

**NECHAKO AND STUART RIVERS
CHINOOK CARCASS RECOVERY
2003**

NECHAKO FISHERIES CONSERVATION PROGRAM
Data Report No. M03-2

Prepared by:
Mark Potyrala and Byron Nutton
Fisheries and Oceans Canada
April 2011

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABSTRACT

INTRODUCTION

METHODS

RESULTS

 Nechako River

 Stuart River

DISCUSSION – COMPARISON TO PREVIOUS YEARS

 Nechako River

 Stuart River

ACKNOWLEDGEMENTS

REFERENCES

LIST OF TABLES

- Table 1. Nechako River Chinook Carcass Recovery by Section, 2003.
- Table 2. Nechako River Chinook Carcass Condition, 2003.
- Table 3. Nechako River Chinook Age Contribution (%) by Sex, 2003.
- Table 4. Stuart River Chinook Carcass Recovery by Zone, 2003.
- Table 5. Stuart River Chinook Carcass Condition, 2003.
- Table 6. Stuart River Chinook Age Contribution (%) by Sex, 2003.
- Table 7. Nechako River Chinook Fecundity, 1978-2003.
- Table 8. Nechako River Chinook Egg Retention, 1988-2003.
- Table 9. Percent Contribution of Stream-type Life Histories to Nechako Chinook Escapements, 1988-2003.
- Table 10. Percent Contribution of Age-at-Return Groupings to Nechako Chinook Escapements, 1988-2003.

LIST OF FIGURES

- Figure 1. Nechako River Drainage.
- Figure 2. Nechako River Chinook Spawning Study Area.
- Figure 3. Stuart River Chinook Spawning Study Area.
- Figure 4. Nechako River Chinook Length Frequency Distribution, 2003.
- Figure 5. Stuart River Chinook Length Frequency Distribution, 2003.
- Figure 6. Nechako River Chinook Sex Ratio, 1988-2003.
- Figure 7. Nechako River Chinook Male Mean Length, 1988-2003.
- Figure 8. Nechako River Chinook Female Mean length, 1988-2003.
- Figure 9. Nechako River Chinook Mean Egg Retention, 1988-2003.

LIST OF APPENDICES

- Appendix 1. 2003 Nechako River Chinook Carcass Recovery Project: Field Data and Ageing Results.
- Appendix 2. 2003 Stuart River Chinook Carcass Recovery Project: Field Data and Ageing Results.

ABSTRACT

In 2003 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 200 carcasses were collected on the Nechako River between September 14th and October 7th. Nechako River Chinook carcasses recovered in 2003 exhibited similar biological characteristics to those collected from 1988 to 2002. The female to male ratio of the sample fell within the range of the existing time series. Mean post-orbital hypural length for both males and females fell within the ranges observed in previous years. The spawning population was exclusively comprised of individuals with a stream-type life history and dominated by the 5₂ age-class.

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 2003 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 normal target sample size is 200 fish.

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. The target sample size was set at a minimum of 250 fish, slightly higher than the normal 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 re-counting 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 2003 are presented in Appendices 1 and 2, respectively. Summaries of these data are provided in the respective sections below.

Nechako River

Between September 14th and October 7th a total of 200¹ carcasses were sampled from 11 of the 16 identified Sections representing all 3 river areas – upper, middle and lower river (Table 1). The observed sex ratio was 1.78 F/M, or 64% females and 36% males (n=200). One Chinook jack and one Chinook jill were collected. Of the carcasses sampled, 54% were fresh or only a few days old (Table 2).

The length (POHL) of the fish sampled ranged from 425 to 835 mm, with a mean of 716 mm (n=72, SD=91) for males, 688 mm (n=128, SD=53) for females and 698 mm (n=200, SD=71) for all fish combined. For males, the majority of individuals sampled ranged in size from 701-800 mm while the majority of females ranged in size from 601-750 mm (Figure 4).

Of the total number of female carcasses sampled (n=128), one was found to be a pre-spawn mortality with undeveloped skeins. A further 2 were found to be partially spawned based on egg

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.

retention estimates of between 1000 and 4999. The remaining 125 (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 16 eggs (n=125, SD=72, range 0–696). When adding the 2 partially spawned samples into the dataset, the mean egg retention for the fully and partially spawned females was 48 eggs (n=127, SD=293, range 0–3032).

Scale and fin samples from 200 carcasses recovered from the Nechako River were sent to the Pacific Biological Station in Nanaimo for age analysis. Complete ages were determined for 164 of those samples (Table 3). The results indicate that the majority of the fish sampled were of two age-classes, 5₂ (65%) and 4₂ (31%). A chi-square test was used to determine that the numbers of males and females in these age-classes were not significantly proportionate to the sex ratio of the sample (p=0.52).

None of the recovered Chinook had an adipose fin missing, and no other form of marking or tagging was observed.

Stuart River

Between September 21st and 28th a total of 250² carcasses were sampled from the six Zones (1 to 6) within the study area (Table 4). The observed sex ratio was 0.72 F/M, or 42% females and 58% males (n=250). Of the 250 carcasses with condition documented, 34% were fresh or only a few days old, while most (64%) were found to be in poor condition with some fungus (Table 5).

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 M03-1). This information is relevant to carcass sampling results presented in this report, and given the much larger sample size (n=3951) 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 1.01 F/M, or 50.3% females and 49.7% males (n=3951, including the carcasses selected for biological sampling).

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.

The length (POHL) of the fish sampled ranged from 500 to 925 mm, with a mean of 764 mm for males (n=145, SD=77), 718 mm for females (n=105, SD=60) and 745 mm (n=250, SD=74) for all fish combined. For males, the majority of individuals sampled ranged in size from 701-850 mm while the majority of females ranged in size from 651-800 mm (Figure 5).

Of the total number of female carcasses sampled (n=105), none were found to be pre-spawn mortalities while two were found to be partially spawned, based on retained egg values of between 1000 and 4999, with estimated egg retention values of 1000 and 1150, respectively. Of the total number of female carcasses sampled, 103 (99%) were determined to be fully spawned, based on egg retention of less than 1000. The mean egg retention of the fully spawned females was 16 eggs (n=103, SD=88, range 0–874). When adding partially spawned females to the sample, the mean egg retention increased to 36 eggs (n=105, SD=170, range 0–1150).

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 198 of those samples (Table 6). The results indicate that a majority of the fish sampled were of two age-classes, 5₂ (64%) and 4₂ (36%). There were no Chinook jacks in the sample. The number of males and females in these age-classes was not significantly disproportionate to the sex ratio of the sample (chi-square test, p=0.32).

Carcasses with tags applied as part of the mark-recapture program were collected. This data is documented in the Nechako and Stuart Rivers Chinook Enumeration report (NFCP M03-1) as the tags are not relevant to the biological sampling project. No other form of marking or tagging was observed.

DISCUSSION - COMPARISON TO PREVIOUS YEARS

Nechako River

A comparison of 2003 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 M02-2). 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 1.78 F/M was within the existing range (1.10-2.23) observed from 1988-2002 (Figure 6), and significantly higher than the mean of 1.54 ($n=15$, $SD=0.30$), as indicated by 95% confidence limit of 1.39-1.69.

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 2003 fell within the ranges observed in previous years (Figures 7 and 8).

No female pre-spawn mortalities were sampled resulting in no change in estimated average female fecundity of 6563 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.

The mean egg retention in fully and partially spawned carcasses was compared to values from previous years (Table 8). The 2003 mean was within the bounds of all years' results (Figure 9).

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 2003, age-classes 4₂ and 5₂ accounted for 96% of the return, with all stream-type fish accounting for 100% (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 M03-1).

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 2003, 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 Ecofor Consulting Ltd. and members of the Nak'azdli Band.

Staff at DFO's Pacific Biological Station in Nanaimo analyzed the various samples.

Rhonda Thibeault and Liz Murphy assisted with data compilation.

REFERENCES

- Anonymous. 1987. Settlement Agreement between Alcan Aluminum Ltd., the Minister of Fisheries and Oceans and the Minister of Energy, Mines and Petroleum. Signed September 14, 1987 in Vancouver, BC.
- Fee, P. and M. Sheng. 1978. Nechako River Chinook Fry and Spawning Survey. Unpublished manuscript prepared by Department of Fisheries and Oceans, Vancouver, BC.
- Jaremovic, L. and D. Rowland. 1988. Review of Chinook Salmon Escapements in the Nechako River, British Columbia. Canadian Manuscript Report of Fisheries and Aquatic Sciences No. 1963.
- NFCP. Nechako and Stuart Rivers Chinook Carcass Recovery 1988 to 2002. Nechako Fisheries Conservation Program Data Reports M88-4 and M89-2 to M02-2.
- Olmsted, W.R., M. Whelan and G.A. Vigers. 1980. 1979 Investigations of Fall Spawning Chinook Salmon (*Oncorhynchus tshawytscha*), Nechako and Quesnel/Horsefly Rivers, B.C. Prepared by E.V.S. Consultants Ltd. North Vancouver, B.C. for the Department of Fisheries and Oceans.
- Russell, L.R., K.R. Conlin, O.K. Johansen and U. Orr. 1983. Chinook Salmon Studies on the Nechako River: 1980, 1981, 1982. Canadian Manuscript Report of Fisheries and Aquatic Sciences No. 1728.

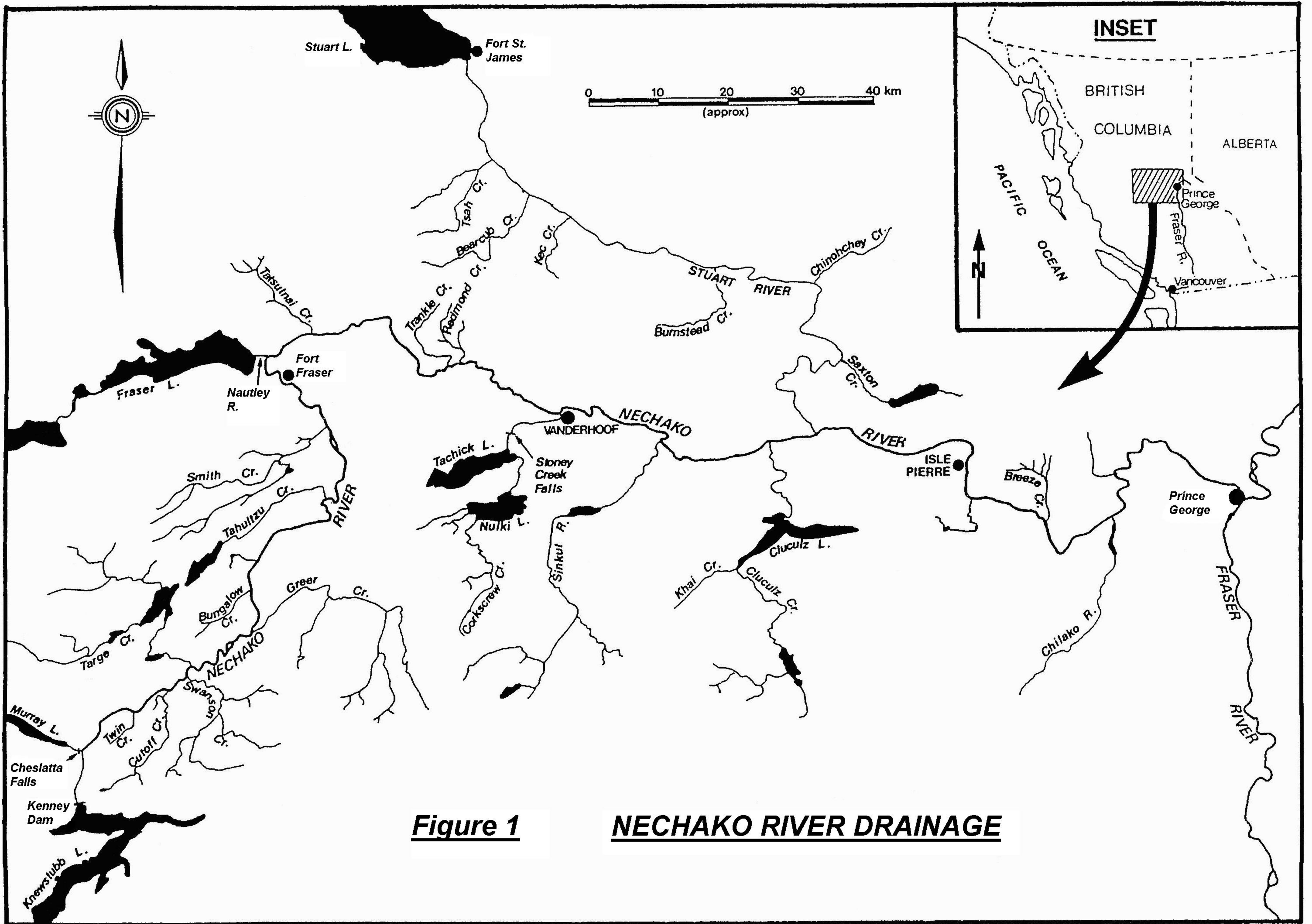
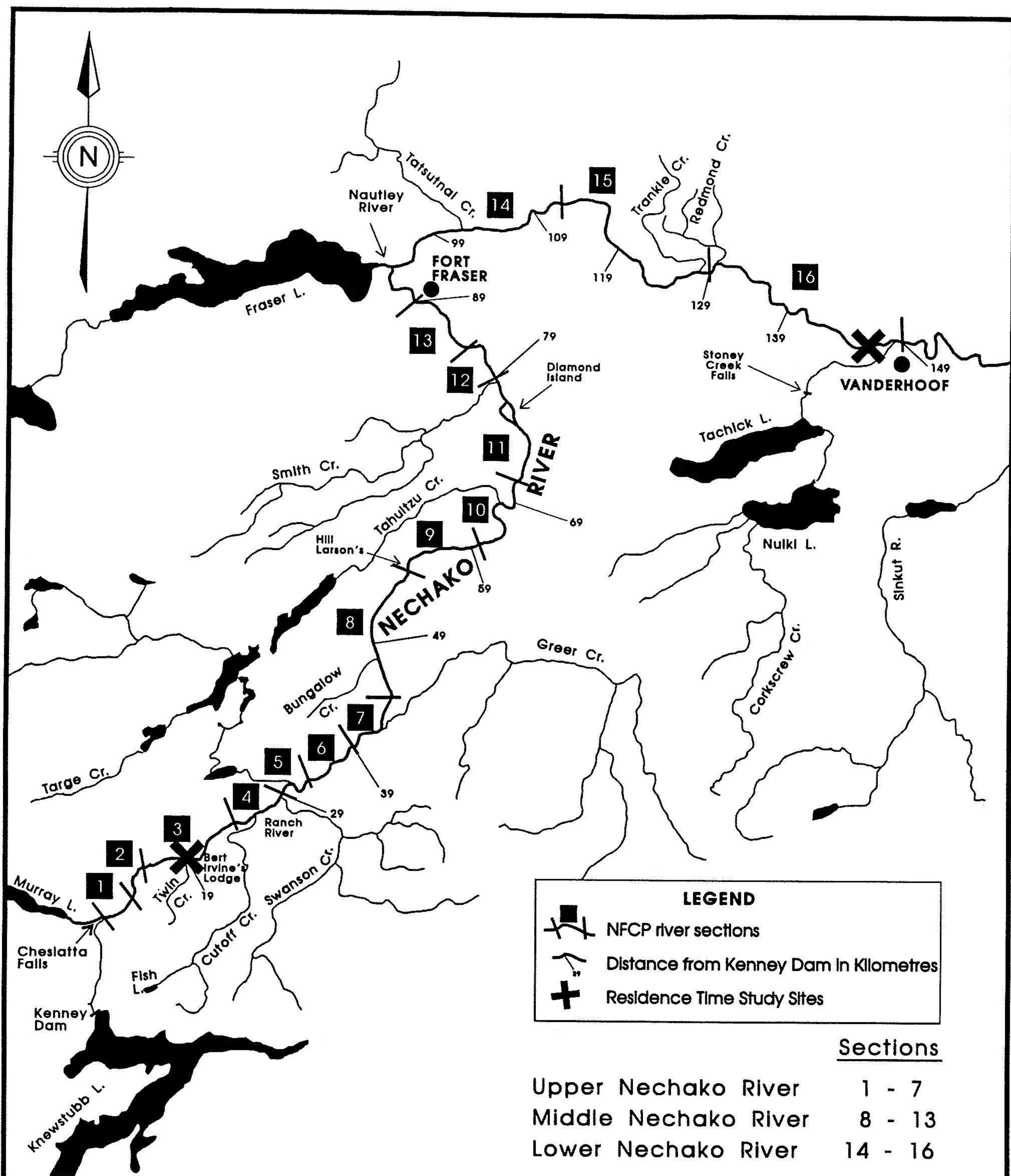


Figure 1

NECHAKO RIVER DRAINAGE



Nechako Fisheries Conservation Program

0 25 km



FIGURE 2. NECHAKO RIVER CHINOOK SPAWNING STUDY AREA

Figure 3

STUART RIVER CHINOOK
SPAWNING STUDY AREA

LEGEND

 river sections

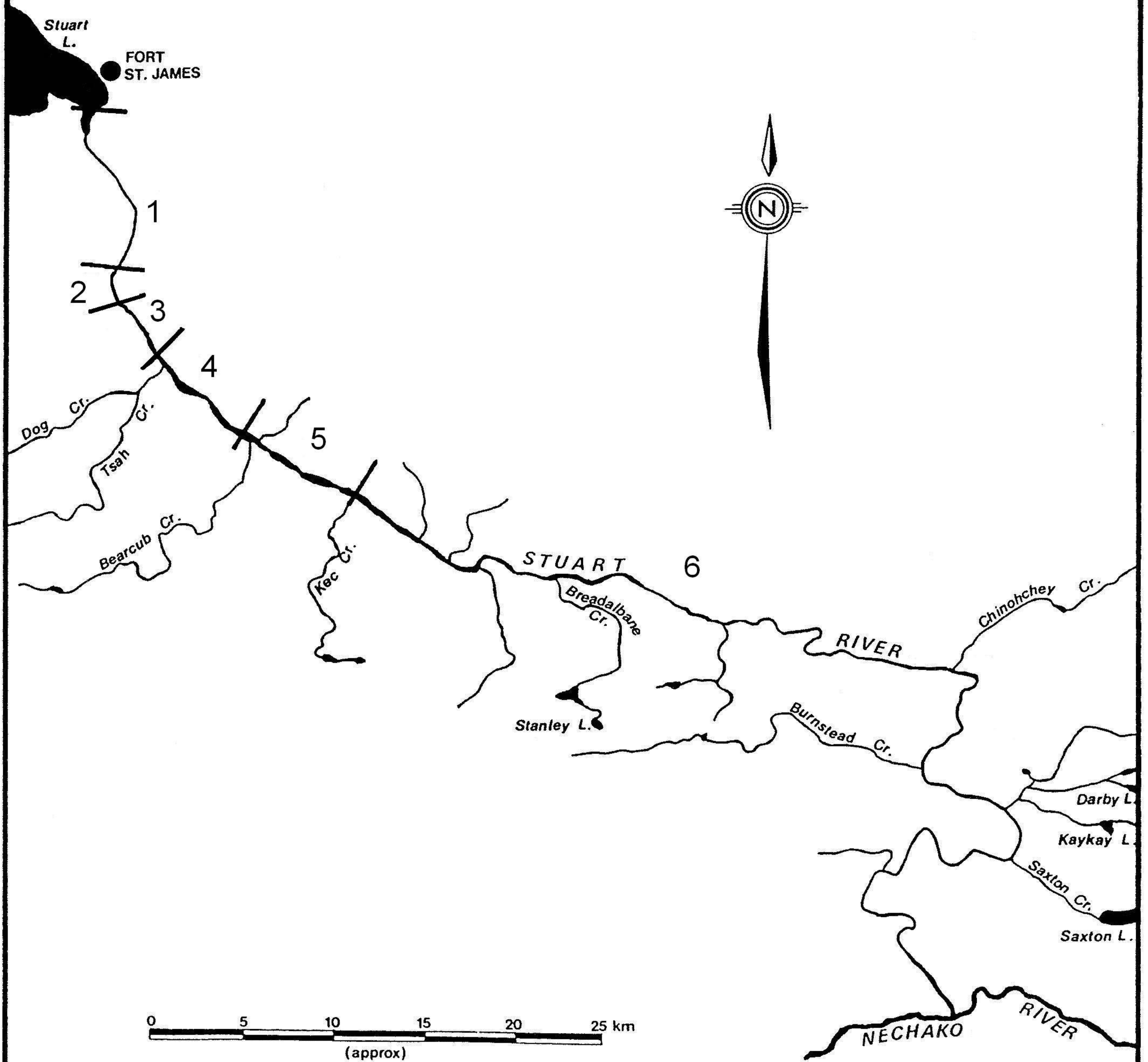


Table 1
Nechako River Chinook Carcass Recovery by Section, 2003

Section	Number	Percent
UPPER NECHAKO		
Section 1	0	0.0
Section 2	0	0.0
Section 3	41	20.5
Section 4	18	9.0
Section 5	8	4.0
Section 6	18	9.0
Section 7	0	0.0
SUB-TOTAL	85	42.5
MIDDLE NECHAKO		
Section 8	0	0.0
Section 9	6	3.0
Section 10	10	5.0
Section 11	31	15.5
Section 12	39	19.5
Section 13	8	4.0
SUB-TOTAL	94	47.0
LOWER NECHAKO		
Section 14	0	0.0
Section 15	6	3.0
Section 16	15	7.5
SUB-TOTAL	21	10.5
TOTAL RIVER	200	100.0

Table 2
Nechako River Chinook Carcass Condition, 2003

Condition *	Number	Percent
1	56	28.0
2	52	26.0
3	52	26.0
4	40	20.0
TOTAL	200	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

Table 3
Nechako River Chinook Age Composition (%) by Sex, 2003

	3-2	4-2	5-2	5-3	6-2	Total # Aged
Males	1.6	27.4	66.1	0.0	4.8	62
Females	1.0	33.3	63.7	1.0	1.0	102

Table 4
Stuart River Chinook Carcass Recovery by Zone, 2003

Zone	Number	Percent
1	12	4.8
2	9	3.6
3	16	6.4
4	114	45.6
5	30	12.0
6	69	27.6
TOTAL	250	100.0

Table 5
Stuart River Chinook Carcass Condition, 2003

Condition *	Number	Percent
1	5	2.0
2	80	32.0
3	161	64.4
4	4	1.6
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

Table 6
Stuart River Chinook Age Composition (%) by Sex, 2003

	4-2	5-2	Total # Aged
Males	33.1	66.9	118
Females	40.0	60.0	80

Table 7
Nechako River Chinook Fecundity, 1978-2003

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
2001	642	7280		6563

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

Table 8
Nechako River Chinook Egg Retention, 1988-2003

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
2000	153	0-965	10.9	3	1366-3500	52.8
2001	274	0-636	12.4	0	n/a	12.4
2002	133	0-813	13.5	0	n/a	13.5
2003	125	0-696	15.7	2	1100-3032	48

Table 9
 Percent Contribution of Stream-type Life Histories
 to Nechako Chinook Escapements, 1988-2003

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
2000	97	100	250
2001	99	100	180
2002	93	98	178
2003	96	100	164

Table 10
 Percent Contribution of Age-at-Return Groupings
 to Nechako Chinook Escapements, 1988-2003

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
2000	0.0	64.8	32.4	2.8	0.0	250
2001	0.0	11.1	88.3	0.6	0.0	180
2002	0.6	22.5	73.0	3.9	0.0	178
2003	1.2	31.1	65.2	2.4	0.0	164

Figure 4
Nechako River Chinook Length Frequency Distribution, 2003

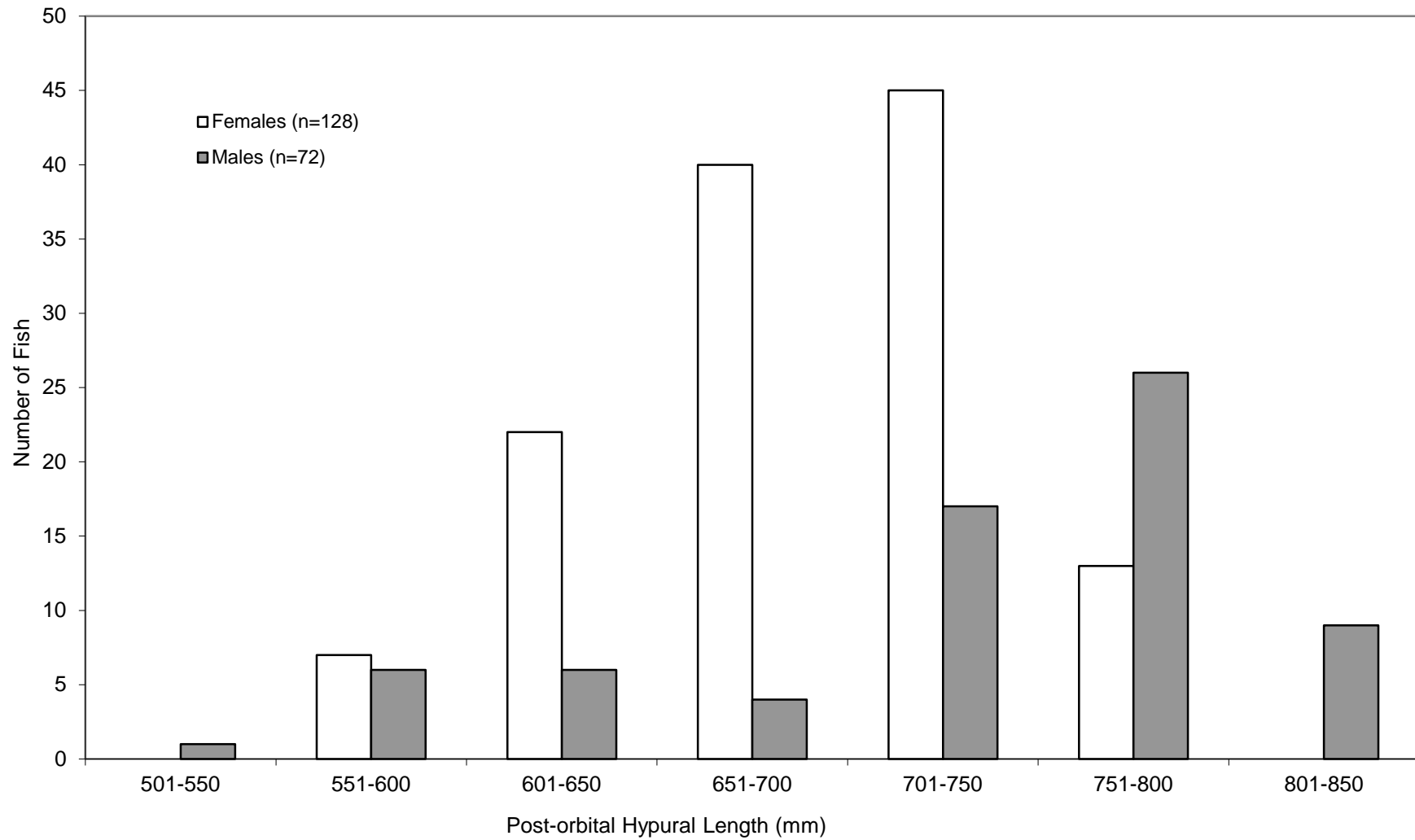


Figure 5
Stuart River Chinook Length Frequency Distribution, 2003

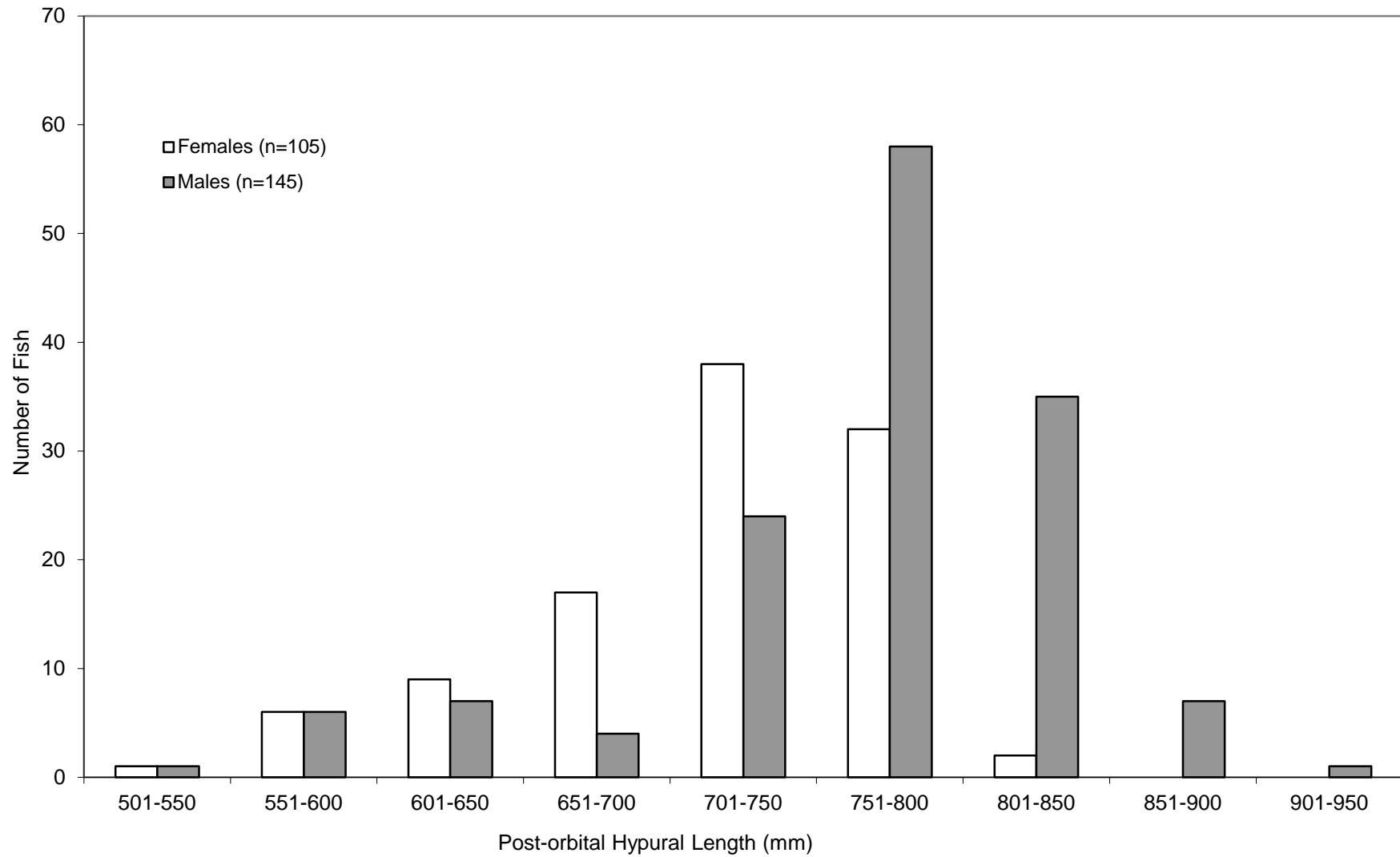


Figure 6
Nechako River Chinook Sex Ratio, 1988-2003

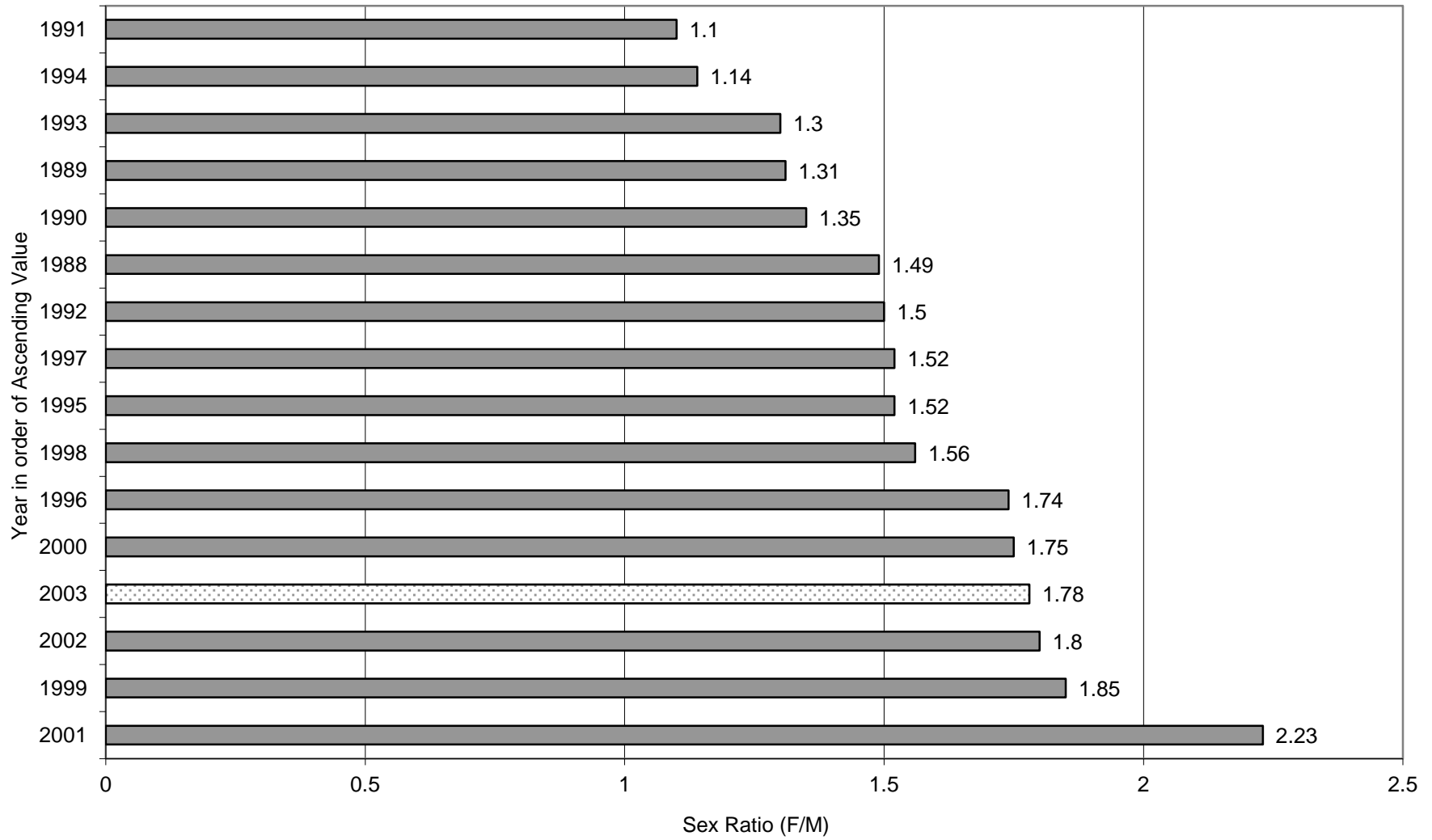


Figure 7
Nechako River Chinook Male Mean Length, 1988-2003

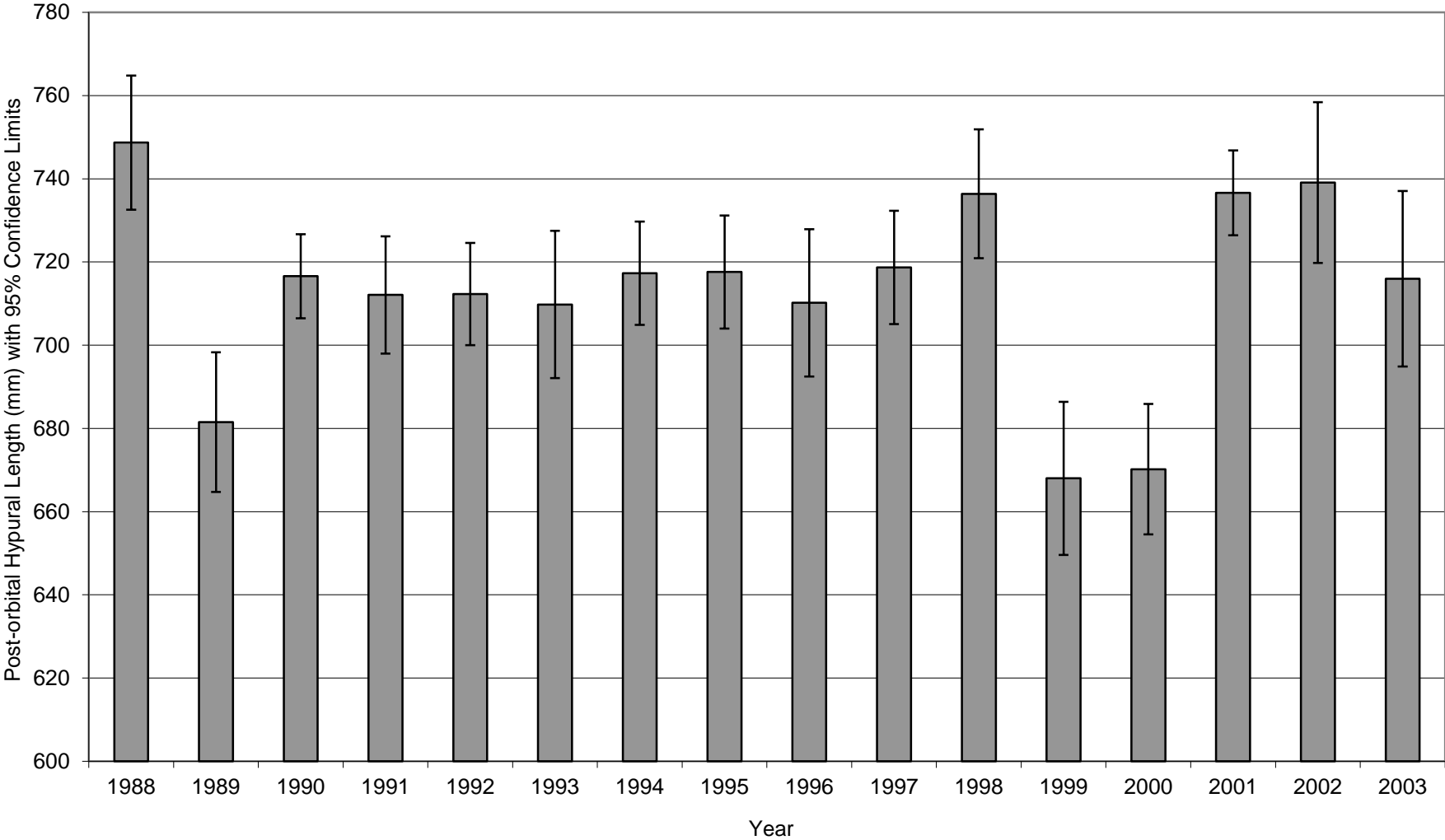


Figure 8
Nechako River Chinook Female Mean Length, 1988-2003

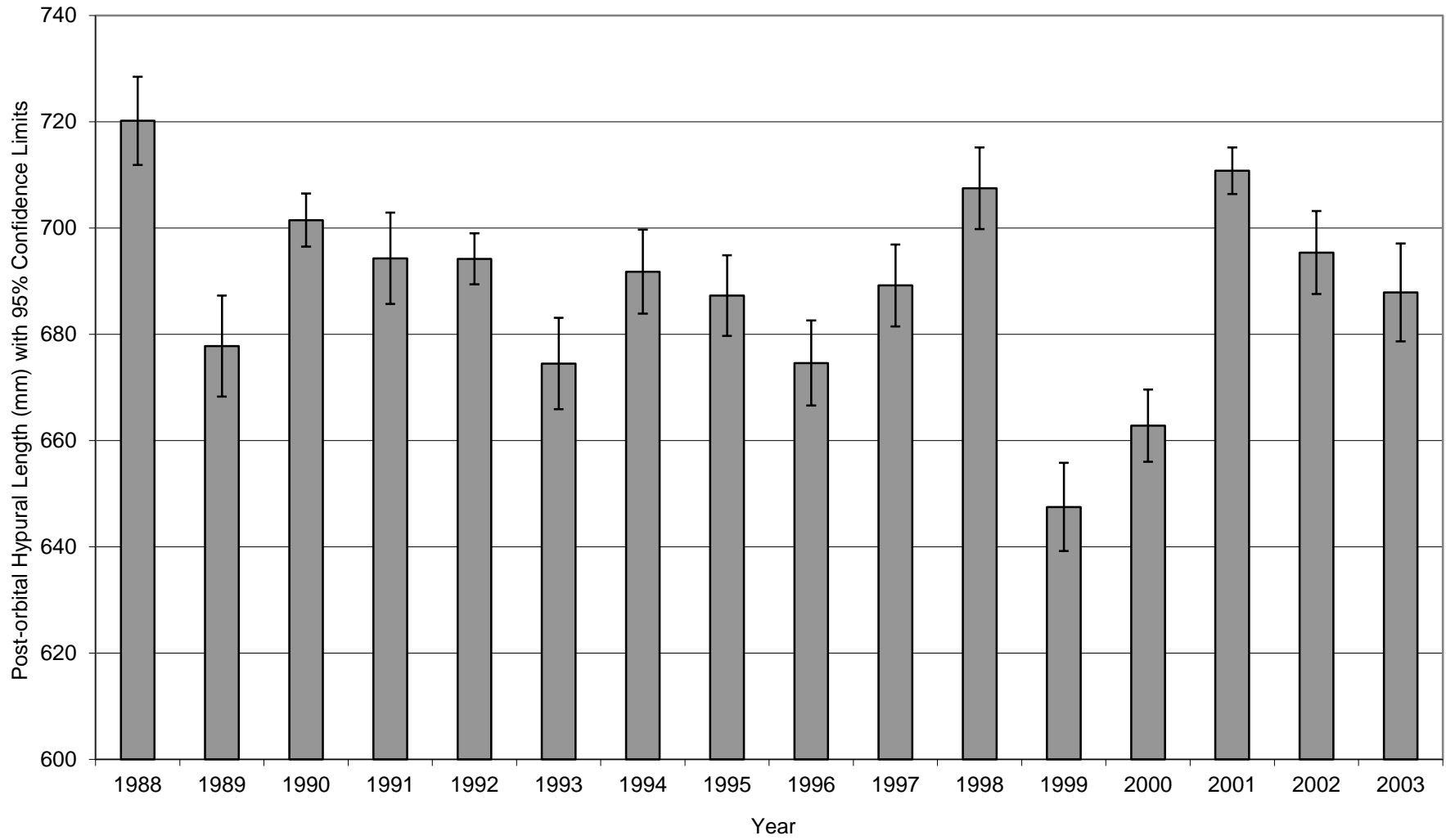
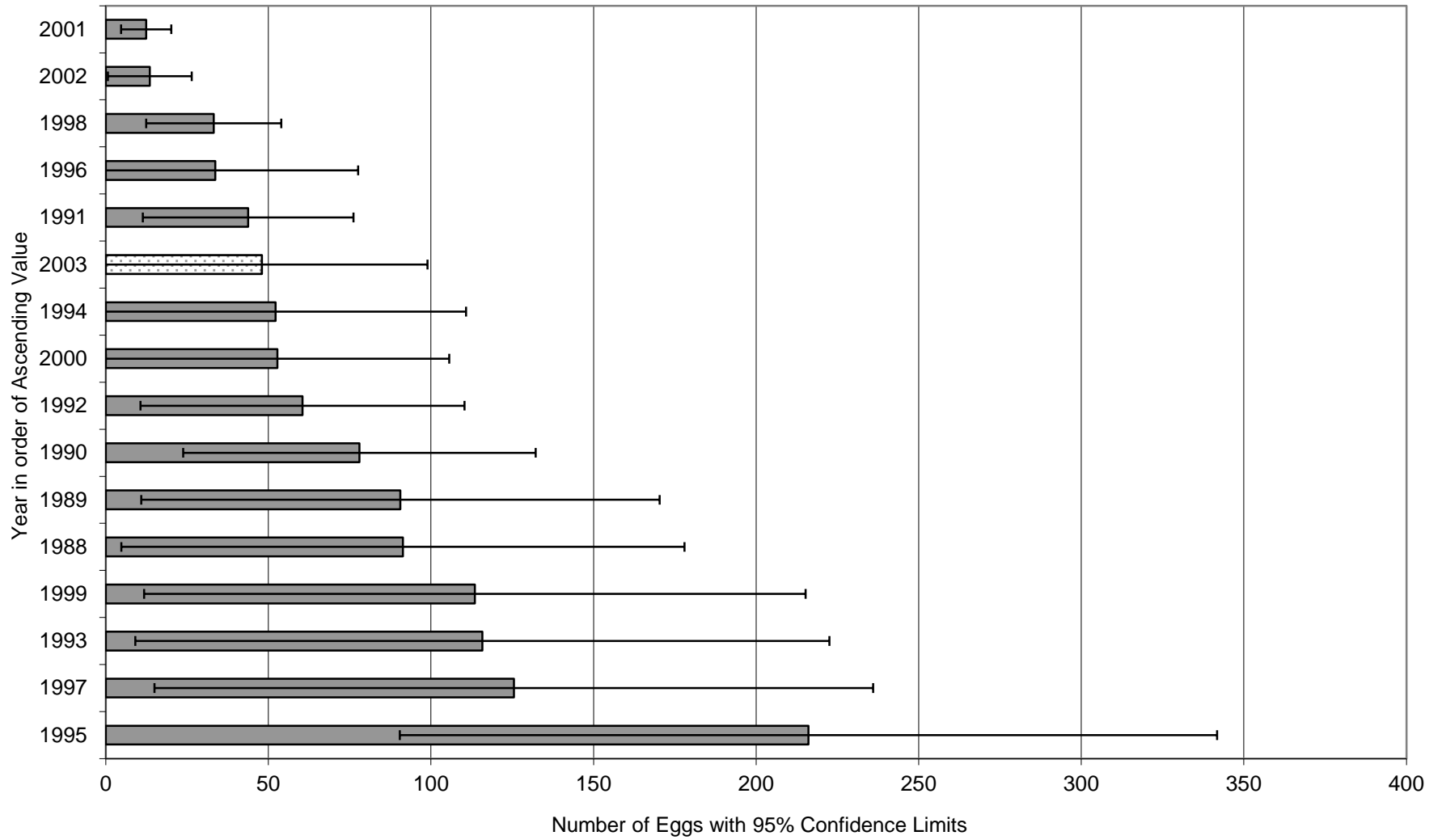


Figure 9
Nechako River Chinook Mean Egg retention, 1988-2003



Appendix 1 Nechako River Carcass Data

Carcass #	Date	Reach	Sex	Condition	POHL (mm)	# Eggs	Scale Book	Scale Spaces	Age (G-R)	Comments
1	14-Sep-03	3B	F	3	632	2	39001	1	52	
2	14-Sep-03	4	F	3	624	11	39001	2	42	
3	14-Sep-03	4	F	3	667	0	39001	3	52	
4	14-Sep-03	4	F	3	595	0	39001	4	42	
5	14-Sep-03	4	M	3	655		39001	5	S2	
6	14-Sep-03	4	M	2	771		39002	1	S2	fork length 1002
7	14-Sep-03	4	M	3	677		39002	2	S2	
8	18-Sep-03	4	M	2	785		39002	3	52	
9	18-Sep-03	4	M	2	752		39002	4	3M	RG
10	18-Sep-03	4	M	2	719		39002	5	S2	
11	18-Sep-03	4	F	2	761	skein	39003	1	52	pre-mort fork length 957
12	18-Sep-03	4	M	4	696		39003	2	42	
13	18-Sep-03	4	M	3	574		39003	3	42	
14	18-Sep-03	4	F	1	734	116	39003	4	52	
15	18-Sep-03	4	F	1	692	19	39003	5	52	
16	20-Sep-03	9	M	2	810		39004	1	52	fork length 1042
17	20-Sep-03	9	M	2	742		39004	2	52	
18	20-Sep-03	9	F	1	736	696	39004	3	52	
19	20-Sep-03	9	F	1	722	2	39004	4	S2	
20	20-Sep-03	9	M	2	579		39004	5	42	
21	20-Sep-03	9	M	1	586		39005	1	42	
22	22-Sep-03	15	F	1	594	6	39005	2	42	
23	22-Sep-03	15	F	2	664	0	39005	3	52	
24	22-Sep-03	15	F	1	695	0	39005	4	52	
25	22-Sep-03	15	F	2	719	173	39005	5	52	
26	22-Sep-03	15	F	3	669	0	39006	1	52	
27	22-Sep-03	15	F	1	703	0	39006	2	52	
28	24-Sep-03	11	F	2	760	109	39006	3	52	
29	24-Sep-03	11	M	1	752		39006	4	52	
30	24-Sep-03	11	F	1	719	2	39006	5	52	
31	24-Sep-03	11	M	1	725		39007	1	52	
32	24-Sep-03	11	F	1	709	3032	39007	2	52	pre-mort
33	24-Sep-03	11	F	1	716	0	39007	3	52	

Carcass					POHL		Scale Samples	Age		
34	24-Sep-03	11	F	1	730	0	39007	4	62	
35	24-Sep-03	11	F	3	616	3	39007	5	53	
36	24-Sep-03	11	M	1	734		39008	1	52	crinkle back
37	24-Sep-03	11	M	3	619		39008	2	42	
38	24-Sep-03	11	F	1	644	1	39008	3	42	
39	24-Sep-03	11	F	2	754	2	39008	4	52	
40	24-Sep-03	11	M	1	770		39008	5	52	
41	24-Sep-03	11	F	1	753	0	39009	1	52	
42	24-Sep-03	11	M	3	773		39009	2	52	
43	24-Sep-03	11	F	1	786	16	39009	3	42	
44	24-Sep-03	11	F	2	612	61	39009	4	2M	RG
45	24-Sep-03	11	F	1	627	0	39009	5	42	
46	25-Sep-03	10	F	1	692	0	39010	1	42	
47	25-Sep-03	10	F	1	741	9	39010	2	52	
								42		jack fork length 579 unspawned
48	25-Sep-03	10	M	2	463		39010	3		
49	25-Sep-03	10	F	1	795	47	39010	4	S2	
50	25-Sep-03	10	F	1	724	0	39010	5	n/a	
51	25-Sep-03	10	F	1	758	0	39011	1	n/a	
52	25-Sep-03	10	F	1	714	11	39011	2	n/a	
53	25-Sep-03	10	M	2	782		39011	3	n/a	
54	25-Sep-03	10	F	2	746	0	39011	4	n/a	
55	25-Sep-03	10	M	2	743		39011	5	n/a	
56	26-Sep-03	12	F	2	751	0	39012	1	n/a	
57	26-Sep-03	12	F	2	730	4	39012	2	n/a	
58	26-Sep-03	12	M	1	727		39012	3	n/a	
59	26-Sep-03	12	F	3	728	1	39012	4	n/a	
60	26-Sep-03	12	F	2	669	350	39012	5	3M	RG; partly skined
61	26-Sep-03	12	F	2	700	49	39013	1	52	
62	26-Sep-03	12	F	1	741	11	39013	2	52	
63	26-Sep-03	12	M	2	802		39013	3	52	fork length 1039
64	26-Sep-03	12	F	1	757	1	39013	4	52	
65	26-Sep-03	12	F	3	595	5	39013	5	42	
66	26-Sep-03	12	M	3	756		39014	1	52	
67	26-Sep-03	12	F	2	763	0	39014	2	52	
68	26-Sep-03	12	F	1	697	0	39014	3	42	

Carcass					POHL		Scale Samples	Age		
69	26-Sep-03	12	F	1	608	0	39014	4	2M	RG
70	26-Sep-03	12	F	1	730	0	39014	5	52	
71	26-Sep-03	12	F	2	634	0	39015	1	42	
72	28-Sep-03	12	F	2	703	4	39015	2	52	
73	28-Sep-03	12	F	2	643	2	39015	3	42	
74	28-Sep-03	12	M	3	773		39015	4	52	
75	28-Sep-03	12	M	1	802		39015	5	52	fork length 1019
76	28-Sep-03	12	M	2	803		39016	1	52	
77	28-Sep-03	12	F	1	708	8	39016	2	S2	
78	28-Sep-03	12	F	2	692	10	39016	3	S2	
79	28-Sep-03	12	M	3	782		39016	4	52	fork length 1009
80	28-Sep-03	12	F	1	692	3	39016	5	52	
81	28-Sep-03	12	M	1	771		39017	1	52	fork length 1000
82	28-Sep-03	12	F	4	732	0	39017	2	52	
83	28-Sep-03	12	F	3	737	4	39017	3	52	
84	28-Sep-03	12	M	2	586		39017	4	42	
85	28-Sep-03	12	M	4	755		39017	5	3M	W
86	28-Sep-03	12	M	3	794		39018	1	52	fork length 1041
87	28-Sep-03	12	M	2	704		39018	2	52	
88	28-Sep-03	12	F	2	634	0	39018	3	42	
89	28-Sep-03	12	F	2	675	0	39018	4	52	
90	28-Sep-03	12	F	1	594	0	39018	5	42	
91	28-Sep-03	12	M	4	757		39019	1	52	heavily predated
92	28-Sep-03	12	F	2	700	1	39019	2	52	
93	29-Sep-03	13	F	1	726	2	39019	3	52	
94	29-Sep-03	13	F	1	791	7	39019	4	52	
95	29-Sep-03	13	M	3	768		39019	5	52	
96	29-Sep-03	13	M	3	657		39020	1	42	
97	29-Sep-03	13	M	3	613		39020	2	42	
98	29-Sep-03	13	M	2	782		39020	3	52	
99	29-Sep-03	13	M	3	779		39020	4	52	
100	29-Sep-03	13	M	3	766		39020	5	52	
101	30-Sep-03	16	F	2	707	7	39021	1	52	
102	30-Sep-03	16	F	3	600	0	39021	2	42	
103	30-Sep-03	16	F	2	661	0	39021	3	S2	
104	30-Sep-03	16	F	1	471	9	39021	4	32	jill fork length 562

Carcass					POHL		Scale Samples	Age		
105	30-Sep-03	16	F	1	652	3	39021	5	42	
106	30-Sep-03	16	F	3	674	0	39022	1	52	
107	30-Sep-03	16	F	4	668	0	39022	2	52	
108	30-Sep-03	16	M	2	724		39022	3	52	
109	30-Sep-03	16	F	2	795	1	39022	4	52	
110	30-Sep-03	16	M	4	746		39022	5	52	
111	30-Sep-03	16	F	1	731	0	39023	1	52	
112	30-Sep-03	16	M	2	717		39023	2	62	
113	30-Sep-03	16	F	4	682	0	39023	3	S2	
114	30-Sep-03	16	M	3	758		39023	4	52	
115	30-Sep-03	16	F	2	680	37	39023	5	52	
116	3-Oct-03	3A	F	3	728	0	39024	1	52	
117	3-Oct-03	3A	F	1	610	0	39024	2	42	
118	3-Oct-03	3A	M	3	605		39024	3	2M	RG
119	3-Oct-03	3A	F	3	707	0	39024	4	52	
120	3-Oct-03	3A	M	2	760		39024	5	52	fork length 1033
121	3-Oct-03	3A	M	3	834		39025	1	62	fork length 1070
122	3-Oct-03	3A	F	3	644	0	39025	2	42	
123	3-Oct-03	3A	F	2	735	2	39025	3	2M	RG
124	3-Oct-03	3A	F	2	677	0	39025	4	S2	
125	3-Oct-03	3A	F	2	634	0	39025	5	42	
126	3-Oct-03	3A	M	1	787		39026	1	52	fork length 1052
127	3-Oct-03	3A	F	1	680	0	39026	2	42	
128	3-Oct-03	3A	M	3	743		39026	3	42	
129	3-Oct-03	3A	M	2	805		39026	4	52	fork length 1049
130	3-Oct-03	3A	F	1	635	0	39026	5	42	
131	3-Oct-03	3A	F	2	633	0	39027	1	42	
132	3-Oct-03	3A	F	2	713	28	39027	2	52	
133	3-Oct-03	3A	F	1	766	21	39027	3	52	
134	3-Oct-03	3A	M	3	810		39027	4	52	fork length 1030
135	3-Oct-03	3A	M	2	635		39027	5	52	
136	4-Oct-03	3B	M	3	826		39028	1	52	fork length 1090
137	4-Oct-03	3B	F	1	621	2	39028	2	S2	
138	4-Oct-03	3B	F	1	645	39	39028	3	2M	RG
139	4-Oct-03	3B	M	1	796		39028	4	52	fork length 1036
140	4-Oct-03	3B	F	4	681	0	39028	5	S2	

Carcass					POHL		Scale Samples	Age		
141	4-Oct-03	3B	M	3	567		39029	1	42	
142	4-Oct-03	3B	M	4	757		39029	2	52	
143	4-Oct-03	3B	F	3	705	0	39029	3	52	
144	4-Oct-03	3B	F	2	746	0	39029	4	52	
145	4-Oct-03	3B	F	3	653	0	39029	5	42	
146	4-Oct-03	3B	F	1	592	3	39030	1	42	
147	4-Oct-03	3B	M	3	734		39030	2	52	
148	4-Oct-03	3B	M	3	571		39030	3	42	
149	4-Oct-03	3B	F	3	687	0	39030	4	42	
150	4-Oct-03	3B	M	4	500		39030	5	42	jack
151	4-Oct-03	3B	F	4	696	0	39031	1	52	
152	4-Oct-03	3B	F	1	627	0	39031	2	42	
153	4-Oct-03	3B	M	1	770		39031	3	62	fork length 1000
154	4-Oct-03	3B	F	2	610	1100	39031	4	42	
155	4-Oct-03	3B	M	3	425		39031	5	32	jack fork length 532
156	6-Oct-03	5	F	1	672	9	39032	1	3M	RG
157	6-Oct-03	5	F	4	673	0	39032	2	52	
158	6-Oct-03	5	F	2	655	0	39032	3	42	
159	6-Oct-03	5	F	4	673	0	39032	4	52	
160	6-Oct-03	5	M	3	525		39032	5	42	
161	6-Oct-03	5	M	3	755		39033	1	52	
162	6-Oct-03	5	F	3	698	0	39033	2	42	
163	6-Oct-03	5	F	3	701	7	39033	3	3M	RG
164	6-Oct-03	6	F	1	628	1	39033	4	42	
165	6-Oct-03	6	F	4	684	0	39033	5	52	
166	6-Oct-03	6	F	3	704	0	39034	1	52	
167	6-Oct-03	6	F	4	695	0	39034	2	52	
168	6-Oct-03	6	F	4	652	0	39034	3	52	
169	6-Oct-03	6	F	3	728	0	39034	4	52	
170	6-Oct-03	6	F	4	698	12	39034	5	42	
171	6-Oct-03	6	F	4	695	8	39035	1	52	
172	6-Oct-03	6	M	3	784		39035	2	52	
173	6-Oct-03	6	F	4	672	4	39035	3	52	
174	6-Oct-03	6	M	4	734		39035	4	52	
175	6-Oct-03	6	F	4	727	0	39035	5	52	
176	6-Oct-03	6	F	4	711	0	39036	1	52	

Carcass					POHL		Scale Samples	Age	
177	6-Oct-03	6	F	4	745	0	39036	2	52
178	6-Oct-03	6	M	4	746		39036	3	42
179	6-Oct-03	6	M	4	713		39036	4	52
180	6-Oct-03	6	F	4	663	0	39036	5	42
181	6-Oct-03	6	F	4	716	0	39037	1	52
182	6-Oct-03	4	F	4	685	0	39037	2	52
183	6-Oct-03	4	M	3	617		39037	3	42
184	6-Oct-03	4	M	1	610		39037	4	42
185	6-Oct-03	4	M	2	747		39037	5	52
186	7-Oct-03	11	M	4	730		39038	1	52
187	7-Oct-03	11	F	4	628	0	39038	2	42
188	7-Oct-03	11	F	4	730	3	39038	3	S2
189	7-Oct-03	11	F	3	562	6	39038	4	52
190	7-Oct-03	11	F	4	666	0	39038	5	42
191	7-Oct-03	11	F	4	669	0	39039	1	52
192	7-Oct-03	11	F	4	615	8	39039	2	S2
193	7-Oct-03	11	F	3	718	0	39039	3	52
194	7-Oct-03	12	F	4	726	2	39039	4	52
195	7-Oct-03	12	M	3	835		39039	5	52
196	7-Oct-03	11	F	4	708	3	39040	1	42
197	7-Oct-03	11	F	4	708	0	39040	2	52
198	7-Oct-03	11	F	4	724	0	39040	3	2M
199	7-Oct-03	11	F	4	732	2	39040	4	52
200	7-Oct-03	11	F	4	705	1	39040	5	52

fork length 1100

RG

Appendix 2. Stuart River Carcass Data

Carcass #	Date	Reach	Sex	Condition	POHL (mm)	# Eggs	Scale Book	Scale Samples Spaces	Age (G-R)	Comments
1	21-Sep-03	1	F	2	760	0	39041	1	52	RS
2	21-Sep-03	2	F	1	755	30	39041	2	S2	
3	21-Sep-03	3	F	1	670	0	39041	3	52	
4	22-Sep-03	3	F	2	750	0	39041	4	S2	RS
5	22-Sep-03	3	F	2	740	0	39041	5	42	
6	22-Sep-03	3	F	2	680	0	39042	1	3M	
7	22-Sep-03	3	M	2	725		39042	2	52	RG
8	22-Sep-03	4	F	2	730	0	39042	3	42	RG
9	22-Sep-03	4	F	2	618	0	39042	4	42	
10	22-Sep-03	4	M	3	730		39042	5	3M	
11	22-Sep-03	4	M	2	740		39043	1	42	
12	22-Sep-03	4	F	2	700	0	39043	2	3M	
13	22-Sep-03	4	M	2	780		39043	3	42	RG
14	22-Sep-03	4	F	2	640	0	39043	4	42	
15	22-Sep-03	4	F	2	610	0	39043	5	52	
16	22-Sep-03	4	M	2	755		39044	1	52	
17	22-Sep-03	4	M	2	500		39044	2	42	Jack
18	22-Sep-03	4	M	2	590		39044	3	42	
19	22-Sep-03	4	M	2	715		39044	4	52	
20	22-Sep-03	4	M	3	690		39044	5	42	
21	22-Sep-03	4	F	2	620	0	39045	1	3M	
22	22-Sep-03	4	F	2	730	0	39045	2	52	RS
23	22-Sep-03	4	F	2	755	54	39045	3	52	RG
24	22-Sep-03	4	M	4	775		39045	4	S2	RG
25	22-Sep-03	4	M	2	760		39045	5	3M	
26	22-Sep-03	4	F	2	690	0	39046	1	52	
27	22-Sep-03	4	M	2	800		39046	2	52	
28	22-Sep-03	4	M	2	710		39046	3	52	
29	22-Sep-03	4	M	2	810		39046	4	52	
30	22-Sep-03	4	M	2	710		39046	5	52	
31	22-Sep-03	4	F	2	740	150	39047	1	n/a	
32	22-Sep-03	4	M	2	725		39047	2	S2	DM
33	22-Sep-03	4	M	2	610		39047	3	52	

Carcass					POHL		Scale Samples	Age		
34	22-Sep-03	4	F	3	690	1000	39047	4	42	RS
35	22-Sep-03	4	F	2	725	1	39047	5	52	
36	23-Sep-03	5	F	2	725	0	39048	1	52	
37	23-Sep-03	5	M	2	800		39048	2	52	
38	23-Sep-03	5	M	3	925		39048	3	52	
39	23-Sep-03	5	M	2	760		39048	4	52	
40	23-Sep-03	5	M	2	860		39048	5	42	
41	23-Sep-03	5	M	2	890		39049	1	n/a	RG
42	23-Sep-03	5	M	2	840		39049	2	n/a	RG
43	23-Sep-03	5	M	2	800		39049	3	n/a	UD
44	23-Sep-03	6	M	2	610		39049	4	n/a	no tag; MF
45	23-Sep-03	6	F	4	800	0	39049	5	52	
46	23-Sep-03	6	M	3	830		39050	1	52	dorsal fin eaten off
							39050	2		Partly Eaten, *Anal Fin
47	23-Sep-03	6	M	3	760				52	Sample
48	23-Sep-03	6	M	3	790		39050	3	52	
49	23-Sep-03	6	M	3	630		39050	4	52	
50	23-Sep-03	6	M	3	820		39050	5	52	
51	23-Sep-03	6	M	3	830		39052	1	52	RG
52	23-Sep-03	6	F	3	720	4	39052	2	42	
53	23-Sep-03	6	M	3	620		39052	3	n/a	
54	23-Sep-03	6	M	3	800		39052	4	2M	
55	23-Sep-03	6	M	2	820		39052	5	52	RS
56	23-Sep-03	6	F	3	760	0	39053	1	52	
57	23-Sep-03	6	M	3	780		39053	2	52	
58	23-Sep-03	6	F	3	570	874	39053	3	52	Full of eggs; RG
59	23-Sep-03	6	F	3	680	0	39053	4	52	RG
60	23-Sep-03	6	M	3	900		39053	5	52	
61	23-Sep-03	6	M	3	730		39051	1	2M	
62	23-Sep-03	6	M	3	740		39051	2	52	
63	23-Sep-03	6	M	3	790		39051	3	42	
64	23-Sep-03	6	F	3	740	0	39051	4	S2	
65	23-Sep-03	6	M	3	750		39051	5	52	
66	24-Sep-03	1	M	3	800		39054	1	52	
67	24-Sep-03	2	F	3	690	0	39054	2	52	
68	24-Sep-03	2	F	3	790	0	39054	3	52	

Carcass					POHL		Scale Samples	Age		
69	24-Sep-03	2	M	3	800		39054	4	52	
70	24-Sep-03	2	F	3	770	10	39054	5	52	
71	24-Sep-03	2	M	3	850		39055	1	52	
72	24-Sep-03	2	F	2	760	0	39055	2	42	
73	24-Sep-03	3	F	2	760	0	39055	3	2M	RG
74	24-Sep-03	3	F	2	600	0	39055	4	42	
75	24-Sep-03	3	F	2	700	0	39055	5	42	
76	24-Sep-03	3	M	3	770		39056	1	n/a	RG
77	24-Sep-03	3	F	2	660	0	39056	2	n/a	RG
78	24-Sep-03	3	M	3	810		39056	3	42	
79	24-Sep-03	3	M	3	800		39056	4	n/a	RG
80	24-Sep-03	3	F	3	700	50	39056	5	3M	undeveloped eggs; RG
81	24-Sep-03	3	M	3	760		39057	1	52	
82	24-Sep-03	3	M	3	760		39057	2	42	
83	24-Sep-03	3	M	3	790		39057	3	2M	RG
84	24-Sep-03	4	M	3	780		39057	4	52	
85	24-Sep-03	4	M	3	770		39057	5	52	
86	24-Sep-03	4	F	2	750	1	39058	1	52	
87	24-Sep-03	4	F	2	770	1	39058	2	52	
88	24-Sep-03	4	M	2	720		39058	3	52	
89	24-Sep-03	4	M	2	780		39058	4	52	
90	24-Sep-03	4	F	3	760	0	39058	5	52	
91	24-Sep-03	4	F	2	765	15	39059	1	52	RS
92	24-Sep-03	4	F	2	740	0	39059	2	42	
93	24-Sep-03	4	F	3	775	0	39059	3	42	
94	24-Sep-03	4	F	3	720	8	39059	4	S2	
95	24-Sep-03	4	F	2	760	0	39059	5	52	
96	24-Sep-03	4	F	2	720	0	39060	1	42	RS
97	24-Sep-03	4	M	2	830		39060	2	S2	Tag ripped out; RG
98	24-Sep-03	4	M	2	820		39060	3	2M	RS
99	24-Sep-03	4	F	3	780	10	39060	4	S2	RG
100	24-Sep-03	4	F	3	790	20	39060	5	n/a	
101	24-Sep-03	4	M	3	810		39061	1	2M	UD
102	24-Sep-03	4	M	3	790		39061	2	3M	UD
103	24-Sep-03	4	F	2	760	6	39061	3	n/a	RG
104	24-Sep-03	4	F	2	700	0	39061	4	42	RG

Carcass					POHL		Scale Samples	Age		
105	24-Sep-03	4	F	3	670	12	39061	5	n/a	
106	24-Sep-03	4	M	3	590		39062	1	2M	RG
107	24-Sep-03	4	F	3	770	0	39062	2	52	W
108	25-Sep-03	4	F	3	770	0	39062	3	42	
109	25-Sep-03	4	M	3	800		39062	4	2M	Scales taken one side
110	25-Sep-03	4	M	3	670		39062	5	42	
111	25-Sep-03	4	F	3	670	0	39063	1	52	
112	25-Sep-03	4	M	3	550		39063	2	52	
113	25-Sep-03	4	M	3	780		39063	3	42	RS
114	25-Sep-03	4	F	2	780	0	39063	4	52	
115	25-Sep-03	4	M	2	740		39063	5	S2	
116	25-Sep-03	4	M	2	810		39064	1	52	
117	25-Sep-03	4	F	2	740	0	39064	2	42	RG
118	25-Sep-03	4	F	3	720	0	39064	3	52	
119	25-Sep-03	4	M	3	740		39064	4	2M	Tag ripped out
120	25-Sep-03	4	M	3	820		39064	5	52	
121	25-Sep-03	4	F	2	690	0	39065	1	52	
122	25-Sep-03	4	M	3	780		39065	2	52	
123	25-Sep-03	4	F	3	730	6	39065	3	52	
124	25-Sep-03	4	F	3	740	0	39065	4	52	
125	25-Sep-03	4	M	3	790		39065	5	42	
126	25-Sep-03	4	F	3	750	6	39066	1	n/a	RG
127	25-Sep-03	4	F	2	740	30	39066	2	S2	RS
128	25-Sep-03	4	F	3	730	30	39066	3	42	
129	25-Sep-03	4	M	3	790		39066	4	42	RS
130	25-Sep-03	4	F	2	760	40	39066	5	S2	
131	25-Sep-03	4	M	3	780		39067	1	42	
132	25-Sep-03	4	M	3	810		39067	2	52	
133	25-Sep-03	4	M	3	780		39067	3	52	
134	25-Sep-03	4	M	1	880		39067	4	52	
135	25-Sep-03	4	M	3	810		39067	5	52	
136	25-Sep-03	4	F	3	720	12	39068	1	52	
137	25-Sep-03	4	F	2	750	0	39068	2	52	
138	25-Sep-03	4	M	3	720		39068	3	52	
139	25-Sep-03	4	M	3	890		39068	4	42	
140	25-Sep-03	4	F	2	760	0	39068	5	52	

Carcass					POHL		Scale Samples	Age		
141	25-Sep-03	4	M	3	580		39069	1	52	
142	25-Sep-03	4	F	2	760	12	39069	2	S2	RS
143	25-Sep-03	4	F	2	780	6	39069	3	42	
144	25-Sep-03	4	F	3	740	25	39069	4	42	
145	25-Sep-03	4	M	3	760		39069	5	42	
146	25-Sep-03	4	M	3	740		39070	1	52	
147	25-Sep-03	4	F	3	750	0	39070	2	52	
148	25-Sep-03	4	M	2	660		39070	3	42	
149	25-Sep-03	4	F	2	760	0	39070	4	52	
150	25-Sep-03	4	M	3	760		39070	5	52	
151	25-Sep-03	4	M	3	860		39071	1	52	
152	25-Sep-03	4	M	3	820		39071	2	52	
153	25-Sep-03	4	M	3	810		39071	3	52	
154	25-Sep-03	4	M	3	870		39071	4	52	
155	25-Sep-03	4	F	4	710	0	39071	5	52	
156	25-Sep-03	4	F	3	620	20	39072	1	42	
157	25-Sep-03	4	M	3	780		39072	2	42	
158	25-Sep-03	4	M	3	790		39072	3	42	
159	25-Sep-03	4	M	4	850		39072	4	52	
160	25-Sep-03	4	M	3	790		39072	5	52	
161	25-Sep-03	4	M	3	830		39073	1	52	
162	25-Sep-03	4	M	3	840		39073	2	52	
163	25-Sep-03	4	M	3	820		39073	3	52	
164	25-Sep-03	4	M	3	790		39073	4	S2	
165	25-Sep-03	4	F	3	740	2	39073	5	52	RS
166	25-Sep-03	4	M	2	800		39074	1	52	
167	25-Sep-03	4	M	3	790		39074	2	52	
168	25-Sep-03	4	F	2	770	0	39074	3	52	
169	25-Sep-03	4	M	2	830		39074	4	42	
170	26-Sep-03	5	F	3	810	0	39074	5	S2	RS
171	26-Sep-03	5	M	3	790		39075	1	52	
172	26-Sep-03	5	M	3	800		39075	2	42	
173	26-Sep-03	5	M	3	740		39075	3	S2	RS
174	26-Sep-03	5	M	3	750		39075	4	52	
175	26-Sep-03	5	M	3	770		39075	5	52	
176	26-Sep-03	5	F	3	720	2	39076	1	42	

Carcass					POHL		Scale Samples	Age		
177	26-Sep-03	5	M	3	820		39076	2	52	
178	26-Sep-03	5	F	3	580	0	39076	3	3M	
179	26-Sep-03	5	M	3	800		39076	4	42	
180	26-Sep-03	5	M	3	760		39076	5	42	RG
181	26-Sep-03	5	F	3	730	30	39077	1	42	
182	26-Sep-03	5	M	3	660		39077	2	42	
183	26-Sep-03	5	M	3	790		39077	3	52	
184	26-Sep-03	5	M	3	820		39077	4	42	
185	26-Sep-03	5	M	3	840		39077	5	52	
186	26-Sep-03	5	F	3	710	0	39078	1	52	
187	26-Sep-03	5	M	3	760		39078	2	52	
188	26-Sep-03	5	M	3	840		39078	3	52	
189	26-Sep-03	5	M	3	760		39078	4	52	
190	26-Sep-03	5	M	3	760		39078	5	42	
191	26-Sep-03	5	M	3	830		39079	1	52	
192	27-Sep-03	6	F	3	760	0	39079	2	52	
193	27-Sep-03	6	F	3	720	0	39079	3	52	
194	27-Sep-03	6	F	3	800	0	39079	4	42	
195	27-Sep-03	6	M	3	650		39079	5	52	
196	27-Sep-03	6	M	3	740		39080	1	42	
197	27-Sep-03	6	M	3	760		39080	2	52	
198	27-Sep-03	6	M	3	770		39080	3	52	
199	27-Sep-03	6	M	3	810		39080	4	52	
200	27-Sep-03	6	F	2	680	0	39080	5	42	
201	27-Sep-03	6	M	3	610		39081	1	42	
202	27-Sep-03	6	M	3	800		39081	2	52	
203	27-Sep-03	6	M	3	590		39081	3	42	
204	27-Sep-03	6	F	3	620	0	39081	4	42	
205	27-Sep-03	6	F	3	720	0	39081	5	52	
206	27-Sep-03	6	M	2	790		39082	1	52	
207	27-Sep-03	6	F	2	720	0	39082	2	52	
208	27-Sep-03	6	M	3	820		39082	3	52	
209	27-Sep-03	6	M	3	810		39082	4	52	
210	27-Sep-03	6	F	3	760	0	39082	5	52	
211	27-Sep-03	6	M	3	740		39083	1	52	
212	27-Sep-03	6	F	3	750	0	39083	2	42	

Carcass					POHL		Scale Samples	Age		
213	27-Sep-03	6	M	3	800		39083	3	52	
214	27-Sep-03	6	F	3	780	0	39083	4	52	
215	27-Sep-03	6	M	3	780		39083	5	52	
216	27-Sep-03	6	F	3	850	1150	39084	1	S2	
217	27-Sep-03	6	F	3	710	150	39084	2	52	RS
218	27-Sep-03	6	F	3	550	0	39084	3	42	
219	27-Sep-03	6	M	3	500		39084	4	42	Jack
220	27-Sep-03	6	M	3	620		39084	5	42	
221	27-Sep-03	6	F	3	580	10	39085	1	2M	RG
222	27-Sep-03	6	M	3	580		39085	2	52	
223	27-Sep-03	6	M	3	770		39085	3	52	
224	27-Sep-03	6	M	3	810		39085	4	52	
225	27-Sep-03	6	M	2	770		39085	5	42	
226	27-Sep-03	6	M	3	770		39086	1	52	
227	27-Sep-03	6	F	3	770	0	39086	2	52	
228	27-Sep-03	6	F	2	590	0	39086	3	42	
229	27-Sep-03	6	F	3	670	0	39086	4	42	
230	27-Sep-03	6	M	2	580		39086	5	42	
231	27-Sep-03	6	F	2	610	1	39087	1	42	
232	27-Sep-03	6	M	1	730		39087	2	42	
233	27-Sep-03	6	F	1	660	1	39087	3	42	
234	27-Sep-03	6	F	3	770	4	39087	4	52	
235	27-Sep-03	6	F	3	600	5	39087	5	52	
236	27-Sep-03	6	M	3	750		39088	1	42	
237	27-Sep-03	6	M	3	830		39088	2	2M	
238	27-Sep-03	6	M	3	710		39088	3	42	RG
239	28-Sep-03	1	F	3	740	0	39088	4	2M	
240	28-Sep-03	1	F	2	640	1	39088	5	42	RG
241	28-Sep-03	1	F	2	720	15	39089	1	52	
242	28-Sep-03	1	M	3	730		39089	2	3M	RG
243	28-Sep-03	1	M	3	810		39089	3	3M	RG
244	28-Sep-03	1	M	3	820		39089	4	42	
245	28-Sep-03	1	F	3	740	0	39089	5	n/a	UD
246	28-Sep-03	1	F	3	620	0	39090	1	52	
247	28-Sep-03	1	M	3	790		39090	2	42	
248	28-Sep-03	1	M	3	740		39090	3	42	

Carcass					POHL		Scale Samples	Age
249	28-Sep-03	2	M	3	820		39090 4	52
250	28-Sep-03	2	F	3	720	0	39090 5	42