

NECHAKO AND STUART RIVERS CHINOOK CARCASS RECOVERY 1999

*NECHAKO FISHERIES CONSERVATION PROGRAM
Technical Report No. M99-2*

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ABSTRACT

In 1999 adult Chinook salmon (*Oncorhynchus tshawytscha*) carcasses were recovered from the Nechako and Stuart rivers in order to collect biological data on sex, size, fecundity, egg retention, life history and age. This information contributes to the database being compiled under the auspices of the Nechako Fisheries Conservation Program to monitor the Nechako Chinook population.

A total of 205 carcasses were collected on the Nechako River between September 12th and October 2nd. Nechako River Chinook carcasses recovered in 1999 exhibited similar biological characteristics to those collected from 1988 to 1998. However, mean post-orbital hypural length for both males and females was the lowest recorded since 1988. The spawning population was exclusively comprised of individuals with a stream-type life history, dominated by 4₂ and 5₂ age-classes, which is consistent with previous years.

On the Stuart River, 250 carcasses were sampled to collect information that could be used as a comparison to the Nechako data, to identify possible effects of flow regulation on the Nechako Chinook population. Since no obvious trends or anomalies were identified during the comparison of 1999 Nechako data to previous years, it was not necessary to use the information collected from the Stuart in this manner. However, the data are documented in this report in the event that longer-term analyses are required in the future.

INTRODUCTION

Each year since 1988 the Nechako Fisheries Conservation Program (NFCP) Technical Committee has conducted a suite of projects to monitor the population of Chinook salmon (*Oncorhynchus tshawytscha*) that spawn and rear in the Nechako River. The goal of these projects is to provide the information necessary for the NFCP to assess whether or not the Conservation Goal identified in the 1987 Settlement Agreement (Anon, 1987) is being met.

As part of this program of studies to monitor Nechako River Chinook salmon, the Technical Committee has conducted carcass recovery projects on the Nechako and Stuart rivers each year. The purpose of these projects is to gather biological data on adult spawners, including: sex, size, fecundity, egg retention, life history and age. In particular, analysis of fish age indicates the relative contribution of each brood year to the current years' spawning population, which is used to interpret the results of the annual NFCP enu-

meration projects. The information collected from the Nechako River is compared to similar information collected from the Stuart River, an adjacent system unaffected by flow regulation (Figure 1), to assist in identifying potential effects of flow regulation on the Nechako Chinook population.

METHODS

Sampling was conducted throughout the period of Chinook spawner die-off, from mid-September to early October.

In the Nechako River sampling was conducted from Cheslatta Falls downstream to Vanderhoof (Figure 2). In order to ensure a representative sample, recovery effort was based on spawner distribution observed during helicopter surveys conducted as part of the concurrent enumeration project. The target sample size was set at a minimum of 200 fish.

FIGURE 1 Nechako River Drainage

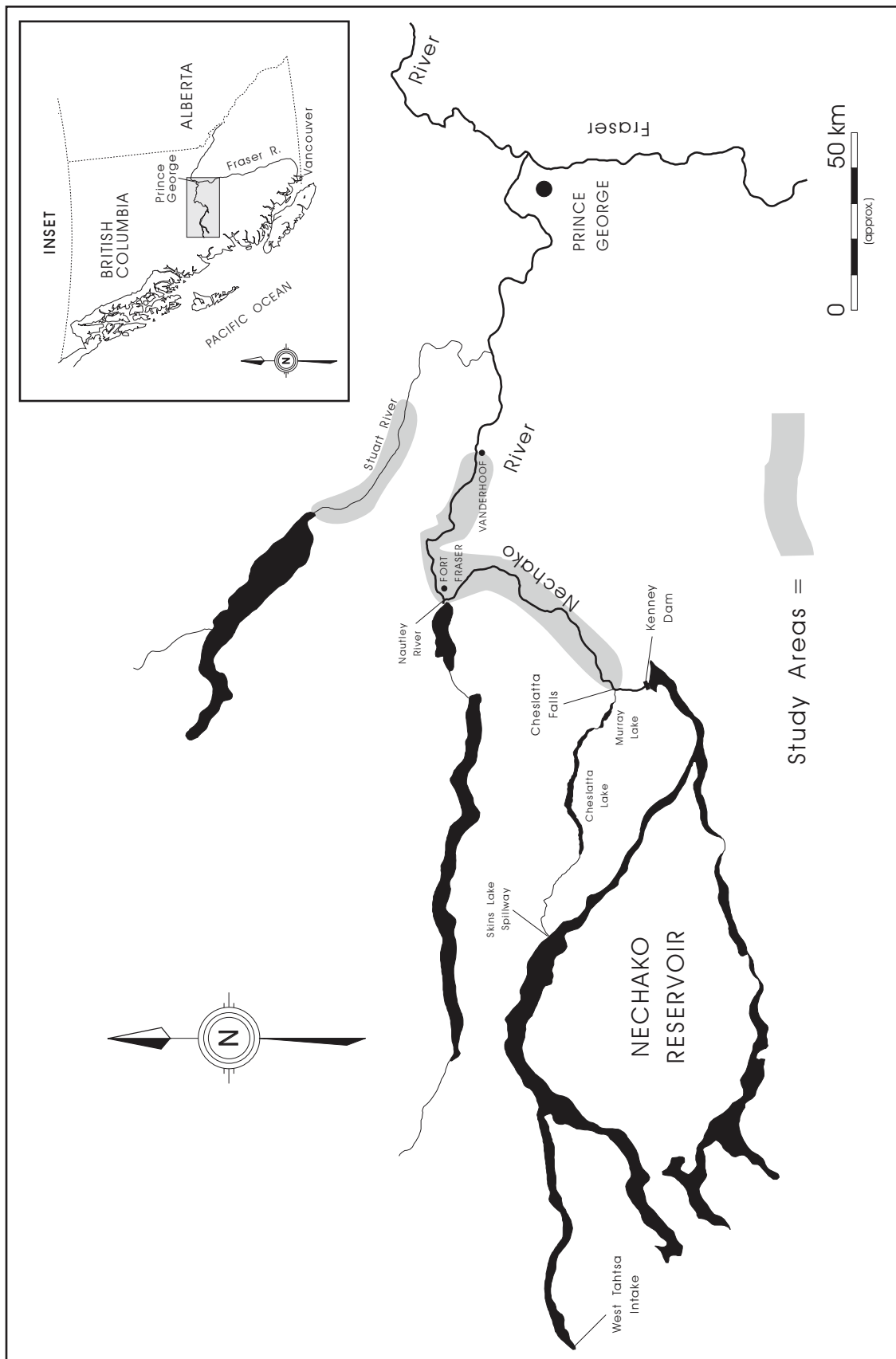


FIGURE 2

Nechako River Chinook Spawning Study Area

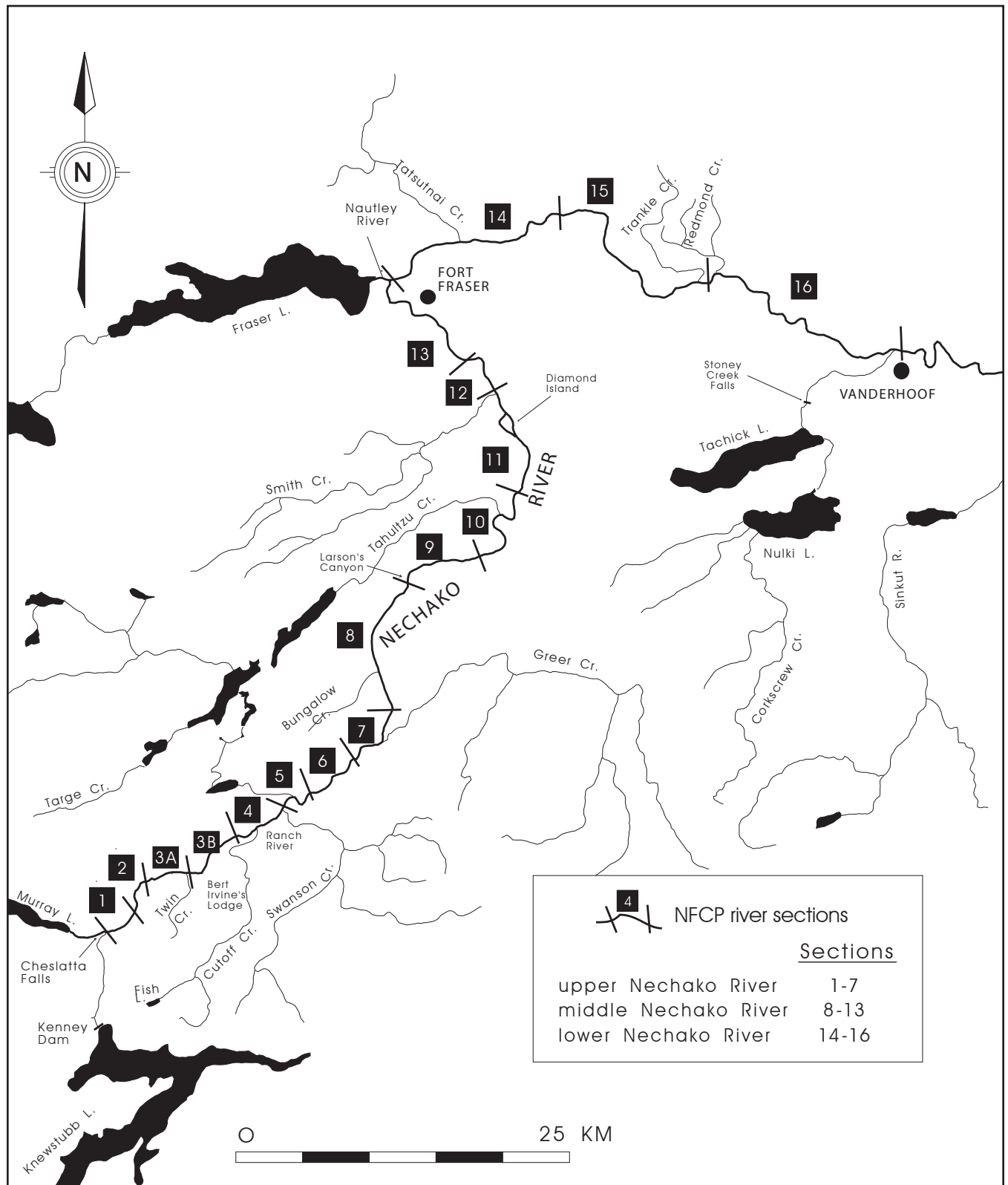
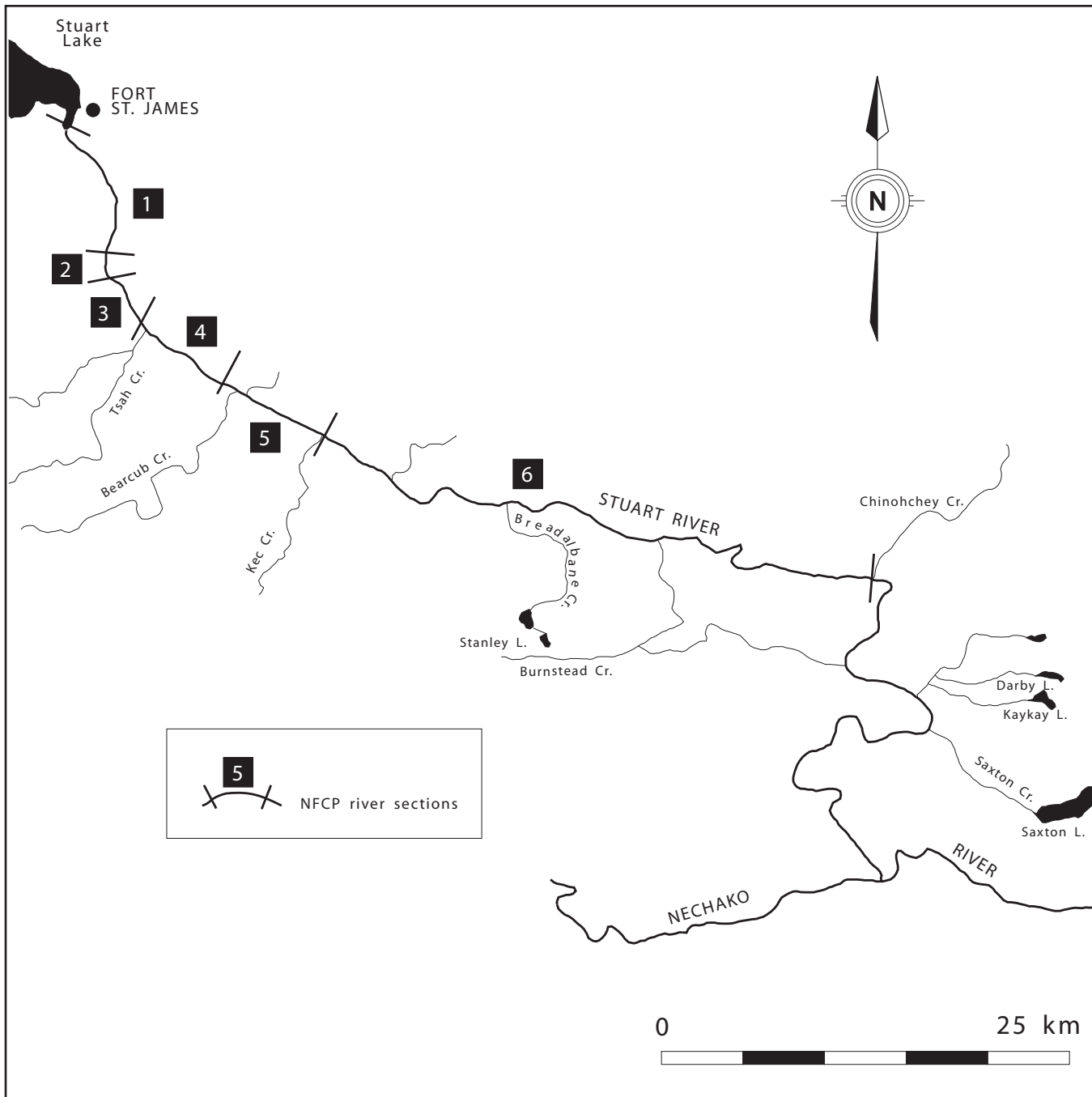


FIGURE 3

Stuart River Chinook Spawning Study Area



Sampling in the Stuart River was conducted from the outlet of Stuart Lake downstream to the confluence of Chinohchey Creek (Figure 3). Carcass sampling was conducted as part of the recovery portion of the mark-recapture enumeration program; all marked carcasses and representative portions of unmarked carcasses from each river section were sampled. In addition to inspecting carcasses for marks and tags applied as part of the mark-recapture program, crews inspected all carcasses recovered for adipose fin clips as an indicator of the success of releases from the Fort St. James hatchery. The target sample size was set at a minimum of 250 fish, slightly higher than the target for the Nechako since Stuart escapements are typically higher.

In each river, several sampling surveys were conducted throughout the period of die-off to ensure that both early and late spawners were represented in the samples. The surveys were conducted by running a jet boat downstream at low speed and recovering carcasses with a gaff. If the carcass was too badly decomposed or eaten by animals to measure body length or take scale samples, it was cut in half to prevent recounting and returned to the river. Each carcass was assigned a number and its location and date of recovery recorded. When a sufficient number of carcasses had been collected, the crew stopped to collect the following samples and biological information:

- **sex:** The sex of each fish was determined based on morphology, and confirmed by abdominal incision and internal examination.
- **condition:** Carcass condition was recorded as: 1) fresh; 2) fair to good; 3) poor with some fungus; or 4) partially decomposed but still able to be sampled. In addition, other observations were recorded, particularly the presence of net scars or lamprey marks.
- **post-orbital hypural length (POHL):** The distance from the posterior margin of the orbit to the flexure of the hypural plate in the caudal peduncle was recorded to the nearest millimeter.
- **egg retention and fecundity:** The body cavities of females were checked for eggs. All eggs were

counted unless the number was greater than 1000, in which case they were estimated volumetrically. In the case of under-developed eggs which could not be separated and counted, the sample was recorded as a pre-spawn mortality with fully skinned eggs.

- **scales and fin rays:** Ten scales were taken from each processed carcass and stored in gummed, pre-numbered scale books. Five scales were taken from each side of the body in the preferred area (several rows above the lateral line between the posterior end of the dorsal fin and the anterior insertion of the anal fin). Care was taken to avoid regenerated, resorbed and irregular shaped scales. Dorsal fins from each carcass were removed with a knife, placed in pre-labeled plastic bags and frozen. Fish age was later determined by analysis of the scales and fin rays, conducted by staff at Fisheries and Oceans Canada (DFO) laboratory facilities.
- **adipose fin:** A missing adipose fin is evidence of a hatchery raised fish with a coded-wire tag implanted in its head. If the fin was missing, the head was removed and sent to an independent laboratory for tag removal and identification.

All processed carcasses were cut in half to prevent recounting and returned to the river.

RESULTS

Data collected from each Chinook carcass sampled in the Nechako and Stuart rivers in 1999 are presented in Appendices 1 and 2, respectively. Summaries of these data are provided in the respective sections below.

Nechako River

Between September 12th and October 2nd a total of 205¹ carcasses were sampled from 10 of the 16 identified sections representing all 3 river areas — upper, middle and lower river (Table 1). The observed sex ratio was 1.85 F/M, or 65% females and 35% males (n=205). One Chinook jacks was collected. Of the carcasses sampled, 62% were fresh or only a few days old (Table 2).

1 Any discrepancy between the total number of carcasses sampled and the reported number of carcasses for various parameters is due to the fact that only partial data were recorded for some carcasses. However, all carcasses were maintained in the dataset and any partial data that was recorded was used in the appropriate analyses.

TABLE 1**Nechako River Chinook
Carcass Recovery by
Section, 1999**

Section	Number	Percent
UPPER NECHAKO		
Section 1	0	0.0
Section 2	0	0.0
Section 3	69	33.7
Section 4	28	13.7
Section 5	20	9.8
Section 6	15	7.3
Section 7	0	0.0
SUB-TOTAL	132	64.4
MIDDLE NECHAKO		
Section 8	1	0.5
Section 9	1	0.5
Section 10	1	0.5
Section 11	25	12.2
Section 12	44	21.5
Section 13	0	0.0
SUB-TOTAL	72	35.1
LOWER NECHAKO		
Section 14	0	0.0
Section 15	1	0.5
Section 16	0	0.0
SUB-TOTAL	1	0.5
TOTAL RIVER	205	100.0

TABLE 2**Nechako River Chinook
Carcass Condition, 1999**

Condition *	Number	Percent
1	61	29.8
2	65	31.7
3	60	29.3
4	19	9.3
TOTAL	205	100.0

* Carcass Condition

1 - Fresh carcass

2 - Fair to good carcass (2 - 3 days old)

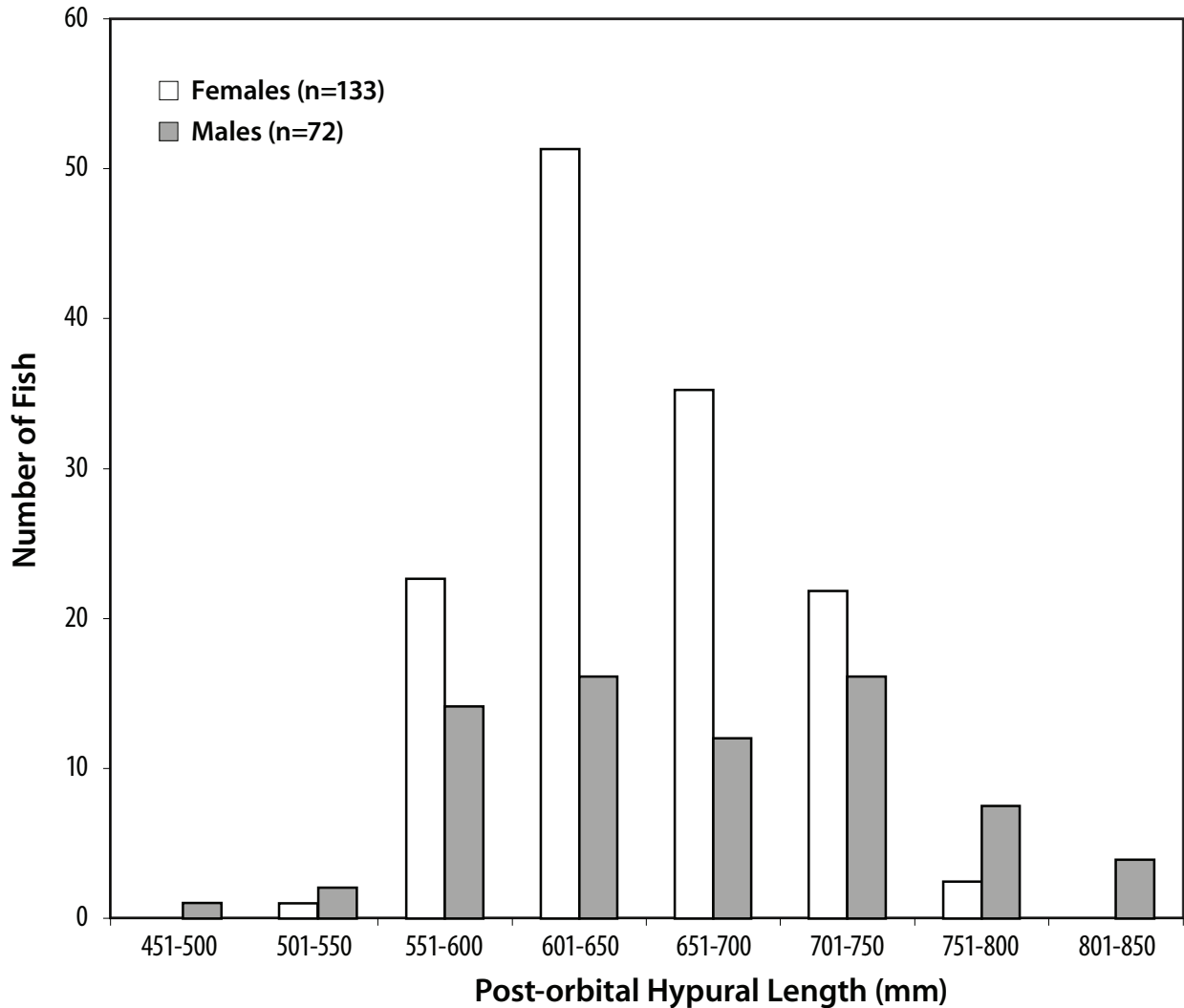
3 - Poor carcass condition with some fungus

4 - Very old and decomposed carcass

The length (POHL) of the fish sampled ranged from 475 to 842 mm, with a mean of 668 mm (n=72, SD=80) for males, 648 mm (n=133, SD=49) for females and 655 mm (n=205, SD=62) for all fish combined. For both males and females, the majority of individuals sampled ranged in size from 551-750 mm (Figure 4).

Of the total number of female carcasses sampled (n=133), none were found to be pre-spawn mortalities, whereas 129 (97%) were determined to be fully spawned, based on egg retention of less than 1000. In addition, there were 4 partially spawned female carcasses (based on egg retention of 1000-4999) with a range of 3100-4000 eggs retained. The mean egg retention of the fully and partially spawned females was 114 eggs (n=133, SD=598, range 0-4000). Removing the partially spawned carcasses from the sample drops the mean egg retention to 9 eggs (n=129, SD=40, range 0-389).

Scale and fin samples from all 205 carcasses recovered from the Nechako River were sent to the Pacific Biological Station in Nanaimo for age analysis. Complete ages were determined for 204 of those samples (Table 3). The results indicate that the majority of the fish sampled were of two age-classes, 5₂ (51%) and 4₂ (44%). A chi-square test was used to determine that the

FIGURE 4**Nechako River Chinook Length Frequency Distribution, 1999**

numbers of males and females in these age-classes were proportionate to the sex ratio of the sample ($p=0.39$).

TABLE 3
**Nechako River Chinook
Age Contribution (%)
by Sex, 1999**

	4 ₁	4 ₂	5 ₂	6 ₂	6 ₃	Total # Aged
Males	0.0	46.5	45.1	7.0	0.0	71
Females	0.0	42.9	54.1	3.0	0.0	133

One live female Chinook with a floy tag was observed, but not recovered. One recovered female Chinook carcass had an adipose fin missing; no other forms of marking or tagging were observed in the sample.

In addition to NFCP data collection requirements, 23 sockeye salmon carcasses were sampled upstream of Larson's Canyon to provide information on this river spawning population. These samples were collected at the request of staff from DFO's Pacific Biological Station and are not directly related to the NFCP sampling program; therefore, the results are not documented in this report..

Stuart River

Between September 18th – 30th a total of 250² carcasses were sampled from the six Zones (1 – 6) within the study area (Table 4). The observed sex ratio was 1.25 F/M, or 56% females and 44% males (n=250). Of the 250 carcasses with condition documented, 10% were fresh or only a few days old (Table 5).

TABLE 4 **Stuart River Chinook
Carcass Recovery by
Zone, 1999**

Zone	Number	Percent
1	13	5.2
2	25	10.0
3	38	15.2
4	113	45.2
5	34	13.6
6	27	10.8
TOTAL	250	100.0

TABLE 5 **Stuart River Chinook
Carcass Condition, 1999**

Condition *	Number	Percent
1	3	1.2
2	21	8.4
3	90	36.0
4	136	54.4
TOTAL	250	100.0

* Carcass Condition

1 - Fresh carcass

2 - Fair to good carcass (2 - 3 days old)

3 - Poor carcass condition with some fungus

4 - Very old and decomposed carcass

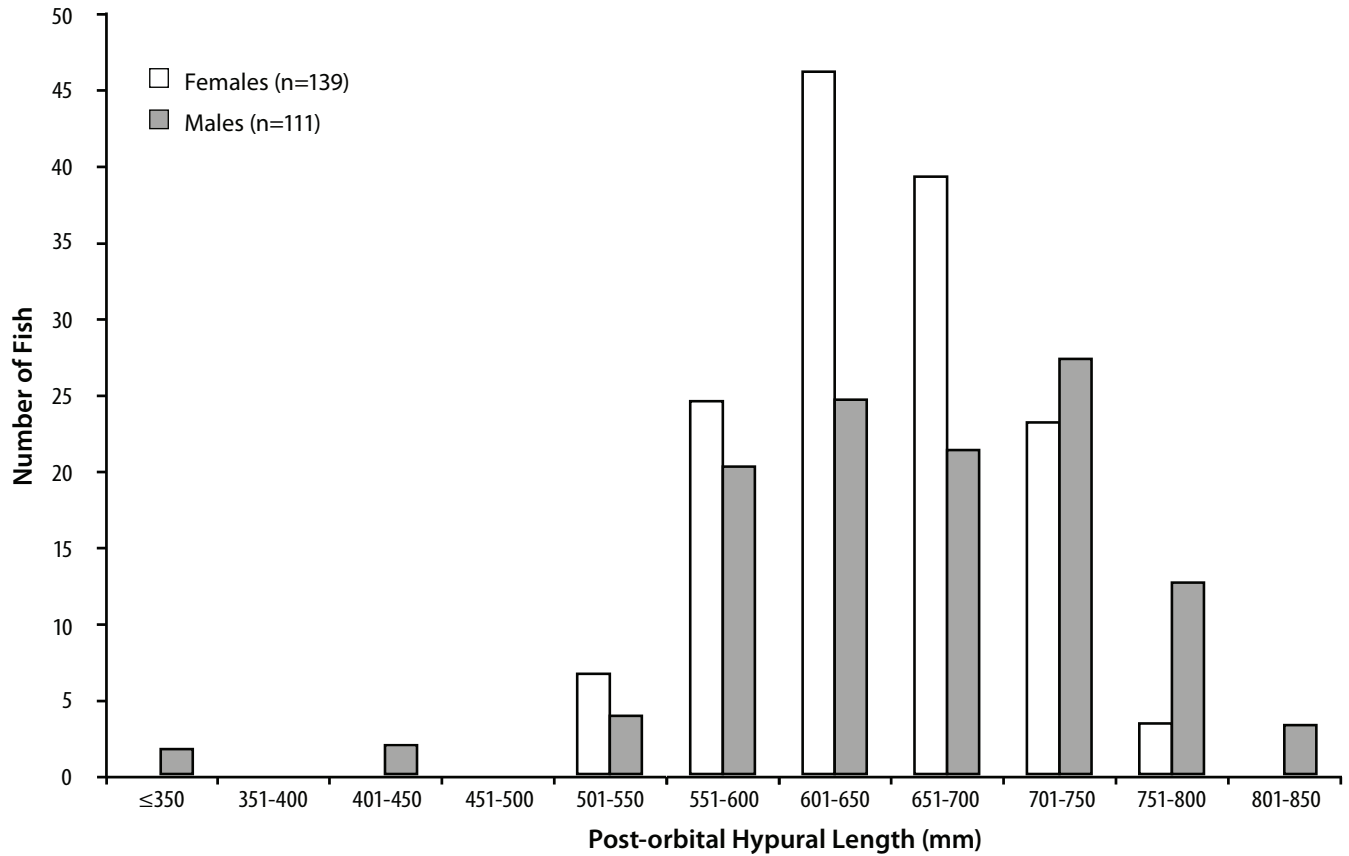
In addition to the carcasses sampled for this project, sex was determined for all carcasses recovered as part of the mark-recapture enumeration project, and documented in the Nechako and Stuart Rivers Chinook Enumeration report (NFCP M95-1). This information is relevant to carcass sampling results presented in this report, and given the much larger sample size (n=543) is likely more representative of the population as a whole. In addition, using the larger dataset eliminates the potential bias associated with the practice of sampling all marked carcasses (sampling for tag application might have a sex bias). The observed sex ratio for this larger sample was 1.27 F/M, or 56% females and 44% males (n=543, including the carcasses selected for biological sampling).

The length (POHL) of the fish sampled ranged from 346 to 831 mm, with a mean of 664 mm for males (n=111, SD=81), 647 mm for females (n=139, SD=56) and 654 mm (n=250, SD=68) for all fish combined. The majority of males and females were distributed across a broad range of lengths from 551-750 mm (Figure 5).

Of the total number of female carcasses sampled (n=139), 100% were determined to be fully spawned, based on egg retention of less than 1000. The mean egg retention of the fully spawned females was 9 eggs (n=139, SD=28, range 0–282). No partially spawned female carcasses (based on egg retention of 1000-4999) were sampled.

Scale and fin samples from all 250 carcasses recovered from the Stuart River were sent to the Pacific Biological Station in Nanaimo for age analysis. Complete ages were determined for 248 of those samples (Table 6). The results indicate that a vast majority of the fish sampled were of two age-classes, 4₂ (50%), and 5₂ (41%). The number of males and females in these age-classes was not significantly

2 Any discrepancy between the total number of carcasses sampled and the reported number of carcasses for various parameters is due to the fact that only partial data were recorded for some carcasses. However, all carcasses were maintained in the dataset and any partial data that was recorded was used in the appropriate analyses.

FIGURE 5**Stuart River Chinook Length Frequency Distribution, 1999**

disproportionate to the sex ratio of the sample (chi-square test, $p=0.61$).

TABLE 6
**Stuart River Chinook
Age Contribution (%)
by Sex, 1999**

	3 ₁	3 ₂	4 ₁	4 ₂	5 ₁	5 ₂	6 ₂	Total # Aged
Males	0.0	1.8	0.0	50.0	1.8	37.3	5.5	110
Females	0.0	0.0	0.0	50.7	2.2	43.5	3.6	138

Carcasses with clipped adipose fins, indicating that they were of hatchery origin, and with tags applied as part of the mark-recapture program were collected. However, these clips and tags are not relevant to the biological sampling project so those results are documented in the Nechako and Stuart Rivers Chinook Enumeration report (NFCP M99-1). In addition, one ocean tag was collected and submitted to the Pacific Biological Station with the Stuart clip and tag data.

DISCUSSION - COMPARISON TO PREVIOUS YEARS

Nechako River

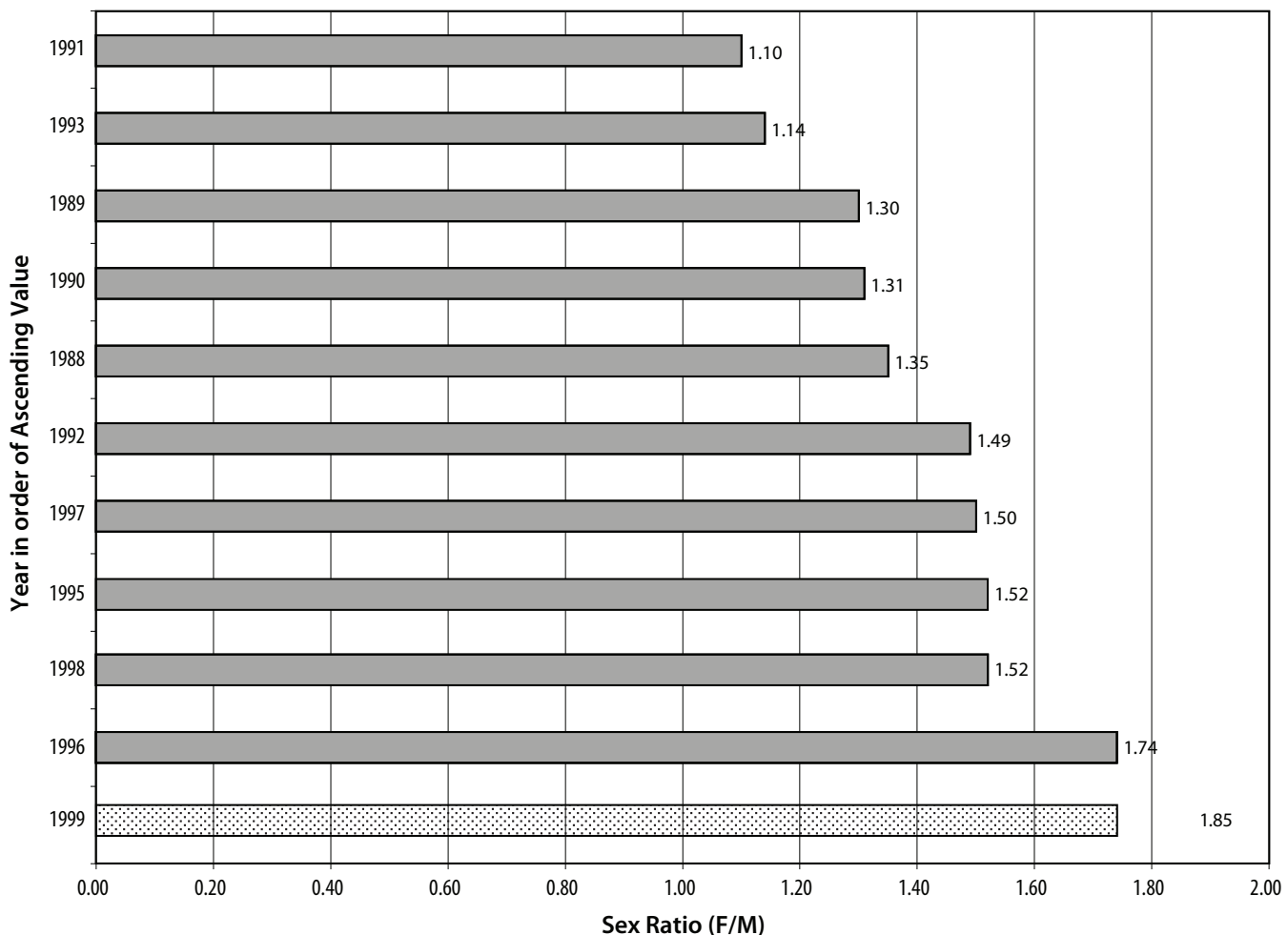
A comparison of 1999 Nechako River Chinook carcass recovery data was made to data collected by the NFCP each year since 1988 (NFCP M88-4 and M89-2 to M98-2). Although some limited data were collected prior to 1988 it was not deemed necessary to include these data in the comparison, since information has been collected by the NFCP for several years using standardized methods and study areas. The exception is the discussion on fecundity which includes data collected prior to the inception of the

NFCP. This exception was made because the prior data adds substantially to the available dataset due to the paucity of information regarding Nechako River Chinook female fecundity.

The observed sex ratio of 1.85 F/M was higher than the existing range (1.10-1.74) observed from 1988-1998 (Figure 6), and significantly higher than the mean of 1.41 ($n=11$, $SD=0.19$), as indicated by 95% confidence limit of 1.30-1.52.

The mean length (POHL) of males (668 mm) was lower than the existing range (682-749 mm) observed from 1988-1998, and significantly lower than the mean of 716 mm ($n=11$, $SD=16$), as indicated by

FIGURE 6 Nechako River Chinook Sex Ratio, 1988-1999



95% confidence limit of 700-732 mm (Figure 7). Similarly, the mean length (POHL) of females (648 mm) was lower than the existing range (675-720 mm)

observed from 1988-1998, and significantly lower than the mean of 692 mm (n=11, SD=8), as indicated by 95% confidence limit of 684-700 mm (Figure 8).

FIGURE 7 Nechako River Chinook Male Mean Length, 1988-1999

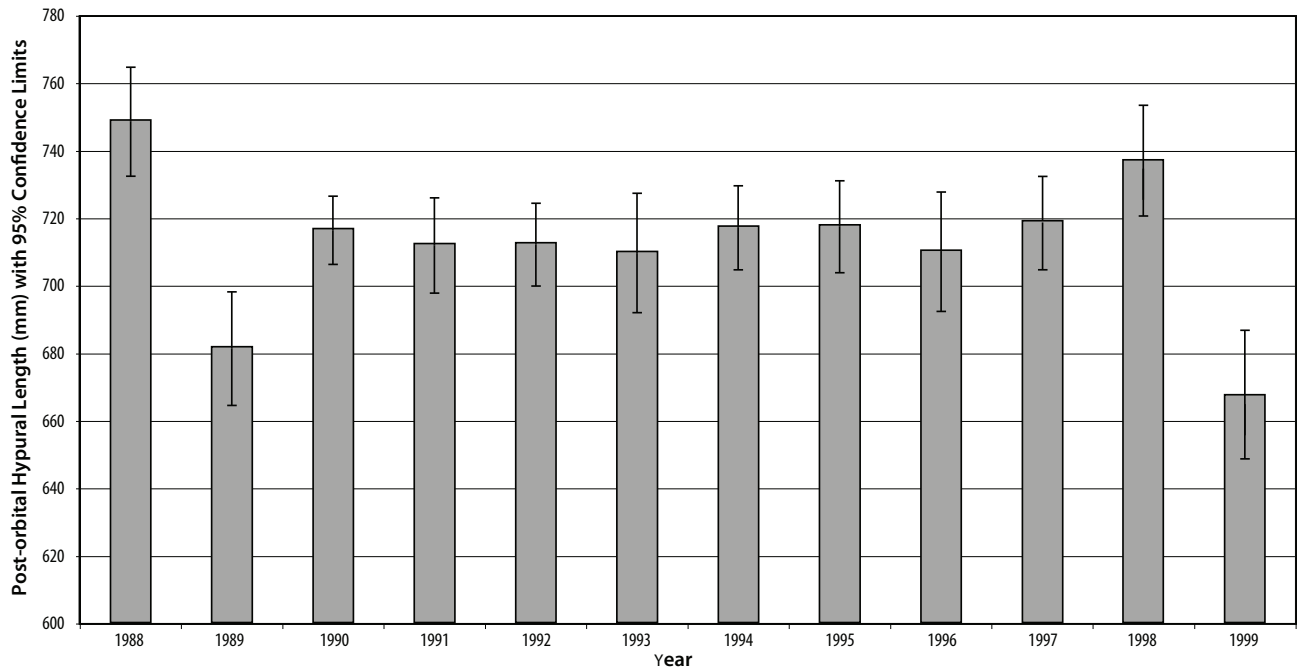
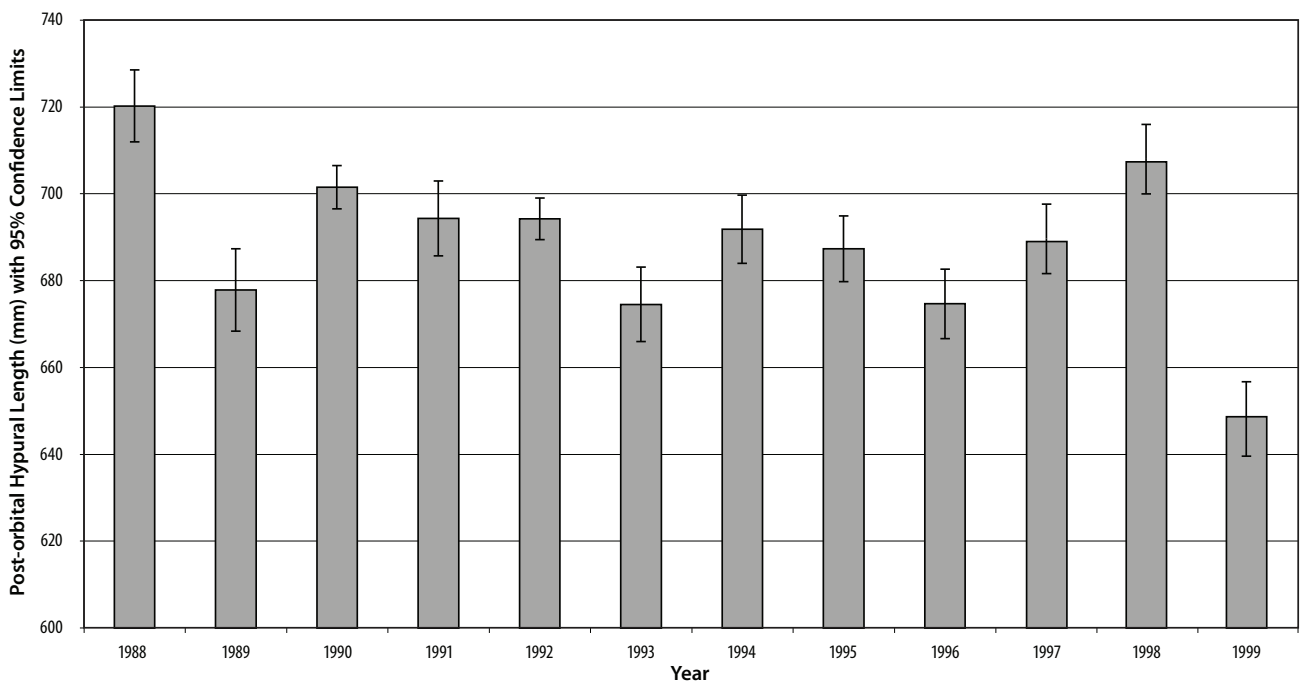


FIGURE 8 Nechako River Chinook Female Mean Length, 1988-1999



No female pre-spawn mortalities were sampled this year, maintaining the average fecundity of Nechako River female Chinook at an estimated 6537 eggs per fish (Table 7). Although no further analysis of

this statistic is conducted for this report, this value may contribute to other aspects of the NFCP monitoring projects, particularly the estimates of egg-to-fry survival.

TABLE 7 Nechako River Chinook
Fecundity, 1978-1999

Year	Post-orbital Hypural Length (mm)	Fecundity (eggs/female)	Sources*	Cumulative Mean
1978	684	5250	1	
1978	663	6305	1	
1979	703	7200	2	
1979	611	5313	2	
1979	611	5284	2	
1980	710	5000	3	
1980	710	5000	3	
1985	760	6800	4	5769
1989	733	6073		
1989	695	5831		
1989	720	5500		
1989	730	5065		5718
1990	760	8831		
1990	730	7040		6035
1991	715	7289		
1991	710	6901		
1991	670	5714		6141
1992	680	7395		
1992	705	7111		6258
1993	690	6848		
1993	630	5705		
1993	720	5575		6229
1995	706	6750		
1995	712	5109		6204
1998	751	10026		
1998	745	9473		
1998	765	8216		
1998	712	6437		6537

*Sources:

1 = Fee and Sheng (1978),

2 = Olmsted *et al.* (1980),

3 = Russell *et al.* (1983), and

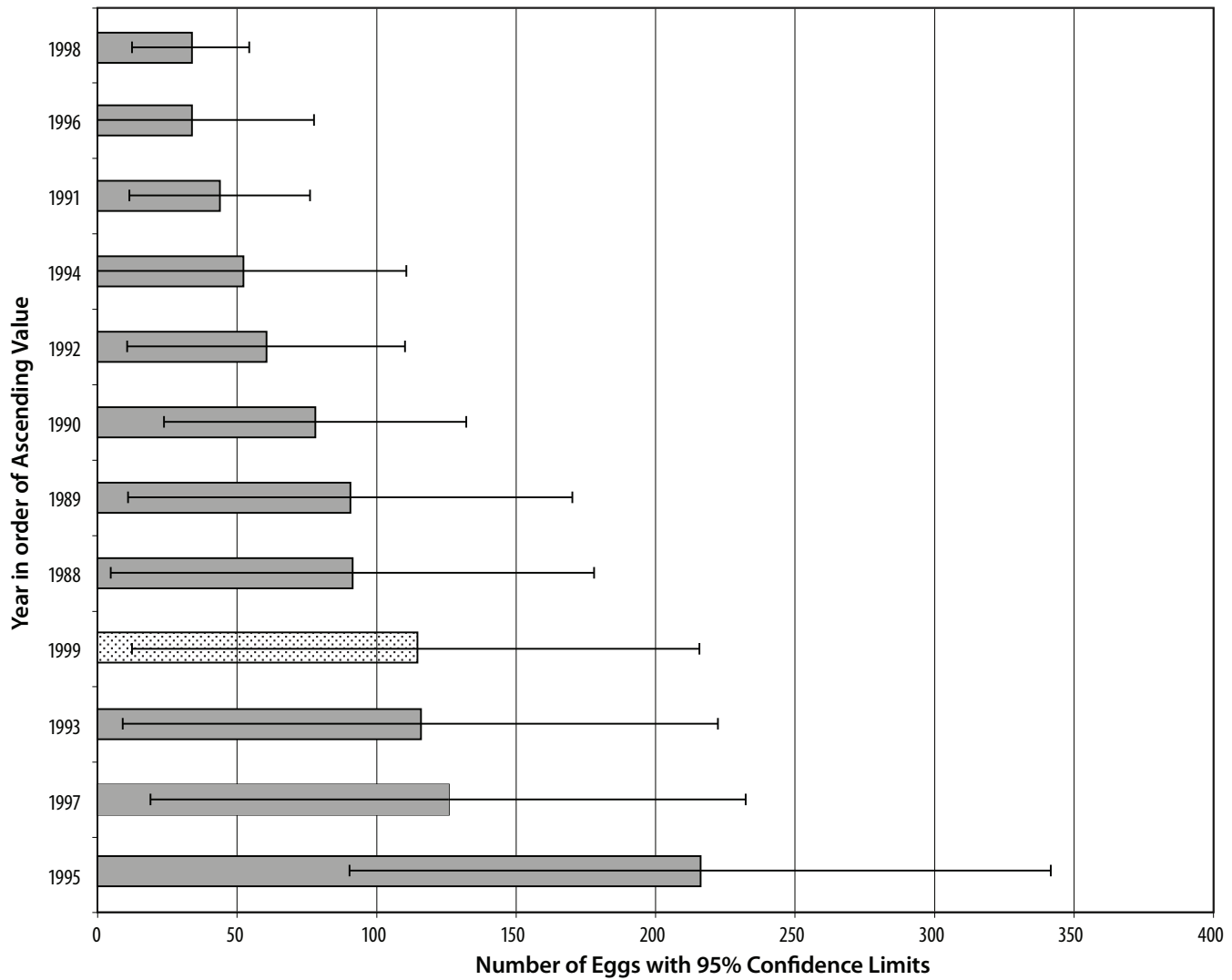
4 = Jaremovic and Rowland (1988)

The mean egg retention in fully and partially spawned carcasses was compared to values from previous years (Table 8). The 1999 mean is within

the range observed since 1988. However, the large confidence limits make it difficult to assign any significance to this observation (Figure 9).

TABLE 8 Nechako River Chinook Egg Retention, 1988-1999

Year	Fully Spawned			Partially Spawned		Fully + Partially
	n	range	mean	n	range	mean
1988	123	0-500	11.5	4	1000-4320	91.4
1989	144	0-757	21.5	3	2760-3960	90.6
1990	226	0-982	40.7	2	4066-4503	78
1991	154	0-732	22.4	2	1383-2005	43.8
1992	219	0-862	20.2	3	1484-4021	60.5
1993	100	0-529	32.8	3	1045-4686	115.8
1994	90	0-249	10.7	2	1565-2272	52.2
1995	144	0-899	38.3	8	1613-4600	216.1
1996	166	0-212	5.8	2	1100-3600	33.7
1997	127	0-326	13.1	4	2700-4081	125.5
1998	124	0-849	33.2	0	n/a	33.2
1999	129	0-389	9.2	4	3100-4000	113.5

FIGURE 9**Nechako River Chinook Mean Egg Retention, 1988-1999**

The Nechako River Chinook spawning population is almost exclusively comprised of individuals that spend one or more years as a fry or parr in fresh water before migrating out to the ocean (stream-type life history), and is dominated by 4₂ and 5₂ age-classes. These have been consistent observations since the inception of the NFCP monitoring program. In 1999 age-classes 4₂ and 5₂ accounted for 95% of the return, with all stream-type fish accounting for 100% (Table 9).

TABLE 9 Percent Contribution of Stream-type Life Histories to Nechako Chinook Escapements, 1988-1999

Year	% Contribution		Sample Size
	4 ₂ + 5 ₂	All Stream-type	
1988	80	99	210
1989	81	97	200
1990	80	98	225
1991	68	96	210
1992	90	99	200
1993	85	100	188
1994	88	100	172
1995	97	99	207
1996	87	99	211
1997	96	100	206
1998	97	99	207
1999	95	100	204

In addition to identifying life history strategies, age data combined with the current years' escapement estimate are used to determine the relative success of past brood years in generating subsequent returns to the river. Since this analysis requires the results of several years, age-at-return data since the inception of the NFCP is documented in Table 10 to facilitate the discussion in the Nechako and Stuart Rivers Chinook Enumeration report (NFCP M95-1).

TABLE 10 Percent Contribution of Age-at-Return Groupings to Nechako Chinook Escapements, 1988-1999

Year	% Contribution					Sample Size
	3 years	4 years	5 years	6 years	7 years	
1988	0.0	9.0	72.4	18.6	0.0	210
1989	1.0	30.0	52.5	15.5	1.0	200
1990	0.0	5.3	76.0	17.3	1.3	225
1991	1.0	16.7	54.3	25.7	2.4	210
1992	1.0	7.0	84.0	8.0	0.0	200
1993	0.0	13.3	71.8	14.9	0.0	188
1994	0.0	11.0	76.7	11.0	1.2	172
1995	0.0	14.0	84.5	1.4	0.0	207
1996	0.0	40.8	49.8	9.5	0.0	211
1997	0.0	20.9	75.7	3.4	0.0	206
1998	0.0	24.6	73.4	1.9	0.0	207
1999	0.5	44.1	51.0	4.4	0.0	204

Stuart River

Information is collected from the Stuart River as a comparison to the Nechako River, to assist in identifying potential effects of flow regulation on the Nechako Chinook population. The geographic proximity of the two rivers means that Chinook returning to the Stuart River most likely experience similar migration timing, ocean conditions and harvest rates as Nechako River Chinook. Given these assumptions, identified trends or anomalies in the Nechako population that were absent from the Stuart might be attributable to factors intrinsic to the Nechako River, but similarities would likely indicate extrinsic factors unrelated to flow regulation.

In 1999, the comparison of information collected from the Nechako to previous years did not identify any significant trends or anomalies, therefore it was not necessary to use the information collected from the Stuart to identify possible intrinsic vs. extrinsic effects. However, the data are documented in this report in the event that longer-term analyses are required in the future.

ACKNOWLEDGMENTS

Nechako River carcass recovery was conducted by Colin Barnard.

Stuart River carcass recovery was carried out by Jim De La Mare and members of the Nak'azdli Band.

Staff at DFO's Pacific Biological Station in Nanaimo, and J.O. Thomas & Associates analyzed the various samples.

Rhonda Thibeault and Liz Murphy assisted with data compilation.

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APPENDIX 1

1999 Nechako River Chinook Carcass Recovery Project: Field Data and Ageing Results

APPENDIX 1**1999 Nechako River Chinook Carcass Recovery Project: Field Data and Ageing Results**

Carcass #	Date	Reach	Sex	Condition	POHL (mm)	# Eggs	Scale Samples		Age (G-R)	Comments
							Book	Spaces		
1	12-Sep-99	4	M	1	719		59001	1	52	
2	12-Sep-99	4	F	1	702	2	59001	2	52	
3	12-Sep-99	4	M	2	806		59001	3	62	
4	12-Sep-99	5	F	2	650	5	59001	4	52	
5	12-Sep-99	5	F	1	606	2	59001	5	42	
6	12-Sep-99	5	F	3	600	0	59002	1	52	
7	14-Sep-99	10	F	2	720	1	59002	2	52	
8	14-Sep-99	11	F	2	742	2	59002	3	52	
9	14-Sep-99	11	F	2	620	1	59002	4	52	
10	14-Sep-99	12	M	2	592		59002	5	42	
11	14-Sep-99	12	M	1	653		59003	1	52	
12	14-Sep-99	12	F	3	672	2	59003	2	52	
13	14-Sep-99	12	F	2	678	5	59003	3	52	
14	14-Sep-99	12	F	2	669	0	59003	4	52	
15	14-Sep-99	12	M	1	754		59003	5	52	
16	14-Sep-99	12	F	1	628	389	59004	1	52	
17	16-Sep-99	3B	M	2	745		59004	2	52	
18	16-Sep-99	3B	M	1	743		59004	3	52	
19	16-Sep-99	3B	M	1	565		59004	4	42	
20	16-Sep-99	4	F	3	657	0	59004	5	52	
21	16-Sep-99	4	F	3	742	12	59006	1	52	
22	16-Sep-99	4	F	1	739	4	59006	2	52	
23	16-Sep-99	5	F	2	632	4	59006	3	52	
24	16-Sep-99	5	M	2	754		59006	4	52	
25	16-Sep-99	5	M	1	731		59006	5	52	
26	16-Sep-99	5	F	3	671	7	59007	1	52	
27	16-Sep-99	6	M	2	570		59007	2	42	
28	16-Sep-99	6	M	2	629		59007	3	52	
29	16-Sep-99	6	F	1	570	4000	59007	4	42	partially spawned, extreme head damage
30	18-Sep-99	11	M	2	717		59007	5	62	
31	18-Sep-99	11	F	2	625	0	59008	1	42	
32	18-Sep-99	11	M	3	596		59008	2	42	
33	18-Sep-99	11	F	2	701	8	59008	3	52	
34	18-Sep-99	11	M	2	742		59008	4	52	
35	18-Sep-99	11	F	3	631	5	59008	5	42	
36	18-Sep-99	11	M	2	824		59009	1	n/a	

APPENDIX 1 (cont.)**1999 Nechako River Chinook Carcass Recovery Project: Field Data and Ageing Results**

Carcass #	Date	Reach	Sex	Condition	POHL (mm)	# Eggs	Scale Samples		Age (G-R)	Comments
							Book	Spaces		
37	18-Sep-99	12	M	2	681		59009	2	42	
38	18-Sep-99	12	F	2	652	1	59009	3	52	
39	18-Sep-99	12	F	3	688	7	59009	4	52	
40	19-Sep-99	12	F	2	745	3100	59009	5	52	partially spawned
41	19-Sep-99	12	F	1	630	3300	59010	1	42	partially spawned
42	19-Sep-99	12	M	1	630		59010	2	42	unspawned
43	19-Sep-99	12	F	2	705	2	59010	3	62	
44	19-Sep-99	12	F	2	710	10	59010	4	62	
45	19-Sep-99	12	F	3	630	0	59010	5	42	
46	19-Sep-99	12	M	3	609		59011	1	42	
47	19-Sep-99	12	F	1	628	0	59011	2	42	
48	19-Sep-99	12	F	3	623	0	59011	3	42	
49	19-Sep-99	12	M	3	730		59011	4	52	
50	19-Sep-99	12	F	1	750	20	59011	5	52	
51	19-Sep-99	12	M	3	600		59012	1	42	
52	19-Sep-99	12	M	2	753		59012	2	52	
53	19-Sep-99	12	M	1	687		59012	3	52	
54	19-Sep-99	12	F	3	587	1	59012	4	52	
55	19-Sep-99	12	F	1	665	5	59012	5	52	
56	19-Sep-99	12	F	1	705	3	59013	1	52	
57	19-Sep-99	12	M	1	620		59013	2	42	
58	20-Sep-99	9	F	2	634	2	59013	3	42	
59	20-Sep-99	8	M	3	594		59013	4	42	
60	22-Sep-99	3A	F	1	631	0	59013	5	52	
61	22-Sep-99	3A	F	1	602	0	59014	1	42	
62	22-Sep-99	3A	F	2	647	39	59014	2	52	
63	22-Sep-99	3A	F	2	694	0	59014	3	52	
64	22-Sep-99	3A	M	2	727		59014	4	52	
65	22-Sep-99	3A	F	1	725	12	59014	5	52	
66	22-Sep-99	3A	F	3	641	234	59015	1	52	
67	22-Sep-99	3A	F	1	619	0	59015	2	42	
68	22-Sep-99	3A	F	1	716	30	59015	3	52	
69	22-Sep-99	3A	F	2	621	11	59015	4	42	
70	22-Sep-99	3A	F	3	718	3	59015	5	52	
71	22-Sep-99	3A	M	3	766		59016	1	52	
72	22-Sep-99	3A	M	1	714		59016	2	52	
73	22-Sep-99	3B	M	3	636		59016	3	42	

APPENDIX 1 (cont.)**1999 Nechako River Chinook Carcass Recovery Project: Field Data and Ageing Results**

Carcass #	Date	Reach	Sex	Condition	POHL (mm)	# Eggs	Scale Samples		Age (G-R)	Comments
							Book	Spaces		
74	22-Sep-99	3B	F	1	617	62	59016	4	42	
75	22-Sep-99	3B	F	2	624	1	59016	5	42	
76	22-Sep-99	3B	M	1	610		59017	1	42	predated
77	22-Sep-99	3B	M	3	585		59017	2	42	
78	22-Sep-99	3B	M	3	580		59017	3	42	
79	22-Sep-99	3B	M	4	692		59017	4	42	
80	22-Sep-99	3B	M	3	642		59017	5	42	
81	22-Sep-99	3B	F	1	595	3	59018	1	42	
82	22-Sep-99	3B	F	3	621	0	59018	2	42	
83	22-Sep-99	3B	F	1	595	3	59018	3	42	
84	22-Sep-99	3B	F	1	620	0	59018	4	42	
85	22-Sep-99	3B	F	1	698	0	59018	5	52	
86	22-Sep-99	3B	F	3	594	0	59019	1	42	
87	22-Sep-99	3B	F	2	566	67	59019	2	42	
88	22-Sep-99	3B	F	2	713	3	59019	3	52	
89	22-Sep-99	3B	F	2	668	0	59019	4	52	
90	22-Sep-99	3B	F	1	707	0	59019	5	52	
91	22-Sep-99	3B	M	1	516		59020	1	42	
92	22-Sep-99	3B	M	2	725		59020	2	52	
93	23-Sep-99	3B	F	2	652	2	59020	3	52	
94	23-Sep-99	3B	M	2	714		59020	4	52	
95	23-Sep-99	3B	F	3	703	9	59020	5	52	
96	23-Sep-99	3B	F	2	686	1	59021	1	52	
97	23-Sep-99	4	F	1	649	3	59021	2	52	large ulceration on side
98	23-Sep-99	4	M	2	578		59021	3	42	
99	23-Sep-99	4	F	3	655	5	59021	4	52	
100	23-Sep-99	4	M	2	619		59021	5	52	
101	23-Sep-99	4	M	1	602		59022	1	42	
102	23-Sep-99	4	M	2	584		59022	2	42	
103	23-Sep-99	4	F	2	643	15	59022	3	52	
104	23-Sep-99	5	F	3	646	4	59022	4	52	
105	23-Sep-99	5	F	4	531	0	59022	5	42	
106	23-Sep-99	5	F	1	612	28	59023	1	42	
107	23-Sep-99	5	F	1	640	1	59023	2	52	
108	23-Sep-99	5	M	2	666		59023	3	42	
109	23-Sep-99	5	F	2	688	1	59023	4	52	
110	23-Sep-99	5	F	1	687	0	59023	5	52	

APPENDIX 1 (cont.)**1999 Nechako River Chinook Carcass Recovery Project: Field Data and Ageing Results**

Carcass #	Date	Reach	Sex	Condition	POHL (mm)	# Eggs	Scale Samples		Age (G-R)	Comments
							Book	Spaces		
111	24-Sep-99	4	M	1	677		59024	1	52	
112	24-Sep-99	5	M	3	661		59024	2	52	
113	24-Sep-99	5	F	1	643	9	59024	3	42	
114	24-Sep-99	5	M	1	643		59024	4	42	
115	24-Sep-99	5	F	3	688	0	59024	5	52	
116	24-Sep-99	5	F	2	562	3500	59025	1	52	unspawned, hard skein, mushy liver (yellow)
117	24-Sep-99	5	M	1	703		59025	2	62	
118	24-Sep-99	6	M	1	655		59025	3	42	
119	24-Sep-99	6	M	4	767		59025	4	52	
120	24-Sep-99	6	M	1	516		59025	5	42	
121	24-Sep-99	6	M	2	733		59026	1	52	
122	24-Sep-99	6	F	2	590	0	59026	2	42	
123	24-Sep-99	6	F	1	659	0	59026	3	52	
124	24-Sep-99	6	F	4	708	0	59026	4	52	
125	24-Sep-99	6	F	1	585	0	59026	5	42	
126	24-Sep-99	6	F	1	610	2	59027	1	42	
127	24-Sep-99	6	F	1	702	2	59027	2	52	
128	24-Sep-99	6	F	3	664	1	59027	3	52	
129	24-Sep-99	6	F	2	599	1	59027	4	42	
130	27-Sep-99	11	F	4	605	0	59027	5	42	
131	27-Sep-99	11	F	1	615	0	59028	1	42	
132	27-Sep-99	11	F	2	602	1	59028	2	42	
133	27-Sep-99	11	F	1	611	0	59028	3	42	
134	27-Sep-99	11	F	3	599	1	59028	4	42	
135	27-Sep-99	11	M	3	650		59028	5	52	
136	27-Sep-99	11	F	3	603	0	59029	1	42	
137	27-Sep-99	11	M	1	573		59029	2	42	
138	27-Sep-99	11	M	1	794		59029	3	52	
139	27-Sep-99	11	F	4	681	0	59029	4	52	
140	27-Sep-99	11	F	4	668	0	59029	5	52	
141	27-Sep-99	11	M	2	842		59030	1	62	
142	27-Sep-99	11	M	3	631		59030	2	52	
143	27-Sep-99	11	F	3	615	2	59030	3	42	
144	27-Sep-99	11	F	1	763	0	59030	4	62	
145	27-Sep-99	11	M	3	816		59030	5	62	
146	27-Sep-99	12	F	2	685	6	59031	1	52	

APPENDIX 1 (cont.)**1999 Nechako River Chinook Carcass Recovery Project: Field Data and Ageing Results**

Carcass #	Date	Reach	Sex	Condition	POHL (mm)	# Eggs	Scale Samples		Age (G-R)	Comments
							Book	Spaces		
147	27-Sep-99	12	F	2	706	3	59031	2	52	
148	27-Sep-99	12	F	2	670	1	59031	3	52	
149	27-Sep-99	12	F	2	697	1	59031	4	52	
150	27-Sep-99	12	M	3	770		59031	5	52	
151	28-Sep-99	12	F	1	566	1	59032	1	42	
152	28-Sep-99	12	F	2	592	0	59032	2	52	
153	28-Sep-99	12	F	2	655	1	59032	3	52	
154	28-Sep-99	12	F	3	555	11	59032	4	42	
155	28-Sep-99	12	F	3	631	0	59032	5	42	
156	28-Sep-99	12	M	3	739		59033	1	52	heavy predation on right side
157	28-Sep-99	12	F	3	670	5	59033	2	52	
158	28-Sep-99	12	F	3	624	0	59033	3	42	
159	28-Sep-99	12	F	2	613	0	59033	4	42	
160	28-Sep-99	12	M	3	622		59033	5	42	
161	28-Sep-99	12	F	4	652	2	59034	1	52	
162	29-Sep-99	15	F	3	585	1	59034	2	42	
163	30-Sep-99	3B	F	4	633	6	59034	3	42	
164	30-Sep-99	3B	F	4	561	17	59034	4	42	
165	30-Sep-99	3B	M	4	698		59034	5	52	
166	30-Sep-99	3B	M	1	741		59035	1	52	
167	30-Sep-99	3B	M	4	630		59035	2	42	
168	1-Oct-99	3A	F	3	598	4	59035	3	42	
169	1-Oct-99	3A	F	2	742	2	59035	4	52	
170	1-Oct-99	3A	F	1	782	0	59035	5	62	
171	1-Oct-99	3A	F	1	710	0	59036	1	52	
172	1-Oct-99	3A	F	1	626	0	59036	2	42	
173	1-Oct-99	3A	F	1	614	1	59036	3	42	
174	1-Oct-99	3A	F	2	663	1	59036	4	42	
175	1-Oct-99	3A	M	2	695		59036	5	52	
176	1-Oct-99	3A	M	3	645		59037	1	42	
177	1-Oct-99	3A	F	1	645	0	59037	2	42	
178	1-Oct-99	3A	F	3	592	0	59037	3	42	
179	1-Oct-99	3A	M	3	571		59037	4	42	
180	1-Oct-99	3A	F	3	627	0	59037	5	52	
181	1-Oct-99	3A	M	3	720		59038	1	52	
182	1-Oct-99	3A	F	4	672	1	59038	2	52	
183	1-Oct-99	3A	F	4	600	0	59038	3	42	

APPENDIX 1 (cont.)**1999 Nechako River Chinook Carcass Recovery Project: Field Data and Ageing Results**

Carcass #	Date	Reach	Sex	Condition	POHL (mm)	# Eggs	Scale Samples		Age (G-R)	Comments
							Book	Spaces		
184	1-Oct-99	3A	F	4	689	3	59038	4	52	
185	1-Oct-99	3B	F	2	631	0	59038	5	42	
186	1-Oct-99	3B	M	2	636		59039	1	42	
187	1-Oct-99	3B	F	4	652	0	59039	2	42	
188	1-Oct-99	3B	M	3	475		59039	3	32	Jack
189	1-Oct-99	3B	F	3	593	0	59039	4	42	
190	1-Oct-99	3B	F	3	576	1	59039	5	42	
191	1-Oct-99	3B	M	3	576		59040	1	42	
192	2-Oct-99	4	F	2	645	3	59040	2	52	
193	2-Oct-99	4	F	3	688	0	59040	3	52	
194	2-Oct-99	4	F	4	634	0	59040	4	52	
195	2-Oct-99	4	F	2	652	0	59040	5	52	
196	2-Oct-99	4	M	3	683		59041	1	42	
197	2-Oct-99	4	M	3	683		59041	2	52	
198	2-Oct-99	4	F	4	625	5	59041	3	42	
199	2-Oct-99	4	F	3	602	21	59041	4	42	
200	2-Oct-99	4	F	3	648	0	59041	5	52	extreme widows peak, possible nose tag
201	2-Oct-99	4	F	2	668	6	59042	1	52	
202	2-Oct-99	4	M	3	552		59042	2	42	
203	2-Oct-99	4	F	4	606	0	59042	3	42	
204	2-Oct-99	4	F	2	635	19	59042	4	52	
205	2-Oct-99	4	F	1	599	11	59042	5	42	
207	7-Oct-98	5	F	3	689	0	51242	2	52	
208	7-Oct-98	5	M	3	622		51242	3	42	
209	7-Oct-98	5	F	3	627	66	51242	4	42	
210	7-Oct-98	5	F	3	722	19	51242	5	52	

APPENDIX 2

**1999 Stuart River Chinook Carcass Recovery Project:
Field Data and Ageing Results**

APPENDIX 2

1999 Stuart River Chinook Carcass Recovery Project: Field Data and Ageing Results

Carcass #	Date	Reach	Sex	Condition	POHL (mm)	# Eggs	Scale Sample Book	Scale Sample Spaces	Age (G-R)	Comments	Carcass #	POHL (mm)	Age (G-R)	Sex
1	18-Sep-99	6	M	3	747		59701	1	62		3	346	32	M
2	18-Sep-99	6	M	3	627		59701	2	42		247	419	32	M
3	18-Sep-99	6	M	2	346		59701	3	32	Jack	12	520	42	M
4	18-Sep-99	5	F	3	677	0	59701	4	52		97	535	42	M
5	18-Sep-99	5	M	3	674		59701	5	42		234	536	42	M
6	18-Sep-99	5	M	2	636		59702	1	42		178	540	42	F
7	18-Sep-99	4	M	2	630		59702	2	42		149	543	42	F
8	18-Sep-99	4	M	3	704		59702	3	52		65	546	42	F
9	18-Sep-99	4	M	2	635		59702	4	42		81	550	42	F
10	18-Sep-99	4	F	2	695	6	59702	5	52		84	550	42	M
11	18-Sep-99	4	M	2	744		59703	1	73		59	552	42	M
12	18-Sep-99	4	M	3	520		59703	2	42		232	554	42	F
13	18-Sep-99	4	M	3	746		59703	3	52		170	557	42	F
14	18-Sep-99	4	M	3	597		59703	4	42		249	557	42	F
15	18-Sep-99	4	F	2	543	11	59703	5	52		79	560	42	F
16	18-Sep-99	4	M	4	685		59704	1	52		54	561	42	F
17	18-Sep-99	4	M	3	751		59704	2	52		157	561	42	M
18	18-Sep-99	4	M	3	696		59704	3	42		47	564	42	F
19	18-Sep-99	4	M	3	759		59704	4	52		172	567	42	F
20	18-Sep-99	4	M	3	588		59704	5	42		240	567	42	M
21	18-Sep-99	4	F	2	688	0	59705	1	52		46	568	42	F
22	18-Sep-99	4	M	3	741		59705	2	52		25	569	42	M
23	18-Sep-99	4	M	3	705		59705	3	52		86	569	42	M
24	18-Sep-99	4	F	4	696	0	59705	4	52		224	573	42	F
25	18-Sep-99	4	M	2	569		59705	5	42		250	574	42	F
26	19-Sep-99	4	M	3	644		59706	1	52		233	578	42	M
27	19-Sep-99	4	F	4	662	0	59706	2	52		117	580	42	F
28	19-Sep-99	4	M	4	741		59706	3	52		118	582	42	F
29	19-Sep-99	4	M	3	588		59706	4	42		150	582	42	M
30	19-Sep-99	4	F	4	666	0	59706	5	52		200	582	42	F
31	19-Sep-99	4	F	4	687	0	59707	1	52		206	582	42	M
32	19-Sep-99	4	F	2	586	0	59707	2	42		32	586	42	F
33	19-Sep-99	4	M	4	597		59707	3	52		96	586	42	F
34	19-Sep-99	4	F	4	689	42	59707	4	52		146	587	42	M
35	19-Sep-99	4	M	3	763		59707	5	52		243	587	42	M
36	19-Sep-99	4	M	4	704		59708	1	52		20	588	42	M
37	19-Sep-99	4	M	4	686		59708	2	52		29	588	42	M

APPENDIX 2 (cont.)
**1999 Stuart River Chinook Carcass Recovery Project:
Field Data and Ageing Results**

Carcass #	Date	Reach	Sex	Condition	POHL (mm)	# Eggs	Scale Sample Book	Scale Sample Spaces	Age (G-R)	Comments	Carcass #	POHL (mm)	Age (G-R)	Sex
38	19-Sep-99	4	M	3	654		59708	3	42		40	588	42	M
39	19-Sep-99	4	F	3	623	0	59708	4	42		241	588	42	M
40	19-Sep-99	4	M	2	588		59708	5	42		179	589	42	F
41	19-Sep-99	4	F	2	662	0	59709	1	52		217	590	42	M
42	19-Sep-99	4	F	2	644	0	59709	2	42		248	593	42	F
43	19-Sep-99	4	F	3	613	0	59709	3	42		44	594	42	M
44	19-Sep-99	4	M	3	594		59709	4	42		135	594	42	F
45	19-Sep-99	4	F	2	636	0	59709	5	52		229	596	42	F
46	19-Sep-99	4	F	4	568	0	59710	1	42		14	597	42	M
47	19-Sep-99	4	F	4	564	3	59710	2	42		95	597	42	F
48	19-Sep-99	4	F	4	739	0	59710	3	52		210	597	42	F
49	19-Sep-99	4	F	4	726	0	59710	4	52		221	597	42	M
50	19-Sep-99	4	F	4	656	0	59710	5	42		94	599	42	F
51	20-Sep-99	4	F	3	704	84	59711	1	52		107	600	42	M
52	20-Sep-99	4	F	3	650	1	59711	2	52		173	600	42	F
53	20-Sep-99	4	F	3	612	0	59711	3	42		223	600	42	F
54	20-Sep-99	4	F	3	561	1	59711	4	42		68	601	42	F
55	20-Sep-99	4	M	3	696		59711	5	52		176	601	42	M
56	20-Sep-99	4	M	3	620		59712	1	42		195	601	42	F
57	20-Sep-99	4	F	4	701	0	59712	2	52		112	602	42	M
58	20-Sep-99	4	F	4	614	0	59712	3	42		187	602	42	M
59	20-Sep-99	4	M	4	552		59712	4	42		238	602	42	F
60	20-Sep-99	4	F	3	607	0	59712	5	42		127	604	42	F
61	20-Sep-99	4	F	4	607	0	59713	1	52		70	605	42	F
62	20-Sep-99	4	F	3	665	0	59713	2	51		134	605	42	F
63	20-Sep-99	4	F	4	680	0	59713	3	52		60	607	42	F
64	20-Sep-99	4	F	4	685	0	59713	4	52		139	607	42	M
65	20-Sep-99	4	F	3	546	0	59713	5	42		110	608	42	M
66	20-Sep-99	4	F	3	648	0	59714	1	42		133	610	42	F
67	20-Sep-99	4	M	4	694		59714	2	52		202	610	42	F
68	20-Sep-99	4	F	3	601	0	59714	3	42		53	612	42	F
69	20-Sep-99	4	F	4	676	0	59714	4	52		43	613	42	F
70	20-Sep-99	4	F	4	605	7	59714	5	42		119	613	42	F
71	20-Sep-99	4	M	4	693		59715	1	52		125	613	42	F
72	20-Sep-99	4	F	4	629	4	59715	2	42		226	613	42	F
73	20-Sep-99	4	F	3	630	19	59715	3	42		239	613	42	F
74	20-Sep-99	4	M	3	753		59715	4	52		58	614	42	F

APPENDIX 2 (cont.)
**1999 Stuart River Chinook Carcass Recovery Project:
Field Data and Ageing Results**

Carcass #	Date	Reach	Sex	Condition	POHL (mm)	# Eggs	Scale Sample Book	Scale Sample Spaces	Age (G-R)	Comments	Carcass #	POHL (mm)	Age (G-R)	Sex
75	20-Sep-99	4	F	4	665	7	59715	5	52		242	616	42	M
76	20-Sep-99	4	F	4	648	0	59716	1	42		152	617	42	M
77	20-Sep-99	4	F	4	615	4	59716	2	n/a		235	618	42	F
78	20-Sep-99	4	M	4	675		59716	3	42		56	620	42	M
79	20-Sep-99	4	F	4	560	0	59716	4	42		39	623	42	F
80	20-Sep-99	4	F	3	695	3	59716	5	52		155	623	42	M
81	20-Sep-99	4	F	4	550	10	59717	1	42		2	627	42	M
82	20-Sep-99	4	M	3	705		59717	2	52		194	627	42	F
83	20-Sep-99	4	M	2	631		59717	3	42		106	628	42	F
84	20-Sep-99	4	M	3	550		59717	4	42		72	629	42	F
85	20-Sep-99	4	F	3	710	6	59717	5	52		7	630	42	M
86	21-Sep-99	3	M	4	569		59718	1	42		73	630	42	F
87	21-Sep-99	3	F	4	750	0	59718	2	51	adipose fin clip	220	630	42	M
88	21-Sep-99	3	F	4	771	9	59718	3	62		83	631	42	M
89	21-Sep-99	3	M	4	752		59718	4	51	adipose fin clip	203	634	42	F
90	21-Sep-99	3	M	4	641		59718	5	42		9	635	42	M
91	21-Sep-99	3	M	4	795		59719	1	62		181	635	42	F
92	21-Sep-99	3	M	4	633		59719	2	52		185	635	42	F
93	21-Sep-99	3	F	4	638	1	59719	3	52		6	636	42	M
94	21-Sep-99	3	F	4	599	0	59719	4	42		245	636	42	M
95	21-Sep-99	3	F	3	597	0	59719	5	42		211	637	42	F
96	21-Sep-99	3	F	4	586	0	59720	1	42		212	638	42	F
97	21-Sep-99	3	M	4	535		59720	2	42		214	639	42	F
98	21-Sep-99	3	F	4	757	2	59720	3	62		90	641	42	M
99	21-Sep-99	3	M	3	735		59720	4	52		213	641	42	F
100	21-Sep-99	3	M	4	705		59720	5	52		183	642	42	F
101	21-Sep-99	3	F	4	738	0	59721	1	52		42	644	42	F
102	21-Sep-99	3	F	4	690	0	59721	2	52		108	645	42	M
103	21-Sep-99	3	F	4	612	2	59721	3	52		120	645	42	M
104	21-Sep-99	3	M	4	745		59721	4	52		124	646	42	M
105	21-Sep-99	3	F	3	671	13	59721	5	52		111	647	42	M
106	21-Sep-99	3	F	4	628	0	59722	1	42		66	648	42	F
107	21-Sep-99	3	M	3	600		59722	2	42		76	648	42	F
108	21-Sep-99	3	M	4	645		59722	3	42		141	648	42	F
109	21-Sep-99	3	F	4	695	0	59722	4	52		184	648	42	F

APPENDIX 2 (cont.)
**1999 Stuart River Chinook Carcass Recovery Project:
Field Data and Ageing Results**

Carcass #	Date	Reach	Sex	Condition	POHL (mm)	# Eggs	Scale Sample Book	Scale Sample Spaces	Age (G-R)	Comments	Carcass #	POHL (mm)	Age (G-R)	Sex
110	21-Sep-99	3	M	4	608		59722	5	42		148	651	42	M
111	21-Sep-99	2	M	3	647		59723	1	42		205	651	42	M
112	21-Sep-99	2	M	3	602		59723	2	42		140	652	42	M
113	21-Sep-99	2	F	4	670	0	59723	3	42		38	654	42	M
114	21-Sep-99	2	F	4	676	84	59723	4	52		50	656	42	F
115	21-Sep-99	2	M	4	801		59723	5	52		153	664	42	F
116	21-Sep-99	2	M	4	831		59724	1	62		113	670	42	F
117	21-Sep-99	2	F	3	580	7	59724	2	42		168	671	42	F
118	21-Sep-99	2	F	4	582	15	59724	3	42		204	673	42	M
119	21-Sep-99	2	F	3	613	1	59724	4	42		5	674	42	M
120	21-Sep-99	2	M	4	645		59724	5	42		78	675	42	M
121	21-Sep-99	2	F	4	725	0	59725	1	52		174	676	42	F
122	21-Sep-99	2	M	3	670		59725	2	51	adipose fin clip	230	679	42	F
123	21-Sep-99	2	F	4	734	21	59725	3	62		191	680	42	M
124	21-Sep-99	2	M	3	646		59725	4	42		167	681	42	F
125	21-Sep-99	2	F	4	613	39	59725	5	42		144	685	42	M
126	21-Sep-99	1	F	4	542	12	59726	1	52		169	689	42	M
127	21-Sep-99	1	F	4	604	1	59726	2	42		18	696	42	M
128	21-Sep-99	1	M	4	809		59726	3	n/a		62	665	51	F
129	21-Sep-99	1	M	4	686		59726	4	52		122	670	51	M
130	21-Sep-99	1	F	3	705	0	59726	5	52		164	695	51	F
131	22-Sep-99	6	M	3	725		59727	1	52		87	750	51	F
132	22-Sep-99	6	M	3	607		59727	2	52		89	752	51	M
133	22-Sep-99	6	F	3	610	8	59727	3	42		126	542	52	F
134	22-Sep-99	6	F	3	605	4	59727	4	42		15	543	52	F
135	22-Sep-99	6	F	4	594	1	59727	5	42		33	597	52	M
136	22-Sep-99	6	F	4	675	16	59728	1	52		61	607	52	F
137	22-Sep-99	6	F	4	686	0	59728	2	52		132	607	52	M
138	22-Sep-99	6	F	3	681	21	59728	3	52		103	612	52	F
139	22-Sep-99	6	M	3	607		59728	4	42		222	616	52	F
140	22-Sep-99	6	M	3	652		59728	5	42		92	633	52	M
141	22-Sep-99	6	F	4	648	0	59729	1	42	sex questionable	231	635	52	F
142	22-Sep-99	6	F	4	742	0	59729	2	52		45	636	52	F
143	22-Sep-99	6	M	3	709		59729	3	52		209	636	52	F
144	22-Sep-99	6	M	3	685		59729	4	42		93	638	52	F

APPENDIX 2 (cont.)
**1999 Stuart River Chinook Carcass Recovery Project:
Field Data and Ageing Results**

Carcass #	Date	Reach	Sex	Condition	POHL (mm)	# Eggs	Scale Sample Book	Scale Sample Spaces	Age (G-R)	Comments	Carcass #	POHL (mm)	Age (G-R)	Sex
145	22-Sep-99	6	M	4	758		59729	5	62		225	642	52	F
146	22-Sep-99	6	M	4	587		59730	1	42		26	644	52	M
147	22-Sep-99	6	F	3	684	1	59730	2	52		52	650	52	F
148	22-Sep-99	6	M	4	651		59730	3	42		236	659	52	F
149	22-Sep-99	6	F	4	543	3	59730	4	42		27	662	52	F
150	22-Sep-99	6	M	4	582		59730	5	42		41	662	52	F
151	23-Sep-99	5	M	4	691		59731	1	52		75	665	52	F
152	23-Sep-99	5	M	4	617		59731	2	42		30	666	52	F
153	23-Sep-99	5	F	3	664	20	59731	3	42		105	671	52	F
154	23-Sep-99	5	M	4	790		59731	4	52		197	671	52	F
155	23-Sep-99	5	M	3	623		59731	5	42		159	673	52	F
156	23-Sep-99	5	F	4	692	32	59732	1	52		193	674	52	M
157	23-Sep-99	5	M	4	561		59732	2	42		136	675	52	F
158	23-Sep-99	5	M	3	789		59732	3	72		237	675	52	F
159	23-Sep-99	5	F	4	673	5	59732	4	52		69	676	52	F
160	23-Sep-99	5	F	4	677	0	59732	5	52		114	676	52	F
161	23-Sep-99	5	M	3	705		59733	1	63		219	676	52	F
162	23-Sep-99	5	M	3	709		59733	2	52		4	677	52	F
163	23-Sep-99	5	M	3	710		59733	3	52		160	677	52	F
164	23-Sep-99	5	F	4	695	0	59733	4	51	adipose fin clip	63	680	52	F
165	23-Sep-99	5	F	4	746	0	59733	5	52		138	681	52	F
166	23-Sep-99	5	M	4	714		59734	1	52		147	684	52	F
167	23-Sep-99	5	F	4	681	0	59734	2	42		16	685	52	M
168	23-Sep-99	5	F	4	671	23	59734	3	42		64	685	52	F
169	23-Sep-99	5	M	4	689		59734	4	42		37	686	52	M
170	23-Sep-99	5	F	4	557	0	59734	5	42		129	686	52	M
171	23-Sep-99	5	F	4	715	282	59735	1	52		137	686	52	F
172	23-Sep-99	5	F	4	567	0	59735	2	42		180	686	52	M
173	23-Sep-99	5	F	4	600	12	59735	3	42		31	687	52	F
174	23-Sep-99	5	F	4	676	0	59735	4	42		21	688	52	F
175	23-Sep-99	5	F	4	712	0	59735	5	52		34	689	52	F
176	24-Sep-99	4	M	2	601		59736	1	42		102	690	52	F
177	24-Sep-99	4	F	2	748	31	59736	2	52		151	691	52	M
178	24-Sep-99	4	F	4	540	0	59736	3	42	adipose fin clip	196	691	52	F
179	24-Sep-99	4	F	4	589	5	59736	4	42		156	692	52	F

APPENDIX 2 (cont.)
**1999 Stuart River Chinook Carcass Recovery Project:
Field Data and Ageing Results**

Carcass #	Date	Reach	Sex	Condition	POHL (mm)	# Eggs	Scale Sample Book	Scale Sample Spaces	Age (G-R)	Comments	Carcass #	POHL (mm)	Age (G-R)	Sex
180	24-Sep-99	4	M	3	686		59736	5	52		71	693	52	M
181	24-Sep-99	4	F	4	635	6	59737	1	42		67	694	52	M
182	24-Sep-99	4	M	4	721		59737	2	52		10	695	52	F
183	24-Sep-99	4	F	3	642	12	59737	3	42		80	695	52	F
184	24-Sep-99	4	F	3	648	1	59737	4	42		109	695	52	F
185	24-Sep-99	4	F	4	635	0	59737	5	42		24	696	52	F
186	24-Sep-99	4	M	3	789		59738	1	52		55	696	52	M
187	24-Sep-99	4	M	4	602		59738	2	42		57	701	52	F
188	24-Sep-99	4	F	3	751	9	59738	3	52		199	702	52	F
189	24-Sep-99	4	F	4	718	2	59738	4	52	adipose fin clip	8	704	52	M
190	24-Sep-99	4	M	4	747		59738	5	62		36	704	52	M
191	24-Sep-99	4	M	3	680		59739	1	42		51	704	52	F
192	24-Sep-99	4	M	3	722		59739	2	63		23	705	52	M
193	24-Sep-99	4	M	3	674		59739	3	52		82	705	52	M
194	24-Sep-99	4	F	4	627	1	59739	4	42		100	705	52	M
195	24-Sep-99	4	F	4	601	1	59739	5	42		130	705	52	F
196	24-Sep-99	4	F	4	691	0	59740	1	52		143	709	52	M
197	24-Sep-99	4	F	4	671	10	59740	2	52		162	709	52	M
198	24-Sep-99	4	M	3	736		59740	3	52		85	710	52	F
199	24-Sep-99	4	F	4	702	3	59740	4	52		163	710	52	M
200	24-Sep-99	4	F	4	582	2	59740	5	42		175	712	52	F
201	26-Sep-99	4	M	4	725		59741	1	52		216	712	52	F
202	26-Sep-99	4	F	4	610	1	59741	2	42		166	714	52	M
203	26-Sep-99	3	F	4	634	0	59741	3	42		171	715	52	F
204	26-Sep-99	3	M	3	673		59741	4	42		215	715	52	F
205	26-Sep-99	3	M	3	651		59741	5	42		189	718	52	F
206	26-Sep-99	3	M	3	582		59742	1	42		182	721	52	M
207	26-Sep-99	3	M	4	738		59742	2	52		121	725	52	F
208	26-Sep-99	3	M	3	730		59742	3	52		131	725	52	M
209	26-Sep-99	3	F	4	636	0	59742	4	52		201	725	52	M
210	26-Sep-99	3	F	4	597	3	59742	5	42		49	726	52	F
211	26-Sep-99	3	F	1	637	29	59743	1	42		208	730	52	M
212	26-Sep-99	3	F	3	638	4	59743	2	42		99	735	52	M
213	26-Sep-99	3	F	4	641	0	59743	3	42		198	736	52	M
214	26-Sep-99	3	F	3	639	2	59743	4	42		227	737	52	F
215	26-Sep-99	3	F	1	715	0	59743	5	52		101	738	52	F

APPENDIX 2 (cont.)
**1999 Stuart River Chinook Carcass Recovery Project:
Field Data and Ageing Results**

Carcass #	Date	Reach	Sex	Condition	POHL (mm)	# Eggs	Scale Sample Book	Scale Sample Spaces	Age (G-R)	Comments	Carcass #	POHL (mm)	Age (G-R)	Sex
216	27-Sep-99	2	F	4	712	7	59744	1	52		207	738	52	M
217	27-Sep-99	2	M	4	590		59744	2	42		48	739	52	F
218	27-Sep-99	2	F	3	723	10	59744	3	62		22	741	52	M
219	27-Sep-99	2	F	4	676	0	59744	4	52		28	741	52	M
220	27-Sep-99	2	M	3	630		59744	5	42		142	742	52	F
221	27-Sep-99	2	M	4	597		59745	1	42		104	745	52	M
222	27-Sep-99	2	F	4	616	0	59745	2	52		13	746	52	M
223	27-Sep-99	2	F	4	600	36	59745	3	42		165	746	52	F
224	27-Sep-99	2	F	4	573	114	59745	4	42		177	748	52	F
225	27-Sep-99	2	F	3	642	7	59745	5	52		17	751	52	M
226	27-Sep-99	1	F	4	613	2	59746	1	42		188	751	52	F
227	27-Sep-99	1	F	4	737	0	59746	2	52		74	753	52	M
228	27-Sep-99	1	M	3	768		59746	3	52		19	759	52	M
229	27-Sep-99	1	F	2	596	0	59746	4	42		35	763	52	M
230	27-Sep-99	1	F	2	679	1	59746	5	42		228	768	52	M
231	27-Sep-99	1	F	2	635	1	59747	1	52		186	789	52	M
232	27-Sep-99	1	F	4	554	0	59747	2	42		154	790	52	M
233	27-Sep-99	1	M	3	578		59747	3	42		115	801	52	M
234	29-Sep-99	6	M	3	536		59747	4	42		218	723	62	F
235	29-Sep-99	6	F	3	618	0	59747	5	42		244	727	62	F
236	29-Sep-99	6	F	4	659	1	59748	1	52		123	734	62	F
237	29-Sep-99	6	F	4	675	0	59748	2	52		1	747	62	M
238	29-Sep-99	5	F	3	602	2	59748	3	42		190	747	62	M
239	29-Sep-99	5	F	4	613	0	59748	4	42		98	757	62	F
240	29-Sep-99	5	M	4	567		59748	5	42		145	758	62	M
241	29-Sep-99	5	M	4	588		59749	1	42		88	771	62	F
242	29-Sep-99	5	M	4	616		59749	2	42		246	785	62	M
243	29-Sep-99	5	M	4	587		59749	3	42		91	795	62	M
244	30-Sep-99	4	F	3	727	9	59749	4	62		116	831	62	M
245	30-Sep-99	4	M	3	636		59749	5	42		161	705	63	M
246	30-Sep-99	4	M	4	785		59750	1	62		192	722	63	M
247	30-Sep-99	4	M	1	419		59750	2	32	Jack	158	789	72	M
248	30-Sep-99	4	F	2	593	22	59750	3	42		11	744	73	M
249	30-Sep-99	4	F	4	557	19	59750	4	42		77	615	n/a	F
250	30-Sep-99	4	F	4	574	0	59750	5	42	floy tag #00068	128	809	n/a	M

