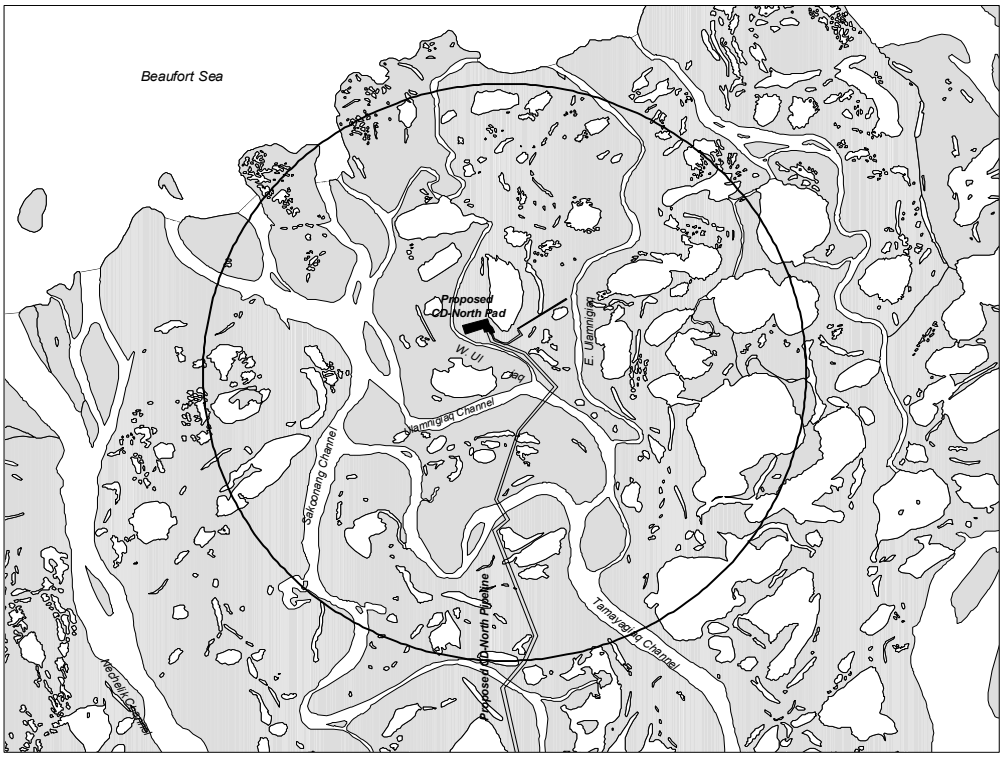
FISH HABITATS IN THE COLVILLE RIVER UNIT SATELLITES DEVELOPMENT CD-NORTH: 1999-2001

Final Report

May 2002



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EXECUTIVE SUMMARY

PHILLIPS Alaska Inc. has been exploring for oil within the Colville Delta North (CD-North) Development Area since the early 1990's. During exploration, rivers and lakes are crossed by ice roads and water is withdrawn from lakes to support both industrial and domestic needs. Because of the biological sensitivity of this area, the fish and fish habitats in this region of the Colville Delta have been studied since 1991 (Moulton 1993). These earlier surveys revealed that lakes within the delta are relatively deep, averaging almost 15 ft deep. This is unlike lakes in the Prudhoe Bay and Kuparuk oil fields, where lakes are rarely in excess of 7 ft deep. The combination of deep water, which allows successful wintering, and proximity to a major river creates abundant habitat for fish and many species are found in lakes throughout the delta (Moulton 1998).

Studies of fish habitats in the channels and tapped lakes of the delta were initiated in 1995 prior to development of the Alpine field in order to obtain information needed for permitting the field. Those studies revealed that the minor channels, such as the Sakoonang Channel, are lightly used during summer, mostly by juvenile fishes. Highest densities of fish were found in tapped lakes, with catches again primarily juveniles, dominated by broad whitefish and least cisco (Moulton 1997). During summer, adult fishes for many of the dominant species range widely through Harrison Bay and along the Beaufort Sea coast, only returning in fall to winter within the delta.

The objectives of this study were to document fish presence and habitat use in lakes and channels in or near the CD-North study area. The study area for the CD-North fisheries investigations is generally defined as the lakes and river channels between the Alpine Development and the coast, and approximately 2500 meters east and west of the proposed CD-North pipeline corridor. Lakes selected include those that may be used to support ice road construction at all activity phases (i.e. exploration, development and operation). Some of the lakes in the areas of interest were sampled in previous years, while others were sampled in 1999 and 2000 as part of the CD-North baseline studies.

River Channel Sampling

During 2000-2001, fyke nets were used to sample 5 delta channels and a tapped lake in the CD-North study area. Previous investigations of the Sakoonang Channel in 1995 and 1996 revealed that minor Colville Delta channels are heavily used by juvenile whitefishes and ciscoes. The year 2000-2001 channel surveys used fyke nets to evaluate if channels between Alpine and CD-North areas serve a similar function. The tapped lake was sampled to provide a comparison between fish use of these lakes and river channels, and to allow comparison with tapped lakes sampled near Alpine.

Sampling in channels and tapped lakes was by fyke net so that fish could be released unharmed. Sampling covered mid to late July (July 10-22) to evaluate fish use of channels after spring out-migration was complete, and the end of August into early September (August

18-Sep 4) to evaluate in-migration patterns of those fish returning from summer feeding areas in the nearshore Beaufort Sea.

The fyke nets were emptied daily; captured fish were measured and released. Water chemistry measurements taken in conjunction with the fyke net sampling included water temperature, specific conductance, dissolved oxygen, turbidity and pH.

In 2001, fish greater than 250 mm were tagged to reveal the extent to which fish caught in the CD-North study area contribute to the subsistence catch. Recapture was monitored in research sampling within the Colville Delta and eastern NPR-A study areas, in the Nuiqsut subsistence fishery and in the Colville Delta commercial fishery.

In 2001, the highest catches were in the tapped lake between the north Sakoonang and West Ulamnigiaq stations. When combined with previous results, it appears that minor distributary channels and tapped lakes provide the most valuable juvenile rearing habitat in the study area, with major channels supporting lower densities. Juvenile broad whitefish, round whitefish and least cisco appear to be more abundant farther upstream in the Sakoonang Channel near the Alpine Development, while arctic cisco and rainbow smelt are more abundant in channels near the CD-North area.

Fish distribution in this outer delta region is strongly influenced by wind direction and water level changes. During prolonged east winds, the water level drops as the sea level decreases, and the remaining water becomes fresher. When the wind reduces velocity or reverses to the west, the water level increases and the water becomes cooler and more saline. These changes are reflected in both water temperature and specific conductance, with stations closer to the coast responding sooner than those farther upstream in the delta.

Most of the fish within the minor channels were young-of-the-year or juveniles, with few mature fish caught. Fish appeared to be moving downstream towards Harrison Bay during the early summer, with a return migration near the end of August into early September. In mid-summer, few fish remained in the river channel and tapped lakes, with most being young-of-the-year. Tapped lakes were more heavily used than river channels.

A total of 236 tagged fish were released in the CD-North study area during 2001. Two least cisco were eventually recovered, one near Nuiqsut in the subsistence fishery and one in the Colville Delta commercial fishery.

Lake Sampling

In 1999-2000, sampling to assess the availability of water was conducted at 21 lakes in or near the CD-North study area. Sampling was with gill nets combined with physical measurements. Lakes were sampled with short-duration gill net sets using multimesh gill nets that have been previously used to collect inventory-level data from lakes throughout the Colville Delta and nearby areas.

Water chemistry parameters were measured in studied lakes to assess habitat conditions and provide information on the suitability of water for domestic and industrial uses. Water chemistry measurements included water temperature, specific conductance or salinity, dissolved oxygen, pH, chloride, sodium, calcium, magnesium, hardness and total dissolved solids (TDS).

Fish sampling has been conducted in 21 lakes in of near the CD-North study area. As with most other fish surveys in this region, least cisco dominated the catches in samples obtained by gill net; broad whitefish and arctic cisco were also present.

Information from fish sampling, depth measurements and water chemistry was used to evaluate each lake regarding its potential to support fish. The 21 lakes in or near the CD-North exploration contain an estimated 344.5 million gallons of water available for winter use under current permitting criteria for one-time withdrawals. The amount available ranges from 0.3 to 70.8 million gallons. Not all lakes are suitable for all uses – for example, lakes with elevated TDS will not be suitable for camp use, but may be acceptable for drilling.

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INTRODUCTION

PHILLIPS Alaska Inc. has been exploring for oil within the Colville Delta North (CD-North) Development Area since the early 1990's (Figure 1). During exploration, rivers and lakes are crossed by ice roads and water is withdrawn from lakes to support both industrial and domestic needs. Additional potential impacts will arise when the area is developed for oil extraction, thus it is important to obtain biological information to define the pre-development baseline conditions.

Because of the biological sensitivity of this area, the fish and fish habitats in this region of the Colville Delta have been studied since 1991 (Moulton 1993). These earlier surveys revealed that lakes within the delta are relatively deep, averaging almost 15 ft deep. This is unlike lakes in the Prudhoe Bay and Kuparuk oil fields, where lakes are rarely in excess of 7 ft deep. The combination of deep water, which allows successful wintering, and proximity to a major river creates abundant habitat for fish and many species are found in lakes throughout the delta (Moulton 1998).

Studies of fish habitats in the channels and tapped lakes of the delta were initiated in 1995 prior to development of the Alpine field in order to obtain information needed for permitting the field. Those studies revealed that the minor channels, such as the Sakoonang Channel, are lightly used during summer, mostly by juvenile fishes. Highest densities of fish were found in tapped lakes, with catches again primarily juveniles, dominated by broad whitefish and least cisco (Moulton 1997). During summer, adult fishes for many of the dominant species range widely through Harrison Bay and along the Beaufort Sea coast, only returning in fall to winter within the delta.

In order to submit applications for exploration and development permits, information specific to the activity area is required in order to evaluate the biological sensitivity of lakes and river channels in the region. This study was designed to provide physical and biological information on lakes and channels associated with potential CD-North development to understand their use by various fish species. Results of the study are used, in concert with the previous surveys within the area, to identify sensitive areas requiring protection when developing spill-response plans and to assess the need for ongoing monitoring during operation of the field.

The objectives of this study are to document fish presence and habitat use in lakes and channels in or near the CD-North study area. The study area for the CD-North fisheries investigations is generally defined as the lakes and river channels between the Alpine Development and the coast, and approximately 2500 meters east and west of the proposed CD-North pipeline corridor (Figure 1). Lakes selected include those that may be used to support ice road construction at all activity phases (i.e. exploration, development and operation). Some of the lakes in the areas of interest were

sampled in previous years, while others were sampled in 1999 and 2000 as part of the CD-North baseline studies.

METHODS

FIELD SAMPLING

River Channel Sampling

During 2001, fyke nets were used to sample 2 delta channels and a tapped lake in the CD-North study area. These new sampling locations bring the total number of stations in the study area to 5 channel sites and 1 tapped lake site (Table 1, Figure 3). Previous investigations of the Sakoonang Channel in 1995 and 1996 revealed that minor Colville Delta channels are heavily used by juvenile whitefishes and ciscoes. The year 2000-2001 channel surveys used fyke nets to evaluate if channels between Alpine and CD-North areas serve a similar function. The tapped lake was sampled for the first time in 2001 to provide a comparison between fish use of these lakes and river channels, and to allow comparison with tapped lakes sampled farther inland near Alpine.

Sampling in channels and tapped lakes was by fyke net so that fish could be released unharmed. Sampling covered mid-July (July 10-22) to evaluate fish use of channels after spring out-migration was complete, and the end of August into early September (August 18-Sep 4) to evaluate in-migration patterns of those fish returning from summer feeding areas in the nearshore Beaufort Sea.

Fyke nets used during the 2000-2001 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 nets were emptied daily. Fish were measured and released, with no fish retained for laboratory analysis. Duration of each set was recorded to allow calculation of catch rates. Water chemistry measurements taken in conjunction with the fyke net sampling included water temperature, specific conductance, dissolved oxygen, turbidity and pH.

In 2001, fish greater than 250 mm were tagged to reveal the extent to which fish caught in the CD-North study area contribute to the subsistence catch. Floy FD-68B anchor tags (monofilament = 5/8 inch, vinyl = 1 1/8 inch) were applied to whitefish, cisco, and burbot caught by fyke net. Recapture was monitored in research sampling within the Colville Delta and eastern NPR-A study areas, in the Nuiqsut subsistence fishery and in the Colville Delta commercial fishery.

Lake Sampling

Sampling to assess availability of water was conducted in 1999-2000 at 21 lakes in or near the CD-North study area identified by PHILLIPS Alaska (Figure 2). The lake sampling included basic inventory in lakes within the CD-North study area that had not previously been surveyed or re-

surveyed lakes that had been sampled in the early 1990's. Sampling was with gill nets combined with physical measurements. Lakes were sampled with short-duration gill net sets using a multimesh gill net (120 feet long, six panels of variable mesh, mesh size ranging from 1 to 3.5 inches stretched mesh). These nets have been previously used to collect inventory-level data from lakes throughout the Colville Delta and nearby areas. Sets were kept to a short duration to minimize both entangling waterfowl and fish mortality. Fish captured were measured and released if not severely injured. Duration of each set was recorded to allow calculation of catch rates.

Water chemistry parameters were measured in studied lakes to assess habitat conditions and provide information on the suitability of water for domestic and industrial uses. Water chemistry measurements included water temperature, specific conductance or salinity, dissolved oxygen, and pH. In many lakes, a water sample was taken and sent to Northern Test Labs for more detailed analysis. Laboratory analysis included determining levels of chloride, sodium, calcium, magnesium, hardness and total dissolved solids (TDS).

Bathymetric data were collected to allow estimating lake volume. Depths were taken with an Eagle SupraPro ID depth sounder. Transect positions were determined by marking the beginning and end locations of transects on base maps of the lakes. Individual depth measurements were located with a hand-held GPS receiver while traversing the lake with either a boat or float tube. Readings were converted to distance measurements and resulting points were plotted on the known location of each transect.

Lake volume is estimated by applying the formula for the volume of a cone to the surface area and maximum depth of each lake. Surface area is obtained from a GIS base map using USGS 1:63,360 scale quads. Maximum depth is the maximum observed depth from the bathymetric transects. The amount allowed for winter water withdrawal from a fish-bearing lake is estimated as 15% of the volume of the lake deeper than 7 feet. The volume estimation is a rough estimate, but is currently accepted for a first estimate for a one-time use. For lakes that are proposed for long-term use, volume is estimated based on contour maps of the lake.

This report uses lake numbering based on the Emergency Response Grid (ERG) used by Alaska Clean Seas, the response organization for the North Slope oilfield region. This numbering system allows the lakes to be quickly located on area maps. The lake number corresponds to the grid within which the lake occurs, along with a sequence number. In most cases, there is only one lake within a grid. Where two or more lakes occur within the same grid, lakes are numbered sequentially beginning from the west and south sides of the grid.

Five different lake types are defined, based primarily on the potential for access by fish. Definitions for the lake types are as follows:

Perched (Frequent Flooding) = Perched lake near a floodplain, but above the water surface elevation of the active channel, with an obvious high water channel. These lakes are likely subject to annual flooding.

Perched (Infrequent Flooding) = Perched lake near a floodplain, but above the water surface elevation of the active channel, with no obvious high water channel. These lakes are likely subject to flooding on an infrequent basis (every five years or more).

Drainage = Drainage Lake, a lake that is part of a defined drainage system, i.e. there is an active connection to a creek.

Oxbow = Oxbow lake, formed from abandoned river channels.

Tundra = Tundra Lake, a thaw lake not within or connected to the Colville Delta, little potential for fish access on a regular basis.

RESULTS AND DISCUSSION

RIVER CHANNEL SAMPLING

Fyke net sampling was conducted at eight stations on five channels during 2000-2001 (Table 1, Figure 3). Station CDN-00A at the south end of East Ulamnigiaq Channel was fished for four days then moved north to CDN-00C for the duration of the sampling, so the analysis is primarily based on the remaining four stations. Nomenclature for the channels is based on interviews with Nuiqsut elders. Tamayagiaq and Ulamnigiaq channels are west-flowing forks of Tamayayak Channel identified on USGS topographical maps of the region, and are second-order distributaries similar to Sakoonang Channel. East and West Ulamnigiaq channels are third-order distributaries that branch off Ulamnigiaq Channel and flow generally north.

The 2001 effort of 1,038 net hours in the two channels and one tapped lake resulted in a catch of 1,743 fish from 12 species (Table 2). Six species (least cisco, arctic cisco, broad whitefish, humpback whitefish, round whitefish and rainbow smelt) accounted for 81% of the catch. These results are similar to 2000, when these six species accounted for 83% of the catch in this region. As in previous sampling within the delta, the catch was dominated by juveniles of all species, with few adult fish caught (Figures 4-9). The only mature fish were least cisco captured sporadically through the summer and during the return migration in late summer, and several humpback whitefish and rainbow smelt.

In 2001, the highest catches were in the tapped lake between the north Sakoonang and West Ulamnigiaq stations (Figure 10, Table 3). When combined with the results reported in Moulton (1997, 1999 and 2001), it appears that minor distributary channels and tapped lakes provide the most valuable juvenile rearing habitat in the study area, with major channels supporting lower densities. Juvenile broad whitefish, round whitefish and least cisco appear to be more abundant farther upstream in the Sakoonang Channel near the Alpine Development, while arctic cisco and rainbow smelt are more abundant in channels near the CD-North area (Figure 11, Table 4). Relative numbers of fish rearing in the different habitats, however, are difficult to assess because of differences in fyke net efficiency (a fyke net in a small channel samples a greater percentage of the channel than one in a large channel) and probable inter-annual distributional differences.

Fish distribution in this outer delta region is strongly influenced by wind direction and water level changes. During prolonged east winds, the water level drops as the sea level decreases, and the remaining water becomes fresher. When the wind reduces velocity or reverses to the west, the water level increases and the water becomes cooler and more saline. These changes are reflected in both water temperature and specific conductance, with stations closer to the coast responding sooner than those farther upstream in the delta. Fish respond rapidly to these water changes, with freshwater species moving downstream during east winds, and retreating upriver when cooler, more brackish water moves upstream under west winds. Concurrent with these changes in water conditions, salt-tolerant species move upstream with the brackish water, and return down-river under east winds.

The result is generally larger and more varied catches when water is moving and smaller catches of fewer species when wind and water conditions are stable.

During the first part of the July 2000 sampling period (July 12-15), east winds dominated, water level decreased, and water in Tamayagiaq Channel was quite fresh (specific conductance around 150-165 μS/cm). Station CDN-00C, on East Ulamnigiaq Channel, is farther out in the delta as reflected in the higher specific conductance. On July 15, the wind switched to the west, with a resulting rise in the water level, increasing specific conductance and decreasing temperature (Figure 12). Catches of least cisco, humpback whitefish, and round whitefish on July 16 and 17 reflect the fish movements induced by this switch in wind and water level, as the area became more brackish (Figures 13-15). By July 20, the wind switched back around to the northeast, but the water quality in the channels and fish catches continued to show effects of the west winds. Substantial mixing was still underway, with specific conductance increasing in some channels and decreasing in others. By July 22, water temperature had increased and specific conductance decreased at all stations, and catches of least cisco and humpback whitefish had decreased.

In 2001, catches similarly fluctuated with changes in specific conductance. During July, the specific conductance was too stable to initiate fish movements, but the large increase in catch at the end of August and early September was accompanied by a rapid increase in specific conductance (Figures 16-20).

The results from 2000-2001 are consistent with those reported in Moulton (1997) for the Sakoonang Channel, that is most of the fish within the minor channels were young-of-the-year or juveniles, with few mature fish caught. Fish appeared to be moving downstream towards Harrison Bay during the early summer, with a return migration near the end of August into early September. In mid-summer, few fish remained in the river channel and tapped lakes, with most being young-of-the-year. Tapped lakes were more heavily used than river channels.

A total of 236 tagged fish were released in the CD-North study area during 2001, primarily least cisco, broad whitefish and humpback whitefish (Table 5). Two least cisco were eventually recovered, one near Nuiqsut in the subsistence fishery and one in the Colville Delta commercial fishery. Both had been released in the tapped lake designated N6 (Station CDN-01B).

LAKE SAMPLING

Biological Observations

Fish sampling has been conducted in 21 lakes in of near the CD-North study area since 1992 (Table 6). As with most other fish surveys in this region, least cisco dominated the catches in samples obtained by gill net; broad whitefish and arctic cisco were also present (Table 7). Additional species, such as ninespine stickleback and Alaska blackfish are present in many of the lakes, as indicated by sampling with fyke nets or minnow traps, but are not sampled efficiently by gill net.

Fish were caught in 57% of the sampled lakes (12 of 21), which is lower than the delta-wide average of 87%. All 12 fish-bearing lakes contained least cisco, which represented 98% (470 of 478 fish) of the catch by gill net.

Water Chemistry Measurements

Water chemistry parameters measured in the studied lakes are presented Table 8). The most relevant parameters are specific conductance and total dissolved solids (TDS), which reflect the dissolved ion concentration. During freeze-up, ions are excluded from the ice, leading to a build-up in ion concentration in the remaining water. High levels of dissolved solids in late winter can lead to fish mortality, thus rendering the lake unsuitable for wintering. Lakes near the delta front or frequently flooded during coastal storm surges often have higher TDS than lakes further inland or less frequently flooded.

Evaluation of Fish Concerns

Information from fish sampling, depth measurements and water chemistry was used to evaluate each lake regarding its potential to support fish. Obviously, if fish were captured during the gill net sampling, the lake was classified as fish-bearing. The gill net sets were short, however, so the absence of catch does not necessarily mean a lake does not support fish. Lakes also were assessed for their proximity to fish-bearing streams, their depth and water chemistry. Lakes deeper than 7 feet, the maximum expected ice thickness on the Arctic Coastal Plain, retain unfrozen water during winter, thus have potential to overwinter fish. Deep lakes with low TDS levels are classified as potential fish-bearing lakes, with additional sampling needed if further clarification of the designation is desired. Results of the evaluation are summarized in Table 9. Lakes with high TDS concentrations and that had not produced fish during sampling are generally classified as non-fish bearing. However, as can be seen in Table 9, three lakes (N7.1, O8.1 and Q7.1) have high TDS (>1,000 mg/l) yet contained fish. These results indicate that high TDS by itself is not an absolute indicator of habitat suitability. All three lakes are deep (19.1, 28.1 and 18.9 ft), which may reduce the effect of ion concentration during winter. The six lakes classified as non-fish bearing are all less than 15 feet deep.

The 21 lakes in or near the CD-North study area contain an estimated 243.3 million gallons of water available for winter use. The amount available ranges from 0.04 to 46.2 million gallons. Not all lakes are suitable for all uses – for example, lakes with elevated TDS will not be suitable for camp use, but may be acceptable for drilling. The differing levels of ionic concentrations are illustrated in Figure 21.

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Table 1. Fyke net stations occupied during 1995-1996 and 2000-2001.
(latitude and longitude based on NAD27 datum)

Station	Year Sampled	Latitude	Longitude	Location
ALP-95A	1995	70.36387	150.91046	Sakoonang Channel
ALP-95B	1995	70.36618	150.88250	Lake M9521 (tapped lake)
ALP-95C	1995	70.36980	150.92852	Lake M9523 (tapped lake)
ALP-96A	1996	70.36965	150.95335	Sakoonang Channel
ALP-96B	1996	70.34804	150.96931	Outlet of Lake L9278 (tapped lake)
ALP-96C	1996	70.34847	150.96776	Outlet of Lake L9278 (tapped lake)
CDN-00A	2000	70.40388	150.85823	East Ulamnigiaq Channel
CDN-00B	2000	70.40662	150.88022	Ulamnigiaq Channel
CDN-00C	2000	70.42715	150.85866	East Ulamnigiaq Channel
CDN-00D	2000	70.39014	150.92507	Tamayagiaq Channel
CDN-00E	2000	70.41602	150.90437	West Ulamnigiaq Channel
CDN-01A	2001	70.43405	150.90348	West Ulamnigiaq Channel
CDN-01B	2001	70.43070	150.91588	Lake N6 (tapped lake)
CDN-01C	2001	70.43475	150.94090	North Sakoonang Channel

Table 2. Catches of fish from fyke net sampling in Colville Delta channels in or near the CD-North study area, 2000-2001.

	2000			2001		
Species	**July**	**August**	**Total**	**July**	**Aug/Sep**	**Total**
Chum salmon	3	0	3	0	0	0
Broad whitefish	171	153	324	340	608	948
Humpback whitefish	590	245	835	219	808	1,027
Arctic cisco	154	89	243	174	98	272
Least cisco	667	312	979	286	1,141	1,427
Round whitefish	325	114	439	261	30	291
Dolly Varden char	0	2	2	4	8	12
Arctic grayling	12	2	14	8	0	8
Burbot	0	0	0	1	2	3
Rainbow smelt	1,171	6	1,177	364	10	374
Longnose sucker	32	0	32	0	0	0
Saffron cod	0	3	3	0	0	0
Arctic flounder	5	8	13	38	4	42
Fourhorn sculpin	44	129	173	46	886	932
Slimy sculpin	0	2	2	0	0	0
Threespine stickleback	0	9	9	0	0	0
Ninespine stickleback	421	153	574	2	0	2
Total Effort (hrs)	1,001	938	1,939	357	681	1,038

Table 3. Catch rates and total catch by species at river channels and tapped lake in the CD-North study area, based on fyke net sampling during July-September 2001.

Catch Rate (fish per day)

	July			August/September		
Species	W. Ulam (CDN-01A)	Lake N6 (tapped) (CDN-01B)	N. Sakoonang (CDN-01C)	W. Ulam (CDN-01A)	Lake N6 (tapped) (CDN-01B)	N. Sakoonang (CDN-01C)
Chum salmon	0.0	0.0	0.0	0.0	0.0	0.0
Broad whitefish	1.6	63.2	5.5	21.3	30.2	11.6
Humpback whitefish	0.2	40.7	4.3	19.4	45.0	19.8
Arctic cisco	3.6	23.5	8.5	4.3	2.9	3.1
Least cisco	2.8	44.5	11.4	44.4	45.9	29.1
Round whitefish	2.4	48.0	3.6	0.4	1.9	0.8
Dolly Varden char	0.4	0.2	0.2	0.3	0.3	0.2
Arctic grayling	0.0	0.0	1.6	0.0	0.0	0.0
Burbot	0.0	0.2	0.0	0.2	0.0	0.0
Rainbow smelt	0.6	53.0	20.9	0.1	0.9	0.0
Longnose sucker	0.0	0.0	0.0	0.0	0.0	0.0
Saffron cod	0.0	0.0	0.0	0.0	0.0	0.0
Arctic flounder	0.0	7.1	0.8	0.0	0.4	0.0
Fourhorn sculpin	0.6	6.6	2.2	18.1	59.0	14.5
Slimy sculpin	0.0	0.0	0.0	0.0	0.0	0.0
Threespine stickleback	0.0	0.0	0.0	0.0	0.0	0.0
Ninespine stickleback	0.0	0.0	0.4	0.0	0.0	0.0

Number of Fish

	July			August/September			
Species	W. Ulam (CDN-01A)	Lake N6 (tapped) (CDN-01B)	N. Sakoonang (CDN-01C)	W. Ulam (CDN-01A)	Lake N6 (tapped) (CDN-01B)	N. Sakoonang (CDN-01C)	2001 Total
Chum salmon	0	0	0	0	0	0	0
Broad whitefish	8	304	28	207	299	102	948
Humpback whitefish	1	196	22	189	445	174	1,027
Arctic cisco	18	113	43	42	29	27	272
Least cisco	14	214	58	432	454	255	1,427
Round whitefish	12	231	18	4	19	7	291
Dolly Varden char	2	1	1	3	3	2	12
Arctic grayling	0	0	8	0	0	0	8
Burbot	0	1	0	2	0	0	3
Rainbow smelt	3	255	106	1	9	0	374
Longnose sucker	0	0	0	0	0	0	0
Saffron cod	0	0	0	0	0	0	0
Arctic flounder	0	34	4	0	4	0	42
Fourhorn sculpin	3	32	11	176	583	127	932
Slimy sculpin	0	0	0	0	0	0	0
Threespine stickleback	0	0	0	0	0	0	0
Ninespine stickleback	0	0	2	0	0	0	2
Total Effort (hrs)	119.8	115.5	121.7	233.4	237.2	210.5	1,038

W. Ulam = West Ulamnigiaq Channel

Table 4. Catch rates by species at river channels and a tapped lake in the Colville delta based on fyke net sampling from July to early September, 1995-1996 and 2000-2001.

	Sakoonang Channel[1] (1995-1996)			Ulamnigiaq Channel (CDN-00B) (2000)			Tamayagiaq Channel (CDN-00D) (2000)			West Ulamnigiaq (CDN-00E) (2000)		
	Mean	Stand. Dev.	No. Sets	Mean	Stand. Dev.	No. Sets	Mean	Stand. Dev.	No. Sets	Mean	Stand. Dev.	No. Sets
Broad whitefish	49.0	60.4	51	2.4	2.5	22	2.0	2.5	17	3.9	3.0	17
Humpback whitefish	6.9	12.2	51	6.4	9.4	22	3.8	6.8	17	9.4	15.3	17
Round whitefish	14.6	16.5	51	4.8	4.2	22	4.2	3.8	17	1.5	1.7	17
Least cisco	40.2	51.2	51	15.1	21.7	22	4.2	4.8	17	10.4	13.7	17
Arctic cisco	0.3	1.2	51	3.5	9.9	22	1.1	1.9	17	4.0	6.6	17
Arctic grayling	1.2	2.8	51	0.2	0.4	22	0.3	0.6	17	0.1	0.3	17
Rainbow smelt	1.8	3.9	51	4.8	10.8	22	7.5	16.7	17	30.5	96.9	17
Dolly Varden char	0.1	0.2	51	0.1	0.3	22	0.1	0.3	17	0.0	0.0	17
Burbot	0.4	0.7	51	0.0	0.0	22	0.0	0.0	17	0.0	0.0	17
Alaska blackfish	0.0	0.2	51	0.0	0.0	22	0.0	0.0	17	0.0	0.0	17
Longnose sucker	0.7	1.2	51	0.5	1.4	22	0.8	2.2	17	0.1	0.3	17
Arctic flounder	0.6	1.7	51	0.0	0.2	22	0.1	0.2	17	0.1	0.4	17
Fourhorn sculpin	2.8	7.9	51	2.4	3.0	22	2.3	3.4	17	2.8	4.2	17
Slimy sculpin	0.0	0.0	51	0.0	0.0	22	0.0	0.0	17	0.1	0.3	17
Threespine stickleback	0.0	0.1	51	0.0	0.0	22	0.0	0.0	17	0.1	0.4	17
Ninespine stickleback	6.2	9.0	51	3.9	3.5	22	4.1	6.5	17	7.8	15.7	17

	East Ulamnigiaq (CDN-00C) (2000)			West Ulamnigiaq (CDN-01A) (2001)			Lake N6 (tapped) (CDN-01B) (2001)			North Sakoonang (CDN-01C) (2001)		
	Mean	Stand. Dev.	No. Sets	Mean	Stand. Dev.	No. Sets	Mean	Stand. Dev.	No. Sets	Mean	Stand. Dev.	No. Sets
Broad whitefish	8.2	9.3	20	14.9	15.7	15	43.5	29.9	15	13.2	17.7	14
Humpback whitefish	19.1	30.9	20	13.0	24.8	15	50.6	50.3	15	17.0	30.8	14
Round whitefish	11.5	13.5	20	1.1	1.4	15	18.5	29.2	15	2.5	2.9	14
Least cisco	17.7	20.2	20	30.6	49.1	15	49.6	26.2	15	30.2	35.3	14
Arctic cisco	4.2	11.1	20	4.0	6.8	15	11.2	13.2	15	9.9	17.2	14
Arctic grayling	0.2	0.4	20	0.0	0.0	15	0.0	0.0	15	0.6	2.4	14
Rainbow smelt	18.0	35.6	20	0.3	0.6	15	22.1	35.6	15	7.9	16.7	14
Dolly Varden char	0.0	0.0	20	0.3	0.6	15	0.3	0.6	15	0.2	0.4	14
Burbot	0.0	0.0	20	0.1	0.3	15	0.1	0.3	15	0.0	0.0	14
Alaska blackfish	0.0	0.0	20	0.0	0.0	15	0.0	0.0	15	0.0	0.0	14
Longnose sucker	0.2	0.6	20	0.0	0.0	15	0.0	0.0	15	0.0	0.0	14
Arctic flounder	0.4	0.8	20	0.0	0.0	15	2.7	5.1	15	0.4	0.9	14
Fourhorn sculpin	2.9	3.3	20	12.4	16.1	15	41.9	33.4	15	10.0	9.3	14
Slimy sculpin	0.0	0.0	20	0.0	0.0	15	0.0	0.0	15	0.0	0.0	14
Threespine stickleback	0.3	0.7	20	0.0	0.0	15	0.0	0.0	15	0.0	0.0	14
Ninespine stickleback	12.7	18.8	20	0.0	0.0	15	0.0	0.0	15	0.1	0.4	14

[1] Sakoonang Channel sample is based on Station ALP-95A, ALP-96A.

Table 5. Tag releases and recaptures in the Colville Delta-North study area, by station and species, 2001.

Station	Broad Whitefish	Humpback Whitefish	Round Whitefish	Least Cisco	Arctic Cisco	Burbot	Rainbow Smelt
Released							
CDN-01A	5	1	0	9	0	1	0
CDN-01B	41	29	1	90	1	1	1
CDN-01C	5	12	1	38	0	0	0
Release Total:	51	42	2	137	1	2	1
Recaptured							
CDN-01A	0	0	0	0	0	0	0
CDN-01B	0	0	0	2	0	0	0
CDN-01C	0	0	0	0	0	0	0
Recapture Total:	0	0	0	2	0	0	0

Table 6. Locations of lakes sampled in the CD-North study area.

ERG Name	Lake Name	Latitiude deg.	Latitiude min.	Longitude deg.	Longitude min.	USGS Topo Sheet	Township/Range	Habitat
M7.2	M9714	70	27.12	150	52.25	Harrison Bay B-2	T13N R5E, Sect. 28	Perched Lake (Frequent Flooding)
N7.1	M9211	70	26.11	150	51.70	Harrison Bay B-2	T13N R5E, Sect. 33	Perched Lake (Infrequent Flooding)
N8.1	L9208	70	26.90	150	50.94	Harrison Bay B-2	T13N R5E, Sect. 28	Perched Lake (Infrequent Flooding)
O6.1	M9713	70	25.42	150	55.63	Harrison Bay B-2	T12N R5E, Sect. 5	Perched Lake (Infrequent Flooding)
O6.2	M9712	70	25.82	150	55.30	Harrison Bay B-2	T12N R5E, Sect. 5	Perched Lake (Infrequent Flooding)
O7.1	M9313	70	25.41	150	53.69	Harrison Bay B-2	T12N R5E, Sect. 4	Perched Lake (Infrequent Flooding)
O7.2	M0019	70	25.23	150	52.43	Harrison Bay B-2	T12N R5E, Sect. 4	Perched Lake (Frequent Flooding)
O7.3	L9903	70	25.20	150	50.60	Harrison Bay B-2	T12N R5E, Sect. 4	Perched Lake (Frequent Flooding?)
O8.1	L9107	70	25.46	150	50.32	Harrison Bay B-2	T12N R5E, Sect. 3	Perched Lake (Infrequent Flooding)
P6.1	L9905	70	24.25	150	57.23	Harrison Bay B-2	T12N R5E, Sect. 7	Perched Lake (Frequent Flooding)
P6.2	L9904	70	24.17	150	56.28	Harrison Bay B-2	T12N R5E, Sect. 8	Perched Lake (Frequent Flooding)
P6.3	L9210	70	24.61	150	55.14	Harrison Bay B-2	T12N R5E, Sect. 8	Perched Lake (Infrequent Flooding)
P6.4	L9908	70	24.16	150	54.70	Harrison Bay B-2	T12N R5E, Sect. 8	Perched Lake (Frequent Flooding?)
P6.5	L9906	70	24.00	150	55.09	Harrison Bay B-2	T12N R5E, Sect. 17	Perched Lake (Frequent Flooding)
P7.1	L9108	70	24.94	150	51.49	Harrison Bay B-2	T12N R5E, Sect. 10	Perched Lake (Infrequent Flooding)
P7.2	L9907	70	24.10	150	53.95	Harrison Bay B-2	T12N R5E, Sect. 9	Perched Lake (Frequent Flooding?)
Q7.1	M9709	70	23.13	150	53.80	Harrison Bay B-2	T12N R5E, Sect. 21	Perched Lake (Infrequent Flooding)
R5.2	M9626	70	22.86	150	57.24	Harrison Bay B-2	T12N R5E, Sect. 19	Perched Lake (Infrequent Flooding)
R6.1	M9522	70	22.19	150	55.21	Harrison Bay B-2	T12N R5E, Sect. 29	Perched Lake (Frequent Flooding)
R6.3	L9281	70	22.43	150	56.56	Harrison Bay B-2	T12N R5E, Sect. 20	Perched Lake (Infrequent Flooding)
R6.4	M9321	70	22.74	150	55.95	Harrison Bay B-2	T12N R5E, Sect. 20	Perched Lake (Infrequent Flooding)

Table 7. Fish caught by gill net sampling in the CD-North study area, 1992-2000.

ERG Name	Lake Name	Date	Sampling Duration (hours)	Broad Whitefish	Humpback Whitefish	Arctic Cisco	Least Cisco	Total Catch
M7.2	M9714	Aug 8 97	12.0					0
N7.1	M9211	Nov 3 92	26.0			6	8	14
N8.1	L9208	Nov 3 92	30.5					0
O4.1	M9708	Jul 23 97	11.0					0
O5.1	M9707	Jul 22 97	10.5					0
O6.1	M9713	Aug 7 97	5.0					0
		Aug 8 97	6.7					0
O6.2	M9712	Aug 7 97	6.0					0
		Aug 8 97	5.8					0
O7.1	M9313	Nov 5 93	20.7				79	79
		Jul 25 00	2.1				4	4
O7.2	M0019	Jul 25 00	7.0					0
O7.3	L9903	Jul 26 00	2.3				3	3
P6.1	L9905	Aug 2 99	2.3					0
P6.2	L9904	Aug 2 99	2.5	1			5	6
P6.3	L9210	Nov 3 92	22.0				50	50
		Jul 26 00	1.4				4	4
P6.4	L9908	Aug 1 99	4.5					0
		Aug 2 99	5.0					0
P6.5	L9906	Aug 2 99	2.2	1			4	5
P7.2	L9907	Aug 1 99	4.7					0
		Aug 2 99	5.0					0
Q3.1	L9401	Jul 21 97	9.9					0
		Aug 3 97	10.8					0
R4.1	M9703	Jul 18 97	6.6				2	2
R4.2	M9704	Jul 19 97	10.8	5				5
R5.2	M9626	Aug 16 96	8.0				2	2

Table 8. Water quality parameters measured at lakes in the CD-North study area.

ERG Name	Lake Name	Date	Water Temp (deg C)	Dissolved Oxygen (mg/l)	Specific Conductance (mS/cm)	Salinity (ppt)	pH	Chloride (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Magnesium (mg/l)	Hardness (mg/l)	TDS[1] (mg/l)
M7.2	M9714	Aug 08 97	12.4	8.3	17,384	7.6	8.3						(10,050)
N7.1	M9211	Aug 13 97	12.0	9.5	6,545	3.6	8.0						(3,785)
		Nov 01 98						2,210	985	79	153	827	3,740
N8.1	L9208	1992						4,800	1,990	260	161	1,500	9,200
O6.1	M9713	Nov 01 98						1,090	556	49	65	388	1,920
		Jul 22 99	13.0	10.4	3,302		7.9	836	439	38	54	317	1,640
O6.2	M9712	Aug 07 97	12.6	9.2	3,767		7.9						(2,180)
O7.1	M9313	Aug 13 97	12.0	10.9	841		8.3						(488)
		Nov 01 98						259	108	29	22	162	484
		Jul 22 99						224	96	24	20	141	472
		Jul 25 00	10.1	10.3	759		7.9	192	71	21	16	120	370
O7.2	M0019	Jul 25 00	10.7		584		7.9	146	58	15	13	90	296
O7.3	L9903	Jul 26 00	9.9		836		8.0						(486)
O8.1	L9107	Aug 11 97	14.1	11.0	1,867		8.1						(1,081)
		Nov 01 98						572	313	38	24	215	1,080
P6.1	L9905	Aug 02 99	10.3	11.7	5,860	3.2	8.4	1,880	991	69	135	737	3,470
P6.2	L9904	Aug 02 99	9.8	11.8	622		8.1	161	79	18	16	112	354
P6.3	L9210	1992						64	20	10	19	92	190
		Nov 01 98						75	26	21	11	100	189
		Jul 22 99						68	24	21	12	101	200
		Jul 26 00	10.1		243		7.9	45	16	14	8	65	170
P6.4	L9908	Aug 01 99	9.8	11.1	251		7.9	48	18	15	10	77	130
P6.5	L9906	Aug 02 99	10.2	11.9	416		8.0	97	49	15	12	86	238
P7.1	L9108	Aug 11 97	13.1	10.0	1,405		8.1						(815)
		Nov 01 98						427	218	31	29	201	800
P7.2	L9907	Aug 01 99	10.1	11.3	264		8.0	36	16	17	12	89	128
O7.1	M9709	Jul 22 97	12.3	10.8	7,209	4.0	7.8	2,390	3,230	258	166	1,480	4,254
R5.2	M9626	Aug 16 96	11.0		246								(144)
R6.1	M9522	Aug 03 96	9.5		4,290								(2,482)
R6.3	L9281	1992						90	4	9	11	62	280
		Jul 09 95	12.8		346								(202)
		Nov 04 95	0.0		420								(245)
R6.4	M9321	Jul 16 95	16.0		146								(88)
		Nov 06 95	0.0		230								(135)

[1] TDS values in parenthesis are estimated from specific conductance/TDS relationship calculated from 68 paired observations in delta lakes.

TDS = 0.578*(specific conductance)+2.330 (r^2 = 0.992)

(specific conductance range: 55 to 7,209 µS/cm; TDS range: 18 to 4,254 mg/l)

Table 9. Summary of fish presence and estimated available winter water in lakes in the CD-North study area.

ERG Name	GIS Est Acreage	Maximum Depth (ft)	Calculated Volume (mil gals)	15% Vol. >7 ft (mil gals)	Fish Caught[1]	TDS (mg/l)	Fish Concern[2]	Volume Available (mil gals)
M7.2	17.4	14.1	26.6	0.5		10,050	No	26.6
N8.1	14.9	11.0	17.8	0.1		9,200	No	17.8
O6.1	14.5	11.0	17.3	0.1		1,640	No	17.3
O6.2	52.5	8.1	46.2	0.0		2,180	No	46.2
P6.1	7.4	12.4	10.0	0.1		3,470	No	10.0
R6.1	19.9	9.0	19.5	0.0		2,482	No	19.5
O7.2	5.4	10.8	6.3	0.0		296	Y?	0.04
P6.4	9.5	11.3	11.7	0.1		130	Y?	0.10
P7.2	11.2	10.1	12.3	0.1		128	Y?	0.05
N7.1	42.9	19.2	89.5	3.4	ARCS,LSCS	3,740	Yes	3.4
O7.1	128.3	25.1	349.7	19.7	LSCS	370	Yes	19.7
O7.3	8.3	22.9	20.7	1.0	LSCS	486	Yes	1.0
O8.1	208.2	28.1	635.4	40.4	LSCS	1,080	Yes	40.4
P6.2	12.5	25.3	34.4	2.0	BDWF,LSCS	354	Yes	2.0
P6.3	117.1	29.1	370.1	24.3	LSCS	170	Yes	24.3
P6.5	14.7	13.0	20.8	0.3	BDWF,LSCS	238	Yes	0.31
P7.1	112.2	17.1	208.4	6.4	LSCS	800	Yes	6.4
Q7.1	64.6	18.9	132.5	5.0	LSCS	4,254	Yes	5.0
R5.2	20.1	20.3	44.3	1.9	LSCS	144	Yes	1.9
R6.3	43.8	13.5	64.2	1.1	LSCS, BKFH, NSSE	202	Yes	1.1
R6.4	20.8	11.7	26.4	0.3	LSCS, NSSB	88	Yes	0.3

[1] BDWF = broad whitefish, LSCS = least cisco, ARCS = arctic cisco, BKFH = Alaska blackfish, NSSB = ninespine stickleback

[2] Y? indicates that fish were not caught, but characteristics of the lake suggest fish may be present at times.

Figure 1. General location of the CD-North exploration area in the Colville Delta, Alaska (approximate boundary of study area included).

Figure 2. Lakes sampled in or near the CD-North study area, 1995-2000.

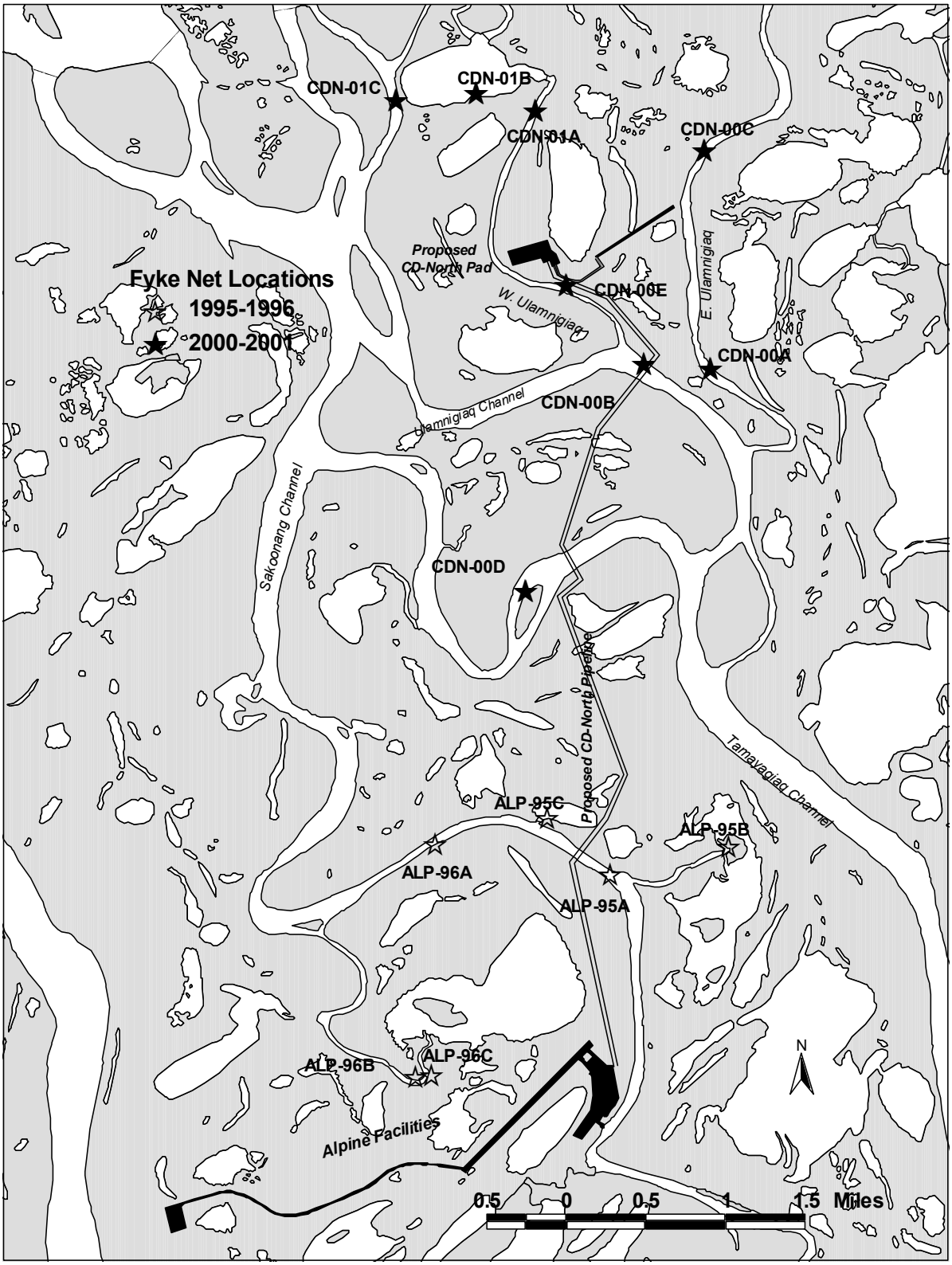

Figure 3. Fyke net locations in the CD-North study area during 2000-2001, and Sakoonang Channel nets sampled in 1995-1996.

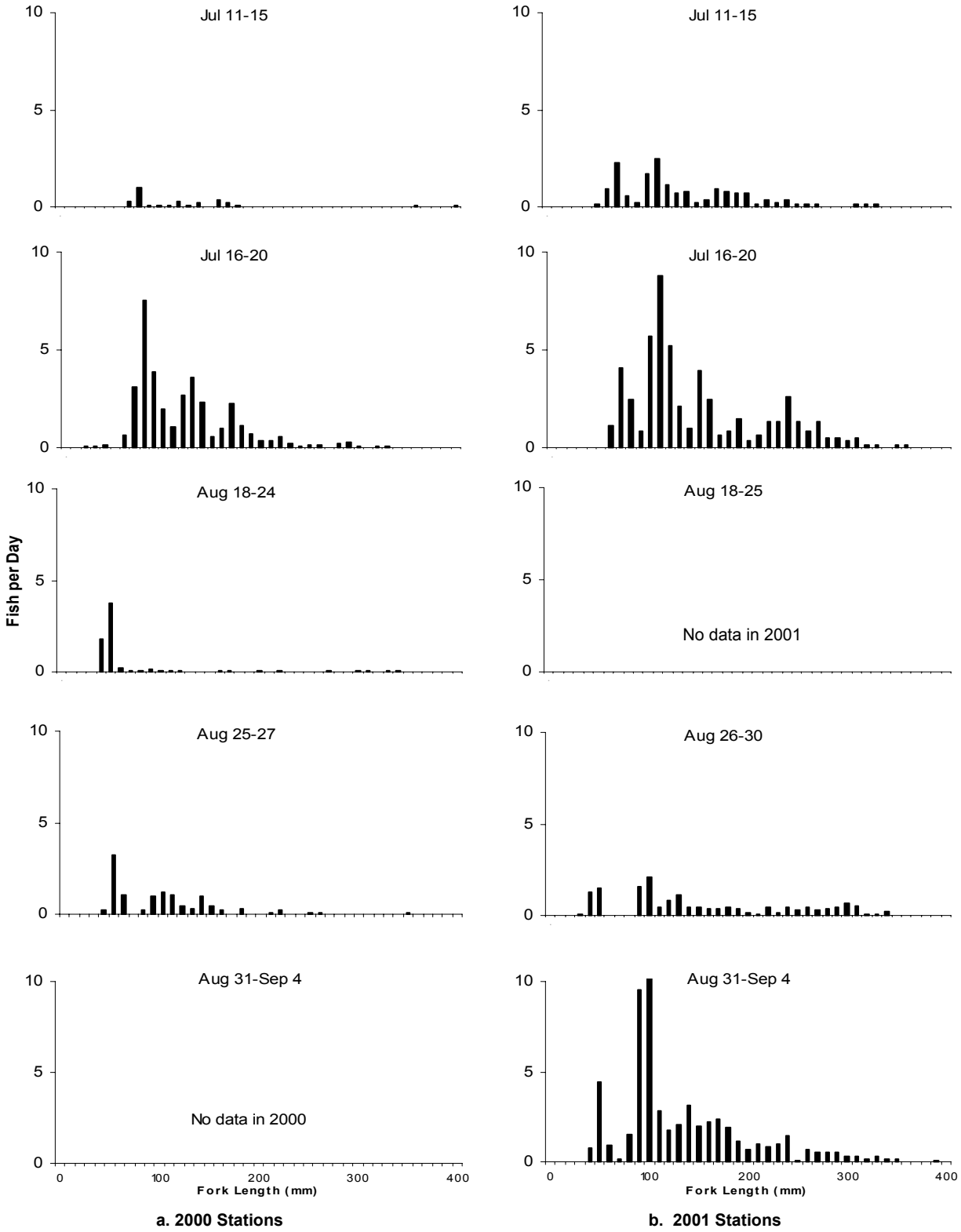

Figure 4. Length frequencies of least cisco caught in the CD-North exploration area by fyke nets, 2000-2001 (least cisco mature at about 250 mm).

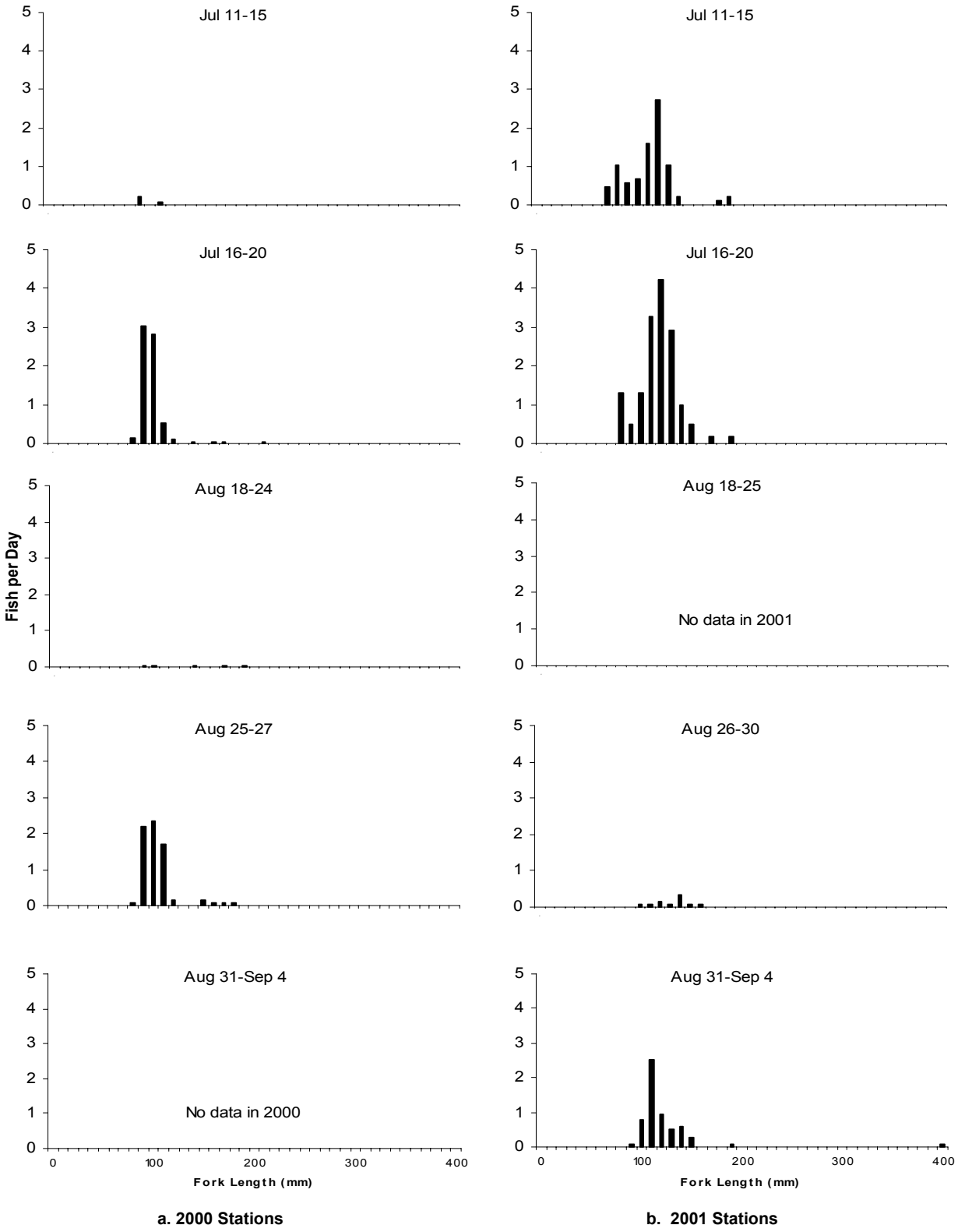

Figure 5. Length frequencies of arctic cisco caught in the CD-North exploration area by fyke nets, 2000-2001 (arctic cisco mature at about 350 mm).

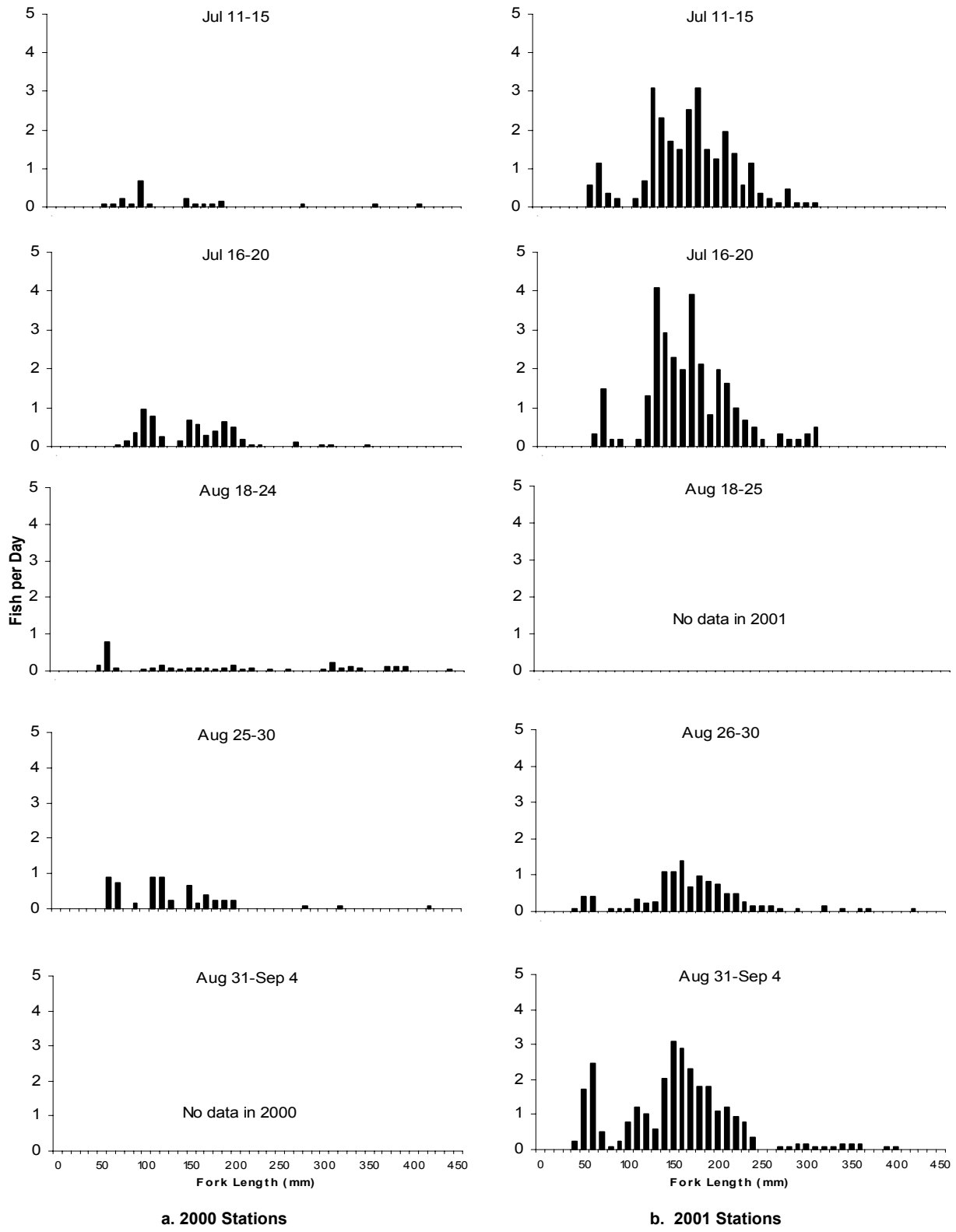

Figure 6. Length frequencies of broad whitefish caught in the CD-North exploration area by fyke nets, 2000-2001 broad whitefish mature at about 480 mm).

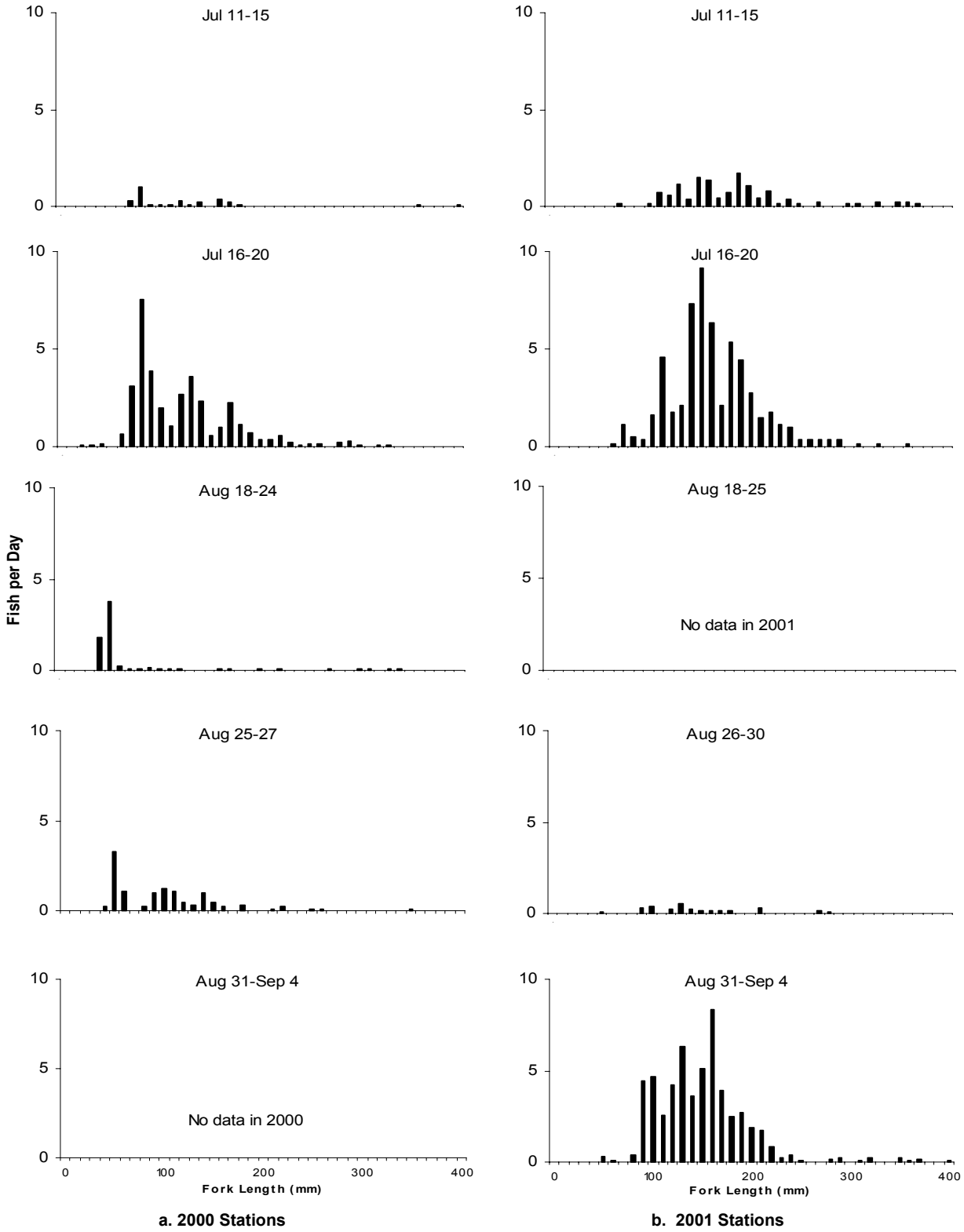

Figure 7. Length frequencies of humpback whitefish caught in the CD-North exploration area by fyke nets, 2000-2001 (humpback whitefish mature at about 350 mm).

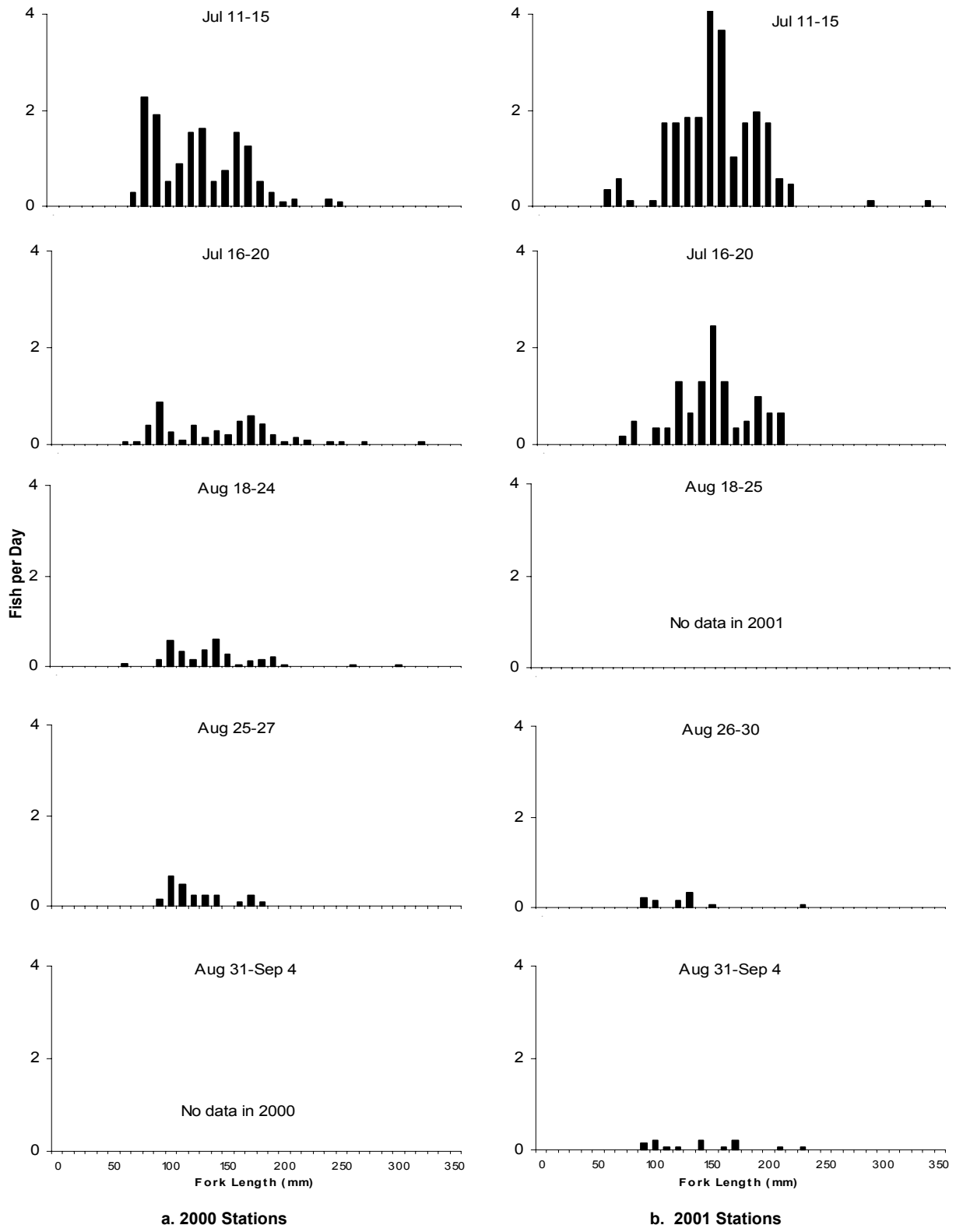

Figure 8. Length frequencies of round whitefish caught in the CD-North exploration area by fyke nets, 2000-2001 (round whitefish mature at about 350 mm).

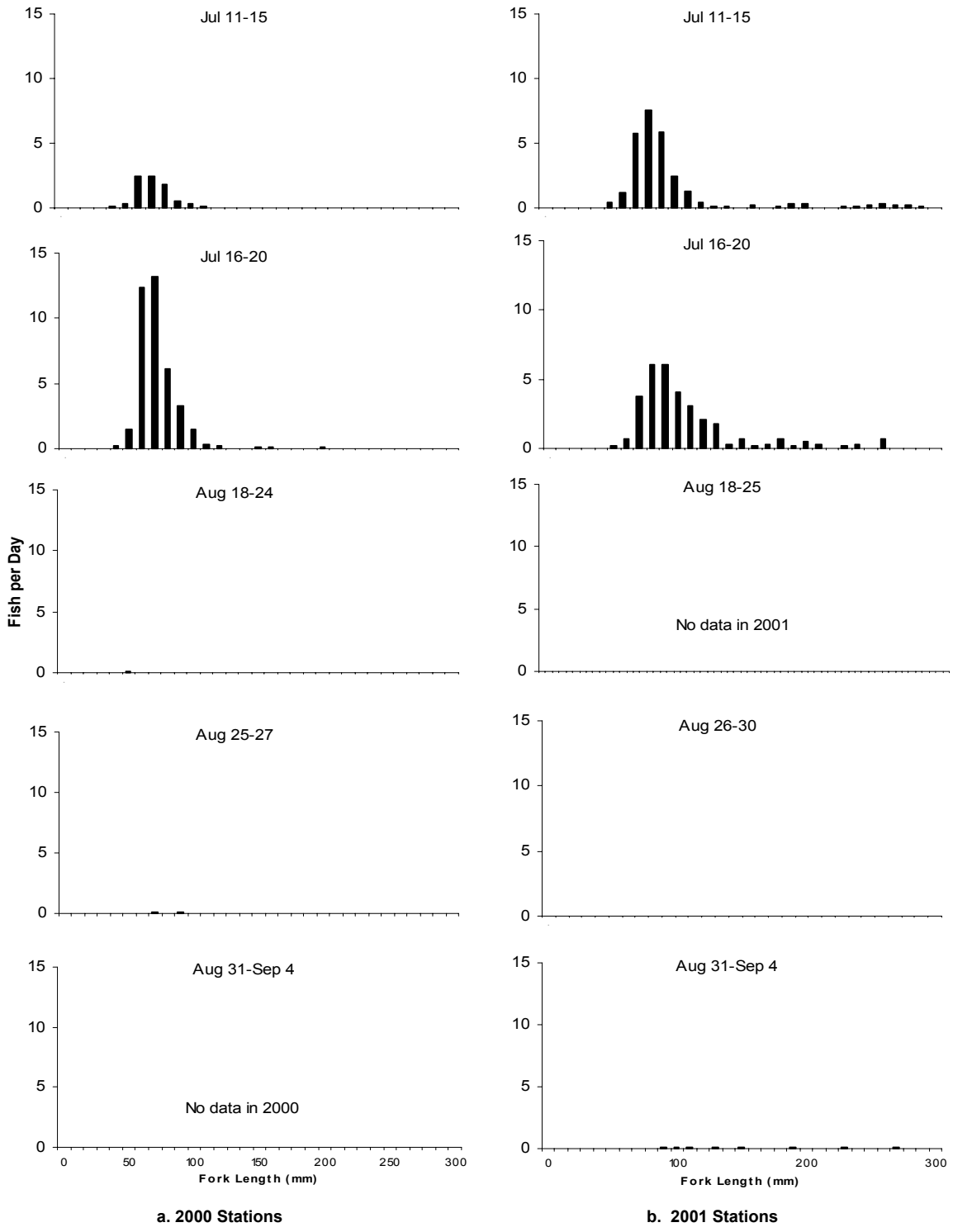

Figure 9. Length frequencies of rainbow smelt caught in the CD-North exploration area by fyke nets, 2001 (rainbow smelt mature at about 200 mm).

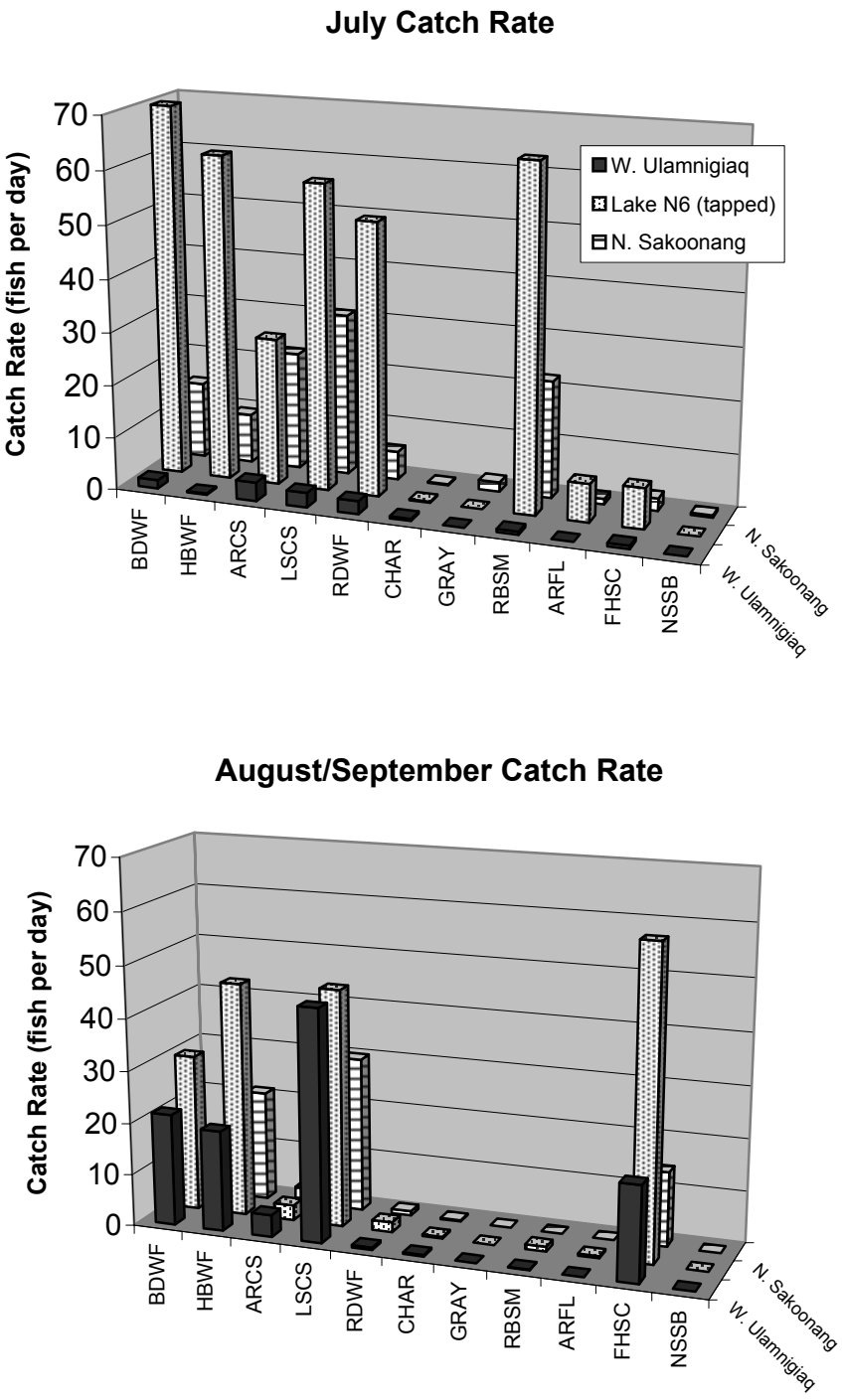

Figure 10. Catch rates by species at stations in the CD-North study area, based on fyke net sampling during July-September 2001.

BDWF = broad whitefish
HBWF = humpback whitefish
ARCS = arctic cisco
LSCS = least cisco
RDWF = round whitefish
CHAR = Dolly Varden
GRAY = arctic grayling
RBSM = rainbow smelt
ARFL = arctic flounder
FHSC = fourhorn sculpin
NSSB = ninespine stickleback

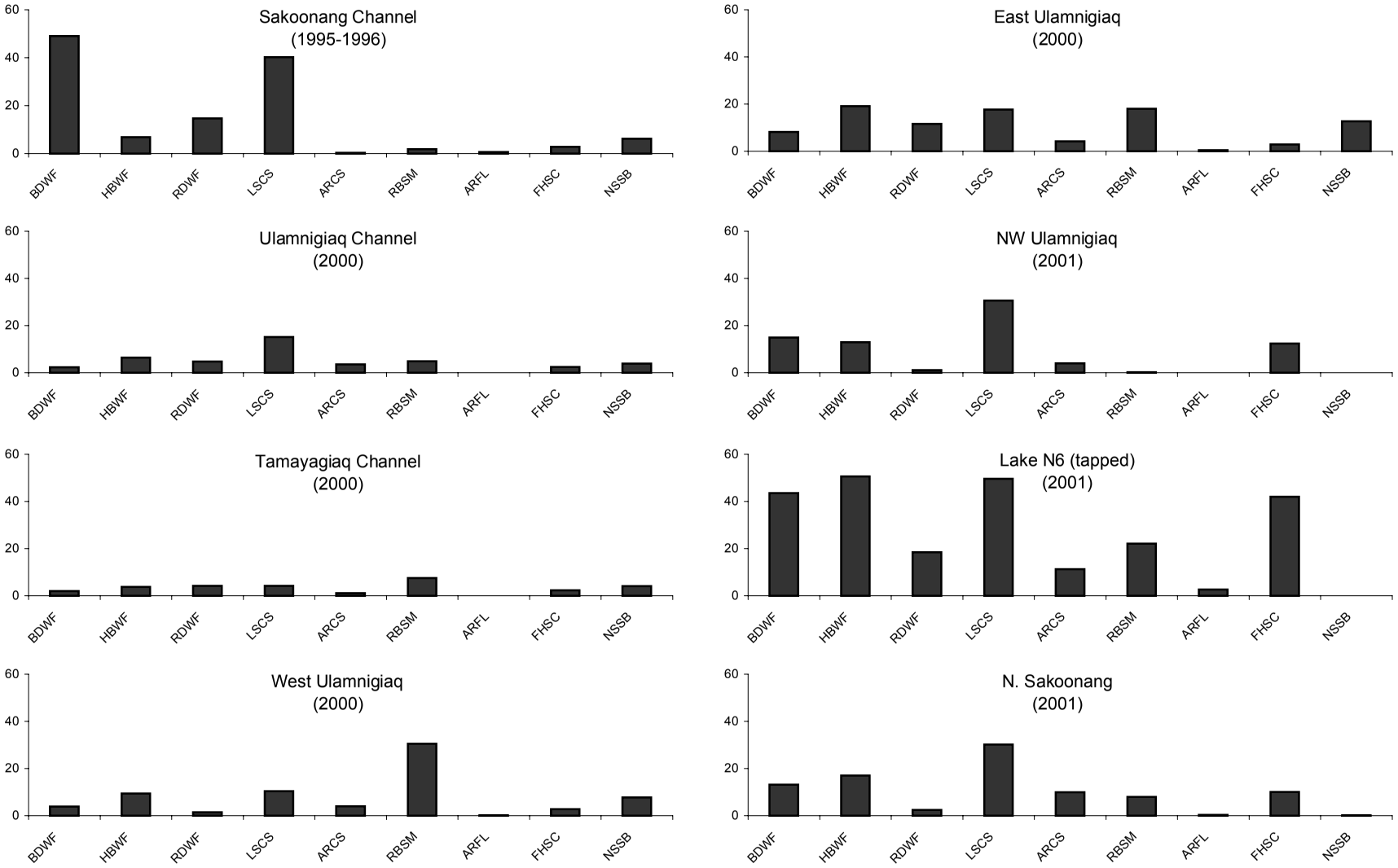

Figure 11. Comparison of catch rates by species at river channels in the CD-North study area and Alpine development area based on fyke net sampling during July and August, 1995-1996 and 2000-2001.

BDWF = broad whitefish
HBWF = humpback whitefish
RDWF = round whitefish
LSCS = least cisco
ARCS = arctic cisco
RBSM = rainbow smelt
ARFL = arctic flounder
FHSC = fourhorn sculpin
NSSB = ninespine stickleback

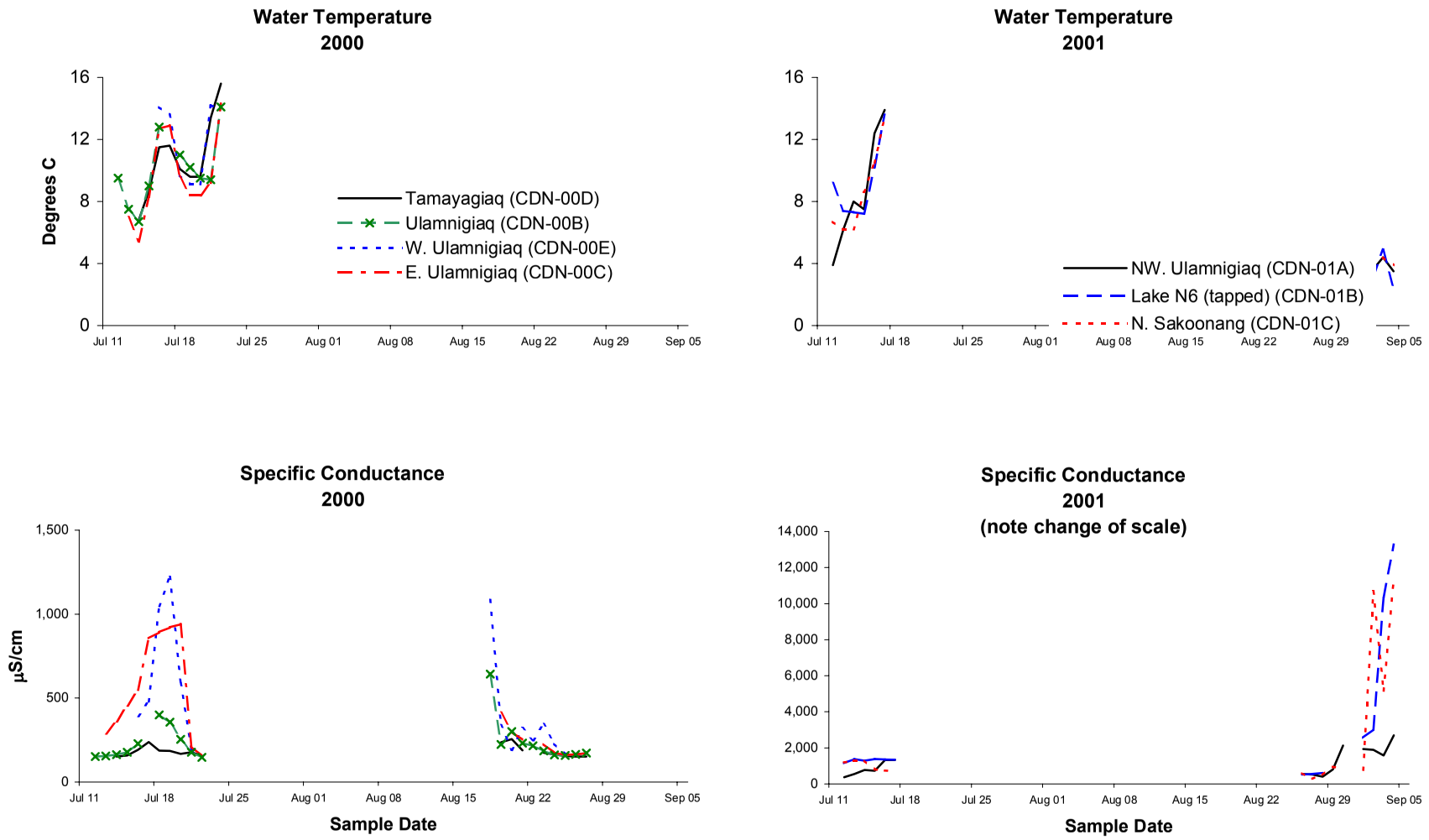

Figure 12. Water temperature and specific conductance at fyke net stations sampled in the CD-North study area, 2000-2001.

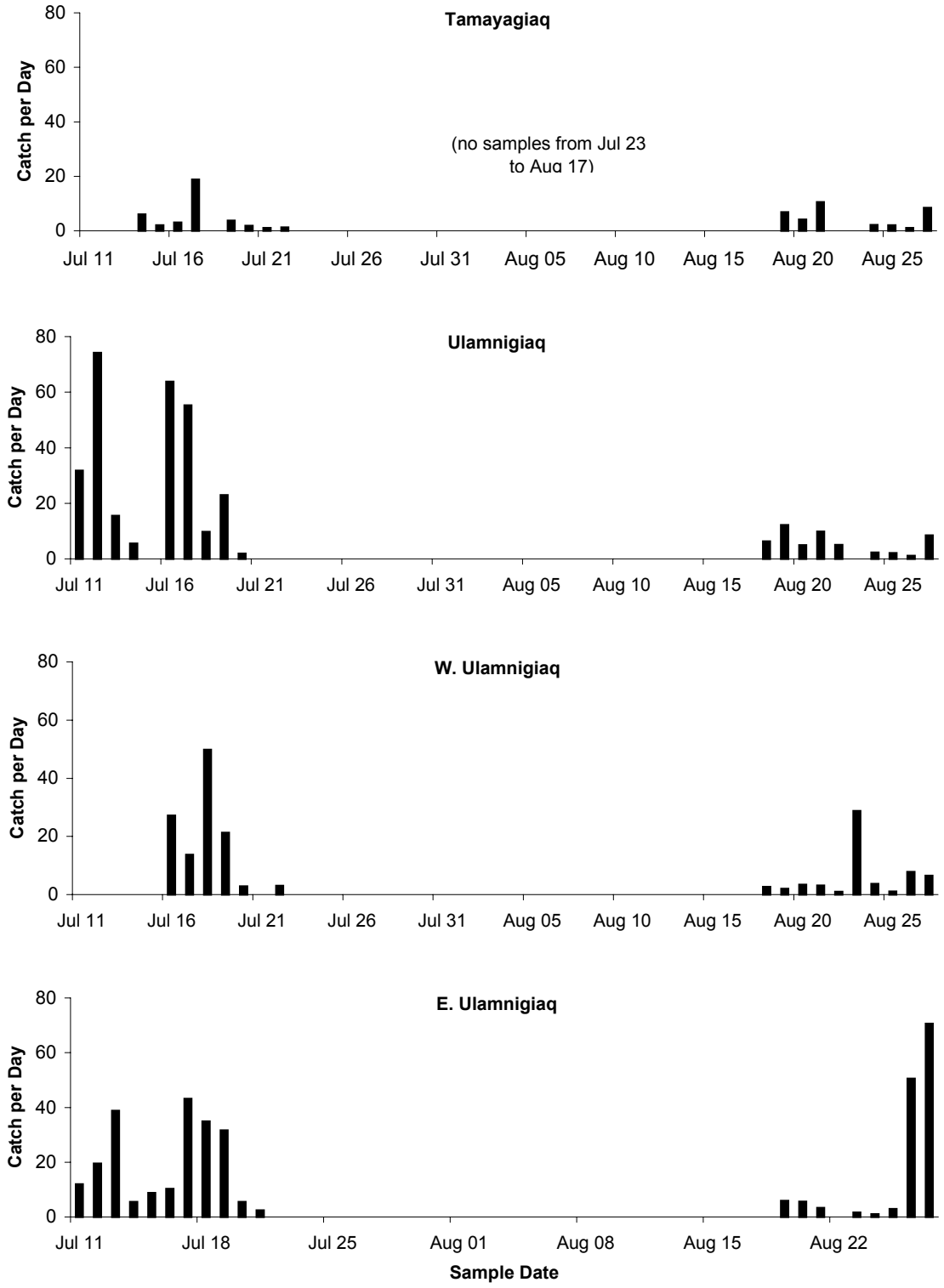

Figure 13. Daily catch rate of least cisco at CD-North study area fyke net stations, 2000.

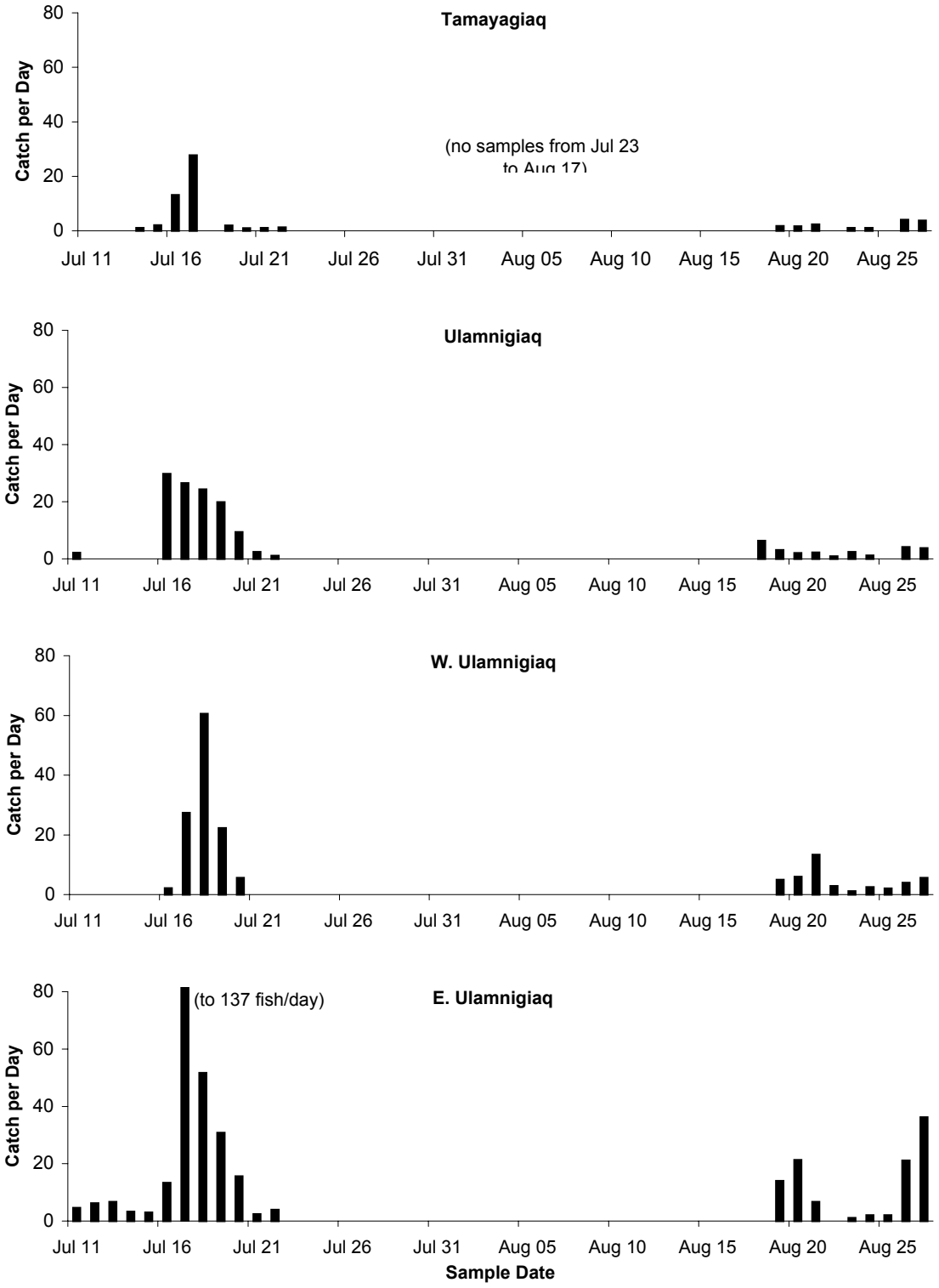

Figure 14. Daily catch rate of humpback whitefish at CD-North study area fyke net stations, 2000.

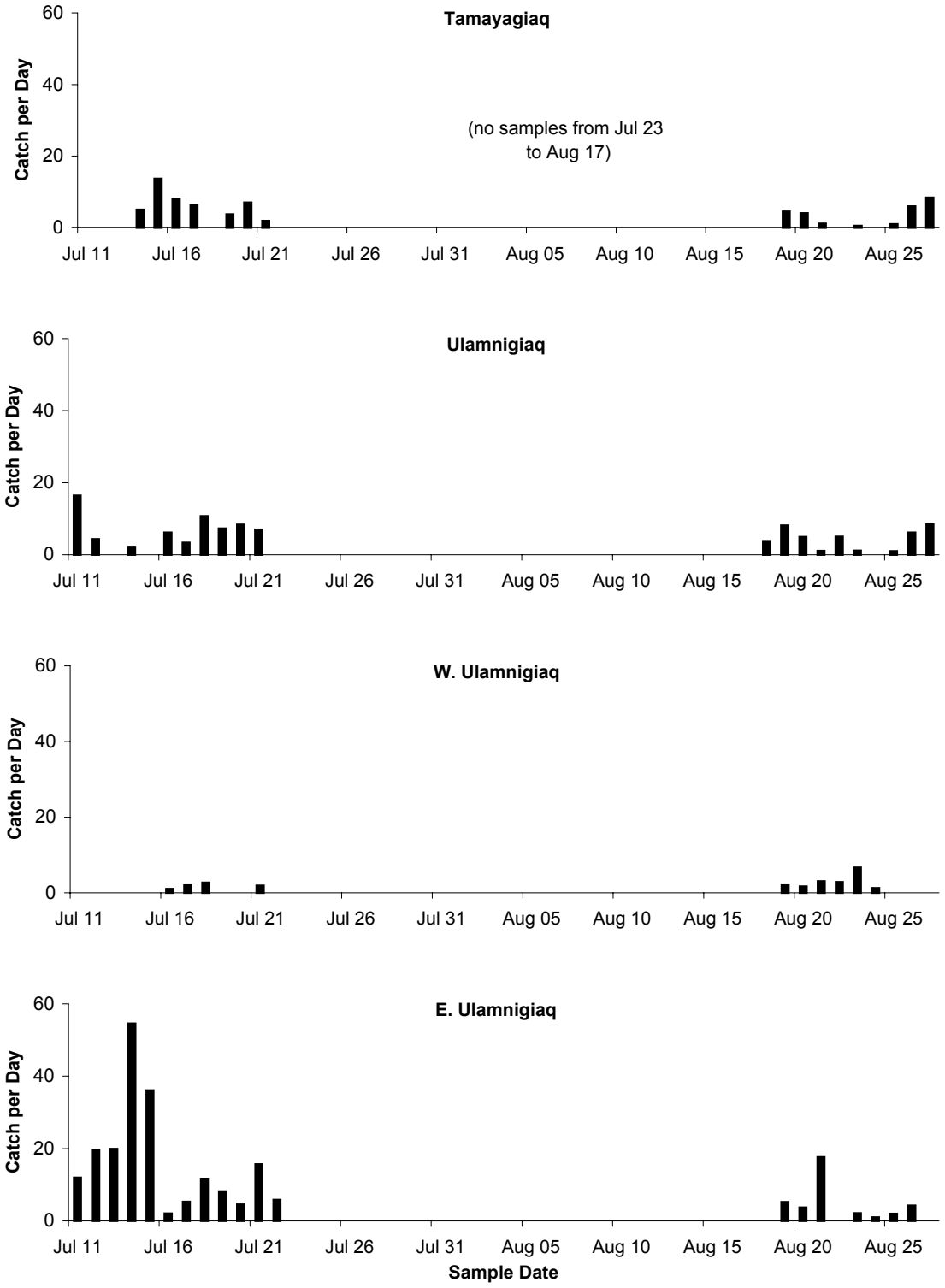

Figure 15. Daily catch rate of round whitefish at CD-North study area fyke net stations, 2000.

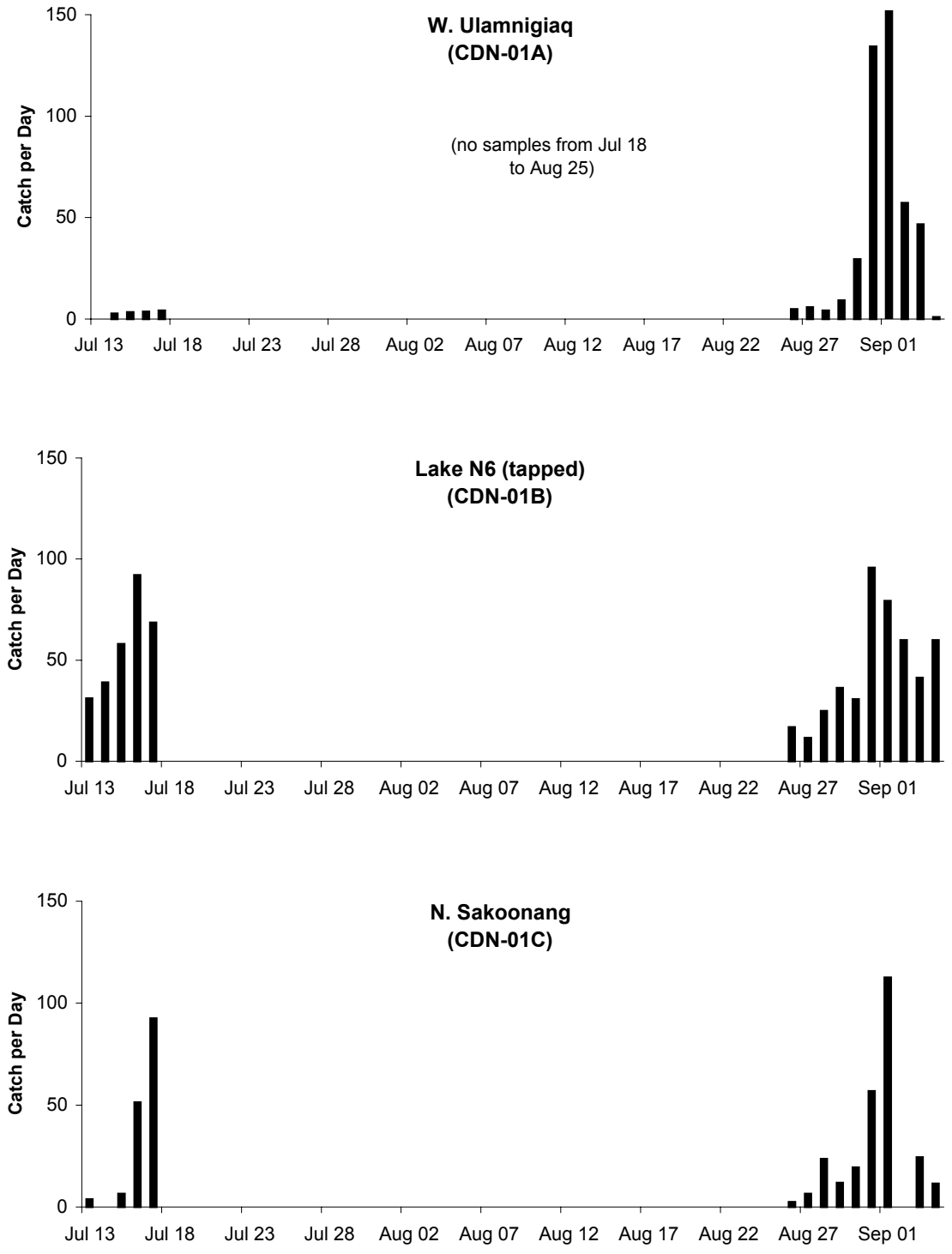

Figure 16. Daily catch rate of least cisco at CD-North study area fyke net stations, 2001

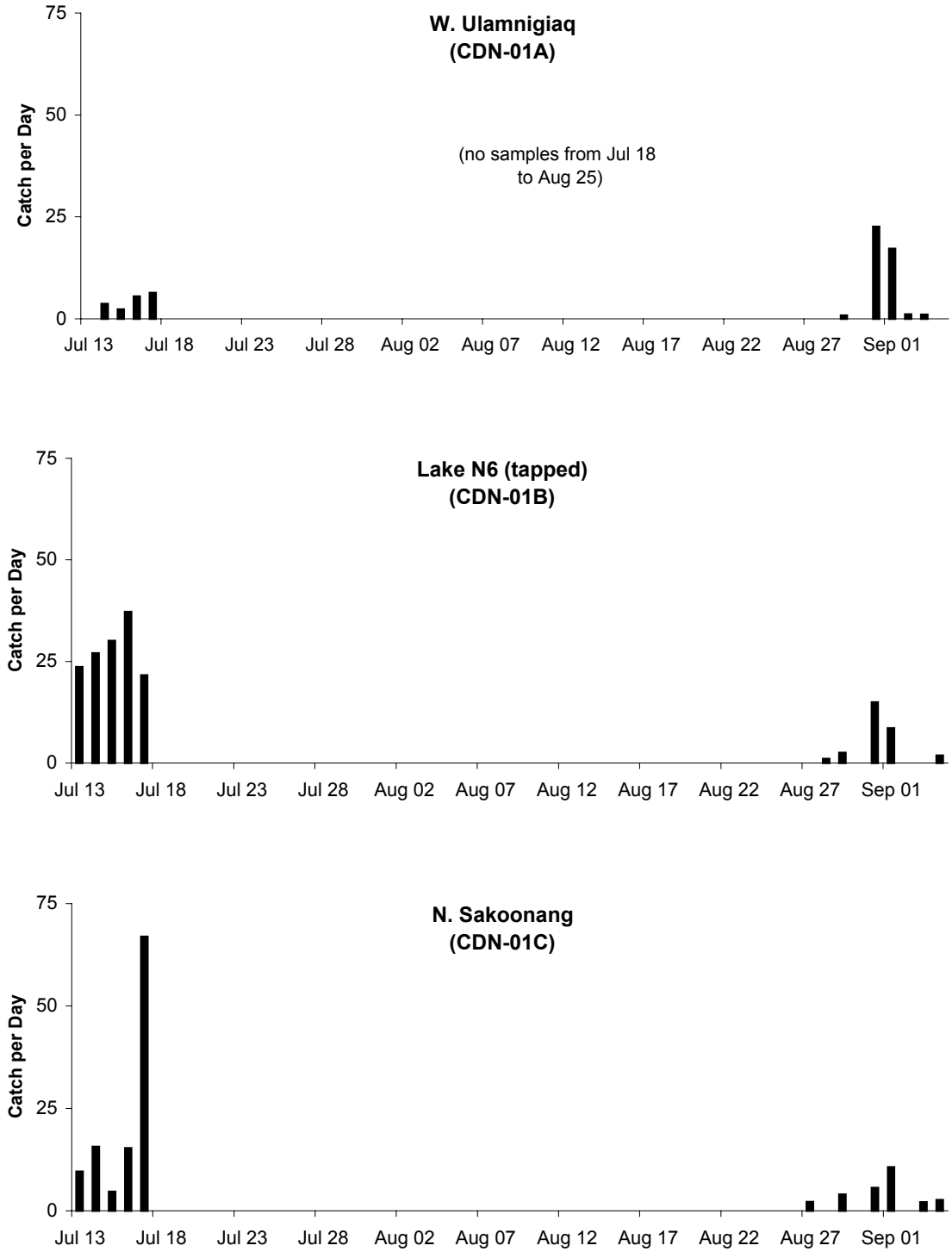

Figure 17 Daily catch rate of arctic cisco at CD-North study area fyke net stations, 2001

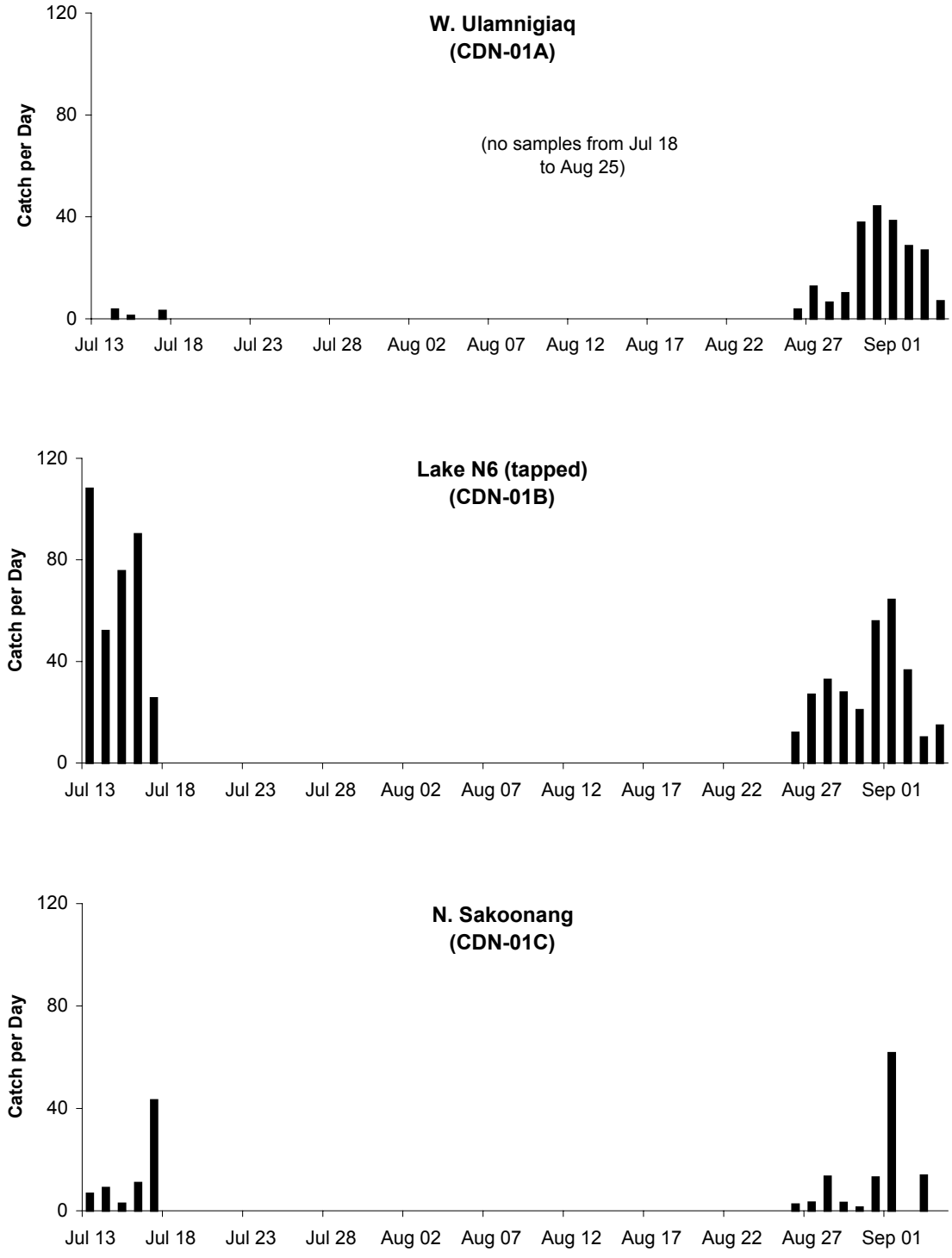

Figure 18. Daily catch rate of broad whitefish at CD-North study area fyke net stations, 2001.

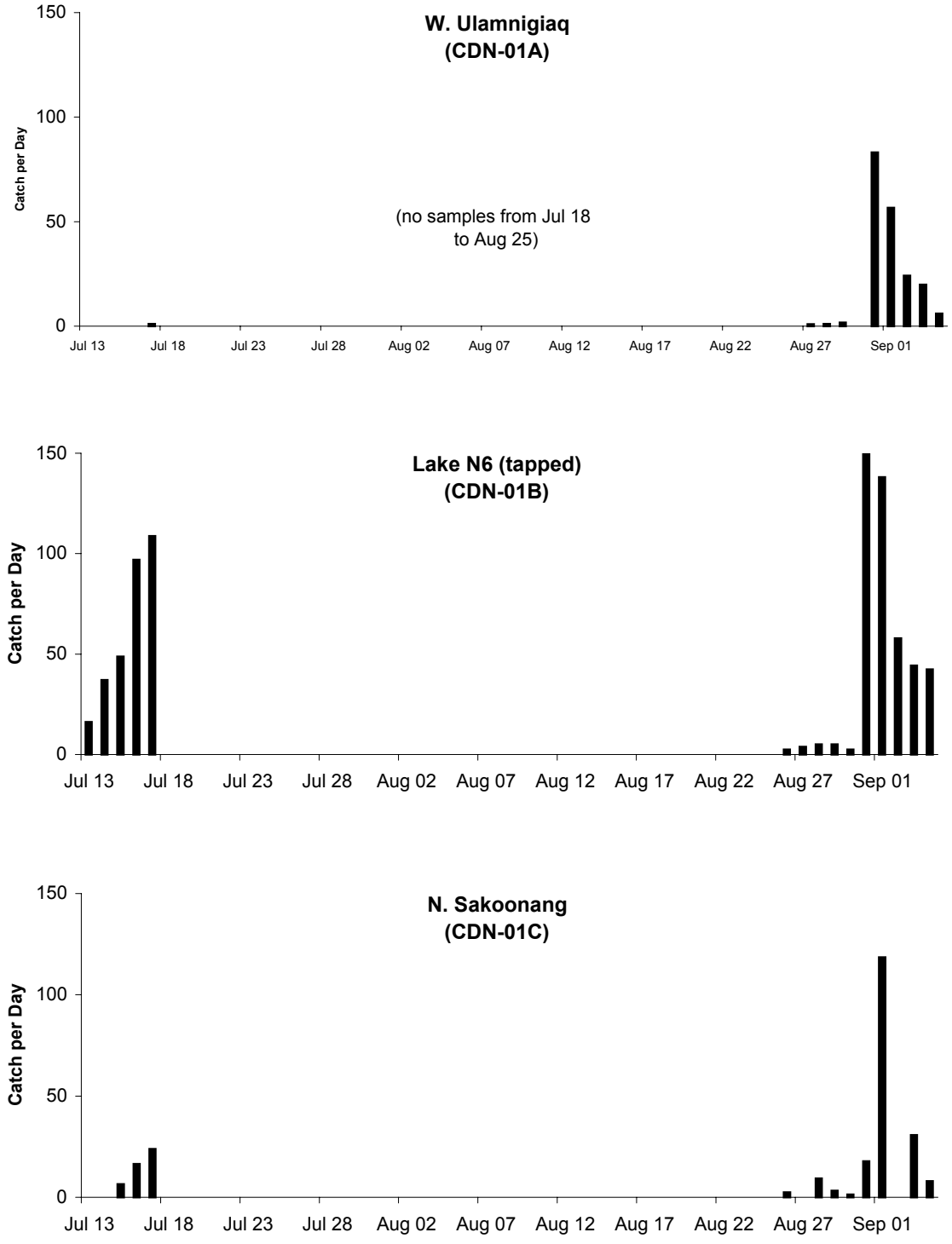

Figure 19. Daily catch rate of humpback whitefish at CD-North study area fyke net stations, 2001.

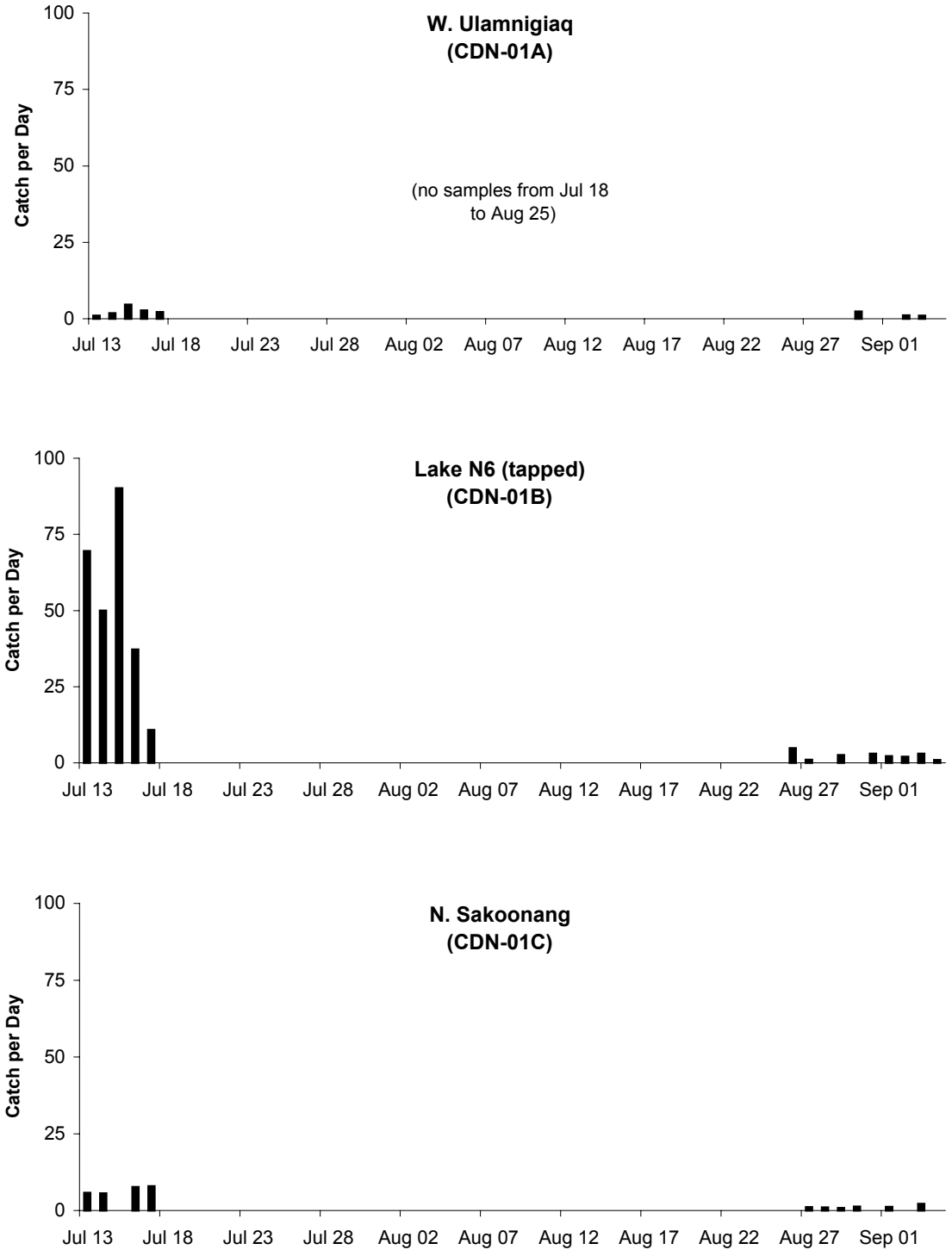

Figure 20. Daily catch rate of round whitefish at CD-North study area fyke net stations, 2001.

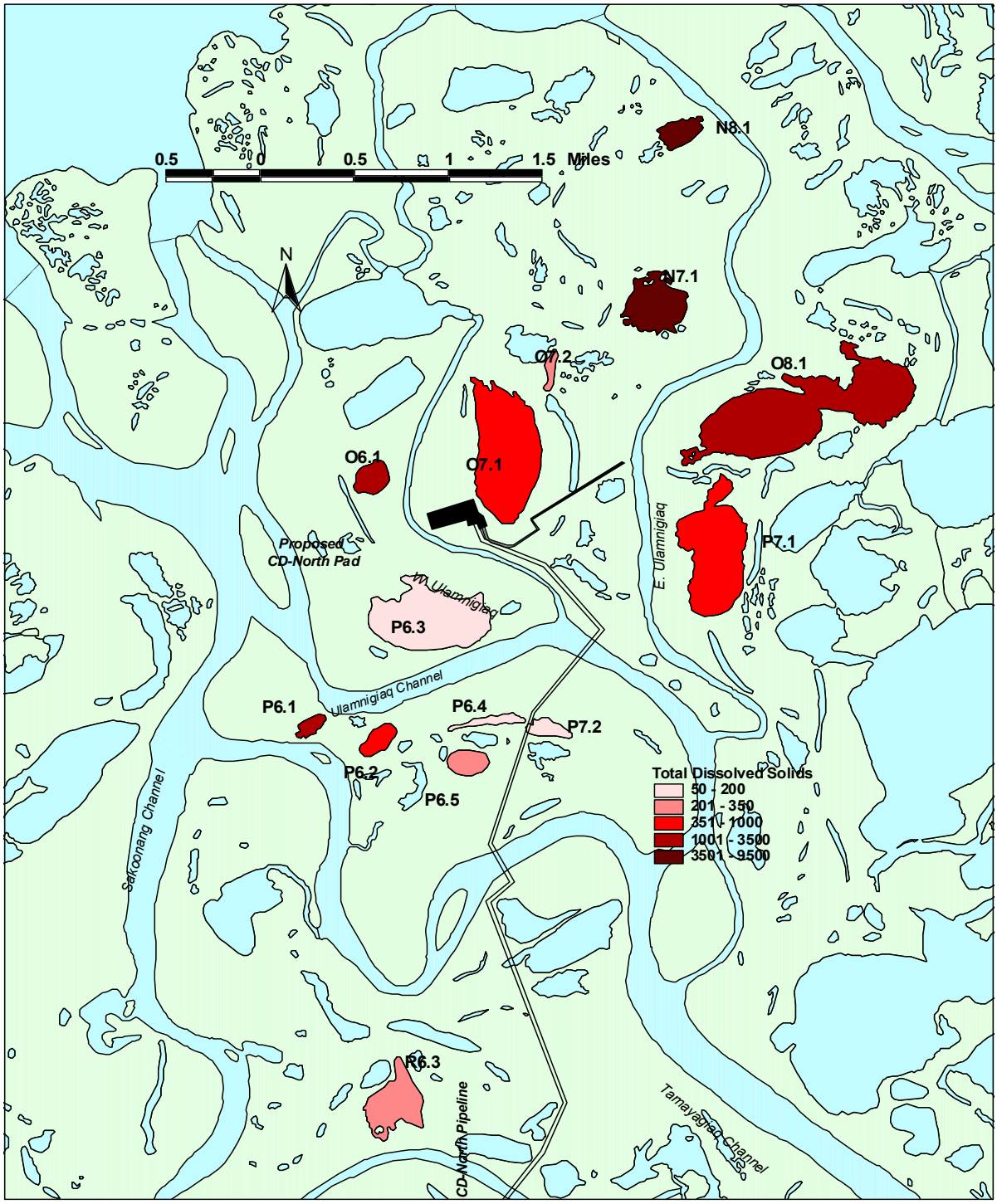

Figure 21. Total dissolved solids in lakes in or near the CD-North exploration area, measured from 1992 to 2000.

DATA APPENDIX

Appendix Tables

Appendix Table 1. Water chemistry parameters measured in conjunction with fyke net sampling in the CD-North study area, 2001.

Station	Date	Time	Water Temp (oC)	Dissolved Oxygen (mg/l)	Dissolved Oxygen (%)	Specific Conductance (microS/cm)	pH	Turbidity (NTU)
CDN-01A								
	Jul 12 01	9:31	3.9	13.1	100	366		
	Jul 13 01	10:40	6.2	12.2	101	556	7.9	148.0
	Jul 14 01	12:45	8.0	12.2	103	782	8.0	133.0
	Jul 15 01	9:45	7.5	11.9	99	722	8.3	49.0
	Jul 16 01	13:05	12.4	11.7	110	1,326	8.1	52.0
	Jul 17 01	10:40	13.9	11.8	115	1,330	8.1	28.4
	Aug 26 01	10:00	3.1	12.1	90	554	7.8	67.5
	Aug 27 01	11:24	3.6	11.3	85	527	7.8	63.7
	Aug 28 01	10:00	4.1	11.8	90	398	7.9	44.5
	Aug 29 01	14:49	4.1	11.6	89	809	8.0	48.0
	Aug 30 01	11:12	3.7	12.7	97	2,129		
	Aug 31 01	10:25					7.7	36.8
	Sep 01 01	10:10	4.0	11.7	90	1,930	7.7	37.4
	Sep 02 01	8:00	3.6	14.3	107	1,887	7.6	26.7
	Sep 03 01	9:30	4.4	11.2	88	1,576	8.0	24.1
	Sep 04 01	9:45	3.5	12.4	95	2,696	8.0	21.5
CDN-01B								
	Jul 12 01	15:55	9.2	10.7	94	1,150		
	Jul 13 01	12:26	7.4	10.2	87	1,387	7.9	174.0
	Jul 14 01	11:05	7.3	11.7	97	1,284	8.0	140.0
	Jul 15 01	10:15	7.2	11.9	99	1,382	8.1	82.8
	Jul 16 01	10:45	10.2	12.0	108	1,354	8.0	59.1
	Jul 17 01	11:10	13.6	11.6	111	1,333	8.1	29.5
	Aug 26 01	10:45	3.1	12.4	94	521	7.9	62.3
	Aug 27 01	10:48	3.6	11.5	87	556	7.8	79.3
	Aug 28 01	10:40	4.1	12.0	92	609	7.8	66.9
	Aug 29 01	15:30	4.4	11.0	89		7.7	146.0
	Aug 30 01	10:50	3.7	12.1	93	1,790	7.8	51.9
	Aug 31 01	10:45					7.7	43.3
	Sep 01 01	9:10	3.8	11.8	90	2,568	7.6	48.7
	Sep 02 01	8:50	3.1	13.8	103	3,043	7.6	46.7
	Sep 03 01	8:40	4.9	12.5	104	10,388	7.8	15.3
	Sep 04 01	10:45	2.4	11.2	86	13,267	7.8	20.9
CDN-01C								
	Jul 12 01	16:45	6.7	11.9	98	1,193		
	Jul 13 01	13:10	6.2	12.1	97	1,301	7.9	184.0
	Jul 14 01	10:15	6.2	11.9	96	1,293	8.1	72.3
	Jul 15 01	12:00	8.6	11.2	96	807	8.0	60.2
	Jul 16 01	10:00	10.5	12.1	109	750	7.8	47.0
	Jul 17 01	13:15	13.4	11.8	113	682	8.1	39.1
	Aug 26 01	11:30	3.2	12.4	94	595	7.8	64.6
	Aug 27 01	10:15	3.8	11.8	89	279	7.9	73.6
	Aug 28 01	9:25	3.7	11.6	88	505	7.8	83.2
	Aug 29 01	15:48	4.0	11.2	85	960	7.8	93.0
	Aug 30 01	10:15	4.0	10.7	82	858	7.8	30.8
	Aug 31 01	12:00					7.8	42.3
	Sep 01 01	8:15	4.2	11.4	89	768	7.7	27.5
	Sep 02 01	9:20	4.0	13.5	107	10,670	7.7	30.4
	Sep 03 01	8:00	4.4	12.3	97	5,169	7.9	25.9
	Sep 04 01	11:20	3.9	11.7	93	11,390	7.9	42.9

Appendix Table 2. Fish catches in CD-North fyke net sampling during July 2001.

Station CDN-01A (Channel)

	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	Total Catch
Broad whitefish		4	1		3	8
Humpback whitefish					1	1
Arctic cisco		4	2	6	6	18
Least cisco		3	3	4	4	14
Round whitefish	1	2	4	3	2	12
Dolly Varden char		1			1	2
Arctic grayling						0
Burbot						0
Rainbow smelt				2	1	3
Arctic flounder						0
Fourhorn sculpin			1		2	3
Ninespine stickleback						0
Effort (hrs)	23.42	26.42	21.00	26.33	22.58	119.75

Station CDN-01B (Tapped Lake N6)

	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	Total Catch
Broad whitefish	87	52	73	92	26	304
Humpback whitefish	13	37	47	99	111	196
Arctic cisco	19	27	29	38	22	113
Least cisco	25	39	56	94	70	214
Round whitefish	56	50	87	38	11	231
Dolly Varden char		1				1
Arctic grayling						0
Burbot		1				1
Rainbow smelt	20	47	75	113	64	255
Arctic flounder	4	17	12	1	1	34
Fourhorn sculpin	19	9		4	2	32
Ninespine stickleback						0
Effort (hrs)	19.33	24.00	23.17	24.50	24.50	115.50

Station CDN-01C (Channel)

	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	Total Catch
Broad whitefish	7	8	3	10	49	28
Humpback whitefish			7	15	27	22
Arctic cisco	10	14	5	14	76	43
Least cisco	4		7	47	105	58
Round whitefish	6	5		7	9	18
Dolly Varden char	1					1
Arctic grayling		8				8
Burbot						0
Rainbow smelt	17	16	66	7	9	106
Arctic flounder		3		1	1	4
Fourhorn sculpin	2	5		4		11
Ninespine stickleback	1	1				2
Effort (hrs)	25.17	21.50	25.75	22.00	27.25	121.67

Appendix Table 3. Fish catches in CD-North fyke net sampling during August-September 2001.

Station CDN-01A (Channel)

	Aug 26	Aug 27	Aug 28	Aug 29	Aug 30	Aug 31	Sep 01	Sep 02	Sep 03	Sep 04	Total Catch
Broad whitefish	3	13	6	12	32	43	38	26	27	7	207
Humpback whitefish		1	1	2		81	56	22	20	6	189
Arctic cisco				1		22	17	1	1		42
Least cisco	4	6	4	11	25	131	151	52	47	1	432
Round whitefish					2			1	1		4
Dolly Varden char			1						2		3
Burbot				1			1				2
Rainbow smelt						1					1
Arctic flounder											0
Fourhorn sculpin	6	7	10	11	5	14	14	52	41	16	176
Ninespine stickleback											0
Effort (hrs)	19.50	24.75	22.65	28.77	20.35	23.40	23.75	21.83	24.17	24.25	233.42

Station CDN-01B (Tapped Lake N6)

	Aug 26	Aug 27	Aug 28	Aug 29	Aug 30	Aug 31	Sep 01	Sep 02	Sep 03	Sep 04	Total Catch
Broad whitefish	10	28	33	33	17	56	60	36	10	16	299
Humpback whitefish	2	4	5	6	2	150	129	57	44	46	445
Arctic cisco			1	3		15	8			2	29
Least cisco	14	12	25	43	25	96	74	59	41	65	454
Round whitefish	4	1		3		3	2	2	3	1	19
Dolly Varden char	1							2			3
Burbot											0
Rainbow smelt						4	4	1			9
Arctic flounder		2						1		1	4
Fourhorn sculpin	25	20	34	49	62	87	54	88	64	100	583
Ninespine stickleback											0
Effort (hrs)	20.00	25.00	24.17	28.47	19.53	24.08	22.42	23.67	23.83	26.08	237.25

Station CDN-01C (Channel)

	Aug 26	Aug 27	Aug 28	Aug 29	Aug 30	Aug 31	Sep 01	Sep 02	Sep 03	Sep 04	Total Catch
Broad whitefish	2	3	13	4	1	14	52		13		102
Humpback whitefish	2		9	4	1	19	100	1	29	9	174
Arctic cisco		2		5		6	9		2	3	27
Least cisco	2	6	23	15	15	61	95	2	23	13	255
Round whitefish		1	1	1	1		1		2		7
Dolly Varden char			1						1		2
Burbot											0
Rainbow smelt											0
Arctic flounder											0
Fourhorn sculpin	2	7	10	19	9	9	26		16	29	127
Ninespine stickleback											0
Effort (hrs)	19.75	22.50	23.42	30.22	18.62	25.75	20.25		22.67	27.33	210.50

Appendix Table 4. Length frequencies of least cisco caught by fyke net in the CD-North study area, 2001.

Fork Length (mm)	CDN-01A Jul 13	Jul 15	Jul 16	Jul 17	July Total	Aug 26	Aug 27	Aug 28	Aug 29	Aug 30	Aug 31	Sep 01	Sep 02	Sep 03	Sep 04	Aug/ Sep Total
0					0											0
10					0											0
20					0											0
30					0											0
40					0		3			13	4	4				24
50					0	3		1	6	9	13	22				54
60		1			1						4	5				9
70	1	1	2		4							2				2
80	1		1		2						4	3	2	2	1	12
90	1				1			1	2	1	34	43	6			87
100				1	1	1	1	1	1	1	34	38	19			96
110			1	2	3			1	1		8	8	6	1		25
120					0							5	3	1		9
130					0					1	6	8	4	1		20
140					0						3	5	2	3		13
150					0						4	3	1	1		9
160					0						2	1		6		9
170					0		1				3	3		3		10
180		1			1				1		2		1			4
190					0						1		1			2
200					0											0
210					0								1	1		2
220					0						2		1	1		4
230					0											0
240					0		1				2		2	1		6
250					0											0
260				1	1						2			1		3
270					0						1					1
280					0						2		1			3
290					0							1				1
300					0											0
310					0									1		1
320					0											0
330					0											0
340					0								2			2
350					0											0
360					0											0
370					0											0
380					0											0
390					0											0
400					0											0
Total:	3	3	4	4	14	4	6	4	11	25	131	151	52	23	1	408

Appendix Table 4. Length frequencies of least cisco caught by fyke net in the CD-North study area, 2001.

Fork Length (mm)	CDN-01B					July												Aug/ Sep
	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	Total	Aug 26	Aug 27	Aug 28	Aug 29	Aug 30	Aug 31	Sep 01	Sep 02	Sep 03	Sep 04	Total
0						0												0
10						0												0
20						0												0
30						0			1									1
40						0			1		1							2
50	1					1												0
60	1	1	2		1	5							1					1
70	3	6	7	6	4	26												0
80	2	1		7		10						4		1		1		6
90	1			2	2	5	1	1	2	6	4	20	17	4	3	3		61
100	3	8	3	9	4	27		1	3	6	4	21	17	6	2	3		63
110	2	3	13	11	8	37				1		6	4	1		2		14
120	4	1	4	7	7	23	1	1		4	1	4	2	4				17
130	1	3	2	6	3	15				6	2	4		3	2	1		18
140	4	3		2		9			1	4	1	5	6	3	6	10		36
150	1		1	4	9	15	1		1	1		3	2	2	2	3		15
160		1	2	6	3	12		1	1		2	4	2	3	5	6		24
170	2	1	5	3	1	12				2	2	3	2	5	4	6		24
180	1	2	1	1	3	8	1		2			3	3	8	2	3		22
190		2	3		5	10		2		1	2	3		1	3	4		16
200	1	1	4			6				1	1	1		2	4	2		11
210			1	2		3		1				3	2	2	3	1		12
220		2	1	4	2	9	1		5			1	5	1		2		15
230		1	1	6	1	9					2	3	1	4		2		12
240			3	7	4	14		2	1	1		2	2	5	1	3		17
250			1	2	3	6			1						1			2
260			1	1	1	3			1	2			4	1	1	2		11
270		1		1	4	6	1				2		1	1	1	3		9
280					1	1	1		1	1		2				2		7
290				2	1	3				2	1	3	1			2		9
300				1	1	2	2	1	1	4				1		1		10
310		1		1	1	3	3	1	1	1		1	1			1		9
320		1			1	2			1							1		2
330			1	1		2		1					1		1	1		4
340						0	2		1									3
350				1		1								1				1
360				1		1												0
370						0												0
380						0												0
390						0												0
400						0												0
Total:	27	39	56	94	70	286	14	12	25	43	25	96	74	59	41	65		454

Appendix Table 4. Length frequencies of least cisco caught by fyke net in the CD-North study area, 2001.

Fork Length (mm)	CDN-01C Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	July Total	Aug 26	Aug 27	Aug 28	Aug 29	Aug 30	Aug 31	Sep 01	Sep 02	Sep 03	Sep 04	Aug/ Sep Total
0						0											0
10						0											0
20						0											0
30						0											0
40						0					1		6		1		8
50						0	1			2		6	29		4		42
60	1			2	5	1	9					1	4		2		7
70		1	1	7	6	15											0
80		1		3	4	8							7				7
90					1	1	1	1	1	1	1	14	14		6	3	42
100	1			7	14	22			8	2	1	16	14		9	2	52
110	1	2	1	10	22	36				3		5	4		1	1	14
120			1	5	13	19			2	2	1	3			2		10
130				1	3	4		1	3		3	2	3		1		13
140				2	2	4				1		1	2		1		5
150				2	9	11				1	3	3	3	2	3		15
160				2	4	6		1					1		3		5
170						0						1			4	2	7
180			2		1	3			1		1	3			4		9
190	1				4	5						2			1	1	4
200					2	2						1					1
210				1	1	2									1		1
220				1	1	2							1				1
230					1	1						1	1		2		4
240					5	5		1		1			2		1	1	6
250					3	3			1		2						3
260					2	2		1		2			1				4
270				1	2	3			1							1	2
280					2	2			1		1				1	1	4
290						0			3								3
300						0		1			1		1			1	4
310					1	1			2								2
320						0							1				1
330						0							1				1
340						0											0
350						0						1					1
360						0											0
370						0											0
380						0											0
390						0						1					1
400						0											0
Total:	4	4	7	47	104	166	2	6	23	15	15	61	95	2	47	13	279

Appendix Table 5. Length frequencies of arctic cisco caught by fyke net in the CD-North study area, 2001.

Fork Length (mm)	CDN-01A												CDN-01B					
	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	July Total	Aug 29	Aug 31	Sep 01	Sep 02	Sep 03	Aug/ Sep Total	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	July Total
0						0						0						0
10						0						0						0
20						0						0						0
30						0						0						0
40						0						0						0
50						0						0						0
60						0						0						0
70	1					1						0	2					2
80			3		3	6						0		1	3			4
90				1	1	2						0	2	2	2			6
100					1	1		2	5			7		1	2	3	2	8
110			1			1		10	8	1	1	20	5	6	6	10	2	29
120		1		2	2	5		6	3			9	6	12	4	13	7	42
130			1		2	3	1	1				2	3	3	7	6	5	24
140						0		2	1			3		1	3	3		7
150						0		1				1			2	1	2	5
160						0						0						0
170						0						0				1		1
180						0						0		1			1	2
190						0					1	1		2		1	2	5
200						0						0						0
210						0						0						0
220						0						0						0
230						0						0					1	1
240						0						0						0
250						0						0						0
260						0						0						0
270						0						0						0
280						0						0						0
290						0						0						0
300						0						0						0
310						0						0						0
320						0						0						0
330						0						0						0
340						0						0						0
350						0						0						0
360						0						0						0
370						0						0						0
380						0						0						0
390						0						0						0
400						0						0						0
410						0						0						0
Total:	1	4	2	6	6	19	1	22	17	1	2	43	18	29	29	38	22	136

Appendix Table 5. Length frequencies of arctic cisco caught by fyke net in the CD-North study area, 2001.

Fork Length (mm)	CDN-01B					Aug/ Sep	CDN-01C					July							Aug/ Sep
	Aug 28	Aug 29	Aug 31	Sep 01	Sep 04	Total	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	Total	Aug 27	Aug 29	Aug 31	Sep 01	Sep 03	Sep 04	Total
0						0						0							0
10						0						0							0
20						0						0							0
30						0						0							0
40						0						0							0
50						0						0							0
60						0						0							0
70						0	1					1							0
80						0	2	3	1	1	1	8							0
90				1		1		1			4	5							0
100	1		1			2	2	3		3	5	13			1	2		1	4
110			6	3		9	1	2	2	1	10	16		1	1	4	1	1	8
120			2	1	1	4	2	3	1	6	26	38	2		1			1	4
130			3	2		5	2	1	1	3	21	28				1			1
140		2	1			3		1			5	6		3	2	2			7
150			2		1	3						0		1	1				2
160		1				1						0							0
170						0						0							0
180						0					1	1							0
190						0					2	2							0
200						0					1	1							0
210						0						0							0
220						0						0							0
230						0						0							0
240						0						0							0
250						0						0							0
260						0						0							0
270						0						0							0
280						0						0							0
290						0						0							0
300						0						0							0
310						0						0							0
320						0						0							0
330						0						0							0
340						0						0							0
350						0						0							0
360						0						0							0
370						0						0							0
380						0						0							0
390						0						0							0
400				1		1						0							0
410						0						0							0
Total:	1	3	15	8	2	29	10	14	5	14	76	119	2	5	6	9	1	3	26

Appendix Table 6. Length frequencies of broad whitefish caught by fyke net in the CD-North study area, 2001.

Fork Length (mm)	Jul 14	Jul 15	Jul 17	July Total	Aug 26	Aug 27	Aug 28	Aug 29	Aug 30	Aug 31	Sep 01	Sep 02	Sep 03	Sep 04	Aug/ Sep Total
0				0											0
10				0											0
20				0											0
30				0					1						1
40				0					3						3
50				0			1	3	17	5	2				28
60			1	1		2		1	4	4	5	2			18
70	1		1	2					1						1
80		1	1	2		1									1
90				0			1						1	1	3
100				0						1	2	1		1	5
110				0								2	1		3
120				0	1	1			1	3	2			2	10
130	1			1		1				2					3
140				0			2		1	5	5	1	1	2	17
150				0		1	1	2		6	3	8	1		22
160				0		1		2	1	5	4	2	1		16
170	2			2			1		1	1	5	2	4		14
180				0		1		1		3	2	2	1	1	11
190				0	1			2	1	1	2	1	1		9
200				0				1		2		1	1		5
210				0		2				1	2	2			7
220				0		2					1	2			5
230				0						1	1		1		3
240				0	1					1	1				3
250				0											0
260				0		1									1
270				0						1					1
280				0											0
290				0											0
300				0											0
310				0											0
320				0											0
330				0											0
340				0						1					1
350				0					1						1
360				0							1				1
370				0											0
380				0											0
390				0											0
400				0											0
410				0											0
420				0											0
430				0											0
440				0											0
450				0											0
Total:	4	1	3	8	3	13	6	12	32	43	38	26	13	7	193

Appendix Table 6. Length frequencies of broad whitefish caught by fyke net in the CD-North study area, 2001.

Fork Length (mm)	CDN-01B Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	July Total	Aug 26	Aug 27	Aug 28	Aug 29	Aug 30	Aug 31	Sep 01	Sep 02	Sep 03	Sep 04	Aug/ Sep Total
0						0											0
10						0											0
20						0											0
30						0											0
40						0		1									1
50						0			1	1							2
60	1	2	1	1		5		1		1							2
70	1	1	7	2		11						1	1				2
80	1					1											0
90	1	1		1		3						1	1				2
100						0			1		1	2	2	1			7
110		1	1			2	2	1	1	1	1	3	4	2	1	1	17
120	2	1	3	4	1	11				1		2	4	1		2	10
130	4	10	11	14	1	40			1	2			4	1			8
140	8	1	9	8	1	27	2	2	5	4	1	5	4	1	2	2	28
150	8	1	5	6		20	1	1	7		2	4	8	3	1	2	29
160	5	3	4	5	2	19	1	5	3	4		10	3	2	3	3	34
170	10	2	6	18	5	41		2	1	4	1	3	4	7		1	23
180	11	6	6	6	2	31		1	3	4	2	5	3	2		2	22
190	8	4	1	4	2	19		2	3	3	4	5	8	2			27
200	3	3	4	7	5	22		5	1	3	1	3	5	1			19
210	6	6	4	5	2	23	1	2	1		1	4	1	4	1	1	16
220	4	5	3	3	2	17		2	1		1	3	4	1			12
230	4	1		4	1	10	1	1		1	1	2		3			9
240	4	2	3		1	10			1		1			1			3
250	1	1	1		1	4	1		1								2
260	2					2				1							1
270			1	1		2			1								1
280	2	2				4											0
290			1			1			1			1		1			3
300			1			1							1		1		2
310				3		3								1			1
320						0	1								1	1	3
330						0						1					1
340						0		1				1					2
350						0							1	1			2
360						0				1			1			1	3
370						0				1							1
380						0											0
390						0								1			1
400						0							1				1
410						0											0
420						0				1							1
430						0											0
440						0											0
450						0											0
Total:	86	53	72	92	26	329	10	27	33	33	17	56	60	36	10	16	298

Appendix Table 6. Length frequencies of broad whitefish caught by fyke net in the CD-North study area, 2001.

Fork Length (mm)	CDN-01C Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	July Total	Aug 26	Aug 27	Aug 28	Aug 29	Aug 30	Aug 31	Sep 01	Sep 03	Aug/ Sep Total
0						0									0
10						0									0
20						0									0
30						0									0
40						0						1	2		3
50						0						1	12	4	17
60	1					1				1		1	12	10	24
70						0						1	4		5
80	1					1								1	1
90					1	1									0
100						0								1	1
110						0							3		3
120				1	4	5						1	1		2
130		1			6	7								1	1
140	1	1		1	4	7	1				1	1	1		4
150		1		3	1	5		1	2				6	1	10
160			1	2	3	6	1		2	1		2	5	3	14
170		2			8	10			2			1	2	2	7
180	2	1	1		5	9			3	1		2	1	2	9
190					5	5		1						1	2
200			1		2	3			1					1	2
210	1			1	5	7				1			1		2
220					3	3			2			1			3
230						0			1			2			3
240		1			1	2							1		1
250						0									0
260						0									0
270						0									0
280				1		1							1		1
290						0									0
300				1	1	2									0
310	1					1									0
320						0		1							1
330						0									0
340						0									0
350						0									0
360						0									0
370						0									0
380						0									0
390						0									0
400						0									0
410						0									0
420						0									0
430						0									0
440						0									0
450						0									0
Total:	7	7	3	10	49	76	2	3	13	4	1	14	52	27	116

Appendix Table 7. Length frequencies of humpback whitefish caught by fyke net in the CD-North study area, 2001.

Fork Length (mm)	CDN-01A Jul 17	July Total	Aug 27	Aug 28	Aug 29	Aug 31	Sep 01	Sep 02	Sep 03	Sep 04	Aug/ Sep Total
0		0									0
10		0									0
20		0									0
30		0									0
40		0									0
50		0				1	1				2
60		0									0
70		0									0
80		0				1	1				2
90		0			1	11	8	3	2		25
100		0			1	12	9	2	2		26
110	1	1				5	2	3	1		11
120		0				9	4	4	1	1	19
130		0	1			8	5	2	3	2	21
140		0				3	7				10
150		0				5	5		3	2	15
160		0		1		12	6	4	7		30
170		0				5	2	2	5	1	15
180		0				2			2		4
190		0				1	1				2
200		0				1	1	2			4
210		0				2	1				3
220		0				2	1		1		4
230		0				1					1
240		0					1				1
250		0									0
260		0									0
270		0									0
280		0							1		1
290		0									0
300		0									0
310		0									0
320		0					1		1		2
330		0									0
340		0									0
350		0									0
360		0									0
370		0									0
380		0									0
390		0									0
400		0									0
410		0									0
420		0									0
430		0									0
440		0									0
Total:	1	1	1	1	2	81	56	22	29	6	198

Appendix Table 7. Length frequencies of humpback whitefish caught by fyke net in the CD-North study area, 2001.

Fork Length (mm)	CDN-01B Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	July Total	Aug 26	Sep 27	Oct 28	Nov 29	Dec 30	Jan 31	Sep 1	Sep 2	Sep 3	Sep 4	Aug/ Sep Total
0						0											0
10						0											0
20						0											0
30						0											0
40						0											0
50						0											0
60				1		1											0
70		1		3		4											0
80					1	1											0
90				1		1		1		1		7	7	4			20
100		1		2	2	5			1	2		13	13	2	1	1	33
110		2	2	8	7	19						5	5	4	2	2	18
120	1	2	1	1	2	7	1			1		10	14	3	2	1	32
130	1	3	3	7	2	16		1		2		18	15	6	4	3	49
140		2	1	12	16	31						14	12	1	3	2	32
150	1	4	5	13	19	42			1			16	9	5	4	7	42
160	1	3	4	5	18	31					1	18	24	10	12	11	76
170		2	2	5	1	10						11	4	8	5	3	31
180			6	11	10	27			1			7	7	2	2	5	24
190		5	9	11	8	33						8	9	6	3	3	29
200		4	4	5	6	19						7	1	2	4	5	19
210	1		3	2	6	12		1	1		1	8	2	4	2	1	20
220	3	2	2	2	3	12						3	3			1	7
230	1			3	4	8						2					2
240	1	1	1	1	1	5						1					1
250		1			1	2											0
260					2	2											0
270		1	1	1	1	4	1	1									2
280				1		1			1								1
290				1	1	2											0
300	1					1											0
310			1	1		2						1					1
320						0							1				1
330	1		1	1		3											0
340						0											0
350	1	1				2						1					1
360		1	1			2							1				1
370		1				1							1				1
380						0											0
390						0											0
400						0							1				1
410						0											0
420						0											0
430						0										1	1
440						0											0
Total:	13	37	47	98	111	306	2	4	5	6	2	150	129	57	44	46	445

Appendix Table 7. Length frequencies of humpback whitefish caught by fyke net in the CD-North study area, 2001.

Fork Length (mm)	CDN-01C Jul 14	Jul 15	Jul 16	Jul 17	July Total	Aug 26	Aug 28	Aug 29	Aug 30	Aug 31	Sep 01	Sep 02	Sep 03	Sep 04	Aug/ Sep Total
0					0										0
10					0										0
20					0										0
30					0										0
40					0										0
50					0	1					2				3
60					0					1					1
70				4	4										0
80				2	2						3				3
90				1	1			1		4	13		1	2	21
100				6	6	1				3	6		1		11
110	2		1	11	14					3	3				6
120	1			8	9		1				8		1	1	11
130	2	1		4	7		2	1	1	2	12		5	3	26
140			3	14	17		2	1		2	4		2		11
150	1	2	5	19	27		1			2	11		1	1	16
160		4	1	15	20						8		4		12
170			1	6	7		2			1	5		2		10
180			2	10	12		1				7				8
190	1			8	9						7				7
200	1			6	7						3				3
210				1	1			1		1	2	1			5
220			1	5	6										0
230					0										0
240			1	3	4						2		1		3
250				1	1									1	1
260					0										0
270					0										0
280				1	1						1				1
290					0						1		1	1	3
300					0										0
310					0										0
320					0										0
330					0										0
340					0										0
350					0						2				2
360				1	1										0
370					0								1		1
380					0										0
390					0										0
400					0										0
410					0										0
420					0										0
430					0										0
440					0										0
Total:	8	7	15	126	156	2	9	4	1	19	100	1	20	9	165

Appendix Table 8. Length frequencies of round whitefish caught by fyke net in the CD-North study area, 2001.

Fork Length (mm)	CDN-01A										CDN-01B					
	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	July Total	Aug 30	Sep 02	Sep 03	Aug/ Sep Total	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	July Total
0						0				0						0
10						0				0						0
20						0				0						0
30						0				0						0
40						0				0						0
50						0				0						0
60		1				1				0		1				1
70			1	1		2				0	1	1	1			3
80				2		2				0				1		1
90						0	1			1						0
100						0				0			1	2		3
110			1		1	2			1	1	4	3	6	1		14
120						0				0	3	3	7	4	1	18
130			1			1	1			1	4	2	9	4		19
140						0				0	7	6	3	6	1	23
150	1				1	2				0	13	11	15	6	4	49
160						0				0	9	7	15	4	1	36
170			1			1		1		1	1	1	5		1	8
180		1				1				0	4	3	6	3		16
190						0				0	6	3	8	3	1	21
200						0				0	4	6	4	1	1	16
210						0				0		2	3	3	1	9
220						0				0	1		3			4
230						0			1	1						0
240						0				0						0
250						0				0						0
260						0				0						0
270						0				0						0
280						0				0						0
290						0				0						0
300						0				0						0
310						0				0						0
320						0				0						0
330						0				0						0
340						0				0			1			1
350						0				0						0
360						0				0						0
370						0				0						0
380						0				0						0
390						0				0						0
400						0				0						0
Total:	1	2	4	3	2	12	2	1	2	5	57	49	87	38	11	242

Appendix Table 8. Length frequencies of round whitefish caught by fyke net in the CD-North study area, 2001.

Fork Length (mm)	CDN-01B								Aug/ Sep Total	CDN-01C				July Total							Aug/ Sep Total
	Aug 26	Aug 27	Aug 29	Aug 31	Sep 01	Sep 02	Sep 03	Sep 04		Jul 13	Jul 14	Jul 16	Jul 17		Aug 27	Aug 28	Aug 29	Aug 30	Sep 01	Sep 03	
0									0					0							0
10									0					0							0
20									0					0							0
30									0					0							0
40									0					0							0
50									0					0							0
60									0		1			1							0
70									0	1				1							0
80									0		1			1							0
90	1		1		1				3					0					1		1
100			1	1			1	1	4					0			1				1
110									0	1				1							0
120	2			1					3		2		3	5							0
130	1		1						2					0		1		1			2
140				1		1	1		3			1		1							0
150		1							1			1	3	4							0
160							1		1	1		2	1	4							0
170						1			1	1		1		2						1	1
180									0	1				1							0
190									0			1	1	2							0
200									0		1	1	1	3							0
210					1				1					0							0
220									0					0							0
230									0					0	1						1
240									0					0							0
250									0					0							0
260									0					0							0
270									0					0							0
280									0					0							0
290									0	1				1							0
300									0					0							0
310									0					0							0
320									0					0							0
330									0					0							0
340									0					0							0
350									0					0							0
360									0					0							0
370									0					0							0
380									0					0							0
390									0					0							0
400									0					0							0
Total:	4	1	3	3	2	2	3	1	19	6	5	7	9	27	1	1	1	1	1	1	6

Appendix Table 9. Length frequencies of rainbow smelt caught by fyke net in the CD-North study area, 2001.

Fork Length (mm)	CDN-01A					Aug/ Sep	CDN-01B						July				Aug/ Sep	CDN-01C						July
	Jul 16	Jul 17	July Total	Aug 31	Aug/ Sep Total		Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	July Total		Aug 31	Sep 01	Sep 02	Aug/ Sep Total		Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	July Total
0			0		0							0					0							0
10			0		0							0					0							0
20			0		0							0					0							0
30			0		0							0					0							0
40			0		0							0					0							0
50			0		0			1		1		2					0		1			2		3
60			0		0			1	1	1	2	5					0		1	1	6		1	9
70			0		0		10	9	6	14	6	45					0		4	4	17	2	1	28
80		1	1		0		5	9	16	19	15	64					0		7	4	25		2	38
90	2		2	1	1		3	14	17	21	12	67					0		4	3	10	2		19
100			0		0			2	14	18	5	39		2			2			2	3	1	1	7
110			0		0			3	7	12	6	28		1			1				1		1	2
120			0		0			1	3	7	5	16					0					1		1
130			0		0		1			5	5	11			1		1						1	1
140			0		0					1	1	2					0				1			1
150			0		0					3	1	4				1	1							0
160			0		0					1		1					0			1	1			2
170			0		0					2		2					0							0
180			0		0			1			3	4					0						1	1
190			0		0			1	2		1	4			1		1							0
200			0		0			2		3		5					0			1				1
210			0		0					1	1	2					0							0
220			0		0							0					0							0
230			0		0			1			1	2		1			1							0
240			0		0				1	2		3					0							0
250			0		0		1		1			2					0							0
260			0		0				3	2		5					0					1	1	2
270			0		0			1	1			2			2		2							0
280			0		0				2			2					0							0
290			0		0				1			1					0							0
300			0		0							0					0							0
310			0		0							0					0							0
320			0		0							0					0							0
330			0		0							0					0							0
340			0		0							0					0							0
350			0		0							0					0							0
360			0		0							0					0							0
370			0		0							0					0							0
380			0		0							0					0							0
390			0		0							0					0							0
400			0		0							0					0							0
Total:	2	1	3	1	1		20	46	75	113	64	318		4	4	1	9		17	16	66	7	9	115

Appendix Table 10. Length frequencies of arctic flounder caught by fyke net in the CD-North study area, 2001.

Fork Length (mm)	CDN-01B								CDN-01C			
	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	Sep 02	Sep 04	Total	Jul 14	Jul 16	Jul 17	Total
0								0				0
10								0				0
20								0				0
30								0				0
40								0				0
50								0				0
60								0				0
70								0				0
80	1			1				2			1	1
90		2						2	1			1
100								0				0
110		2						2				0
120								0				0
130								0				0
140		2						2				0
150		1						1				0
160								0				0
170	1		2		1			4				0
180		2	2					4				0
190	1	2				1	1	5	1			1
200		2	3					5				0
210	1	3	4					8	1			1
220		1						1		1		1
230								0				0
240								0				0
250								0				0
Total:	4	17	4	1	1	1	1	36	3	1	1	5

Appendix Table 11. Length frequencies of Dolly Varden char caught by fyke net in the CD-North study area, 2001.

Fork Length (mm)	CDN-01A				CDN-01B				CDN-01C			
	Jul 14	Jul 17	Aug 28	Total	Jul 14	Aug 26	Sep 02	Total	Jul 13	Aug 28	Sep 03	Total
0				0				0				0
10				0				0				0
20				0				0				0
30				0				0				0
40				0				0				0
50				0				0				0
60				0				0				0
70				0				0				0
80				0				0				0
90				0				0				0
100				0				0				0
110				0				0				0
120				0				0				0
130				0				0				0
140				0				0				0
150				0				0				0
160	1	1		2	1			1				0
170				0				0				0
180				0				0	1			1
190			1	1				0				0
200				0			1	1				0
210				0				0			2	2
220				0			1	1				0
230				0		1		1			1	1
240				0				0		1		1
250				0				0				0
Total:	1	1	1	3	1	1	2	4	1	1	3	5

Appendix Table 12. Tagged fish released in the CD-North study area, 2001.

Release Station	Release Date	Species	Fork Length (mm)	Tag Number	Capture Station	Capture Date	Capture Length
CDN-01B	7/13/2001	HBWF	335	MJM010301			
CDN-01B	7/13/2001	BDWF	252	MJM010302			
CDN-01B	7/13/2001	BDWF	288	MJM010303			
CDN-01B	7/13/2001	BDWF	262	MJM010304			
CDN-01B	7/13/2001	HBWF	351	MJM010306			
CDN-01B	7/13/2001	BDWF	270	MJM010307			
CDN-01B	7/13/2001	RBSM	258	MJM010308			
CDN-01B	7/13/2001	BDWF	286	MJM010309			
CDN-01B	7/13/2001	HBWF	303	MJM010312			
CDN-01C	7/13/2001	RDWF	292	MJM010313			
CDN-01C	7/13/2001	BDWF	311	MJM010314			
CDN-01B	7/14/2001	BDWF	290	MJM010315			
CDN-01B	7/14/2001	HBWF	375	MJM010316			
CDN-01B	7/14/2001	LSCS	276	MJM010318			
CDN-01B	7/14/2001	HBWF	272	MJM010319			
CDN-01B	7/14/2001	HBWF	257	MJM010320			
CDN-01B	7/14/2001	BDWF	283	MJM010322			
CDN-01B	7/14/2001	LSCS	317	MJM010323			
CDN-01B	7/14/2001	LSCS	330	MJM010324			
CDN-01B	7/14/2001	HBWF	363	MJM010325			
CDN-01B	7/14/2001	HBWF	360	MJM010326			
CDN-01B	7/14/2001	BDWF	258	MJM010327			
CDN-01B	7/14/2001	BURB	510	MJM010328			
CDN-01B	7/15/2001	BDWF	256	MJM010329			
CDN-01B	7/15/2001	LSCS	268	MJM010330			
CDN-01B	7/15/2001	LSCS	255	MJM010331			
CDN-01B	7/15/2001	LSCS	337	MJM010332			
CDN-01B	7/15/2001	HBWF	335	MJM010333			
CDN-01B	7/15/2001	HBWF	316	MJM010334			
CDN-01B	7/15/2001	HBWF	278	MJM010337			
CDN-01B	7/15/2001	BDWF	272	MJM010338			
CDN-01B	7/15/2001	HBWF	362	MJM010339			
CDN-01B	7/15/2001	BDWF	299	MJM010340			
CDN-01B	7/15/2001	RDWF	347	MJM010341			
CDN-01B	7/15/2001	BDWF	306	MJM010342			
CDN-01C	7/16/2001	LSCS	272	MJM010343			
CDN-01C	7/16/2001	BDWF	301	MJM010344			
CDN-01C	7/16/2001	BDWF	283	MJM010345			
CDN-01B	7/16/2001	LSCS	267	MJM010346			
CDN-01B	7/16/2001	HBWF	276	MJM010347			
CDN-01B	7/16/2001	LSCS	250	MJM010348			
CDN-01B	7/16/2001	LSCS	294	MJM010349			
CDN-01B	7/16/2001	LSCS	254	MJM010350			
CDN-01B	7/16/2001	LSCS	363	MJM010351			
CDN-01B	7/16/2001	LSCS	259	MJM010352			
CDN-01B	7/16/2001	LSCS	277	MJM010354			
CDN-01B	7/16/2001	LSCS	291	MJM010355			
CDN-01B	7/16/2001	LSCS	332	MJM010356			
CDN-01B	7/16/2001	LSCS	308	MJM010357			
CDN-01B	7/16/2001	BDWF	314	MJM010358			
CDN-01B	7/16/2001	BDWF	319	MJM010359			
CDN-01B	7/16/2001	BDWF	313	MJM010360			
CDN-01B	7/16/2001	LSCS	312	MJM010361	Nuiqsut	10/31/2001	308
CDN-01B	7/16/2001	LSCS	357	MJM010362			

Appendix Table 12. Tagged fish released in the CD-North study area, 2001.

Release Station	Release Date	Species	Fork Length (mm)	Tag Number	Capture Station	Capture Date	Capture Length
CDN-01B	7/16/2001	HBWF	338	MJM010363			
CDN-01B	7/16/2001	HBWF	285	MJM010364			
CDN-01B	7/16/2001	BDWF	280	MJM010365			
CDN-01B	7/16/2001	HBWF	311	MJM010366			
CDN-01B	7/16/2001	HBWF	293	MJM010367			
CDN-01A	7/17/2001	LSCS	263	MJM010368			
CDN-01B	7/17/2001	BDWF	256	MJM010369			
CDN-01B	7/17/2001	LSCS	295	MJM010370			
CDN-01B	7/17/2001	LSCS	254	MJM010372			
CDN-01B	7/17/2001	HBWF	272	MJM010374			
CDN-01B	7/17/2001	HBWF	268	MJM010375			
CDN-01B	7/17/2001	LSCS	274	MJM010376			
CDN-01B	7/17/2001	LSCS	267	MJM010378			
CDN-01B	7/17/2001	LSCS	288	MJM010379			
CDN-01B	7/17/2001	LSCS	307	MJM010380			
CDN-01B	7/17/2001	LSCS	260	MJM010381			
CDN-01B	7/17/2001	LSCS	250	MJM010383			
CDN-01B	7/17/2001	HBWF	296	MJM010385			
CDN-01B	7/17/2001	LSCS	326	MJM010386			
CDN-01B	7/17/2001	LSCS	258	MJM010387			
CDN-01B	7/17/2001	HBWF	259	MJM010389			
CDN-01B	7/17/2001	LSCS	272	MJM010391			
CDN-01B	7/17/2001	LSCS	274	MJM010393			
CDN-01B	7/17/2001	LSCS	311	MJM010394			
CDN-01B	7/17/2001	LSCS	273	MJM010395			
CDN-01B	7/17/2001	LSCS	250	MJM010398			
CDN-01B	7/17/2001	HBWF	268	MJM010399			
CDN-01C	7/17/2001	LSCS	250	MJM010400			
CDN-01C	7/17/2001	LSCS	289	MJM010501			
CDN-01C	7/17/2001	LSCS	267	MJM010502			
CDN-01C	7/17/2001	HBWF	254	MJM010504			
CDN-01C	7/17/2001	LSCS	273	MJM010505			
CDN-01C	7/17/2001	LSCS	276	MJM010506			
CDN-01C	7/17/2001	LSCS	259	MJM010507			
CDN-01C	7/17/2001	LSCS	258	MJM010508			
CDN-01C	7/17/2001	HBWF	366	MJM010509			
CDN-01C	7/17/2001	LSCS	289	MJM010510			
CDN-01C	7/17/2001	LSCS	315	MJM010511			
CDN-01C	7/17/2001	LSCS	252	MJM010512			
CDN-01C	7/17/2001	HBWF	286	MJM010513			
CDN-01C	7/17/2001	HBWF	250	MJM010514			
CDN-01C	7/17/2001	LSCS	265	MJM010515			
CDN-01C	7/17/2001	BDWF	309	MJM010516			
CDN-01C	9/1/2001	LSCS	326	MJM011142			
CDN-01C	9/1/2001	HBWF	297	MJM011143			
CDN-01C	9/1/2001	HBWF	352	MJM011144			
CDN-01C	9/1/2001	HBWF	354	MJM011145			
CDN-01B	9/1/2001	LSCS	265	MJM011151			
CDN-01B	9/1/2001	LSCS	300	MJM011152			
CDN-01B	9/1/2001	HBWF	364	MJM011153			
CDN-01B	9/1/2001	LSCS	313	MJM011156			
CDN-01B	9/1/2001	ARCS	403	MJM011157			
CDN-01B	9/1/2001	BDWF	353	MJM011158			
CDN-01B	9/1/2001	BDWF	409	MJM011159			

Appendix Table 12. Tagged fish released in the CD-North study area, 2001.

Release Station	Release Date	Species	Fork Length (mm)	Tag Number	Capture Station	Capture Date	Capture Length
CDN-01B	9/1/2001	HBWF	372	MJM011160			
CDN-01B	9/1/2001	HBWF	402	MJM011161			
CDN-01B	9/1/2001	BDWF	303	MJM011162			
CDN-01B	9/1/2001	BDWF	370	MJM011163			
CDN-01A	8/31/2001	HBWF	321	MJM011164			
CDN-01A	8/31/2001	LSCS	292	MJM011165			
CDN-01A	8/31/2001	BDWF	363	MJM011166			
CDN-01A	9/2/2001	LSCS	347	MJM011167			
CDN-01A	9/2/2001	LSCS	343	MJM011168			
CDN-01B	9/1/2001	LSCS	264	MJM011170			
CDN-01B	9/1/2001	LSCS	265	MJM011172			
CDN-01B	9/1/2001	LSCS	334	MJM011173			
CDN-01B	9/1/2001	LSCS	277	MJM011174			
CDN-01B	9/1/2001	HBWF	325	MJM011175			
CDN-01C	8/28/2001	LSCS	282	MJM011426			
CDN-01C	8/28/2001	LSCS	278	MJM011427			
CDN-01C	8/28/2001	LSCS	313	MJM011428			
CDN-01C	8/28/2001	LSCS	293	MJM011429			
CDN-01C	8/28/2001	LSCS	314	MJM011430			
CDN-01C	8/28/2001	LSCS	260	MJM011431			
CDN-01B	8/28/2001	BDWF	290	MJM011432			
CDN-01B	8/28/2001	LSCS	251	MJM011433			
CDN-01B	8/28/2001	BDWF	285	MJM011434			
CDN-01B	8/28/2001	BDWF	274	MJM011435			
CDN-01B	8/28/2001	LSCS	312	MJM011436			
CDN-01B	8/28/2001	BDWF	223	MJM011437			
CDN-01B	8/28/2001	LSCS	268	MJM011438			
CDN-01B	8/28/2001	LSCS	324	MJM011439			
CDN-01B	8/28/2001	LSCS	343	MJM011440			
CDN-01B	8/28/2001	LSCS	305	MJM011441			
CDN-01B	8/28/2001	BDWF	297	MJM011442			
CDN-01B	8/28/2001	LSCS	223	MJM011443			
CDN-01B	8/28/2001	LSCS	254	MJM011444			
CDN-01B	8/29/2001	BDWF	264	MJM011445			
CDN-01B	8/29/2001	BDWF	361	MJM011446			
CDN-01B	8/29/2001	LSCS	292	MJM011447			
CDN-01B	8/29/2001	LSCS	270	MJM011448			
CDN-01B	8/29/2001	LSCS	301	MJM011449			
CDN-01C	9/1/2001	LSCS	268	MJM011449			
CDN-01B	8/29/2001	LSCS	269	MJM011450			
CDN-01C	9/1/2001	LSCS	309	MJM011450			
CDN-01C	8/28/2001	LSCS	293	MJM011451			
CDN-01C	8/28/2001	LSCS	294	MJM011452			
CDN-01A	8/28/2001	BURB	279	MJM011453			
CDN-01A	8/27/2001	BDWF	265	MJM011454			
CDN-01B	8/27/2001	BDWF	486	MJM011455			
CDN-01B	8/27/2001	BDWF	341	MJM011456			
CDN-01B	8/27/2001	LSCS	335	MJM011457			
CDN-01B	8/27/2001	HBWF	278	MJM011458			
CDN-01B	8/27/2001	LSCS	313	MJM011459			
CDN-01B	8/27/2001	LSCS	310	MJM011460			
CDN-01C	8/27/2001	LSCS	304	MJM011461			
CDN-01C	8/27/2001	LSCS	269	MJM011462			
CDN-01C	8/27/2001	BDWF	323	MJM011463			

Appendix Table 12. Tagged fish released in the CD-North study area, 2001.

Release Station	Release Date	Species	Fork Length (mm)	Tag Number	Capture Station	Capture Date	Capture Length
CDN-01B	8/26/2001	BDWF	253	MJM011464			
CDN-01B	8/26/2001	LSCS	278	MJM011465			
CDN-01B	8/26/2001	HBWF	271	MJM011466			
CDN-01B	8/26/2001	LSCS	307	MJM011467			
CDN-01B	8/26/2001	LSCS	348	MJM011468			
CDN-01B	8/26/2001	BDWF	328	MJM011469			
CDN-01B	8/26/2001	LSCS	283	MJM011470			
CDN-01B	8/26/2001	LSCS	341	MJM011471			
CDN-01B	8/26/2001	LSCS	320	MJM011472			
CDN-01B	8/26/2001	LSCS	319	MJM011473			
CDN-01B	8/26/2001	LSCS	312	MJM011474			
CDN-01B	8/26/2001	LSCS	303	MJM011475			
CDN-01A	8/31/2001	BDWF	343	MJM011476			
CDN-01A	8/31/2001	LSCS	275	MJM011477			
CDN-01A	8/31/2001	LSCS	282	MJM011478			
CDN-01A	8/31/2001	LSCS	267	MJM011479			
CDN-01A	8/31/2001	LSCS	286	MJM011480			
CDN-01A	8/31/2001	LSCS	262	MJM011481			
CDN-01A	8/31/2001	BDWF	277	MJM011482			
CDN-01A	8/30/2001	BDWF	352	MJM011483			
CDN-01B	8/30/2001	LSCS	277	MJM011484			
CDN-01B	8/30/2001	LSCS	273	MJM011485			
CDN-01B	8/30/2001	LSCS	300	MJM011486			
CDN-01C	8/30/2001	LSCS	260	MJM011487			
CDN-01C	8/30/2001	LSCS	305	MJM011488			
CDN-01C	8/30/2001	LSCS	257	MJM011490			
CDN-01C	8/30/2001	LSCS	288	MJM011491			
CDN-01C	8/29/2001	LSCS	267	MJM011492			
CDN-01C	8/29/2001	LSCS	267	MJM011493			
CDN-01B	8/29/2001	LSCS	313	MJM011494			
CDN-01B	8/29/2001	LSCS	289	MJM011495			
CDN-01B	8/29/2001	LSCS	308	MJM011496			
CDN-01B	8/29/2001	BDWF	378	MJM011497			
CDN-01C	9/1/2001	HBWF	288	MJM011497			
CDN-01B	8/29/2001	LSCS	306	MJM011498			
CDN-01C	9/1/2001	LSCS	340	MJM011498			
CDN-01B	8/29/2001	LSCS	294	MJM011499			
CDN-01B	8/29/2001	BDWF	421	MJM011500			
CDN-01B	9/4/2001	LSCS	299	MJM011601			
CDN-01B	9/4/2001	LSCS	303	MJM011602			
CDN-01B	9/4/2001	LSCS	313	MJM011603			
CDN-01B	9/4/2001	LSCS	326	MJM011604			
CDN-01B	9/4/2001	HBWF	432	MJM011605			
CDN-01B	9/4/2001	LSCS	273	MJM011606			
CDN-01B	9/4/2001	BDWF	368	MJM011608			
CDN-01B	9/4/2001	LSCS	289	MJM011610			
CDN-01B	9/4/2001	LSCS	271	MJM011612			
CDN-01B	9/4/2001	LSCS	334	MJM011613			
CDN-01B	9/4/2001	LSCS	267	MJM011614			
CDN-01C	9/4/2001	HBWF	298	MJM011615			
CDN-01C	9/4/2001	HBWF	256	MJM011616			
CDN-01C	9/4/2001	LSCS	302	MJM011617			
CDN-01C	9/4/2001	LSCS	290	MJM011618			
CDN-01C	9/4/2001	LSCS	273	MJM011619			

Appendix Table 12. Tagged fish released in the CD-North study area, 2001.

Release Station	Release Date	Species	Fork Length (mm)	Tag Number	Capture Station	Capture Date	Capture Length
CDN-01B	9/2/2001	LSCS	303	MJM011626			
CDN-01B	9/2/2001	LSCS	355	MJM011627			
CDN-01B	9/2/2001	BDWF	297	MJM011628			
CDN-01B	9/2/2001	BDWF	392	MJM011629			
CDN-01B	9/2/2001	LSCS	273	MJM011630			
CDN-01B	9/2/2001	BDWF	360	MJM011631			
CDN-01B	9/2/2001	LSCS	270	MJM011632			
CDN-01B	9/2/2001	BDWF	316	MJM011633			
CDN-01C	9/3/2001	LSCS	314	MJM011634			
CDN-01C	9/3/2001	LSCS	261	MJM011635			
CDN-01C	9/3/2001	HBWF	289	MJM011636			
CDN-01B	9/3/2001	LSCS	333	MJM011637	Helmericks	10/20/2001	320
CDN-01B	9/3/2001	BDWF	310	MJM011638			
CDN-01B	9/3/2001	LSCS	258	MJM011639			
CDN-01B	9/4/2001	LSCS	284	MJM011644			
CDN-01B	9/4/2001	LSCS	296	MJM011645			
CDN-01C	9/3/2001	LSCS	282	MJM011646			
CDN-01C	9/3/2001	HBWF	379	MJM011647			
CDN-01B	9/3/2001	LSCS	277	MJM011648	CDN-01B	9/4/2001	278
CDN-01B	9/3/2001	BDWF	324	MJM011649	CDN-01B	9/4/2001	322

BDWF = broad whitefish
BURB = burbot
HBWF = humpback whitefish
RDWF = round whitefish
LSCS = least cisco
ARCS = arctic cisco
RBSM = rainbow smelt

Appendix Table 13. Observed handling mortality for fyke nets in the CD-North study area, 2001.

Species	Number of Mortalities	Total Caught	Percent Mortality
Broad whitefish	9	948	0.9
Humpback whitefish	10	1,027	1.0
Arctic cisco	5	272	1.8
Least cisco	25	1,427	1.8
Round whitefish	0	291	0.0
Dolly Varden char	0	12	0.0
Arctic grayling	0	8	0.0
Burbot	0	3	0.0
Rainbow smelt	82	374	21.9
Arctic flounder	0	42	0.0
Fourhorn sculpin	0	932	0.0
Ninespine stickleback	0	2	0.0