NECHAKO AND STUART RIVERS CHINOOK CARCASS RECOVERY 1998

NECHAKO FISHERIES CONSERVATION PROGRAM
Technical Report No. M98-2

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ABSTRACT

In 1998 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 210 carcasses were collected on the Nechako River from September 13th to October 7th. Nechako River Chinook carcasses recovered in 1998 exhibited similar biological characteristics to those collected from 1988 to 1997. However, mean post-orbital hypural length for both males and females was the second highest observed since 1988. The spawning population was almost exclusively comprised of individuals with a stream-type life history, dominated by 4_2 and 5_2 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 1998 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 enumeration 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**

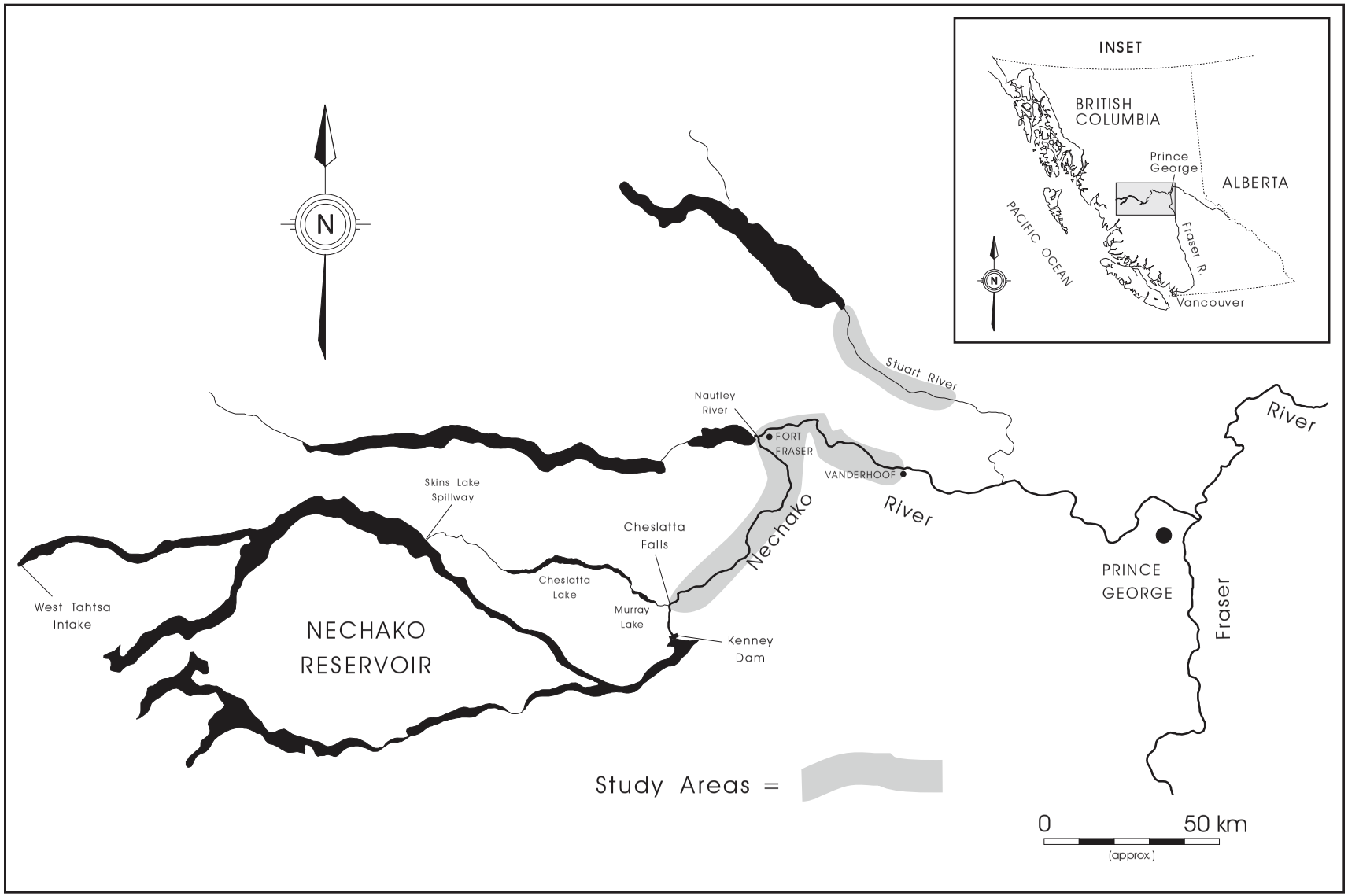


FIGURE 2 **Nechako River Chinook Spawning Study Area**

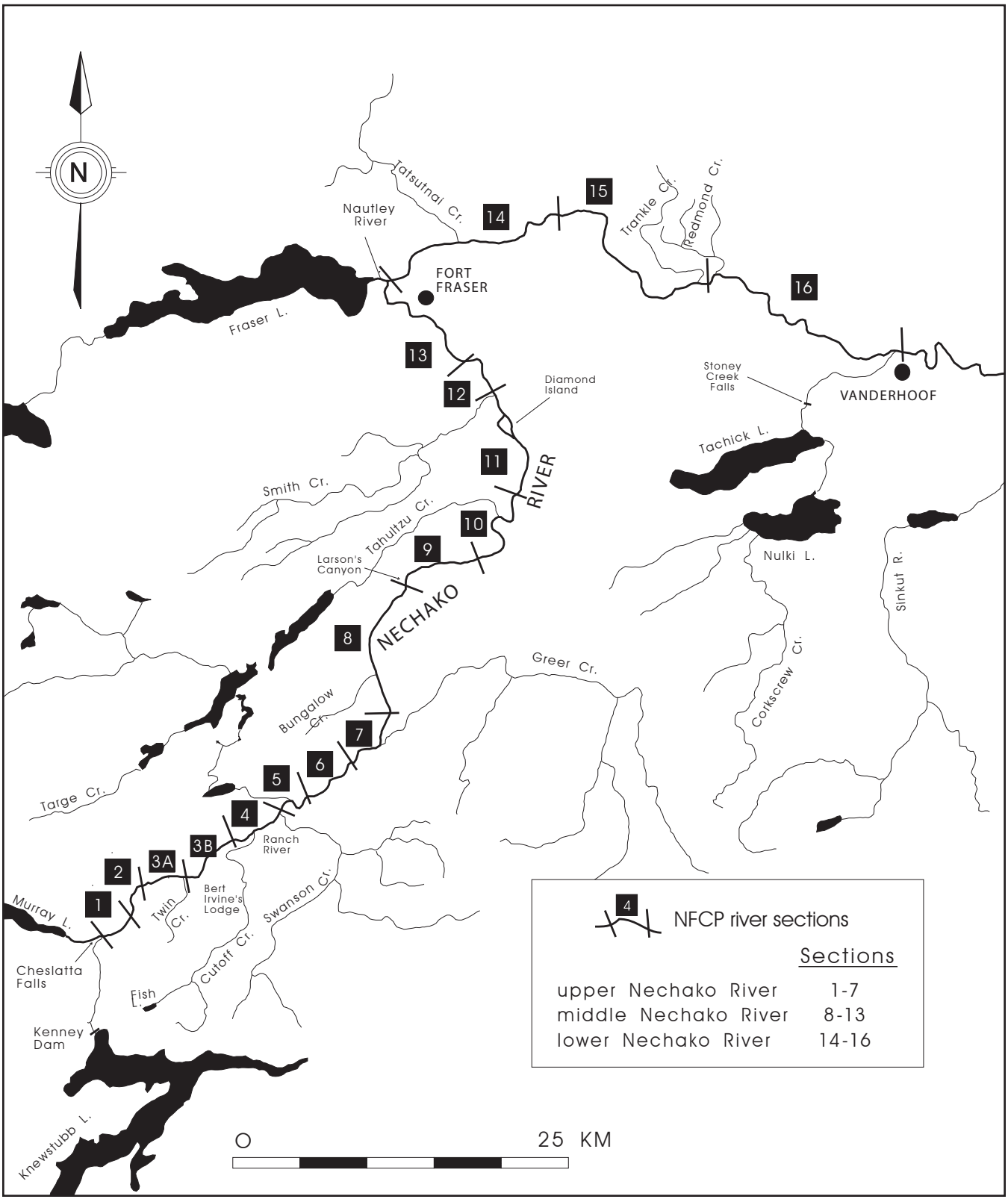
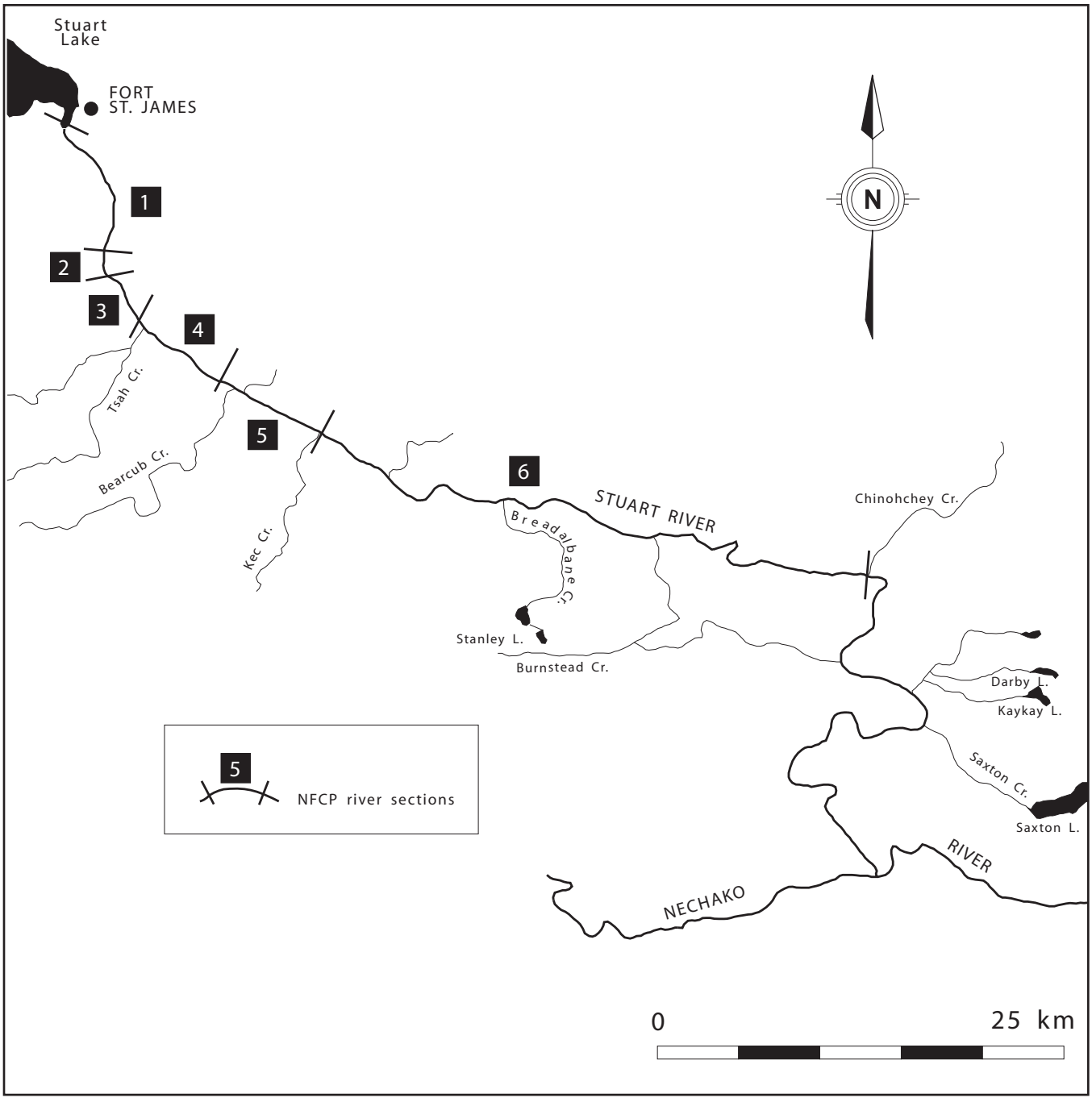


FIGURE 3 **Stuart River Chinook Spawning Study Area**



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 skeined 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 1998 are presented in Appendices 1 and 2, respectively. Summaries of these data are provided in the respective sections below.

Nechako River

Between September 13th and October 7th a total of 210[1] 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 1.56 F/M, or 61% females and 39% males (n=210). Of the carcasses sampled, 41% 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, 1998

Section	Number	Percent
UPPER NECHAKO		
Section 1	0	0.0
Section 2	0	0.0
Section 3	9	4.3
Section 4	52	24.8
Section 5	29	13.8
Section 6	22	10.5
Section 7	13	6.2
SUB-TOTAL	**125**	**59.5**
MIDDLE NECHAKO		
Section 8	0	0.0
Section 9	0	0.0
Section 10	0	0.0
Section 11	4	1.9
Section 12	33	15.7
Section 13	41	19.5
SUB-TOTAL	**78**	**37.1**
LOWER NECHAKO		
Section 14	3	1.4
Section 15	0	0.0
Section 16	4	1.9
SUB-TOTAL	**7**	**3.3**
TOTAL RIVER	**210**	**100.0**

TABLE 2 Nechako River Chinook Carcass Condition, 1998

Condition *	Number	Percent
1	28	13.3
2	59	28.1
3	88	41.9
4	35	16.7
TOTAL	**210**	**100.0**

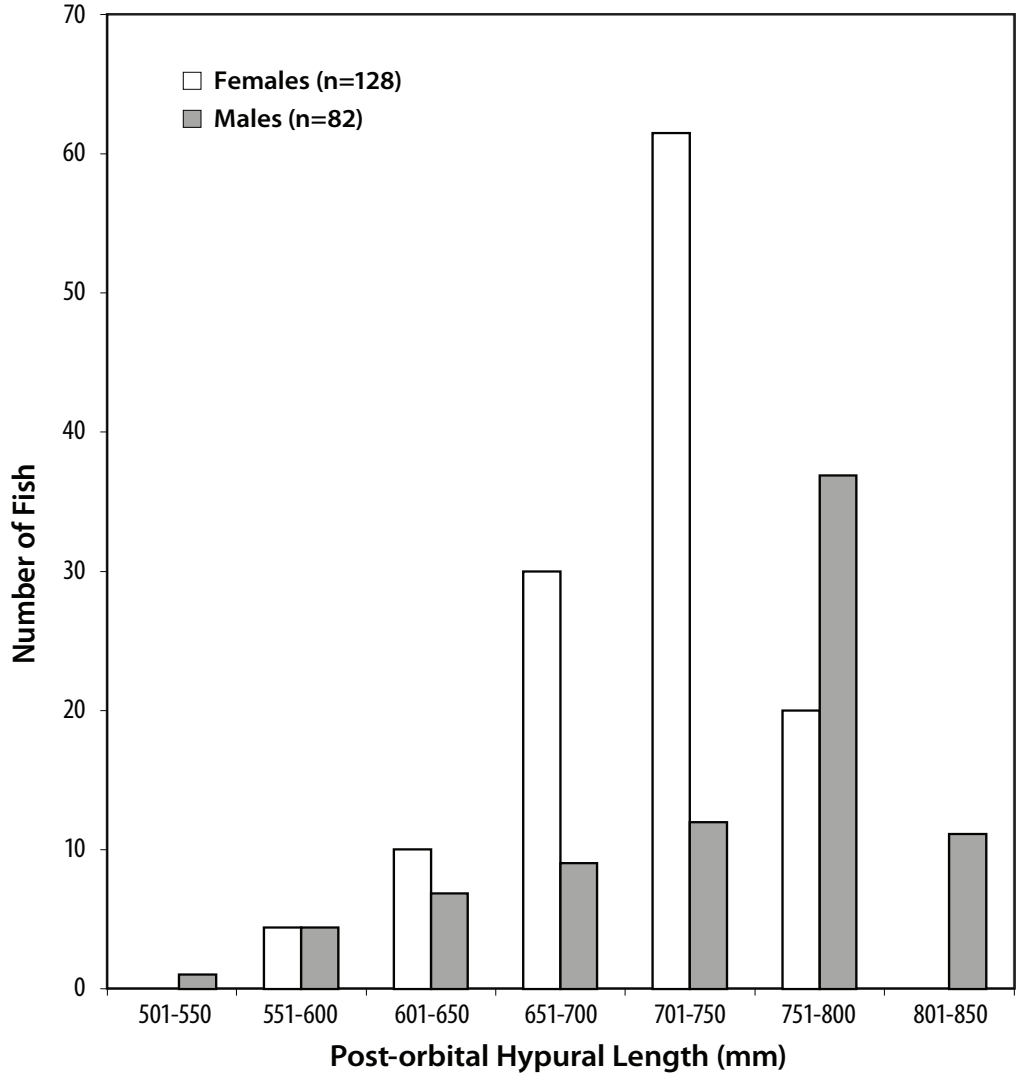
* Carcass Condition
1 - Fresh carcass
2 - Fair to good carcass (2 - 3 days old)
3 - Poor carcass condition with some fungus
4 - Very old and decomposed carcass

The length (POHL) of the fish sampled ranged from 526 to 823 mm, with a mean of 736 mm (n=82, SD=72) for males, 708 mm (n=128, SD=45) for females and 719 mm (n=210, SD=58) for all fish combined. The majority of males ranged in size from 751-850 mm, whereas the majority of females ranged in size from 701-750 mm (Figure 4).

Of the total number of female carcasses sampled (n=128), 4 were found to be pre-spawn mortalities with a mean of 8538 eggs remaining. These individuals were not included in the egg retention statistics reported below, since in some years sampling included pre-spawn mortalities with under-developed skeins, prohibiting individual egg counts. Therefore, including pre-spawn mortalities would bias year-to-year comparisons of egg retention. However, it is important to report these numbers as they are a measure of the overall fecundity of Nechako River female Chinook.

Of the total number of female carcasses sampled, excluding pre-spawn mortalities, 124 (100%) were determined to be fully spawned, based on egg retention of less than 1000. There were no partially spawned female carcasses sampled (based on an egg retention of 1000-4999). The mean egg retention of the fully spawned females was 33 eggs (n=124, SD=118, range 0–849).

FIGURE 4 **Nechako River Chinook Length Frequency Distribution, 1998**



Scale and fin samples from all 210 carcasses recovered from the Nechako River were sent to the Pacific Biological Station in Nanaimo for age analysis. Complete ages were determined for 207 of those samples (Table 3). The results indicate that the majority of the fish sampled were of two age-classes, 5_2 (73%) and 4_2 (25%). A chi-square test was used to determine that the numbers of males and females in these age-classes were proportionate to the sex ratio of the sample (p=0.97. A chi-square test was used to determine that the numbers of males and females in these age-classes were proportionate to the sex ratio of the sample (p=0.97).

TABLE 3 **Nechako River Chinook Age Contribution (%) by Sex, 1998**

	4_1	4_2	5_2	6_2	6_3	Total # Aged
Males	0.0	23.8	72.5	3.8	0.0	80
Females	0.0	25.2	74.0	0.8	0.0	127

Two of the recovered Chinook had an adipose fin missing, and one additional Chinook had post dorsal tag scars and a right opercular punch.

In addition to NFCP data collection requirements, bioassay tissue samples were collected from 17 Sockeye 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 and October 2nd a total of 250[2] carcasses were sampled from the six Zones (1-6) within the study area (Table 4). The observed sex ratio was 1.34 F/M, or 57% females and 43% males (n=250). No Chinook jacks were collected; however, one hatchery-raised (adipose fin clip) jill (Age 3_1, POHL 619 mm) was recorded. Of the 250 carcasses with condition documented, 25% were fresh or only a few days old (Table 5).

TABLE 4 **Stuart River Chinook Carcass Recovery by Zone, 1998**

Zone	Number	Percent
1	16	6.4
2	19	7.6
3	29	11.6
4	77	30.8
5	47	18.8
6	62	24.8
TOTAL	**250**	**100.0**

TABLE 5 **Stuart River Chinook Carcass Condition, 1998**

Condition *	Number	Percent
1	3	1.2
2	60	24.0
3	131	52.4
4	56	22.4
TOTAL	**250**	**100.0**

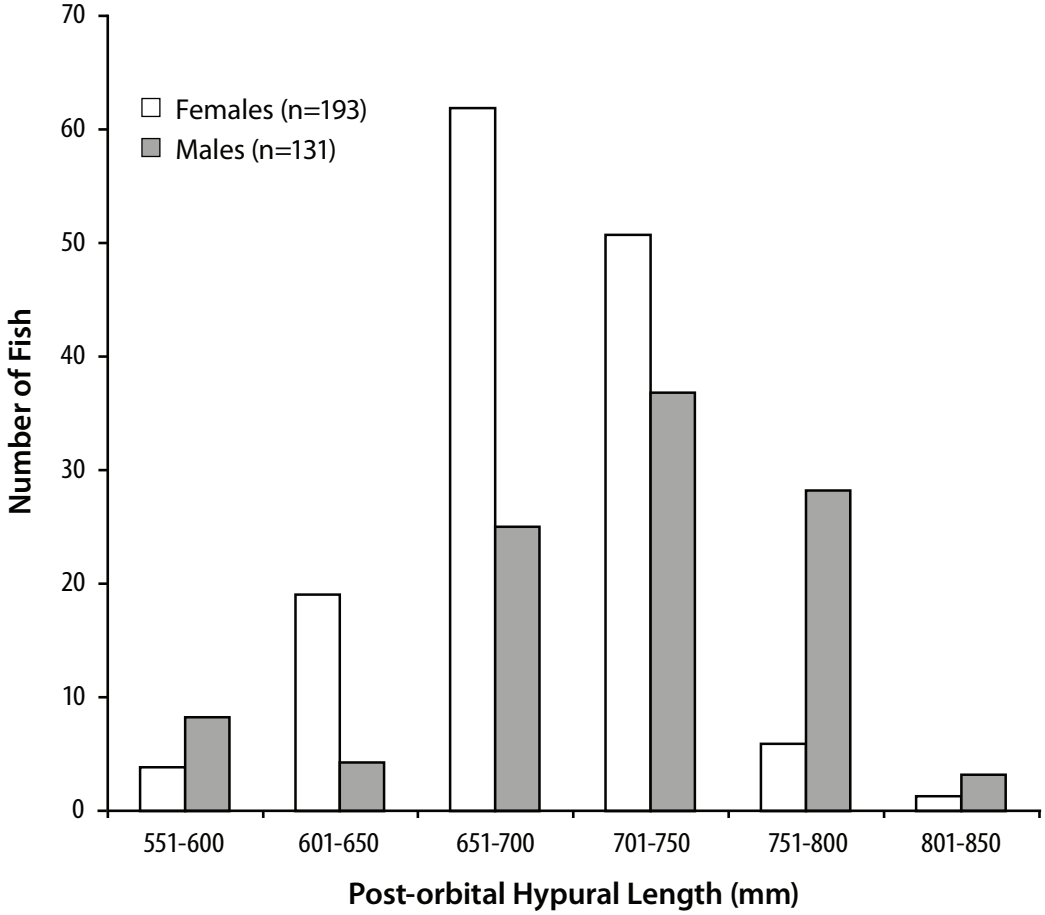
* Carcass Condition
1 - Fresh carcass
2 - Fair to good carcass (2 - 3 days old)
3 - Poor carcass condition with some fungus
4 - Very old and decomposed carcass

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 M98-1). This information is relevant to carcass sampling results presented in this report, and given the much larger sample size (n=843) 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 1.15 F/M, or 54% females and 46% males (n=843, including the carcasses selected for biological sampling).

The length (POHL) of the fish sampled ranged from 555 to 805 mm, with a mean of 716 mm for males (n=107, SD=56), 689 mm for females (n=143, SD=42) and 701 mm (n=250, SD=50) for all fish combined. The majority of males were distributed across a broad range of lengths (651-800 mm), with the majority in the 701-750 mm range (Figure 5). Compared to the

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, 1998**



males, the majority of females were smaller in size and within a narrower range (651-750 mm).

Of the total number of female carcasses sampled (n=143), no pre-spawn mortalities were observed.

Of the total number of female carcasses sampled, 140 (98%) were determined to be fully spawned, based on egg retention of less than 1000. The mean egg retention of the fully spawned females was 14 eggs (n=140, SD=52, range 0–432). Three partially spawned female carcasses (based on an egg retention of 1000-4999) were sampled (n=3, range 1709-4283).

Scale and fin samples from all 250 carcasses recovered from the Stuart River were sent to the Pacific Biological Station for age analysis. Complete ages were determined for 249 of those samples (Table 6). The results indicate that a vast majority of the fish sampled were of two age-classes, 5_2 (64%), and 4_1 (26%). The number of males and females in these age-classes were close to being significantly disproportionate to the sex ratio of the sample (chi-square test, p=0.05).

TABLE 6 **Stuart River Chinook Age Contribution (%) by Sex, 1998**

	3_1	3_2	4_1	4_2	5_1	5_2	6_2	Total # Aged
Males	0.0	0.0	17.8	10.3	0.0	68.2	0.9	**107**
Females	0.0	0.0	31.7	7.0	0.7	60.6	0.0	**142**

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 M98-1). No other form of marking or tagging was observed.

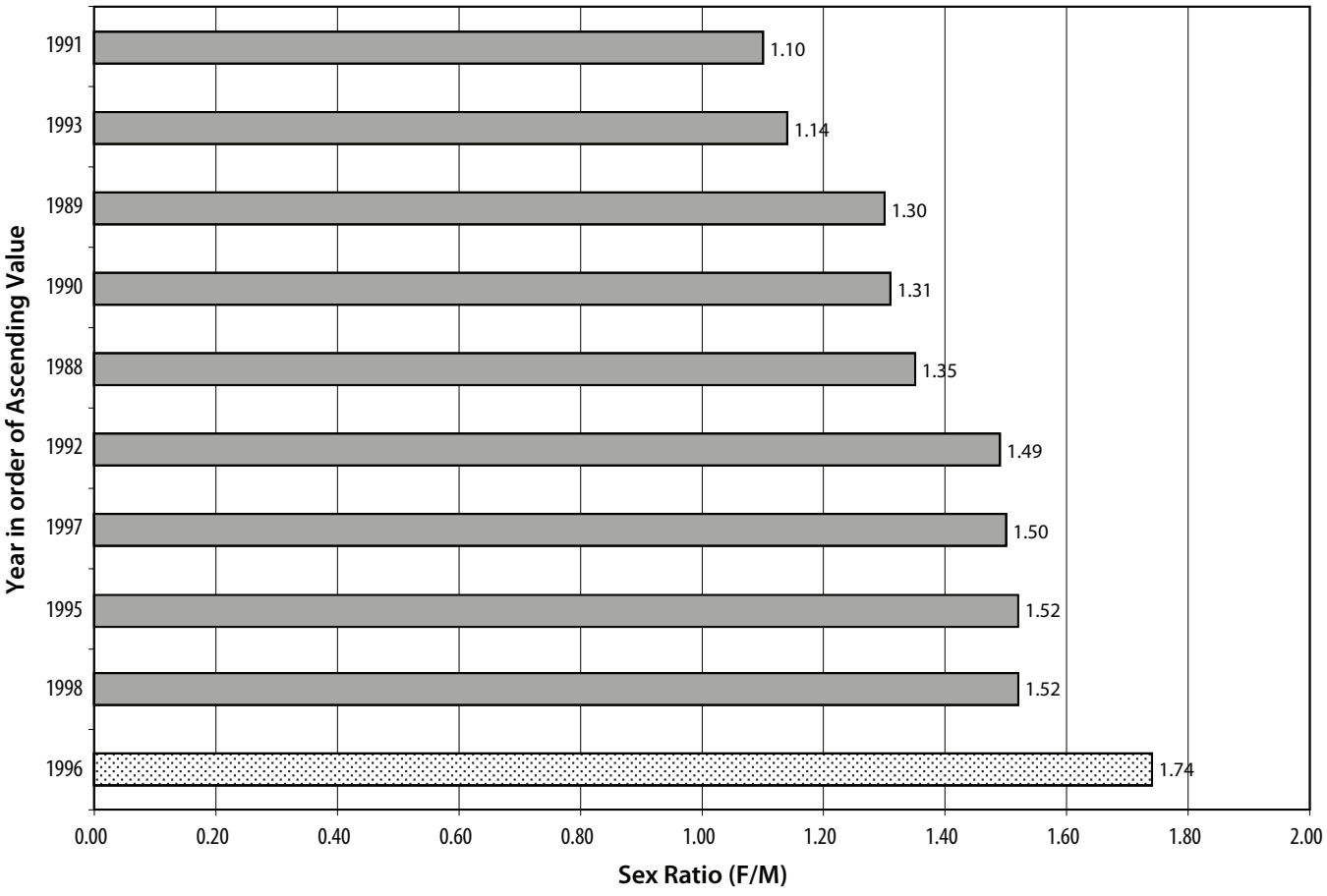
DISCUSSION - COMPARISON TO PREVIOUS YEARS

Nechako River

A comparison of 1998 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 M97-2). 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 1.56 F/M fell within the range (1.10-1.74) observed from 1988-1997 (Figure 6), and significantly higher than the mean of 1.40 (n=10, SD=0.19), as indicated by 95% confidence limit of 1.28-1.52.

FIGURE 6 **Nechako River Chinook Sex Ratio, 1988-1998**



When comparing the mean length (POHL) of both males and females to observations from previous years, no obvious trends were apparent. For both sexes, the mean lengths observed in 1998 fell within the ranges observed in previous years (Figures 7 and 8).

FIGURE 7 **Nechako River Chinook Male Mean Length, 1988-1998**

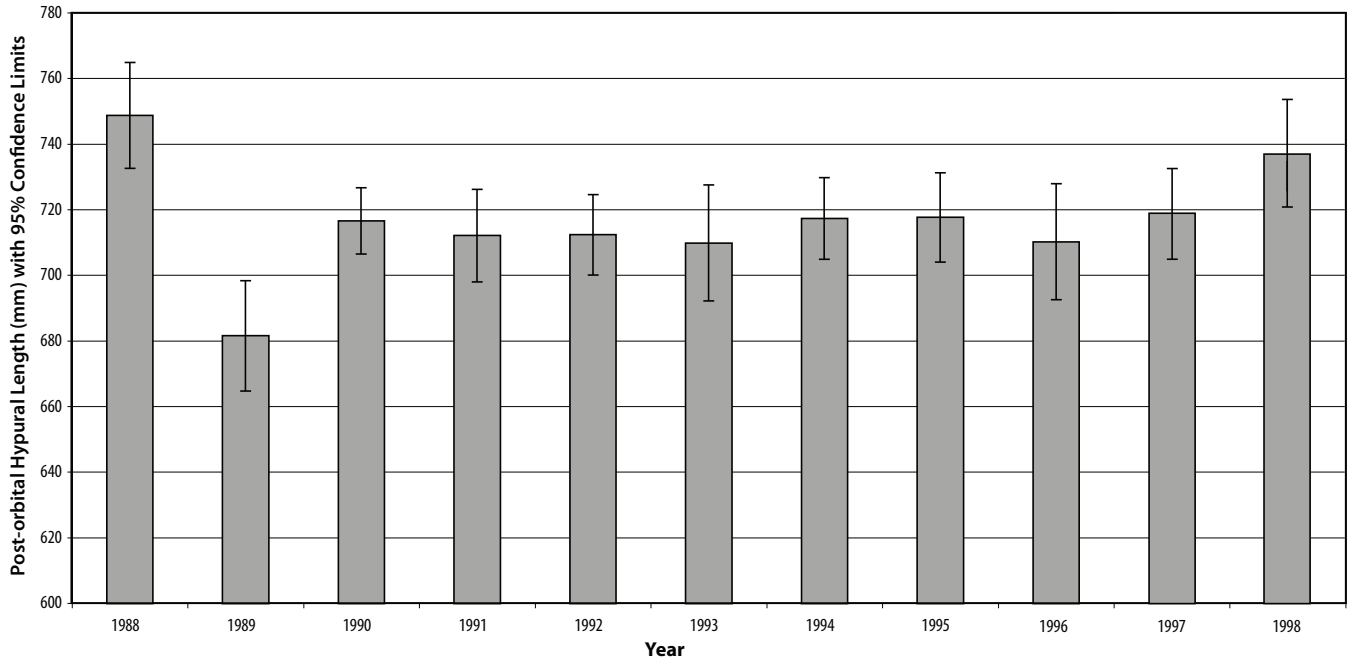
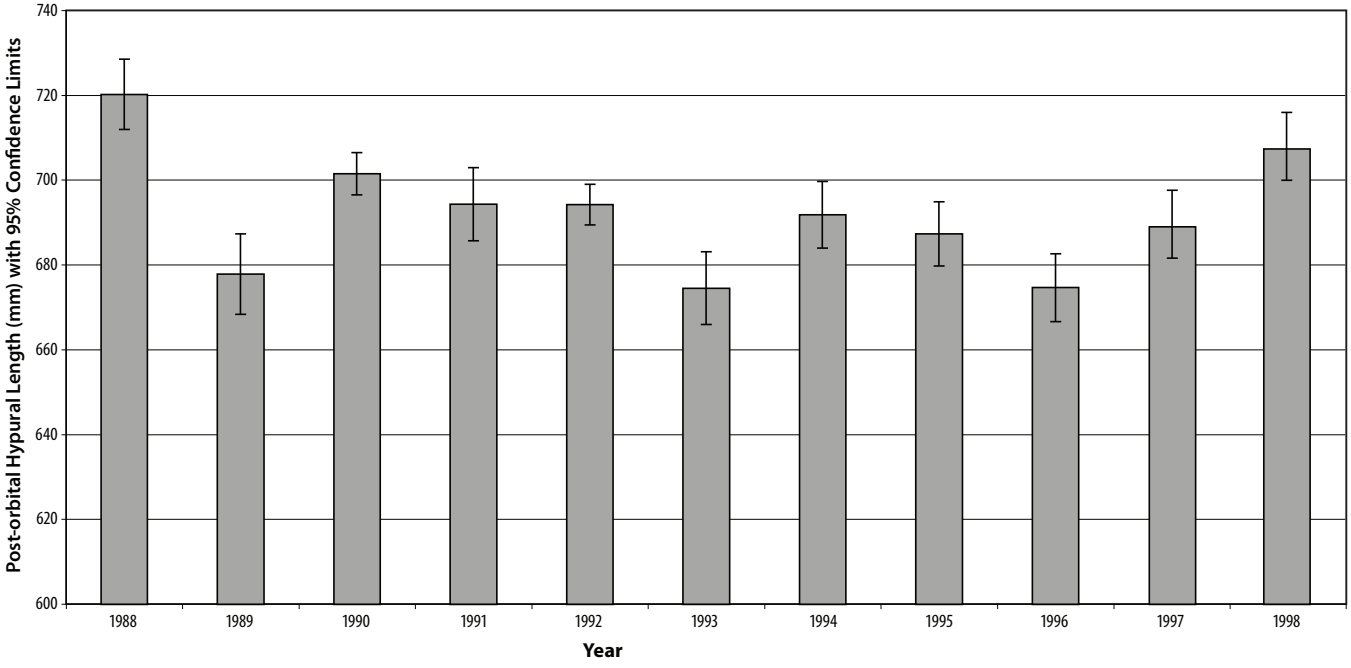


FIGURE 8 **Nechako River Chinook Female Mean Length, 1988-1998**



A total of four female pre-spawn mortalities were sampled and the total number of eggs from each carcass was recorded. When these data are added to the existing dataset, the average fecundity of Nechako River female Chinook is estimated at 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, 1978-1998**

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:

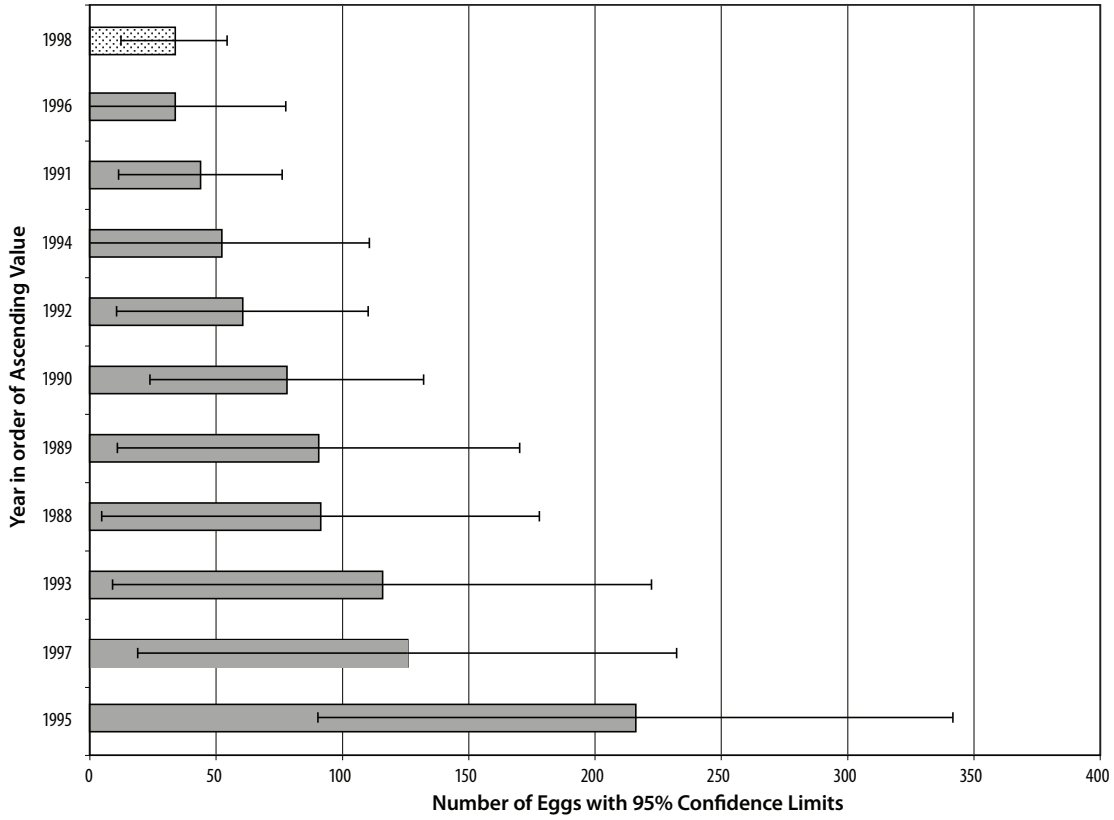
1 = Fee and Sheng (1978),
2 = Olmsted et al. (1980),
3 = Russell *et al.* (1983), and
4 = Jaremovic and Rowland (1988)

The mean egg retention in fully and partially spawned carcasses was compared to values from previous years (Table 8). Although the 1998 mean is the lowest observed, the large confidence limits make it difficult to assign any significance to this observation (Figure 9).

TABLE 8 **Nechako River Chinook Egg Retention, 1988-1998**

	Fully Spawned			Partially Spawned		Fully + Partially
Year	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

FIGURE 9 **Nechako River Chinook Mean Egg Retention, 1988-1998**



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 4_2 and 5_2 age-classes. These have been consistent observations since the inception of the NFCP monitoring program. In 1998 age-classes 4_2 and 5_2 accounted for 97% of the return, with all stream-type fish accounting for 99% (Table 9).

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 M98-1).

TABLE 9 **Percent Contribution of Stream-type Life Histories to Nechako Chinook Escapements, 1988-1998**

	% Contribution		Sample
Year	$4_2 + 5_2$	All Stream-type	Size
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

TABLE 10 **Percent Contribution of Age-at-Return Groupings to Nechako Chinook Escapements, 1988-1998**

	% Contribution					Sample
Year	3 years	4 years	5 years	6 years	7 years	Size
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

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.

It is of interest to note that due to the relatively large contribution of 4_1 hatchery raised females observed (n=43), the number of males and females in these age-classes was close to being significantly disproportionate to the sex ratio of the sample (chi-square test, p=0.05).

In 1998, 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

Peter Delaney, Jason Hwang and Roy Argue managed the delivery of the projects for DFO, on behalf of the NFCP Technical Committee.

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 the Pacific Biological Station and J.O. Thomas & Associates Nanaimo analyzed the various samples.

Rhonda Thibeault and Liz Murphy assisted with data compilation.

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APPENDIX 1

1998 Nechako River Chinook Carcass Recovery Project: Field Data and Ageing Results

APPENDIX 1

1998 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	13-Sep-98	12	F	2	732	14	51201	1	52	
2	13-Sep-98	13	F	2	751	10026	51201	2	52	pre-mort female
3	13-Sep-98	11	F	2	687	36	51201	3	52	
4	14-Sep-98	11	F	3	796	551	51201	4	52	large eggs
5	14-Sep-98	11	M	1	659		51201	5	42	partially spawned
6	14-Sep-98	11	F	1	719	849	51202	1	52	
7	17-Sep-98	3B	F	1	764	1	51202	2	52	
8	17-Sep-98	3B	F	3	710	444	51202	3	52	partially spawned
9	17-Sep-98	3B	M	2	789		51202	4	62	partially eaten
10	17-Sep-98	3B	M	3	747		51202	5	52	
11	17-Sep-98	3B	M	3	682		51203	1	52	widows peak clip - poor
12	17-Sep-98	3B	M	3	620		51203	2	42	
13	17-Sep-98	3B	F	1	698	8	51203	3	52	
14	17-Sep-98	3B	F	3	655	356	51203	4	52	
15	17-Sep-98	3B	M	3	776		51203	5	62	
16	17-Sep-98	3B	F	2	741	490	51204	1	52	partially spawned
17	17-Sep-98	3B	M	1	814		51204	2	52	
18	17-Sep-98	3B	F	1	745	9473	51204	3	52	premort, not a mark on her
19	18-Sep-98	4	F	4	647	477	51204	4	52	partially spawned
20	18-Sep-98	4	F	3	576	68	51204	5	42	
21	18-Sep-98	4	M	3	667		51205	1	42	
22	18-Sep-98	4	M	2	788		51205	2	52	
23	18-Sep-98	4	F	2	723	29	51205	3	52	
24	18-Sep-98	4	F	1	595	42	51205	4	52	very small eggs
25	18-Sep-98	4	F	2	586	2	51205	5	42	
26	18-Sep-98	4	F	1	592	1	51206	1	42	
27	18-Sep-98	5	M	2	762		51206	2	52	
28	18-Sep-98	5	F	2	628	3	51206	3	42	
29	18-Sep-98	5	F	3	647	29	51206	4	42	
30	18-Sep-98	5	F	1	704	94	51206	5	52	
31	20-Sep-98	10	F	2	696	0	51207	1	42	
32	20-Sep-98	10	F	1	735	3	51207	2	52	
33	20-Sep-98	10	F	3	719	0	51207	3	52	
34	20-Sep-98	11	M	3	792		51207	4	52	
35	20-Sep-98	11	M	2	696		51207	5	42	
36	20-Sep-98	11	F	2	712	4	51208	1	52	
37	20-Sep-98	11	F	3	725	93	51208	2	52	

APPENDIX 1 (cont.)

1998 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		
38	20-Sep-98	11	F	2	732	0	51208	3	52	
39	22-Sep-98	11	F	1	605	3	51208	4	42	
40	22-Sep-98	11	F	2	706	7	51208	5	52	
41	22-Sep-98	11	M	3	780		51209	1	52	
42	22-Sep-98	11	M	2	782		51209	2	52	
43	22-Sep-98	11	M	2	808		51209	3	51	
44	22-Sep-98	11	M	3	772		51209	4	52	
45	22-Sep-98	12	F	2	757	3	51209	5	52	
46	22-Sep-98	12	F	3	662	0	51210	1	42	
47	22-Sep-98	12	F	2	679	4	51210	2	52	
48	22-Sep-98	12	M	2	671		51210	3	42	tag scar- right opercular punch
49	22-Sep-98	12	F	3	765	8216	51210	4	52	premort
50	22-Sep-98	12	M	2	781		51210	5	52	
51	22-Sep-98	12	M	2	794		51211	1	52	
52	22-Sep-98	12	F	3	696	3	51211	2	52	
53	22-Sep-98	12	M	2	576		51211	3	42	
54	22-Sep-98	12	M	2	722		51211	4	52	
55	22-Sep-98	12	M	3	823		51211	5	52	
56	22-Sep-98	12	M	2	724		51212	1	52	partially eaten
57	22-Sep-98	12	F	3	718	0	51212	2	52	
58	22-Sep-98	12	F	3	693	3	51212	3	52	
59	22-Sep-98	12	F	3	710	0	51212	4	52	
60	22-Sep-98	12	F	1	723	0	51212	5	52	
61	22-Sep-98	12	F	3	691	0	51213	1	52	
62	22-Sep-98	12	F	2	695	0	51213	2	52	
63	22-Sep-98	12	M	3	626		51213	3	42	partially eaten
64	22-Sep-98	12	M	3	646		51213	4	42	
65	22-Sep-98	12	F	1	766	3	51213	5	52	
66	22-Sep-98	12	F	1	735	2	51214	1	52	
67	22-Sep-98	12	F	2	717	2	51214	2	42	
68	22-Sep-98	12	F	3	657	0	51214	3	42	
69	22-Sep-98	12	F	3	755	0	51214	4	42	
70	22-Sep-98	12	F	2	712	6437	51214	5	52	premort
71	22-Sep-98	12	F	3	703	22	51215	1	52	
72	22-Sep-98	12	F	1	666	1	51215	2	52	
73	22-Sep-98	12	F	2	713	0	51215	3	52	
74	22-Sep-98	12	M	2	594		51215	4	42	

APPENDIX 1 (cont.)

1998 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		
75	22-Sep-98	12	F	3	765	0	51215	5	52	
76	22-Sep-98	12	F	3	654	8	51216	1	42	
77	22-Sep-98	12	M	2	616		51216	2	52	
78	24-Sep-98	10	F	1	697	41	51216	3	52	
79	24-Sep-98	11	F	1	635	2	51216	4	42	
80	24-Sep-98	11	F	1	768	0	51216	5	52	
81	24-Sep-98	11	M	2	776		51217	1	52	
82	24-Sep-98	11	F	3	700	13	51217	2	52	
83	24-Sep-98	11	F	1	688	0	51217	3	52	
84	24-Sep-98	11	M	4	576		51217	4	42	
85	24-Sep-98	11	F	2	728	0	51217	5	52	
86	24-Sep-98	11	M	3	743		51218	1	52	
87	24-Sep-98	11	M	3	822		51218	2	52	
88	24-Sep-98	11	M	3	648		51218	3	42	
89	24-Sep-98	11	F	3	700	1	51218	4	52	
90	24-Sep-98	11	M	2	772		51218	5	52	
91	24-Sep-98	11	F	2	683	3	51219	1	52	
92	24-Sep-98	11	M	2	772		51219	2	52	
93	24-Sep-98	11	M	2	803		51219	3	52	
94	24-Sep-98	12	M	4	768		51219	4	42	
95	26-Sep-98	3A	M	3	786		51219	5	52	
96	26-Sep-98	3A	F	3	719	8	51220	1	52	
97	26-Sep-98	3A	F	2	731	3	51220	2	52	
98	26-Sep-98	3A	M	1	751		51220	3	52	
99	26-Sep-98	3A	F	2	682	17	51220	4	52	
100	26-Sep-98	3A	F	2	703	2	51220	5	42	
101	27-Sep-98	3B	F	2	762	1	51221	1	51	
102	27-Sep-98	3B	F	2	723	0	51221	2	52	possible adipose clip - no adipose
103	27-Sep-98	3B	F	3	740	6	51221	3	62	
104	27-Sep-98	3B	M	3	805		51221	4	4M	
105	27-Sep-98	3B	M	3	761		51221	5	52	
106	27-Sep-98	3B	M	4	792		51222	1	52	
107	27-Sep-98	3B	F	3	771	2	51222	2	52	
108	27-Sep-98	3B	M	4	777		51222	3	3M	
109	27-Sep-98	3B	M	4	805		51222	4	52	
110	27-Sep-98	3B	M	4	752		51222	5	52	
111	27-Sep-98	3B	M	2	770		51223	1	52	

APPENDIX 1 (cont.)

1998 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		
112	27-Sep-98	3B	M	3	751		51223	2	52	
113	27-Sep-98	3B	F	3	736	11	51223	3	52	
114	27-Sep-98	3B	M	3	651		51223	4	42	
115	27-Sep-98	3B	F	3	755	2	51223	5	52	
116	27-Sep-98	3B	M	1	737		51224	1	52	
117	27-Sep-98	3B	F	3	712	12	51224	2	52	
118	27-Sep-98	3B	F	1	731	2	51224	3	52	
119	27-Sep-98	3B	F	3	709	3	51224	4	52	
120	27-Sep-98	3B	F	3	729	3	51224	5	52	
121	27-Sep-98	3B	F	3	736	19	51225	1	52	
122	28-Sep-98	5	F	4	702	0	51225	2	42	
123	28-Sep-98	5	F	3	781	19	51225	3	42	
124	28-Sep-98	5	F	3	724	6	51225	4	52	
125	28-Sep-98	5	F	4	600	2	51225	5	42	
126	28-Sep-98	5	M	3	635		51226	1	53	
127	28-Sep-98	5	M	2	821		51226	2	62	
128	28-Sep-98	5	F	4	625	3	51226	3	42	
129	28-Sep-98	5	F	3	641	11	51226	4	42	
130	28-Sep-98	5	F	2	742	27	51226	5	52	
131	28-Sep-98	5	M	3	704		51227	1	52	
132	28-Sep-98	5	M	2	726		51227	2	52	
133	28-Sep-98	4	F	3	744	6	51227	3	52	
134	29-Sep-98	5	F	3	732	19	51227	4	42	
135	29-Sep-98	4	M	2	738		51227	5	52	
136	29-Sep-98	4	M	3	566		51228	1	42	
137	29-Sep-98	4	F	4	722	0	51228	2	52	
138	29-Sep-98	4	M	4	755		51228	3	52	
139	29-Sep-98	4	M	2	722		51228	4	52	
140	29-Sep-98	4	F	1	658	3	51228	5	52	
141	29-Sep-98	4	F	4	667	0	51229	1	52	
142	29-Sep-98	4	M	2	785		51229	2	52	
143	29-Sep-98	4	M	3	526		51229	3	42	
144	29-Sep-98	4	M	3	772		51229	4	52	
145	29-Sep-98	4	F	3	705	5	51229	5	52	
146	29-Sep-98	4	F	2	634	0	51230	1	42	
147	29-Sep-98	4	M	4	781		51230	2	52	
148	29-Sep-98	4	F	4	699	3	51230	3	52	

APPENDIX 1 (cont.)

1998 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		
149	29-Sep-98	4	F	4	799	16	51230	4	52	
150	29-Sep-98	4	M	3	697		51230	5	42	
151	29-Sep-98	5	F	2	737	13	51231	1	52	
152	30-Sep-98	6	F	2	649	2	51231	2	42	
153	30-Sep-98	6	F	3	728	6	51231	3	52	
154	30-Sep-98	6	F	3	717	0	51231	4	52	
155	30-Sep-98	6	F	3	746	1	51231	5	52	
156	30-Sep-98	6	F	3	709	0	51232	1	52	
157	30-Sep-98	6	M	3	804		51232	2	52	
158	30-Sep-98	6	F	3	719	3	51232	3	42	
159	30-Sep-98	6	M	3	787		51232	4	52	
160	30-Sep-98	6	M	3	803		51232	5	52	
161	30-Sep-98	6	M	4	791		51233	1	52	
162	30-Sep-98	6	M	2	744		51233	2	52	
163	30-Sep-98	6	F	4	761	0	51233	3	52	
164	30-Sep-98	6	F	3	722	0	51233	4	52	
165	1-Oct-98	3A	F	4	741	6	51233	5	52	
166	1-Oct-98	3A	F	2	740	0	51234	1	52	
167	1-Oct-98	3A	F	2	759	0	51234	2	52	
168	1-Oct-98	3B	F	3	752	0	51234	3	52	
169	1-Oct-98	3B	F	4	761	0	51234	4	52	
170	1-Oct-98	3B	M	4	772		51234	5	52	
171	1-Oct-98	3B	M	3	793		51235	1	52	
172	1-Oct-98	3B	F	4	716	9	51235	2	52	
173	1-Oct-98	3B	F	1	684	0	51235	3	42	
174	1-Oct-98	3B	F	4	709	0	51235	4	52	partially eaten
175	1-Oct-98	3B	F	4	711	1	51235	5	52	
176	1-Oct-98	3B	M	1	781		51236	1	52	
177	1-Oct-98	3B	F	2	674	0	51236	2	42	
178	1-Oct-98	3B	F	4	683	0	51236	3	52	
179	1-Oct-98	3B	F	1	702	1	51236	4	42	
180	1-Oct-98	3B	M	3	712		51236	5	52	
181	1-Oct-98	3B	F	2	736	7	51237	1	52	
182	1-Oct-98	3B	M	1	781		51237	2	52	
183	1-Oct-98	3B	F	4	769	0	51237	3	52	
184	1-Oct-98	3B	M	2	792		51237	4	52	
185	1-Oct-98	3B	M	4	803		51237	5	52	

APPENDIX 1 (cont.) **1998 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		
186	3-Oct-98	11	F	3	712	9	51238	1	52	
187	3-Oct-98	15	F	2	711	2	51238	2	52	
188	3-Oct-98	15	F	3	683	0	51238	3	52	partially eaten
189	3-Oct-98	15	F	4	708	0	51238	4	n/a	RG
190	3-Oct-98	15	M	4	746		51238	5	42	
191	5-Oct-98	11	M	4	814		51239	1	52	
192	5-Oct-98	11	M	4	787		51239	2	52	
193	5-Oct-98	12	F	4	703	0	51239	3	42	
194	5-Oct-98	12	M	3	761		51239	4	52	
195	5-Oct-98	12	F	3	758	2	51239	5	52	
196	5-Oct-98	12	F	4	733	0	51240	1	42	
197	5-Oct-98	12	F	3	739	13	51240	2	42	
198	5-Oct-98	12	F	3	766	0	51240	3	52	
199	5-Oct-98	13	M	4	796		51240	4	52	
200	5-Oct-98	13	M	4	593		51240	5	42	
201	7-Oct-98	3B	F	1	652	29	51241	1	42	
202	7-Oct-98	4	F	3	683	0	51241	2	52	
203	7-Oct-98	4	M	3	699		51241	3	52	
204	7-Oct-98	4	F	3	711	3	51241	4	52	
205	7-Oct-98	4	M	3	653		51241	5	52	
206	7-Oct-98	5	F	3	668	0	51242	1	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

1998 Stuart River Chinook Carcass Recovery Project: Field Data and Ageing Results

APPENDIX 2

1998 Stuart 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		
3	20-Sep-98	1	F	1	684	3617	51151	3	41	adipose fin clip
4	20-Sep-98	1	F	3	705	0	51151	4	52	
5	20-Sep-98	1	M	3	698		51151	5	52	
6	20-Sep-98	1	M	3	775		51152	1	52	
7	20-Sep-98	1	M	3	725		51152	2	52	
8	20-Sep-98	1	M	3	788		51152	3	52	
9	20-Sep-98	1	M	3	767		51152	4	52	
10	20-Sep-98	2	M	2	783		51152	5	52	
11	20-Sep-98	2	M	2	555		51153	1	41	adipose fin clip
12	20-Sep-98	2	F	1	645	0	51153	2	41	adipose fin clip
13	20-Sep-98	2	F	2	643	0	51153	3	52	
14	20-Sep-98	3	M	2	715		51153	4	42	
15	20-Sep-98	3	M	2	724		51153	5	52	
16	20-Sep-98	3	M	2	770		51154	1	52	
17	20-Sep-98	3	M	3	765		51154	2	52	
18	20-Sep-98	3	M	3	757		51154	3	41	adipose fin clip
19	20-Sep-98	3	M	3	757		51154	4	52	
20	20-Sep-98	3	F	2	706	7	51154	5	52	
21	20-Sep-98	4	M	2	715		51155	1	52	
22	20-Sep-98	4	F	3	612	8	51155	2	41	adipose fin clip
23	20-Sep-98	4	F	3	730	34	51155	3	52	
24	20-Sep-98	4	M	2	749		51155	4	52	
25	20-Sep-98	4	M	2	678		51155	5	52	
26	20-Sep-98	4	F	4	672	4283	51156	1	41	adipose fin clip
27	20-Sep-98	4	F	3	580	1709	51156	2	41	adipose fin clip
28	20-Sep-98	4	M	3	616		51156	3	52	
29	20-Sep-98	4	M	3	719		51156	4	52	
30	20-Sep-98	4	M	3	641		51156	5	42	
31	21-Sep-98	4	F	4	655	6	51157	1	52	
32	21-Sep-98	4	M	2	701		51157	2	52	adipose fin clip
33	21-Sep-98	4	F	3	728	15	51157	3	52	
34	21-Sep-98	4	F	3	689	2	51157	4	52	
35	21-Sep-98	4	F	4	687	0	51157	5	52	
36	21-Sep-98	4	M	3	758		51158	1	52	
37	21-Sep-98	4	M	3	729		51158	2	52	
38	21-Sep-98	4	F	2	662	2	51158	3	52	
39	21-Sep-98	4	F	3	694	4	51158	4	52	

APPENDIX 2 (cont.)

1998 Stuart 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		
40	21-Sep-98	4	M	3	683		51158	5	52	
41	21-Sep-98	4	M	3	576		51159	1	53	
42	21-Sep-98	4	F	4	619	0	51159	2	31	adipose fin clip
43	21-Sep-98	4	M	3	735		51159	3	52	
44	21-Sep-98	4	M	3	689		51159	4	42	
45	21-Sep-98	4	F	3	659	0	51159	5	52	
46	21-Sep-98	4	M	3	587		51160	1	42	
47	21-Sep-98	4	F	4	702	278	51160	2	52	
48	21-Sep-98	4	M	3	803		51160	3	52	
49	21-Sep-98	4	F	2	716	0	51160	4	41	adipose fin clip
50	21-Sep-98	4	M	2	640		51160	5	41	adipose fin clip
51	21-Sep-98	4	M	3	721		51161	1	41	adipose fin clip
52	21-Sep-98	4	M	3	659		51161	2	42	
53	21-Sep-98	4	M	2	625		51161	3	52	
54	21-Sep-98	4	M	3	801		51161	4	52	
55	21-Sep-98	4	M	3	734		51161	5	52	
56	22-Sep-98	5	M	2	561		51162	1	53	
57	22-Sep-98	5	M	2	574		51162	2	52	
58	22-Sep-98	5	M	3	712		51162	3	52	
59	22-Sep-98	5	F	3	748	74	51162	4	52	
60	22-Sep-98	5	F	2	664	102	51162	5	41	adipose fin clip
61	22-Sep-98	5	M	2	726		51163	1	52	
62	22-Sep-98	5	M	2	676		51163	2	41	
63	22-Sep-98	5	F	2	629	16	51163	3	41	adipose fin clip
64	22-Sep-98	5	M	3	745		51163	4	52	
65	22-Sep-98	5	M	4	669		51163	5	52	
66	22-Sep-98	5	F	4	658	23	51164	1	52	
67	22-Sep-98	5	F	3	562	19	51164	2	42	
68	22-Sep-98	5	M	3	744		51164	3	52	
69	22-Sep-98	5	M	2	681		51164	4	41	
70	22-Sep-98	5	F	3	588	0	51164	5	41	adipose fin clip
71	22-Sep-98	5	M	3	760		51165	1	52	
72	22-Sep-98	5	F	3	662	31	51165	2	52	adipose fin clip
73	22-Sep-98	5	M	2	799		51165	3	52	
74	22-Sep-98	5	M	3	790		51165	4	42	
75	22-Sep-98	5	M	2	709		51165	5	52	
76	22-Sep-98	5	F	3	770	0	51166	1	52	

APPENDIX 2 (cont.)

1998 Stuart 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		
77	22-Sep-98	5	M	3	759		51166	2	52	
78	22-Sep-98	5	F	3	739	0	51166	3	52	
79	23-Sep-98	6	F	4	666	6	51166	4	41	adipose fin clip
80	23-Sep-98	6	M	3	664		51166	5	52	
81	23-Sep-98	6	M	3	753		51167	1	52	
82	23-Sep-98	6	M	3	741		51167	2	52	
83	23-Sep-98	6	F	2	671	0	51167	3	52	
84	23-Sep-98	6	M	3	763		51167	4	52	
85	23-Sep-98	6	F	4	673	11	51167	5	41	adipose fin clip
86	23-Sep-98	6	F	2	731	304	51168	1	52	
87	23-Sep-98	6	M	3	742		51168	2	52	
88	23-Sep-98	6	M	4	672		51168	3	42	
89	23-Sep-98	6	F	2	647	2	51168	4	41	adipose fin clip
90	23-Sep-98	6	F	2	720	0	51168	5	52	
91	23-Sep-98	6	F	3	655	6	51169	1	52	
92	23-Sep-98	6	F	3	678	0	51169	2	52	adipose fin clip
93	23-Sep-98	6	M	4	692		51169	3	53	
94	23-Sep-98	6	M	2	680		51169	4	41	
95	23-Sep-98	6	F	3	647	12	51169	5	52	
96	23-Sep-98	6	M	3	707		51170	1	52	
97	23-Sep-98	6	M	3	730		51170	2	52	
98	23-Sep-98	6	F	2	698	0	51170	3	52	
99	23-Sep-98	6	F	3	751	0	51170	4	52	
100	23-Sep-98	6	M	3	688		51170	5	52	
101	23-Sep-98	6	M	2	690		51171	1	42	
102	23-Sep-98	6	M	3	736		51171	2	41	adipose fin clip
103	23-Sep-98	6	F	2	657	22	51171	3	41	adipose fin clip
104	23-Sep-98	6	M	4	716		51171	4	41	adipose fin clip
105	23-Sep-98	6	M	2	742		51171	5	52	
106	23-Sep-98	6	F	2	714	0	51172	1	52	adipose fin clip
107	23-Sep-98	6	F	2	669	0	51172	2	41	adipose fin clip
108	23-Sep-98	6	M	3	642		51172	3	41	adipose fin clip
109	23-Sep-98	6	F	4	626	0	51172	4	41	adipose fin clip
110	24-Sep-98	1	F	2	774	0	51172	5	52	
111	24-Sep-98	1	F	4	752	0	51173	1	52	
112	24-Sep-98	1	M	3	734		51173	2	52	
113	24-Sep-98	1	F	2	760	6	51173	3	52	adipose fin clip

APPENDIX 2 (cont.)

1998 Stuart 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		
114	24-Sep-98	1	F	3	742	4	51173	4	52	
115	24-Sep-98	1	F	2	590	54	51173	5	42	
116	24-Sep-98	1	M	3	745		51174	1	52	
117	24-Sep-98	1	F	2	620	2	51174	2	42	
118	24-Sep-98	1	M	3	687		51174	3	52	
119	24-Sep-98	2	F	4	684	0	51174	4	42	
120	24-Sep-98	2	M	3	799		51174	5	52	
121	24-Sep-98	2	M	3	768		51175	1	52	
122	24-Sep-98	2	M	3	677		51175	2	41	adipose fin clip
123	24-Sep-98	2	F	3	738	0	51175	3	52	
124	24-Sep-98	2	F	2	713	432	51175	4	52	
125	24-Sep-98	2	F	3	712	0	51175	5	52	
126	24-Sep-98	2	M	3	668		51176	1	42	
127	24-Sep-98	2	F	3	676	8	51176	2	41	adipose fin clip
128	24-Sep-98	2	M	3	592		51176	3	52	
129	24-Sep-98	2	F	2	744	12	51176	4	52	
130	24-Sep-98	2	M	2	700		51176	5	41	adipose fin clip
131	24-Sep-98	2	F	2	695	3	51177	1	41	adipose fin clip
132	24-Sep-98	2	F	3	708	0	51177	2	52	
133	25-Sep-98	3	F	3	698	8	51177	3	41	adipose fin clip
134	25-Sep-98	2	F	3	661	4	51177	4	41	adipose fin clip
135	25-Sep-98	3	M	3	755		51177	5	52	
136	25-Sep-98	3	F	3	632	0	51178	1	41	adipose fin clip
137	25-Sep-98	3	M	3	716		51178	2	41	adipose fin clip
138	25-Sep-98	3	F	2	715	8	51178	3	52	
139	25-Sep-98	3	M	2	805		51178	4	52	
140	25-Sep-98	3	F	2	706	16	51178	5	52	adipose fin clip
141	25-Sep-98	3	M	3	735		51179	1	41	adipose fin clip
142	25-Sep-98	3	F	3	717	0	51179	2	41	adipose fin clip
143	25-Sep-98	3	M	3	763		51179	3	52	
144	25-Sep-98	3	M	3	777		51179	4	52	
145	25-Sep-98	3	F	2	724	6	51179	5	52	
146	25-Sep-98	3	M	3	720		51180	1	52	
147	25-Sep-98	3	F	4	708	0	51180	2	52	
148	25-Sep-98	3	F	2	722	0	51180	3	52	
149	25-Sep-98	3	F	4	655	0	51180	4	52	
150	25-Sep-98	3	F	3	672	1	51180	5	52	

APPENDIX 2 (cont.)

1998 Stuart 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		
151	25-Sep-98	3	F	4	740	103	51181	1	52	
152	25-Sep-98	3	F	4	712	0	51181	2	52	
153	25-Sep-98	3	F	4	718	0	51181	3	52	
154	25-Sep-98	3	F	3	805	0	51181	4	52	
155	25-Sep-98	3	F	3	706	8	51181	5	52	
156	26-Sep-98	4	F	2	679	0	51182	1	41	adipose fin clip
157	26-Sep-98	4	F	4	698	0	51182	2	41	adipose fin clip
158	26-Sep-98	4	F	4	729	0	51182	3	42	
159	26-Sep-98	4	M	2	699		51182	4	52	
160	26-Sep-98	4	M	2	746		51182	5	52	
161	26-Sep-98	4	F	4	714	12	51183	1	52	
162	26-Sep-98	4	F	3	678	0	51183	2	52	
163	26-Sep-98	4	F	2	694	0	51183	3	52	adipose fin clip
164	26-Sep-98	4	F	3	718	6	51183	4	41	adipose fin clip
165	26-Sep-98	4	F	3	688	5	51183	5	52	
166	26-Sep-98	4	F	3	699	0	51184	1	52	
167	26-Sep-98	4	F	3	746	7	51184	2	52	
168	26-Sep-98	4	F	2	728	0	51184	3	41	
169	26-Sep-98	4	F	4	748	0	51184	4	52	
170	26-Sep-98	4	F	3	687	9	51184	5	52	adipose fin clip
171	26-Sep-98	4	F	2	723	30	51185	1	52	
172	26-Sep-98	4	F	2	634	4	51185	2	42	
173	26-Sep-98	4	M	3	699		51185	3	52	
174	26-Sep-98	4	F	2	686	4	51185	4	52	adipose fin clip
175	26-Sep-98	4	F	3	715	116	51185	5	41	adipose fin clip
176	26-Sep-98	4	F	3	605	0	51186	1	41	adipose fin clip
177	26-Sep-98	4	F	2	696	12	51186	2	52	
178	26-Sep-98	4	F	3	630	0	51186	3	41	adipose fin clip
179	26-Sep-98	4	F	3	653	0	51186	4	41	adipose fin clip
180	26-Sep-98	4	F	3	678	19	51186	5	52	
181	28-Sep-98	4	M	3	690		51187	1	41	adipose fin clip
182	28-Sep-98	4	F	3	715	0	51187	2	41	adipose fin clip
183	28-Sep-98	4	M	3	731		51187	3	52	
184	28-Sep-98	4	M	3	685		51187	4	41	adipose fin clip
185	28-Sep-98	4	F	3	692	0	51187	5	42	
186	28-Sep-98	4	F	2	724	2	51188	1	52	
187	28-Sep-98	4	F	4	699	0	51188	2	52	

APPENDIX 2 (cont.)

1998 Stuart 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		
188	28-Sep-98	4	F	4	700	0	51188	3	52	
189	28-Sep-98	4	F	4	746	0	51188	4	52	
190	28-Sep-98	4	F	4	711	0	51188	5	52	
191	28-Sep-98	4	M	3	772		51189	1	52	
192	28-Sep-98	4	M	3	721		51189	2	42	
193	28-Sep-98	4	F	4	723	0	51189	3	52	
194	28-Sep-98	4	F	3	691	0	51189	4	52	
195	28-Sep-98	4	F	4	690	0	51189	5	41	adipose fin clip
196	29-Sep-98	5	M	3	724		51190	1	41	adipose fin clip
197	29-Sep-98	5	F	3	625	0	51190	2	42	
198	29-Sep-98	5	F	4	691	0	51190	3	41	adipose fin clip
199	29-Sep-98	5	F	4	651	0	51190	4	41	
200	29-Sep-98	5	F	3	702	0	51190	5	41	adipose fin clip
201	29-Sep-98	5	F	3	674	0	51191	1	41	adipose fin clip
202	29-Sep-98	5	F	3	603	0	51191	2	41	adipose fin clip
203	29-Sep-98	5	F	3	715	0	51191	3	52	
204	29-Sep-98	5	F	3	668	0	51191	4	42	
205	29-Sep-98	5	M	4	756		51191	5	52	
206	29-Sep-98	5	M	3	778		51192	1	52	
207	29-Sep-98	5	F	2	669	0	51192	2	52	
208	29-Sep-98	5	F	3	730	0	51192	3	52	
209	29-Sep-98	5	F	4	684	0	51192	4	41	adipose fin clip
210	29-Sep-98	5	F	4	645	21	51192	5	52	
211	30-Sep-98	5	F	4	732	0	51193	1	52	
212	30-Sep-98	5	F	4	704	0	51193	2	52	
213	30-Sep-98	5	M	3	755		51193	3	52	
214	30-Sep-98	5	M	3	776		51193	4	62	
215	30-Sep-98	5	F	2	715	12	51193	5	52	
216	30-Sep-98	5	F	4	689	0	51194	1	41	adipose fin clip
217	30-Sep-98	5	F	4	696	0	51194	2	41	
218	30-Sep-98	5	F	4	664	0	51194	3	41	adipose fin clip
219	30-Sep-98	5	F	4	648	0	51194	4	52	adipose fin clip
220	1-Oct-98	6	F	4	672	0	51194	5	52	
221	1-Oct-98	6	F	4	676	0	51195	1	41	adipose fin clip
222	1-Oct-98	6	M	4	657		51195	2	41	adipose fin clip
223	1-Oct-98	6	F	3	664	2	51195	3	52	
224	1-Oct-98	6	F	4	678	0	51195	4	52	adipose fin clip

APPENDIX 2 (cont.)

1998 Stuart 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		
225	1-Oct-98	6	M	3	695		51195	5	52	
226	1-Oct-98	6	F	3	683	0	51196	1	41	adipose fin clip
227	1-Oct-98	6	F	3	724	0	51196	2	52	
228	1-Oct-98	6	F	4	698	0	51196	3	41	adipose fin clip
229	1-Oct-98	6	F	3	627	0	51196	4	42	
230	1-Oct-98	6	F	3	688	0	51196	5	52	
231	1-Oct-98	6	M	3	723		51197	1	52	
232	1-Oct-98	6	F	3	754	0	51197	2	51	
233	1-Oct-98	6	F	3	732	0	51197	3	52	
234	1-Oct-98	6	M	4	774		51197	4	52	
235	1-Oct-98	6	F	3	673	0	51197	5	52	
236	2-Oct-98	6	M	4	595		51198	1	42	
237	2-Oct-98	6	M	3	778		51198	2	52	
238	2-Oct-98	6	F	4	636	0	51198	3	52	adipose fin clip
239	2-Oct-98	6	M	3	708		51198	4	41	adipose fin clip
240	2-Oct-98	6	M	3	692		51198	5	52	adipose fin clip
241	2-Oct-98	6	M	3	708		51199	1	52	adipose fin clip
242	2-Oct-98	6	F	4	702	0	51199	2	52	
243	2-Oct-98	6	F	4	667	0	51199	3	52	
244	2-Oct-98	6	F	4	712	0	51199	4	41	adipose fin clip
245	2-Oct-98	6	F	4	720	0	51199	5	52	
246	2-Oct-98	6	M	3	741		51200	1	52	
247	2-Oct-98	6	F	4	655	0	51200	2	41	adipose fin clip
248	2-Oct-98	6	M	4	723		51200	3	52	
249	2-Oct-98	6	F	4	694	0	51200	4	52	adipose fin clip
250	2-Oct-98	6	M	3	748		51200	5	52	