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Creel Census and Biological Data
from the Subsistence and Sport
Fisheries for Arctic Charr, *Salvelinus
alpinus* (L.), at Diana River, Northwest
Territories, 1984-86

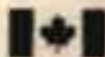
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Winnipeg, Manitoba R3T 2N6



1992

Canadian Data Report of
Fisheries and Aquatic Sciences
888



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Canadian Data Report of
Fisheries and Aquatic Sciences 888

1992

CREEL CENSUS AND BIOLOGICAL DATA FROM
THE SUBSISTENCE AND SPORT FISHERIES FOR
ARCTIC CHARR, *Salvelinus alpinus* (L.),
AT DIANA RIVER, NORTHWEST TERRITORIES, 1984-86

by

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This is the 78th Data Report
from the Central and Arctic Region, Winnipeg

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Cat. no. Fs 97-13/888

ISSN 0706-6465

Correct citation for this publication is:

Carder, G.W. 1992. Creel census and biological data from the subsistence and sport fisheries for Arctic charr, *Salvelinus alpinus* (L.), at Diana River, Northwest Territories, 1984-86. Can. Data Rep. Fish. Aquat. Sci. 888: iv + 19 p.

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ABSTRACT

Carder, G.W. 1992. Creel census and biological data from the subsistence and sport fisheries for Arctic charr, *Salvelinus alpinus* (L.), at Diana River, Northwest Territories, 1984-86. Can. Data Rep. Fish. Aquat. Sci. 888: iv + 19 p.

Data from creel census and biological sampling programs conducted at Diana River, Northwest Territories (NWT) during the downstream anadromous Arctic charr migrations in 1984, 1985 and 1986 are presented. In 1984 a total creel census covering the period 16 June to 7 July was conducted at the river. Results of interviews with 171 subsistence anglers revealed that 553 hours were spent angling, with a success rate of three charr per angler or one charr per angler-hour. Additionally, 217 sport fishermen spent 466 hours angling with a success rate of one charr per angler or 0.5 charr per angler-hour. During 1984 a total of 524 charr were caught by subsistence anglers, 389 were caught in subsistence gillnets and 225 were caught by sport fishermen. In 1985 a partial creel census covering the period 21 June to 7 July was conducted at the river. Results showed that 178 subsistence anglers spent 436 hours angling with a success rate of four charr per angler or two charr per angler-hour and 168 sport fishermen spent 355 hours angling with a success rate of two charr per angler or approximately one charr per angler-hour. During 1985 a total of 744 charr were caught by subsistence anglers and 363 were caught by sport fishermen. In 1986 an access point survey was conducted at Diana River during the period 22 June to 19 July. Results showed that 434 subsistence anglers spent 1733 hours angling with a success rate of 2.5 charr per angler or 0.6 charr per angler-hour, and 243 sport fishermen spent 1018 hours angling with a success rate of two charr per angler or 0.5 charr per angler-hour. During 1986 a total of 1073 charr were caught by subsistence anglers, 1316 were caught by subsistence gillnets and 496 were caught by sport fishermen. Biological information collected during 1984, 1985 and 1986 includes length, weight, sex and stage of maturity.

Key words: angling; subsistence fishing; sport fishing; fishery management; monitoring; gillnets.

RÉSUMÉ

Carder, G.W. 1992. Creel census and biological data from the subsistence and sport fisheries for Arctic charr, *Salvelinus alpinus* (L.), at Diana River, Northwest Territories, 1984-86. Can. Data Rep. Fish. Aquat. Sci. 888: iv + 19 p.

On présente des données tirées des programmes de relevé des prises et d'échantillonnage biologique effectués sur la rivière Diana, dans les territoires du Nord-Ouest, au cours des avalaisons de l'omble chevalier anadrome en 1984, 1985 et 1986. En 1984, un relevé total des prises a été effectué à la rivière au cours de la période du 16 juin au 7 juillet. Les résultats des entrevues avec 171 pêcheurs à la ligne pratiquant la pêche de subsistance ont révélé que ces pêcheurs avaient consacré 553 heures à la pêche et que le taux de succès avait été de trois ombles par pêcheur, soit un omble par heure de pêche. De plus, 217 pêcheurs sportifs ont consacré 466 heures à la pêche et obtenu un taux de succès de un omble par pêcheur ou 0,5 omble par heure de pêche. En 1984, 524 ombles ont été capturés par les pêcheurs à la ligne pratiquant la pêche de subsistance, 389 ont été capturés au filet maillant dans le cadre de la pêche de subsistance et 225 ont été capturés par des pêcheurs sportifs. En 1985, un relevé partiel des prises a été réalisé à la rivière au cours de la période du 21 juin au 7 juillet. Les résultats du relevé indiquent que 178 pêcheurs à la ligne pratiquant la pêche de subsistance ont consacré 436 heures à la pêche et ont obtenu un taux de succès de quatre ombles par pêcheur ou deux ombles par heure de pêche et que 168 pêcheurs sportifs ont consacré 355 heures à la pêche et obtenu un taux de succès de deux ombles par pêcheur ou environ un omble par heure de pêche. En 1985, 744 ombles ont été capturés par les pêcheurs à la ligne pratiquant la pêche de subsistance et 363 par les pêcheurs sportifs. En 1986, un relevé aux points d'accès de la rivière Diana a été réalisé au cours de la période du 22 juin au 19 juillet. D'après les résultats, 434 pêcheurs à la ligne pratiquant la pêche de subsistance ont consacré 1 733 heures à la pêche et obtenu un taux de succès de 2,5 ombles par pêcheur ou 0,6 omble par heure de pêche et 243 pêcheurs sportifs ont consacré 1 018 heures à la pêche et obtenu un taux de succès de deux ombles par pêcheur ou environ 0,5 omble par heure de pêche. En 1986, 1 073 ombles ont été capturés par les pêcheurs à la ligne pratiquant la pêche de subsistance, 1 316 ont été capturés au filet maillant dans le cadre de la pêche de subsistance et 496 ont été capturés par des pêcheurs sportifs. Les données biologiques obtenues en 1984, 1985 et 1986 comprennent la longueur, le poids, le sexe et le stade de maturité des poissons.

Mots clés: pêche à la loigne; pêche de subsistance; pêche sportive; gestion des pêches; surveillance; filet maillant.

INTRODUCTION

Historically wage employment in the Rankin Inlet area has been limited. The Rankin Nickel Mine began operating at Rankin Inlet in 1957 and was a major source of employment until its closure in 1962 (Carder and Peet 1983). In 1964, the Department of Indian and Northern Affairs initiated a commercial fishery which included the harvest of marine mammals. The main purpose of the fishery was to help alleviate the economic distress caused by the closure of the mine. A fish plant was first located at Daly Bay (Fig. 1) in 1964; however, it was found that the fish and marine mammal stocks in this area could not support a commercial fishery and the plant was relocated to the community of Rankin Inlet (Carder and Peet 1983) in 1966.

In response to the increased fishing activity in the Rankin Inlet area, Environment Canada, Fisheries and Marine Service (now the Department of Fisheries and Oceans) initiated studies at Diana River (Fig. 2) in 1973. From 1973 to 1978 these studies were carried out to assess the status of the anadromous Arctic charr stock by counting the upstream migrants through a fish weir placed in the river near its mouth. The study included biological sampling and tagging, the latter during 1973-75. The intent of tagging was to determine the summer distribution of charr while at sea and the degree of exploitation imposed by the fishery on this stock.

In 1979, Fisheries and Oceans (DFO) began monitoring the commercial fishery in Rankin Inlet. Data obtained from the fishery between 1979 and 1983 showed a decline in the commercial harvest and in the mean size and age of fish caught; consequently, meetings were held between DFO and the residents of the community of Rankin Inlet to discuss the changes. A consensus was reached that the stock was depleted and that fishing pressure should be reduced to allow the charr population to recover. This was accomplished by reducing the commercial quota for 1984. The 1984 fishing season proved to be poor, failing to achieve the reduced quota. The commercial fishery was closed in 1985 and remained so until 1991. During the closure experimental gillnetting was conducted annually to monitor the recovery of the stock. Data from commercial and experimental samples can be found in Carder (1983, 1988, 1991); Carder and Low (1985); Carder and Peet (1983) and Carder

and Stewart (1989). Data on the enumeration of the 1986 upstream migration are provided by McGowan (1987).

In addition to the commercial gillnet fishery, the Diana River Arctic charr stock also supports a sport and subsistence fishery. The latter is carried out by native residents of Rankin Inlet who use angling and gillnets to obtain charr for food. DFO conducted creel census and biological sampling programs on the Diana River downstream Arctic charr migration in 1984, 1985 and 1986 to determine the impact of the sport and subsistence fisheries on the charr stock. This report summarizes the information obtained from these studies.

MATERIALS AND METHODS

DESCRIPTION OF THE FISHERY

Yaremchuk et al. (1989) summarize the categories of fisheries in the NWT as defined by the Northwest Territories Fishery Regulations. A subsistence fisherman is defined as being an Indian, Inuk, or person of mixed blood who fishes for the purpose of obtaining food for himself, his family or his dogs, or for barter or gift, but not for sale, to another Indian, Inuk, or person of mixed blood. A person other than the above may be considered to be a subsistence fisherman providing that person obtains a subsistence fishing licence that authorizes that person to engage in subsistence fishing. A sport fisherman is a person who has a sport fishing licence authorizing that person to engage in sport fishing. Sport fishing means fishing for pleasure and not for sale or barter.

Both subsistence and sport fishermen fish at Diana River during the months of June and July of each year. Subsistence fishermen catch fish at Diana River by angling or by gillnet; sport fishermen by angling only. Fishing occurs along the river from its outlet at Diana Lake to its mouth, a distance of approximately 15 km. Most fishing occurs within 2.5 km. of the river mouth (Fig. 2). Species caught include Arctic charr, *Salvelinus alpinus* (L.), lake trout, *Salvelinus namaycush* (Walbaum), and Arctic grayling, *Thymallus arcticus* (Pallas).

CREEL CENSUS

During 1984 DFO personnel camped at the mouth of Diana River (Fig. 2) throughout the downstream Arctic charr run from 16 June to 7 July. In 1985 creel censuses were carried out during peak fishing periods (weekends) from 21 June to 7 July. Fisheries staff interviewed both subsistence and sport fishermen in the vicinity of the river mouth during these years. In 1986 DFO staff camped near the community of Rankin Inlet along the trail leading to the river (Fig. 2) and conducted an access point survey (Malvestuto 1983) from 22 June to 19 July.

Fishermen were interviewed at the end of their fishing trip. Each was questioned about the length of time spent fishing, the species of fish caught, released and retained. Whenever possible, retained catch was sampled for biological data.

Subsistence gillnet survey

Subsistence fishermen gillnetted Arctic charr throughout the downstream migration during 1984 and 1986. Net location was dependent on the stage of the migration. Nets were 139 mm stretch mesh but lengths and depths varied greatly. The number of fish caught by gillnet was recorded daily by DFO staff. Gillnetting did not occur during 1985 owing to ice conditions along the river.

BIOLOGICAL SAMPLING

Fish were sampled from anglers' creel and subsistence gillnets for fork length (± 1 mm) and round weight (± 50 g). Whenever possible, information was obtained on age (otoliths), sex and stage of maturity. Sagittal otoliths were taken and stored dry in coin envelopes. In the laboratory they were ground on a fine carborundum stone and placed in benzyl benzoate for clearing before being read under a binocular dissecting microscope (30x). A reflecting light source against a black background was used to highlight the annual growth zones which were counted to determine the age. The method of age determination followed Grainger (1953).

DATA ANALYSIS

Data were analyzed using a Micro Vax II computer. The Statistical Analysis System (SAS 1985) was used to generate length, weight, age, sex and stage of maturity summaries and to perform basic calculations and statistical analyses.

Relative condition factor (K) was calculated using the formula:

$$K = \frac{W \times 10^5}{L^3}$$

where: W = round weight in grams
L = fork length in millimetres

RESULTS

Creel census summary information from subsistence and sport fishermen are presented in Tables 1-15. Biological data are presented in Tables 16-22. All length tables indicate the lower boundary of the length interval (e.g., 350 indicates the length interval 350-399 mm). During the period 19 June to 6 July 1984, 389 charr were caught by gillnet and from 22 June to 15 July 1986, 1316 were caught by gillnet. Based on fishermen interviews and on-site observations, the creel census data are believed to represent over 90% of catch and effort data collected during 1984 and 1986 downstream Arctic charr migrations. During 1985 creel censuses were conducted on weekends only. Data obtained in 1984 indicated that the majority of fishing occurred on weekends.

ACKNOWLEDGMENTS

The author wishes to thank all subsistence and sport fishermen for their help and cooperation during the study.

Summer field assistance was provided by A. Bourrier (1986), R. Buchanan (1985), R. Nadeau (1984), K. Proctor (1986) and T. Sprado (1984). A special thanks to D. K. McGowan who was in charge of the project in 1985. The author also wishes to thank DFO staff in Rankin Inlet during 1984, 1985 and 1986.

A. H. Kristofferson provided scientific advice and W. A. Bond and A.H. Kristofferson reviewed the final draft of this report. Word processing and typing services was done by C. Moreno and K. DeCaigny.

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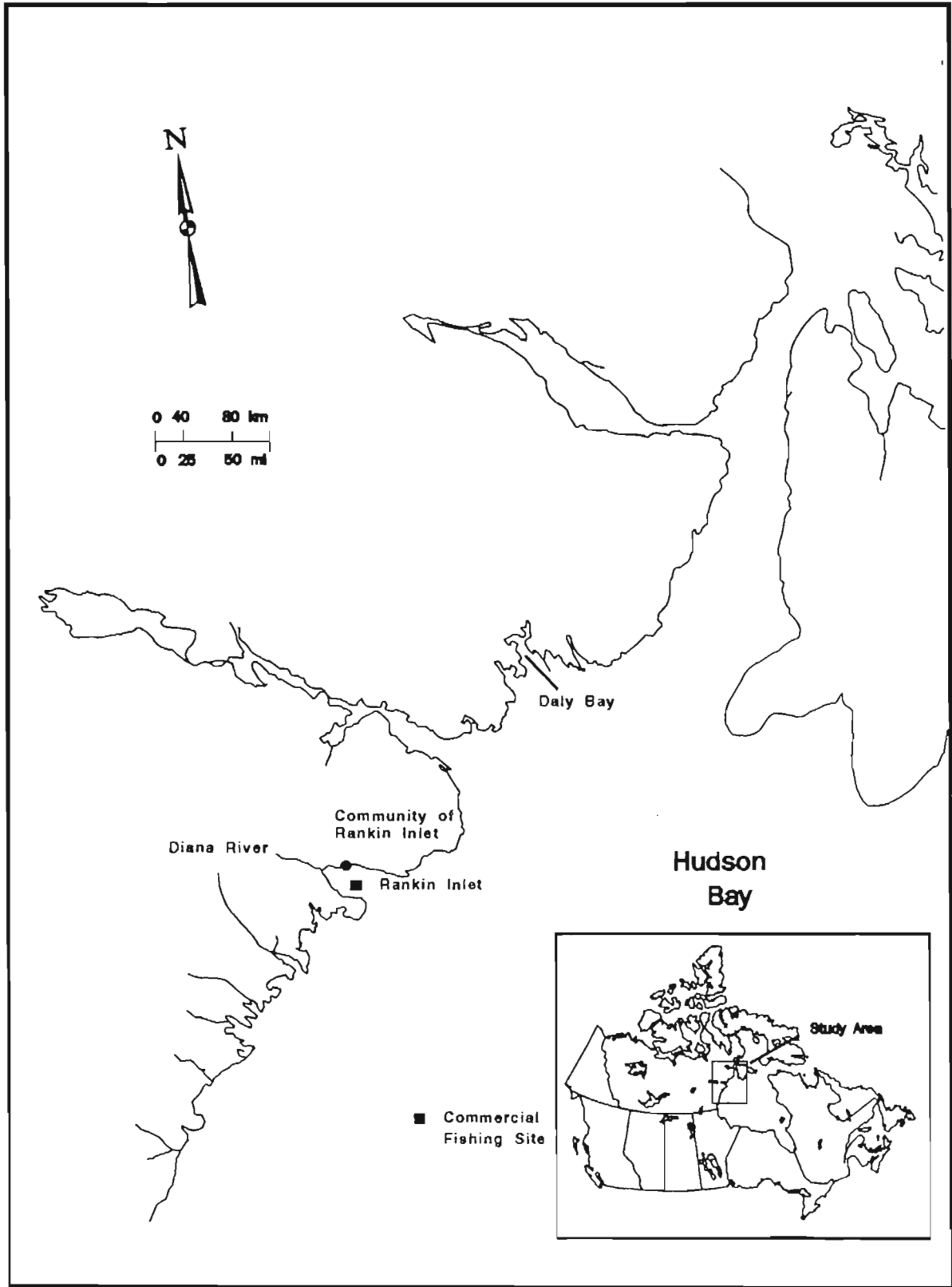


Fig. 1. The District of Keewatin showing the location of the study area.

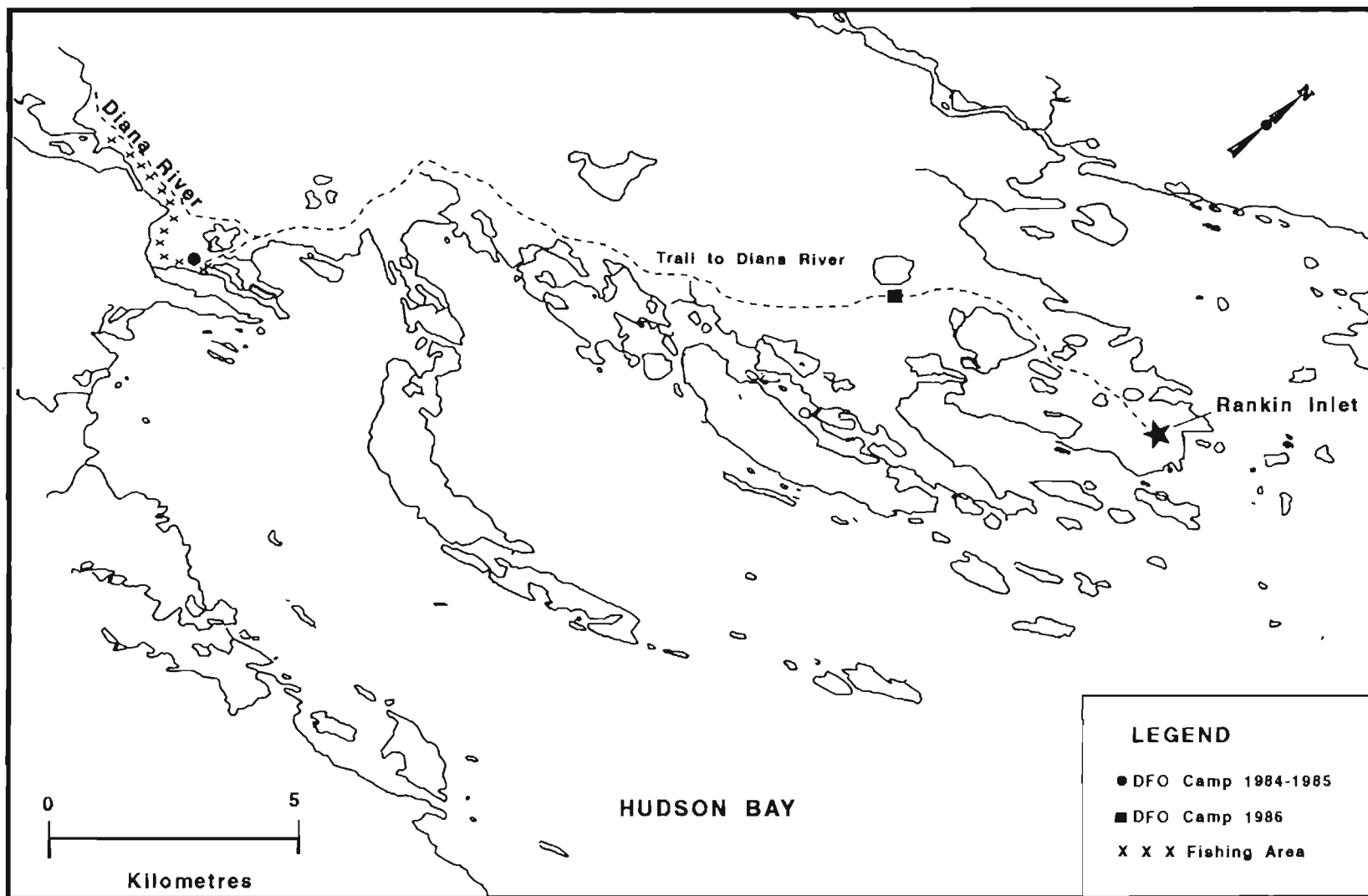


Fig. 2. The Rankin Inlet area showing the community of Rankin Inlet, the trail to Diana River and the fishing area.

Table 1. Creel census summary of subsistence anglers at Diana River, 16 - 30 June 1984.

Date	No. of Angler Interviews	Percent Successful	Arctic charr			Lake Trout			Arctic Grayling			Total Hours Fished	No. of Arctic Charr	
			C	R	K	C	R	K	C	R	K		Per Angler	Per Angler - Hour
16/6	1	-	1	-	1	1	-	1	-	-	-	12.00	1.00	0.08
19/6	3	100.0	9	-	9	-	-	-	-	-	-	12.00	3.00	0.75
20/6	3	100.0	6	-	6	-	-	-	-	-	-	8.00	2.00	0.75
21/6	3	100.0	6	-	6	2	-	2	-	-	-	12.00	2.00	0.50
22/6	3	66.7	3	-	3	1	-	1	-	-	-	14.50	1.00	0.21
23/6	4	-	-	-	-	-	-	-	-	-	-	12.00	-	-
24/6	2	50.0	12	-	12	-	-	-	-	-	-	7.00	6.00	1.71
26/6	1	100.0	8	8	-	-	-	-	-	-	-	3.00	8.00	2.67
27/6	9	88.9	51	-	51	-	-	-	-	-	-	67.00	5.67	0.76
28/6	1	100.0	5	-	5	-	-	-	-	-	-	.75	5.00	6.67
29/6	14	100.0	31	-	31	-	-	-	-	-	-	39.50	2.21	0.78
30/6	23	100.0	89	-	89	-	-	-	-	-	-	123.00	3.87	0.72
Total Mean	67	88.1	221	8	213	4	-	4	-	-	-	310.75	3.30	0.71

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Table 2. Creel census summary of subsistence anglers at Diana River, 1 - 6 July 1984.

Date	No. of Angler Interviews	Percent Successful	Arctic charr			Lake Trout			Arctic Grayling			Total Hours Fished	No. of Arctic Charr	
			C	R	K	C	R	K	C	R	K		Per Angler	Per Angler - Hour
1/7	31	87.1	127	8	119	-	-	-	-	-	-	66.00	4.10	1.92
2/7	37	70.3	79	1	78	-	-	-	-	-	-	86.00	2.14	0.92
3/7	11	100.0	32	-	32	-	-	-	-	-	-	27.00	2.91	1.19
4/7	19	94.7	62	-	62	-	-	-	-	-	-	51.00	3.26	1.22
5/7	4	25.0	2	-	2	1	-	1	-	-	-	10.00	0.50	0.20
6/7	2	50.0	1	-	1	-	-	-	-	-	-	2.00	0.50	0.50
Total Mean	104	80.8	303	9	294	1	-	1	-	-	-	242.00	2.91	1.25

C = number caught
R = number released
K = number kept

Table 3. Creel census summary of sport fishermen at Diana River, 16 - 30 June 1984.

Date	No. of Angler Interviews	Percent Successful	Arctic charr			Lake Trout			Arctic Grayling			Total Hours Fished	No. of Arctic Charr	
			C	R	K	C	R	K	C	R	K		Per Angler	Per Angler - Hour
16/6	4	-	-	-	-	-	-	-	-	-	-	8.00	-	-
17/6	1	-	-	-	-	-	-	-	-	-	-	2.00	-	-
18/6	1	-	-	-	-	-	-	-	-	-	-	1.00	-	-
19/6	2	50.0	2	2	-	-	-	-	-	-	-	5.00	1.00	0.40
20/6	4	75.0	2	-	2	1	-	1	-	-	-	10.00	0.50	0.20
21/6	3	66.7	3	-	3	-	-	-	2	-	2	21.00	1.00	0.14
22/6	4	-	-	-	-	-	-	-	-	-	-	7.00	-	-
23/6	13	15.4	3	-	3	-	-	-	-	-	-	29.50	0.23	0.10
24/6	21	14.3	12	-	12	1	-	1	-	-	-	64.75	0.57	0.19
25/6	14	28.6	11	-	11	-	-	-	-	-	-	29.50	0.79	0.37
26/6	11	63.6	18	-	18	1	-	1	-	-	-	33.50	1.64	0.54
27/6	21	28.6	11	-	11	-	-	-	-	-	-	32.00	0.52	0.34
28/6	8	25.0	7	3	4	1	-	1	1	-	1	18.00	0.88	0.39
29/6	20	25.0	16	6	10	-	-	-	1	-	1	17.50	0.80	0.91
30/6	47	72.3	97	5	92	2	-	2	-	-	-	96.50	2.06	1.01
Total	174	39.7	182	16	166	6	-	6	4	-	4	375.25		
Mean													1.05	0.49

C = number caught
R = number released
K = number kept

Table 4. Creel census summary of sport fishermen at Diana River, 1 - 7 July 1984.

Date	No. of Angler Interviews	Percent Successful	Arctic charr			Lake Trout			Arctic Grayling			Total Hours Fished	No. of Arctic Charr	
			C	R	K	C	R	K	C	R	K		Per Angler	Per Angler - Hour
1/7	15	80.0	34	3	31	-	-	-	-	-	-	28.75	2.27	1.18
2/7	3	100.0	3	-	3	-	-	-	-	-	-	5.00	1.00	0.60
3/7	2	100.0	2	-	2	-	-	-	-	-	-	8.00	1.00	0.25
4/7	3	33.3	1	-	1	-	-	-	-	-	-	9.00	0.33	0.11
5/7	3	33.3	2	-	2	-	-	-	-	-	-	7.00	0.67	0.29
6/7	5	-	-	-	-	-	-	-	-	-	-	5.00	-	-
7/7	12	8.0	1	-	1	-	-	-	-	-	-	28.00	0.08	0.04
Total Mean	43	46.5	43	3	40	-	-	-	-	-	-	90.75	1.00	0.47

Table 5. Creel census summary of subsistence anglers at Diana River, 21 - 30 June 1985.

Date	No. of Angler Interviews	Percent Successful	Arctic charr			Lake Trout			Arctic Grayling			Total Hours Fished	No. of Arctic Charr	
			C	R	K	C	R	K	C	R	K		Per Angler	Per Angler - Hour
21/6	1	100.0	-	-	-	1	-	1	-	-	-	.50	-	-
22/6	22	68.2	73	-	73	3	1	2	-	-	-	49.25	3.32	1.48
23/6	22	40.9	26	-	26	1	-	1	-	-	-	27.25	1.18	0.95
28/6	11	63.6	15	-	15	-	-	-	-	-	-	13.00	1.36	1.15
29/6	45	86.7	273	6	267	2	-	2	1	-	1	140.50	6.07	1.94
30/6	40	82.5	209	13	196	-	-	-	-	-	-	122.00	5.23	1.71
Total Mean	141	73.8	596	19	577	7	1	6	1	-	1	325.50	4.23	1.83

C = number caught
R = number released
K = number kept

Table 6. Creel census summary of subsistence anglers at Diana River, 1 - 7 July 1985.

Date	No. of Angler Interviews	Percent Successful	Arctic charr			Lake Trout			Arctic Grayling			Total Hours Fished	No. of Arctic Charr	
			C	R	K	C	R	K	C	R	K		Per Angler	Per Angler - Hour
1/7	12	100.0	101	15	86	-	-	-	-	-	-	48.50	8.42	2.08
6/7	19	26.3	29	6	23	-	-	-	-	-	-	45.50	1.53	0.64
7/7	6	100.0	18	-	18	-	-	-	-	-	-	16.50	3.00	1.09
Total Mean	37	62.2	148	21	127	-	-	-	-	-	-	110.50	4.00	1.34

Table 7. Creel census summary of sport fishermen at Diana River, 21 - 30 June 1985.

Date	No. of Angler Interviews	Percent Successful	Arctic charr			Lake Trout			Arctic Grayling			Total Hours Fished	No. of Arctic Charr	
			C	R	K	C	R	K	C	R	K		Per Angler	Per Angler - Hour
21/6	2	-	-	-	-	-	-	-	-	-	-	4.00	-	-
22/6	12	-	-	-	-	-	-	-	8	4	4	15.50	-	-
23/6	15	13.3	4	-	4	1	-	1	32	27	5	35.25	0.27	0.11
27/6	6	50.0	4	-	4	-	-	-	3	-	3	12.00	0.67	0.33
28/6	14	50.0	11	1	10	-	-	-	-	-	-	32.00	0.79	0.34
29/6	33	66.7	46	8	38	1	-	1	-	-	-	57.25	1.39	0.80
30/6	50	80.0	140	44	96	-	-	-	2	-	2	115.00	2.80	1.22
Total Mean	132	56.1	205	53	152	2	-	2	45	31	14	271.00	1.55	0.76

C = number caught
R = number released
K = number kept

Table 8. Creel census summary of sport fishermen at Diana River, 1 - 7 July 1985.

Date	No. of Angler Interviews	Percent Successful	Arctic charr			Lake Trout			Arctic Grayling			Total Hours Fished	No. of Arctic Charr	
			C	R	K	C	R	K	C	R	K		Per Angler	Per Angler - Hour
1/7	20	90.0	117	71	46	-	-	-	-	-	-	41.25	5.85	2.84
6/7	10	70.0	19	6	13	-	-	-	-	-	-	25.00	1.90	0.76
7/7	6	100.0	22	-	22	-	-	-	-	-	-	18.00	3.67	1.22
Total Mean	36	86.1	158	77	81	-	-	-	-	-	-	84.25	4.39	1.88

Table 9. Creel census summary of subsistence anglers at Diana River, 22 - 30 June 1986.

Date	No. of Angler Interviews	Percent Successful	Arctic charr			Lake Trout			Arctic Grayling			Total Hours Fished	No. of Arctic Charr	
			C	R	K	C	R	K	C	R	K		Per Angler	Per Angler - Hour
22/6	1	100.0	5	-	5	-	-	-	-	-	-	16.00	5.00	0.31
25/6	3	33.3	1	-	1	-	-	-	-	-	-	24.00	0.33	0.04
27/6	7	28.6	2	-	2	1	-	1	-	-	-	23.00	0.29	0.09
28/6	30	36.7	29	1	28	-	-	-	1	-	1	126.00	0.97	0.23
29/6	42	38.1	65	-	65	-	-	-	-	-	-	217.50	1.55	0.30
30/6	8	37.5	5	-	5	-	-	-	-	-	-	29.00	0.63	0.17
Total Mean	91	37.4	107	1	106	1	-	1	1	-	1	435.50	1.18	0.25

C = number caught
R = number released
K = number kept

Table 10. Creel census summary of subsistence fishermen at Diana River, 1 - 19 July 1986.

Date	No. of Angler Interviews	Percent Successful	Arctic charr			Lake Trout			Arctic Grayling			Total Hours Fished	No. of Arctic Charr	
			C	R	K	C	R	K	C	R	K		Per Angler	Per Angler - Hour
1/7	16	62.5	28	-	28	-	-	-	-	-	63.00	1.75	0.44	
2/7	14	50.0	19	-	19	1	-	1	-	-	39.00	1.36	0.49	
3/7	17	76.5	64	3	61	-	-	-	-	-	77.00	3.76	0.83	
4/7	20	65.0	57	-	57	-	-	-	-	-	116.50	2.85	0.49	
5/7	59	57.6	148	-	148	-	-	-	-	-	292.00	2.51	0.51	
6/7	27	44.4	45	-	45	-	-	-	-	-	89.75	1.67	0.50	
7/7	13	61.5	53	-	53	-	-	-	-	-	53.00	4.08	1.00	
8/7	22	90.9	128	-	128	-	-	-	-	-	67.25	5.82	1.90	
9/7	18	77.8	80	-	80	-	-	-	-	-	73.50	4.44	1.09	
10/7	22	54.5	57	-	57	-	-	-	-	-	59.00	2.59	0.97	
11/7	17	70.6	61	-	61	-	-	-	-	-	35.50	3.59	1.72	
12/7	28	60.7	98	5	93	-	-	-	-	-	122.00	3.50	0.80	
13/7	31	74.2	80	1	79	-	-	-	-	-	105.00	2.58	0.76	
14/7	11	45.5	25	-	25	-	-	-	-	-	41.00	2.27	0.61	
15/7	14	42.9	15	-	15	-	-	-	-	-	46.00	1.07	0.33	
16/7	5	80.0	8	-	8	-	-	-	-	-	6.00	1.60	1.33	
17/7	1	-	-	-	-	-	-	-	-	-	3.00	-	-	
18/7	4	-	-	-	-	-	-	-	-	-	6.75	-	-	
19/9	4	-	-	-	-	-	-	-	-	-	2.50	-	-	
Total	343	61.2	966	9	957	1	-	1	-	-	1297.75			
Mean												2.82	0.74	

C = number caught
R = number released
K = number kept

Table 11. Creel census summary of sport fishermen at Diana River, 24 - 30 June 1986.

Date	No. of Angler Interviews	Percent Successful	Arctic charr			Lake Trout			Arctic Grayling			Total Hours Fished	No. of Arctic Charr	
			C	R	K	C	R	K	C	R	K		Per Angler	Per Angler - Hour
24/6	2	-	-	-	-	-	-	-	-	-	-	14.00	-	-
25/6	2	-	-	-	-	-	-	-	-	-	-	14.00	-	-
26/6	2	-	-	-	-	-	-	-	-	-	-	2.00	-	-
27/6	17	11.8	-	-	-	1	-	1	1	-	1	100.00	-	-
28/6	43	11.6	11	-	11	-	-	-	1	-	1	197.50	0.26	0.06
29/6	33	30.3	48	-	48	-	-	-	-	-	-	132.00	1.45	0.36
30/6	11	36.4	6	-	6	-	-	-	1	-	1	38.00	0.55	0.16
Total	110	19.1	65	-	65	1	-	1	3	-	3	497.50		
Mean													0.59	0.13

C = number caught
R = number released
K = number kept

Table 12. Creel census summary of sport fishermen at Diana River, 1 - 19 July 1986.

Date	No. of Angler Interviews	Percent Successful	Arctic charr			Lake Trout			Arctic Grayling			Total Hours Fished	No. of Arctic Charr	
			C	R	K	C	R	K	C	R	K		Per Angler	Per Angler - Hour
1/7	12	58.3	12	-	12	-	-	-	-	-	64.00	1.00	0.19	
2/7	9	77.8	43	30	13	-	-	-	-	-	64.00	4.78	0.67	
3/7	6	100.0	16	-	16	-	-	-	-	-	31.50	2.67	0.51	
4/7	4	100.0	8	-	8	-	-	-	-	-	8.25	2.00	0.97	
5/7	30	60.0	100	80	20	-	-	-	-	-	127.00	3.33	0.79	
6/7	15	46.7	15	-	15	-	-	-	-	-	56.50	1.00	0.27	
7/7	7	57.1	7	-	7	-	-	-	-	-	29.00	1.00	0.24	
8/7	3	100.0	7	1	6	-	-	-	-	-	7.50	2.33	0.93	
9/7	2	50.0	1	-	1	1	-	1	-	-	4.00	0.50	0.25	
10/7	2	100.0	4	-	4	-	-	-	-	-	8.50	2.00	0.47	
11/7	8	100.0	96	78	18	-	-	-	-	-	32.50	12.00	2.95	
12/7	23	78.3	110	67	43	-	-	-	-	-	66.75	4.78	1.65	
13/7	4	75.0	7	-	7	-	-	-	-	-	7.00	1.75	1.00	
14/7	2	50.0	4	3	1	-	-	-	-	-	4.00	2.00	1.00	
15/7	1	-	-	-	-	-	-	-	-	-	2.00	-	-	
16/7	1	-	-	-	-	-	-	-	-	-	1.00	-	-	
17/7	2	50.0	1	-	1	-	-	-	-	-	6.00	0.50	0.17	
18/7	1	-	-	-	-	-	-	-	-	-	0.25	-	-	
19/7	1	-	-	-	-	-	-	-	-	-	0.50	-	-	
TOTAL	133	67.7	431	259	172	1	-	1	-	-	520.25			
MEAN												3.24	0.83	

C = number caught
R = number released
K = number kept

Table 13. Summary of data on catch, effort and catch-per-unit-effort of Arctic charr caught by angling by subsistence fishermen at Diana River during the downstream Arctic charr migration, 1984, 1985 and 1986.

Year	No. Anglers	No. Caught	No. Released	Percent Retained	Total Hours Fished	No. of Arctic Charr Caught Per Angler	Per Angler Hour
1984	171	524	17	96.8	552.75	3.06	0.95
1985	178	744	40	94.6	436.00	4.18	1.71
1986	434	1073	10	99.1	1733.25	2.47	0.62

Table 14. Summary of data on catch, effort and catch-per-unit-effort of Arctic charr caught by by sport fishermen at Diana River during the downstream Arctic charr migration, 1984, 1985 and 1986.

Year	No. Anglers	No. Caught	No. Released	Percent Retained	Total Hours Fished	No. of Arctic Charr Caught Per Angler	Per Angler Hour
1984	217	225	19	91.6	466.00	1.04	0.48
1985	168	363	130	64.2	355.25	2.16	1.02
1986	243	496	259	47.8	1017.75	2.04	0.49

Table 15. Comparison of harvest of Arctic charr by fishery for years 1984, 1985 and 1986.

Year	Duration of Survey	Fishery	Total Harvest(kept)
1984	16 June - 7 July	Subsistence anglers	524
		Subsistence gillnets	389
		Sport Fishery anglers	225
1985	21 June - 7 July	Subsistence anglers	744
		Subsistence gillnets	0
		Sport Fishery anglers	363
1986	22 June - 19 July	Subsistence anglers	1 073
		Subsistence gillnets	1 316
		Sport Fishery anglers	496

Table 16. Biological data by age group for Arctic charr angled at Diana River, 1984.

Age (Yr)	Males							Females							Combined						
	Length (mm)			Weight(g)		K	Mat	Length (mm)			Weight(g)		K	Mat	Length (mm)			Weight(g)		K	Mat
	N	Mean	SD	Mean	SD			N	Mean	SD	Mean	SD			N	Mean	SD	Mean	SD		
6	2	408	25	650	141	0.95	0	2	423	45	700	212	0.91	0	4	415	31	675	150	0.93	0
7	4	451	34	1000	469	1.04	0	8	444	35	931	474	1.01	0	12	447	33	954	452	1.02	0
8	10	477	35	1040	270	0.94	0	13	480	45	1062	314	0.93	0	23	479	40	1052	289	0.93	0
9	4	557	52	1700	430	0.97	0	6	525	41	1467	209	1.02	0	10	537	46	1560	317	1.00	0
10	2	540	14	1475	35	0.94	0	5	553	35	1640	288	0.96	0	7	549	30	1593	249	0.96	0
11	2	603	47	2075	389	0.94	0	1	595	-	1900	-	0.90	0	3	600	33	2017	293	0.93	0
12	1	605	-	2300	-	1.04	0	-	-	-	-	-	-	-	1	605	-	2300	-	1.04	0
13	-	-	-	-	-	-	-	1	528	-	1300	-	0.88	0	1	528	-	1300	-	0.88	0
Total	25							36							61						
Mean		500	66	1276	533	0.97			491	57	1190	433	0.96			495	61	1225	474	0.96	
Mean Age	8.4							8.3							8.4						

Table 17. Biological data by length interval for Arctic charr angled at Diana River, 1984.

Length Interval (mm)	Males							Females							Combined						
	Length(mm)		Weight(g)		K	Mat		Length(mm)		Weight(g)		K	Mat		Length(mm)		Weight(g)		K	Mat	
	N	Mean	Mean	SD				N	Mean	Mean	SD				N	Mean	Mean	SD			
250	-	-	-	-	-	-	-	-	-	-	-	-	-	1	295	350	-	1.36	0		
300	2	324	375	106	1.18	0	-	-	-	-	-	-	-	7	329	407	67	1.17	0		
350	2	385	575	35	1.01	0	3	381	433	104	0.78	0	15	371	530	140	1.03	0			
400	11	435	895	362	1.08	0	7	430	721	138	0.90	0	42	428	792	248	1.00	0			
450	8	479	1100	273	0.99	0	14	469	1079	288	1.04	0	46	472	1038	224	0.98	0			
500	10	522	1405	130	0.98	0	13	523	1362	133	0.95	0	37	523	1369	151	0.96	0			
550	3	569	1717	236	0.93	0	5	564	1720	130	0.96	0	12	571	1779	179	0.95	0			
600	3	615	2267	104	0.98	0	1	610	2100	-	0.93	0	6	615	2300	176	0.99	0			
800	-	-	-	-	-	-	-	-	-	-	-	-	-	1	801	4100	-	0.80	0		
Total	39						43							167							
Mean		482	1194	513	1.02			487	1159	422	0.96			470	1090	522	0.99				

Table 18. Biological data by length interval for Arctic charr caught in subsistence gillnets at Diana River, 1984.

Length Interval (mm)	No.	Percent	Mean Fork Length(mm)	Round Weight(g)		K
				Mean	SD	
350	2	2	355	475	106	1.06
400	18	20	430	914	119	1.15
450	21	23	472	1124	163	1.06
500	14	16	525	1557	221	1.07
550	4	4	575	2113	160	1.11
600	16	18	626	2669	299	1.09
650	10	11	670	3085	352	1.03
700	3	3	734	3700	346	0.94
750	1	1	757	4250	-	0.98
850	1	1	870	5300	-	0.80
Total Mean	90		539	1838	1007	1.08

Table 19. Biological data by age group for Arctic charr angled at Diana River, 1985.

Age (Yr)	Males				Females				Combined													
	N	Length (mm) Mean	SD	Weight (g) Mean	SD	K	% Mat	N	Length (mm) Mean	SD	Weight (g) Mean	SD	K	% Mat	N	Length (mm) Mean	SD	Weight (g) Mean	SD	K	% Mat	
7	2	469	43	1225	247	1.19	0	-	-	-	-	-	-	-	2	469	43	1225	247	1.19	0	
8	7	542	49	1871	513	1.15	14	4	520	26	1725	299	1.22	25	11	534	42	1818	436	1.17	18	
9	8	566	32	2100	301	1.16	25	4	564	26	2150	252	1.20	75	12	565	29	2117	275	1.17	42	
10	5	607	49	2440	532	1.08	40	7	560	35	1971	269	1.12	57	13	578	44	2142	438	1.10	46	
11	1	645	-	3300	-	1.23	100	-	-	-	-	-	-	-	1	645	-	3300	-	1.23	100	
12	2	646	76	3225	1096	1.17	100	1	611	-	2600	-	1.14	100	3	634	58	3017	855	1.16	100	
13	-	-	-	-	-	-	-	1	646	-	2500	-	0.93	100	1	646	-	2500	-	0.93	100	
15	-	-	-	-	-	-	-	1	612	-	2400	-	1.05	100	1	612	-	2400	-	1.05	100	
Total	25							18							44							
Mean		569	61	2172	675	1.15			562	42	2044	345	1.15			566	53	2113	554	1.14		
Mean Age	9.9							9.9							9.4							

Table 20. Biological data by length interval for Arctic charr angled at Diana River, 1985.

Length Interval (mm)	Males				Females				Combined										
	N	Length (mm) Mean	Weight (g) Mean	SD	K	% Mat	N	Length (mm) Mean	Weight (g) Mean	SD	K	% Mat	N	Length (mm) Mean	Weight (g) Mean	SD	K	% Mat	
400	1	438	1050	-	1.25	0	-	-	-	-	-	-	1	438	1050	-	1.25	0	
450	2	487	1275	177	1.10	0	1	486	1350	-	1.18	0	3	486	1300	132	1.13	0	
500	6	526	1733	137	1.19	0	10	532	1820	151	1.21	20	16	529	1788	148	1.20	13	
550	9	570	2117	206	1.14	44	7	571	2107	295	1.13	71	17	570	2097	241	1.13	53	
600	8	617	2594	328	1.10	50	4	622	2413	193	1.01	100	12	618	2533	294	1.07	67	
650	1	669	3200	-	1.07	100	-	-	-	-	-	-	1	669	3200	-	1.07	100	
700	1	700	4000	-	1.17	100	-	-	-	-	-	-	1	700	4000	-	1.17	100	
Total	28						22						51						
Mean		571	2179	641	1.14			559	1998	334	1.15			566	2094	527	1.14		

Table 21. Biological data by length interval for Arctic charr angled at Diana River, 1986.

Length Interval (mm)	No.	Percent	Mean Fork Length (mm)	Round Weight (g)		K
				Mean	SD	
350	2	4	376	825	106	1.59
400	5	9	431	850	117	1.06
450	8	15	480	1113	146	1.01
500	17	31	528	1529	156	1.04
550	12	22	574	1942	272	1.02
600	8	15	608	2213	164	0.98
650	3	5	677	3167	553	1.01
Total Mean	55		536	1660	605	1.04

Table 22. Biological data by length interval for Arctic charr caught in subsistence gillnets at Diana River, 1986.

Length Interval (mm)	No.	Percent	Mean Fork Length (mm)	Round Weight (g)		K
				Mean	SD	
400	3	4	438	967	153	1.15
450	7	10	485	1129	175	0.99
500	8	11	526	1506	221	1.03
550	14	20	572	1971	231	1.05
600	25	36	625	2608	353	1.07
650	9	13	664	3064	313	1.05
700	4	6	712	4263	774	1.18
Total Mean	70		591	2290	863	1.06

