NECHAKO RIVER
CHINOOK CARCASS RECOVERY
2008

NECHAKO FISHERIES CONSERVATION PROGRAM
Data Report No. M08-2

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ABSTRACT

In 2008 adult Chinook salmon (*Oncorhynchus tshawytscha*) carcasses were recovered from the Nechako River 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 16th and October 2nd. Nechako River Chinook carcasses recovered in 2008 exhibited mostly similar biological characteristics to those collected from 1988 to 2007. Values for the female to male ratio of the sample and the mean post-orbital hypural length for both males and females fell within the ranges observed in previous years. The spawning population was almost exclusively comprised of individuals with a stream-type life history and dominated by the 4_2 age-class, whereas in most years the 5_2 age-class is dominant.

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 a carcass recovery project on the Nechako River each year. The purpose of this project 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 project.

In the past, the information collected from the Nechako River has been 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. As no obvious trends or anomalies were identified over the initial 18 years of the study history (1988-2005), it was decided by the NFCP Technical Committee that the continuation of the annual Stuart River component was not necessary. The annual Stuart River study component may be restarted in the future if deemed necessary.

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 Nechako River target sample size is 200 fish.

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 survey was 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 skeined eggs.
- **scales:** 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. Fish age was later determined by analysis of the scales, 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 River in 2008 are presented in Appendix 1. Summaries of this data are provided in the respective sections below.

Between September 16th and October 2nd a total of 200[1] carcasses were sampled from 6 of the 16 identified Sections representing all 3 river areas – upper, middle and lower river (Table 1). The observed sex ratio was 1.50 F/M, or 58% females and 42% males (n=200). No Chinook jacks were collected. Of the carcasses sampled, 65% were fresh or only a few days old while all but one of the remaining samples were in poor condition with some fungus (Table 2).

The length (POHL) of the fish sampled ranged from 518 to 805 mm, with a mean of 656 mm (n=80, SD=59) for males, 637 mm (n=120, SD=39) for females and 645 mm (n=200, SD=49) for all fish combined. For males, the majority of individuals sampled were between 551-750 mm in length while the majority of females were between 551-700 mm in length (Figure 3).

Of the total number of female carcasses sampled (n=120), one was found to be a pre-spawn mortality, with undeveloped skeins. In addition, one sample found to be partially spawned, as determined by a retention value of between 1000 and 4999 eggs, with a retention estimate of 1645 eggs. Meanwhile, 118 (>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 17 eggs (n=118, SD=97, range 0–804). When including datum from the partially spawned sample, mean egg retention increased to 31 eggs (n=119, SD=178, range 0–1645).

Scale 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 177 of those samples (Table 3). The results indicate that the majority of the fish sampled were of two age-classes, 5_2 (6%) and 4_2 (87%), with an anomalously high proportion of 4_2 fish when compared to historic data. A chi-square test was used to determine that the numbers of males and females

[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.

in these age-classes were not significantly disproportionate to the sex ratio of the sample ($p=0.11$).

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

DISCUSSION - COMPARISON TO PREVIOUS YEARS

A comparison of 2008 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 M07-2). 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 1.50 F/M was within the existing range (1.10-2.28) observed from 1988-2007 (Figure 7), and slightly lower than the mean of 1.61 (n=20, SD=0.31), as indicated by 95% confidence limit of 1.47-1.74.

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 2008 fell within the ranges observed in previous years (Figures 5 and 6).

The average fecundity of Nechako River female Chinook is estimated at 6563 eggs per fish (Table 4) based on egg retention estimates of unspawned females collected since 1978. 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 5). The 2008 mean is among the lowest values when compared to historic data but the confidence limits fit within the bounds of all years' results (Figure 7).

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, with the 4_2 age-class component being anomalously high when compared to the existing data set. In 2008, age-classes 4_2 and 5_2 accounted for 93% of the return (n=177), with all stream-type fish accounting for 94% of the sample (Table 6).

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 7 to facilitate the discussion in the Nechako River Chinook Enumeration report (NFCP M08-1).

ACKNOWLEDGMENTS

Len Seefried managed the delivery of the projects for DFO, on behalf of the NFCP Technical Committee.

Nechako River carcass recovery was conducted by Avison Management Service, Ltd.

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

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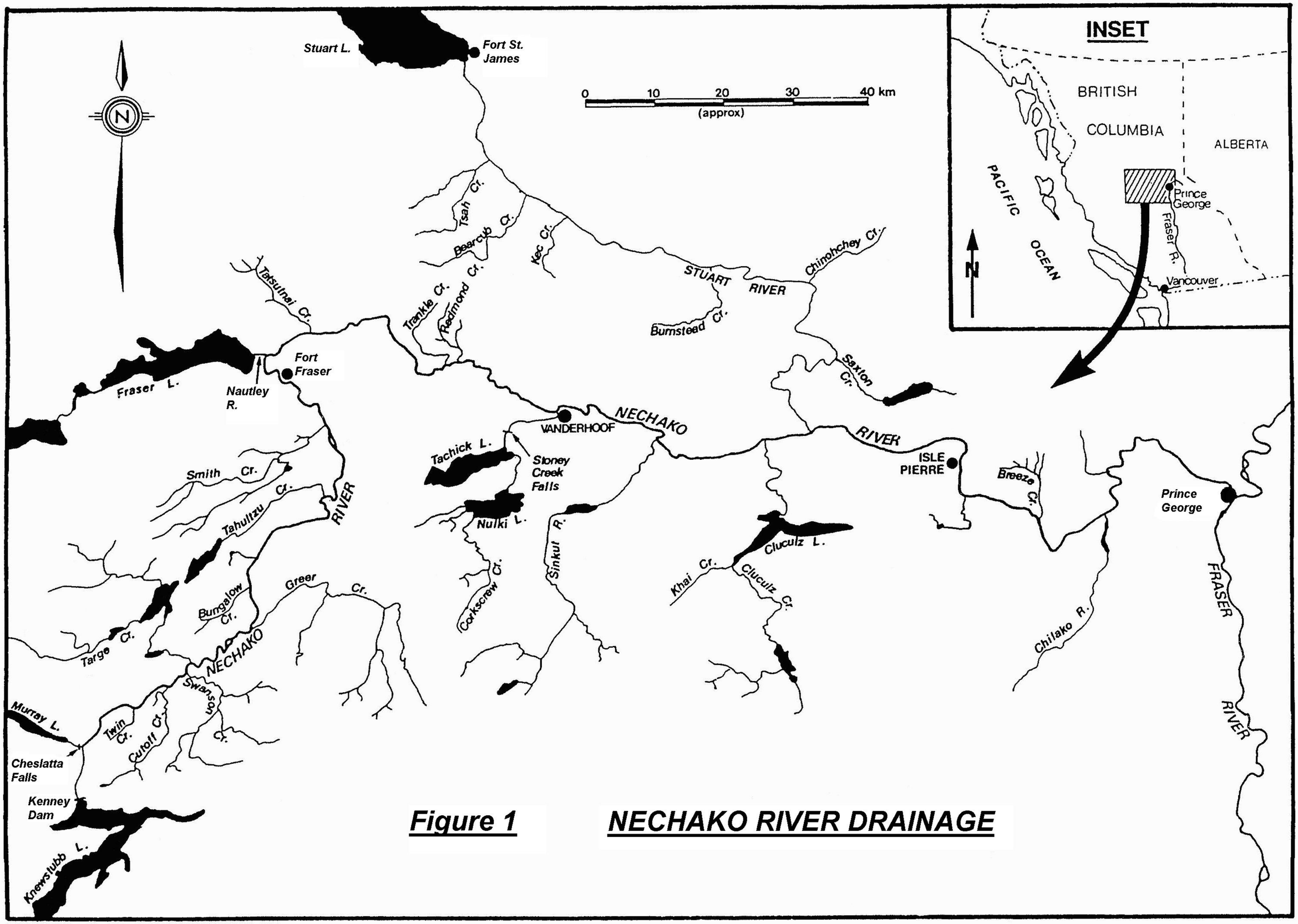

Figure 1 **NECHAKO RIVER DRAINAGE**

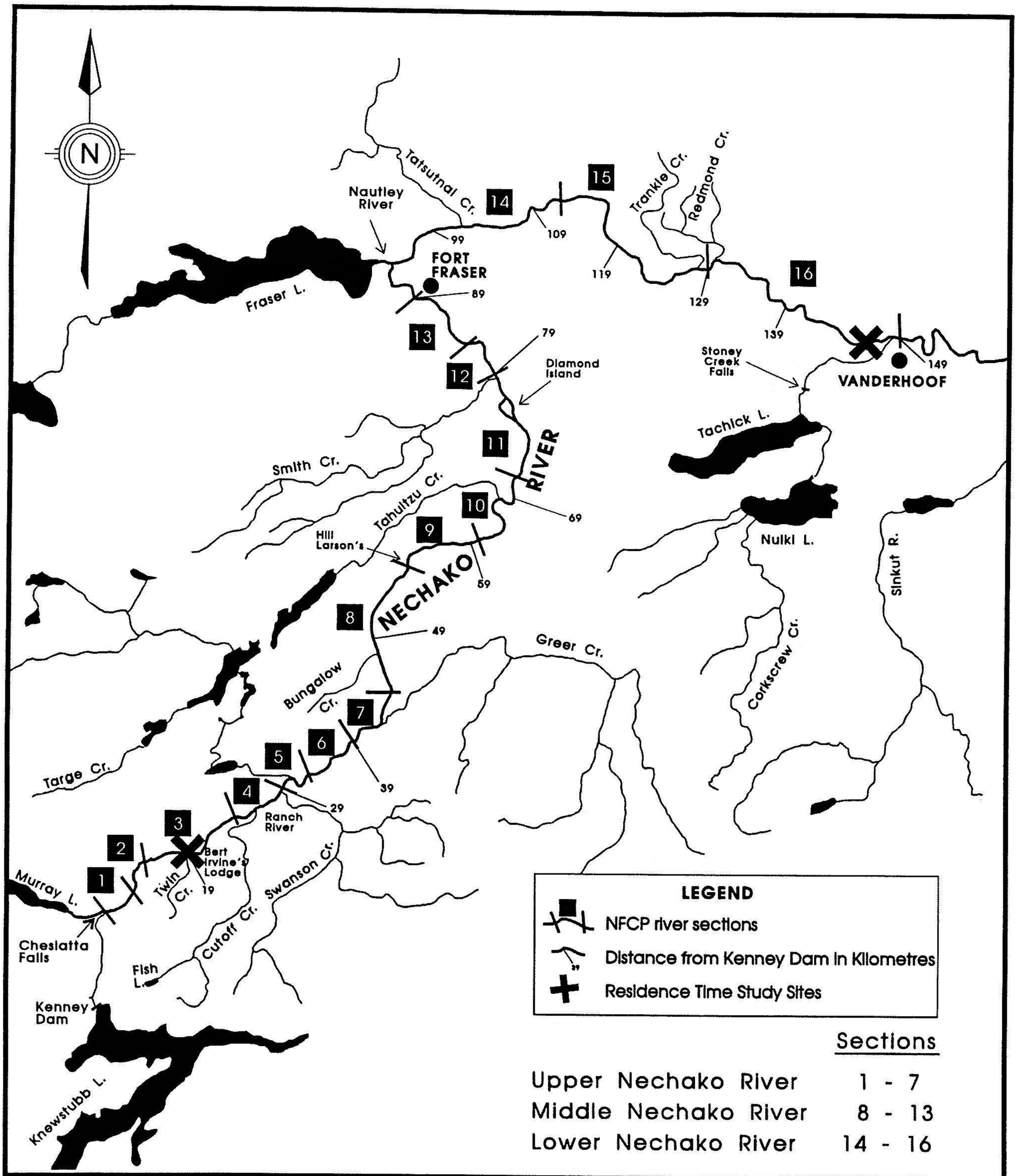

FIGURE 2. NECHAKO RIVER CHINOOK SPAWNING STUDY AREA

Figure 3
Nechako River Chinook Length Frequency Distribution, 2008

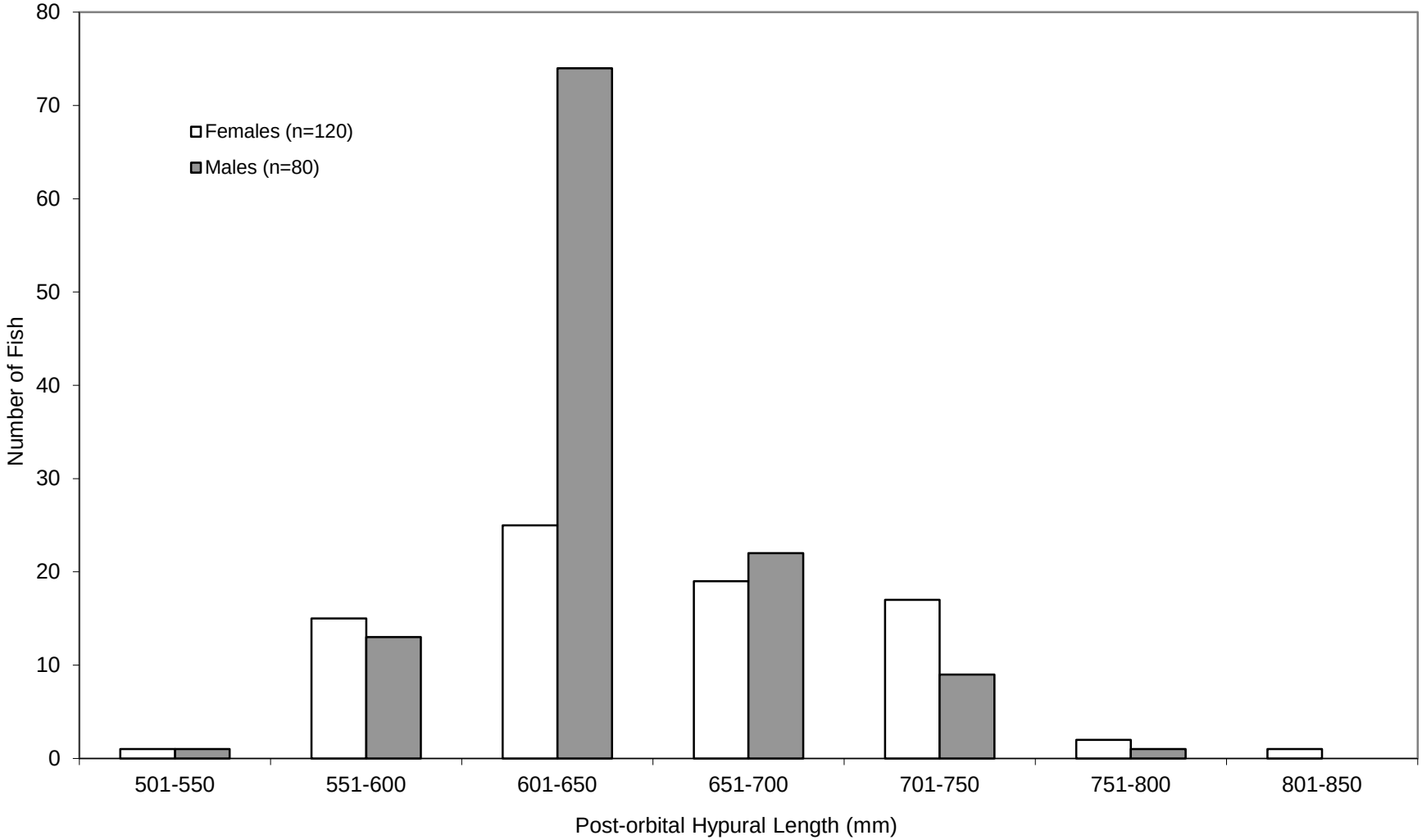

Figure 4
Nechako River Chinook Sex Ratio, 1988-2008

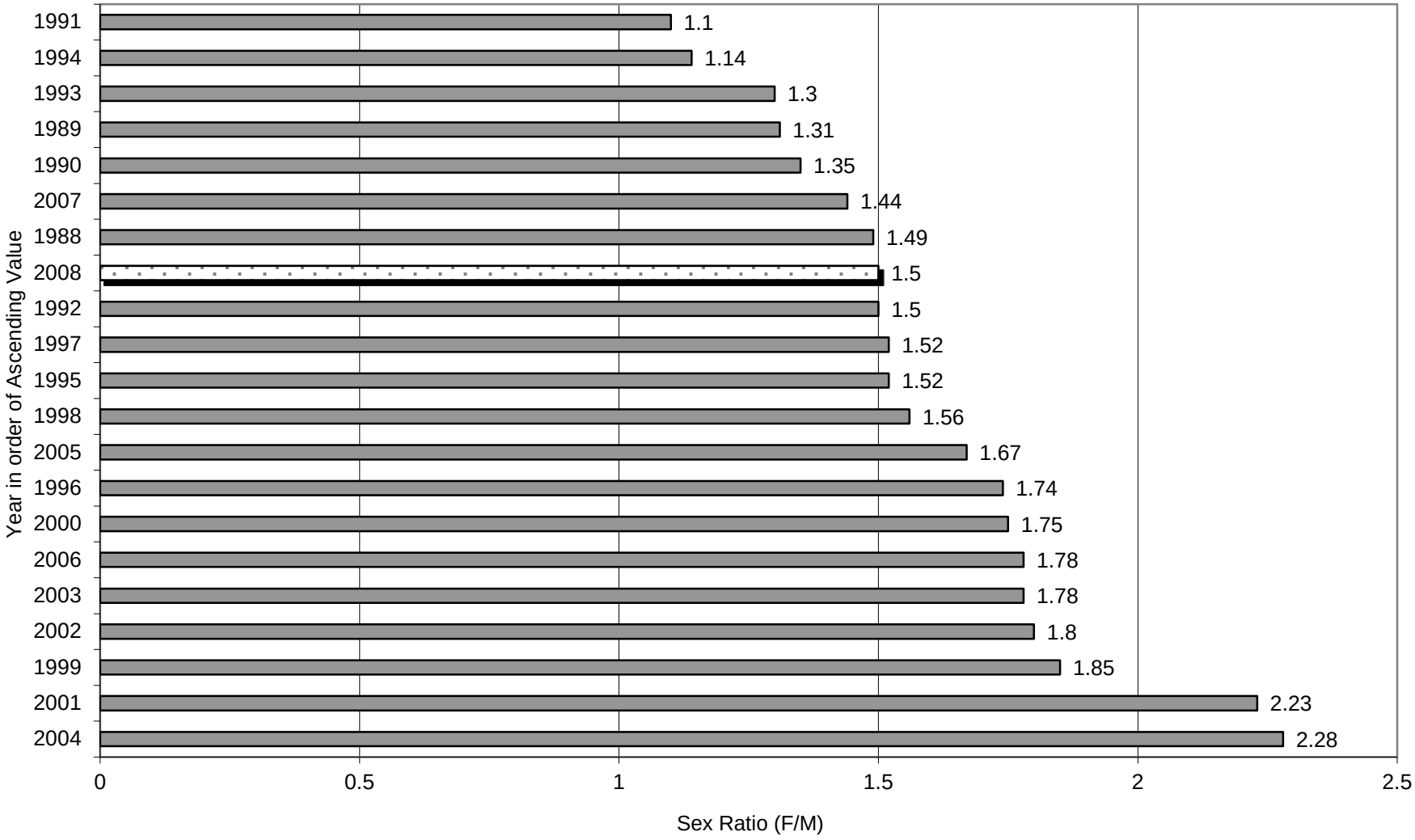

Figure 5
Nechako River Chinook Male Mean Length, 1988-2008

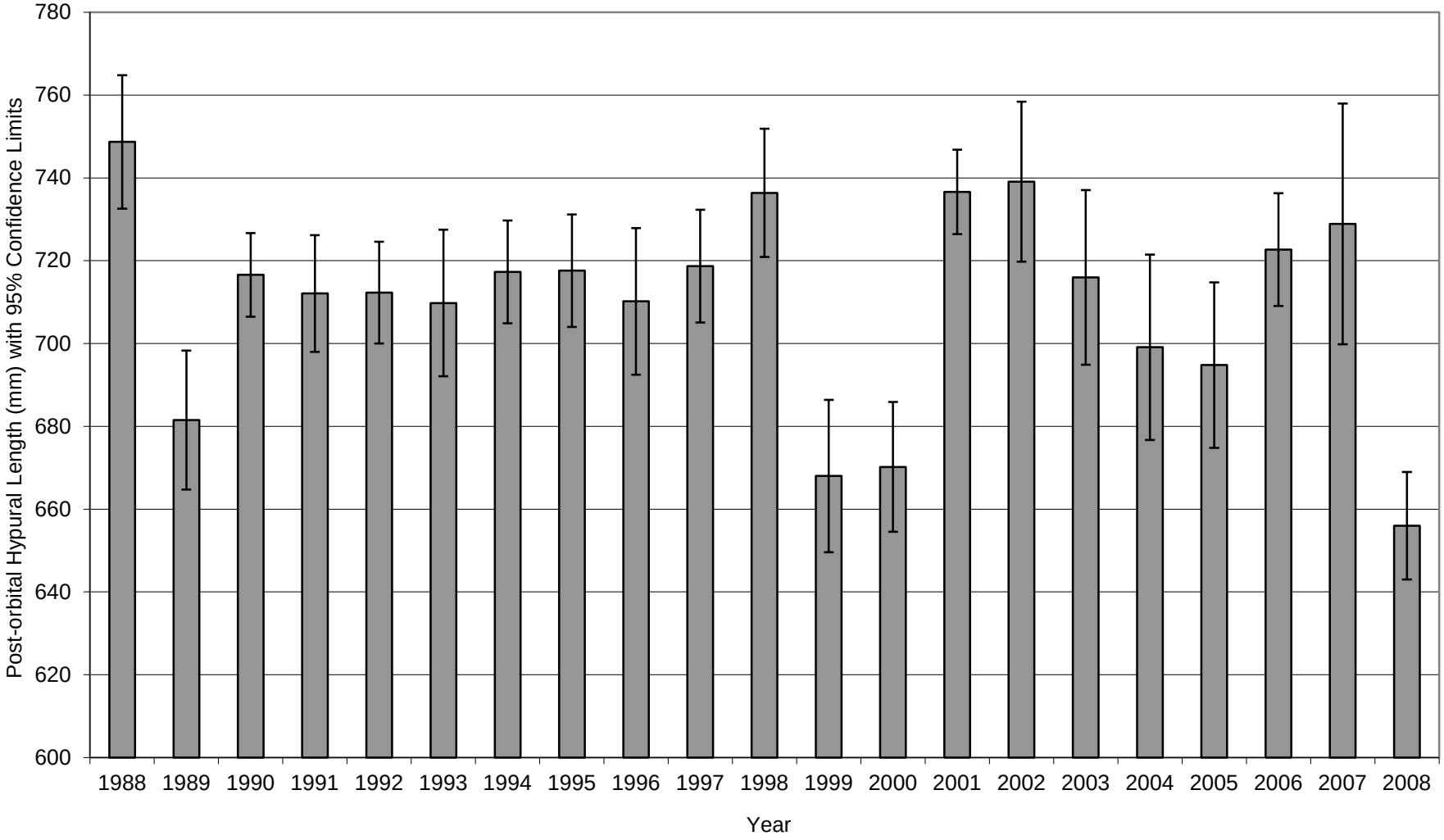

Figure 6
Nechako River Chinook Female Mean Length, 1988-2008

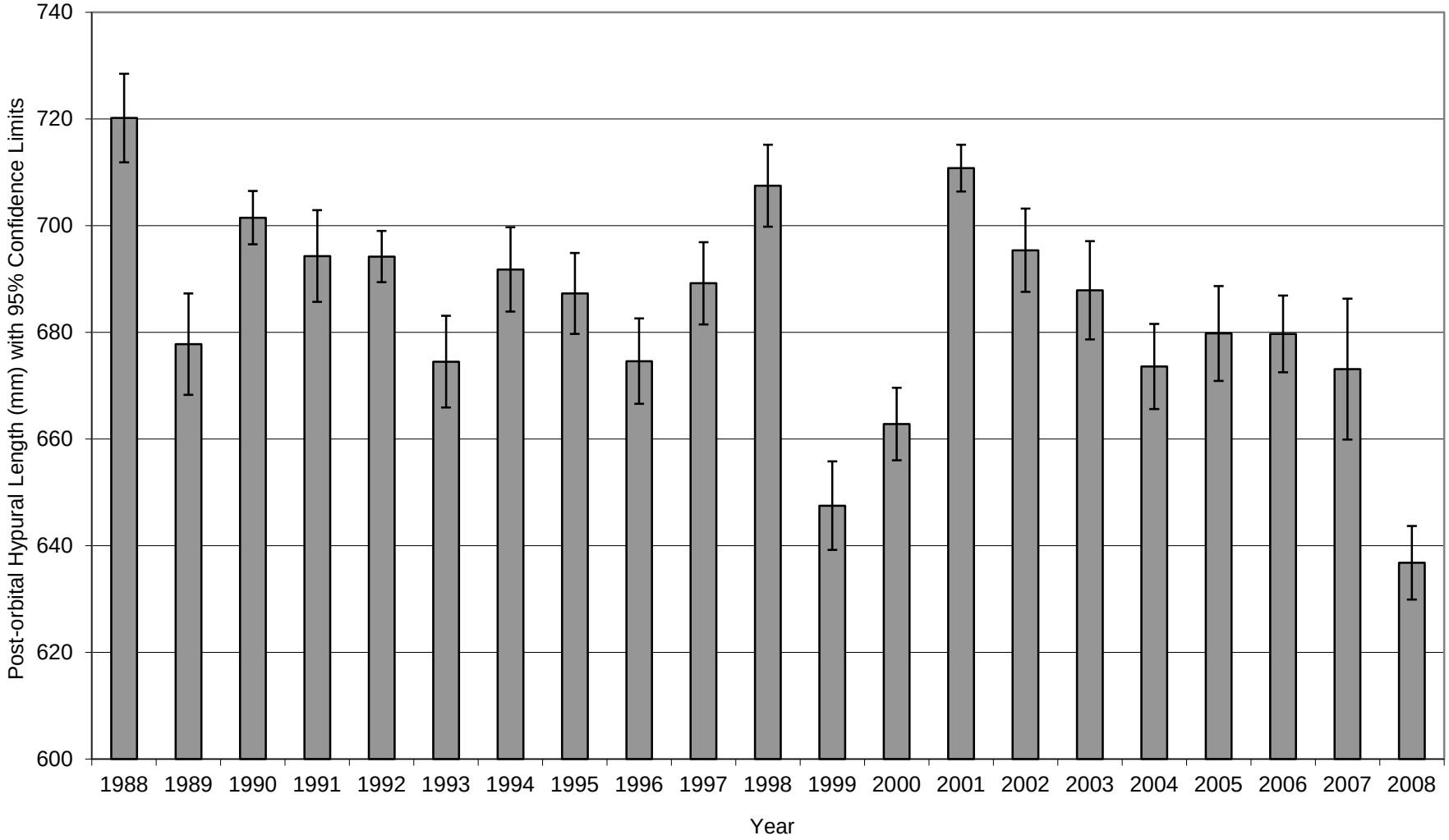

Figure 7
Nechako River Chinook Mean Egg retention, 1988-2008

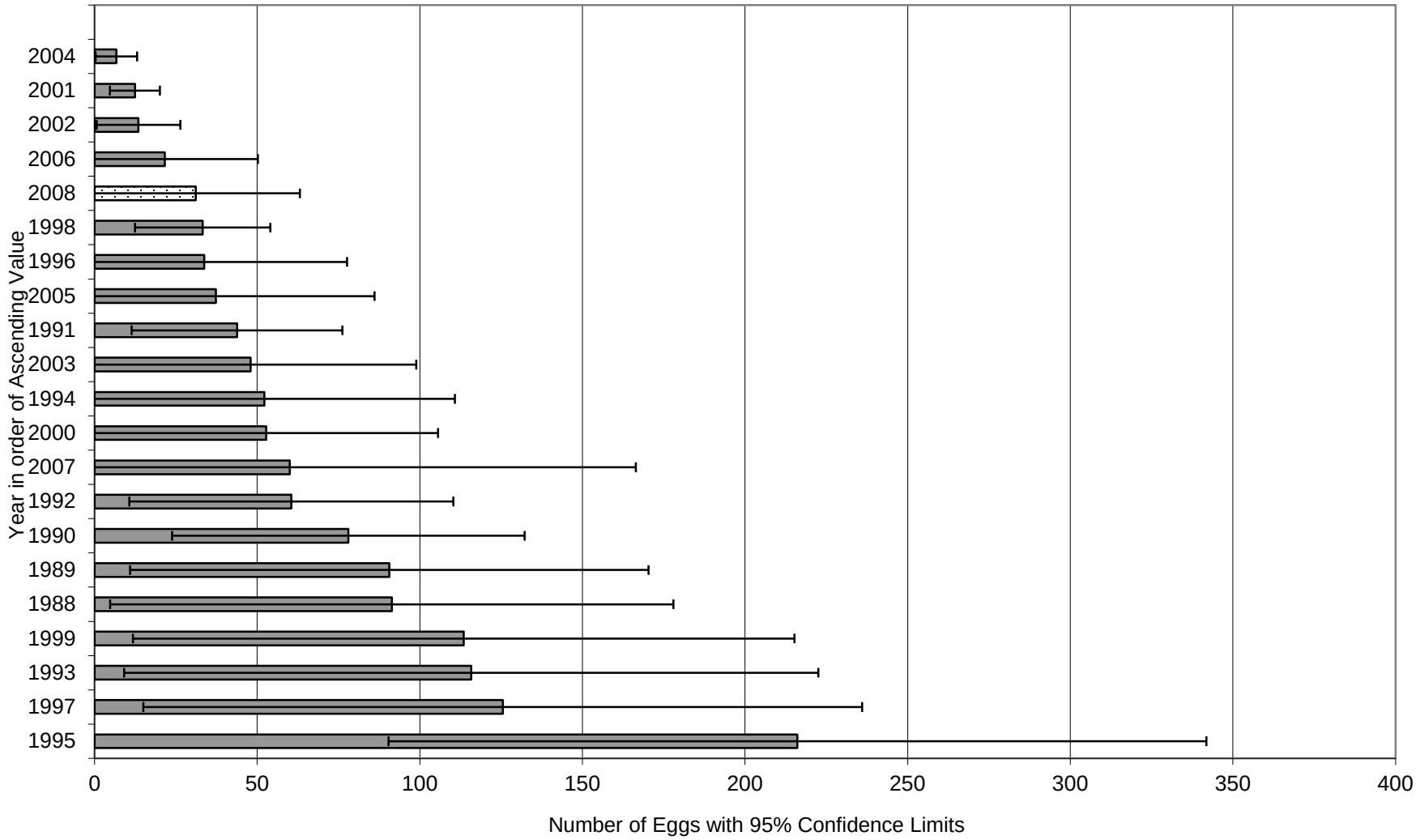

Table 1
Nechako River Chinook Carcass Recovery by Section, 2008

Section	Number	Percent
UPPER NECHAKO		
Section 1	0	0.0
Section 2	0	0.0
Section 3	52	26.0
Section 4	50	25.0
Section 5	4	2.0
Section 6	0	0.0
Section 7	0	0.0
SUB-TOTAL	106	53.0
MIDDLE NECHAKO		
Section 8	0	0.0
Section 9	0	0.0
Section 10	0	0.0
Section 11	19	9.5
Section 12	39	19.5
Section 13	0	0.0
SUB-TOTAL	58	29.0
LOWER NECHAKO		
Section 14	0	0.0
Section 15	0	0.0
Section 16	36	18.0
SUB-TOTAL	36	18.0
TOTAL RIVER	200	100.0

Table 2
Nechako River Chinook Carcass Condition, 2008

Condition *	Number	Percent
1	23	11.5
2	107	53.5
3	69	34.5
4	1	0.5
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, 2008

	4-1	4-2	5-2	6-2	Total # Aged
Males	8.1	81.1	9.5	0.0	74
Females	2.9	91.3	3.9	1.9	103

Table 4
Nechako River Chinook Fecundity, 1978-2008

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 5
Nechako River Chinook Egg Retention, 1988-2008

	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
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
2004	139	0-417	6.7	0	n/a	6.7
2005	123	0-584	13.2	1	3000	37.3
2006	127	0-450	7.5	1	1803	21.6
2007	57	0-175	5.8	1	3150	60
2008	118	0-804	17.4	1	1645	31.1

Table 6
Percent Contribution of Stream-type Life Histories
to Nechako Chinook Escapements, 1988-2008

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
2004	98	100	169
2005	95	100	170
2006	95	96	184
2007	79	96	70
2008	93	94	177

Table 7
Percent Contribution of Age-at-Return Groupings
to Nechako Chinook Escapements, 1988-2008

	% 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
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
2004	0.6	37.3	60.9	1.2	0.0	169
2005	0.6	27.1	67.6	4.7	0.0	170
2006	0.0	19.6	79.3	1.1	0.0	184
2007	1.4	14.3	68.6	12.9	2.9	70
2008	0.6	92.1	6.2	1.1	0.0	177

Appendix 1 Nechako Carcass Data

Fish #	Date	Reach	Sex	Condition	POHL (mm)	# Eggs Retained	Fish Sample	Age (Gilbert-Rich)	Comments
1	9/16/2008	3.1	M	2	702	N/A	79271 1	42	
2	9/16/2008	3.1	M	2	665	N/A	79271 2	42	
3	9/16/2008	3.2	M	3	662	N/A	79271 3	42	
4	9/16/2008	4	F	2	647	1	79271 4	42	
5	9/16/2008	4	F	1	705	167	79271 5	62	possible clip; high widow's peak
6	9/16/2008	4	M	3	594	N/A	79272 1	42	
7	9/18/2008	11	F	2	636	7	79272 2	42	
8	9/18/2008	11	M	2	608	N/A	79272 3	42	
9	9/18/2008	11	F	2	600	4	79272 4	42	
10	9/18/2008	11	M	2	689	N/A	79272 5	42	
11	9/18/2008	12	M	1	794	N/A	79273 1	52	
12	9/18/2008	12	F	2	733	1	79273 2	3M	
13	9/18/2008	12	F	2	602	10	79273 3	42	
14	9/18/2008	12	F	2	653	10	79273 4	42	
15	9/18/2008	12	F	3	631	fully skeined	79273 5	RG	pre-mort; fully skeined tight
16	9/19/2008	16	M	2	638	N/A	79274 1	42	
17	9/19/2008	16	F	1	575	0	79274 2	42	
18	9/19/2008	16	F	2	518	1	79274 3	2M	
19	9/19/2008	16	F	1	630	1	79274 4	42	
20	9/19/2008	16	F	3	607	1	79274 5	42	insides decomposed
21	9/19/2008	16	F	2	621	2	79275 1	42	
22	9/19/2008	16	M	2	650	N/A	79275 2	42	
23	9/19/2008	16	M	2	662	N/A	79275 3	42	
24	9/19/2008	16	M	2	646	N/A	79275 4	42	
25	9/19/2008	16	M	2	679	N/A	79275 5	42	
26	9/19/2008	16	F	2	677	2	79276 1	42	
27	9/19/2008	16	M	3	656	N/A	79276 2	42	
28	9/19/2008	16	F	2	655	1	79276 3	42	
29	9/19/2008	16	F	1	623	0	79276 4	42	
30	9/19/2008	16	F	3	605	0	79276 5	42	insides decomposed
31	9/19/2008	16	F	3	596	1	79277 1	2M	
32	9/19/2008	16	F	2	682	5	79277 2	2M	
33	9/19/2008	16	F	2	570	0	79277 3	42	
34	9/19/2008	16	F	2	599	0	79277 4	42	
35	9/19/2008	16	F	3	601	2	79277 5	42	

1	9/16/2008	3.1	M	2	702	N/A	79271	1	42	
36	9/20/2008	4	M	2	652	N/A	79278	1	42	
37	9/20/2008	4	M	2	636	N/A	79278	2	42	
38	9/20/2008	4	M	2	621	N/A	79278	3	42	
39	9/20/2008	4	M	2	566	N/A	79278	4	42	
40	9/20/2008	4	F	2	624	0	79278	5	42	
41	9/20/2008	4	F	1	637	392	79279	1	42	
42	9/20/2008	4	F	2	643	0	79279	2	42	
43	9/20/2008	4	F	3	620	0	79279	3	42	insides decomposed
44	9/20/2008	4	F	2	622	0	79279	4	42	
45	9/20/2008	4	M	1	575	N/A	79279	5	42	
46	9/20/2008	4	M	3	805	N/A	79280	1	52	N/F 1020 mm
47	9/20/2008	4	M	3	650	N/A	79280	2	42	
48	9/20/2008	5	M	2	738	N/A	79280	3	41	
49	9/20/2008	5	M	2	726	N/A	79280	4	52	
50	9/20/2008	5	M	2	678	N/A	79280	5	3M	
51	9/20/2008	5	M	2	568	N/A	79281	1	42	
52	9/21/2008	11	F	1	619	0	79281	2	42	
53	9/21/2008	11	F	2	626	0	79281	3	42	
54	9/21/2008	11	F	3	610	5	79281	4	42	
55	9/21/2008	11	F	2	615	0	79281	5	42	
56	9/21/2008	11	F	2	648	2	79282	1	42	
57	9/21/2008	11	F	2	647	0	79282	2	42	
58	9/21/2008	11	M	3	722	N/A	79282	3	42	
59	9/21/2008	12	F	2	642	1	79282	4	42	
60	9/21/2008	12	M	3	622	N/A	79282	5	42	
61	9/21/2008	12	F	2	652	3	79283	1	42	
62	9/21/2008	12	M	2	644	N/A	79283	2	42	
63	9/21/2008	12	F	2	624	0	79283	3	42	
64	9/21/2008	12	F	2	628	1	79283	4	2M	
65	9/21/2008	12	F	2	611	0	79283	5	42	
66	9/21/2008	12	M	2	675	N/A	79284	1	42	
67	9/21/2008	12	F	2	691	1	79284	2	S2	
68	9/21/2008	12	M	1	541	N/A	79284	3	42	
69	9/21/2008	12	M	2	594	N/A	79284	4	42	
70	9/21/2008	12	M	2	635	N/A	79284	5	42	
71	9/22/2008	16	M	3	749	N/A	79285	1	42	N/F 970 mm
72	9/22/2008	16	M	1	612	N/A	79285	2	42	
73	9/22/2008	16	F	1	605	0	79285	3	42	
74	9/22/2008	16	F	3	625	0	79285	4	42	insides decomposed

1	9/16/2008	3.1	M	2	702	N/A	79271	1	42	
75	9/22/2008	16	F	1	617	0	79285	5	42	
76	9/22/2008	16	F	2	609	0	79286	1	42	
77	9/22/2008	16	M	3	580	N/A	79286	2	42	
78	9/22/2008	16	F	2	662	2	79286	3	42	
79	9/22/2008	16	F	2	612	8	79286	4	42	
80	9/22/2008	16	M	1	584	N/A	79286	5	42	
81	9/22/2008	16	M	2	707	N/A	79287	1	42	
82	9/22/2008	16	F	3	746	0	79287	2	52	insides decomposed
83	9/22/2008	16	M	2	660	N/A	79287	3	42	
84	9/22/2008	16	M	2	643	N/A	79287	4	42	
85	9/22/2008	16	M	2	677	N/A	79287	5	42	
86	9/22/2008	16	F	1	601	6	79288	1	42	
87	9/23/2008	3.1	F	1	622	3	79288	2	42	
88	9/23/2008	3.1	F	2	589	0	79288	3	42	
89	9/23/2008	3.1	F	2	616	14	79288	4	2M	
90	9/23/2008	3.1	F	2	745	5	79288	5	52	
91	9/23/2008	3.1	M	2	695	N/A	79289	1	42	
92	9/23/2008	3.1	F	3	685	0	79289	2	52	insides decomposed
93	9/23/2008	3.1	F	3	673	3	79289	3	42	
94	9/23/2008	3.1	M	2	670	N/A	79289	4	42	
95	9/23/2008	3.1	F	2	696	1645	79289	5	3M	volumetric count; partial spawn
96	9/23/2008	3.1	F	2	618	0	79290	2	42	
97	9/23/2008	3.1	F	3	713	0	79290	1	41	insides decomposed
98	9/23/2008	3.1	M	2	652	N/A	79290	3	42	
99	9/23/2008	3.1	F	3	730	2	79290	4	42	
100	9/23/2008	3.2	M	2	743	N/A	79290	5	52	
101	9/23/2008	3.2	F	2	631	0	79291	1	42	
102	9/23/2008	3.2	F	3	645	0	79291	2	42	insides decomposed
103	9/23/2008	3.2	M	1	604	N/A	79291	3	42	
104	9/23/2008	3.2	M	3	648	N/A	79291	4	42	
105	9/23/2008	3.2	M	3	722	N/A	79291	5	41	
106	9/23/2008	3.2	M	2	647	N/A	79292	1	42	
107	9/23/2008	3.2	F	2	638	2	79292	2	2M	
108	9/23/2008	3.2	F	3	630	0	79292	3	42	insides decomposed
109	9/23/2008	3.2	M	2	725	N/A	79292	4	41	
110	9/23/2008	3.2	F	2	713	0	79292	5	41	
111	9/25/2008	3.2	F	2	632	6	79293	1	42	
112	9/25/2008	3.2	F	3	594	0	79293	2	42	insides decomposed
113	9/25/2008	3.2	F	2	625	0	79293	3	42	

1	9/16/2008	3.1	M	2	702	N/A	79271	1	42	
114	9/25/2008	3.2	M	3	559	N/A	79293	4	42	
115	9/25/2008	3.2	M	3	591	N/A	79293	5	42	
116	9/25/2008	3.2	F	3	659	0	79294	1	42	insides decomposed
117	9/25/2008	3.2	M	1	740	N/A	79294	2	S1	
118	9/25/2008	3.2	M	2	630	N/A	79294	3	42	
119	9/25/2008	3.2	F	2	635	804	79294	4	RS	
120	9/25/2008	3.2	F	2	623	0	79294	5	42	
121	9/25/2008	3.2	M	2	674	N/A	79295	1	42	
122	9/25/2008	3.2	F	3	616	0	79295	2	42	insides decomposed
123	9/25/2008	3.2	M	4	677	N/A	79295	3	41	
124	9/25/2008	3.2	M	2	582	N/A	79295	4	42	
125	9/25/2008	3.2	F	2	666	0	79295	5	42	
126	9/25/2008	4	M	3	634	N/A	79296	1	42	
127	9/25/2008	4	M	3	744	N/A	79296	2	52	
128	9/25/2008	4	F	3	651	0	79296	3	42	tear in belly; insides decomposed
129	9/25/2008	4	M	2	594	N/A	79296	4	42	
130	9/25/2008	4	M	3	620	N/A	79296	5	31	
131	9/26/2008	4	F	2	597	0	79297	1	42	
132	9/26/2008	4	M	1	579	N/A	79297	2	42	
133	9/26/2008	4	F	2	621	0	79297	3	42	
134	9/26/2008	4	F	3	590	0	79297	4	42	insides decomposed
135	9/26/2008	4	F	2	622	0	79297	5	42	
136	9/26/2008	4	F	2	638	0	79298	1	42	
137	9/26/2008	4	F	2	656	0	79298	2	41	
138	9/26/2008	4	M	3	612	N/A	79298	3	42	
139	9/26/2008	4	M	2	732	N/A	79298	4	41	
140	9/26/2008	4	F	3	602	0	79298	5	42	insides decomposed
141	9/26/2008	4	F	3	640	0	79299	1	42	insides decomposed
142	9/26/2008	4	F	3	641	0	79299	2	2M	insides decomposed
143	9/26/2008	4	F	2	659	0	79299	3	42	
144	9/26/2008	4	M	1	598	N/A	79299	4	42	
145	9/26/2008	4	F	2	725	4	79299	5	52	
146	9/26/2008	4	F	3	658	0	79300	1	42	insides decomposed
147	9/26/2008	4	F	3	650	0	79300	2	42	insides decomposed
148	9/26/2008	4	M	3	614	N/A	79300	3	2M	
149	9/26/2008	4	F	2	636	0	79300	4	42	
150	9/26/2008	4	F	3	630	2	79300	5	2M	
151	9/26/2008	4	F	2	591	0	79341	1	42	
152	9/26/2008	4	F	2	582	0	79341	2	42	

1	9/16/2008	3.1	M	2	702	N/A	79271	1	42	
153	9/26/2008	4	M	2	590	N/A	79341	3	42	
154	9/26/2008	4	M	3	617	N/A	79341	4	42	
155	9/26/2008	4	M	2	749	N/A	79341	5	52	
156	9/26/2008	4	F	2	755	1	79342	1	3M	
157	9/26/2008	4	M	3	600	N/A	79342	2	42	
158	9/26/2008	4	M	2	603	N/A	79342	3	42	
159	9/26/2008	4	M	3	707	N/A	79342	4	42	
160	9/26/2008	4	M	3	672	N/A	79342	5	2M	
161	9/29/2008	12	M	3	696	N/A	79343	1	42	
162	9/29/2008	12	F	2	673	0	79343	2	42	
163	9/29/2008	12	M	3	683	N/A	79343	3	2M	
164	9/29/2008	12	M	2	615	N/A	79343	4	42	
165	9/29/2008	12	F	3	612	0	79343	5	42	insides decomposed
166	9/29/2008	12	M	3	762	N/A	79344	1	52	
167	9/29/2008	12	F	2	639	0	79344	2	42	
168	9/29/2008	12	F	3	626	0	79344	3	42	insides decomposed
169	9/29/2008	12	F	2	639	1	79344	4	42	
170	9/29/2008	12	F	2	615	0	79344	5	42	
171	9/29/2008	12	M	3	606	N/A	79345	1	42	
172	9/29/2008	12	F	2	708	0	79345	2	42	
173	9/29/2008	12	F	3	636	0	79345	3	42	insides decomposed
174	9/29/2008	12	F	3	640	0	79345	4	42	insides decomposed
175	9/29/2008	12	F	3	641	0	79345	5	2M	insides decomposed
176	9/30/2008	11	F	2	672	0	79346	1	42	
177	9/30/2008	11	F	2	634	3	79346	2	42	
178	9/30/2008	11	F	2	647	0	79346	3	42	
179	9/30/2008	11	F	2	651	0	79346	4	42	
180	9/30/2008	11	F	3	662	0	79346	5	42	insides decomposed
181	9/30/2008	11	F	3	674	0	79347	1	62	insides decomposed
182	9/30/2008	11	F	2	614	0	79347	2	42	
183	9/30/2008	11	M	3	721	N/A	79347	3	3M	
184	9/30/2008	12	F	3	614	0	79347	4	42	insides decomposed
185	9/30/2008	12	F	3	633	0	79347	5	2M	insides decomposed
186	9/30/2008	12	F	3	645	0	79348	1	42	
187	9/30/2008	12	F	3	602	0	79348	2	42	
188	9/30/2008	12	F	3	622	0	79348	3	42	
189	9/30/2008	12	F	3	570	0	79348	4	42	
190	9/30/2008	12	F	3	633	0	79348	5	42	
191	10/2/2008	3.2	F	1	615	0	79349	1	42	

1	9/16/2008	3.1	M	2	702	N/A	79271	1	42	
192	10/2/2008	3.2	M	1	606	N/A	79349	2	42	
193	10/2/2008	3.2	F	2	600	562	79349	3	42	
194	10/2/2008	3.2	M	2	714	N/A	79349	4	42	N/F = 955 mm
195	10/2/2008	3.2	F	2	689	2	79349	5	42	
196	10/2/2008	3.2	F	2	624	0	79350	1	42	
197	10/2/2008	3.2	F	3	613	0	79350	2	42	insides decomposed
198	10/2/2008	3.2	F	1	615	0	79350	3	42	
199	10/2/2008	3.2	F	3	623	0	79350	4	2M	insides decomposed
200	10/2/2008	3.2	M	1	744	N/A	79350	5	41	N/F = 955 mm