of catch rates. Subsamples of coregonines and Arctic grayling were retained for more detailed examination. For retained specimens, the fish were re-measured under controlled conditions and weight to the nearest 0.1 gram was also recorded. Sex and stage of maturity were obtained. For mature non-spawning females and pre-spawning females and males, the gonads were removed and weighed to the nearest 0.1 gram. Otoliths were removed from all retained specimens to determine age-length relationships. Otoliths were read using the break-and-burn technique.

A bathymetric transect of each sampled lake was measured during the summer using an Eagle SupraPro depth sounder for depth measurements and a Magellan Trailblazer GPS for positioning. Salinity or conductivity was measured at each of the sampling locations. During the summer, conductivity was measured at the surface of each lake. During the fall, a conductivity or salinity profile in 0.5 m increments was measured at the beginning or end of each set using a YSI Model 33 salinity/conductivity meter.

Analysis Methods

A habitat classification was used to analyze catch results. Habitats used in the analysis were: 1) major channels, 2) minor channels, 3) tapped lakes, 4) frequently flooded perched lakes, 5) infrequently-flooded perched lakes, and 6) drainage lakes. Major channel habitat is composed primarily of the main Colville River between the Itkillik River and the mouths of the Kupigruak and East channels, and the Nigliq Channel. These channels convey most of the flow during the summer and hold substantial volumes of water during the winter.

Numerous minor distributary channels lace the delta. In total, these minor channels convey

a substantial amount of water during the spring, but have very low to no flow during the summer. Because of the low summer flow and shallow water, these channels warm rapidly and provide abundant rearing habitat.

Tapped lakes have year-round connecting channels that fish can pass through during the summer. The connecting channel is usually the drainage path for the lake, hence most of these lakes are shallow, typically less than six feet deep.

Perched lakes often lack well-defined connections, however, some are of such low elevation that river water floods them every spring during break-up, while others are flooded infrequently during unusually high water. In this report, frequently flooded perched lakes will be termed low perched lakes, while those infrequently flooded will be termed high perched lakes.

Drainage lakes are connected to streams that drain into the Colville River or its tributaries. One complex of drainage lakes occurs within the delta, but they are more common along the potential pipeline corridor between the Colville River and the Kuparuk Field facilities. The degree a lake is connected to the river channel determines the suite of species able to utilize the available habitat.

RESULTS AND DISCUSSION

Physical Measurements

Air temperature ranged from near 20 to 0°C (Figure 5). Temperatures were highest in early to mid-July, then decreased in late July and generally remained below 10°C, with some exceptions, for the remainder of the summer field program. Winds were mainly from the east, typically between 10-20 km/hr, with some periods of wind in excess of 20 km/hr (Figure 5). A period of west winds from July 16 to 18 was missed because of instrument malfunction, but that was the only significant west wind period during the summer study.

Water depths were obtained from 45 lakes during the 1995 sampling. Maximum depths ranged from 0.7 to 6.5 meters. Most lakes (32 of 45) were greater than 2.0 meters deep, with the distribution of depths as follows:

Depths (meters)	Number of Lakes
0-2.0	13
2.1-3.0	7
3.1-4.0	15
4.1-5.0	8
5.1-6.0	1
6.1-7.0	1
Total:	45

The 45 lakes measured for water depth in 1995 brings the total number of lakes with depth information to 130. Lakes less than 2.0 meters deep were either tapped lakes within the delta or tundra lakes east of the Colville River. Perched lakes within the delta were all in excess of 2.0 meters deep (Figure 6).

Flow in the Sakoonang Channel had ceased when the 1995 summer sampling was initiated on July 8. The channel was under tidal influence during the sampling period (Jul 8 to Aug 4) except for a 3 day period when high water caused by rainstorms overtopped the upstream end of the channel.

Most of the Sakoonang Channel was less than 2 meters deep during the summer, indicating little potential for overwintering. Several areas deeper than 2.0 meters were

found, however, indicating some areas for potential overwintering (Figure 7). A maximum depth of 8.0 meters was observed. Sampling at these deep areas in November revealed elevated salinity (8-9 ‰ by Nov 4, 1995), indicating upstream movement of marine water by that time.

Conductivity tended to be low in most of the lakes surveyed. Seventeen, or 38%, had conductivities less than 100 mho/cm, with an additional 31% between 100-199 mho/cm. High conductivities were measured in one perched lake (Lake M9522: 2700 mho/cm) and one tapped lake (Lake L9278: 3580 mho/cm), indicating marine influence.

Biological Observations

Catch Summary

Fifteen species of fish were caught during the 1995 sampling effort, accounting for a total of 38,701 fish from 15 species, with the majority (37,142) captured by fyke net during the summer (Table 1). Over 75% of the captured fish were ninespine stickleback. Whitefish, cisco and Arctic grayling accounted for 23% of the remaining catch (or 94% of the catch excluding sticklebacks). Least cisco and broad whitefish were caught in similar abundance during the summer, followed by round whitefish. Least cisco were the dominant species in the fall sampling. Minnow traps, set lines and seines were relatively ineffective, with few fish and species captured.

Fish Occurrence in River Channels and Tapped Lakes. Fish catches within the Sakoonang Channel and associated tapped lakes consisted of 13 species, and were dominated by least cisco and broad whitefish, with round whitefish and humpback whitefish also common (Table 2). Catches in both habitats were similar in composition, although broad whitefish outnumbered least cisco in tapped lakes, while least cisco were more numerous in the river channel samples.

Fish appeared to be leaving the Sakoonang Channel during the July 8 to August 4 sampling period. Catch rates tended to be highest during the early portion of the sampling period, with declining catch rates as sampling progressed (Figure 8). Catches increased in late July for least cisco, these increased catches were composed primarily of young-of-the-year (Figure 9). By early August, few of the dominant species were being caught in the study area (Figures 9 to 12). Catches during the entire sampling period were dominated by juveniles of all species. Few mature fish of any species were caught, with most being ages 0 and 1. This pattern is similar to that observed in 1985, when sampling in the major channels of the Colville River revealed a downstream movement of broad whitefish and least cisco through July into early August, then a return movement from mid August to early September (Figures 13 to 14).

Fish Occurrence in Perched Lakes. Low perched lakes were restricted to Study Area 1, high perched lakes occurred throughout the delta study area and to the east of the Colville River (Figures 2-4). Ninespine stickleback were the most abundant species caught in perched lakes during summer fyke net sampling, often being very abundant. Least cisco dominated the non-stickleback catch, followed by broad whitefish and Alaska blackfish (Table 2). Excluding sticklebacks, least cisco were 96% of the catch in low perched lakes, 50% in high perched lakes during summer and 96% in both lake types during the fall (Table 3). Few other species were captured.

The relatively high contribution of broad whitefish to the catch in high perched lakes (18.2% of the fyke net catch) was caused by a high catch in one lake, where 13 of the 16 total broad whitefish from this habitat were taken. The fall catch of broad whitefish from high perched lakes (2.3%) is probably a more accurate representation of this species. The lowest catches were recorded from a complex of lakes near the Kuparuk Field, in the eastern portion of the proposed transportation corridor. These lakes were relatively shallow compared to lakes within the delta and contained only ninespine sticklebacks.

Fish Occurrence in Drainage Lakes. Drainage lakes occurred along the eastern shore of the main Colville River. Arctic grayling were the dominant species, comprising 52% of the catch. Most of this dominance was caused by a high catch in one lake, however, Arctic grayling were taken in 4 of the 7 drainage lakes sampled. Other abundant species included least cisco and Alaska blackfish, with round whitefish, humpback whitefish and broad whitefish also caught. These lakes were connected to the Colville River via small creeks, thus facilitating movements into and out of the lakes by any freshwater fish species found in the river system.

Fish Occurrence in Tundra Streams. Fish caught within the Miluveach and Kachemach rivers included Arctic grayling, round whitefish and ninespine stickleback. Arctic grayling within the Miluveach River included young-of-the-year (27-36 mm) and larger juveniles (90-174 mm) (Figure 15). Adult grayling were not observed. Round whitefish in the Miluveach River ranged between 164-243 mm; again, adults were not observed. These findings are consistent with those reported in Moulton (1980), who reported the same species in similar size ranges from a survey conducted in July 1980. Only young-of-the-year and juvenile Arctic grayling and ninespine stickleback were caught in the lower reaches of the Kachemach River.

Growth and Maturity Patterns

Riverine Populations. Age-length relationships of broad whitefish, humpback whitefish and least cisco caught by fyke net in the Sakoonang Channel were generally similar to those observed in 1985 over the entire age range (Figure 16). Closer examination of the younger ages indicated that growth in recent years has been more rapid than that observed in 1985 (Figure 17). Since the growth difference is observed in all three species, it is unlikely to be an artifact of sample size or procedure. The 1985 samples were collected from the main channels, while the 1995 samples were from the Sakoonang Channel. It is possible that the difference in habitat could account for much of the observed difference, since the Sakoonang Channel, characterized by shallow, low velocity

water, would warm more rapidly than the deep main channels and could promote more rapid growth. The differences in habitat could influence both food supply and growing conditions.

Few of the fish captured within river channels or tapped lakes associated with the Sakoonang Channel during the summer or fall had reached maturity. Less than 1.5% of the least cisco had reached the length of first maturity (250 mm), while less than 0.5% of the broad whitefish and humpback whitefish were large enough to mature. In contrast, mature fish were commonly caught in main channels. For example, during fall sampling in the main Colville River, 87% of the least cisco captured by gill net were mature, along with 22% of the broad whitefish and 38% of the humpback whitefish.

Lacustrine Populations. Least cisco from lakes demonstrated a variety of growth patterns, depending on the type of lake inhabited. Populations in low perched lakes showed growth similar to that seen in the anadromous population associated with river channels (Figure 18). This pattern could result from the introduction of fish of various sizes during break-up. An alternative explanation would be that the annual flooding creates similar productivity or feeding conditions across the low perched lakes.

Least cisco populations in high perched lakes demonstrate a variety of growth patterns, from growth rates much lower to rates much higher than the anadromous population, with a range of all possibilities between the extremes (Figures 18 and 19). The growth pattern within a lake showed variability similar to that seen within the anadromous and low perched lakes. These differences in growth rates between lakes have previously been described in Moulton (1994), who classified the various populations as normal, large or stunted based on growth characteristics. Based on this classification, 11 of 26 evaluated high perched lakes throughout the delta contained normal, 11 contained large and 4 contained stunted least cisco. There was no obvious geographical separation of the different forms; all were spread throughout the delta, with the various forms sometimes occurring in adjacent lakes (Figure 20).

Reproductive activity was readily apparent within lacustrine populations of least cisco. Mature least cisco were caught in 2 of the 5 low perched lakes and 10 of 21 high perched lakes within the delta or along the east bank of the Colville River. Within high perched lakes, over 58% of the captured least cisco were mature and 33% were in pre-spawning or spawning condition.

Male least cisco outnumbered females in both low and high perched lakes (62% and 60% males, respectively). Conversely, males were only 35% of the catch from the anadromous population (Table 4). Males in perched lakes had a longer life span than males from the anadromous population, averaging in excess of 9.5 years, compared to 6.7 years for anadromous males. Females from all populations averaged between 8.1 and 8.9 years. Few anadromous males (12%) exceeded age 10, compared to over 50% of the males from high perched lakes (Table 4). The pattern indicates that lake residence is more benign, at least for males, than the annual migration between coastal regions and river channels undertaken by the anadromous population.

Fyke Net Mortality Rates

Sampling mortality was calculated by species for the long term sets at river channel and tapped lake stations. Mortality was highest in rainbow smelt (33.9%), which primarily consisted of larvae (Table 5). All captured rainbow smelt were less than 85 mm long, with 80% at 60 mm or less. The second highest mortality was observed in least cisco, at 3.3%, with mortality highest in the smaller sizes; 94% of the least cisco mortalities were 100 mm or less.

Gear Effectiveness

The effectiveness of the fyke nets in lakes within the Colville Delta was evaluated to assess the validity of the findings based on that gear type. The perched lakes within the delta often had steep bottom contours near shore, which restricted the locations where

fyke nets could be set. There was often low confidence in fyke net sets, particularly when catches were low. To test the effectiveness of the fyke nets, eight lakes that had no or low catches of least cisco in the fyke nets were re-sampled in the fall with gill nets. One lake that had produced high catches of least cisco during the summer was also re-sampled.

The comparison of gill net to fyke net catches confirmed that the fyke nets were relatively ineffective at catching ciscoes and whitefish in lakes with steep nearshore contours (Table 6). The fyke nets, however, were more effective at catching smaller species, such as Alaska blackfish, slimy sculpin and ninespine stickleback. Least cisco were caught by gill net in four of the five lakes in which none were caught during the summer. Overall catch rates of least cisco and broad whitefish were an order of magnitude greater in gill nets than in fyke nets. There was only one lake, L9313, that produced least cisco during the summer, but failed to yield any to the gill nets.

CONCLUSIONS

1. Perched lakes within the delta portion of the 1995 study area exceeded 2 m in water depth, thus providing the opportunity for fish to overwinter. Tapped lakes were less than 2 m deep, thus diminishing chances for successful overwintering. Several deep areas within the Sakoonang Channel that provided some opportunity for overwintering were identified, but successful overwintering would depend on winter water suitability.

2. Few mature fish were captured within the Sakoonang Channel, the catches were dominated by young-of-the-year and juveniles for most species.

3. Fish within the Sakoonang Channel appeared to be moving downstream towards Harrison Bay during the early summer study period (July 8 to August 5). By the end of the fyke net monitoring, few fish remained in the river channel and tapped lakes, with most of the remaining fish being young-of-the-year.

4. River channel and tapped lake habitats produced similar species composition, although broad whitefish were more abundant in tapped lakes than in channels.

5. Perched lakes contained mostly least cisco, broad whitefish, Alaska blackfish and ninespine stickleback, with sporadic catches of other species commonly caught within the delta.

6. Least cisco populations in low perched lakes exhibited growth patterns similar to the anadromous population found in channels, while those in high perched lakes exhibited a wide range of growth rates.

7. Male least cisco from populations inhabiting perched lakes have higher survival rates than males in the anadromous population.

8. The Miluveach and Kachemach rivers are spawning areas for Arctic grayling and provide feeding areas for both grayling and round whitefish.

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Table 1. Fish caught by each gear type during the 1995 sampling program in and near the Colville Delta.

	Summer						
	Fyke Net	Minnow Trap	Lake Seine	Stream Seine	Set Line	Fall Gill Net	Total
Broad whitefish	3,287	0	0	0	0	42	3,329
Humpback whitefish	480	0	0	0	0	8	488
Round whitefish	1,074	0	0	27	0	2	1,103
Least cisco	3,369	0	36	0	0	406	3,811
Arctic cisco	2	0	0	0	0	7	9
Arctic grayling	140	0	0	26	0	11	177
Rainbow smelt	248	0	0	0	0	0	248
Burbot	18	0	0	0	0	7	25
Alaska blackfish	32	10	0	0	0	3	45
Longnose sucker	76	0	0	0	0	2	78
Arctic flounder	1	0	0	0	0	0	1
Fourhorn sculpin	146	0	0	0	1	11	158
Slimy sculpin	4	2	0	0	0	0	6
Ninespine stickleback	28,264	328	629	1	0	0	29,222
Threespine stickleback	1	0	0	0	0	0	1
Total Catch:	37,142	340	665	54	1	499	38,701
Number of Species:	15	3	2	3	1	10	15

Table 2. Species caught during 1995 sampling by season and habitat for summer fyke net and fall gill net samples.

	Major Channel		Minor Channel		Tapped Lake		Low Perched Lake[1]		High Perched Lake		Drainage Lake		
	Summer	Fall	Summer	Fall	Summer	Fall	Summer	Fall	Summer	Fall	Summer	Fall	
Species	Fyke Net	Gill Net	Fyke Net	Gill Net	Fyke Net	Gill Net	Fyke Net	Gill Net	Fyke Net	Gill Net	Fyke Net	Gill Net	Total
Broad whitefish	--	9	942	24	2,328	--	0	1	16	8	1	--	3,329
Humpback whitefish	--	8	157	0	320	--	1	0	0	0	2	--	488
Round whitefish	--	2	488	0	579	--	0	0	1	0	6	--	1,076
Least cisco	--	46	1,103	5	1,962	--	226	24	48	331	30	--	3,775
Arctic cisco	--	4	0	3	0	--	2	0	0	0	0	--	9
Arctic grayling	--	11	54	0	32	--	0	0	1	0	53	--	151
Rainbow smelt	--	0	65	0	183	--	0	0	0	0	0	--	248
Burbot	--	7	10	0	8	--	0	0	0	0	0	--	25
Alaska blackfish	--	0	2	0	0	--	5	0	16	3	9	--	35
Longnose sucker	--	2	22	0	52	--	0	0	2	0	0	--	78
Arctic flounder	--	0	1	0	0	--	0	0	0	0	0	--	1
Fourhorn sculpin	--	10	71	1	74	--	1	0	0	0	0	--	157
Slimy sculpin	--	0	0	0	0	--	0	0	4	0	0	--	4
Ninespine stickleback	--	0	248	0	801	--	1,061	0	25,998	0	156	--	28,264
Threespine stickleback	--	0	0	0	1	--	0	0	0	0	0	--	1
Total Catch:	Not	99	3,163	33	6,340	Not	1,296	25	26,086	342	257	Not	37,641
Number of Species:	Sampled	9	12	4	11	Sampled	6	2	8	3	7	Sampled	15

1 low perched lake = perched lake likely to be flooded on an annual basis, often with a high water channel;
high perched lake = perched lake flooded on less than an annual basis, no obvious high water channel.

Table 3. Species composition from project area habitats during 1995 (excluding sticklebacks).

Summer Fyke Net: Percent of Catch

Species	Major Channel	Minor Channel	Tapped Lake	Low[1] Perched Lake	High[1] Perched Lake	Drainage Lake
Broad whitefish	--	32.3	42.0	0.0	18.2	1.0
Humpback whitefish	--	5.4	5.8	0.4	0.0	2.0
Round whitefish	--	16.7	10.5	0.0	1.1	5.9
Least cisco	--	37.8	35.4	96.2	54.5	29.7
Arctic cisco	--	0.0	0.0	0.9	0.0	0.0
Arctic grayling	--	1.9	0.6	0.0	1.1	52.5
Rainbow smelt	--	2.2	3.3	0.0	0.0	0.0
Burbot	--	0.3	0.1	0.0	0.0	0.0
Alaska blackfish	--	0.1	0.0	2.1	18.2	8.9
Longnose sucker	--	0.8	0.9	0.0	2.3	0.0
Arctic flounder	--	0.0	0.0	0.0	0.0	0.0
Fourhorn sculpin	--	2.4	1.3	0.4	0.0	0.0
Slimy sculpin	--	0.0	0.0	0.0	4.5	0.0
Total Catch: (excluding sticklebacks)	Not Sampled	2,915	5,539	235	88	101

Fall Gill Net: Percent of Catch

Species	Major Channel	Minor Channel	Tapped Lake	Low Perched Lake	High Perched Lake	Drainage Lake
Broad whitefish	9.1	72.7	--	4.0	2.3	--
Humpback whitefish	8.1	0.0	--	0.0	0.0	--
Round whitefish	2.0	0.0	--	0.0	0.0	--
Least cisco	46.5	15.2	--	96.0	96.8	--
Arctic cisco	4.0	9.1	--	0.0	0.0	--
Arctic grayling	11.1	0.0	--	0.0	0.0	--
Rainbow smelt	0.0	0.0	--	0.0	0.0	--
Burbot	7.1	0.0	--	0.0	0.0	--
Alaska blackfish	0.0	0.0	--	0.0	0.9	--
Longnose sucker	2.0	0.0	--	0.0	0.0	--
Arctic flounder	0.0	0.0	--	0.0	0.0	--
Fourhorn sculpin	10.1	3.0	--	0.0	0.0	--
Slimy sculpin	0.0	0.0	--	0.0	0.0	--
Total Catch:	99	33	Not Sampled	25	342	Not Sampled

[1] low perched lake = perched lake likely to be flooded on an annual basis, often with a high water channel; high perched lake = perched lake flooded on less than an annual basis, no obvious high water channel.

Table 4. Comparison of least cisco sex composition and survival in lakes and channels of the Colville River delta.

	Female			Male		
Population Parameter	Value	Standard Deviation	Sample Size	Value	Standard Deviation	Sample Size
Percent Composition						
Anadromous Population						
(River Channels+Tapped Lakes)	64.7%		123	35.3%		67
Low Perched Lakes	38.3%		63	61.7%		100
High Perched Lakes	40.4%		327	59.6%		482
Mean Age (>=age 3)						
Anadromous Population						
(River Channels+Tapped Lakes)	8.63	4.14	115	6.66	3.38	58
Low Perched Lakes	8.11	5.26	63	9.51	4.73	98
High Perched Lakes	8.95	4.12	303	9.97	4.29	447
Percent >age 10						
Anadromous Population						
(River Channels+Tapped Lakes)	26.0%		123	11.9%		67
Low Perched Lakes	27.0%		63	44.0%		100
High Perched Lakes	41.0%		327	51.2%		482

Table 5. Fyke net mortality rate during summer 1995, Colville Delta.

Species	Number Captured	Number Found Dead in Net	Percent Mortality
Broad whitefish	3,273	79	2.4%
Humpback whitefish	480	13	2.7%
Least cisco	2,496	82	3.3%
Arctic cisco	2	0	0.0%
Round whitefish	1,074	10	0.9%
Arctic grayling	140	1	0.7%
Rainbow smelt	242	82	33.9%
Burbot	18	0	0.0%
Longnose sucker	75	0	0.0%
Alaska blackfish	8	0	0.0%

Table 6. Comparison of catches from fyke nets and gill nets in Colville Delta lakes, 1995.

	Fyke Nets (Summer)			Gill Nets (Fall)		
Lake	Effort (days)	Species	Catch per Day	Effort (days)	Species	Catch per Day
L9279	2.90	Ninespine stickleback	3,386.0	0.92	None	0.0
L9281	2.82	Ninespine stickleback	201.5	0.87	Least Cisco	60.8
					Alaska Blackfish	2.3
L9310	1.61	Least Cisco	0.6	0.94	Least Cisco	27.5
		Alaska Blackfish	2.5		Broad Whitefish	2.1
		Slimy Sculpin	1.9			
		Ninespine stickleback	106.5			
L9311	2.06	Ninespine stickleback	242.0	0.88	Least Cisco	42.3
					Broad Whitefish	1.1
L9312	1.83	Broad Whitefish	0.5	0.92	Least Cisco	67.6
		Alaska Blackfish	0.5		Broad Whitefish	5.5
		Slimy Sculpin	0.5			
		Ninespine stickleback	10.9			
L9313	1.84	Least Cisco	2.7	0.86	None	0.0
		Alaska Blackfish	3.3			
		Ninespine stickleback	39.2			
L9316	0.70	Least Cisco	28.7	0.93	Least Cisco	25.8
		Alaska Blackfish	2.9		Broad Whitefish	1.1
		Ninespine stickleback	106.0			
L9342	2.57	Least Cisco	0.4	0.98	Least Cisco	58.0
		Ninespine stickleback	361.5		Alaska Blackfish	1.0
M9321	0.89	Ninespine stickleback	246.5	0.97	Least Cisco	99.5
Total:	17.22	Least Cisco	1.6	8.26	Least Cisco	43.0
		Broad Whitefish	0.1		Broad Whitefish	1.1
		Alaska Blackfish	0.8		Alaska Blackfish	0.4
		Slimy Sculpin	0.2		Slimy Sculpin	0.0
		Ninespine stickleback	719.5		Ninespine stickleback	0.0

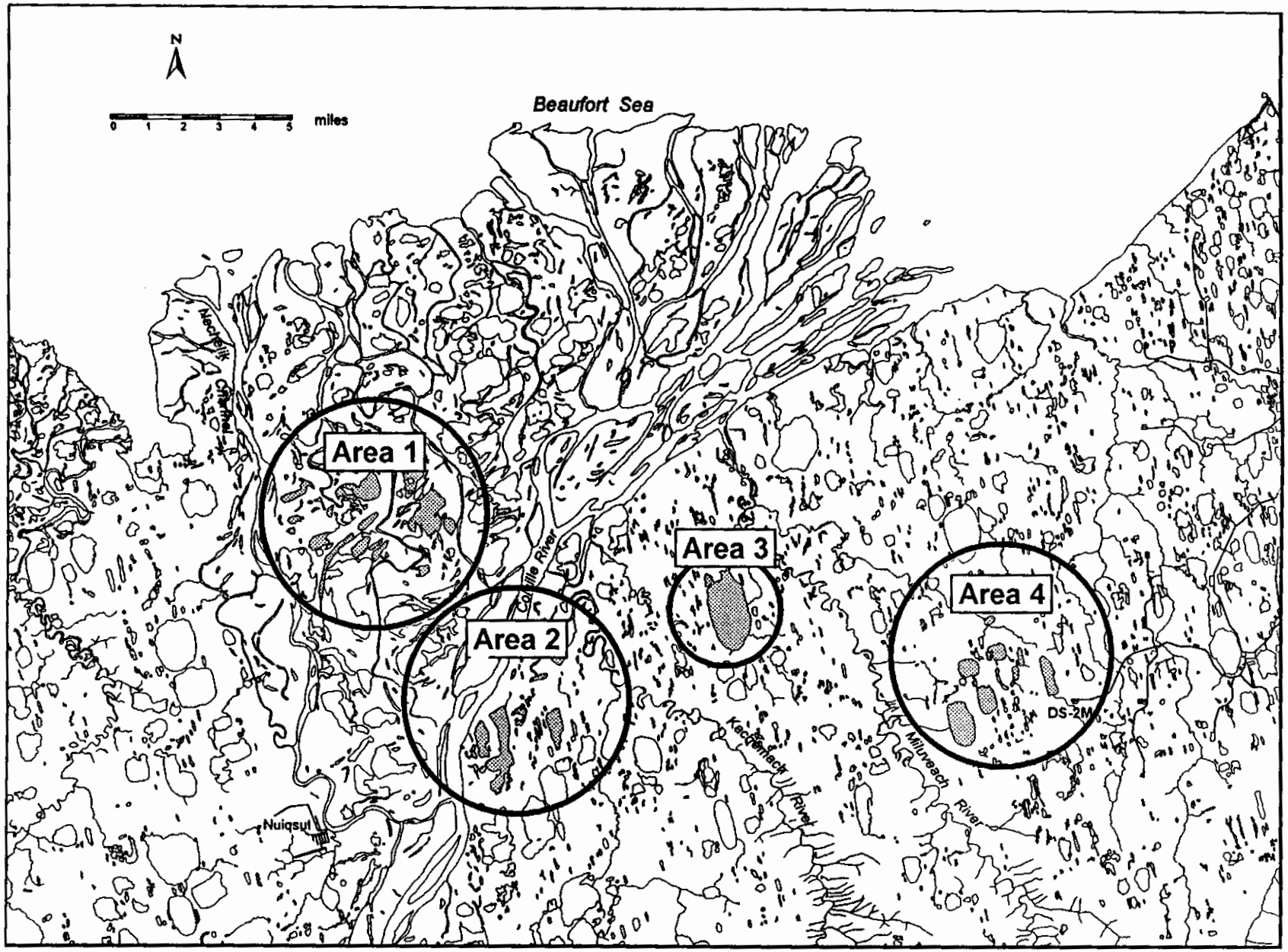

Figure 1. Colville Delta showing study areas sampled in 1995.

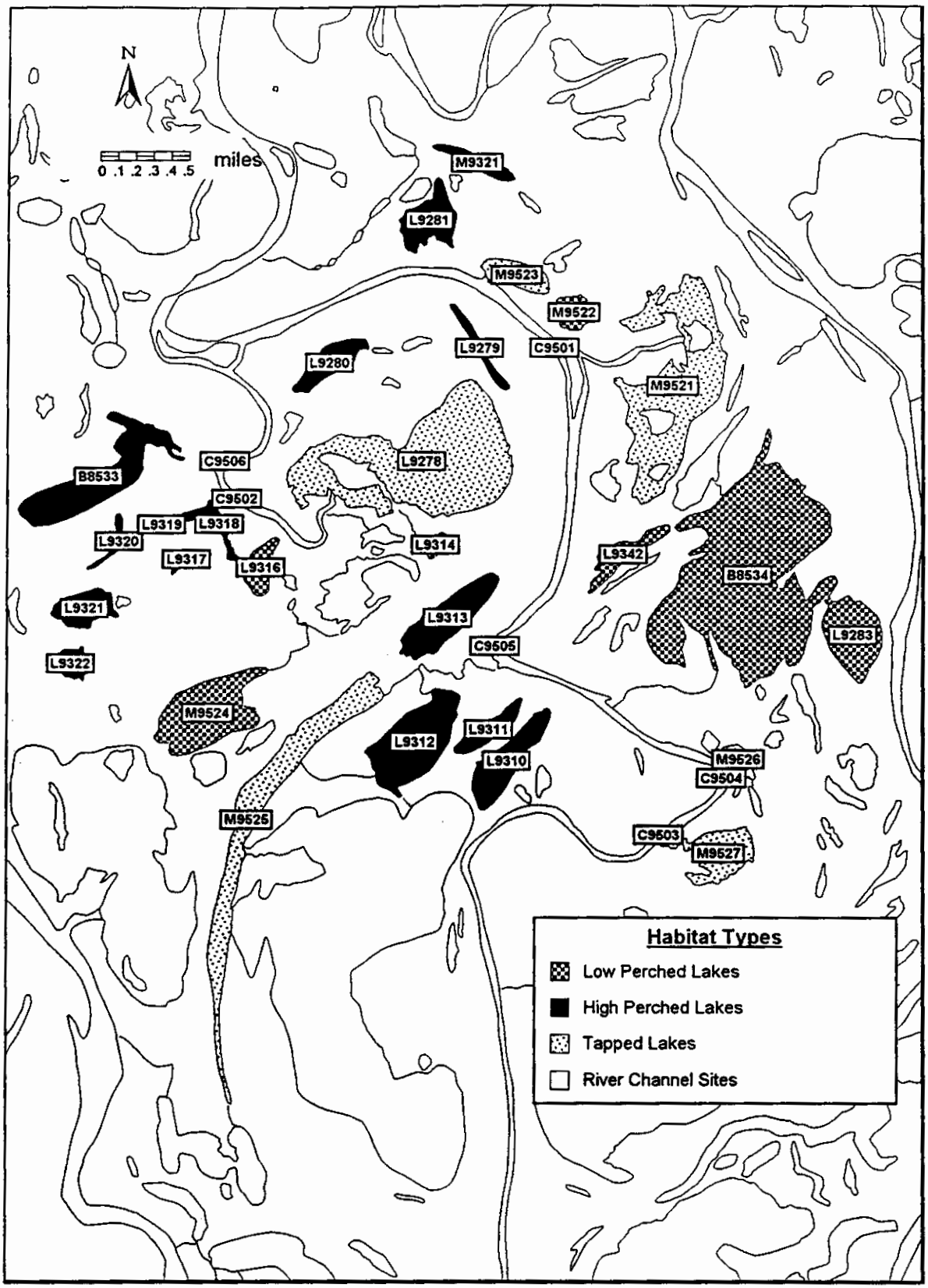

Figure 2. Detail of Study Area 1 sampled in 1995.

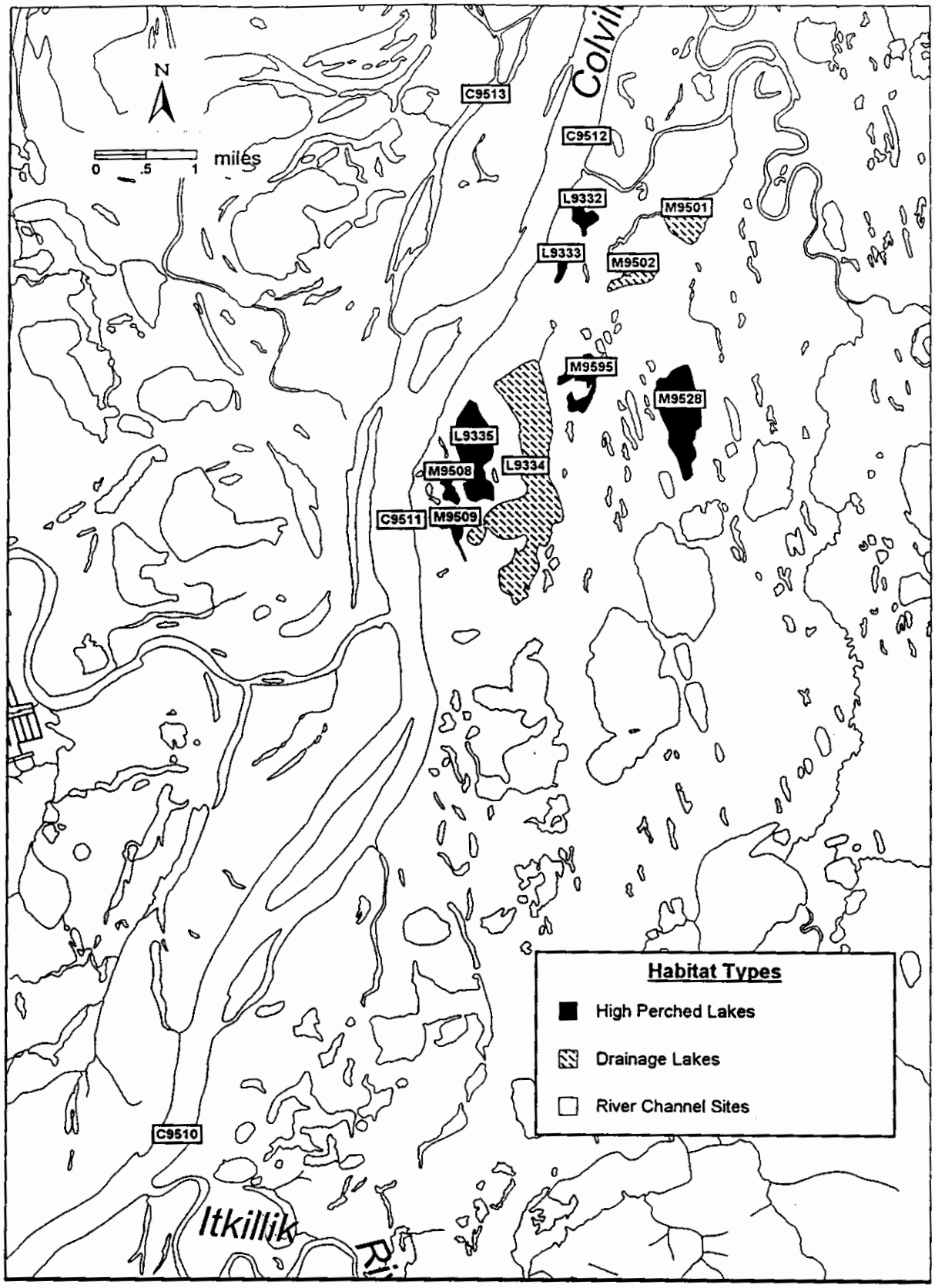

Figure 3. Detail of Study Area 2 sampled in 1995.

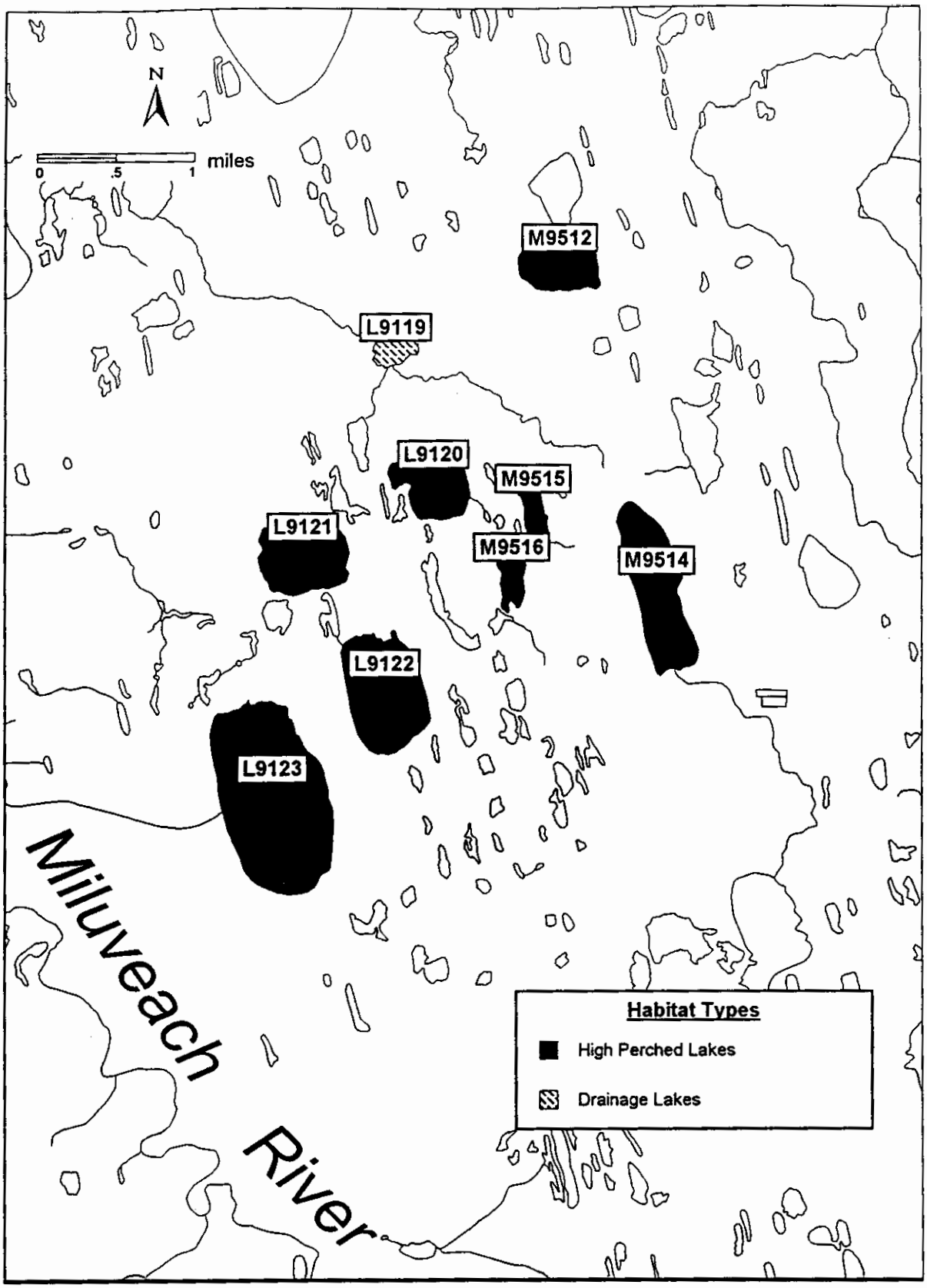

Figure 4. Detail of Study Area 4 sampled in 1995.

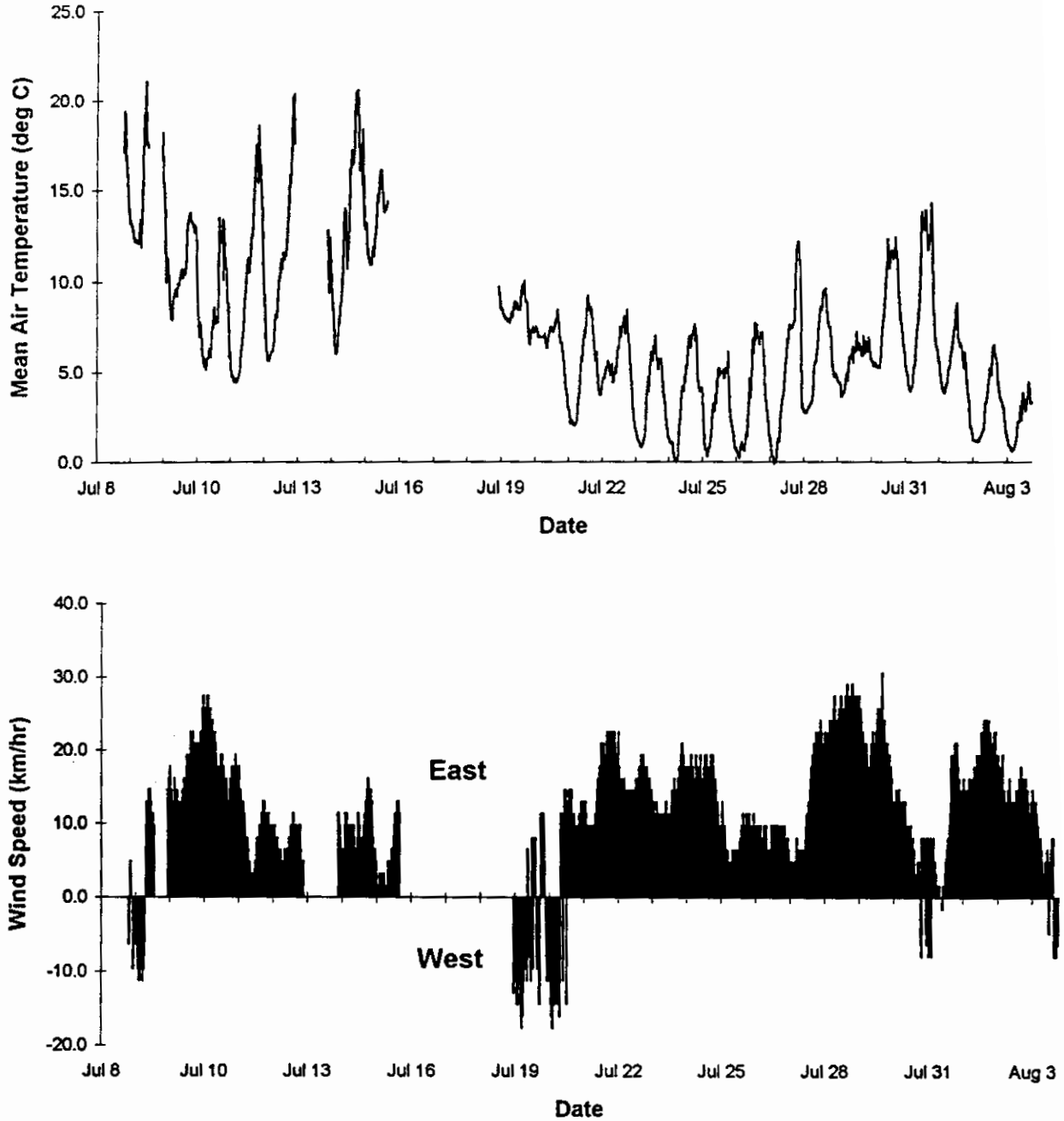

Figure 5. Air temperature and wind speed during the 1995 fish sampling program.

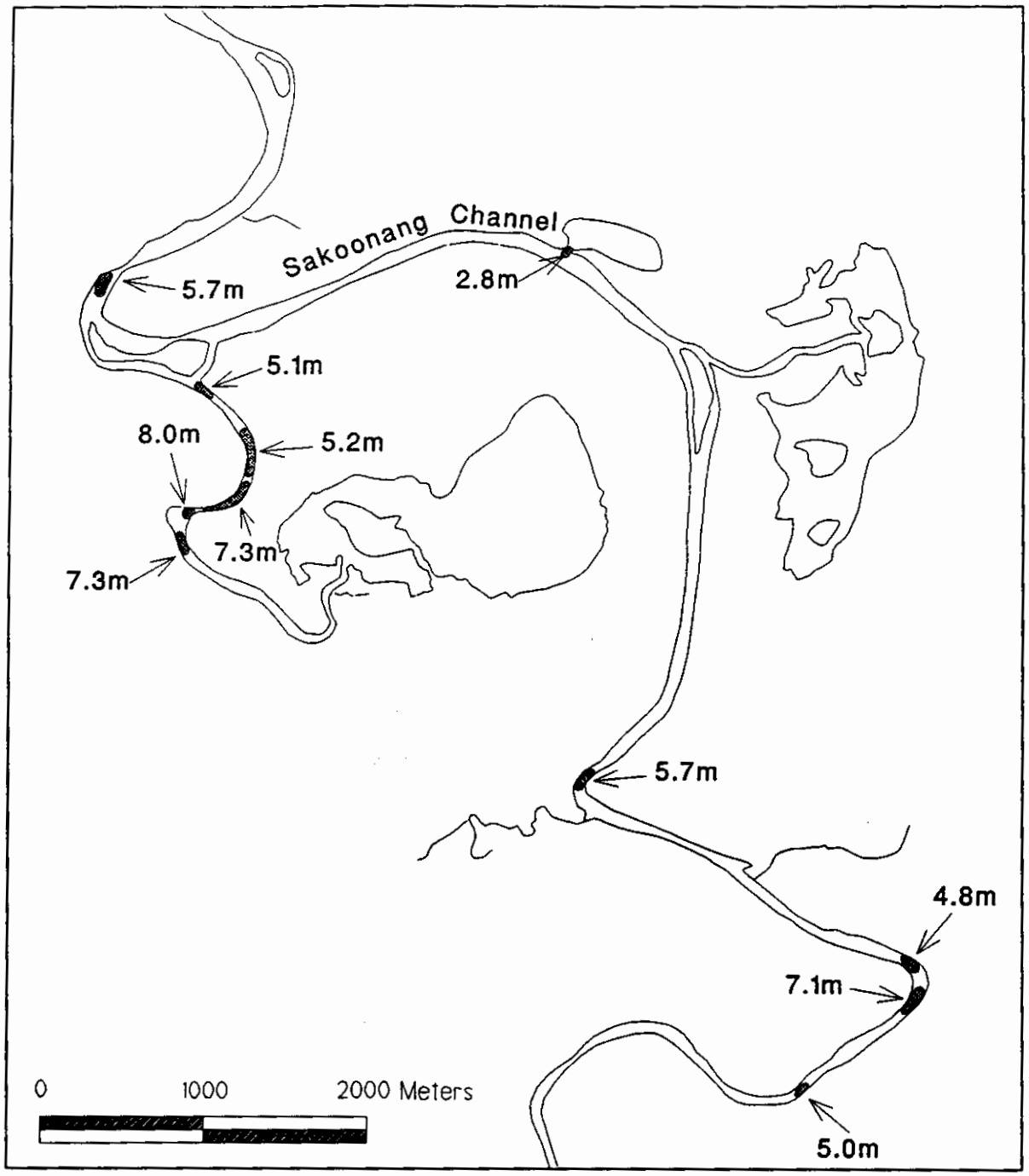

Figure 6. Location of potential wintering sites within the Sakoonang Channel, where water depths exceed 2.0 m.

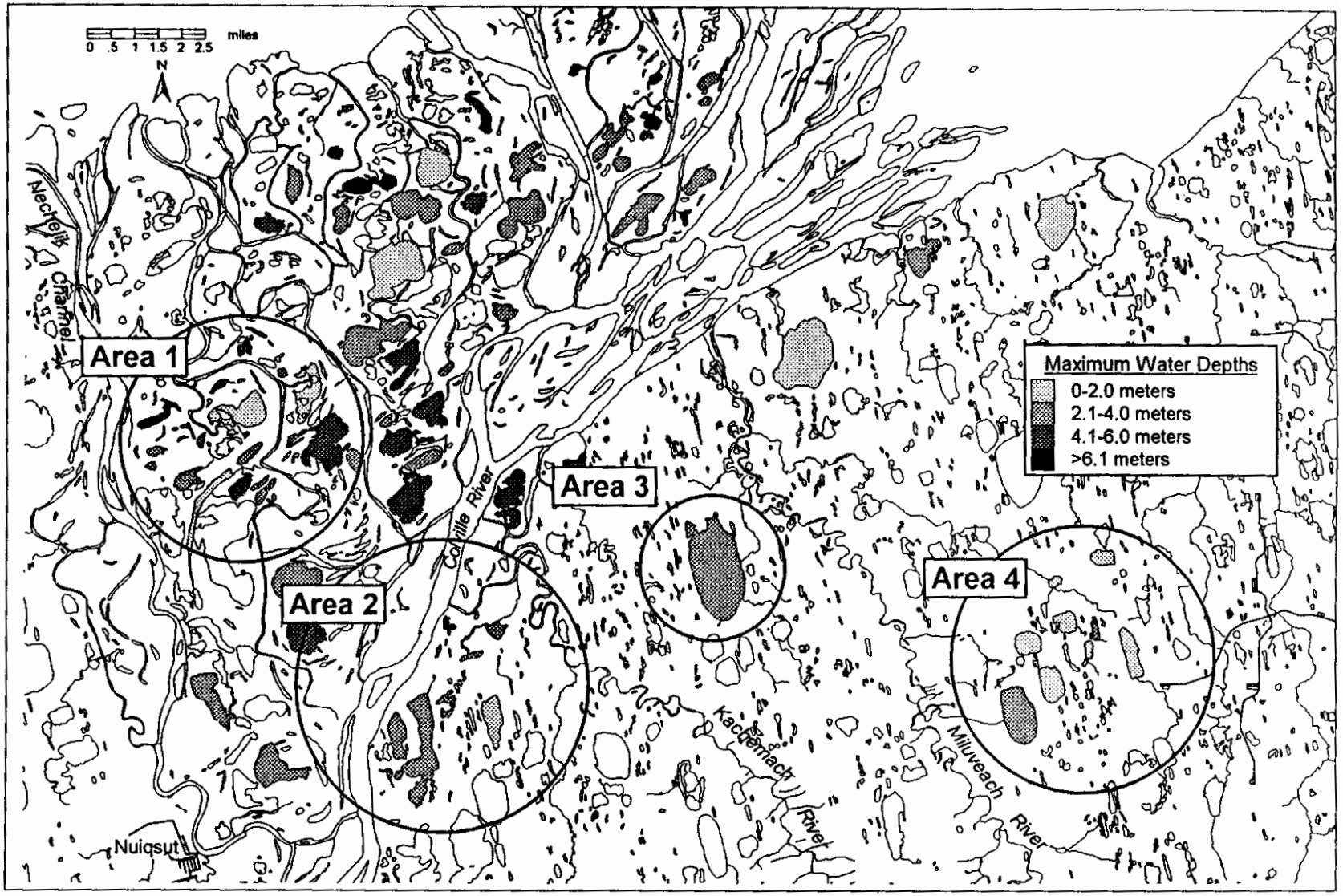

Figure 7. Depth of lakes within the Colville Delta (water depth information from Bendock and Burr 1986, Moulton 1994, Lobdell unpublished data, and current study).

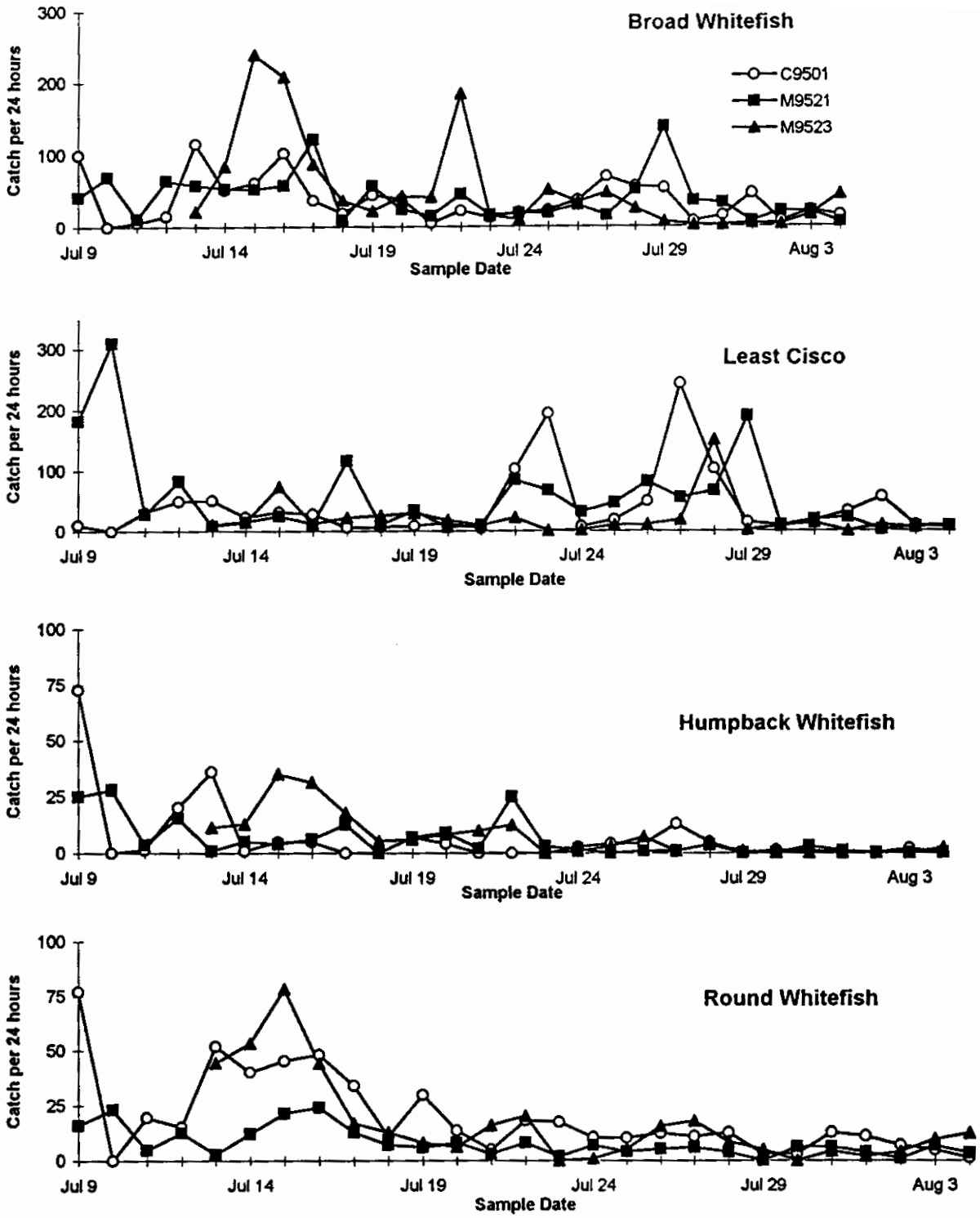

Figure 8. Catch rate (in fish per 24 hours) for dominant species captured at Sakoonang Channel stations, 1995

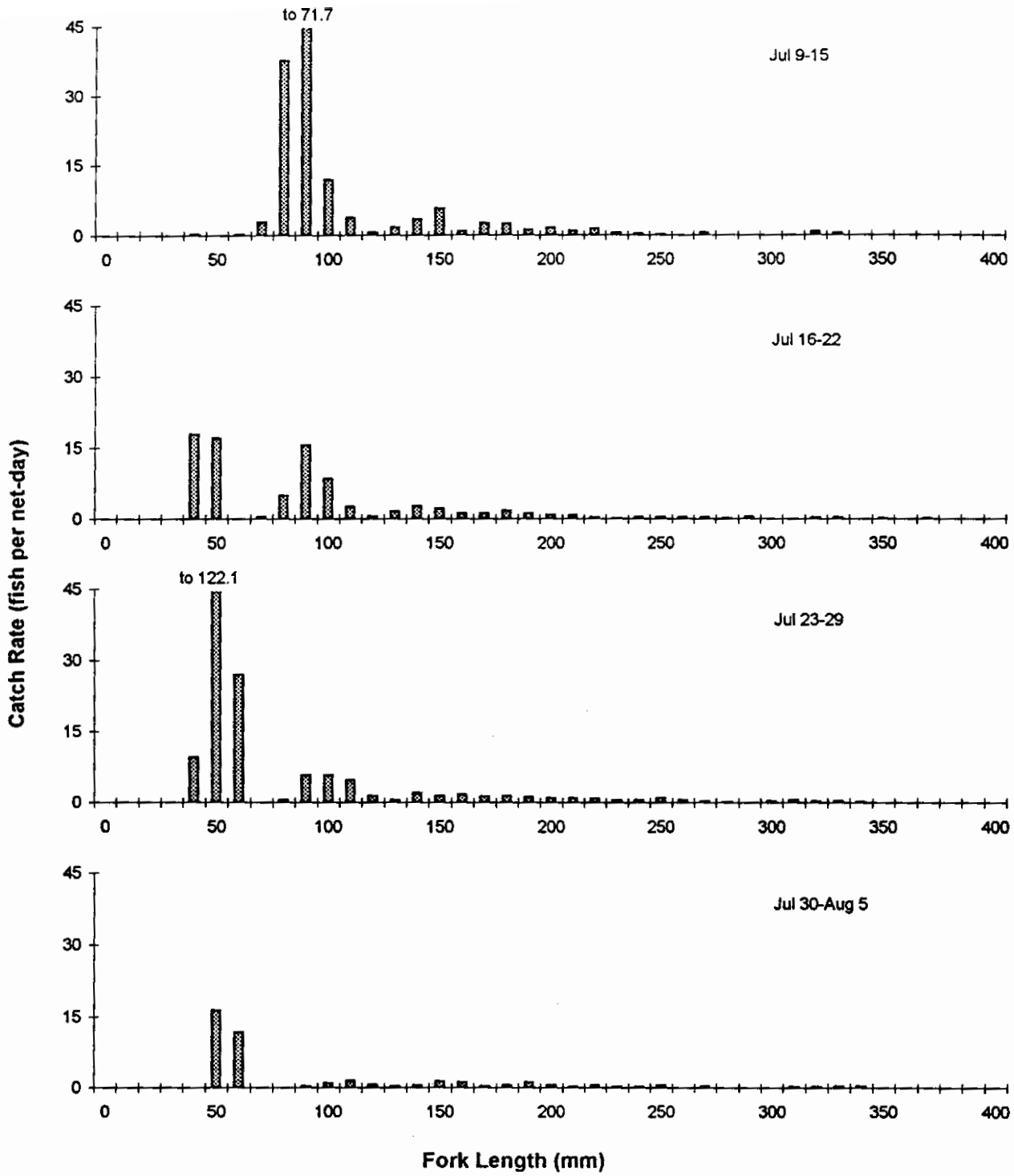

Figure 9. Length frequency of least cisco captured during fyke net sampling in the Sakoonang Channel, Colville Delta, in 1995.

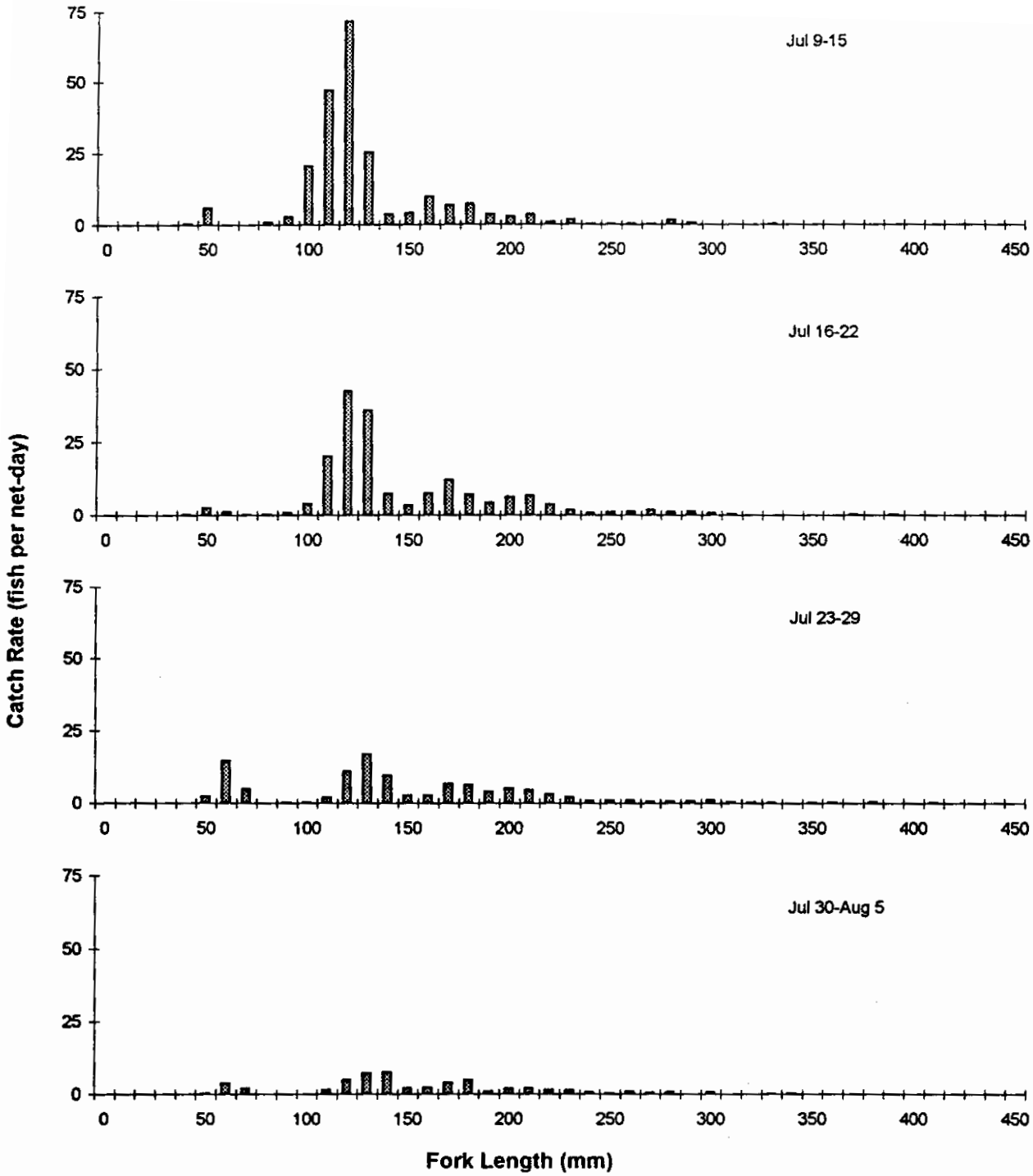

Figure 10. Length frequency of broad whitefish captured during fyke net sampling in the Sakoonang Channel, Colville Delta, in 1995.

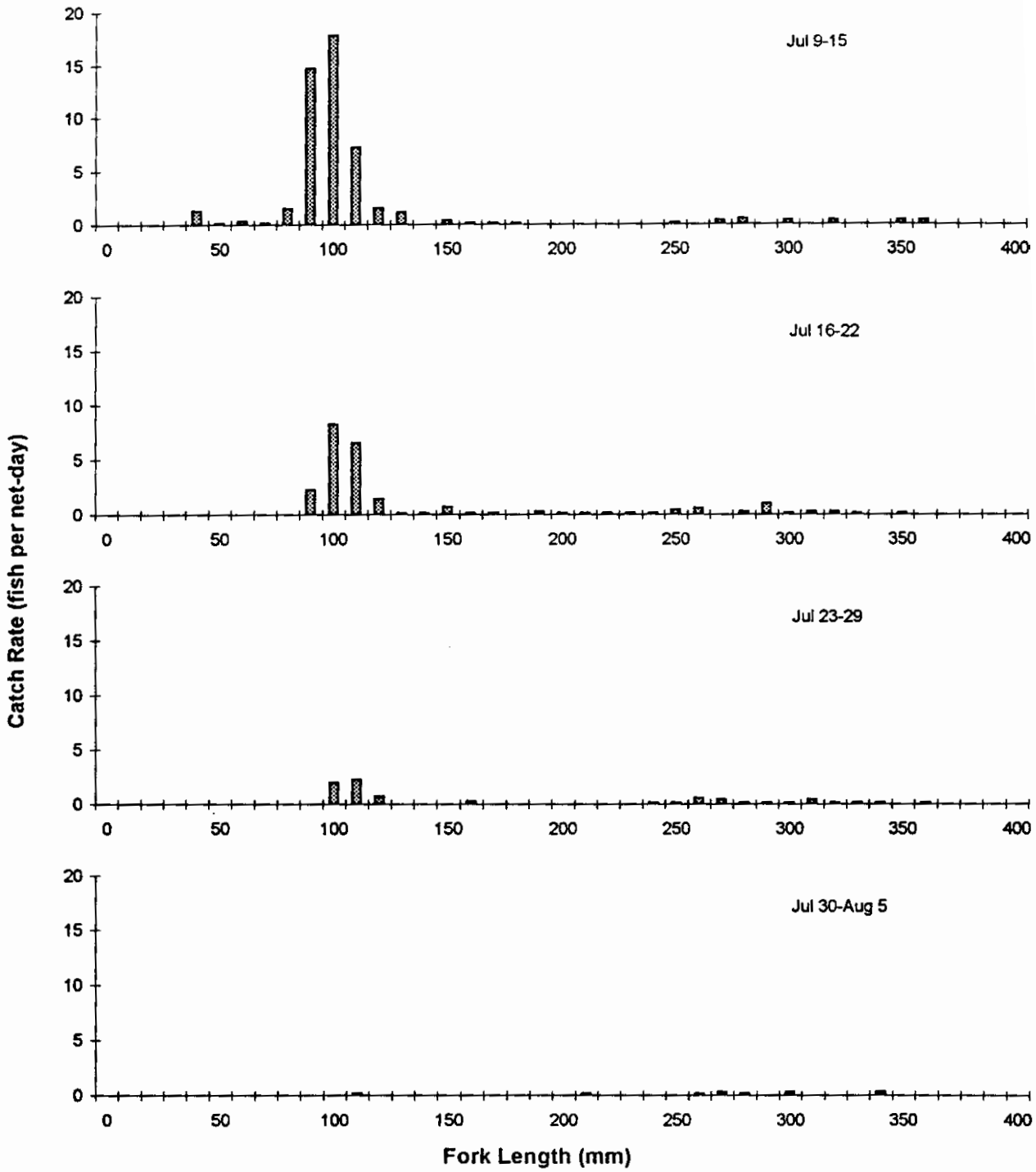

Figure 11. Length frequency of humpback whitefish captured during fyke net sampling in the Sakoonang Channel, Colville Delta, in 1995.

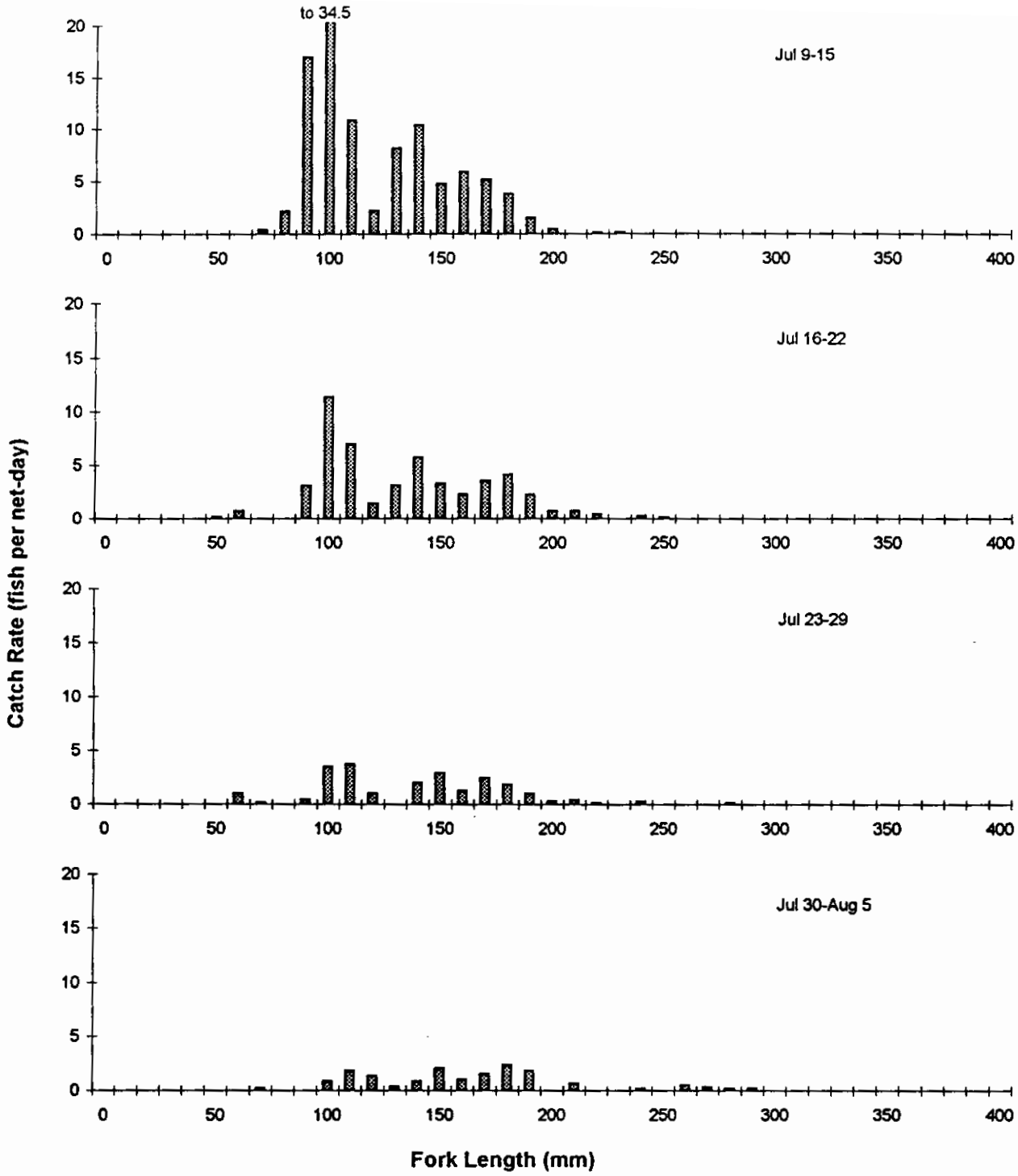

Figure 12. Length frequency of round whitefish captured during fyke net sampling in the Sakoonang Channel, Colville Delta, in 1995.

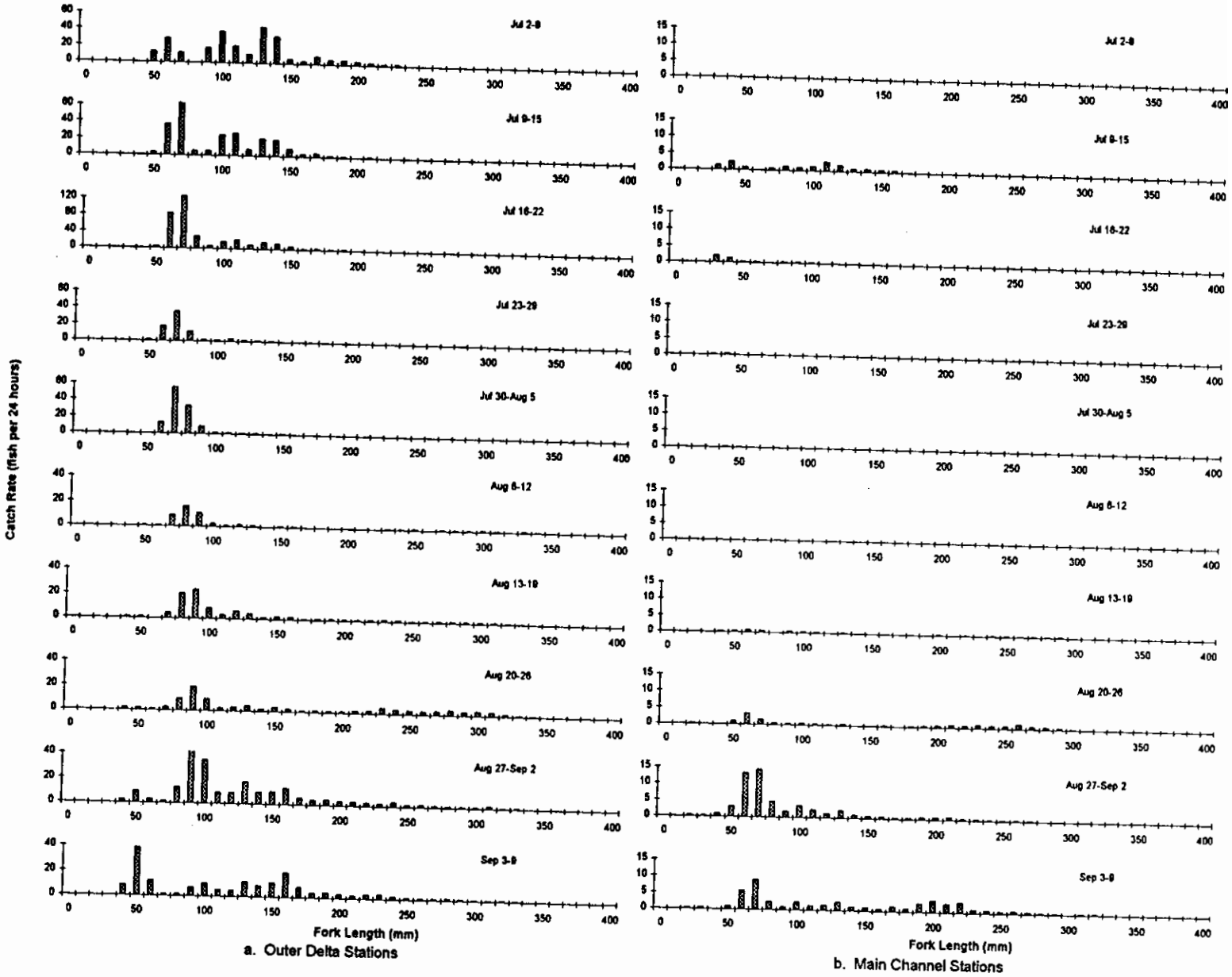

Figure 13. Length frequencies of least cisco captured during 1985 sampling within the Colville Delta at outer delta and lower river main channel stations (from Fawcett et al. 1986).

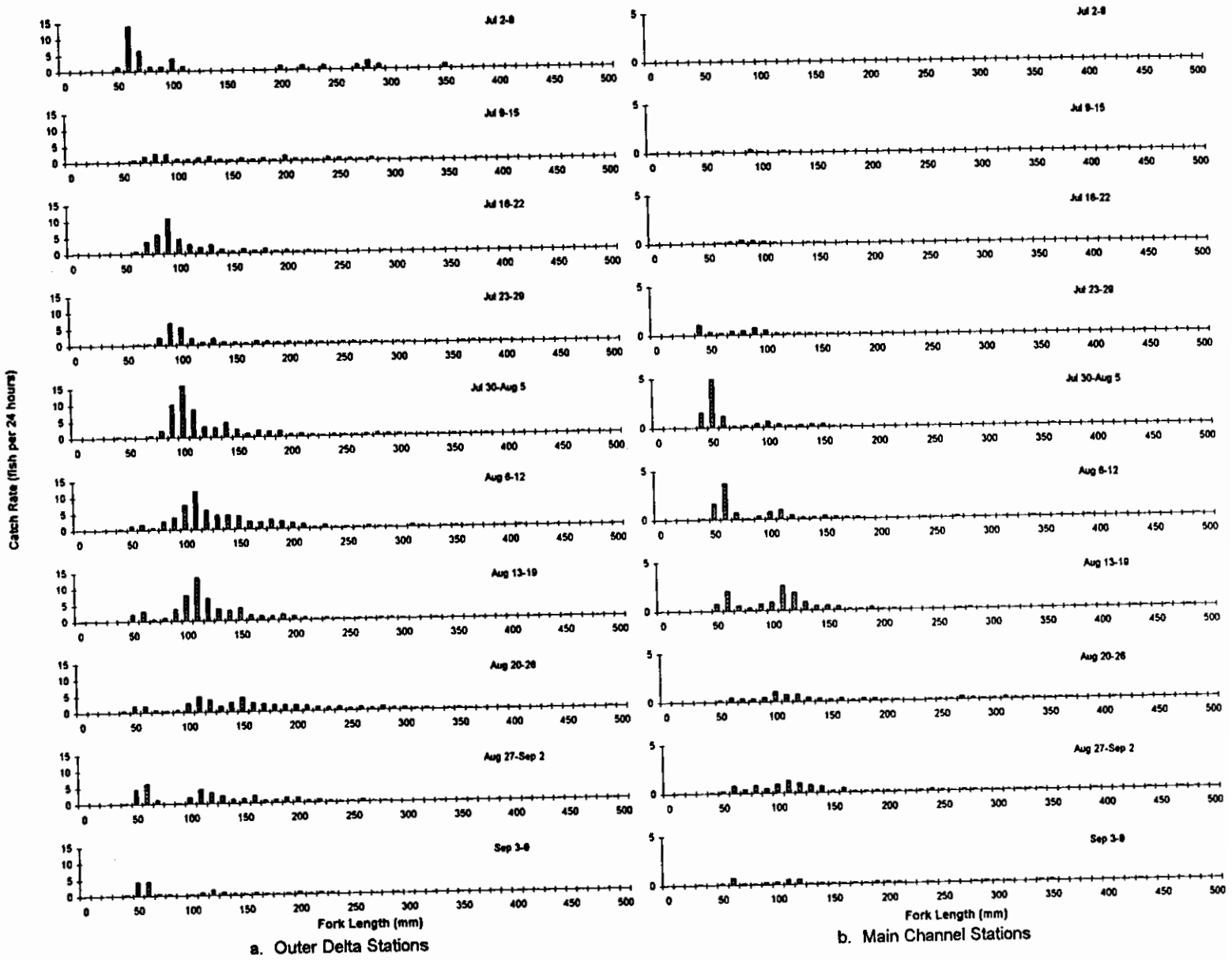

Figure 14. Length frequencies of broad whitefish captured during 1985 sampling within the Colville Delta at outer delta and lower river main channel stations (from Fawcett et al. 1986).

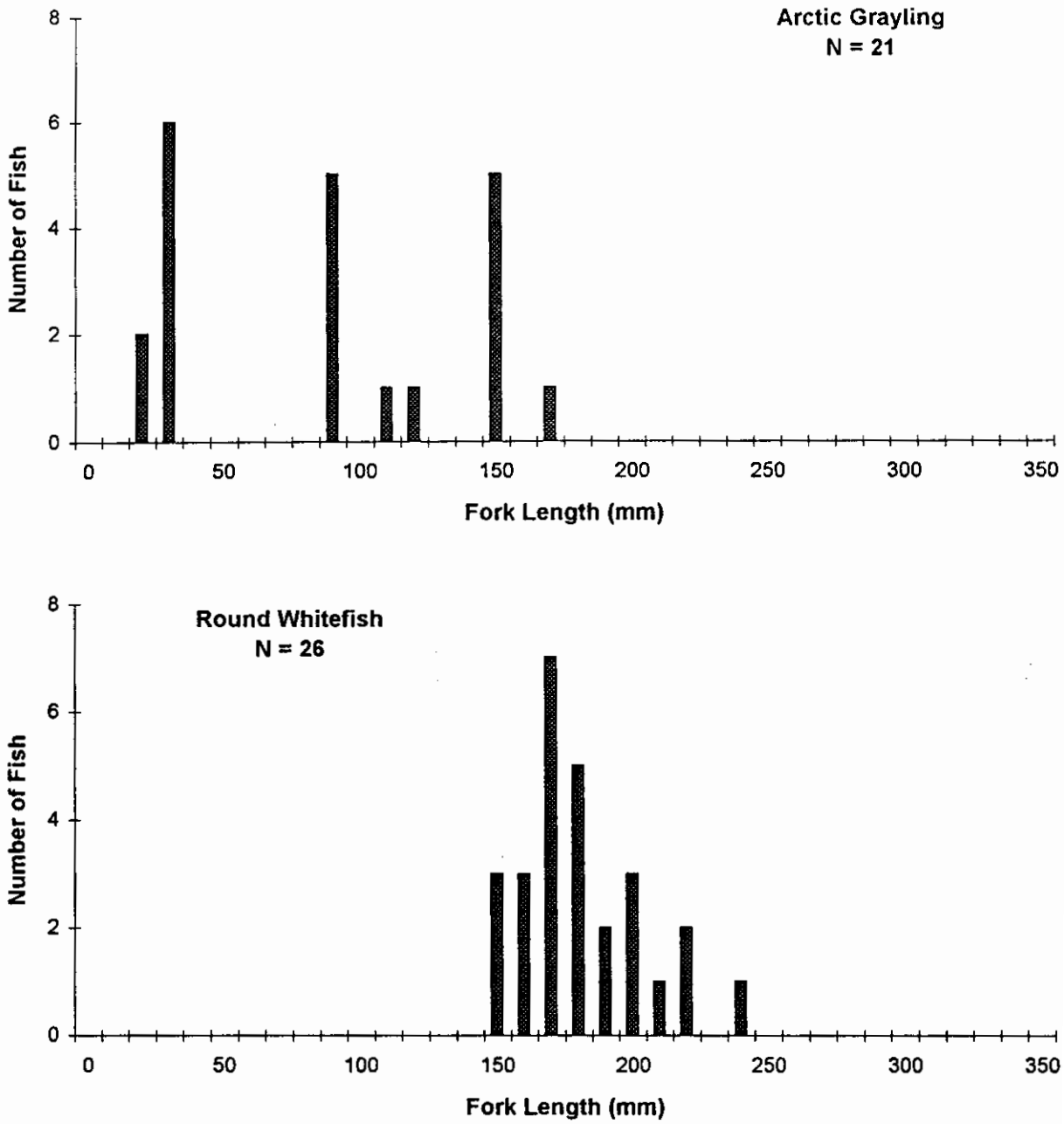

Figure 15. Length frequency distribution of Arctic grayling and round whitefish caught in the Miluveach River, 1995.

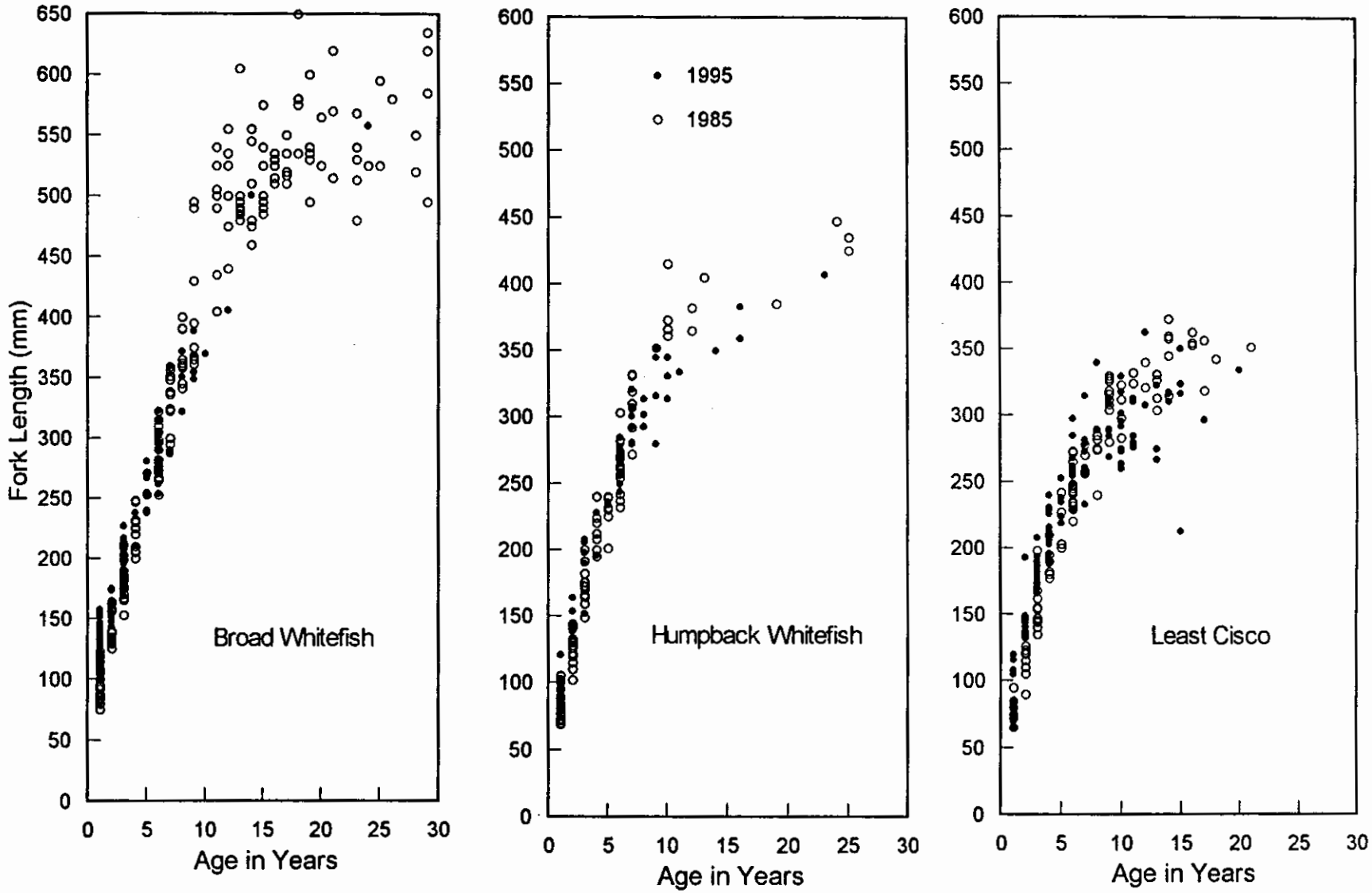

Figure 16. Length vs age scatter plots for broad whitefish, humpback whitefish and least cisco caught in river channels and tapped lakes in the Colville Delta, 1985 and 1995 (solid dots = 1995, open dots = 1985).

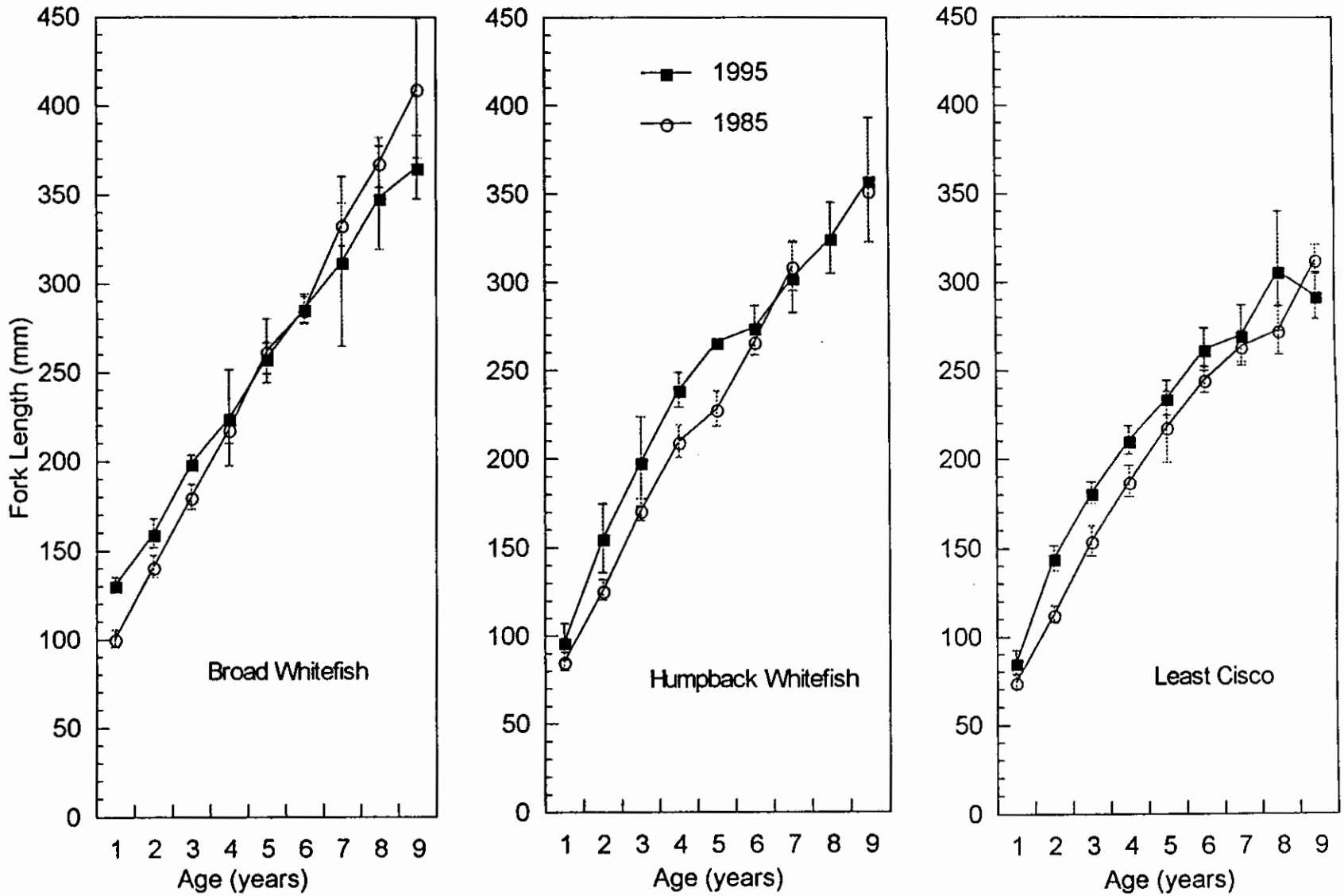

Figure 17. Mean length at age for age 1 to 9 broad whitefish, humpback whitefish and least cisco caught in river channels and tapped lakes in the Colville Delta, 1985 and 1995 (vertical bars = 1 standard deviation, 1985 data from Fawcett et al. 1986)

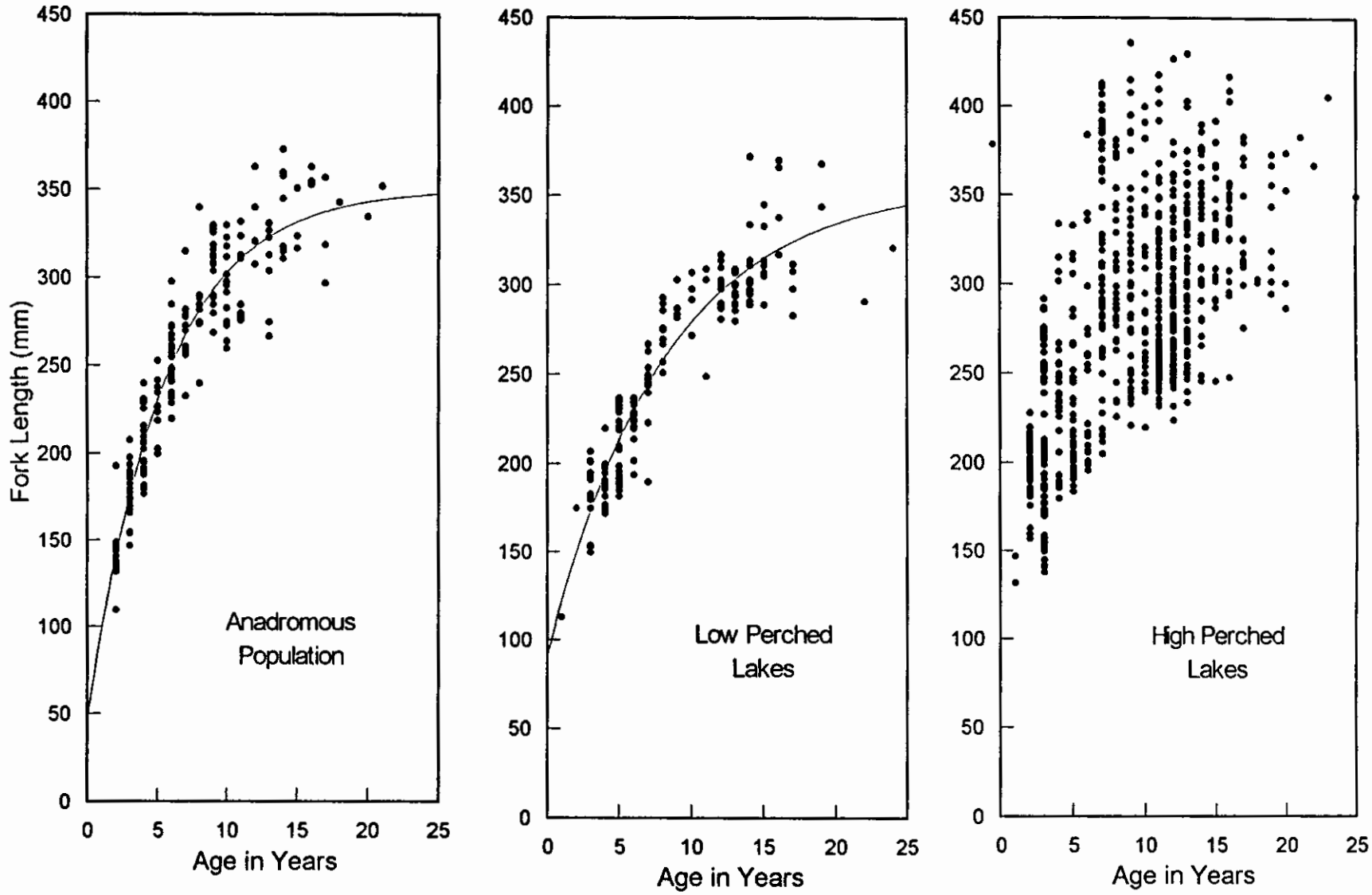

Figure 18. Comparison of growth for least cisco caught in various Colville Delta habitats.

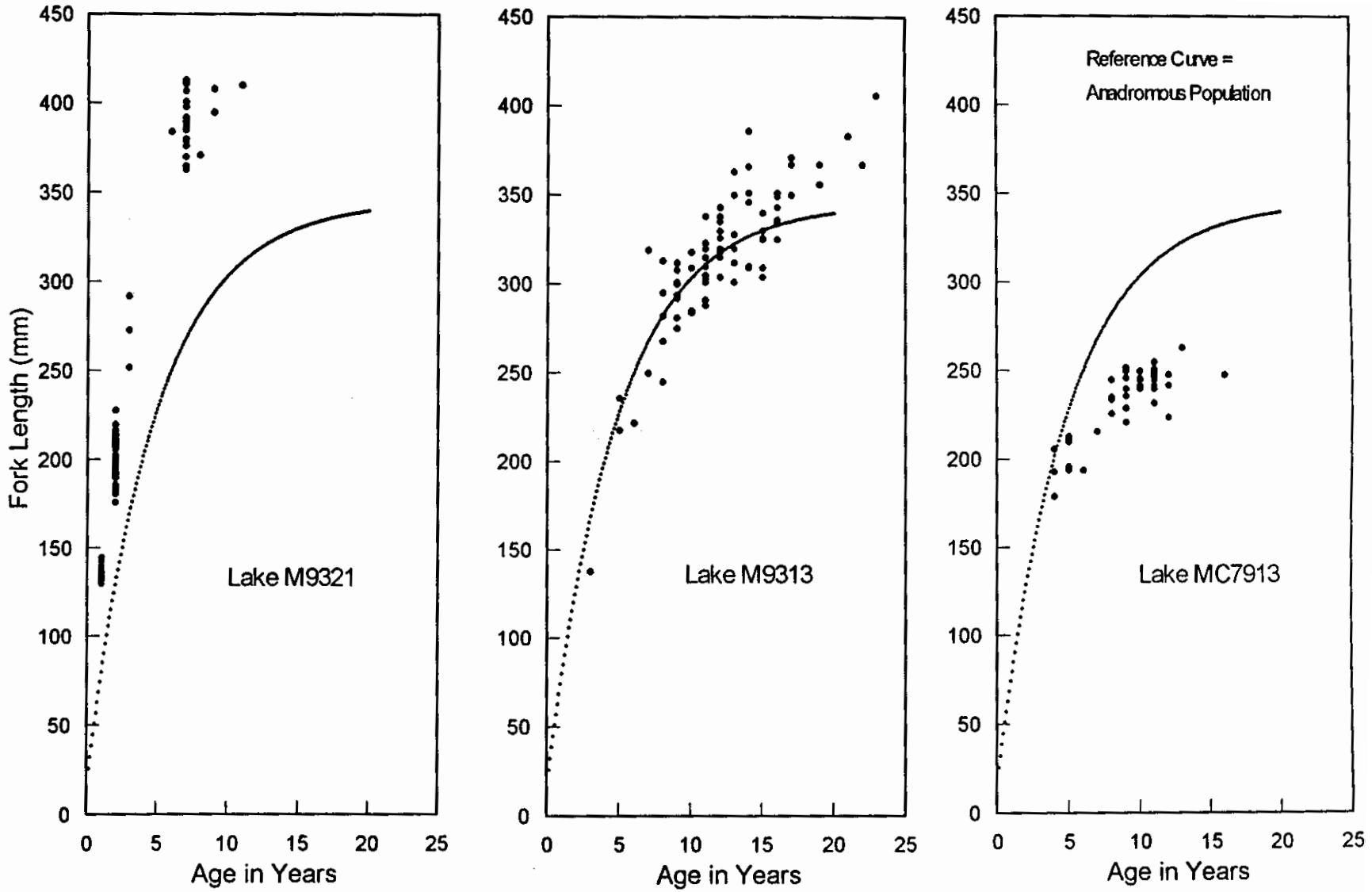

Figure 19. Examples of growth variablility in least cisco from high perched lakes.

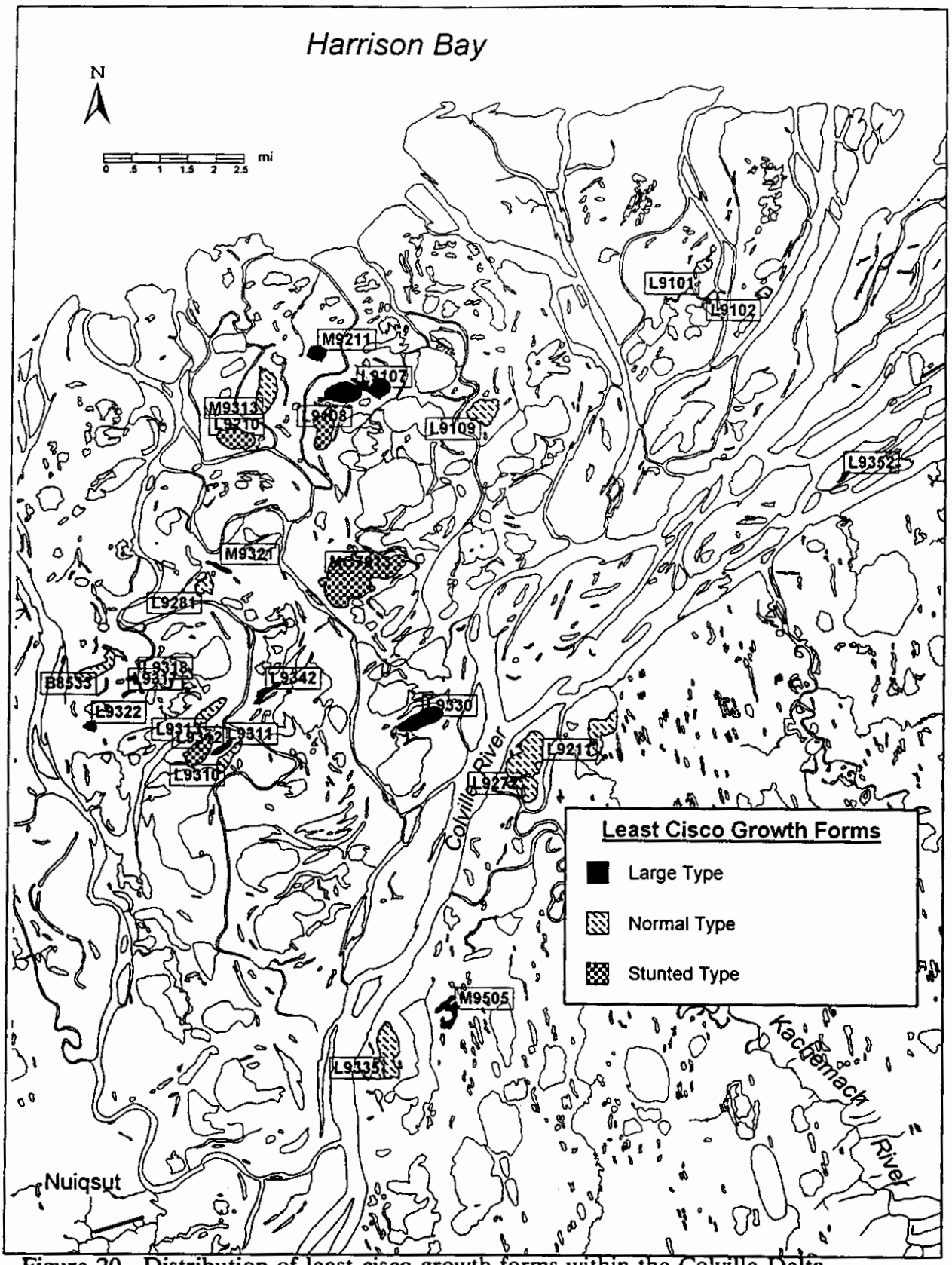

Figure 20. Distribution of least cisco growth forms within the Colville Delta.

DATA APPENDIX

APPENDIX TABLES

Appendix Table 1. Catch by fyke net at each station sampled during 1995 summer sampling in the Colville Delta (data are number of fish by station, date and hours of effort).

Appendix Table 2. CPUE (in fish per 24 hours) by fyke net at each station sampled (data are CPUE by station, date and hours of effort).

Appendix Table 3. Catch by gill net at each sampled station during 1995 fall sampling in the Colville Delta.

Appendix Table 4. CPUE (in fish per 24 hours) by gill net at each sampled station during 1995 fall sampling in the Colville Delta.

Appendix Table 5. Catch by minnow traps at each sampled station during 1995 summer sampling in the Colville Delta (two minnow traps set overnight)

Appendix Table 6. Least cisco length frequency by date and station - 1995 river channel and tapped lakes.

Appendix Table 7. Broad whitefish length frequency by date and station - 1995 river channel and tapped lakes.

Appendix Table 8. Humpback whitefish length frequency by date and station - 1995 river channel and tapped lakes.

Appendix Table 9. Round whitefish length frequency by date and station - 1995 river channel and tapped lakes.

Appendix Table 10. Length frequency of least cisco at perched, drainage and miscellaneous tapped lakes during 1995 (F = fyke net, G = gill net).

Appendix Table 11. Length frequency of broad whitefish at perched, drainage and miscellaneous tapped lakes during 1995.

Appendix Table 12. Length frequency of Arctic grayling at perched and drainage lakes during 1995.

Appendix Table 13. Fyke net effort (in hours) at continuous sampling stations in the Sakoonang Channel (C9501) and tapped lakes (M9521 and M9523), Colville Delta 1995.

Appendix Table 14. Fyke net and gill net effort (in hours) at various habitats in the

Colville Delta during 1995.

Appendix Table 15. Minnow trap effort (in hours) at various habitats in the Colville Delta during 1995.

Appendix Table 16. Set line effort (in hours) and seine effort (in number of hauls) at various habitats in the Colville Delta during 1995.

Appendix Table 17. Water temperature and conductivity at continuously sampled stations in the Sakoonang Channel and tapped lakes in the Colville Delta, 1995.

Appendix Table 18. Water temperature and conductivity at Colville Delta lakes surveyed in summer, 1995.

Appendix Table 19. Water temperature and conductivity at Colville Delta lakes surveyed in fall, 1995.

Appendix Table 20. Water temperature, conductivity and salinity at Colville Delta river channel stations surveyed in fall, 1995.

Appendix Table 21. Mean length at age for least cisco caught by fyke net from river channels and tapped lakes during summer 1995.

Appendix Table 22. Mean length at age for broad whitefish caught by fyke net from river channels and tapped lakes during summer 1995.

Appendix Table 23. Mean length at age for humpback whitefish caught by fyke net from river channels and tapped lakes during summer 1995.

Appendix Table 24. Mean length at age for round whitefish caught by fyke net from river channels and tapped lakes during summer 1995.

Appendix Table 1. Catch by fyke net at each station sampled during 1995 summer sampling in the Colville Delta (data are number of fish by station, date and hours of effort).

River Channel Station C9501

Species	C9501 Jul 9 16.5 hr	C9501 Jul 10 14.8 hr	C9501 Jul 11 16.1 hr	C9501 Jul 12 28.4 hr	C9501 Jul 13 18.0 hr	C9501 Jul 14 25.8 hr	C9501 Jul 15 24.3 hr	C9501 Jul 16 24.5 hr	C9501 Jul 17 24.8 hr	C9501 Jul 18 22.2 hr	C9501 Jul 19 24.2 hr	C9501 Jul 20 23.0 hr	C9501 Jul 21 24.3 hr	C9501 Jul 22 25.4 hr	C9501 Jul 23 22.3 hr	C9501 Jul 24 25.1 hr	C9501 Jul 25 23.4 hr
Broad whitefish	68	0	4	18	86	55	62	104	38	17	44	37	5	23	12	21	22
Humpback whitefish	50	0	1	24	27	1	5	5	0	0	7	4	0	0	0	3	4
Round whitefish	53	0	13	18	39	43	46	49	35	10	30	13	5	19	16	11	10
Least cisco	7	0	21	58	38	25	32	29	6	6	9	12	4	108	179	8	18
Arctic cisco	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arctic grayling	3	0	11	7	4	4	5	6	5	1	1	1	1	1	1	0	0
Rainbow smelt	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	8
Burbot	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
Alaska blackfish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Longnose sucker	4	0	0	1	2	2	0	0	3	0	1	1	0	0	0	3	1
Arctic flounder	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Fourhorn sculpin	1	0	0	0	0	4	0	0	0	2	2	50	0	2	1	1	0
Slimy sculpin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ninespine stickleback	3	0	6	11	22	30	32	37	11	12	13	3	11	2	8	5	7
Threespine stickleback	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total:	189	0	56	138	218	165	183	230	98	48	108	121	26	155	217	55	71

Species	C9501 Jul 26 23.4 hr	C9501 Jul 27 24.2 hr	C9501 Jul 28 24.9 hr	C9501 Jul 29 22.9 hr	C9501 Jul 30 22.8 hr	C9501 Jul 31 22.8 hr	C9501 Aug 1 24.4 hr	C9501 Aug 2 24.2 hr	C9501 Aug 3 25.5 hr	C9501 Aug 4 22.3 hr	Station Total
Broad whitefish	36	70	58	51	7	14	46	7	23	14	942
Humpback whitefish	4	13	5	0	1	1	0	0	2	0	157
Round whitefish	12	11	13	3	3	12	11	7	5	1	488
Least cisco	48	243	106	14	9	16	33	57	10	7	1,103
Arctic cisco	0	0	0	0	0	0	0	0	0	0	0
Arctic grayling	0	0	0	2	0	0	0	1	0	0	54
Rainbow smelt	4	3	13	6	1	2	22	2	0	1	65
Burbot	0	2	2	0	2	0	0	0	1	1	10
Alaska blackfish	0	0	0	0	0	0	0	0	0	0	2
Longnose sucker	0	0	2	0	0	0	1	0	1	0	22
Arctic flounder	0	0	0	0	0	0	0	0	0	0	1
Fourhorn sculpin	0	1	0	1	1	1	0	0	4	0	71
Slimy sculpin	0	0	0	0	0	0	0	0	0	0	0
Ninespine stickleback	7	1	5	9	5	3	2	3	0	0	248
Threespine stickleback	0	0	0	0	0	0	0	0	0	0	0
Total:	111	344	204	86	29	49	115	77	46	24	3,163

Appendix Table 1. continued

Tapped Lake Station M9521

Species	M9521 Jul 9 18.2 hr	M9521 Jul 10 23.0 hr	M9521 Jul 11 25.1 hr	M9521 Jul 12 23.1 hr	M9521 Jul 13 24.3 hr	M9521 Jul 14 24.0 hr	M9521 Jul 15 23.8 hr	M9521 Jul 16 24.2 hr	M9521 Jul 17 24.6 hr	M9521 Jul 18 23.5 hr	M9521 Jul 19 23.8 hr	M9521 Jul 20 24.2 hr	M9521 Jul 21 24.0 hr	M9521 Jul 22 24.0 hr	M9521 Jul 23 24.0 hr	M9521 Jul 24 24.4 hr	M9521 Jul 25 24.0 hr
Broad whitefish	31	66	12	61	58	53	52	58	124	9	56	24	15	45	16	19	19
Humpback whitefish	19	27	4	15	1	5	4	6	13	0	7	9	2	25	3	2	0
Round whitefish	12	22	5	12	3	12	21	24	13	7	6	8	3	8	2	7	4
Least cisco	138	296	29	79	9	15	24	12	118	10	34	6	10	84	67	33	47
Arctic cisco	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arctic grayling	0	0	0	0	0	1	0	0	1	1	0	0	0	1	1	0	0
Rainbow smelt	0	0	3	6	1	4	13	2	6	0	7	4	5	32	4	0	1
Burbot	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Alaska blackfish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Longnose sucker	0	1	3	2	1	0	3	3	4	4	1	1	0	1	0	0	0
Arctic flounder	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fourhorn sculpin	0	0	1	0	0	2	1	5	6	1	1	3	0	0	0	3	0
Slimy sculpin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ninespine stickleback	9	14	9	13	1	13	10	11	8	1	10	9	13	20	12	7	4
Threespine stickleback	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total:	209	426	66	188	74	105	128	121	293	33	123	64	48	216	105	71	75

Species	M9521 Jul 26 23.2 hr	M9521 Jul 27 24.2 hr	M9521 Jul 28 25.3 hr	M9521 Jul 29 23.0 hr	M9521 Jul 30 23.7 hr	M9521 Jul 31 23.6 hr	M9521 Aug 1 24.7 hr	M9521 Aug 2 24.3 hr	M9521 Aug 3 25.4 hr	M9521 Aug 4 22.0 hr	Station Total
Broad whitefish	29	16	54	132	35	32	7	21	22	5	1,071
Humpback whitefish	1	1	4	0	0	3	1	0	0	0	152
Round whitefish	5	6	4	0	6	6	4	1	7	3	211
Least cisco	79	56	70	180	9	18	23	2	7	7	1,462
Arctic cisco	0	0	0	0	0	0	0	0	0	0	0
Arctic grayling	3	2	0	0	0	0	0	0	0	0	10
Rainbow smelt	0	0	1	24	3	1	4	1	8	0	130
Burbot	0	0	0	0	1	0	0	0	0	0	2
Alaska blackfish	0	0	0	0	0	0	0	0	0	0	0
Longnose sucker	0	0	1	1	0	1	1	1	0	1	30
Arctic flounder	0	0	0	0	0	0	0	0	0	0	0
Fourhorn sculpin	0	2	1	1	3	4	5	4	6	5	54
Slimy sculpin	0	0	0	0	0	0	0	0	0	0	0
Ninespine stickleback	10	8	12	12	29	6	2	0	1	0	244
Threespine stickleback	0	0	0	0	0	1	0	0	0	0	1
Total:	127	91	147	350	86	72	47	30	51	21	3,367

Appendix Table 1. continued

Tapped Lake Station M9523

Species	M9523 Jul 13 16.7 hr	M9523 Jul 14 22.5 hr	M9523 Jul 15 23.3 hr	M9523 Jul 16 24.5 hr	M9523 Jul 17 25.7 hr	M9523 Jul 18 22.7 hr	M9523 Jul 19 24.2 hr	M9523 Jul 20 23.2 hr	M9523 Jul 21 24.1 hr	M9523 Jul 22 25.0 hr	M9523 Jul 23 22.9 hr	M9523 Jul 24 24.8 hr	M9523 Jul 25 23.5 hr	M9523 Jul 26 23.3 hr	M9523 Jul 27 24.2 hr	M9523 Jul 28 25.5 hr	M9523 Jul 29 23.6 hr
Broad whitefish	15	78	232	212	93	35	22	41	41	192	14	10	50	33	48	27	7
Humpback whitefish	8	12	34	32	19	5	6	8	10	13	0	1	3	7	1	4	1
Round whitefish	31	50	76	45	18	12	8	6	16	21	0	1	5	15	18	9	5
Least cisco	8	14	71	12	24	24	30	17	9	23	1	2	10	11	19	159	2
Arctic cisco	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arctic grayling	2	1	11	0	2	1	0	0	0	0	0	0	0	0	0	1	0
Rainbow smelt	0	0	0	0	0	1	3	9	2	3	0	0	1	4	2	0	0
Burbot	0	1	0	0	0	0	2	0	0	0	0	0	1	0	1	0	1
Alaska blackfish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Longnose sucker	1	1	0	4	3	3	2	4	1	0	0	1	0	1	0	0	0
Arctic flounder	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fourhorn sculpin	2	0	0	0	5	2	3	1	0	1	0	0	0	0	0	1	0
Slimy sculpin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ninespine stickleback	8	7	44	8	8	0	12	20	20	13	9	4	6	8	0	5	0
Threespine stickleback	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total:	75	164	468	313	172	83	88	106	99	266	24	19	76	79	89	206	16

Species	M9523 Jul 30 22.9 hr	M9523 Jul 31 22.8 hr	M9523 Aug 1 24.4 hr	M9523 Aug 2 24.2 hr	M9523 Aug 3 25.4 hr	M9523 Aug 4 22.0 hr	Station Total
Broad whitefish	2	2	4	3	17	40	1,218
Humpback whitefish	0	0	0	0	0	2	166
Round whitefish	0	4	2	4	10	11	367
Least cisco	7	13	0	9	6	7	478
Arctic cisco	0	0	0	0	0	0	0
Arctic grayling	0	0	0	1	2	1	22
Rainbow smelt	0	8	0	0	9	11	53
Burbot	0	0	0	0	0	0	6
Alaska blackfish	0	0	0	0	0	0	0
Longnose sucker	0	0	0	0	1	0	22
Arctic flounder	0	0	0	0	0	0	0
Fourhorn sculpin	0	1	1	2	1	0	20
Slimy sculpin	0	0	0	0	0	0	0
Ninespine stickleback	1	1	0	0	0	2	176
Threespine stickleback	0	0	0	0	0	0	0
Total:	10	29	7	19	46	74	2,528

Appendix Table 1. continued
Mixed Lake Types

	Low Perched Lakes					High Perched Lakes												
	B8534	L9283	L9314	L9316	M9524	B8533	L9279	L9279	L9280	L9281	L9281	L9281	L9310	L9310	L9311	L9311	L9312	L9312
	Jul 19	Jul 19	Jul 16	Jul 15	Jul 18	Jul 17	Jul 11	Jul 28	Jul 12	Jul 11	Jul 27	Jul 28	Jul 13	Jul 26	Jul 13	Jul 25	Jul 14	Jul 26
Species	20.5 hr	20.9 hr	21.7 hr	16.7 hr	21.2 hr	23.7 hr	28.0 hr	17.6 hr	20.3 hr	25.6 hr	21.0 hr	21.1 hr	18.3 hr	20.3 hr	22.6 hr	26.9 hr	23.9 hr	20.0 hr
Broad whitefish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Humpback whitefish	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Round whitefish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Least cisco	63	11	0	20	132	3	0	0	4	0	0	0	0	1	0	0	0	0
Arctic cisco	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Arctic grayling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rainbow smelt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Burbot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alaska blackfish	1	2	0	2	0	0	0	0	0	0	0	0	3	1	0	0	1	0
Longnose sucker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arctic flounder	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fourhorn sculpin	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Slimy sculpin	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0
Ninespine stickleback	840	0	40	74	107	1680	9758	10	67	560	4	5	130	41	460	39	10	10
Threespine stickleback	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total:	904	13	40	96	243	1683	9758	10	71	560	4	5	136	43	460	39	13	10

	High Perched Lakes																	
	L9313	L9313	L9317	L9317	L9318	L9319	L9320	L9321	L9322	L9342	L9342	L9342	M9321	L9332	L9333	L9279	M9505	L9335
	Jul 14	Jul 26	Jul 16	Jul 17	Jul 14	Jul 15	Jul 16	Jul 18	Jul 23	Jul 12	Jul 13	Jul 24	Jul 17	Jul 19	Jul 20	Jul 27	Jul 25	Jul 21
Species	23.3 hr	20.7 hr	23.3 hr	23.6 hr	24.2 hr	17.1 hr	22.1 hr	22.4 hr	44.9 hr	19.9 hr	23.2 hr	18.5 hr	21.4 hr	22.8 hr	23.4 hr	24.1 hr	119.5 hr	23.2 hr
Broad whitefish	0	0	0	0	1	0	0	0	0	0	0	0	0	0	13	0	0	0
Humpback whitefish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Round whitefish	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Least cisco	5	0	0	3	2	0	0	5	5	0	0	1	0	0	1	0	8	7
Arctic cisco	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arctic grayling	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Rainbow smelt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Burbot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alaska blackfish	6	0	1	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0
Longnose sucker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arctic flounder	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fourhorn sculpin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slimy sculpin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ninespine stickleback	63	9	1155	140	2420	860	6320	120	0	0	860	68	220	140	222	68	72	33
Threespine stickleback	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total:	74	9	1156	144	2423	860	6323	125	5	0	860	69	220	142	236	68	80	40

Appendix Table 1. continued

	High Perched Lakes									Drainage Lakes							Tapped Lakes	
	M9509	M9512	M9514	M9515	M9516	L9120	L9121	L9122	M9528	L9334	M9501	M9502	MC7903	MC7903	L9119	L9123	L9278	M9525
	Jul 25	Aug 3	Aug 3	Aug 4	Aug 4	Aug 1	Aug 1	Jul 31	Aug 4	Jul 21	Jul 20	Jul 20	Jul 30	Jul 30	Aug 3	Jul 31	Jul 15	Jul 18
Species	94.8 hr	52.2 hr	46.0 hr	19.1 hr	16.2 hr	21.5 hr	22.3 hr	23.1 hr	18.5 hr	24.2 hr	22.7 hr	20.3 hr	21.2 hr	21.0 hr	52.2 hr	22.4 hr	24.3 hr	23.0 hr
Broad whitefish	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	31	8
Humpback whitefish	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0
Round whitefish	0	0	0	0	0	0	0	0	0	0	5	1	0	0	0	0	1	0
Least cisco	3	0	0	0	0	0	0	0	0	2	1	27	0	0	0	0	20	2
Arctic cisco	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arctic grayling	0	0	0	0	0	0	0	0	0	4	43	4	0	0	2	0	0	0
Rainbow smelt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Burbot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alaska blackfish	0	0	0	0	0	0	0	0	0	0	0	0	4	5	0	0	0	0
Longnose sucker	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arctic flounder	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fourhorn sculpin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slimy sculpin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ninespine stickleback	385	4	18	0	0	16	9	17	5	62	0	39	8	3	44	0	5	376
Threespine stickleback	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total:	391	4	18	0	0	16	9	17	5	70	49	72	12	8	46	0	59	386

Appendix Table 2. CPUE (in fish per 24 hours) by fyke net at each station sampled (data are CPUE by station, date and hours of effort).

Species	C9501 Jul 9 16.5	C9501 Jul 10 14.8	C9501 Jul 11 16.1	C9501 Jul 12 28.4	C9501 Jul 13 18.0	C9501 Jul 14 25.8	C9501 Jul 15 24.3	C9501 Jul 16 24.5	C9501 Jul 17 24.8	C9501 Jul 18 22.2	C9501 Jul 19 24.2	C9501 Jul 20 23.0	C9501 Jul 21 24.3	C9501 Jul 22 25.4	C9501 Jul 23 22.3	C9501 Jul 24 25.1	C9501 Jul 25 23.4
Broad whitefish	98.9	0.0	6.0	15.2	114.7	51.2	61.2	101.9	36.8	18.4	43.6	38.6	4.9	21.7	12.9	20.1	22.6
Humpback whitefish	72.7	0.0	1.5	20.3	36.0	0.9	4.9	4.9	0.0	0.0	6.9	4.2	0.0	0.0	0.0	2.9	4.1
Round whitefish	77.1	0.0	19.4	15.2	52.0	40.0	45.4	48.0	33.9	10.8	29.8	13.6	4.9	18.0	17.2	10.5	10.3
Least cisco	10.2	0.0	31.3	49.0	50.7	23.3	31.6	28.4	5.8	6.5	8.9	12.5	4.0	102.0	192.6	7.6	18.5
Arctic cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic grayling	4.4	0.0	16.4	5.9	5.3	3.7	4.9	5.9	4.8	1.1	1.0	1.0	1.0	0.9	1.1	0.0	0.0
Rainbow smelt	0.0	0.0	0.0	0.8	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	8.2
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0
Alaska blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
Longnose sucker	5.8	0.0	0.0	0.8	2.7	1.9	0.0	0.0	2.9	0.0	1.0	1.0	0.0	0.0	0.0	2.9	1.0
Arctic flounder	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fourhorn sculpin	1.5	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	2.2	2.0	52.2	0.0	1.9	1.1	1.0	0.0
Slimy sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ninespine stickleback	4.4	0.0	8.9	9.3	29.3	27.9	31.6	36.2	10.6	13.0	12.9	3.1	10.9	1.9	8.6	4.8	7.2
Threespine stickleback	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total:	275	0	83	117	291	153	181	225	95	52	107	126	26	146	234	53	73

Species	C9501 Jul 26 23.4	C9501 Jul 27 24.2	C9501 Jul 28 24.9	C9501 Jul 29 22.9	C9501 Jul 30 22.8	C9501 Jul 31 22.8	C9501 Aug 1 24.4	C9501 Aug 2 24.2	C9501 Aug 3 25.5	C9501 Aug 4 22.3	Station Total
Broad whitefish	36.9	69.4	55.9	53.4	7.4	14.7	45.2	6.9	21.6	15.1	995
Humpback whitefish	4.1	12.9	4.8	0.0	1.1	1.1	0.0	0.0	1.9	0.0	185
Round whitefish	12.3	10.9	12.5	3.1	3.2	12.6	10.8	6.9	4.7	1.1	524
Least cisco	49.2	241.0	102.2	14.7	9.5	16.8	32.5	56.5	9.4	7.5	1,122
Arctic cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Arctic grayling	0.0	0.0	0.0	2.1	0.0	0.0	0.0	1.0	0.0	0.0	61
Rainbow smelt	4.1	3.0	12.5	6.3	1.1	2.1	21.6	2.0	0.0	1.1	65
Burbot	0.0	2.0	1.9	0.0	2.1	0.0	0.0	0.0	0.9	1.1	10
Alaska blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2
Longnose sucker	0.0	0.0	1.9	0.0	0.0	0.0	1.0	0.0	0.9	0.0	24
Arctic flounder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
Fourhorn sculpin	0.0	1.0	0.0	1.0	1.1	1.1	0.0	0.0	3.8	0.0	73
Slimy sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Ninespine stickleback	7.2	1.0	4.8	9.4	5.3	3.2	2.0	3.0	0.0	0.0	256
Threespine stickleback	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Total:	114	341	197	90	31	52	113	76	43	26	3,319

Appendix Table 2. continued.

Species	M9521 Jul 9 18.2	M9521 Jul 10 23.0	M9521 Jul 11 25.1	M9521 Jul 12 23.1	M9521 Jul 13 24.3	M9521 Jul 14 24.0	M9521 Jul 15 23.8	M9521 Jul 16 24.2	M9521 Jul 17 24.6	M9521 Jul 18 23.5	M9521 Jul 19 23.8	M9521 Jul 20 24.2	M9521 Jul 21 24.0	M9521 Jul 22 24.0	M9521 Jul 23 24.0	M9521 Jul 24 24.4	M9521 Jul 25 24.0
Broad whitefish	40.9	68.9	11.5	63.4	57.3	53.0	52.4	57.5	121.0	9.2	56.5	23.8	15.0	45.0	16.0	18.7	19.0
Humpback whitefish	25.1	28.2	3.8	15.6	1.0	5.0	4.0	6.0	12.7	0.0	7.1	8.9	2.0	25.0	3.0	2.0	0.0
Round whitefish	15.8	23.0	4.8	12.5	3.0	12.0	21.2	23.8	12.7	7.1	6.1	7.9	3.0	8.0	2.0	6.9	4.0
Least cisco	182.0	308.9	27.7	82.1	8.9	15.0	24.2	11.9	115.1	10.2	34.3	6.0	10.0	84.0	67.0	32.5	47.0
Arctic cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic grayling	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0
Rainbow smelt	0.0	0.0	2.9	6.2	1.0	4.0	13.1	2.0	5.9	0.0	7.1	4.0	5.0	32.0	4.0	0.0	1.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Alaska blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Longnose sucker	0.0	1.0	2.9	2.1	1.0	0.0	3.0	3.0	3.9	4.1	1.0	1.0	0.0	1.0	0.0	0.0	0.0
Arctic flounder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fourhorn sculpin	0.0	0.0	1.0	0.0	0.0	2.0	1.0	5.0	5.9	1.0	1.0	3.0	0.0	0.0	0.0	3.0	0.0
Slimy sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ninespine stickleback	11.9	14.6	8.6	13.5	1.0	13.0	10.1	10.9	7.8	1.0	10.1	8.9	13.0	20.0	12.0	6.9	4.0
Threespine stickleback	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total:	276	445	63	195	73	105	129	120	286	34	124	63	48	216	105	70	75

Species	M9521 Jul 26 23.2	M9521 Jul 27 24.2	M9521 Jul 28 25.3	M9521 Jul 29 23.0	M9521 Jul 30 23.7	M9521 Jul 31 23.6	M9521 Aug 1 24.7	M9521 Aug 2 24.3	M9521 Aug 3 25.4	M9521 Aug 4 22.0	Station Total
Broad whitefish	30.0	15.9	51.2	137.7	35.4	32.5	6.8	20.7	20.8	5.5	1,086
Humpback whitefish	1.0	1.0	3.8	0.0	0.0	3.1	1.0	0.0	0.0	0.0	159
Round whitefish	5.2	6.0	3.8	0.0	6.1	6.1	3.9	1.0	6.6	3.3	216
Least cisco	81.7	55.5	66.4	187.8	9.1	18.3	22.3	2.0	6.6	7.6	1,524
Arctic cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Arctic grayling	3.1	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10
Rainbow smelt	0.0	0.0	0.9	25.0	3.0	1.0	3.9	1.0	7.6	0.0	131
Burbot	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	2
Alaska blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Longnose sucker	0.0	0.0	0.9	1.0	0.0	1.0	1.0	1.0	0.0	1.1	30
Arctic flounder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Fourhorn sculpin	0.0	2.0	0.9	1.0	3.0	4.1	4.9	4.0	5.7	5.5	54
Slimy sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Ninespine stickleback	10.3	7.9	11.4	12.5	29.4	6.1	1.9	0.0	0.9	0.0	248
Threespine stickleback	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1
Total:	131	90	139	365	87	73	46	30	48	23	3,460

Appendix Table 2. continued.

Species	M9523 Jul 13 16.7	M9523 Jul 14 22.5	M9523 Jul 15 23.3	M9523 Jul 16 24.5	M9523 Jul 17 25.7	M9523 Jul 18 22.7	M9523 Jul 19 24.2	M9523 Jul 20 23.2	M9523 Jul 21 24.1	M9523 Jul 22 25.0	M9523 Jul 23 22.9	M9523 Jul 24 24.8	M9523 Jul 25 23.5	M9523 Jul 26 23.3	M9523 Jul 27 24.2	M9523 Jul 28 25.5	M9523 Jul 29 23.6
Broad whitefish	21.6	83.2	239.0	207.7	86.8	37.0	21.8	42.4	40.8	184.3	14.7	9.7	51.1	34.0	47.6	25.4	7.1
Humpback whitefish	11.5	12.8	35.0	31.3	17.7	5.3	6.0	8.3	10.0	12.5	0.0	1.0	3.1	7.2	1.0	3.8	1.0
Round whitefish	44.6	53.3	78.3	44.1	16.8	12.7	7.9	6.2	15.9	20.2	0.0	1.0	5.1	15.5	17.9	8.5	5.1
Least cisco	11.5	14.9	73.1	11.8	22.4	25.4	29.8	17.6	9.0	22.1	1.0	1.9	10.2	11.3	18.8	149.6	2.0
Arctic cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic grayling	2.9	1.1	11.3	0.0	1.9	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
Rainbow smelt	0.0	0.0	0.0	0.0	0.0	1.1	3.0	9.3	2.0	2.9	0.0	0.0	1.0	4.1	2.0	0.0	0.0
Burbot	0.0	1.1	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	1.0
Alaska blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Longnose sucker	1.4	1.1	0.0	3.9	2.8	3.2	2.0	4.1	1.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0
Arctic flounder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fourhorn sculpin	2.9	0.0	0.0	0.0	4.7	2.1	3.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
Slimy sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ninespine stickleback	11.5	7.5	45.3	7.8	7.5	0.0	11.9	20.7	19.9	12.5	9.4	3.9	6.1	8.2	0.0	4.7	0.0
Threespine stickleback	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total:	108	175	482	307	161	88	87	110	99	255	25	18	78	81	88	194	16

Species	M9523 Jul 30 22.9	M9523 Jul 31 22.8	M9523 Aug 1 24.4	M9523 Aug 2 24.2	M9523 Aug 3 25.4	M9523 Aug 4 22.0	Station Total
Broad whitefish	2.1	2.1	3.9	3.0	16.1	43.6	1,225
Humpback whitefish	0.0	0.0	0.0	0.0	0.0	2.2	170
Round whitefish	0.0	4.2	2.0	4.0	9.4	12.0	385
Least cisco	7.3	13.7	0.0	8.9	5.7	7.6	476
Arctic cisco	0.0	0.0	0.0	0.0	0.0	0.0	0
Arctic grayling	0.0	0.0	0.0	1.0	1.9	1.1	23
Rainbow smelt	0.0	8.4	0.0	0.0	8.5	12.0	54
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	6
Alaska blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0
Longnose sucker	0.0	0.0	0.0	0.0	0.9	0.0	22
Arctic flounder	0.0	0.0	0.0	0.0	0.0	0.0	0
Fourhorn sculpin	0.0	1.1	1.0	2.0	0.9	0.0	21
Slimy sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0
Ninespine stickleback	1.0	1.1	0.0	0.0	0.0	2.2	181
Threespine stickleback	0.0	0.0	0.0	0.0	0.0	0.0	0
Total:	10	31	7	19	43	81	2,563

Appendix Table 2. continued.

	Low Perched Lakes					High Perched Lakes											
	B8534	L9283	L9314	L9316	M9524	B8533	L9279	L9279	L9280	L9281	L9281	L9281	L9310	L9310	L9311	L9311	L9312
	Jul 19	Jul 19	Jul 16	Jul 15	Jul 18	Jul 17	Jul 11	Jul 28	Jul 12	Jul 11	Jul 27	Jul 28	Jul 13	Jul 26	Jul 13	Jul 25	Jul 14
Species	20.5	20.9	21.7	16.7	21.2	23.7	28.0	17.6	20.3	25.6	21.0	21.1	18.3	20.3	22.6	26.9	23.9
Broad whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Humpback whitefish	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Round whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least cisco	73.8	12.6	0.0	28.7	149.4	3.0	0.0	0.0	4.7	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0
Arctic cisco	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic grayling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alaska blackfish	1.2	2.3	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	1.2	0.0	0.0	1.0
Longnose sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic flounder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fourhorn sculpin	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Slimy sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0	0.0	0.0	1.0
Ninespine stickleback	983.4	0.0	44.2	106.3	121.1	1701.3	8364.0	13.6	79.2	525.0	4.6	5.7	170.5	48.5	488.5	34.8	10.0
Threespine stickleback	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total:	1058	15	44	138	275	1704	8364	14	84	525	5	6	178	51	488	35	13

	High Perched Lakes																
	L9313	L9313	L9317	L9317	L9318	L9319	L9320	L9321	L9322	L9342	L9342	L9342	M9321	L9332	L9333	L9279	M9505
	Jul 14	Jul 26	Jul 16	Jul 17	Jul 14	Jul 15	Jul 16	Jul 18	Jul 23	Jul 12	Jul 13	Jul 24	Jul 17	Jul 19	Jul 20	Jul 27	Jul 25
Species	23.3	20.7	23.3	23.6	24.2	17.1	22.1	22.4	44.9	19.9	23.2	18.5	21.4	22.8	23.4	24.1	119.5
Broad whitefish	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.3	0.0	0.0
Humpback whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Round whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Least cisco	5.2	0.0	0.0	3.1	2.0	0.0	0.0	5.4	2.7	0.0	0.0	1.3	0.0	0.0	1.0	0.0	1.6
Arctic cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic grayling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Rainbow smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alaska blackfish	6.2	0.0	1.0	1.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Longnose sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic flounder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fourhorn sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Slimy sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ninespine stickleback	64.9	10.4	1189.7	142.4	2400.0	1207.0	6863.3	128.6	0.0	0.0	889.7	88.2	246.7	147.4	227.7	67.7	14.5
Threespine stickleback	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total:	76	10	1191	146	2403	1207	6867	134	3	0	890	90	247	149	242	68	16

Appendix Table 2. continued.

	High Perched Lakes									Drainage Lakes							Tapped Lakes	
	M9509	M9512	M9514	M9515	M9516	L9120	L9121	L9122	M9528	L9334	M9501	M9502	MC7903	MC7903	L9119	L9123	L9278	M9525
	Jul 25	Aug 3	Aug 3	Aug 4	Aug 4	Aug 1	Aug 1	Jul 31	Aug 4	Jul 21	Jul 20	Jul 20	Jul 30	Jul 30	Aug 3	Jul 31	Jul 15	Jul 18
Species	94.8	52.2	46.0	19.1	16.2	21.5	22.3	23.1	18.5	24.2	22.7	20.3	21.2	21.0	52.2	22.4	24.3	23.0
Broad whitefish	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	30.6	8.3
Humpback whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
Round whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	1.2	0.0	0.0	0.0	0.0	1.0	0.0
Least cisco	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	1.1	31.9	0.0	0.0	0.0	0.0	19.8	2.1
Arctic cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic grayling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	45.5	4.7	0.0	0.0	0.9	0.0	0.0	0.0
Rainbow smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alaska blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	5.7	0.0	0.0	0.0	0.0
Longnose sucker	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic flounder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fourhorn sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Slimy sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ninespine stickleback	97.5	1.8	9.4	0.0	0.0	17.9	9.7	17.7	6.5	61.5	0.0	46.1	9.1	3.4	20.2	0.0	4.9	392.3
Threespine stickleback	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total:	99	2	9	0	0	18	10	18	6	69	52	85	14	9	21	0	58	403

Appendix Table 3. Catch by gill net at each sampled station during 1995 fall sampling in the Colville Delta.

Species	C9504 Oct 31 20.3 hr	C9505 Nov 4 22.8 hr	C9506 Nov 4 20.5 hr	C9510 Oct 29 26.5 hr	C9511 Oct 30 20.8 hr	C9512 Oct 30 24.7 hr	C9513 Oct 31 21.1 hr	L9316 Nov 6 22.3 hr	L9279 Nov 5 22.0 hr	L9281 Nov 5 21.0 hr	L9310 Nov 3 22.7 hr	L9311 Nov 2 20.8 hr	L9312 Nov 2 21.7 hr	L9313 Nov 1 20.7 hr	L9342 Nov 3 23.7 hr	M9321 Nov 6 23.1 hr	Gear Total
Broad whitefish	24	0	0	5	2	0	2	1	0	0	2	1	5	0	0	0	42
Humpback whitefish	0	0	0	3	1	1	3	0	0	0	0	0	0	0	0	0	8
Round whitefish	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
Least cisco	4	1	0	0	6	15	25	24	0	53	26	37	62	0	57	96	406
Arctic cisco	1	2	0	0	1	0	3	0	0	0	0	0	0	0	0	0	7
Arctic grayling	0	0	0	2	0	9	0	0	0	0	0	0	0	0	0	0	11
Burbot	0	0	0	0	3	4	0	0	0	0	0	0	0	0	0	0	7
Alaska blackfish	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	3
Longnose sucker	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Fourhorn sculpin	1	0	0	6	0	3	1	0	0	0	0	0	0	0	0	0	11
Total:	30	3	0	19	13	33	34	25	0	55	28	38	67	0	58	96	499

Appendix Table 4. CPUE (in fish per 24 hours) by gill net at each sampled station during 1995 fall sampling in the Colville Delta.

Species	C9504 Oct 31 20.30	C9505 Nov 4 22.80	C9506 Nov 4 20.50	C9510 Oct 29 26.50	C9511 Oct 30 20.80	C9512 Oct 30 24.70	C9513 Oct 31 21.10	L9316 Nov 6 22.30	L9279 Nov 5 22.00	L9281 Nov 5 21.00	L9310 Nov 3 22.70	L9311 Nov 2 20.80	L9312 Nov 2 21.70	L9313 Nov 1 20.70	L9342 Nov 3 23.70	M9321 Nov 6 23.10
Broad whitefish	28.4	0.0	0.0	4.5	2.3	0.0	2.3	1.1	0.0	0.0	2.1	1.2	5.5	0.0	0.0	0.0
Humpback whitefish	0.0	0.0	0.0	2.7	1.2	1.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Round whitefish	0.0	0.0	0.0	0.9	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least cisco	4.7	1.1	0.0	0.0	6.9	14.6	28.4	25.8	0.0	60.6	27.5	42.7	68.6	0.0	57.7	99.7
Arctic cisco	1.2	2.1	0.0	0.0	1.2	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arctic grayling	0.0	0.0	0.0	1.8	0.0	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	3.5	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alaska blackfish	0.0	0.0	.0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	1.0	0.0
Longnose sucker	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fourhorn sculpin	1.2	0.0	0.0	5.4	0.0	2.9	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total:	35	3	0	17	15	32	39	27	0	63	30	44	74	0	59	100

Appendix Table 5. Catch by minnow traps at each sampled station during 1995 summer sampling in the Colville Delta (two minnow traps set overnight)

Species	C9501 Jul 12	L9278 Jul 15	L9279 Jul 10	L9280 Jul 12	L9281 Jul 10	L9281 Jul 11	L9282 Jul 19	L9283 Jul 19	L9310 Jul 13	L9311 Jul 13	L9312 Jul 14	L9313 Jul 14	L9313 Jul 15	L9314 Jul 16	L9315 Jul 17	L9316 Jul 15	L9317 Jul 16
Alaska blackfish	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0
Slimy sculpin	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
Ninespine stickleback	0	0	0	5	147	1	0	45	2	0	1	0	9	2	15	0	3
Total:	0	0	0	5	148	2	1	45	2	0	3	0	9	2	15	0	3

Species	L9318 Jul 14	L9319 Jul 15	L9320 Jul 16	L9321 Jul 18	L9322 Jul 23	L9342 Jul 12	M9321 Jul 17	M9501 Jul 20	M9502 Jul 20	M9503 Jul 19	M9504 Jul 20	M9505 Jul 25	M9506 Jul 21	M9507 Jul 21	M9509 Jul 25	M9510 Jul 30	M9512 Aug 3
Alaska blackfish	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	3	0
Slimy sculpin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ninespine stickleback	0	2	7	3	2	6	0	0	0	3	5	1	0	3	29	0	0
Total:	0	3	8	3	4	6	0	0	0	3	5	1	0	3	29	3	0

Species	M9513 Aug 3	M9514 Aug 3	M9515 Aug 4	M9516 Aug 4	M9517 Aug 1	M9518 Aug 1	M9519 Jul 31	M9520 Jul 31	M9521 Jul 12	M9524 Jul 18	M9525 Jul 18	M9528 Aug 4	Gear Total
Alaska blackfish	0	0	0	0	0	0	0	0	0	0	0	0	10
Slimy sculpin	0	0	0	0	0	0	0	0	0	0	0	0	2
Ninespine stickleback	0	0	0	0	0	0	0	0	0	4	33	0	328
Total:	0	0	0	0	0	0	0	0	0	4	33	0	340

Appendix Table 6. Least cisco length frequency by date and station - 1995 river channel and tapped lakes.
(Stations C9501, M9521 and M9523 are fyke net catches, others are gill net catches)

Fork Length (mm)	C9501 7/9/95	C9501 7/10/95	C9501 7/11/95	C9501 7/12/95	C9501 7/13/95	C9501 7/14/95	C9501 7/15/95	C9501 7/16/95	C9501 7/17/95	C9501 7/18/95	C9501 7/19/95	C9501 7/20/95	C9501 7/21/95	C9501 7/22/95	C9501 7/23/95	C9501 7/24/95	C9501 7/25/95	C9501 7/26/95
30				1										28	38			
40											1		2	72	134	6	13	12
50					1											2		3
60	1		2	4	2													
70			3	27	8	3	8	5		1								
80	1		7	18	9	3	12	5			1	2		3	1		1	5
90	2		3	3	1	3	3	4	1		2	3		3	1			5
100	1			1	1		2		1			3						9
110							1	1										
120			1				1	3		2	1	1			1			1
130	1		3	1	5	3	1	3		1				1	1			3
140					7	3	2	2	2	1		2			2			2
150						4								1				
160				2		3	1	1							1			1
170				1	3	1		1	1		2							1
180								1										
190						2	1	1			1		1				1	3
200			1							1	1		1					1
210			1														1	
220																		
230					1			1										
240																		1
250									1			1						
260	1																	
270																		
280																		
290																		
300																		1
310								1									1	
320																		
330																	1	
340																		
350																		
360																		
370																		
380																		
390																		
Total:	7	0	21	58	38	25	32	29	6	6	9	12	4	108	179	8	18	48
Effort (hrs	16.52	14.83	16.08	28.42	18.00	25.83	24.33	24.50	24.75	22.17	24.25	23.00	24.33	25.42	22.25	25.08	23.42	23.42

Appendix Table 6. Least cisco length frequency by date and station - 1995 river channel and tapped lakes.

Fork Length (mm)	C9501 7/27/95	C9501 7/28/95	C9501 7/29/95	C9501 7/30/95	C9501 7/31/95	C9501 8/1/95	C9501 8/2/95	C9501 8/3/95	C9501 8/4/95	M9521 7/9/95	M9521 7/10/95	M9521 7/11/95	M9521 7/12/95	M9521 7/13/95	M9521 7/14/95	M9521 7/15/95	M9521 7/16/95	M9521 7/17/95
30	4																	
40	156	72	5	3	7	3	25	1	4								1	52
50	30	19	4	1	2	5	24											5
60										2	3	1					1	1
70										44	85	10	27	3	2	4	1	12
80	10	1				1			1	85	181	10	31	1	6	11	3	32
90	14	3		1	2	1		1		6	18	3	14	2	2	2	1	7
100	8	2	1	1	2	3	1	1				1	1		1	1		1
110	4	1			1		2				1	1	1					1
120	1					1			1			1		1		2		
130	1	3	1			1			1								2	2
140	2					6	1							1	2	1	1	2
150	2		2			1		2					1					1
160	4	1		1				1									1	
170	2	1		1		2					2		1					
180		1				2	2	1			1				1	1		1
190	1					1	1	1		1	2	1		1			1	
200	1							1										
210	1					3					2	1						
220				1												1		
230						1										1		
240	1	1	1		1	1									1			
250																		
260		1				1												
270																		
280																		
290																		
300	1						1											
310					1													
320																		
330								1										
340																		
350																		
360																		
370																		
380																		
390																		
Total:	243	106	14	9	16	33	57	10	7	138	295	29	78	9	15	24	12	117
Effort (hr	24.17	24.92	22.92	22.83	22.83	24.42	24.25	25.50	22.25	18.25	23.00	25.08	23.08	24.33	24.00	23.75	24.17	24.58

Appendix Table 6. Least cisco length frequency by date and station - 1995 river channel and tapped lakes.

Fork Length (mm)	M9521 7/18/95	M9521 7/19/95	M9521 7/20/95	M9521 7/21/95	M9521 7/22/95	M9521 7/23/95	M9521 7/24/95	M9521 7/25/95	M9521 7/26/95	M9521 7/27/95	M9521 7/28/95	M9521 7/29/95	M9521 7/30/95	M9521 7/31/95	M9521 8/1/95	M9521 8/2/95	M9521 8/3/95	M9521 8/4/95
30				3	24	13	3	2	4			3						
40		5		3	20	44	14	34	57	37	50	103	5	10	15		1	5
50							1			9	13	60	3	7	8	1	2	2
60	1																	
70		2	1		6	1		1	1		1							
80	8	6	1	2	20	5	3	4		6	2	2						
90		5	2		8	2	4	2	3	1	1	2						
100		2	1	1	1		3			2	1	2					1	
110						2			1		1	1						
120		1					1											
130		1		1	1		1	1	1									
140					1			1		1		1	1					
150							1				1	3					2	
160		3							1			1						
170	1	2			1		1		2			1						
180			1						1			1					1	
190							1		1									
200																		
210		1							1									
220					1			1										
230		1							2									
240								1										
250									1									
260									1					1				
270		1							1									
280		1																
290									1									
300																		
310					1													
320		1														1		
330																		
340																		
350																		
360																		
370																		
380																		
390																		
Total:	10	32	6	10	84	67	33	47	79	56	70	180	9	18	23	2	7	7
Effort (hr	23.50	23.83	24.17	24.00	24.00	24.00	24.42	24.00	23.17	24.17	25.25	23.00	23.67	23.58	24.67	24.25	25.42	22.00

Appendix Table 6. Least cisco length frequency by date and station - 1995 river channel and tapped lakes.

Fork Length (mm)	M9523 7/13/95	M9523 7/14/95	M9523 7/15/95	M9523 7/16/95	M9523 7/17/95	M9523 7/18/95	M9523 7/19/95	M9523 7/20/95	M9523 7/21/95	M9523 7/22/95	M9523 7/23/95	M9523 7/24/95	M9523 7/25/95	M9523 7/26/95	M9523 7/27/95	M9523 7/28/95	M9523 7/29/95	M9523 7/30/95
30						5	12											
40						3	8						1		6	105		4
50															1	47		3
60	1																	
70	1	1	7	1	5													
80		5	34	3	9	4	2	1	3	4								
90			6	1	1	7	4	6	1	3		1				1		
100		1	5	1		3		1		3				2	3			
110				1						1								
120		1	1	1				1	1									
130			3	1	2			3		1				1	1			
140	2	1	5	2	2											1		
150					2			1		3				1	2			
160	2	1	1		1			1		1								
170		1	2	1			1	1		1			1	1				
180		2				1	1	2	1		1		1	1	1	1		
190	1								1	1								
200			2							2			2	2	1			
210		1	1				1							1		1	1	
220			1										2		1			
230																1	1	
240						1	1							1	1			
250												1			2			
260	1									2								
270																		
280					2													
290													1					
300														1		1		
310			2										1					
320			1						1				1			1		
330																		
340									1									
350																		
360										1								
370																		
380																		
390																		
Total:	8	14	71	12	24	24	30	17	9	23	1	2	10	11	19	159	2	7
Effort (hr	16.75	22.50	23.33	24.50	25.67	22.67	24.17	23.17	24.08	25.00	22.92	24.83	23.50	23.33	24.00	25.50	23.58	22.92

Appendix Table 6. Least cisco length frequency by date and station - 1995 river channel and tapped lakes.

Fork Length (mm)	M9523 7/31/95	M9523 8/1/95	M9523 8/2/95	M9523 8/3/95	M9523 8/4/95	Gill Nets C9504 10/31/95	C9505 11/4/95	C9506 11/4/95	C9510 10/29/95	C9511 10/30/95	C9512 10/30/95	C9513 10/31/95
30												
40	9		4	1								
50	4		5	2	1							
60												
70												
80												
90					1							
100						1						
110				1								
120												1
130					1							
140												
150					2							
160												
170												
180					1	1						2
190						1						1
200												1
210							1					1
220												2
230											1	
240					1	1						
250											2	
260										1	1	5
270										3	2	3
280												5
290										1	3	2
300											1	
310									1	1	3	1
320				1								
330				1							1	1
340												
350											1	
360												
370												
380												
390												
Total:	13	0	9	6	7	4	1	0	1	6	15	25
Effort (hr	22.75	24.42	24.17	25.42	22.00	20.29	22.79	20.54	26.54	20.79	24.71	21.12

Appendix Table 7. Broad whitefish length frequency by date and station - 1995 river channel and tapped lakes.
(Stations C9501, M9521 and M9523 are fyke net catches, others are gill net catches)

Fork Length (mm)	C9501 7/9/95	C9501 7/10/95	C9501 7/11/95	C9501 7/12/95	C9501 7/13/95	C9501 7/14/95	C9501 7/15/95	C9501 7/16/95	C9501 7/17/95	C9501 7/18/95	C9501 7/19/95	C9501 7/20/95	C9501 7/21/95
30													
40					7	2	3	1	1	1	3	2	1
50											2	1	
60													
70	3												
80	3				2	1	1						
90	15			4	14	6	3	1	1				1
100	21		1	6	21	11	20	10	6	1	5	2	
110	20			1	18	18	14	41	6	2	6	8	1
120	3			1	8	10	10	24	6		3	3	
130				1	1		1	3			1	3	
140	1		1	1	2	1	1	4		1		3	
150	1			2	7	3	4	2	4	1	1	2	1
160					1		2	7	5	1	4	1	
170				1	5	3	1	1	2	1	4	2	
180	1			1				2		3	4	1	
190			2				2	6	2	1	1	1	
200								1	2	2	8		1
210									1		1	3	
220												1	
230													
240													
250								1					
260									1				
270													
280									1	2		1	
290										1			
300												2	
310													
320													
330													
340													
350													
360											1		
370													
380													
390													
400													
410													
420													
430													
440													
450													
460													
470													
480													
490													
500													
510													
520													
530													
540													
550													
560													
Total:	68	0	4	18	86	55	62	104	38	17	44	36	5
Effort (hr	16.52	14.83	16.08	28.42	18.00	25.83	24.33	24.50	24.75	22.17	24.25	23.00	24.33

Appendix Table 7. Broad whitefish length frequency by date and station - 1995 river channel and tapped lakes.

Fork Length (mm)	C9501 7/22/95	C9501 7/23/95	C9501 7/24/95	C9501 7/25/95	C9501 7/26/95	C9501 7/27/95	C9501 7/28/95	C9501 7/29/95	C9501 7/30/95	C9501 7/31/95	C9501 8/1/95	C9501 8/2/95	C9501 8/3/95
30													
40		1		1	2	1		1					
50		2	6	2	7	20	16	31	1	5	10		2
60					1	15	9	9	2		2	2	4
70													
80													
90	1												
100	1		1		2	2	4			1	2		
110	8	2	1	5	4	7	7			2	2	1	2
120	6	1		2	6	12	11	3	3	1	5		3
130	2	1		1	3	4	4	5		3	8	1	1
140			1		1	3	2				1	1	1
150	1			1	1	1	3				2		
160	1	1		1	3	2				1	5	1	2
170	2	4	3	1		1				1	2	1	2
180			1	2	1		2	1					
190			1	1							1		2
200	1		1	1	2			1	1		2		
210				1							1		1
220			3	1							1		
230						1					1		
240				2									
250			1		1								2
260													
270						1							
280					1								
290			1		1								1
300			1										
310													
320													
330											1		
340													
350													
360													
370													
380													
390													
400													
410													
420													
430													
440													
450													
460													
470													
480													
490													
500													
510													
520													
530													
540													
550													
560													
Total:	23	12	21	22	36	70	58	51	7	14	46	7	23
Effort (hr	25.42	22.25	25.08	23.42	23.42	24.17	24.92	22.92	22.83	22.83	24.42	24.25	25.50

Appendix Table 7. Broad whitefish length frequency by date and station - 1995 river channel and tapped lakes.

Fork Length (mm)	C9501 8/4/95	M9521 7/9/95	M9521 7/10/95	M9521 7/11/95	M9521 7/12/95	M9521 7/13/95	M9521 7/14/95	M9521 7/15/95	M9521 7/16/95	M9521 7/17/95	M9521 7/18/95	M9521 7/19/95	M9521 7/20/95
30													
40													
50	1												
60	1												1
70			1									1	
80		2	5		1							1	
90		2	8		3	1	2	9		6			
100		2	6	2	7	6	7	19	8	6		4	
110	1	16	23	3	12	12	20	14	8	29	1	3	12
120	3	3	9		4	10	15	7	11	16	1	6	6
130					1	1	2	1	2	3		4	1
140	2		2	2	2	1				2	1	3	
150	1	1	4		4	10	2		1	9	1		3
160	1	1	1	1	5	3	1	1	8	6	1	10	1
170	3	1	2	1	3	4			8	10	1	1	
180		2			3	3	1		3	5		2	
190		1	2		4	3			1	9		3	
200	1		2	1	7			1	4	5	1	4	
210						2	2		1	5		7	
220				1	1					1		2	
230			1							2		2	
240						1			1			2	
250					1				1	3			
260					1					2			
270				1	1		1		1	3	2	1	
280													
290										1			
300													
310													
320					1								
330													
340													
350													
360													
370													
380													
390													
400													
410													
420													
430													
440													
450													
460													
470													
480													
490													
500													
510													
520													
530													
540													
550													
560													
Total:	14	31	66	12	61	57	53	52	58	123	9	56	24
Effort (hr	22.25	18.25	23.00	25.08	23.08	24.33	24.00	23.75	24.17	24.58	23.50	23.83	24.17

Appendix Table 7. Broad whitefish length frequency by date and station - 1995 river channel and tapped lakes.

Fork Length (mm)	M9521 7/21/95	M9521 7/22/95	M9521 7/23/95	M9521 7/24/95	M9521 7/25/95	M9521 7/26/95	M9521 7/27/95	M9521 7/28/95	M9521 7/29/95	M9521 7/30/95	M9521 7/31/95	M9521 8/1/95	M9521 8/2/95
30		1											
40	1	2	1		3								
50	1	2	3		2	2			2	1			
60													
70													
80	1				1								
90		3											
100	1	9	1	1				1	2	3			1
110	1	4		2	1	3	1	10	18	4	4	1	2
120	7	7	4	1	1	7	1	9	29	5	6	1	
130	2		3	2	1	3	1	8	19	2	5		5
140				1	1		1	2	3	1			
150		3		1	1	3	2	1	1	2	2	1	1
160		3	3	2	1	5	1	5	12		4	1	2
170		2		2	1	4	1	1	16	5	2	1	4
180		1					1	3	4	2	2		
190		4	1	2	1	1	2	1	6	1	2	1	1
200				1	1	1	1	4	4	2	2		1
210		2					3	3	6	2			2
220				2				2	4	1			
230									2	2	1		
240				1									1
250							1	2	1				1
260		1			1			1	1		1		
270					1					2		1	
280	1				1								
290											1		
300													
310													
320					1								
330													
340													
350													
360													
370													
380													
390													
400													
410													
420													
430													
440													
450													
460													
470													
480													
490													
500													
510													
520													
530													
540													
550													
560													
Total:	15	44	16	18	19	29	16	53	130	35	32	7	21
Effort (hr	24.00	24.00	24.00	24.42	24.00	23.17	24.17	25.25	23.00	23.67	23.58	24.67	24.25

Appendix Table 7. Broad whitefish length frequency by date and station - 1995 river channel and tapped lakes.

Fork Length (mm)	M9521 8/3/95	M9521 8/4/95	M9523 7/13/95	M9523 7/14/95	M9523 7/15/95	M9523 7/16/95	M9523 7/17/95	M9523 7/18/95	M9523 7/19/95	M9523 7/20/95	M9523 7/21/95	M9523 7/22/95	M9523 7/23/95
30					1								
40					10	3		1	1	1			2
50											1		3
60													
70					1								
80				1		1	1	1					
90			1	5	20	7	4		2			1	
100	1		3	14	52	38	18	2	4	2	6	18	
110	1		7	26	84	72	28	6	4	11	3	43	2
120	2		1	8	25	50	14	7	1	12	3	69	2
130	1	3		1	5	7	5		3	3	2	10	1
140	1				5	3		2				5	
150	1		2	3	5	7	2	3	2	1		8	
160	2		1	4	6	9	4	2	3	1	10	8	1
170		1		7	3	5	1	2		3	3	2	
180	1			3	2	1	1	1		2	1	3	1
190	1				2	3	2	5		1	2	3	
200	1			3	2	3	3			2	2	8	
210	3				1		3				1	2	1
220	2	1		3	1	1	1	1		1		4	
230								1					1
240							2				2	1	
250							1		1			2	
260	1						2	1	1		4		
270	1				3							1	
280					2					1		3	
290	2					1					1	1	
300							1						
310													
320	1												
330													
340													
350													
360													
370													
380						1							
390													
400													
410													
420													
430													
440													
450													
460													
470													
480													
490													
500													
510													
520													
530													
540													
550													
560													
Total:	22	5	15	78	230	212	93	35	22	41	41	192	14
Effort (hr	25.42	22.00	16.75	22.50	23.33	24.50	25.67	22.67	24.17	23.17	24.08	25.00	22.92

Appendix Table 7. Broad whitefish length frequency by date and station - 1995 river channel and tapped lakes.

Fork Length (mm)	M9523 7/24/95	M9523 7/25/95	M9523 7/26/95	M9523 7/27/95	M9523 7/28/95	M9523 7/29/95	M9523 7/30/95	M9523 7/31/95	M9523 8/1/95	M9523 8/2/95	M9523 8/3/95	M9523 8/4/95
30												
40	1		2	1								1
50		3	1		1						1	
60												1
70												
80												
90		1										
100												1
110			1	7	3	2			1		3	5
120		3	4	12	10				2	1	1	9
130		2	5	2	1			1			2	12
140				3	1		1				1	3
150		2	2						1		2	
160		2	2	3	2						2	1
170	1	5		2	1	1		1		1	2	3
180		6	1	2	3							
190		7	4	5	2	1						2
200	1	5	2	3	2	1					2	
210		3	3	1								
220				2	1		1					1
230		1				1						
240		2	2									
250				1							1	1
260		1		1						1		
270		1	1	1								
280	1	3										
290	1	2	1	1								
300	1		1									
310	1			1								
320												
330												
340	1											
350	1	1										
360												
370	1					1						
380												
390												
400			1									
410												
420												
430												
440												
450												
460												
470												
480												
490												
500												
510												
520												
530												
540												
550												
560												
Total:	10	50	33	48	27	7	2	2	4	3	17	40
Effort (hr	24.83	23.50	23.33	24.00	25.50	23.58	22.92	22.75	24.42	24.17	25.42	22.00

Appendix Table 7. Broad whitefish length frequency by date and station - 1995 river channel and tapped lakes.

Fork Length (mm)	Gill Nets C9504 10/31/95	C9505 11/4/95	C9506 11/4/95	C9510 10/29/95	C9511 10/30/95	C9512 10/30/95	C9513 10/31/95
30							
40							
50							
60							
70							
80							
90							
100							
110							
120	3						
130	9						
140	8						
150	4						1
160							
170							
180							
190							
200							
210							
220							
230							
240							
250							
260							
270				1			
280							
290					2		
300							
310				1			
320							
330							
340							
350				1			
360							1
370							
380							
390							
400							
410							
420							
430							
440							
450							
460							
470							
480							
490							
500				1			
510							
520							
530							
540							
550				1			
560							
Total:	24	0	0	5	2	0	2
Effort (hrs	20.29	22.79	20.54	26.54	20.79	24.71	21.12

Appendix Table 8. Humpback whitefish length frequency by date and station - 1995 river channel and tapped lakes.
(Stations C9501, M9521 and M9523 are fyke net catches, others are gill net catches)

Fork Length (mm)	C9501 7/9/95	C9501 7/10/95	C9501 7/11/95	C9501 7/12/95	C9501 7/13/95	C9501 7/14/95	C9501 7/15/95	C9501 7/16/95	C9501 7/17/95	C9501 7/18/95	C9501 7/19/95	C9501 7/20/95	C9501 7/21/95	C9501 7/22/95	C9501 7/23/95	C9501 7/24/95	C9501 7/25/95	C9501 7/26/95
30			1	6														
40				1														
50	1			1														
60	1																	
70	3				1		1											
80	23			6	16		2				1							
90	19			6	7		2	2			4	2				1	1	2
100	2			2	3			3			1	1						2
110												1						
120																		
130																		
140																		
150																	1	
160																		
170																		
180																		
190																		
200											1							
210																		
220																		
230																	1	
240	1																	
250																		
260																		
270						1												
280																1		
290																	1	
300																1		
310																		
320																		
330																		
340																		
350																		
360																		
370																		
380																		
390																		
400																		
410																		
420																		
Total:	50	0	1	22	27	1	5	5	0	0	7	4	0	0	0	3	4	4
Effort (hr	16.52	14.83	16.08	28.42	18.00	25.83	24.33	24.50	24.75	22.17	24.25	23.00	24.33	25.42	22.25	25.08	23.42	23.42

Appendix Table 8. Humpback whitefish length frequency by date and station - 1995 river channel and tapped lakes.

Fork Length (mm)	C9501 7/27/95	C9501 7/28/95	C9501 7/29/95	C9501 7/30/95	C9501 7/31/95	C9501 8/1/95	C9501 8/2/95	C9501 8/3/95	C9501 8/4/95	M9521 7/9/95	M9521 7/10/95	M9521 7/11/95	M9521 7/12/95	M9521 7/13/95	M9521 7/14/95	M9521 7/15/95	M9521 7/16/95	M9521 7/17/95
30												1						
40																		
50																		
60																		
70										1		1						
80										4	4	1	7		2		3	
90	5	2								7	14	1	6		3	2	1	2
100	4	2								4	3		1			2	1	10
110	2	1								2	1							
120										1	3		1					
130																		
140																		
150	1													1				
160											1							
170											1							
180																	1	
190																		
200					1													
210																		
220																		
230																		
240																		
250																		
260								1										
270																		
280																		1
290								1										
300																		
310																		
320	1																	
330				1														
340																		
350																		
360																		
370																		
380																		
390																		
400																		
410																		
420																		
Total:	13	5	0	1	1	0	0	2	0	19	27	4	15	1	5	4	6	13
Effort (hr	24.17	24.92	22.92	22.83	22.83	24.42	24.25	25.50	22.25	18.25	23.00	25.08	23.08	24.33	24.00	23.75	24.17	24.58

Appendix Table 8. Humpback whitefish length frequency by date and station - 1995 river channel and tapped lakes.

Fork Length (mm)	M9521 7/18/95	M9521 7/19/95	M9521 7/20/95	M9521 7/21/95	M9521 7/22/95	M9521 7/23/95	M9521 7/24/95	M9521 7/25/95	M9521 7/26/95	M9521 7/27/95	M9521 7/28/95	M9521 7/29/95	M9521 7/30/95	M9521 7/31/95	M9521 8/1/95	M9521 8/2/95	M9521 8/3/95	M9521 8/4/95
30																		
40																		
50																		
60																		
70																		
80		3			2													
90		1	3	2	12	3												
100		1	3		9				1		4				1			
110			2		2		1			1								
120																		
130			1															
140																		
150		1																
160																		
170																		
180																		
190																		
200																		
210																		
220																		
230																		
240																		
250																		
260														1				
270														1				
280		1																
290																		
300																		
310																		
320																		
330														1				
340																		
350																		
360																		
370																		
380																		
390																		
400																		
410							1											
420																		
Total:	0	7	9	2	25	3	2	0	1	1	4	0	0	3	1	0	0	0
Effort (hr	23.50	23.83	24.17	24.00	24.00	24.00	24.42	24.00	23.17	24.17	25.25	23.00	23.67	23.58	24.67	24.25	25.42	22.00

Appendix Table 8. Humpback whitefish length frequency by date and station - 1995 river channel and tapped lakes.

Fork Length (mm)	M9523 7/13/95	M9523 7/14/95	M9523 7/15/95	M9523 7/16/95	M9523 7/17/95	M9523 7/18/95	M9523 7/19/95	M9523 7/20/95	M9523 7/21/95	M9523 7/22/95	M9523 7/23/95	M9523 7/24/95	M9523 7/25/95	M9523 7/26/95	M9523 7/27/95	M9523 7/28/95	M9523 7/29/95	M9523 7/30/95
30																		
40																		
50																		
60																		
70	1																	
80	1	5	5	3	2	1	1											
90	5	2	12	16	5	3	2	3										
100		4	8	7	3		1	2	2	2								
110		1	2	3	1			1						1		2		
120	1							1										
130																		
140			1		2		2		1									
150																		
160					1													
170																		
180																		
190									1									
200					1													
210																		
220									1									
230									1									
240									1									
250						1				2								
260					1				2	1							1	
270			1											2		2		
280			1										3					
290					1					2				1				
300			1		1				1	3								
310				1				1										
320			1											2				
330				1						2					1			
340																		
350			1		1									1				
360			1															
370												1						
380																		
390																		
400																		
410																		
420																		
Total:	8	12	34	31	19	5	6	8	10	12	0	1	3	7	1	4	1	0
Effort (hr	16.75	22.50	23.33	24.50	25.67	22.67	24.17	23.17	24.08	25.00	22.92	24.83	23.50	23.33	24.00	25.50	23.58	22.92

Appendix Table 8. Humpback whitefish length frequency by date and station - 1995 river channel and tapped lakes.

Fork						Gill Nets						
Length	M9523	M9523	M9523	M9523	M9523	C9504	C9505	C9506	C9510	C9511	C9512	C9513
(mm)	7/31/95	8/1/95	8/2/95	8/3/95	8/4/95	10/31/95	11/4/95	11/4/95	10/29/95	10/30/95	10/30/95	10/31/95
30												
40												
50												
60												
70												
80												
90												
100												
110												
120												1
130												
140												
150												
160												
170												
180												
190											1	
200												
210												
220												
230												1
240												
250					1							
260												
270									1			
280												
290					1							
300									1			
310												
320												
330												
340												
350										1		1
360												
370												
380									1			
390												
400												
410												
420												
Total:	0	0	0	0	2	0	0	0	3	1	1	3
Effort (hr	22.75	24.42	24.17	25.42	22.00	20.29	22.79	20.54	26.54	20.79	24.71	21.12

Appendix Table 9. Round whitefish length frequency by date and station - 1995 river channel and tapped lakes.
(Stations C9501, M9521 and M9523 are fyke net catches, others are gill net catches)

Fork Length (mm)	C9501 7/9/95	C9501 7/10/95	C9501 7/11/95	C9501 7/12/95	C9501 7/13/95	C9501 7/14/95	C9501 7/15/95	C9501 7/16/95	C9501 7/17/95	C9501 7/18/95	C9501 7/19/95	C9501 7/20/95	C9501 7/21/95	C9501 7/22/95	C9501 7/23/95	C9501 7/24/95	C9501 7/25/95	C9501 7/26/95
30																		
40														1				
50														3	1	1	1	1
60																		
70			2		3	1												
80	16		3	3	7	7	7	4	6		2						1	
90	8		2	3	19	15	13	18	5	1	9	3		8		1	1	1
100			2		1	5	4	5	7		3	3	1	2	1	1	1	1
110				1	1		1	2			1							1
120	8		1		3	4	5	2	1		2							
130	6		1	4	1	2	3	4	4	2	1	3		3	2	1	1	
140	2			2	2	1	1		5	2	1	1			2	1	2	4
150	3		1	1		3	4	1			3	2			2	1		1
160	7				1	3	5	2	2	3	3		1	1	5	2	1	2
170	2			2		1	2	4	3		2		1	1	3	1		
180	1			1				1	1	2	2	1				2		
190				1			1	2									1	
200									1				2					
210						1		3										1
220																		
230											1							
240								1										
250																		
260																		
270																	1	
280																		
290																		
300																		
310																		
320																		
330																		
340																		
350																		
360																		
370																		
380																		
390																		
Total:	53	0	12	18	38	43	46	49	35	10	30	13	5	19	16	11	10	12
Effort (hr	16.52	14.83	16.08	28.42	18.00	25.83	24.33	24.50	24.75	22.17	24.25	23.00	24.33	25.42	22.25	25.08	23.42	23.42

Appendix Table 9. Round whitefish length frequency by date and station - 1995 river channel and tapped lakes.

Fork Length (mm)	C9501 7/27/95	C9501 7/28/95	C9501 7/29/95	C9501 7/30/95	C9501 7/31/95	C9501 8/1/95	C9501 8/2/95	C9501 8/3/95	C9501 8/4/95	M9521 7/9/95	M9521 7/10/95	M9521 7/11/95	M9521 7/12/95	M9521 7/13/95	M9521 7/14/95	M9521 7/15/95	M9521 7/16/95	M9521 7/17/95
30																		
40																		
50		2																
60							1											
70																		
80										2	5				1	4	1	
90	2	4				1				2	5	1	2	1	4	8	5	5
100	1	2	2				1	1		1	1		1		2	3	1	
110	1	1		1		1	1									1		1
120					1					1	1	2	1		1	2	1	
130	1	1			1					2	5	2	2	1			2	1
140	1	1		1	1	2		1		1	2		1			1	3	
150	2				1										3		3	2
160		1		1		1			1	1	2				1		2	
170	1	1			5	1	1	1		2			2			1	2	2
180	2				2	2	1	1					2			1	2	2
190														1				
200			1			1		1									1	
210																		
220											1							
230							1											
240																		
250						2												
260					1													
270																		
280							1											
290																		
300																		
310																		
320																		
330																		
340																		
350																		
360																		
370																		
380																		
390																		
Total:	11	13	3	3	12	11	7	5	1	12	22	5	11	3	12	21	23	13
Effort (hr	24.17	24.92	22.92	22.83	22.83	24.42	24.25	25.50	22.25	18.25	23.00	25.08	23.08	24.33	24.00	23.75	24.17	24.58

Appendix Table 9. Round whitefish length frequency by date and station - 1995 river channel and tapped lakes.

Fork Length (mm)	M9521 7/18/95	M9521 7/19/95	M9521 7/20/95	M9521 7/21/95	M9521 7/22/95	M9521 7/23/95	M9521 7/24/95	M9521 7/25/95	M9521 7/26/95	M9521 7/27/95	M9521 7/28/95	M9521 7/29/95	M9521 7/30/95	M9521 7/31/95	M9521 8/1/95	M9521 8/2/95	M9521 8/3/95	M9521 8/4/95
30																		
40																		
50										1								
60																		
70																		
80																		
90			1	1	2	1	2	1	1		2				1			1
100	1		2		1		2	1	1				1	1	1		1	
110							1			1			1	1				
120	1	1	2															
130			1	1	3				1	1	1						1	
140	2			1	1	1							1	2			1	
150	1							1	1				2			1	1	
160	1	1	1							1				1				1
170	1	1	1		1		1			2				1	1		2	
180		2					1		1				1					1
190																		
200								1			1							
210																		
220																		
230		1																
240																		
250															1			
260																	1	
270																		
280																		
290																		
300																		
310																		
320																		
330																		
340																		
350																		
360																		
370																		
380																		
390																		
Total:	7	6	8	3	8	2	7	4	5	6	4	0	6	6	4	1	7	3
Effort (hr	23.50	23.83	24.17	24.00	24.00	24.00	24.42	24.00	23.17	24.17	25.25	23.00	23.67	23.58	24.67	24.25	25.42	22.00

Appendix Table 9. Round whitefish length frequency by date and station - 1995 river channel and tapped lakes.

Fork Length (mm)	M9523 7/13/95	M9523 7/14/95	M9523 7/15/95	M9523 7/16/95	M9523 7/17/95	M9523 7/18/95	M9523 7/19/95	M9523 7/20/95	M9523 7/21/95	M9523 7/22/95	M9523 7/23/95	M9523 7/24/95	M9523 7/25/95	M9523 7/26/95	M9523 7/27/95	M9523 7/28/95	M9523 7/29/95	M9523 7/30/95
30																		
40																		
50										2								
60	1													1				
70	1	2																
80	6	9	6	4	2	1	1		1				1	1				
90	10	13	32	8	4	4	2	2	2					2	6			
100	1	5	14	9	3	2		1	3	5			3	4	3	2	1	
110	1	3		1			1		1	3					1		1	
120	4	2	3	5	1	1	2	1	1	1								
130	1	4	10	5	3		2	1	2	2				1	2	2		
140	2	2	3	2					2	3			1	2	2	1	2	
150	2	5	2		2				1	1						1		
160	1	1	3	4		2			1	1				2	2	1		
170	1	2	2	4	2			1		3		1		1	2			
180		2		1		1			1							1		
190				1	1	1								1				
200									1									
210																		
220																		
230																1	1	
240																		
250																		
260																		
270																		
280																		
290																		
300																		
310																		
320																		
330																		
340																		
350																		
360																		
370																		
380																		
390																		
Total:	31	50	75	44	18	12	8	6	16	21	0	1	5	15	18	9	5	0
Effort (hr	16.75	22.50	23.33	24.50	25.67	22.67	24.17	23.17	24.08	25.00	22.92	24.83	23.50	23.33	24.00	25.50	23.58	22.92

Appendix Table 9. Round whitefish length frequency by date and station - 1995 river channel and tapped lakes.

Fork						Gill Nets						
Length	M9523	M9523	M9523	M9523	M9523	C9504	C9505	C9506	C9510	C9511	C9512	C9513
(mm)	7/31/95	8/1/95	8/2/95	8/3/95	8/4/95	10/31/95	11/4/95	11/4/95	10/29/95	10/30/95	10/30/95	10/31/95
30												
40												
50												
60												
70												
80												
90				1	1							
100				3	2							
110					3							
120				1								
130		1			2							
140	1				2							
150	1											
160	2			2							1	
170			2									
180			1	1	1							
190												
200		1		1								
210												
220												
230												
240												
250												
260												
270				1								
280												
290									1			
300												
310												
320												
330												
340												
350												
360												
370												
380												
390												
Total:	4	2	3	10	11	0	0	0	1	0	1	0
Effort (hr	22.75	24.42	24.17	25.42	22.00	20.29	22.79	20.54	26.54	20.79	24.71	21.12

Appendix Table 10. Length frequency of least cisco at perched, drainage and miscellaneous tapped lakes during 1995 (F = fyke net, G = gill net).

	Low Perched Lakes					High Perched Lakes										
Fork Length (mm)	B8534-F Jul 19 20.5 hr	L9283-F Jul 19 20.9 hr	L9316-F Jul 15 16.7 hr	L9316-G Nov 6 22.3 hr	M9524-F Jul 18 21.2 hr	B8533-F Jul 17 23.7 hr	L9280-F Jul 12 20.3 hr	L9281-G Nov 5 21.0 hr	L9310-F Jul 26 20.3 hr	L9310-G Nov 3 22.7 hr	L9311-G Nov 2 20.8 hr	L9312-G Nov 2 21.7 hr	L9313-F Jul 14 23.3 hr	L9317-F Jul 16 23.3 hr	L9318-F Jul 14 24.2 hr	L9321-F Jul 18 22.4 hr
30																
40																
50																
60																
70	2				12		3									
80	46	3			87		1									
90	9	1			26											1
100																1
110					1			1				1				1
120				1	2			2								
130				1	2					2						1
140					1											
150			3									1				
160																
170			2	1								13				
180	1		8							1		7				1
190			5	3				2			2	20				
200				4				9			1	7				
210					1	1		3		1		7				
220		1	1								1	2	1			
230	1										1					
240		2									3					
250	1	1	1								5	2	1			
260		1		1				1		1	6		2			
270								3		1	7					
280	1	1		2						7	4		1			
290	2	1		1				8		5	1	1			1	
300				4		1		8		1	2	1		1	1	
310				2		1		5	1		1			1		
320								4		4						
330				2				1			1			1		
340				1				1		1						
350								3								
360				1				1								
370										1						
380										1						
390																
400																
410								1			1					
420																
430											1					
440																
450																
Totals:	63	11	20	24	132	3	4	53	1	26	37	62	5	3	2	5

Appendix Table 10. Length frequency of least cisco at perched, drainage and miscellaneous tapped lakes during 1995 (F = fyke net, G = gill net).

	High Perched Lakes								Drainage Lakes			Tapped Lakes	
Fork Length (mm)	L9322-F Jul 23 44.9 hr	L9333-F Jul 20 23.4 hr	L9335-F Jul 21 23.2 hr	L9342-F Jul 24 18.5 hr	L9342-G Nov 3 23.7 hr	M9321-G Nov 6 23.1 hr	M9505-F Jul 25 119.5 hr	M9509-F Jul 25 94.8 hr	L9334-F Jul 21 24.2 hr	M9501-F Jul 20 22.7 hr	M9502-F Jul 20 20.3 hr	L9278-F Jul 15 24.3 hr	M9525-F Jul 18 23.0 hr
30												1	
40													
50													
60			1										
70												3	
80											1	4	
90	2									1			
100	2										3	2	1
110											7		1
120											10		
130						14					3		
140				1	3	4					1	1	
150					14						1	1	
160							1						
170						1					1	2	
180		1	1			6						1	
190			1			17							
200						14						1	
210						7							
220						3						1	
230													
240			2				2					2	
250			1			1						1	
260			1										
270					3	1							
280					2			1					
290	1				1	2							
300					2		1	1					
310					3		2						
320					3			1	1				
330					2								
340					5								
350					8				1				
360					3	2	1						
370					2	4							
380						6	1						
390					3	7							
400					3	3							
410						3							
420													
430													
440													
450													
Totals:	5	1	7	1	57	95	8	3	2	1	27	20	2

Appendix Table 11. Length frequency of broad whitefish at perched, drainage and miscellaneous tapped lakes during 1995. (F = fyke net, G = gill net).

	Low Perched	High Perched Lakes							Drainage	Tapped Lakes	
Fork Length (mm)	L9316-G Nov 6 22.3 hr	L9310-G Nov 3 22.7 hr	L9311-G Nov 2 20.8 hr	L9312-F Jul 26 20.0 hr	L9312-G Nov 2 21.7 hr	L9318-F Jul 14 24.2 hr	L9333-F Jul 20 23.4 hr	M9509-F Jul 25 94.8 hr	M9502-F Jul 20 20.3 hr	L9278-F Jul 15 24.3 hr	M9525-F Jul 18 23.0 hr
30											
40											
50											
60											
70											
80										1	
90										1	
100									1	5	
110										3	2
120						1				2	2
130										2	3
140							1			1	1
150							4			8	
160							5			1	
170							2			2	
180								1		1	
190	1										
200											
210											
220											
230											
240										1	
250											
260											
270										1	
280											
290											
300										1	
310										1	
320											
330					1						
340					1						
350											
360											
370											
380											
390											
400											
410											
420											
430				1							
440					1						
450		1									
460					1						
470					1						
480											
490											
500											
510											
520											
530											
540							1				
550											
560											
570											
580											
590		1									
600											
610											
620											
630											
640			1								
650											
Totals:	1	2	1	1	5	1	13	1	1	31	8

Appendix Table 12. Length frequency of Arctic grayling at perched and drainage lakes during 1995.

	High Perched	Drainage Lakes			
Fork Length (mm)	L9332-F Jul 19 22.8 hr	L9119-F Aug 3 52.2 hr	L9334-F Jul 21 24.2 hr	M9501-F Jul 20 22.7 hr	M9502-F Jul 20 20.3 hr
30					
40					
50					
60					
70				2	
80			3	3	1
90				2	
100					
110				1	
120				1	
130			1	3	
140				3	1
150					
160				1	
170		1		2	1
180				4	
190				1	
200				2	
210				4	1
220				1	
230				1	
240					
250				1	
260		1		2	
270					
280					
290				1	
300				1	
310	1			2	
320				3	
330					
340					
350				1	
360				1	
370					
380					
390					
400					
Totals:	1	2	4	43	4

Appendix Table 13. Fyke net effort (in hours) at continuous sampling stations in the Sakoonang Channel (C9501) and tapped lakes (M9521 and M9523), Colville Delta 1995.

	Stations		
Date	C9501	M9521	M9523
7/9/95	16.52	18.25	--
7/10/95	14.83	23.00	--
7/11/95	16.08	25.08	--
7/12/95	28.42	23.08	--
7/13/95	18.00	24.33	16.75
7/14/95	25.83	24.00	22.50
7/15/95	24.33	23.75	23.33
7/16/95	24.50	24.17	24.50
7/17/95	24.75	24.58	25.67
7/18/95	22.17	23.50	22.67
7/19/95	24.25	23.83	24.17
7/20/95	23.00	24.17	23.17
7/21/95	24.33	24.00	24.08
7/22/95	25.42	24.00	25.00
7/23/95	22.25	24.00	22.92
7/24/95	25.08	24.42	24.83
7/25/95	23.42	24.00	23.50
7/26/95	23.42	23.17	23.33
7/27/95	24.17	24.17	24.00
7/28/95	24.92	25.25	25.50
7/29/95	22.92	23.00	23.58
7/30/95	22.83	23.67	22.92
7/31/95	22.83	23.58	22.75
8/1/95	24.42	24.67	24.42
8/2/95	24.25	24.25	24.17
8/3/95	25.50	25.42	25.42
8/4/95	22.25	22.00	22.00

Appendix Table 14. Fyke net and gill net effort (in hours) at various habitats in the Colville Delta during 1995.

Fyke Net Effort

Habitat	Station Number	Date	Sampling Duration (hours)
Drainage Lake	L9119	8/3/95	52.20
	L9123	7/31/95	22.37
	L9334	7/21/95	24.17
	M9501	7/20/95	22.67
	M9502	7/20/95	20.25
	MC7903	7/30/95	21.22
	MC7903	7/30/95	21.00
Low Perched Lake	B8534	7/19/95	20.50
	L9283	7/19/95	20.92
	L9314	7/16/95	21.67
	L9316	7/15/95	16.75
	M9524	7/18/95	21.17
High Perched Lake	B8533	7/17/95	23.67
	L9120	8/1/95	21.53
	L9121	8/1/95	22.33
	L9122	7/31/95	23.13
	L9279	7/11/95	28.00
	L9279	7/27/95	24.08
	L9279	7/28/95	17.63
	L9280	7/12/95	20.27
	L9281	7/11/95	25.62
	L9281	7/27/95	21.03
	L9281	7/28/95	21.12
	L9310	7/13/95	18.30
	L9310	7/26/95	20.25
	L9311	7/13/95	22.62
	L9311	7/25/95	26.87
	L9312	7/14/95	23.87
	L9312	7/26/95	20.00
	L9313	7/14/95	23.33
	L9313	7/26/95	20.73
	L9317	7/16/95	23.25
	L9317	7/17/95	23.58
	L9318	7/14/95	24.20
	L9319	7/15/95	17.08
	L9320	7/16/95	22.05
	L9321	7/18/95	22.42
	L9322	7/23/95	44.90
	L9332	7/19/95	22.83
	L9333	7/20/95	23.45
	L9335	7/21/95	23.22
	L9342	7/12/95	19.92
	L9342	7/13/95	23.17
	L9342	7/24/95	18.53
	M9321	7/17/95	21.42
	M9505	7/25/95	119.50
	M9509	7/25/95	94.83
	M9512	8/3/95	52.17
	M9514	8/3/95	46.00
	M9515	8/4/95	19.08
	M9516	8/4/95	16.17
	M9528	8/4/95	18.53
Tapped Lake	L9278	34895	24.28
	M9525	34898	23.00

Gill Net Effort

Habitat	Station Number	Date	Sampling Duration (hours)
Low Perched Lake	L9316	11/6/95	22.33
High Perched Lake	L9279	11/5/95	22.00
	L9279	11/5/95	22.00
	L9281	11/5/95	20.92
	L9281	11/5/95	21.08
	L9310	11/3/95	22.67
	L9311	11/2/95	20.67
	L9311	11/2/95	21.00
	L9312	11/2/95	21.33
	L9312	11/2/95	22.00
	L9313	11/1/95	20.58
	L9313	11/1/95	20.83
	L9342	11/3/95	23.58
	L9342	11/3/95	23.92
	M9321	11/6/95	23.17
	M9321	11/6/95	23.08
River Channel	C9504	10/31/95	20.17
	C9504	10/31/95	20.42
	C9505	11/4/95	22.83
	C9505	11/4/95	22.75
	C9506	11/4/95	20.50
	C9506	11/4/95	20.58
	C9510	10/29/95	26.75
	C9510	10/29/95	26.33
	C9511	10/30/95	20.33
	C9511	10/30/95	21.25
	C9512	10/30/95	24.67
	C9512	10/30/95	24.75
	C9513	10/31/95	21.42
	C9513	10/31/95	20.83

Appendix Table 15. Minnow trap effort (in hours) at various habitats in the Colville Delta during 1995.

Minnow Trap Effort

Habitat	Station Number	Date	Sampling Duration (hours)
Drainage Lake	M9501	7/20/95	22.28
	M9501	7/20/95	22.35
	M9502	7/20/95	20.32
	M9502	7/20/95	20.32
	L9334	7/21/95	23.87
	L9334	7/21/95	23.85
	MC7903	7/30/95	21.43
	MC7903	7/30/95	21.02
	MC7903	7/30/95	21.02
	L9123	7/31/95	22.35
	L9123	7/31/95	22.35
	L9119	8/3/95	52.17
	L9119	8/3/95	52.17
Low Perched Lake	L9316	7/15/95	16.43
	L9314	7/16/95	21.67
	L9314	7/16/95	21.55
	M9524	7/18/95	21.17
	M9524	7/18/95	21.10
	B8534	7/19/95	20.25
	L9283	7/19/95	20.90
	L9283	7/19/95	20.70
High Perched Lake	L9279	7/10/95	18.88
	L9281	7/10/95	21.17
	L9281	7/10/95	21.25
	L9281	7/11/95	26.25
	L9280	7/12/95	20.27
	L9280	7/12/95	20.32
	L9342	7/12/95	20.30
	L9342	7/12/95	20.92
	L9310	7/13/95	18.75
	L9310	7/13/95	18.68
	L9311	7/13/95	22.28
	L9311	7/13/95	16.33
	L9312	7/14/95	24.32
	L9312	7/14/95	24.30
	L9318	7/14/95	24.23
	L9318	7/14/95	23.78
	L9313	7/15/95	21.60
	L9313	7/15/95	21.58
	L9319	7/15/95	17.23
	L9319	7/15/95	17.25
	L9317	7/16/95	23.18
	L9317	7/16/95	22.97
	L9320	7/16/95	22.42
	L9320	7/16/95	21.93
	B8533	7/17/95	24.23
	B8533	7/17/95	24.10
	M9321	7/17/95	22.32
	M9321	7/17/95	22.03
	L9321	7/18/95	22.42
	L9321	7/18/95	22.42
	L9332	7/19/95	22.62
	L9332	7/19/95	22.58
	L9333	7/20/95	23.22

Habitat	Station Number	Date	Sampling Duration (hours)
High Perched Lake	L9333	7/20/95	21.87
	L9335	7/21/95	23.15
	L9335	7/21/95	23.00
	L9322	7/23/95	44.80
	L9322	7/23/95	44.80
	M9505	7/25/95	119.40
	M9505	7/25/95	119.57
	M9509	7/25/95	95.83
	L9122	7/31/95	23.08
	L9120	8/1/95	21.33
	L9121	8/1/95	22.33
	M9512	8/3/95	51.92
	M9514	8/3/95	45.83
	M9514	8/3/95	46.15
	M9515	8/4/95	19.08
	M9515	8/4/95	19.08
	M9516	8/4/95	16.07
	M9528	8/4/95	18.25
	M9528	8/4/95	18.25
River Channel	C9501	7/12/95	21.83
	C9501	7/12/95	21.92
Tapped Lake	L9278	7/15/95	24.05
	M9525	7/18/95	23.00
	M9525	7/18/95	23.00
	M9521	7/12/95	20.75
	M9521	7/12/95	21.02

Appendix Table 16. Set line effort (in hours) and seine effort (in number of hauls) at various habitats in the Colville Delta during 1995.

Set Line Effort

Habitat	Station Number	Date	Sampling Duration (hours)
Drainage Lake	L9119	8/3/95	52.00
	L9123	7/31/95	22.08
	L9334	7/21/95	24.08
	M9501	7/20/95	22.45
	M9502	7/20/95	20.08
	MC7903	7/30/95	21.08
	MC7903	7/30/95	20.95
Low Perched Lake	B8534	7/19/95	20.08
	L9283	7/19/95	20.77
	L9314	7/16/95	21.32
	L9316	7/15/95	16.72
	M9524	7/18/95	21.32
High Perched Lake	B8533	7/17/95	23.77
	L9120	8/1/95	21.75
	L9121	8/1/95	22.13
	L9122	7/31/95	23.00
	L9279	7/12/95	21.40
	L9280	7/13/95	24.08
	L9310	7/13/95	18.13
	L9311	7/13/95	22.67
	L9312	7/14/95	23.53
	L9313	7/15/95	21.57
	L9313	7/16/95	24.32
	L9317	7/16/95	23.15
	L9318	7/14/95	24.02
	L9319	7/15/95	17.03
	L9320	7/16/95	22.12
	L9321	7/18/95	22.38
	L9322	7/23/95	44.50
	L9332	7/19/95	22.33
	L9333	7/20/95	22.83
	L9335	7/21/95	23.03
	L9342	7/12/95	19.90
	M9321	7/17/95	22.12
	M9505	7/25/95	120.37
	M9509	7/25/95	95.92
	M9512	8/3/95	52.05
	M9514	8/3/95	45.60
	M9515	8/4/95	19.08
	M9516	8/4/95	16.17
	M9528	8/4/95	18.08
River Channel	C9502	7/14/95	20.17
	C9503	7/24/95	18.58
	C9503	7/25/95	27.83
	C9504	7/24/95	19.17
	C9504	7/25/95	27.08
Tapped Lake	L9278	7/15/95	24.67
	M9521	7/12/95	21.15
	M9525	7/18/95	23.12
	M9526	7/26/95	20.33
	M9527	7/26/95	20.25

Seine Effort

Habitat	Station Number	Date	Sampling Effort (hauls)
Low Perched Lake	L9316	7/14/95	1
High Perched Lake	L9279	7/9/95	4
	L9280	7/12/95	3
	L9281	7/9/95	4
	L9342	34892	3
Tapped Lake	L9278	34894	3

Appendix Table 17. Water temperature and conductivity at continuously sampled stations in the Sakoonang Channel and tapped lakes in the Colville Delta, 1995.

	C9501		M9521		M9523	
Date	Water Temperature (°C)	Conductivity (μmho/cm)	Water Temperature (°C)	Conductivity (μmho/cm)	Water Temperature (°C)	Conductivity (μmho/cm)
7/8/95	19.0	180	15.0	252	–	–
7/9/95	16.4	420	16.0	265	–	–
7/10/95	–	–	12.5	463	–	–
7/11/95	–	–	13.5	463	–	–
7/12/95	–	–	–	–	–	–
7/13/95	–	–	–	–	–	–
7/14/95	14.0	–	–	–	13.5	–
7/15/95	–	–	–	–	–	–
7/16/95	–	–	–	–	–	–
7/17/95	15.0	–	15.0	–	15.0	–
7/18/95	15.0	–	13.0	–	14.0	–
7/19/95	–	–	14.0	–	14.0	–
7/20/95	12.0	–	12.0	–	13.0	–
7/21/95	12.0	–	11.0	–	12.0	–
7/22/95	10.0	–	8.0	–	9.0	–
7/23/95	10.0	–	8.0	–	9.0	–
7/24/95	9.0	–	8.0	–	9.0	–
7/25/95	8.0	–	5.0	–	7.0	–
7/26/95	8.0	–	7.0	–	8.0	–
7/27/95	8.0	–	6.0	–	7.0	–
7/28/95	8.0	–	6.0	–	7.0	–
7/29/95	8.0	–	6.0	–	7.0	–
7/30/95	7.0	–	6.0	–	7.0	–
7/31/95	7.5	–	7.0	–	7.0	–
8/1/95	8.0	–	8.0	–	8.5	–
8/2/95	9.0	–	8.5	–	8.5	–
8/3/95	7.0	–	6.5	–	6.0	–
8/4/95	0.4	–	6.0	–	6.0	–

Appendix Table 18. Water temperature and conductivity at Colville Delta lakes surveyed in summer, 1995.

Summer Measurements

Habitat Classification	Lake Number	Date	Water Temperature (°C)	Conductivity (µmho/cm)
Drainage Lake	L9119	8/1/95	9.3	218
	L9123	7/30/95	7.9	92
	L9334	7/20/95	14.0	113
	M9501	7/19/95	16.9	88
	M9502	7/19/95	15.8	90
	MC7903	7/29/95	8.5	165
Low Perched Lake	B8534	7/18/95	15.3	225
	L9283	7/18/95	16.8	197
	L9314	7/15/95	16.2	525
	L9316	7/14/95	15.0	98
	M9522	7/8/95		2700
	M9524	7/17/95	15.9	95
High Perched Lake	B8533	7/16/95	16.1	138
	L9120	7/31/95	8.1	198
	L9121	7/31/95	8.3	206
	L9122	7/30/95	8.1	252
	L9279	7/9/95	14.8	155
	L9280	7/11/95	12.9	205
	L9281	7/9/95	12.8	265
	L9310	7/12/95	13.0	97
	L9311	7/12/95	13.1	98
	L9312	7/13/95	13.4	47
	L9313	7/13/95	13.1	83
	L9317	7/15/95	15.8	113
	L9318	7/23/95	12.1	75
	L9319	7/14/95	15.5	97
	L9320	7/15/95	14.0	119
	L9321	7/18/95	15.1	113
	L9322	7/21/95	13.0	62
	L9332	7/18/95	15.2	73
	L9333	7/19/95	16.0	109
	L9335	7/20/95	14.1	58
	L9342	7/12/95	12.7	64
	M9321	7/16/95	16.0	121
	M9505	7/20/95	14.1	66
	M9508	7/21/95	12.8	58
	M9509	7/21/95	13.5	101
	M9512	8/1/95	9.5	241
	M9514	8/1/95	10.5	234
	M9515	8/3/95	8.2	153
	M9516	8/3/95	8.1	172
	M9528	8/4/95	6.2	329
Tapped Lake	L9278	7/14/95	16.9	3580
	M9525	7/18/95	14.8	280

Appendix Table 19. Water temperature and conductivity at Colville Delta lakes surveyed in fall, 1995.

Fall Measurements

Habitat Classification	Lake Number	Date	Depth (m)	Water Temperature (°C)	Conductivity (µmho/cm)
Low Perched Lake	L9316	11/6/95	0.0	0.0	98
			0.5	0.2	100
			1.0	0.8	99
			1.5	0.9	98
			2.0	1.0	98
			2.5	1.0	98
			3.0	1.2	98
High Perched Lake	L9279	11/4/95	0.0	0.0	151
			0.5	0.1	151
			1.0	0.2	151
			1.5	0.4	151
			2.0	0.8	151
			2.5	1.0	151
			3.0	1.0	146
High Perched Lake	L9281	11/4/95	0.0	0.1	220
			0.5	0.3	220
			1.0	0.5	220
			1.5	0.5	220
			2.0	0.7	220
			2.5	0.7	220
			3.0	0.9	220
			3.5	1.0	220
High Perched Lake	L9310	11/2/95	0.0	0.0	92
			0.5	0.1	92
			1.0	0.2	92
			1.5	0.5	93
			2.0	0.5	95
			2.5	0.8	95
			3.0	1.2	95
			3.5	1.9	105
High Perched Lake	L9311	11/2/95	0.0	0.1	103
			0.5	0.2	103
			1.0	0.4	103
			1.5	0.5	105
			2.0	0.6	105
			2.5	1.0	105
			3.0	1.2	104
High Perched Lake	L9312	11/2/95	0.0	0.0	71
			0.5	0.0	72
			1.0	0.5	70
			1.5	0.5	70
			2.0	0.8	71
			2.5	1.1	71
			3.0	1.7	73
			3.5	1.8	75

Appendix Table 18. Water temperature and conductivity at Colville Delta lakes surveyed in fall, 1995.

Fall Measurements

Habitat Classification	Lake Number	Date	Depth (m)	Water Temperature (°C)	Conductivity (µmho/cm)
High Perched Lake	L9313	10/31/95	0.0	0.0	99
			0.5	0.1	99
			1.0	0.2	99
			1.5	0.4	99
			2.0	0.9	98
			2.5	1.0	92
High Perched Lake	L9342	11/2/95	0.0	0.2	98
			0.5	0.3	98
			1.0	0.5	98
			1.5	0.7	98
			2.0	1.0	99
			2.5	1.1	100
High Perched Lake	M9321	11/6/95	0.0	0.0	120
			0.5	0.0	120
			1.0	0.1	119
			1.5	0.2	118
			2.0	0.9	115
			2.5	1.0	112
			3.0	1.2	112

Appendix Table 20. Water temperature, conductivity and salinity at Colville Delta river channel stations surveyed in fall, 1995.

Fall Measurements

Habitat Classification	Station Number	Date	Depth (m)	Water Temperature (°C)	Conductivity (µmho/cm)	Salinity (‰)
River Channel	C9504	10/31/95	0.0	0.0		0.9
			0.5	0.0		1.2
			1.0	0.0		1.5
			1.5	0.0		1.7
			2.0	0.0		1.8
			2.5	0.0		1.8
			3.0	0.1		1.9
			3.5	0.1		1.9
			4.0	0.1		2.0
			4.5	0.4		2.0
			5.0	2.7		3.8
			5.5	3.0		4.1
River Channel	C9505	11/4/95	0.0	0.0		2.0
			0.5	0.0		2.0
			1.0	0.0		5.5
			1.5	0.0		6.2
			2.0	0.0		6.9
			2.5	0.0		7.2
			3.0	0.0		7.8
			3.5	0.0		7.8
			4.0	0.0		7.8
River Channel	C9506	11/4/95	0.0	0.0		3.8
			0.5	0.0		3.8
			1.0	0.0		4.3
			1.5	0.0		6.2
			2.0	0.0		7.4
			2.5	0.0		8.3
			3.0	0.0		9.0
			3.5	0.0		9.2
River Channel	C9510	10/29/95	0.0	0.0	32	
			0.5	0.0	31	
			1.0	0.0	30	
			1.5	0.0	29	
			2.0	0.0	28	
			2.5	0.0	25	
			3.0	0.0	23	
			3.5	0.0	22	
			4.0	0.0	22	
River Channel	C9511	10/29/95	0.0	0.0	57	
			0.5	0.0	57	
			1.0	0.0	54	
			1.5	0.0	50	
			2.0	0.0	49	
			2.5	0.0	42	
			3.0	0.0	42	
			3.4	0.0	42	

Appendix Table 20. Water temperature, conductivity and salinity at Colville Delta river channel stations surveyed in fall, 1995.

Fall Measurements

Habitat Classification	Station Number	Date	Depth (m)	Water Temperature (°C)	Conductivity (μmho/cm)
River Channel	C9511	10/31/95	0.0	0.0	132
			0.5	0.0	132
			1.0	0.0	132
			1.5	0.1	132
			2.0	0.1	132
			2.5	0.2	132
			3.0	0.3	133
			3.5	0.5	135
River Channel	C9512	10/29/95	0.0	0.0	132
			0.5	0.0	132
			1.0	0.0	133
			1.5	0.0	134
			2.0	0.0	135
			2.5	0.0	135
			3.0	0.0	139
			3.5	0.0	141
River Channel	C9513	10/31/95	0.0	0.0	129
			0.5	0.1	129
			1.0	0.2	129
			1.5	0.5	130
			2.0	0.7	138
			2.5	0.9	151

Appendix Table 21. Mean length at age for least cisco caught by fyke net from river channels and tapped lakes during summer 1995.

Age	Mean Fork Length (mm)	Standard Deviation	Sample Size	Minimum Length (mm)	Maximum Length (mm)
0			0		
1	82.4	11.7	18	65	116
2	141.5	5.5	15	132	149
3	180.4	12.8	12	166	208
4	210.3	14.1	12	188	231
5	241.0	8.1	4	235	253
6	262.7	12.7	6	249	285
7	292.0	20.0	3	279	315
8	314.5	36.1	2	289	340
9	309.0		1	309	309
10	318.0		1	318	318
11	311.0		1	311	311
12	335.5	38.9	2	308	363
13	323.0		1	323	323
14			0		
15	324.0		1	324	324

Appendix Table 22. Mean length at age for broad whitefish caught by fyke net from river channels and tapped lakes during summer 1995.

Age	Mean Fork Length (mm)	Standard Deviation	Sample Size	Minimum Length (mm)	Maximum Length (mm)
0			0		
1	118.8	10.7	19	100	141
2	160.5	12.8	8	144	175
3	199.1	13.2	34	169	227
4	224.5	19.1	2	211	238
5	258.0	13.8	10	238	281
6	284.4	17.4	17	254	323
7	323.5	51.6	2	287	360
8	347.0	35.4	2	322	372
9	364.3	21.6	3	349	389
10	370.0		1	370	370
11			0		
12	406.0		1	406	406

Appendix Table 23. Mean length at age for humpback whitefish caught by fyke net from river channels and tapped lakes during summer 1995.

Age	Mean Fork Length (mm)	Standard Deviation	Sample Size	Minimum Length (mm)	Maximum Length (mm)
0			0		
1	92.3	8.0	12	80	103
2	148.2	10.5	5	139	164
3	190.8	22.8	5	152	208
4	228.0		1	228	228
5	234.0		1	234	234
6	262.3	13.0	12	244	285
7	295.2	16.9	5	280	321
8	303.0	10.5	3	293	314
9	313.7	32.6	3	280	345
10	330.0	15.5	3	314	345
11	334.0		1	334	334
12			0		
13			0		
14			0		
15			0		
16	359.0		1	359	359
17			0		
18			0		
19			0		
20			0		
21			0		
22			0		
23	407.0		1	407	407

Appendix Table 24. Mean length at age for round whitefish caught by fyke net from river channels and tapped lakes during summer 1995.

Age	Mean Fork Length (mm)	Standard Deviation	Sample Size	Minimum Length (mm)	Maximum Length (mm)
0			0		
1	92.5	4.0	4	87	96
2	132.0	17.9	11	101	160
3	169.2	8.1	18	155	187
4	199.3	13.0	6	178	213
5	219.4	22.8	5	182	238
6	252.3	27.3	4	216	280
7			0		
8	277.0		1	277	277