

**NECHAKO RIVER CHINOOK SPAWNER ENUMERATION
2004-2012 SUMMARY REPORT**

NECHAKO FISHERIES CONSERVATION PROGRAM
Data Report No. M13-2

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ABSTRACT

From 1988 to 2003, adult Chinook salmon (*Oncorhynchus tshawytscha*) were enumerated in both the Nechako and Stuart rivers. The number of Chinook salmon returning to spawn in the Nechako River each year is a key measure of the Conservation Goal identified in the *1987 Settlement Agreement* (Anonymous 1987). The Stuart River portion of this study provided a control Chinook population as Stuart River flows are unaffected by flow regulation. Following 16 years of study, the Stuart portion was discontinued in 2003 as data gathered during the time series failed to show any appreciable deviation in results when compared to the Nechako River data. Chinook salmon continue to be enumerated on the Nechako River to gauge the returning population against the Conservation Goal identified in the *1987 Settlement Agreement* (Anonymous 1987).

Since 1988 the escapement of Chinook salmon to the Nechako River has been estimated based on aerial counts and residence time observations using standardized methodology. Residence times were estimated annually from 1989 to 2004, with estimates varying from 8.9 days in 1994 to 12.5 days in 2004 and a mean of 10.6 days (SD=1.03). Due to the relatively small variation in residence time estimates observed since 1988, the Nechako Fisheries Conservation Program Technical Committee (NFCP TC) decided to apply an average mean residence time of 10.6 days for AUC calculations for years when residence time studies were not conducted. A residence time study was also conducted in 2009, with an average value of 9.8 days

During the reporting period of 2004-2012, peak total live counts varied between 1,123 and 4,608 fish. Applying Area-Under-the-Curve methodology yielded annual escapement estimates of 1,021 to 7,039 fish. During the 2004-2012 time series, annual escapements did not reach the lower limit of the *1987 Settlement Agreement* target population range of 1700-4000 fish in two years (2007 and 2012), was within the target range twice (2005, 2009) and exceeded the range 5 times. The mean estimated Nechako Chinook escapement of 4,021 fish is slightly greater than the upper limit of the *1987 Settlement Agreement* target escapement range.

INTRODUCTION

Each year since 1988 the Nechako Fisheries Conservation Program Technical (NFCP TC) Committee has conducted a suite of projects to monitor the population of Chinook salmon (*Oncorhynchus tshawytscha*) that spawn and rear in the Nechako River (Figure 1). 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) was being met.

As part of this program of studies to monitor Nechako River Chinook salmon, the NFCP TC conducted spawner enumeration projects on the Nechako and Stuart rivers. Since the primary measure of the Conservation Goal is the number of Chinook salmon returning to spawn in the Nechako River each year, the enumeration project was designed to provide the most accurate estimate possible of the size, timing and distribution of the returning population. The information collected from the Nechako River was compared to similar information collected from the Stuart River, an adjacent system unaffected by flow regulation, to assist in identifying potential effects of flow regulation on the Nechako Chinook population. Following 16 years of Chinook salmon escapement data comparison between the Nechako and Stuart populations, no significant anomalies were identified. As such, following the recommendation by the NFCP TC, the Stuart River component of the study was terminated in 2003. Annual Nechako Chinook enumeration continues and results from the 2004-2012 studies are presented in this report.

METHODS

Nechako River

Aerial Counts

Nechako Chinook spawn almost exclusively in the 150 km long portion of river between Cheslatta Falls and Vanderhoof. To facilitate analysis of spawner distribution this portion of the river was divided into 16 sections aggregated into three areas - Upper, Middle and Lower river (Figure 2).

Helicopter surveys beginning at Cheslatta Falls and finishing at Vanderhoof, were conducted once every seven days from mid-August to early October. The helicopter flew at approximately 50 km/hr between 30 to 35 m above the river, circling islands or bars where necessary, or re-orienting its flight path to compensate for glare off the river surface.

Two observers seated on the same side of the helicopter counted all the Chinook spawners and carcasses observed in each of the sections. The observers wore polarized sunglasses to reduce glare off the river surface, used hand-held counters to record their counts, and switched seats on alternate flights to avoid seating bias.

At the beginning of the season, discussion and comparison of fish counts took place between the two observers to ensure consistency in counting methodology, but after this initial comparison the observers counted independently. Each fish observed was assigned to one of three classes and at the end of each section the totals for each class were recorded. Fish were classified according to the following criteria:

- **on redds:** Chinook clearly associated with a redd, or just moving away from a redd as the helicopter approached.
- **migrating/holding:** Chinook observed in a deep pool or moving downstream or upstream at a distance from redds. This included moribund post-spawners drifting downstream or holding near a bank.
- **carcasses.**

The observers compared counts after each flight. Differences in counts were attributed to one observer having missed fish, rather than the other observer counting objects that were not Chinook. Therefore, the higher of the two counts in each section of the river was assumed to be the most accurate and was chosen as the final count for the section.

Flying conditions, weather, visibility and incidental observations of interest were documented. In addition, observations of sockeye salmon (*O. nerka*) and white sturgeon (*Acipenser transmontanus*) were recorded.

Residence Time Observations

Residence time was defined as the number of days from a female's arrival at a redd site to departure, plus one day to account for a half day before first sighting and a half day after last sighting.

Historically, residence time observation sites were located in each of the three areas – Upper, Middle and Lower river (Figure 2). Observers viewed each site from elevated positions that allowed unobstructed views of the river, using polarized sunglasses to reduce glare. In 2001, based on the large overlap in 95% confidence intervals, it was considered valid to group the individuals from all three study areas into one sample to calculate an overall mean residence time. By 2002, following observations of little variation in residence times between the 3 sections over the history of residence time studies on the Nechako, the NFCP TC decided that residence time studies would yield adequate results when gathered from the Lower and Upper sections. The following year, residence time data was collected solely from the Upper section for similar reasons.

The appearance and behaviour of female spawners on or near well-defined redds was recorded daily throughout the period of redd occupancy. Although females were not individually marked, it was assumed that any female occupying a position over a redd for a number of days was the same fish. Repeated observations of fish with unusual markings on the same redd over a period of days validated the assumption.

The residence times of males were assumed to be identical to those of females. Actual male residence times could not be measured because males are too transient to be followed over the spawning period.

Due to the significantly small variance in residence time estimates between 1988 and 2004, the NFCP TC decided to use an average mean time of 10.6 days for AUC calculations in years when no residence time studies were completed. To track possible anomalies in residence time trends, the NFCP TC also suggested periodic studies be conducted every 5 years, as was the case in 2009.

Escapement Estimate

The Area-Under-the-Curve (AUC) trapezoidal methodology described by Neilson and Geen (1981) was used to calculate the escapement estimate up to the 2006 sampling year. To convert observations to an escapement estimate, the counts of spawners on redds were summed over each of the 16 sections for each survey flight and plotted by date. In the event that spawners were observed on the first and/or last flight, zero counts were added one week before/after the actual flight dates to “zero-out” the count, forming a normal distribution curve. The total number of spawner-days was calculated by integrating the “Area-Under-the-Curve” and was divided by the mean residence time (in days) to obtain an escapement estimate.

In an effort to yield similarly accurate escapement estimation results using fewer spawner enumeration flights, a model utilizing the AUC Maximum-Likelihood (M/L) escapement approach to fit a normal curve to aerial count data was created following the methodology described in Hilborn, et al. (1999). A retrospective analysis comparing results of the trapezoidal method to the M/L method concluded 5 weekly flights spanning the month of September and the first week of October were sufficient to achieve accurate escapement estimates and produce reliable inferences of stock status when using the AUC M/L estimation method (N. Trouton, 2005.). As such, this approach to escapement estimation replaced the AUC trapezoidal method in 2007.

RESULTS

Nechako River

Nechako River Chinook escapement estimates varied from 1,021 to 7,039 fish. This estimate was derived using the results of data collected during helicopter overflights and residence time studies (Appendices 1 and 4, respectively). Summaries of these data are presented in the sections below.

Aerial Enumeration Counts

Historically, up to 9 weekly enumeration flights took place in a given year. As resulting data led to refined spawn timing estimations, the number of required flights was reduced. A total of 7 helicopter flights were conducted in both 2004 and 2005. Since then, 5 flights have been required annually to gather sufficient data to calculate accurate Chinook escapement estimates. All flights began at Cheslatta Falls in the late morning and concluded at Vanderhoof in the early afternoon. Visibility conditions were generally recorded as “good”, with very few flights being recorded as having poor visibility.

The first appreciable numbers of Nechako Chinook typically arrive at the upper Nechako by the last week of August, with initial spawning occurring by the first week of September. Peak escapement and spawning observations occur by the 3rd week of September. Between 2004 and 2012, the earliest flight date with recorded spawning activity was August 25th, during the 2005 season. The latest date recording first spawning observations was September 5th, the year of the weakest return recorded in the reporting time series (2007).

Peak spawner count flight dates varied from September 14 to September 20, with the mean date of September 16th (Table 1). Peak spawner counts varied from 930 in 2012 to 4,300 in 2006, while peak live counts varied from 1,123 in 2007 to 4,608 in 2006. Meanwhile, the 2004-2012 mean peak spawner count was 2,617 and the mean total live count was 3,110. In most years, spawning is essentially completed by the second week of October. Total counts of live fish and fish ‘on redds’ exhibited a normal distribution in all study years (Appendix 3).

Spawning distribution by year shows that Chinook spawners predominantly utilized the upper section in all years. The mean spawner distribution for the 2004 to 2012 period was 56.4%, 25.4% and 18.4% for the Upper, Middle and Lower sections. (Table 2).

Residence Time Observations

For the years covered by this report, residence time data was collected in 2004 and 2009, and only from the Upper Section of the upper Nechako.

In 2004, residence time was determined for 164 fish observed in the Upper section of the Nechako River, with the first and last observations being recorded on September 7th and October 6th, respectively. Observer data suggested an overall mean residence time of 12.5 days (n=164, SD=2.93), with an observed range of 4-19 days.

In 2009, residence time was determined for 78 fish observed in the Upper section of the Nechako River, with the first and last observations being recorded on September 4th and October 4th, respectively. Observer data suggested an overall mean residence time of 9.8 days (n=78, SD=1.96), with an observed range of 6-15 days.

For the remaining years covered by this report, a residence time of 10.6 days, the calculated mean value over the 1989-2004 time series, was used for AUC population estimate calculations.

Escapement Estimate

Annual Area-Under-the-Curve calculations varied from spawner-day totals of 10,827 in 2012 to 74,610 in 2006, with a 2004-2012 mean spawner-day value of 43,479 (Appendices 5 and 6). Dividing annual spawner –day values by the corresponding annual mean residence time generated a total escapement estimate for the 2004-2006 sample years, while fitting the normal curve to the spawner count data was used from 2007-2012. Annual total escapement estimates ranges from 1,021 spawning Chinook in 2012 to 7,039 spawners in 2006 (Figure 5). The mean annual escapement estimate for the 2004-2012 reporting period was 4,021 spawning Chinook.

Other Observations

Incidental observations recorded during the helicopter overflights included references to sockeye salmon and white sturgeon.

Sockeye were observed in the Nechako River, above the Nautley River confluence in section 13, in all years covered by this report, excepting the 2012 sampling year. In years of prevalence, the number of spawners varied from as low as a few hundred to as high as several thousand. Spawning typically occurs in sections 1-5 and 14-16. Considerable numbers of sockeye were also observed migrating through sections 13-16 before entering the Nautley River on route to spawning locations in the Stellako River and are of less interest to studies related to flow control in the Nechako.

Sturgeon were observed during spawner flights in 2005, 2006 and 2009, 2010 and 2011, though sightings were limited to 1 or 2 fish distributed in the lower 4 sections of the Nechako sampling area.

DISCUSSION – COMPARISON TO PREVIOUS YEARS

Nechako River

A comparison of 2004-2012 Nechako River Chinook enumeration data was made to data collected by the NFCP each year since 1988.

Since flights were conducted on a weekly basis, it is unlikely that the date of the peak spawning observation is coincident with the actual timing of peak spawning activity. However, comparison of the reporting years' peak observation dates against those observed in previous years provides an indication of potential large-scale (more than a week) shifts in timing. From 2004-2012, peak observations in the Nechako River occurred on flights as early as September 14th and as late as September 20th, with a mean peak date of September 16th. The observed range of dates for peak spawning flight between 1988 and 2003 was September 9th to 20th, while the mean peak date was calculated to be September 12th (n=16, S.D. = 3.2) for those years (Table 1). Meanwhile, the 2004-2012 mean peak spawner count was 2,617 and the mean total live count was 3,110, compared to the 1988-2003 means peaks of 2,219 spawners and 2,040 total live.

The mean spawner distribution for the 2004 to 2012 period was 56.4%, 25.4% and 18.4% for the Upper, Middle and Lower sections. When comparing these data to the 1988 to 2003 mean values (48.6%, 25.8% and 25.6%) it appears that spawning preference has shifted from the Lower section to the Upper section by 7.8%, while the proportion of spawning taking place in the Middle area remained unchanged (Table 2).

Historically, residence time observation sites were located in each of the three areas – Upper, Middle and Lower river. In 2001, based on the large overlap in 95% confidence intervals (Figure 4), it was considered valid to group the individuals from all three study areas into one sample to calculate an overall mean residence time. By 2002, following observations of little variation in residence times between the 3 sections over the history of residence time studies on the Nechako,

the NFCP TC decided that residence time studies would yield adequate results when gathered from the Lower and Upper sections. The following year, residence time data was collected solely from the Upper section for similar reasons.

Due to changes to the residence time study schedule, observations were no longer carried out on an annual basis following 2003 and observations were only carried out in the Upper area. For the purposes of this report, residence time studies were performed only in 2004 and 2009 and confined to the upper reach. In 2004, the observed mean residence time was 12.5 days (n=164, SD=0.45) while the 2009 study resulting in a mean residence time of 9.8 days (n=78, SD=0.43). A comparison of mean female residence times and 95% confidence intervals indicated that the mean residence time of 10.4 days observed in 1995 was not significantly different from any observations collected from 1989 to 1994 (Table 3). Although residence time was fairly consistent from year to year, significant differences between some years have been observed (Figure 4).

During the 2004-2012 study period, the annual total escapement estimate ranged from 1,021 spawning Chinook in 2012 to 7,039 spawners in 2006, while the mean annual escapement estimate was 4,396 spawning Chinook. During this time series, annual escapements did not reach the lower limit of the *1987 Settlement Agreement* target population range of 1700-4000 fish in two years (2007 and 2012), was within the target range twice (2005, 2009) and exceeded the range 5 times. The mean estimated Nechako Chinook escapement of 4,021 fish is slightly greater than the *1987 Settlement Agreement* maximum target escapement. No discernible trends in Nechako River Chinook escapement were identified over the study period or since the inception of the Nechako Chinook Spawner Enumeration Program in 1988. As such, the Nechako Chinook population appears to be stable and consistently meeting the objectives of the *1987 Settlement Agreement*.

ACKNOWLEDGMENTS

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Nechako River residence time data was collected by R.A. Poile and Reid Schrul and Robert Heibin.

Rhonda Thibeault and Liz Murphy assisted with data compilation.

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APPENDIX 1

Annual Nechako River Chinook Overflight Data, 2004-2012

APPENDIX 2

Annual Nechako River Chinook Aerial Counts, 2004-2012

APPENDIX 3

Annual Nechako River Chinook Spawner Distribution by Area, 2004-2012

APPENDIX 4

Annual Nechako River Chinook Residence Time Data, 2004-2012

APPENDIX 5

Annual Nechako River Chinook Trapezoidal Area-Under-the-Curve, 2004-2006

APPENDIX 6

Annual Nechako River Chinook Maximum Likelihood Area-Under-the-Curve, 2007-2012

Table 1
 Nechako River Chinook Peak Spawner Count Flight
 Counts and Dates, 2004 - 2012

Year	Peak Flight	Count
2004	15-Sep	4,493
2005	14-Sep	2,511
2006	20-Sep	4,608
2007	19-Sep	1,123
2008	17-Sep	3,486
2009	16-Sep	1,709
2010	15-Sep	4,355
2011	14-Sep	4,428
2012	19-Sep	1,281
1988-2003 Mean	12-Sep	1,887
1988-2003 Earliest	9-Sep	
1988-2003 Latest	20-Sep	
2004-2012 Mean	16-Sep	3,110
2004-2012 Earliest	14-Sep	
2004-2012 Latest	20-Sep	

Table 2
 Nechako River Chinook Spawner Distribution by Area, 2004-2012

Year	Upper	Middle	Lower	# observations
2004	54.9	26.3	18.8	4962
2005	53.1	25.0	21.9	5303
2006	54.9	26.3	18.8	9562
2007	67.8	18.4	13.8	2193
2008	62.7	23.2	14.2	7000
2009	63.4	24.8	11.8	3267
2010	48.0	30.5	21.6	10157
2011	57.3	32.3	10.4	6626
2012	45.4	22.0	32.6	3010
1988-03 Mean	48.6	25.8	25.6	
2004-11 Mean	56.4	25.4	18.2	

Table 3
 Nechako River Chinook Mean Residence Time, 2004-2012

Year	Mean	95%	n
2004	12.5	0.45	164
2005	10.5		
2006	10.6		
2007	10.6		
2008	10.6		
2009	9.8	0.43	78
2010	10.6		
2011	10.6		
2012	10.6		
1989-2003 Mean	10.5		
1989-2003 Min	8.9		
1989-2003 Max	11.9		
2004-2012 Mean	10.7		
2004-2012 Min	9.8		
2004-2012 Max	12.5		

note: 2005-08 and 2010-12 used long-term mean residence time.

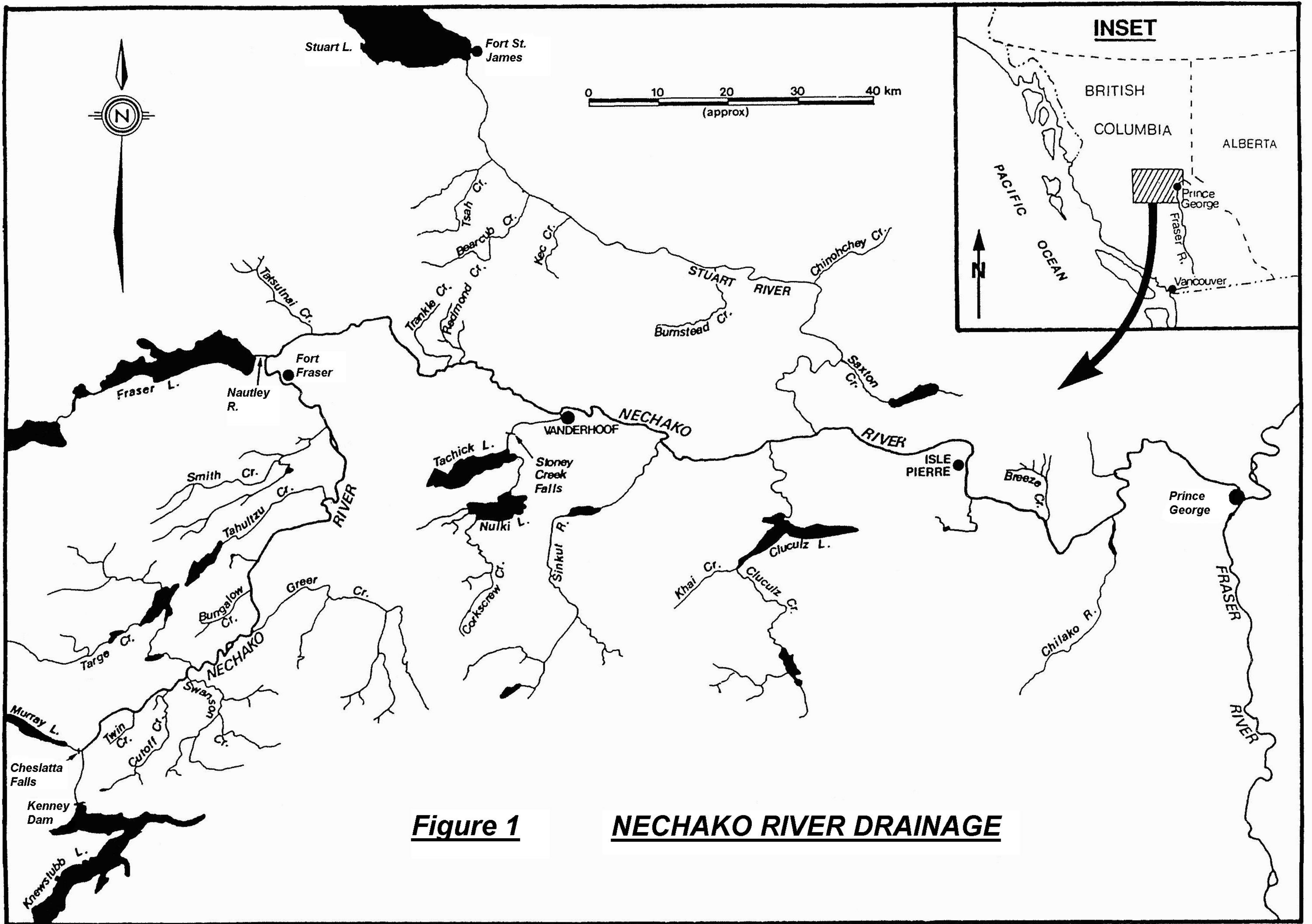


Figure 1

NECHAKO RIVER DRAINAGE

Figure 2

NECHAKO RIVER CHINOOK SPAWNING STUDY AREA

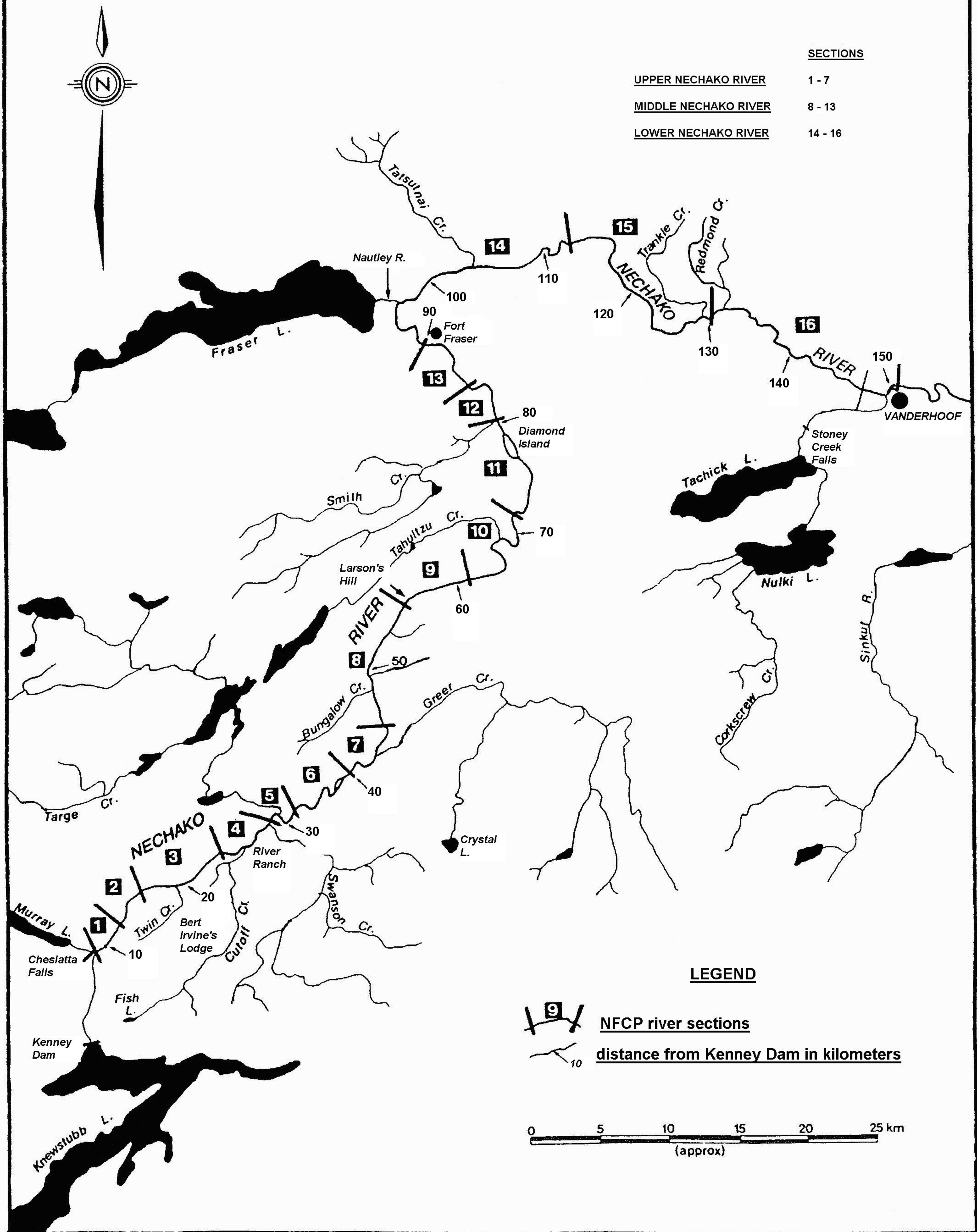


Figure 3
Nechako River Chinook Spawner Distribution by Area, 2004-2012

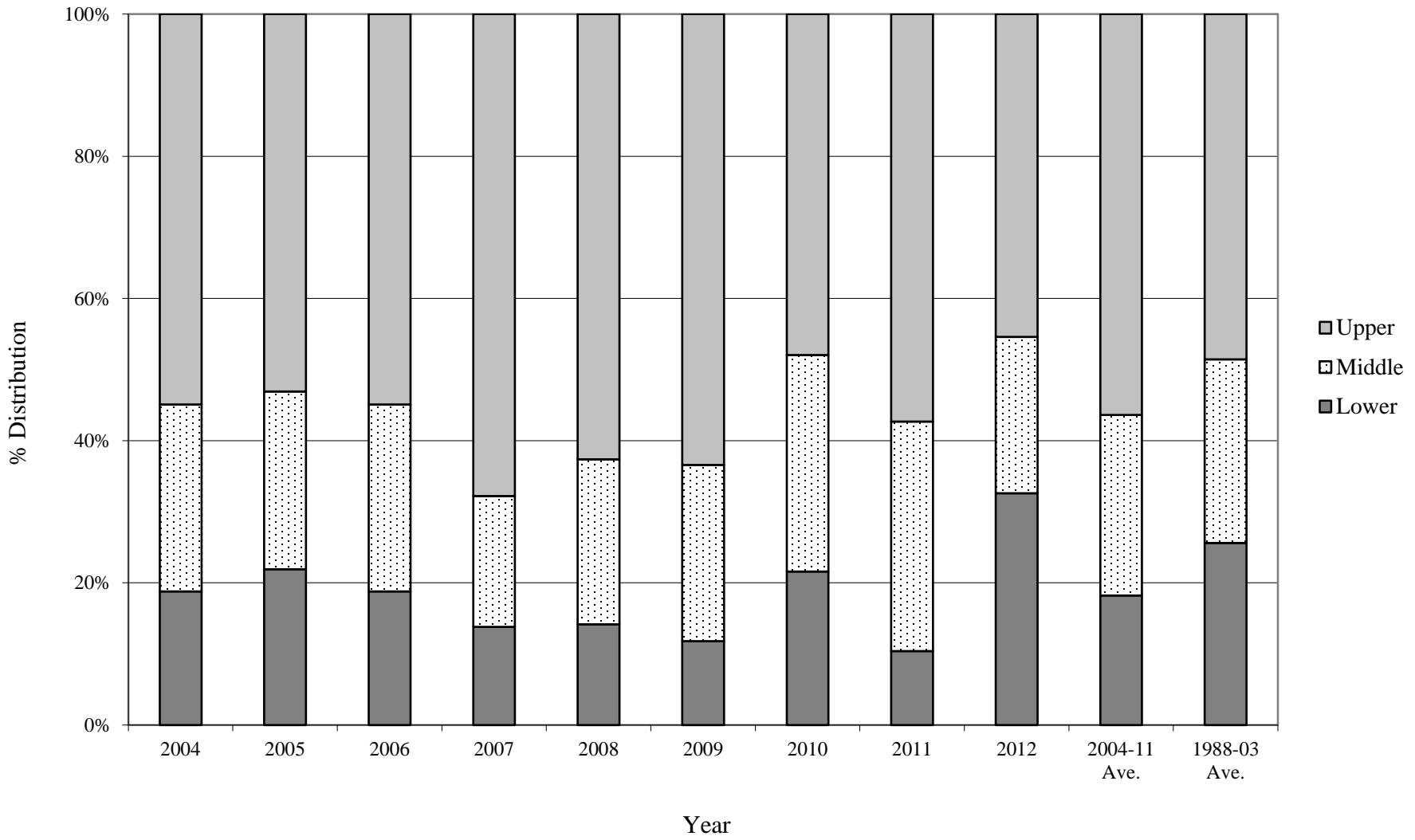


Figure 4
Nechako River Chinook Mean Residence Time, 1989-2012

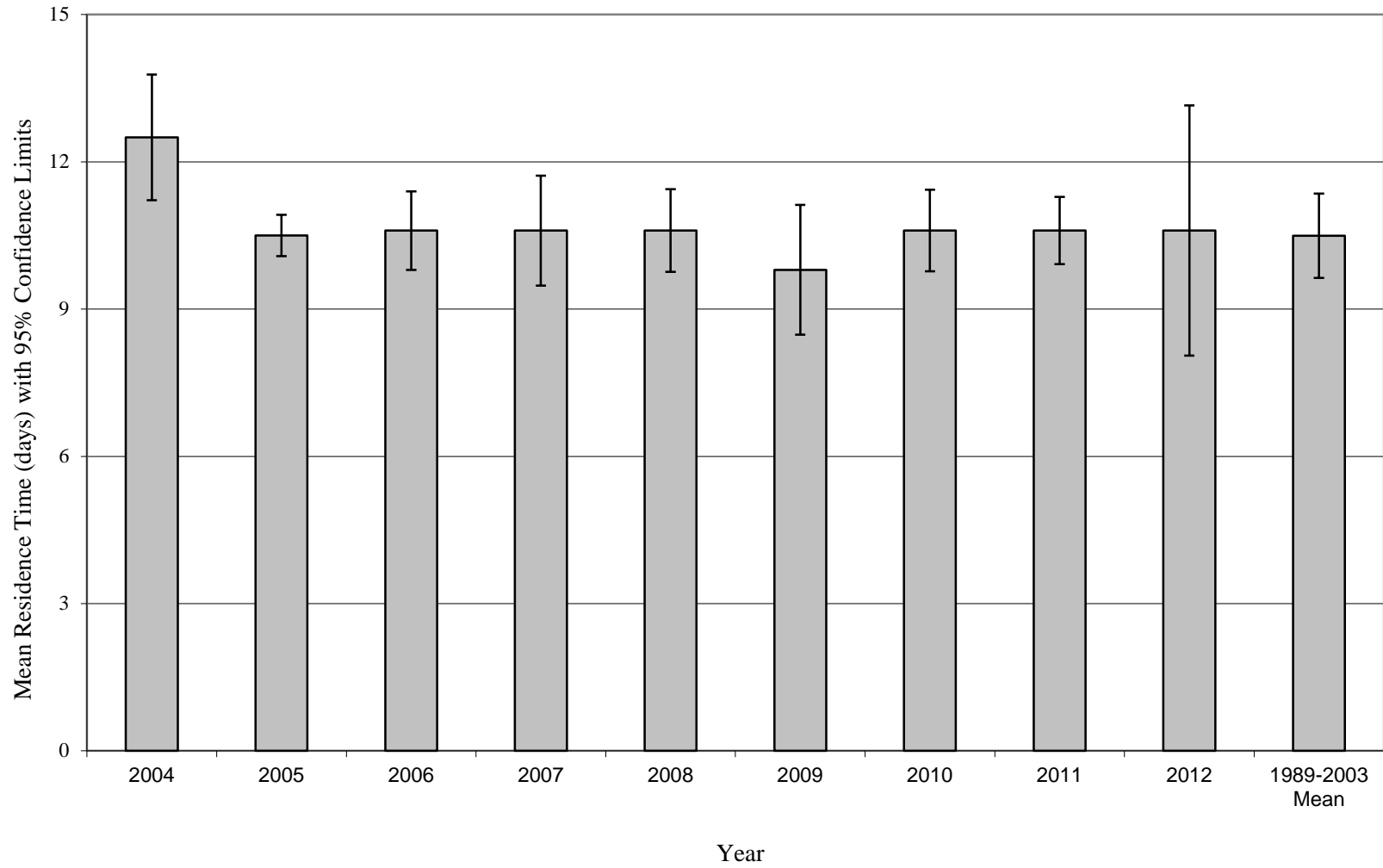
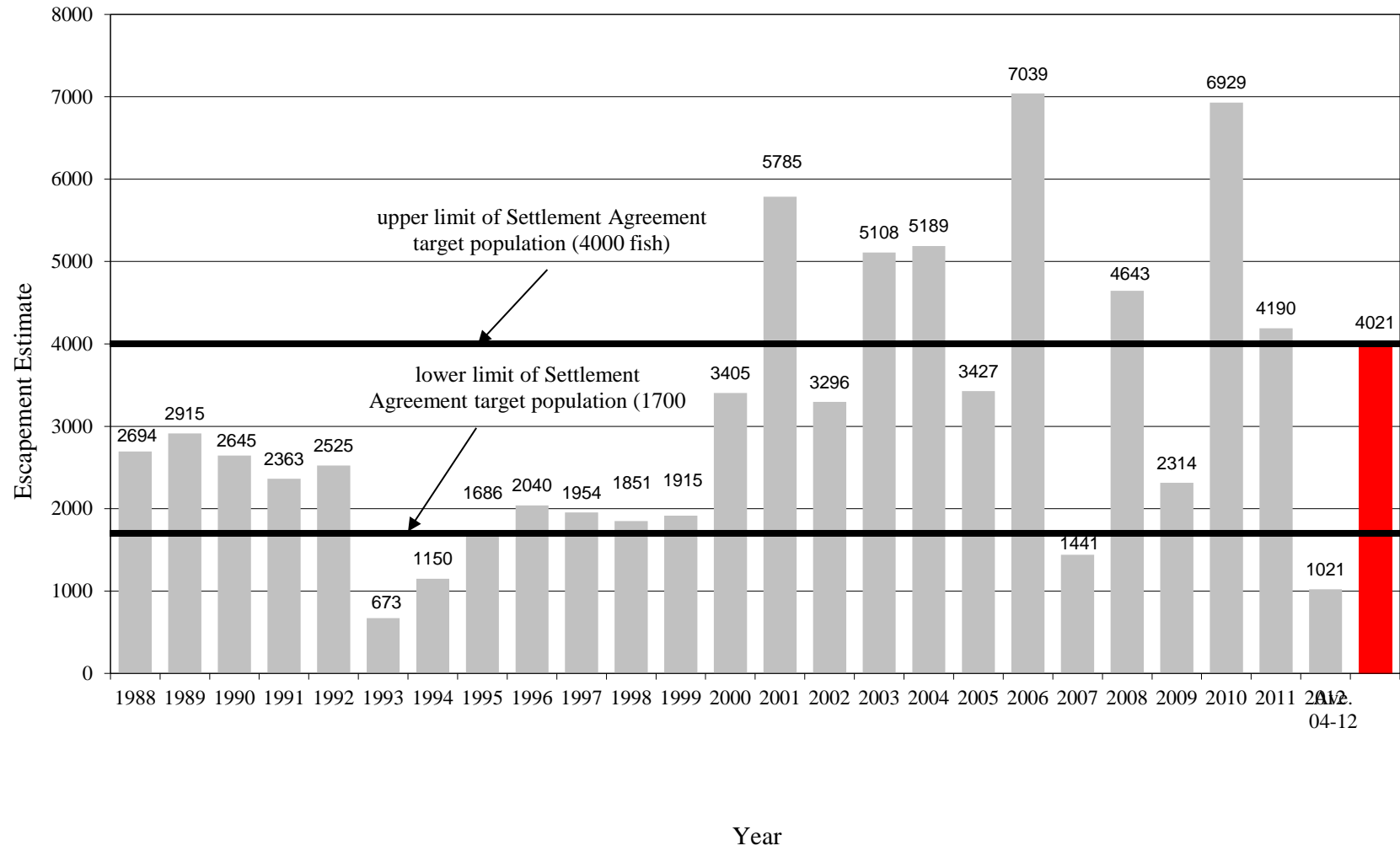


Figure 5
Nechako River Chinook Escapement Estimates, 1988-2012



Flight #: 1
 Date: 25-Aug-04
 Pilot: Chris McGoran, Pacific Western Helicopters

Observers Representing		Front: Colin Barnard ALCAN						Back: Byron Nutton DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	10:47	bad	0	2	0	0	0	sun	0	0	0	0	0	0	2
2	10:51	bad	0	1	0	0	0	sun	0	0	0	0	0	0	1
3A	11:02	poor	0	22	0	0	0	sun	0	20	0	0	0	0	22
3B	11:11	fair	0	30	0	0	0	sun	0	25	0	0	0	0	30
4	11:23	good	0	130	0	0	0	sun	0	130	0	0	0	0	130
5	11:38	fair	0	11	0	0	0	sun	0	10	0	0	0	0	11
6	11:47	poor	0	34	0	0	0	sun	0	19	0	0	0	0	34
7	11:57	poor	0	6	0	0	0	sun	0	6	0	0	0	0	6
8	12:04	poor	0	0	0	0	0	cloud/wind	0	0	0	0	0	0	0
9	12:13	poor	0	2	0	0	0	cloud/wind	0	2	0	0	0	0	2
10	12:18	poor/fair	0	25	0	0	0	sun	0	21	0	0	0	0	25
11	12:28	fair	0	39	0	0	0	sun	0	35	0	0	0	0	39
12	13:20	wind/poor	0	66	0	0	0	sun	0	53	0	0	0	0	66
13	13:29	poor	0	5	2	0	0	wind	0	5	1	0	0	0	5
14	13:47	poor	0	4	1	0	0	cloud/wind	0	4	1	0	0	0	4
15	14:02	fair/poor	0	5	1	0	0	sun	0	4	0	0	0	0	5
16	14:22	fair/poor	0	3	1	0	0	sun	0	3	0	0	0	0	3
Total			0	385	5				0	337	2			0	385
Weather am:	high broken, light winds						clear, blue, some puffy white clouds								
Weather pm:	more cloud, winds picked up														
Comments:							water still deep and green, poor visibility despite decent weather conditions								

Flight #: 2
 Date: 2-Sep-04
 Pilot: Chris Norman, Pacific Western Helicopters

Observers Representing		Front: Byron Nutton DFO						Back: Colin Barnard ALCAN							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:01	sun	0	24	0			sun/wind	0	25	0			0	25
2	11:05	sun	0	22	0			sun/wind	0	22	0			0	22
3A	11:12	wind	2	60	0			sun/wind	2	84	0			2	86
3B	11:19	cloud/wind	8	40	0			sun/wind	6	52	2			8	58
4	11:29	cloud	12	151	4			sun/wind	14	151	3			14	165
5	11:39	cloud	4	91	0			sun/wind	2	92	0			4	95
6	11:47	sun	43	85	0			sun/wind	44	98	0			44	142
7	12:01	sun	0	0	0			sun/wind	0	0	0			0	0
8	12:06	sun	15	6	0			sun/wind	19	10	0			19	29
9	12:20	wind	0	9	0			sun/wind	8	4	0			8	12
10	12:28	wind	0	48	0			sun/wind	1	51	0			1	52
11	12:40	cloud	4	124	0			sun/wind	12	130	1			12	142
12	13:32	sun	36	102	0			sun/wind	39	100	1			39	139
13	13:43	sun	0	55	3	100		sun/wind	6	52	4	100		6	58
14	14:04	sun	20	2	0	300		sun/wind	20	3	1	400		20	23
15	14:27	cloud	4	7	2	400		sun/wind	4	7	2	400		4	11
16	14:47	sun	9	97	0	100		sun/wind	6	93	0	100		9	106
Total			157	923	9				183	974	14			190	1165
Weather am:	blue sky with broken cloud, cloud building						broken cloud, sun, wind								
Weather pm:	still broken clouds, wind picking up						less cloud, sun, wind								
Comments:	500 to 1000 sox in Nautley below bridge														

Flight #: 3
 Date: 8-Sep-04
 Pilot: Chris Norman, Pacific Western Helicopters

Observers Representing		Front: Colin Barnard ALCAN						Back: Byron Nutton DFO							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:10		4	9	0			cloud/wind	3	6	0			4	13
2	11:14		4	71	0			cloud/wind	3	62	0			4	75
3A	11:22		30	100	0			cloud/wind	23	53	0			30	130
3B	11:31		72	85	1			cloud/wind	94	44	1			94	157
4	11:42		15	50	1			cloud/wind	35	15	1			35	65
5	11:56		45	143	2			cloud/wind	35	134	2			45	188
6	12:08		65	50	2	25		cloud/wind	38	82	1	30		65	120
7	12:22		0	4	0	45		cloud/wind	0	4	0	40		0	4
8	12:28		11	9	0	25		cloud/wind	5	7	0	20		11	20
9	12:39		15	24	1	50		cloud/wind	14	13	1	40		15	39
10	12:47		30	30	0	60		cloud/wind	28	19	0	40		30	60
11	12:57		90	38	2	40		cloud/vap	76	48	1	40		90	128
12	13:38		180	56	1			cloud	138	76	1			180	236
13	13:50		20	35	4	60		cloud/wind	10	32	3	20		20	55
14	14:07		25	26	4	250		cloud/wind	24	26	4	250		25	51
15	14:28		72	30	2	100		cloud/wind	74	26	2	75		74	102
16	14:56		96	80	3			cloud/wind	108	66	3			108	176
Total			774	840	23				708	713	20			830	1619
Weather am:	cloud, fog, rain, wind, no sun						overcast, low cloud, wind, cold								
Weather pm:	cloud, fog, rain, wind, no sun						overcast, low cloud, less wind, light rain, cold								
Comments:							approx 300 sox in Nautley below bridge								

Flight #: 4
 Date: 15-Sep-04
 Pilot: Chris Norman, Pacific Western Helicopters

Observers Representing		Front: Byron Nutton DFO						Back: Colin Barnard ALCAN						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:02	good	30	104	0			good	31	140	0			31	171
2	11:07	good	157	43	1			good	160	48	1			160	208
3A	11:16	good	310	97	2	20		good	390	37	2	20		390	427
3B	11:25	good	604	45	1	20		good	590	74	1	20		604	664
4	11:38	good	112	44	5	30		good	110	37	5	30		112	156
5	11:51	good	310	28	3	15		good	300	55	3	15		310	355
6	12:02	good	342	20	2			good	313	50	2			342	363
7	12:17	good	4	4	0			good	4	3	0			4	8
8	12:23	good	90	6	0			good	90	6	0			90	96
9	12:35	good	78	4	0			good	78	4	0			78	82
10	12:42	good	92	10	1			good	90	8	1			92	102
11	12:55	good	257	16	1			good	280	19	1			280	299
12	13:49	good	388	32	2	12		good	365	25	2	12		388	420
13	14:00	wind	29	5	2	30		good	30	8	2	30		30	38
14	14:17	good	226	10	2	200		good	250	8	2	200		250	258
15	14:41	good	420	40	1	1000		good	500	27	1	1000		500	527
16	15:09	good	289	13	7	1000		good	303	16	7	1000		303	319
Total			3738	521	30				3884	565	30			3964	4493
Weather am:	high cloud, no wind, decent light						mainly sunny, very light winds, good vis								
Weather pm:	high cloud, no wind, decent light						more cloud, wind, good vis								
Comments:	100 sox at Nautley confluence 100 sox in Nautley, 300 more below Nautley bridge														

Flight #: 5
Date: 22-Sep-04
Pilot: Chris Norman, Pacific Western Helicopters

Observers Representing		Front: Colin Barnard ALCAN						Back: Byron Nutton DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other		
1	10:55	excellent	140	46	0			sun	106	49	0			140	186
2	11:01	excellent	300	14	1			sun	219	0	1			300	314
3A	11:09	excellent	510	27	8	20		sun	401	6	7	20		510	537
3B	11:18	excellent	460	39	21	150		sun	444	20	22	150		460	499
4	11:31	excellent	144	20	22	12		sun	93	21	20	12		144	164
5	11:44	excellent	200	8	15	50		sun	196	2	13	50		200	208
6	11:54	excellent	150	21	24	2		sun	137	14	30	2		150	171
7	12:10	excellent	2	5	2			sun	2	4	3			2	7
8	12:18	excellent	48	2	3			cloud	42	0	3			48	50
9	12:31	excellent	56	2	11			cloud	41	2	10			56	58
10	12:37	excellent	96	4	3			cloud	74	5	4			96	100
11	12:49	excellent	162	20	16			sun	142	14	15			162	182
12	13:44	excellent	221	5	15	25		sun	206	5	15	25		221	226
13	13:57	excellent	19	6	9	3000		cloud	13	6	9	3000		19	25
14	14:15	excellent	279	4	13	6		sun	247	6	12	100		279	283
15	14:41	excellent	277	6	14	100		cloud	256	4	15	100		277	283
16	15:06	excellent	282	17	24	1000		sun	244	8	19	1000		282	299
Total			3346	246	201				2863	166	198			3346	3592
Weather am:	stiff winds, no clouds, mostly sunny, good vis						blue sky, clouds building, wind								
Weather pm:	winds light, high clouds, mostly sunny, good vis						high overcast, no wind								
Comments:							1000 sox at Nautley confluence, none in Nautley								

Flight #: 6
 Date: 29-Sep-04
 Pilot: Chris Norman, Pacific Western Helicopters

Observers Representing		Front: Byron Nutton DFO						Back: Colin Barnard ALCAN						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:03	shadow	60	0	2			excellent	95	0	2			95	95
2	11:07	shadow	134	0	9			excellent	144	0	8			144	144
3A	11:14	excellent	137	0	82	50		excellent	173	1	69	50		173	174
3B	11:21	excellent	132	0	168	150		excellent	158	0	109	150		158	158
4	11:33	excellent	16	0	140	12		excellent	21	0	107	15		21	21
5	11:40	excellent	41	0	26	300		excellent	48	0	33	350		48	48
6	11:47	excellent	25	0	102			excellent	33	0	88			33	33
7	11:56	excellent	0	1	3			excellent	5	1	8			5	6
8	12:01	excellent	12	0	8	6		excellent	14	0	9	6		14	14
9	12:11	excellent	9	0	13			excellent	11	0	10			11	11
10	12:16	excellent	4	0	12			excellent	6	0	9			6	6
11	12:24	excellent	28	0	42			excellent	31	0	36			31	31
12	13:18	excellent	24	1	38			excellent	28	1	41			28	29
13	13:27	excellent	5	0	20	50		excellent	5	0	19	50		5	5
14	13:40	excellent	37	0	20	30		excellent	55	0	31	30		55	55
15	13:59	excellent	14	0	21	20		excellent	24	0	25	20		24	24
16	14:15	excellent	45	0	82	300		excellent	64	0	67	300		64	64
Total			723	2	788				915	3	671			915	918
Weather am:	blue sky with some high "haze", no wind						blue sky, some high cloud, very light wind								
Weather pm:	blue sky with some high haze, light wind						blue sky, some high cloud, very light wind								
Comments:	sox in 3B and 5 spawning green below Nautley						sox in 3B and 5 spawning								

Flight #: 7
 Date: 6-Oct-04
 Pilot: Chris Norman, Pacific Western Helicopters

Observers Representing		Front: Byron Nutton DFO						Back: Liz Murphy DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	10:26	shadow	10	0	1				10	0	2			10	10
2	10:30	shadow	18	0	7				5	0	4			18	18
3A	10:36	excellent	8	0	42				9	0	34			9	9
3B	10:40	excellent	7	0	77	150			4	0	47	150		7	7
4	10:48	excellent	5	0	27				4	0	20			5	5
5	10:54	excellent	7	0	27	50			5	0	25	50		7	7
6	11:00	excellent	9	2	35	2			10	2	30	2		10	12
7	11:10	excellent	0	1	5	6			1	1	9	6		1	2
8	11:20	excellent	0	0	10	4			0	0	7	4		0	0
9	11:31	excellent	1	0	13				0	0	12			1	1
10	11:37	excellent	0	0	12	1			0	0	9	1		0	0
11	11:45	excellent	2	0	29				2	0	21			2	2
12	12:31	wind	1	0	35				1	0	25			1	1
13	12:40	cloud/wind	0	0	15	6			0	0	15	6		0	0
14	12:55	cloud/wind	2	0	5	30			1	0	8	30		2	2
15	13:15	wind	5	0	1	30			4	0	4	30		5	5
16	13:35	excellent	2	0	30	30			1	0	25	30		2	2
Total			77	3	371				57	3	297			80	83
Weather am:	blue sky, strong wind														
Weather pm:	blue sky, stronger wind, clouds building														
Comments:	no sox in Nautley, sox in 3B and 5 spawning														

Flight #: 1
Date: 24-Aug-05
Pilot: Chris Norman, Pacific Western Helicopters

Observers Representing		Front: Colin Barnard Alcan						Back: Byron Nutton DFO							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	12:26		0	14	0			sun	0	7	0			0	14
2	12:31		0	9	0			sun	0	6	0			0	9
3A	12:38		0	10	0			sun	0	9	0			0	10
3B	12:44		0	27	0			sun	0	30	0			0	30
4	12:53		0	25	0			sun	0	25	0			0	25
5	13:00		0	47	0			sun	0	37	0			0	47
6	13:06		0	54	0			sun	0	65	0			0	65
7	13:20		0	1	0			sun	0	0	0			0	1
8	13:26		0	4	0			sun	0	3	0			0	4
9	13:37		0	30	0			sun	0	22	0			0	30
10	13:43		0	15	0			sun	0	15	0			0	15
11	13:53		0	74	0			sun	0	73	0			0	74
12	14:46		2	96	0			sun	2	102	0			2	104
13	14:58		0	44	0		sturgeon	sun	0	35	0		sturgeon	0	44
14	15:22		0	14	0			sun	0	10	0			0	14
15	15:44		1	15	0		sturgeon	sun	1	13	0		sturgeon	1	16
16	16:08		0	51	0	250		shadow	0	66	0	200		0	66
Total			3	530	0				3	518	0			3	568
Weather am:	sunny/clear/excellent vis						calm, clear, sunny - some deep, dark, green spots								
Weather pm:	sunny/clear/excellent vis						calm, clear, sunny - even more deep, dark, green								
Comments:	nautley ~200 CH, 1500 sockeye						late start due to fog in P.G. ~1200 sox & 200 chinook in Nautley both sturgeon ~ 6' long - km134 and km95.5 (btw bridges)								

Flight #: 2
 Date: 1-Sep-05
 Pilot: Chris Norman, Pacific Western Helicopters

Observers Representing		Front: Byron Nutton DFO						Back: Colin Barnard Alcan						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	10:21	ok	0	30	0				0	31	0			0	31
2	10:25	good	0	50	0				0	43	0			0	50
3A	10:32	good	0	46	0				0	41	0			0	46
3B	10:39	good	1	49	0				1	58	0			1	59
4	10:48	sun	0	116	0				0	127	0			0	127
5	10:58	sun	1	98	2				1	80	2			1	99
6	11:06	sun	7	25	1				10	29	1			10	39
7	11:18	good	0	1	0				0	1	0			0	1
8	11:23	good	0	6	0				0	7	1			0	7
9	11:32	good	2	1	0				0	3	0			2	3
10	11:38	ok	2	13	0				2	15	0			2	17
11	11:47	ok	1	69	0				1	60	0			1	70
12	12:23	cloud	12	46	0				9	41	0			12	58
13	12:32	cloud	0	27	0	6			0	28	0	6		0	28
14	14:50	poor	7	4	0				7	6	0			7	13
15	15:09	cloud	15	19	0	20			15	20	1	20		15	35
16	15:31	ok	6	32	1	300			4	32	2	300		6	38
Total			54	632	4				50	622	7			57	721
Weather am:	high overcast w sunny breaks, no wind						high overcast, broken								
Weather pm:	overcast, light rain, no wind						high overcast, broken early, rain & unbroken overcast later								
Comments:	dark and green below Nautley Nautley ~3000 sox														

Flight #: 3
Date: 7-Sep-05
Pilot: Chris Norman, Pacific Western Helicopters

Observers Representing		Front: Colin Barnard Alcan						Back: Byron Nutton DFO							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	10:28		10	49	0			shadow	4	55	0			10	59
2	10:31		12	105	0			good	2	104	0			12	117
3A	10:38		13	150	0			good	15	145	0			15	163
3B	10:45		15	55	2			excellent	19	57	2			19	76
4	10:54		19	101	3			excellent	9	110	1			19	120
5	11:02		22	116	0			excellent	22	113	0			22	138
6	11:10		42	180	0			cloud	43	121	0			43	222
7	11:21		0	4	0	250		cloud	0	4	0	250		0	4
8	11:27		8	30	0			sun	4	27	0			8	38
9	11:37		30	30	0			excellent	31	21	0			31	60
10	11:43		21	32	0			excellent	20	28	0			21	53
11	11:52		65	108	2			cloud	68	98	1			68	173
12	12:32		100	96	1			cloud	85	92	1			100	196
13	12:42		31	50	0	500		cloud	31	51	0	500		31	82
14	13:49		68	5	0	20		cloud/rain	62	5	0	20		68	73
15	14:09		28	5	1	100		cloud	22	4	1	100		28	33
16	14:30		93	30	0	600		cloud	69	55	0	600		93	124
Total			577	1146	9				506	1090	6			588	1731
Weather am:	wind, overcast						mostly blue sky, some high scattered cloud, brisk tail wind								
Weather pm:	wind, rain, overcast						more cloud, less wind, light rain								
Comments:							1000 sox in Nautley Nechako green below Nautley								

Flight #: 4
Date: 14-Sep-05
Pilot: Chris Norman, Pacific Western Helicopters

Observers Representing		Front: Byron Nutton DFO						Back: Colin Barnard Alcan						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other		
1	10:16	shadow	4	91	0				10	92	0			10	102
2	10:20	shadow	32	44	0				24	61	0			32	85
3A	10:26	sun	109	88	3				104	96	3			109	200
3B	10:33	sun	220	60	3				230	50	5			230	280
4	10:45	sun	32	58	2				34	90	2			34	124
5	10:53	sun	202	43	1				190	55	3			202	245
6	11:01	sun	219	38	4				240	14	5			240	257
7	11:12	sun	0	0	0				0	2	0			0	2
8	11:17	sun	12	17	0				23	12	0			23	35
9	11:27	sun/cloud	54	14	3				53	22	3			54	75
10	11:33	sun	74	11	2				72	3	2			74	85
11	11:42	sun	195	22	0				200	15	1			200	217
12	12:19	sun/cloud	203	33	3	10			225	36	3	10		225	261
13	12:29	wind	14	6	1	30			14	7	1	30		14	21
14	13:27	cloud	198	21	0	400			216	16	1	400		216	232
15	13:48	sun	93	5	0	100			83	5	0	100		93	98
16	14:09	cloud	182	10	12	1000			150	13	12	1000		182	192
Total			1843	561	34				1868	589	41			1938	2511
Weather am:	high broken overcast, light steady tailwind						light winds, high scattered broken to blue and sun								
Weather pm:	more clouds, steady tailwind						light winds, heavier overcast but still broken to blue and sun								
Comments:	excellent visibility in the AM, very good visibilty in the PM 250 sox in the Nautley						visibility generally excellent all day								

Flight #: 5
 Date: 21-Sep-05
 Pilot: Chris Norman, Pacific Western Helicopters

Observers Representing		Front: Colin Barnard Alcan						Back: Byron Nutton DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	10:43		91	9	0			sun	90	14	0			91	104
2	10:47		111	5	0			shadow	90	12	0			111	116
3A	10:53		232	20	6	25		sun	218	21	4	30		232	252
3B	11:04		255	21	14			sun	240	21	14			255	276
4	11:12		28	4	9			cloud	25	9	9			28	34
5	11:20		202	6	2			cloud	192	7	2			202	208
6	11:27		164	10	22			sun	139	10	20			164	174
7	11:37		9	2	2			sun	9	0	2			9	11
8	11:42		55	0	2			sun	42	0	2			55	55
9	11:52		28	0	6			sun	27	0	6			28	28
10	11:57		52	0	4			sun	39	0	5			52	52
11	12:06		105	8	31			cloud	95	7	27			105	113
12	12:45		87	2	19			cloud	76	2	16			87	89
13	12:52		13	5	12	300		sun	9	5	12	500		13	18
14	13:07		131	20	6	500		sun	130	6	6	500		131	151
15	13:28		70	10	22	800		sun	64	10	22	800		70	80
16	13:50		140	11	29	2000		sun	140	10	30	2000		140	151
Total			1773	133	186				1625	134	177			1773	1912
Weather am:	high partial overcast, mainly broken to blue, light winds						high broken cloud, mostly blue sky, excellent visibility								
Weather pm:	high partial overcast, mainly broken to blue, light winds						clouds building but still mostly sunny, light tailwind, excellent visibility								
Comments:							excellent visibility all day 2000 sox in Nautley								

Flight #: 6
 Date: 27-Sep-05
 Pilot: Chris Norman, Pacific Western Helicopters

Observers Representing		Front: Len Seefried DFO						Back: Colin Barnard Alcan							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	12:35		65	1	3	2			114	8	1	4		114	122
2	12:41		86	9	2				96	12	2			96	108
3A	12:48		138	1	13	50			128	9	16	50		138	139
3B	13:10		109	8	27	6			112	2	31			112	117
4	13:20		22	8	45	30			29	2	46	24		29	31
5	13:31		78	4	8	12			98	3	9	6		98	101
6	13:39		43	4	26	30			52	3	36	20		52	55
7	13:49		2	0	6				5	0	5			5	5
8	13:54		16	4	4	20			17	2	3	20		17	20
9	14:04		18	2	7				15	2	7			18	20
10	14:11		21	0	2				18	2	2			21	21
11	14:20		23	3	20				27	0	21			27	27
12	15:04		14	1	30	10			19	0	19	10		19	19
13	15:12		2	3	11	40			5	0	6	40		5	5
14	15:26		34	0	25				41	0	18			41	41
15	15:47		13	0	19	20			10	0	18	20		13	13
16	16:09		48	8	28	1000			50	12	15	1000		50	62
Total			732	56	276				836	57	255			855	906
Weather am:	clear						blue sky, light winds, sunny								
Weather pm:	high overcast						high overcast but great visibility								
Comments:	Nautley ~ 100 sockeye						late start due to heavy fog in AM								

Flight #: 7
 Date: 5-Oct-05
 Pilot: Chris Norman, Pacific Western Helicopters

Observers Representing		Front: Colin Barnard Alcan						Back: Len Seefried DFO							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	9:47		15	1	1				13	1	1			15	16
2	9:51		12	0	0				13	0	0			13	13
3A	9:57		20	0	29	45			17	0	22	45		20	20
3B	10:02		2	0	50				5	0	40			5	5
4	10:09		3	1	30				4	0	43			4	4
5	10:15		8	0	12	8			11	0	10	8		11	11
6	10:22		4	0	19	50			4	0	17	50		4	4
7	10:30		0	0	2				0	0	3			0	0
8	10:35		1	0	3				1	0	5			1	1
9	10:44		4	0	11				5	0	5			5	5
10	10:49		0	0	4				0	0	3			0	0
11	10:59		1	0	9				2	0	14			2	2
12	11:56		2	0	5				3	0	10			3	3
13	12:02		0	0	9				0	0	7			0	0
14	12:18		3	0	7	250			3	0	8	250		3	3
15	12:35		1	0	2	20			1	0	2	20		1	1
16	12:53		2	0	9	300			2	0	13	300		2	2
Total			78	2	202				84	1	203			89	90
Weather am:	overcast, light rain						overcast, light rain								
Weather pm:	light wind, overcast, rain						overcast, light rain								
Comments:	visibility excellent all day						on sockeye in the Nautley								

Flight #: 1
 Date: 29-Aug-06
 Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: Byron Nutton DFO						Back: Colin Barnard Alcan								
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live	
1	10:45	sun	0	71	0				7	59	0			7	71	
2	10:48	sun	1	3	0				6	1	0			6	7	
3A	10:53	sun	0	109	0				0	113	0			0	113	
3B	10:58	sun	0	41	0				0	46	0			0	46	
4	11:02	sun	17	165	0				20	164	0			20	184	
5	11:08	sun	0	302	0				0	311	0			0	311	
6	11:15	sun	0	130	1				0	133	1			0	133	
7	11:25	sun	0	17	1				0	22	1			0	22	
8	11:29	sun	0	53	2				0	46	3			0	53	
9	11:37	sun	1	38	1				8	35	1			8	43	
10	11:43	sun	0	197	0				0	181	1			0	197	
11	11:48	sun	1	199	0				1	193	0			1	200	
12	12:03	sun	1	191	0				0	192	0			1	192	
13	12:10	wind	0	110	0		2 sturgeon		0	86	1		2 sturgeon	0	110	
14	13:50	sun	0	23	1	300			0	25	1	300		0	25	
15	14:04	sun	0	35	2	300			0	48	2	300		0	48	
16	14:20	sun	0	71	4	200			0	78	6	225		0	78	
Total			21	1755	12				42	1733	17			43	1833	
Weather am:	some high scattered cloud, mostly sunny							clear, sunny, light winds								
Weather pm:	clouds building, lots of deep green							cloudy, sunny periods, winds picked up, rain at times								
Comments:	300 sockeye in the Nautley															

Flight #: 2
 Date: 5-Sep-06
 Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: Colin Barnard Alcan						Back: Byron Nutton DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:16		4	119	0			sun	3	100	0			4	123
2	11:20		0	166	0			sun	0	147	0			0	166
3A	11:27		0	280	0			sun	0	308	0			0	308
3B	11:33		15	64	0			sun	17	52	0			17	79
4	11:40		20	363	1			sun	16	384	1			20	400
5	11:50		10	574	0			sun	10	584	0			10	594
6	11:59		10	209	0			sun	18	166	0			18	219
7	12:10		0	47	0			sun	0	42	0			0	47
8	12:15		9	30	0			sun	4	29	0			9	39
9	12:25		12	91	0			sun	11	83	0			12	103
10	12:31		6	210	0			sun	5	202	0			6	216
11	12:40		52	275	1			sun	102	219	1			102	327
12	12:51		22	266	1			sun	54	236	2			54	290
13	12:58		7	224	0	600	1 sturgeon	wind	5	195	0	600	1 sturgeon	7	231
14	14:43		48	187	12	4000	1 sturgeon	sun	52	178	13	4000		52	235
15	15:03		26	123	3	1500		sun	27	125	3	1500		27	152
16	15:22		24	146	4	600		sun	25	118	3	600		25	170
Total			265	3374	22				349	3168	23			363	3699
Weather am:	sunny, warm, light winds						clear sky, light wind, excellent visibility								
Weather pm:	sunny, warm, light winds						clear sky, light wind, excellent visibility								
Comments:							~500 of s13 sox & 2000 of s14 sox at Nautley confluence. in lower Nautley ~200 sox + 500 at Nautley bridge								

Flight #: 3
 Date: 13-Sep-06
 Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: Byron Nutton DFO						Back: Colin Barnard Alcan						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:00	cloud	5	74	0				3	90	0			5	93
2	11:05	cloud	41	41	0				32	60	0			41	92
3A	11:13	cloud	153	177	1				144	200	2			153	344
3B	11:19	cloud	199	121	2				141	140	3			199	320
4	11:29	cloud	130	77	3	60			180	21	3	60		180	207
5	11:38	cloud	285	119	3				216	200	4			285	416
6	11:46	cloud	302	170	2				300	182	2			302	482
7	11:59	cloud	13	21	0				8	30	1			13	38
8	12:05	sun	101	24	1				75	41	1			101	125
9	12:15	cloud	52	9	5				60	15	5			60	75
10	12:20	cloud	117	71	3				100	95	3			117	195
11	12:30	cloud/wind	317	33	6				297	56	6			317	353
12	13:16	cloud	325	99	6				386	64	7			386	450
13	13:25	cloud	37	25	1	120			58	16	1	120		58	74
14	13:43	cloud	211	41	5	3000			204	52	5	3000		211	256
15	14:06	cloud	246	45	2	300			265	55	2	300		265	320
16	14:25	sun	146	11	5	1000			158	10	5	1000		158	168
Total			2680	1158	45				2627	1327	50			2851	4008
Weather am:	light wind, broken overcast, vis OK but not great, couldn't see into deeper holes/runs						light winds/gusts, high broken to blue								
Weather pm:	light wind, clouds building, vis OK but not great, couldn't see into deeper holes/runs						higher winds, more cloud, light rain showers								
Comments:	Nautley - 2000 sox in lower end, 2000 sox below bridge, no fishing observed. 2500 of sox in s14 at Nautley confluence						generally poor visibility especially in the deep holes and below Nautley River								

Flight #: 4
Date: 20-Sep-06
Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: Colin Barnard Alcan						Back: Byron Nutton DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other		
1	11:08		60	14	0			poor	36	0	0			60	74
2	11:12		153	10	0			poor	69	0	0			153	163
3A	11:15		455	25	9			poor	284	28	9			455	480
3B	11:27		640	33	6			ok	608	35	10			640	673
4	11:39		250	36	8			ok	211	36	7			250	286
5	11:50		398	20	18	15		ok	379	25	14	12		398	418
6	12:01		430	31	17			ok	399	32	15			430	461
7	12:18		23	15	2			good	19	12	3			23	38
8	12:24		101	14	1			good	104	4	1			104	115
9	12:36		81	4	14			excellent	81	3	12			81	85
10	12:44		204	18	9	12		excellent	198	22	10	12		204	222
11	12:56		272	15	13			excellent	240	17	14			272	287
12	13:45		330	13	31	12		good	295	16	32	12		330	343
13	13:56		77	12	16	60		good	65	12	16	60		77	89
14	14:14		305	30	15	900+		wind	301	21	14	1000		305	335
15	14:40		220	15	14	700		good	214	13	11	700		220	235
16	15:04		298	6	15	1200		good	272	0	14	1200		298	304
Total			4297	311	188				3775	276	182			4300	4608
Weather am:	rain, clouds, winds light and gusting						cloud, rain, fog...getting brighter								
Weather pm:	more rain, clouds, lighter winds						clearing up, getting brighter, some blue patches, no rain wind kicking up around Nautley								
Comments:	reasonable visibility overall						sox in s 5 & 10 spawning. No fish in the Nautley In back seat had real problems with visibility in sec 1, 2, 3A								

Flight #: 5
 Date: 27-Sep-06
 Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: Byron Nutton DFO						Back: Colin Barnard Alcan						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	10:12		102	5	0				132	4	0			132	136
2	10:17		163	2	11				195	2	10			195	197
3A	10:23		298	4	72				394	3	72			394	397
3B	10:30		400	1	106				378	1	96			400	401
4	10:40		94	13	139	30			96	10	117	50		96	107
5	10:51		195	2	89	100			180	3	87	100		195	197
6	11:00		116	4	116	25			137	4	136	25		137	141
7	11:12		10	1	14				12	1	22			12	13
8	11:15		34	0	11	250			39	1	10	250		39	40
9	11:31		28	0	31				37	0	38			37	37
10	11:37		27	0	35				33	0	38			33	33
11	11:47		39	0	71	150			40	0	73	150		40	40
12	12:40		36	5	67	450			49	4	42	450		49	53
13	12:47	wind	6	3	28	70			7	3	30	70		7	10
14	13:05	green	85	1	73	250			99	1	73	250		99	100
15	13:24	wind	35	0	43	700			41	0	51	700		41	41
16	13:41		89	0	60	400			99	2	65	400		99	101
Total			1757	41	966				1968	39	960			2005	2044
Weather am:	high broken white cloud with sunny patches, getting brighter						high broken cloud /sun/light winds								
Weather pm:	mostly sunny, some high cloud, light winds with gusts						more sun/more wiind								
Comments:	excellent visibility. No fish or fishing observed in Nautley sox in s5 spawning, rest migrating						rough counting in PM								

Flight #: 1
 Date: 5-Sep-07
 Pilot: D. Schilling, Pacific Western Helicopters

Observers Representing		Front: Byron Nutton DFO						Back: Colin Barnard Alcan						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:12	cloud	0	7	0				0	15	0			0	15
2	11:16	cloud	0	12	0				0	20	0			0	20
3A	11:21	cloud	0	8	0				0	18	0			0	18
3B	11:24	cloud	0	8	0				0	11	0			0	11
4	11:30	cloud	1	13	0				1	21	0			1	22
5	11:35	cloud	0	4	0				0	8	0			0	8
6	11:40	cloud	0	5	0				0	7	0			0	7
7	11:48	cloud	0	0	0				0	1	0			0	1
8	11:53	sun	0	3	0				0	4	0			0	4
9	12:00	sun/cloud	0	1	0				0	3	0			0	3
10	12:05	sun/cloud	0	7	0				0	8	0			0	8
11	12:13	sun/cloud	0	10	0				0	13	0			0	13
12	12:24	sun/cloud	0	0	0				0	0	0			0	0
13	12:31	sun/cloud	0	17	0				0	17	0			0	17
14	14:50	cloud/rain	0	7	0	100			0	6	0	100		0	7
15	15:03	cloud/rain	0	1	0				0	1	0			0	1
16	15:16	cloud	0	3	0	50			0	3	0	50		0	3
Total			1	106	0				1	156	0			1	158
Weather am:	high overcast, high water, high turbidity						clouds breaking to blue, windy								
Weather pm:	sunny w broken clouds, to full clouds and light rain						rain, cloud, wind								
Comments:	weather somewhat poor especially below the Nautley, but viewing entirely poor due to high water and high turbidity						water high and turbid above Nautley water very turbid below Nautley								

Flight #: 2
 Date: 12-Sep-07
 Pilot: D. Schilling, Pacific Western Helicopters

Observers Representing		Front: Colin Barnard Alcan						Back: Byron Nutton DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:06		0	6	0			sun	0	4	0			0	6
2	11:11		14	11	0			shadow	11	7	0			14	25
3A	11:17		26	60	0			sun	20	46	0			26	86
3B	11:23		82	104	0			sun	71	84	0			82	186
4	11:35		80	32	0			sun	67	35	0			80	112
5	11:48		96	12	0	6		sun	58	23	0			96	108
6	11:59		13	30	0	10		sun	9	28	0			13	43
7	12:11		1	4	0			sun	1	4	0			1	5
8	12:18		6	3	0			green	4	1	0			6	9
9	12:29		4	0	0			green	4	0	0			4	4
10	12:35		30	7	0			sun	25	6	0			30	37
11	12:44		101	20	0			sun	90	15	0			101	121
12	12:56		30	11	2	25		sun	20	11	2	25		30	41
13	13:04		5	0	0			sun	3	0	0			5	5
14	13:17		15	1	0			sun	17	2	0			17	19
15	14:26		17	9	1			sun	17	4	1			17	26
16	14:48		50	6	1	200		sun	40	8	1	200		50	56
Total			570	316	4				457	278	4			572	889
Weather am:	clear, blue skies, light winds						clear, light wind								
Weather pm:	clear, blue skies, light winds						clear, light wind								
Comments:	water still turbid enough to not allow viewing into deeper holes						water lower/clearer, fairly good vis spawning areas but could not see into deep, esp. below Nautley. ~3K sox in Nautley								

Flight #: 3
Date: 19-Sep-07
Pilot: D. Schilling, Pacific Western Helicopters

Observers Representing		Front: Byron Nutton DFO						Back: Colin Barnard Alcan							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:27	shadow	5	2	0				7	3	0			7	10
2	11:29	shadow	19	9	0				37	3	0			37	40
3A	11:36	sun	106	28	0	25			200	17	0	25		200	217
3B	11:41	sun	176	25	0	50			210	35	0	60		210	245
4	11:51	sun	78	16	6	6			107	11	5	30		107	118
5	12:01	sun	49	11	7				70	8	8	20		70	78
6	12:09	sun	44	8	5				52	8	5			52	60
7	12:22	sun	6	0	1				7	0	1			7	7
8	12:28	sun	14	0	3				15	0	3			15	15
9	12:38	sun	1	0	0				2	0	0			2	2
10	12:43	sun	31	4	2				38	3	2			38	41
11	12:53	sun	71	11	1				86	11	1			86	97
12	13:04	sun	21	7	5				27	3	5			27	30
13	13:11	sun	1	1	2				1	0	1			1	2
14	13:25	sun	48	0	1				53	0	1			53	53
15	14:40	cloud	34	2	3				38	2	2			38	40
16	15:01	cloud/wind	48	5	5				66	2	6			66	68
Total			752	129	41				1016	106	40			1016	1123
Weather am:		clear, but had to wait for fog to lift						heavy fog in early AM, broken to blue, light wind but good sun							
Weather pm:		high overcast, but vis still generally good						high broken, mainly blue sky							
Comments:		~2000 sox in nautley						water quality improved, good vis							

Flight #: 4
 Date: 26-Sep-07
 Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: Colin Barnard Alcan						Back: Byron Nutton DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:11		7	0	0			cloud	1	0	0			7	7
2	11:15		60	0	0			sun	44	0	0			60	60
3A	11:21		76	4	5			sun	57	7	5			76	80
3B	11:27		130	2	15	20		sun	107	4	16	20		130	132
4	11:36		30	1	13			sun	31	3	15			31	34
5	11:45		27	1	7			sun	26	2	7			27	28
6	11:52		17	2	4			sun	15	0	3			17	19
7	12:03		2	0	3			sun	1	0	3			2	2
8	12:10		9	1	0			sun	9	1	0			9	10
9	12:19		1	0	1			sun	1	0	1			1	1
10	12:25		16	2	3			sun	16	0	3			16	18
11	12:35		13	0	11			sun	9	0	11			13	13
12	12:45		8	2	5			sun	8	1	6			8	10
13	12:51		0	0	0	100		sun	0	0	0	150		0	0
14	13:05		21	0	0			sun	14	0	0			21	21
15	13:21		14	0	0			sun	11	0	1			14	14
16	14:19		10	0	2	15		cloud	8	0	2	20		10	10
Total			441	15	69				358	18	73			442	459
Weather am:	clear to blue, light winds						excellent visibility, some deep, dark holes								
Weather pm:	winds picking up slowly, clear to blue						excellent visibility, some deep, dark holes								
Comments:	best visibility yet						no sox in Nautley								

Flight #: 5
 Date: 3-Oct-07
 Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: Byron Nutton DFO						Back: Colin Barnard Alcan							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:02	cloud	2	0	1				4	0	1			4	4
2	11:05	cloud	26	0	0				28	0	0			28	28
3A	11:11	cloud	36	5	2				41	5	2			41	46
3B	11:16	cloud	38	3	5	10			43	3	5	10		43	46
4	11:23	cloud	4	0	15				5	0	16			5	5
5	11:32	cloud	8	0	7				8	0	7			8	8
6	11:38	sun	5	0	3				5	0	3			5	5
7	11:47	sun	0	0	0				0	0	0			0	0
8	11:52	deep/gree	3	0	0				3	0	0			3	3
9	11:59	cloud	1	0	0				1	0	0			1	1
10	12:03	sun	4	0	1				5	0	1			5	5
11	12:10	cloud	0	0	5				0	0	5			0	0
12	12:18	cloud	2	0	5				2	0	5			2	2
13	12:23	cloud	0	0	0				0	0	0			0	0
14	12:33	sun	0	0	7				0	0	7			0	0
15	12:46	cloud	6	0	0				6	0	0			6	6
16	13:47	sun	10	0	2	50			11	0	2	50		11	11
Total			145	8	53				162	8	54			162	170
Weather am:	high light overcast, no wind						high broken cloud, no wind, calm								
Weather pm:	broken cloud, system moving in but we were ahead of it.						high broken cloud, light winds								
Comments:	no sockeye in Nautley						good vis								

Flight #: 1
 Date: 3-Sep-08
 Pilot: K. Knight - PWH

Observers Representing		Front: Colin Barnard Rio-Tinto Alcan						Back: Len Seefried DFO							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:32		0	11	0	0	0		0	9	0	0	0	0	11
2	11:36		0	2	0	0	0		0	2	0	0	0	0	2
3A	11:42		0	111	0	6	0		0	137	0	0	0	0	137
3B	11:49		13	125	0	0	0		11	81	0	6	0	13	138
4	11:57		14	137	0	2	0		7	157	0	2	0	14	164
5	12:08		10	127	0	0	0		7	103	0	0	0	10	137
6	12:15		6	96	0	0	0		2	91	0	0	0	6	102
7	12:29		0	11	0	0	0		0	11	0	0	0	0	11
8	12:36		0	10	0	0	0		0	9	0	0	0	0	10
9	12:47		0	33	0	0	0		0	33	0	0	0	0	33
10	12:54		2	24	0	0	0		0	28	0	0	0	2	28
11	13:05		13	70	0	60	0		12	76	0	35	0	13	88
12	13:18		27	20	0	0	0		19	40	0	0	0	27	59
13	13:28		0	33	0	0	0		0	44	0	0	0	0	44
14	13:43		8	16	0	0	0		2	16	0	0	0	8	24
15	14:01		0	0	0	0	0		0	1	0	60	0	0	1
16	15:31		20	25	1	100	0		0	51	1	100	0	20	51
Total			113	851	1	168	0		60	889	1	203	0	113	1040
Weather am:	calm, warm, sunny, high scattered clouds						partly cloudy, calm								
Weather pm:	calm, warm, broken & sunny, water quite turbid below Nautley						partly cloudy, high altitude haze, calm								
Comments:	Sockeye in Nautley ~ 2000 at bridge						~ 2000 SK in Nautley River								

Flight #: 2
Date: 10-Sep-08
Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: Len Seefried DFO						Back: Colin Barnard Rio-Tinto Alcan							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:40		0	42	0	0	0		0	41	0	0	0	0	42
2	11:44		4	17	0	0	0		4	32	0	0	0	4	36
3A	11:50		67	114	0	0	0		56	150	0	0	0	67	206
3B	11:56		223	125	0	6	0		329	200	0	6	0	329	529
4	12:06		135	66	2	75	0		200	17	0	75	0	200	217
5	12:16		162	62	0	12	0		200	51	1	12	0	200	251
6	12:24		114	124	4	0	0		191	77	6	0	0	191	268
7	12:38		16	0	0	0	0		13	0	0	0	0	16	16
8	12:44		5	4	1	0	0		17	4	1	0	0	17	21
9	12:53		24	14	0	0	0		32	2	0	0	0	32	38
10	12:59		5	5	0	0	0		3	0	0	0	0	5	10
11	13:08		270	29	0	25	0		230	32	0	25	0	270	299
12	13:18		179	3	0	0	0		250	22	0	0	0	250	272
13	13:26		28	9	1	130	0		42	6	0	130	0	42	48
14	13:41		46	0	0	0	0		52	0	0	0	0	52	52
15	13:57		30	0	0	40	0		29	0	0	40	0	30	30
16	15:21		80	9	3	250	0		145	7	2	250	0	145	152
Total			1388	623	11	538	0		1793	641	10	538	0	1850	2487
Weather am:		16 deg. C, high overcast, light breeze						Lt winds, high broken cloud, some sun							
Weather pm:		14 deg. C, overcast, periodic light showers, light breeze						Lt winds, overcast, Lt rain showers							
Comments:		Nautley River ~ 3,000 SK migrating/holding below bridge						~ 3000 Sockeye below Nautley River bridge							

Flight #: 3
Date: 17-Sep-08
Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: Colin Barnard Rio-Tinto Alcan						Back: Len Seefried DFO							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:19		44	3	0	0	0		29	2	0	0	0	44	47
2	11:24		89	3	0	0	0		77	2	0	0	0	89	92
3A	11:31		280	14	5	12	0		161	9	5	12	0	280	294
3B	11:38		700	29	8	15	0		641	22	8	15	0	700	729
4	11:49		290	15	23	30	0		221	31	23	30	0	290	305
5	12:01		230	17	6	50	0		199	28	6	50	0	230	247
6	12:09		238	10	13	50	0		153	8	13	50	0	238	248
7	12:22		8	2	0	0	0		8	2	0	0	0	8	10
8	12:28		12	0	0	0	0		26	0	0	0	0	26	26
9	12:37		66	0	6	0	0		72	2	6	0	0	72	74
10	12:44		55	4	4	0	0		59	4	4	0	0	59	63
11	12:53		304	13	7	30	0		367	11	7	30	0	367	378
12	13:04		218	60	37	25	0		210	9	37	25	0	218	278
13	13:12		48	3	5	2000	0		37	3	5	2000	0	48	51
14	12:27		190	3	12	200	0		168	2	12	200	0	190	193
15	13:47		277	4	14	120	0		204	4	14	120	0	277	281
16	15:16		161	9	51	100	0		129	7	51	100	0	161	170
Total			3210	189	191	2632	0		2761	146	191	2632	0	3297	3486
Weather am:															
Weather pm:															
Comments:															

Flight #: 4
Date: 24-Sep-08
Pilot: Darren McCully, Pacific Western Helicopters

Observers Representing		Front: Len Seefried DFO						Back: Colin Barnard Rio-Tinto Alcan							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:27		20	0	0	0	0		29	0	0	0	0	29	29
2	11:31		155	0	0	0	0		142	0	0	0	0	155	155
3A	11:38		231	0	30	20	0		260	0	23	20	0	260	260
3B	11:46		372	3	80	30	0		402	3	72	30	0	402	405
4	12:00		73	3	113	0	0		117	3	107	0	0	117	120
5	12:17		143	0	43	15	0		124	0	37	15	0	143	143
6	12:28		96	0	37	0	0		105	0	32	0	0	105	105
7	12:40		4	0	5	0	0		2	0	3	0	0	4	4
8	12:46		3	0	6	0	0		4	0	2	0	0	4	4
9	12:59		34	0	9	0	0		20	0	8	0	0	34	34
10	13:06		12	0	14	0	0		13	0	15	0	0	13	13
11	13:15		65	0	33	0	0		66	0	39	0	0	66	66
12	13:26		37	0	51	0	0		30	0	77	0	0	37	37
13	13:32		10	0	33	100	0		7	0	35	100	0	10	10
14	13:46		18	0	12	0	0		21	0	9	0	0	21	21
15	14:01		21	0	33	0	0		25	0	35	0	0	25	25
16	15:26		41	0	36	75	0		45	0	23	0	0	45	45
Total			1335	6	535	240	0		1412	6	517	240	0	1470	1476
Weather am:		cool, light wind, light rain, overcast						rain, light winds, overcast							
Weather pm:		cool, light rain, wind gusts, overcast						rain, light winds, overcast							
Comments:		0 SK @ Nautley Bridge						No sockeye at Nautley Bridge							

Flight #: 5
Date: 1-Oct-08
Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: Colin Barnard Rio-Tinto Alcan						Back: Len Seefried DFO							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:37		37	0	2	0	0		38	0	2	0	0	38	38
2	11:43		40	0	10	0	0		36	0	9	0	0	40	40
3A	11:49		94	0	65	15	0		81	0	56	15	0	94	94
3B	11:54		58	0	90	1	0		50	0	81	1	0	58	58
4	12:02		1	0	120	0	0		2	0	109	0	0	2	2
5	12:10		8	0	59	0	0		8	0	46	0	0	8	8
6	12:17		2	0	29	20	0		2	0	27	20	0	2	2
7	12:26		0	0	4	0	0		0	0	4	0	0	0	0
8	12:31		0	0	0	0	0		0	0	0	0	0	0	0
9	12:39		0	0	13	0	0		0	0	13	0	0	0	0
10	12:44		2	0	4	0	0		2	0	4	0	0	2	2
11	12:51		5	0	12	100	0		5	0	10	100	0	5	5
12	13:00		3	0	22	0	0		3	0	21	0	0	3	3
13	13:04		1	0	8	30	0		1	0	7	30	0	1	1
14	13:16		1	0	19	40	0		1	0	12	40	0	1	1
15	13:30		4	0	20	0	0		4	0	15	0	0	4	4
16	14:31		12	0	21	150	0		10	0	14	150	0	12	12
Total			268	0	498	356	0		243	0	430	356	0	270	270
Weather am:															
Weather pm:															
Comments:															

Flight #: 1
 Date: 2-Sep-09
 Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: Shane Kalyn - DFO						Back: Justus Benckhuysen - RTA							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:02		0	0	0	0			0	0	0			0	0
2	11:08		0	14	0	0			0	11	0			0	14
3A	11:13		2	110	0	0			0	108	0			2	112
3B	11:18		3	95	0	0			5	71	0			5	98
4	11:26		6	108	1	0			7	80	0			7	114
5	11:35		15	193	0	0			0	165	0			15	208
6	11:43		7	51	0	0			4	47	1			7	58
7	11:55		0	11	1	0			0	5	0			0	11
8	12:02		0	5	0	0			1	10	0			1	11
9	12:13		0	10	0	0			0	14	0			0	14
10	12:20		0	29	0	0			1	17	0			1	29
11	12:32		0	30	1	0			0	11	0			0	30
12	12:43		13	89	2	0			5	71	2			13	102
13	12:49		0	109	0	0			0	69	0			0	109
14	13:07		0	9	0	80			1	9	0			1	10
15	13:31		0	20	2	25			3	27	2	24		3	30
16	13:51		0	28	0	53			0	16	1	7		0	28
Total	14:17		46	911	7	158			27	731	6	31		55	978
Weather am:	sunny, no wind						sun, part cloudy, light wind. flow at Vanderhoof: 102 cms								
Weather pm:	partial cloud (12:15 - 12:45); return to full sun. Water 18C														
Comments:	l/o @ 9:01 (PG), Vanderhoof airport @ 09:28. ~ 400-500 SK in Nautley R. holding. Vanderhoof airport @ 14:20.														

Flight #: 2
 Date: 10-Sep-09
 Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: B. Nutton - DFO						Back: Justus B. - RTA							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:00		0	23	0	0			0	20	0	0		0	23
2	11:03		9	43	0	0			4	39	0	0		9	52
3A	11:09		31	181	1	0			29	170	1	0		31	212
3B	11:17		58	152	0	0			62	148	0	0		62	210
4	11:28		55	72	1	0			52	72	1	0		55	127
5	11:37		95	148	0	30			102	105	0	30		102	243
6	11:46		109	55	2	0			112	33	8	0		112	164
7	11:59		9	17	0	0			6	16	0	0		9	26
8	12:06		26	2	0	0			14	8	0	0		26	28
9	12:17		20	15	2	0			14	14	1	0		20	35
10	12:23		12	3	1	0			14	4	1	0		14	18
11	12:33		89	18	0	0			80	20	0	0		89	107
12	12:49		153	51	1	0			141	49	2	0	sturgeon	153	204
13	12:56		41	13	0	0			26	18	0	0		41	54
14	13:10		61	12	0	0			20	39	0	0		61	73
15	13:38		37	2	3	15			2	32	3	0		37	39
16	13:58		40	54	2	40			50	35	2	0		50	94
Total			845	861	13	85			728	822	19	30		871	1709
Weather am:	light breeze, light high overcast						part clear, calm								
Weather pm:	light clouds						overcast								
Comments:	~ 500 SK @ Nautley R. bridge; no fishing obs.						sturgeon observed in reach 12 was ~ 3-4 feet long. Flow at Vanderhoof 95 cms								

Flight #: 3
 Date: 16-Sep-09
 Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: Byron Nutton - DFO						Back: Justus B. - RTA							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	10:33		5	39	0	0			8	24	0			8	44
2	10:37		32	4	0	0			32	3	0			32	36
3A	10:43		89	21	3	50			79	20	4			89	110
3B	10:50		213	23	2	0			208	24	3			213	236
4	10:58		102	22	7	0			87	10	9			102	124
5	11:07		206	42	9	60			180	42	9			206	248
6	11:15		139	9	8	0			131	11	10			139	148
7	11:27		11	0	0	0			9	0	0			11	11
8	11:32		20	0	0	0			20	1	0			20	21
9	11:41		33	2	4	30			27	1	5			33	35
10	11:48		15	0	8	0			20	2	8			20	22
11	11:56		80	2	13	0			60	4	8			80	82
12	12:09		157	0	35	0			142	1	23			157	157
13	12:18		18	5	14	0			19	2	13			19	23
14	12:59		54	0	13	0			24	0	9			54	54
15	13:18		23	0	12	0			19	2	11			23	23
16	13:37		66	4	22	0			39	0	19			66	70
Total			1263	173	150	140			1104	147	131			1272	1444
Weather am:	high overcast, brisk wind						overcast, windy								
Weather pm:	increase in cloud cover, windy; poorer vis. Below nautley.														
Comments:	~ 100 SK below nautley bridge; 1 couple fishing						85 cms at Vamderhoof								

Flight #: 4
Date: 23-Sep-09
Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: Dan Tomlinson - DFO						Back: Justus B. - RTA							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	10:44		16	0	1	0			9	0	1	0		16	16
2	10:47		32	3	5	0			34	2	3	0		34	36
3A	10:54		124	15	28	25			170	5	27	30		170	175
3B	10:59		155	36	46	0			182	0	29	0		182	191
4	11:07		83	24	17	0			47	2	41	0		83	107
5	11:15		110	9	50	15			84	1	77	15		110	119
6			64	21	61	0			64	0	33	0		64	85
7	11:29		6	2	11	2			5	0	9	0		6	8
8	11:36		16	4	10	0			17	0	1	0		17	20
9			6	2	17	15			8	0	17	15		8	8
10	11:52		5	0	26	0			4	0	10	0		5	5
11	12:01		25	4	19	0			21	0	24	0		25	29
12	12:11		43	1	118	0			50	0	94	0		50	50
13	12:17		6	0	34	0			4	0	14	0		6	6
14			16	0	38	0			20	0	24	0		20	20
15	13:09		25	0	39	0			24	0	34	0		25	25
16	13:22		36	0	36	10			42	0	17	10		42	42
Total			768	121	556	67			785	10	455	70		863	942
Weather am:		warm, +15-20C, clear, s. wind.						sun, no wind.							
Weather pm:		hot, +20-30C, clear, s. wind.													
Comments:															

Flight #: 5
 Date: 30-Sep-09
 Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing Front: Don Knoop - DFO

Back: Justus B. - RTA

River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:18		10	0	3	0			11	0	0			11	11
2	11:23		24	0	12	0			22	0	0			24	24
3A	11:29		53	0	40	50			50	0	39			53	53
3B	11:35		63	0	44	0			53	0	43			63	63
4	11:42		11	0	57	0			12	0	61			12	12
5	11:50		16	0	24	15			13	0	23			16	16
6	11:56		7	0	46	0			7	0	39			7	7
7	12:06		4	0	4	0			4	0	3			4	4
8	12:13		3	0	3	0			4	0	3			4	4
9	12:22		0	0	18	0			1	0	14			1	1
10	12:28		0	0	10	0			1	0	8			1	1
11	12:37		1	0	10	0			1	0	6			1	1
12	12:46		3	0	36	0			2	0	53			3	3
13	12:51		1	0	19	0			0	0	6			1	1
14	13:03		0	0	4	0			0	0	1			0	0
15	13:17		0	0	7	0			0	0	4			0	0
16	13:31		5	0	10	0			5	0	6			5	5
Total			201	0	347	65			186	0	309			206	206

Weather am:

fog; sunny on top

part cloud; light wind

Weather pm:

sunny; few clouds

mostly cloudy

Comments:

Flow at Vanderhoof = 53.5 cms

Flight #: 1
Date: 1-Sep-10
Pilot: Steve Tanaka, Pacific Western Helicopters

Observers Representing		Front: Mark Potyrala DFO						Back: Justus Benckhuysen RTA							
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	10:55	sun/no wir	0	0	0				0	0	0			0	0
2	10:58	sun/wind	0	0	0				0	0	0			0	0
3A	11:03	sun/wind	0	30	0				0	18	0			0	30
3B	11:14	sun/no wir	13	197	1				14	204	1			14	218
4	11:30	sun/wind	61	145	7				44	134	6			61	206
5	11:46	sun/wind	9	106	0				11	87	0			11	115
6	11:59	sun/wind	6	78	4				6	60	4			6	84
7	12:15	sun/wind	3	31	11	7			4	28	5			4	34
8	12:26	sun/wind				present								0	0
9		sun/wind				present								0	0
10		sun/wind				present								0	0
11		sun/wind	4	186	13	30			21	146	10			21	190
12	13:53	sun/wind	22	405	1	present			52	367	2			52	427
13	14:07	cloud/wind	0	203	1	present	sturgeon		0	141	3			0	203
14	15:26	cloud/wind	3	113	13	present			7	23	10			7	116
15	16:05	cloud/wind	12	558	28	present			15	518	24			15	570
16	17:24	cloud/wind				present								0	0
Total			133	2052	79				174	1726	65			191	2193
Weather am:	Sunny with cloudy patches and a minor breeze						Cloudy								
Weather pm:	Increasing cloud and wind						Windy and mostly overcast								
Comments:	Wind and cloud cover increased during survey Deep water and ripple made visibility poor Not all sockeye were enumerated Missed Section breaks between Sections 8-9-10-11 and 15-16 due to crew inexperience						Windier and cloudier as day progressed. Water deep in lower reaches added to poor visibility Lots of sockeye and 1 large sturgeon								

Flight #: 2
 Date: 8-Sep-10
 Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: Byron Nutton DFO						Back: Mark Potyrala DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:07	sun	3	43	0			sun	2	41	0			3	46
2	11:11	sun	3	22	0	6		sun	4	28	0	9		4	32
3A	11:18	sun	40	189	0	300		sun	42	182	0	180		42	229
3B	11:27	sun/cloud	240	251	3			sun/cloud	247	271	1			247	518
4	11:41	sun/cloud	107	260	14	12		sun/cloud	105	257	14	10		107	367
5	11:54	sun	211	299	15	350		sun	187	298	17	220		211	510
6	12:07	sun	136	101	8			sun	122	112	8			136	237
7	12:20	cloud	30	17	14	6		cloud	35	29	14	6		35	64
8	12:27	cloud	27	17	18	8		cloud	18	25	18	8		27	44
9	12:39	cloud	39	42	14	50		cloud	44	37	14	40		44	81
10	12:46	cloud	16	29	1	20		cloud	13	32	1	20		16	45
11	12:55	cloud	257	150	13			cloud	199	209	13			257	408
12	13:09	cloud	402	204	5	25		cloud	389	224	5	20		402	613
13	13:18	cloud	53	64	4	20		cloud	48	72	4	35		53	120
14	14:00	cloud	46	38	3	85		cloud	50	38	3	70		50	88
15	14:20	sun/cloud	99	45	3	130		sun/cloud	96	49	3	130		99	145
16	15:11	sun/cloud	235	164	8	1020		sun/cloud	204	206	8	1020		235	410
Total			1944	1935	123				1805	2110	123			1968	3957
Weather am:	Broken high overcast						Sunny with some cloud								
Weather pm:	Broken high overcast						Cloud with some sun and a light breeze								
Comments:	~550 sockeye in Nautley						Visual observation of ~ 550 sockeye in Nautley River, most sitting below bridge, with unknown amount situated at Nautley/Nechako confluence.								

Flight #: 3
 Date: 15-Sep-10
 Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: Mark Potyrala DFO						Back: Byron Nutton DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:20	cloud	6	2	0	50		cloud	6	2	0	50		6	8
2	11:28	cloud	47	0	0	20		cloud	44	0	0	30		47	47
3A	11:33	cloud	168	97	16	150s/300m		cloud	169	89	16	150s/100m		169	265
3B	11:43	cloud	623	70	40	30		cloud	570	52	35	50m		623	693
4	11:57	cloud	216	81	38	30s		cloud	218	66	42	30s		218	297
5	12:07	cloud	341	120	45	200s/15m		cloud	355	115	45	250s/20m		355	470
6	12:19	cloud	200	74	27			cloud	227	40	24			227	274
7	12:32	cloud	22	7	9			cloud	25	8	9			25	33
8	12:39	cloud	72	14	2	40s		cloud	80	4	2	40s		80	86
9	12:50	cloud	55	4	29			cloud	54	4	31			55	59
10	12:57	cloud	39	19	4			cloud	40	17	4			40	58
11	13:05	cloud	332	19	13			cloud	338	19	13			338	357
12	13:19	cloud	530	56	27			cloud	530	33	29			530	586
13	13:29	cloud	111	10	16	20		cloud	93	9	15	20m		111	121
14	14:07	sun	142	14	9	150		sun	152	9	8	200m		152	161
15	14:31	sun	379	42	15	230		sun	375	38	18	250m		379	421
16	15:32	sun	384	35	26	800		sun	358	29	29	800m		384	419
Total			3667	664	316				3634	534	320			3739	4355
Weather am:	Cloudy but with good visibility						Overcast but good to very good visibility								
Weather pm:	Clearing as survey progressed with very good visibility for Sections 14-16						Broken overcast with mostly clear sky								
Comments:	Low water in Nautley River with no sockeye visible and no fishers						Nautley R. very low, no sox observed, no fishing Excellent visibility d/s of Nautley R.								

Flight #: 4
 Date: 22-Sep-10
 Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: Byron Nutton DFO						Back: Mark Potyrala DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:08	sun	20	7	0	40s/10m		sun-calm	20	8	0	40s/10m		20	28
2	11:11	sun	44	5	0			sun-calm	50	8	0			50	58
3A	11:17	sun	246	16	17	200s		sun-calm	236	14	23	200s		246	262
3B	11:23	sun	500	16	89	20s		sun-calm	480	21	80	20s		500	516
4	11:34	sun	282	21	115	20s		sun-calm	297	18	117	20s		297	315
5	11:43	sun	327	8	38	100s		sun-calm	342	11	62	70s		342	353
6	11:51	sun	237	14	67			sun-calm	223	12	68			237	251
7	12:02	sun	12	1	15	5m		sun-calm	13	1	10	5		13	14
8	12:07	sun	57	2	6	100s		sun-calm	60	3	5	60s		60	63
9	12:14	sun	78	0	51			sun-calm	76	0	54			78	78
10	12:21	sun	83	0	12			sun-calm	83	0	11			83	83
11	12:28	sun	255	6	63			sun-calm	252	8	64			255	261
12	12:39	sun	373	2	138			sun-calm	373	2	149			373	375
13	12:46	sun	76	0	57			sun-calm	71	0	86	65s		76	76
14	13:26	sun	158	0	39	100m		sun-calm	167	0	39	100		167	167
15	13:46	sun	295	0	83	250m		sun-calm	333	0	87	250		333	333
16	14:06	sun	260	7	91	200m	sturgeon	sun-calm	252	9	91	215	sturgeon	260	267
Total			3303	105	881				3328	115	946			3390	3500
Weather am:	Sunny and calm with excellent visibility						Sunny and calm with excellent visibility								
Weather pm:	Sunny and calm with excellent visibility						Sunny and calm with excellent visibility								
Comments:	~500 sox in Nautley R. - very low water ~5-6 ft. sturgeon ~2Km u/s of Hwy 27 Bridge						~450 sox in Nautley R. - very low water ~6 ft sturgeon in Section 16 (Km 146)								

Flight #: 5
 Date: 29-Sep-10
 Pilot: Ken Knight, Pacific Western Helicopters

Observers Representing		Front: Byron Nutton DFO						Back: Phil Taylor DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:00	shadow	16	0	0	50s			19	0	0	50s		19	19
2	11:05	sun	33	0	0				27	0	1			33	33
3A	11:11	sun	126	2	65	200s			111	2	65	225		126	128
3B	11:16	sun	187	1	128	60s			234	2	120	60		234	236
4	11:27	sun	70	0	158	10m			76	1	150	10		76	77
5	11:35	sun	68	0	68	30s/10m			61	0	83	30s/10m		68	68
6	11:42	sun	56	3	74				57	2	77			57	59
7	11:51	sun	2	1	6				2	0	7			2	3
8	11:56	sun	21	0	20	75s			16	0	19	75		21	21
9	12:06	sun	17	0	44				18	0	44			18	18
10	12:11	sun	11	0	34				13	0	24			13	13
11	12:19	sun	32	0	97				37	0	95			37	37
12	12:30	sun	45	0	167				43	0	199			45	45
13	12:36	sun	5	0	35				8	0	63			8	8
14	13:22	sun	25	0	23				26	0	28			26	26
15	13:38	sun	26	0	31	20s/12m			23	0	52	20s/12m		26	26
16	13:57	sun	60	0	109	40m			59	0	64	40m		60	60
Total			800	7	1059				830	7	1091			869	877
Weather am:	clear blue sky, winds calm to very light														
Weather pm:	clear blue sky, winds calm to very light														
Comments:	~500 sox at Nautley bridge + ~dozen carcasses excellent viewing all day														

Flight #: 1
 Date: 31-Aug-11
 Pilot: Ken Knight Pacific Western Helicopters

Observers Representing		Front: Mark Potyrala DFO						Back: Jesse Laframboise DWB						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:50	Sun	0	0	0	0		Sun	0	0	0	0		0	0
2	11:53	Sun	0	0	0	0		Sun	0	0	0	0		0	0
3A	11:58	Sun	0	5	0	0		Sun	0	4	0	0		0	5
3B	12:02	Sun	0	83	0	0		Sun	0	82	0	0		0	83
4	12:11	Sun	5	55	0	0		Sun	4	53	0	0		5	60
5	12:19	Sun	0	64	0	0		Sun	1	64	0	0		1	65
6	12:27	Sun	4	117	0	0		Sun	8	106	0	0		8	121
7	12:45	Sun/cloud	0	7	0	0		Sun/cloud	0	9	0	0		0	9
8	12:52	Sun/cloud	0	1	0	4		Sun/cloud	0	1	0	4		0	1
9	13:04	Cloud/Sun	0	0	0	0		Cloud/Sun	0	0	0	0		0	0
10	13:10	Cloud/Sun	0	18	0	0		Cloud/Sun	0	18	0	0		0	18
11	13:24	Cloud/Sun	23	151	0	0		Cloud/Sun	23	130	0	0		23	174
12	13:42	Cloud/Sun	24	52	0	20		Cloud/Sun	24	55	0	20		24	79
13	13:53	Cloud/Sun	1	9	0	70		Cloud/Sun	0	9	0	70		1	10
14	14:54	Cloud/Sun	0	8	0	0		Cloud/Sun	0	8	0	0		0	8
15	15:11	Sun/cloud	0	4	0	0		Sun/cloud	0	3	0	0		0	4
16	15:33	Sun	0	36	0	8		Sun	0	38	0	7		0	38
Total			57	610	0	102			60	580	0	101		62	675

Weather am: Sunny with cloudy patches and a minor breeze

Sunny

Weather pm: Increasing cloud and wind

Increasing cloud and wind

Comments: Wind and cloud cover increased during survey

Windier and cloudier as day progressed.

Deep water, increasing cloud and ripple made visibility poor in sections 13-15

Water deep in lower reaches added to poor visibility

Section 13 sockeye at Nautley R. mouth and below Nautley bridge

Active side channels containing spawning fish in Section 11 which may not contain water as flows decrease

Flight #: 2
 Date: 7-Sep-11
 Pilot: Steven Tanaka, Pacific Western Helicopters
 PWH

Observers Representing		Front: Jesse Laframboise DWB						Back: Mark Potyrala DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	10:54	sun	0	1	0			sun	0	4	0	0		0	4
2	10:58	sun	0	26	0	4		sun	0	27	0	3		0	27
3A	11:06	sun	14	326	0			sun	16	335	0	0		16	351
3B	11:19	sun	93	463	0			sun	83	492	0	0		93	575
4	11:33	sun	82	386	1			sun	103	409	1	0		103	512
5	11:46	cloud	30	148	0			cloud	73	106	0	0		73	179
6	11:56	cloud/wind	52	220	1			cloud/wind	60	202	1	0		60	272
7	12:12	sun/wind	6	27	0			sun/wind	8	24	0	0		8	33
8	12:21	sun/wind	11	21	0			sun/wind	14	17	0	0		14	32
9	12:36	sun/wind	0	18	1			sun/wind	4	18	1	0		4	22
10	12:44	sun/wind	45	112	1			sun/wind	69	92	1	0		69	161
11	13:00	sun/wind	188	424	2			sun/wind	205	427	2	0		205	632
12	13:25	sun/wind	249	382	9			sun/wind	301	339	9	0		301	640
13	14:57	sun	11	63	4			sun	15	61	4	Observed		15	76
14	15:19	sun	30	46	2	15		sun	39	36	2	0		39	76
15	15:37	sun	46	36	0			sun	98	21	1	15		98	119
16	15:58	sun	110	87	9	68	Sturgeon	sun	128	88	9	72	Sturgeon	128	216
Total			967	2786	30	87			1216	2698	31	90		1226	3927

Weather am: Sun/wind

Sun/wind with spotty cloud late in morning

Weather pm: Sun

Sun with wind early in afternoon, then sun

Comments: Water levels much lower than previous week

~1000 sockeye @ Nautley bridge, with some holding at Nechako/Nautley confluence

Sockeye nets in place ~ 300 m above Nautley bridge

Sturgeon in Section 16

Visibility still less than ideal below Nautley confluence

Flight #: 3
 Date: 14-Sep-11
 Pilot: Ken Knight Pacific Western Helicopters

Observers Representing		Front: Mark Potyrala DFO						Back: Jesse Laframboise DWB						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:15	Sun	4	21	0			Sun	5	19	0			5	25
2	11:20	Sun	24	32	0			Sun	12	29	0			24	56
3A	11:28	Sun	247	205	0			Sun	170	249	0			247	452
3B	11:36	Sun	521	245	21			Sun	490	262	21			521	766
4	11:52	Sun	218	196	52			Sun	280	175	52			280	455
5	12:05	Sun	325	153	21			Sun	269	186	20			325	478
6	12:15	Sun	301	138	44	7		Sun	213	159	48	5		301	439
7	12:31	Sun	28	26	4			Sun	20	23	7			28	54
8	12:39	Sun	25	18	3			Sun	21	14	1			25	43
9	12:51	Sun	46	13	6			Sun	35	15	9			46	59
10	12:59	Sun	73	69	7			Sun	83	41	8			83	142
11	13:10	Sun	329	88	89			Sun	282	77	98			329	417
12	13:33	Cloud	514	79	97			Cloud	455	80	96			514	593
13	13:48	Cloud	51	50	78			Cloud	42	37	73			51	101
14	14:56	Cloud	72	14	27	20	Sturgeon	Cloud	36	15	32	20	Sturgeon	72	86
15	16:04	Cloud	64	5	41	40		Cloud	51	6	41	30		64	69
16	16:34	Sun	183	10	57	70		Sun	139	24	54	70		183	193
Total			3025	1362	547	137			2603	1411	560	125		3098	4428

Weather am: Sunny with no wind
 Weather pm: Sun early, with cloud as day progressed, then sun late with no wind
 Comments: Good visibility with water at lowest level this survey year
 Small (~24-30") sturgeon in Section 14 (~113 Km)
 ~ 500 sockeye at Nautley bridge
 ~15-20 redds in Km 80 river right side channel
 ~6 redds in Km 86 river right side channel

Flight #: 4
Date: 21-Sep-11
Pilot: Ken Knight Pacific Western Helicopters

Observers Representing Front: Jesse Laframboise
 DWB

Back: Mark Potyrala
 DFO

River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:13	Cloud/Wind	1	0	0	18		Cloud/Wind	1	0	0	20		1	1
2	11:16	Cloud/Wind	10	3	2	100		Cloud/Wind	12	3	2	100		12	15
3A	11:24	Cloud/Wind	30	3	13			Cloud/Wind	34	0	8	10		34	34
3B	11:26	Cloud/Wind	430	24	46	2		Cloud/Wind	461	20	48			461	481
4	11:35	Cloud/Wind	236	28	127			Cloud/Wind	221	22	143			236	264
5	11:44	Cloud/Wind	220	18	54	4		Cloud/Wind	221	9	69	5		221	238
6	11:51	Cloud/Wind	161	19	138			Cloud/Wind	184	11	142			184	195
7	12:04	Cloud/Wind	13	0	24			Cloud/Wind	12	0	14			13	13
8	12:10	Cloud/Wind	14	2	14			Cloud/Wind	16	3	12			16	19
9	12:17	Cloud/Wind	15	1	12			Cloud/Wind	10	1	15			15	16
10	12:22	Cloud/Wind	50	0	18			Cloud/Wind	25	1	17			50	50
11	12:31	Cloud/Wind	54	0	84			Cloud/Wind	49	0	83			54	54
12	12:41	Cloud/Wind	121	0	81			Cloud/Wind	141	1	120			141	142
13	12:48	Cloud/Wind	13	7	136			Cloud/Wind	17	7	131			17	24
14	13:00	Cloud/Wind	14	0	21	10		Cloud/Wind	4	0	23	10		14	14
15	13:11	Cloud/Wind	0	0	20			Cloud/Wind	0	0	21			0	0
16	14:11	Cloud/Wind/R	24	5	73	17		Cloud/Wind/R	44	2	78	25		44	46
Total			1406	110	863	151			1452	80	926	170		1513	1606

Weather am: Wind, cloudy with sunny periods

Cloud and strong wind

Weather pm: Rain and overcast, visibility poor overall

Cloud and strong wind, with rain in Section 16

Comments: Most sockeye in Sections 1 and 2 on redds

Water clarity good but visibility poor due to wind and cloud (and rain in Section 16)

Sockeye in upper sections were actively spawning

Flight #: 5
Date: 28-Sep-11
Pilot: Ken Knight Pacific Western Helicopters

Observers Representing		Front: Mark Potyrala DFO						Back: Jesse Laframboise DWB						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:20	Sunny	1	2	0	12		Sunny	2	0	0	12		2	3
2	11:23	Sunny	1	1	2	20		Sunny	4	3	3	25		4	7
3A	11:28	Sunny	84	2	25	50		Sunny	41	2	23	55		84	86
3B	11:33	Sunny	236	3	44	30		Sunny	212	0	35	30		236	239
4	11:42	Sunny	49	6	140	0		Sunny	60	6	125	0		60	66
5	11:48	Sunny	73	4	131	0		Sunny	96	2	120	0		96	98
6	11:54	Sunny	47	0	191	0		Sunny	51	4	125	0		51	55
7	12:02	Sunny	2	0	23	0		Sunny	4	0	29	0		4	4
8	12:06	Sunny	10	0	17	0		Sunny	4	0	18	0		10	10
9	12:13	Sunny	8	0	10	1		Sunny	9	0	18	0		9	9
10	12:17	Sunny	13	0	19	0		Sunny	10	0	20	0		13	13
11	12:23	Sunny	42	0	100	0		Sunny	38	0	79	0		42	42
12	12:33	Sunny	65	0	77	0		Sunny	62	2	46	0		65	65
13	12:38	Sunny	5	0	150	0		Sunny	2	1	40	0		5	5
14	12:46	Sunny	5	0	11	0		Sunny	3	0	8	0		5	5
15	12:56	Sunny	3	0	17	0		Sunny	6	0	8	0		6	6
16	13:08	Sunny	35	0	58	6		Sunny	30	1	27	0		35	35
Total			679	18	1015	119			634	21	724	122		727	748
Weather am:	Sunny with a light breeze														
Weather pm:	Sunny with a light breeze														
Comments:	Good visibility throughout entire flight														

Flight #: 1
Date: 29-Aug-12
Pilot: Detlef, Yellowhead Helicopters

Observers Representing		Front: Byron Nutton DFO						Back: Don Knoop DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:00	Sunny						Sunny						0	0
2	11:02	Sunny						Sunny						0	0
3A	11:08	Sunny						Sunny						0	0
3B	11:11	Sunny						Sunny						0	0
4	11:16	Sunny		3				Sunny		3				0	3
5	11:21	Sunny		18				Sunny		18				0	18
6	11:26	Sunny		11				Sunny		11				0	11
7	11:32	Sunny						Sunny						0	0
8	11:36	Sunny						Sunny						0	0
9	11:43	Sunny						Sunny						0	0
10	11:46	Sunny		1				Sunny		1				0	1
11	11:53	Sunny		4				Sunny		4				0	4
12	12:09	Sunny		5				Sunny		5				0	5
13	12:11	Cloud		6				Cloud		6				0	6
14	12:26	Sunny		1				Sunny		1				0	1
15	12:39	Sun/Cloud	1	0		40		Sun/Cloud	1			40		1	1
16	12:55	Sun/Cloud		13		150		Sun/Cloud		13		150		0	13
Total			1	62	0	190			1	62	0			1	63

Weather am:	Broken high overcast all day with STRONG tailwind	Windy, partly cloudy
Weather pm:	Strong tailwind led to fast trip but visibility good	
Comments:	~ 1000 sockeye d/s of Naughtyly bridge, with another 200 downstream	

Flight #: 2
Date: 5-Sep-12
Pilot: Detlef, Yellowhead Helicopters

Observers Representing		Front: Shane Smith DFO						Back: Byron Nutton DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	10:41	Sunny						Sunny						0	0
2	10:44	Sunny						Sunny						0	0
3A	10:49	Sunny						Sunny						0	0
3B	10:53	Sunny		6				Sunny		6				0	6
4	10:58	Sunny		23				Sunny		25				0	25
5	11:04	Sunny		84				Sunny		88				0	88
6	11:13	Sunny		13	1			Sunny		13				0	13
7	11:22	Sunny		4				Sunny		4				0	4
8	11:27	Sunny		2				Sunny		2				0	2
9	11:37	Sunny		4				Sunny		4				0	4
10	11:41	Sunny		6				Sunny		6				0	6
11	11:48	Sunny	4	34				Sunny	4	34				4	38
12	12:01	Sunny		21				Sunny		20				0	21
13	12:06	Sunny		10				Sunny		10				0	10
14	12:19	Sunny		5				Sunny		3				0	5
15	12:32	Sun/Cloud		7		60		Sun/Cloud		8		60		0	8
16	12:48	Sun/Cloud		37		600		Sun/Cloud		36		650		0	37
Total			4	256	1	660			4	259	0	710		4	267
Weather am:	Sunny						Some high overcast, sunny with good visibility								
Weather pm:	Sunny						Some cloudy patches, but mostly sunny and some wind								
Comments:	Good visibility; river low and clear						~2000-3000 sockeye below Naughty bridge								

Flight #: 3
 Date: 13-Sep-12
 Pilot: Detlef, Yellowhead Helicopters

Observers Representing		Front: Mark Potyrala DFO						Back: Byron Nutton DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	10:55	Sunny		2				Sunny		2				0	2
2	10:57	Sunny		17				Sunny		18				0	18
3A	11:02	Sunny		62				Sunny		63				0	63
3B	11:06	Sunny	22	97				Sunny	27	95				27	122
4	11:14	Sunny	10	86	1			Sunny	11	82	1			11	96
5	11:21	Sunny	14	110	1			Sunny	20	105	1			20	125
6	11:27	Sunny	15	58	1			Sunny	16	63	1			16	79
7	11:38	Sunny		4				Sunny		1				0	4
8	11:43	Sunny		5				Sunny		5				0	5
9	11:52	Sunny		12				Sunny		10				0	12
10	11:57	Sunny		5				Sunny		4				0	5
11	12:05	Sunny	31	45	2			Sunny	28	46	2			31	76
12	12:16	Sunny	33	69	1			Sunny	32	66	1			33	102
13	12:22	Sunny	13	28	1			Sunny	28	15	1			28	43
14	12:33	Sunny	26	49	1	50		Sunny	46	23	1			46	75
15	12:49	Sunny	29	15	1	40		Sunny	14	29	1			29	44
16	13:03	Sunny	74	42		20		Sunny	64	41				74	116
Total			267	706	9				286	668	9			315	987
Weather am:	Sunny and calm						Clear, sunny								
Weather pm:	Sunny and calm						Light wind , clear and sunny								
Comments:	Calm winds with excellent visibility for duration ~2000 sockeye below Naughtyly bridge						~2000-3000 sockeye below Naughtyly bridge								

Flight #: 4
 Date: 19-Sep-12
 Pilot: Jeff Coenen, Yellowhead

Observers Representing		Front: Mark Potyrala DFO						Back: Byron Nutton DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1	11:35	Sunny	0	11	0			Sunny	0	10	0			0	11
2	11:38	Sunny	3	32	0			Sunny	4	28	0			4	35
3A	11:43	Sunny	8	48	2			Sunny	13	42	2			13	56
3B	11:48	Sunny	132	106	0			Sunny	166	83	0			166	249
4	11:57	Sunny	45	113	7			Sunny	46	115	8			46	161
5	12:08	Sunny	128	52	10			Sunny	161	22	10			161	183
6	12:20	Sunny	10	9	2			Sunny	10	8	2			10	19
7	12:26	Sunny	0	1	0			Sunny	0	0	0			0	1
8	12:30	Sunny	0	0	0			Sunny	0	0	0			0	0
9	12:37	Sunny	6	0	0			Sunny	6	0	0			6	6
10	12:41	Sunny	7	1	2			Sunny	7	1	2			7	8
11	12:48	Sunny	80	12	7			Sunny	77	10	7			80	92
12	12:51	Sunny	67	15	5			Sunny	82	8	5			82	90
13	13:04	Sunny	42	3	3			Sunny	43	2	3			43	45
14	13:16	Sunny	78	3	3	60		Sunny	79	1	3	60		79	81
15	13:31	Sunny	63	20	5			Sunny	76	5	5			76	83
16	13:48	Sunny	145	15	14	25		Sunny	157	4	14	25		157	161
Total			814	441	60				927	339	61			930	1281
Weather am:	Sun with heavy smoke, calm winds Excellent visibility.						Clear and smoky. Excellent visibility								
Weather pm:	Sun, with light to gusty breeze. Excellent visibility.						Gusty								
Comments:	~1000 sockeye below Nautley bridge						~1000 sockeye below Nautley bridge								

Flight #: 5
 Date: 26-Sep-12
 Pilot: Detlef Yellowhead

Observers Representing		Front: Mark Potyrala DFO						Back: Byron Nutton DFO						Max on Redds	Max Live
River Section	Start	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Visibility Index	On Redds	M / H	Carcass	Sockeye	Other	Max on Redds	Max Live
1		Sunny	1	7	0			Sunny	1	7	0			1	8
2		Sunny	22	2	0			Sunny	22	1	0			22	24
3A		Sunny	43	4	1			Sunny	36	1	1			43	47
3B		Sunny	104	16	5			Sunny	122	8	6			122	130
4		Sunny	16	1	13			Sunny	25	1	14			25	26
5		Sunny	40	6	22			Sunny	43	5	21			43	48
6		Sunny	6	0	25			Sunny	7	0	27			7	7
7		Sunny	0	0	2			Sunny	0	0	2			0	0
8		Sunny	0	0	1			Sunny	0	0	1			0	0
9		Sunny	1	0	2			Sunny	1	0	2			1	1
10		Sunny	4	1	1			Sunny	3	0	1			4	5
11		Sunny	17	1	24			Sunny	18	1	23			18	19
12		Sunny	11	2	12			Sunny	12	2	15			12	14
13		Sunny	7	0	3			Sunny	9	0	0			9	9
14		Sunny	18	1	13			Sunny	17	0	11			18	19
15		Sunny	8	0	15			Sunny	9	0	12			9	9
16		Sunny	41	5	29			Sunny	40	4	27			41	46
Total			339	46	168				365	30	163			375	412
Weather am:	Thin, high cloud but bright and calm - excellent visibility						Some high haze but bright								
Weather pm:	Sunny with slight breeze - excellent visibility						Some high haze but bright								
Comments:	No sockeye in Nautley River						No sockeye in Nautley River								

Appendix 2 Nechako Chinook Aerial Counts, 2004-2012

Nechako River Chinook Aerial Counts, 2004

Flight Date	Total Live	Fish on Redds
2-Sep-04	1165	190
8-Sep-04	1619	830
15-Sep-04	4493	3964
22-Sep-04	3592	3346
29-Sep-04	918	915
6-Oct-04	83	80

Nechako River Chinook Aerial Counts, 2005

Flight Date	Total Live	Fish on Redds
24-Aug-05	568	3
1-Sep-05	721	57
7-Sep-05	1731	588
14-Sep-05	2511	1938
21-Sep-05	1912	1773
27-Sep-05	906	855
5-Oct-05	90	89

Nechako River Chinook Aerial Counts, 2006

Flight Date	Total Live	Fish on Redds
29-Aug-06	1833	43
5-Sep-06	3699	363
13-Sep-06	4008	2851
20-Sep-06	4608	4300
27-Sep-06	2044	2005

Nechako River Chinook Aerial Counts, 2007

Flight Date	Total Live	Fish on Redds
5-Sep-07	158	1
12-Sep-07	889	572
19-Sep-07	1123	1016
26-Sep-07	459	442
3-Oct-07	170	162

Nechako River Chinook Aerial Counts, 2008

Flight Date	Total Live	Fish on Redds
3-Sep-08	1040	113
10-Sep-08	2487	1850
17-Sep-08	3486	3297
24-Sep-08	1476	1470
1-Oct-08	270	270

Nechako River Chinook Aerial Counts, 2009

Flight Date	Total Live	Fish on Redds
2-Sep-09	978	55
10-Sep-09	1709	871
16-Sep-09	1444	1272
23-Sep-09	942	863
30-Sep-09	206	206

Nechako River Chinook Aerial Counts, 2010

Flight Date	Total Live	Fish on Redds
1-Sep-10	2193	191
8-Sep-10	3957	1968
15-Sep-10	4355	3739
22-Sep-10	3500	3390
29-Sep-10	877	869

Nechako River Chinook Aerial Counts, 2011

Flight Date	Total Live	Fish on Redds
31-Aug-11	675	62
7-Sep-11	3927	1226
14-Sep-11	4428	3098
21-Sep-11	1606	1513
28-Sep-11	748	727

Nechako River Chinook Aerial Counts, 2012

Flight Date	Total Live	Fish on Redds
29-Aug-12	63	1
5-Sep-12	267	4
13-Sep-12	987	315
19-Sep-12	1281	930
26-Sep-12	412	375

Appendix 3 Nechako River Observed Chinook Spawner Distribution by Area, 2004-2012

Nechako River Observed Chinook Spawner Distribution by Area, 2004

Date	Upper Area	Middle Area	Lower Area
2-Sep-04	72	85	33
8-Sep-04	277	346	207
15-Sep-04	1953	958	1053
22-Sep-04	1906	602	838
29-Sep-04	677	95	143
6-Oct-04	67	4	9
# of Observations	4952	2090	2283
% Distribution	53.1%	22.4%	24.5%

Nechako River Observed Chinook Spawner Distribution by Area, 2005

Date	Upper Area	Middle Area	Lower Area
24-Aug-05	0	2	1
1-Sep-05	12	17	28
7-Sep-05	140	259	189
14-Sep-05	857	590	491
21-Sep-05	1092	340	341
27-Sep-05	644	107	104
5-Oct-05	72	11	6
# of Observations	2817	1326	1160
% Distribution	53.1%	25.0%	21.9%

Nechako River Observed Chinook Spawner Distribution by Area, 2008

Date	Upper Area	Middle Area	Lower Area
3-Sep-08	43	42	28
10-Sep-08	1007	616	227
17-Sep-08	1879	790	628
24-Sep-08	1215	164	91
1-Oct-08	242	11	17
# of Observations	4386	1623	991
% Distribution	62.7%	23.2%	14.2%

Nechako River Observed Chinook Spawner Distribution by Area, 2009

Date	Upper Area	Middle Area	Lower Area
2-Sep-09	36	15	4
10-Sep-09	380	343	148
16-Sep-09	800	329	143
23-Sep-09	665	111	87
30-Sep-09	190	11	5
# of Observations	2071	809	387
% Distribution	63.4%	24.8%	11.8%

Appendix 3 Nechako River Observed Chinook Spawner Distribution by Area, 2004-2012

Nechako River Observed Chinook Spawner Distribution by Area, 2006

Date	Upper Area	Middle Area	Lower Area
29-Aug-06	33	10	0
5-Sep-06	69	190	104
13-Sep-06	1178	1039	634
20-Sep-06	2409	1068	823
27-Sep-06	1561	205	239
# of Observations	5250	2512	1800
% Distribution	54.9%	26.3%	18.8%

Nechako River Observed Chinook Spawner Distribution by Area, 2011

Date	Upper Area	Middle Area	Lower Area
31-Aug-11	14	48	0
7-Sep-11	353	608	265
14-Sep-11	1731	1048	319
21-Sep-11	1162	293	58
28-Sep-11	537	144	46
# of Observations	3797	2141	688
% Distribution	57.3%	32.3%	10.4%

Nechako River Observed Chinook Spawner Distribution by Area, 2007

Date	Upper Area	Middle Area	Lower Area
5-Sep-07	1	0	0
12-Sep-07	312	176	84
19-Sep-07	690	169	157
26-Sep-07	350	47	45
3-Oct-07	134	11	17
# of Observations	1487	403	303
% Distribution	67.8%	18.4%	13.8%

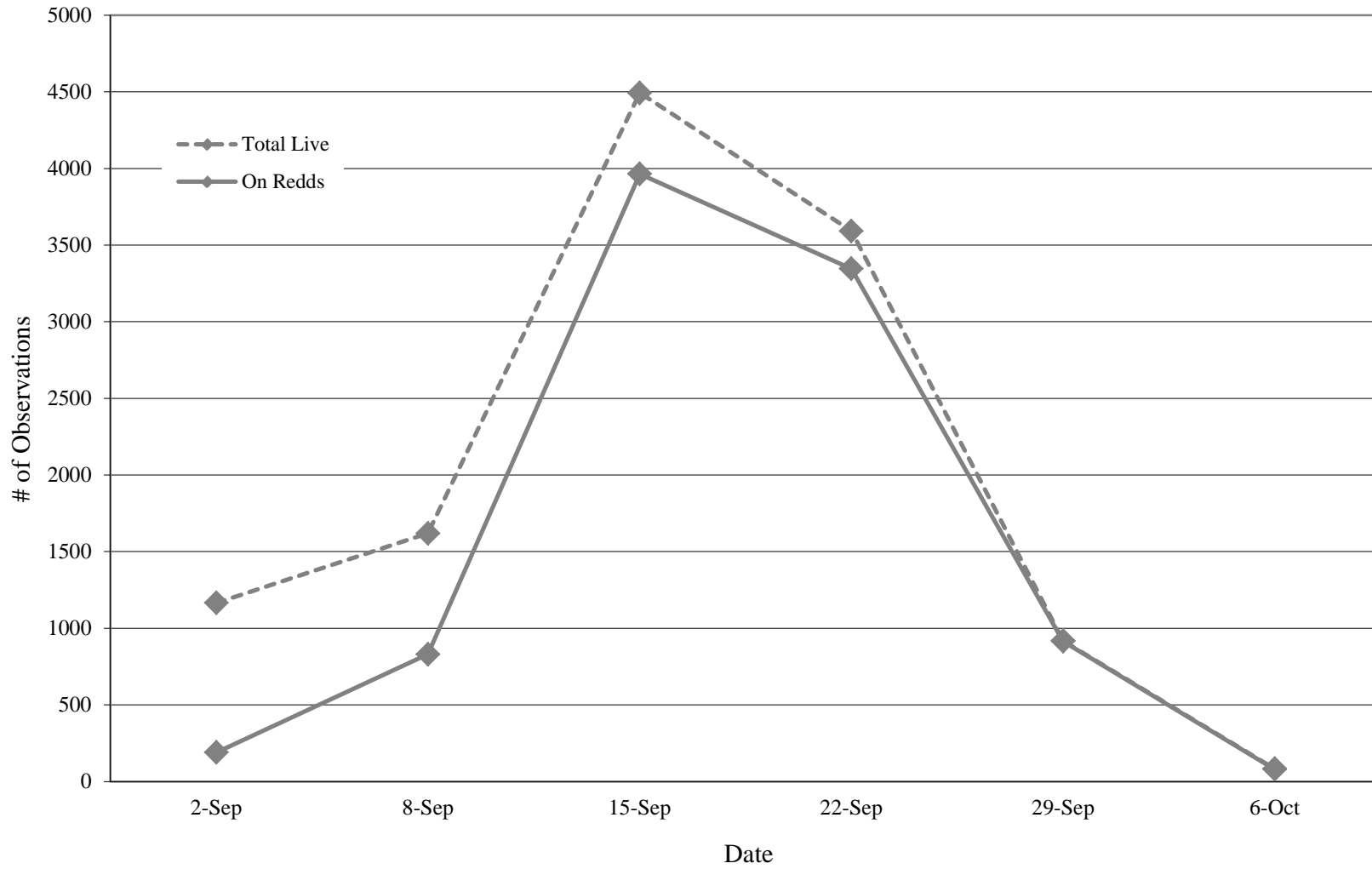
Nechako River Observed Chinook Spawner Distribution by Area, 2012

Date	Upper Area	Middle Area	Lower Area
25-Aug-12	0	0	1
5-Sep-12	0	4	0
13-Sep-12	74	92	149
19-Sep-12	400	218	312
26-Sep-12	263	44	68
# of Observations	737	358	530
% Distribution	45.4%	22.0%	32.6%

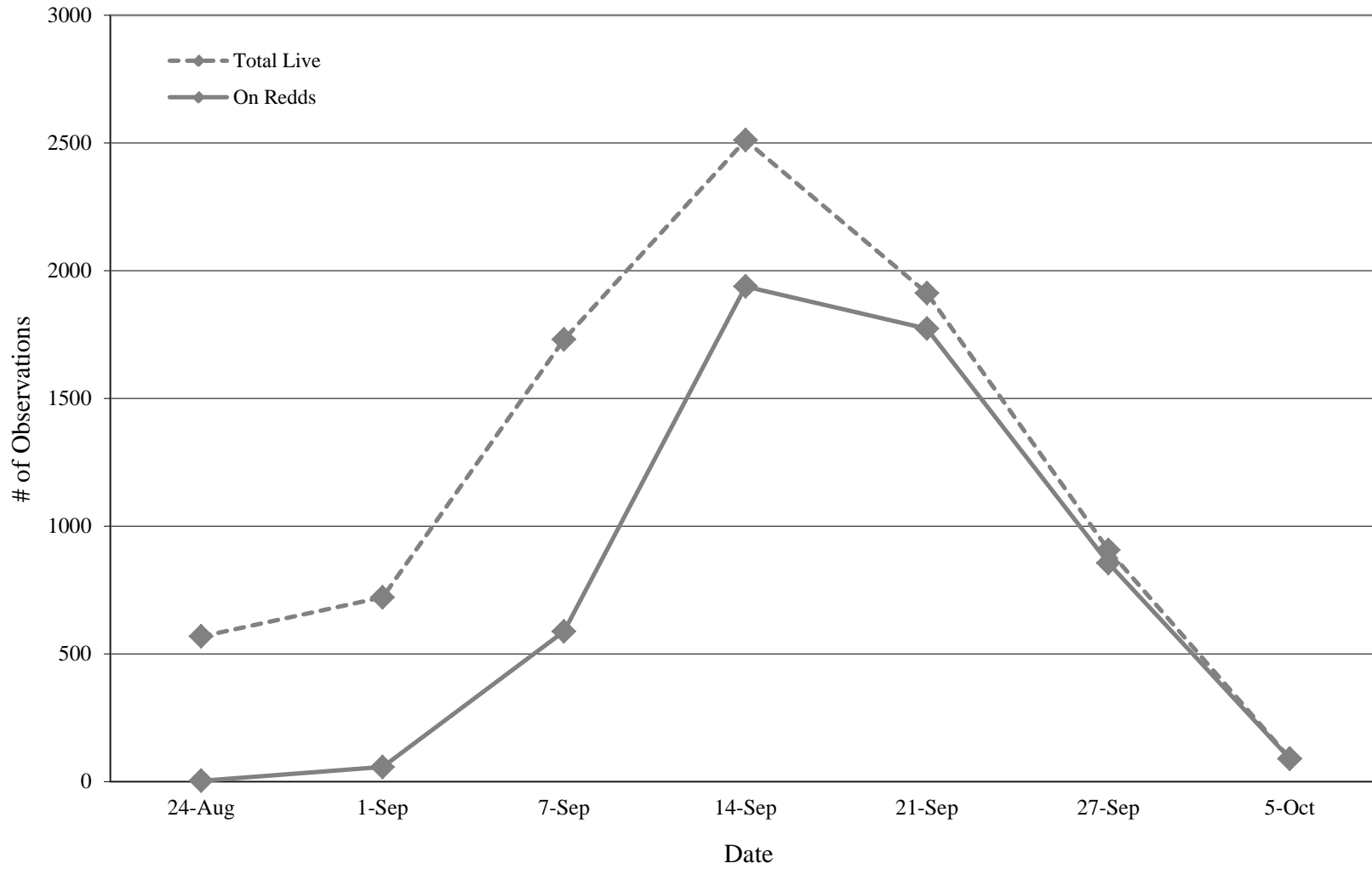
Nechako River Observed Chinook Spawner Distribution by Area, 2010

Date	Upper Area	Middle Area	Lower Area
1-Sep-10	96	73	22
8-Sep-10	785	799	384
15-Sep-10	1670	1154	915
22-Sep-10	1705	925	760
29-Sep-10	615	142	112
# of Observations	4871	3093	2193
% Distribution	48.0%	30.5%	21.6%

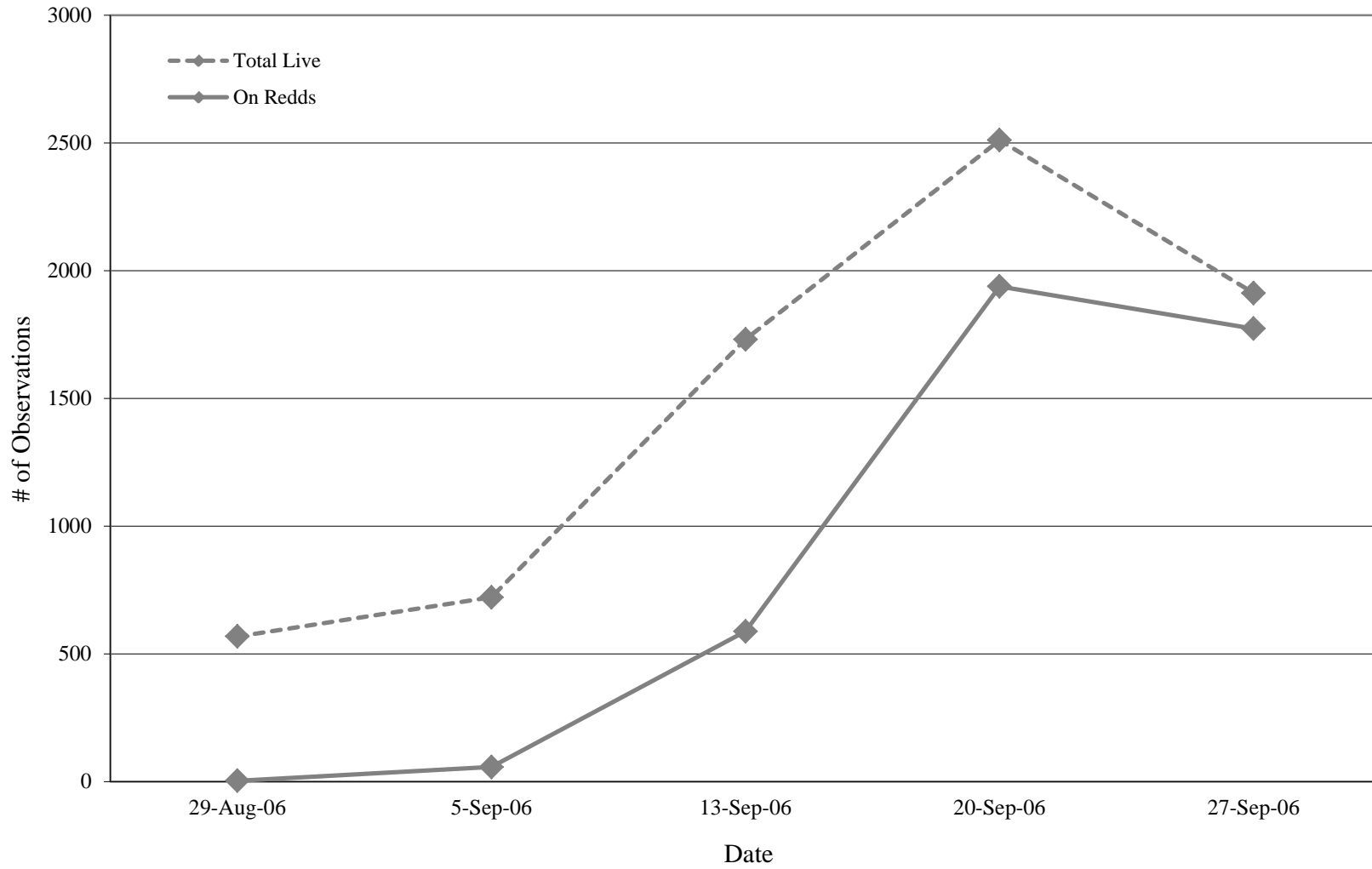
Nechako River Chinook Aerial Counts, 2004



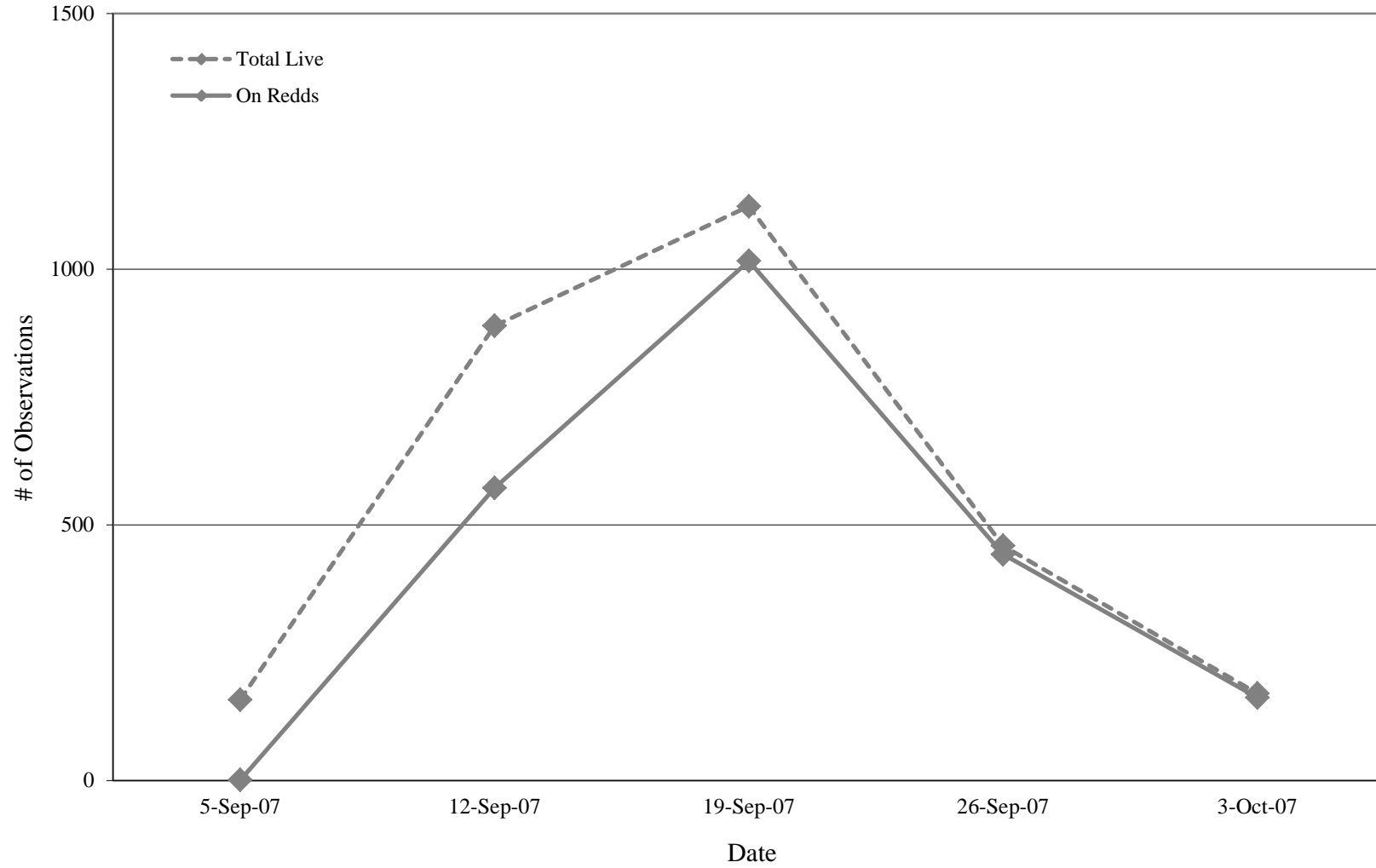
Nechako River Chinook Aerial Counts, 2005



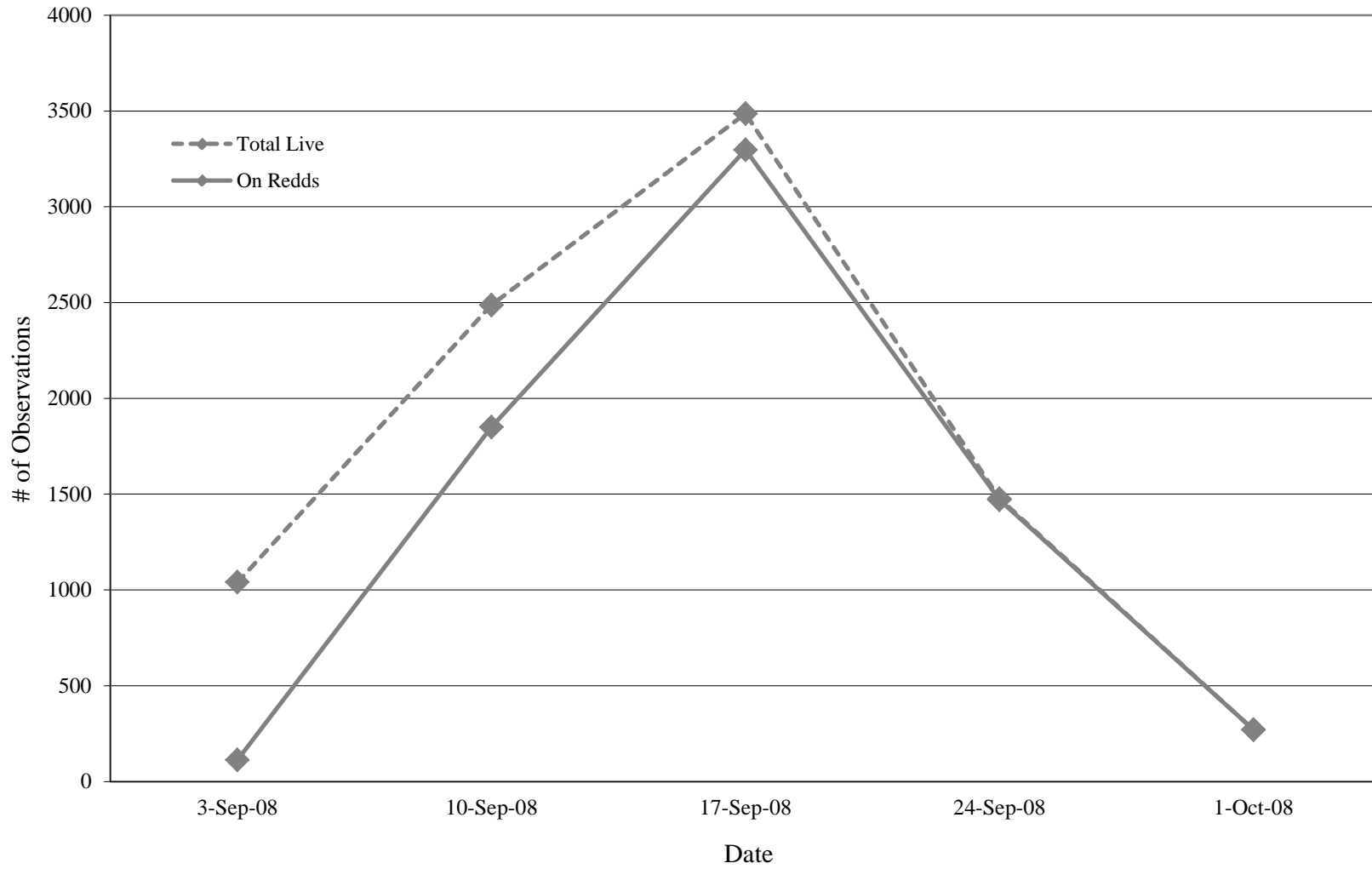
Nechako River Chinook Aerial Counts, 2006



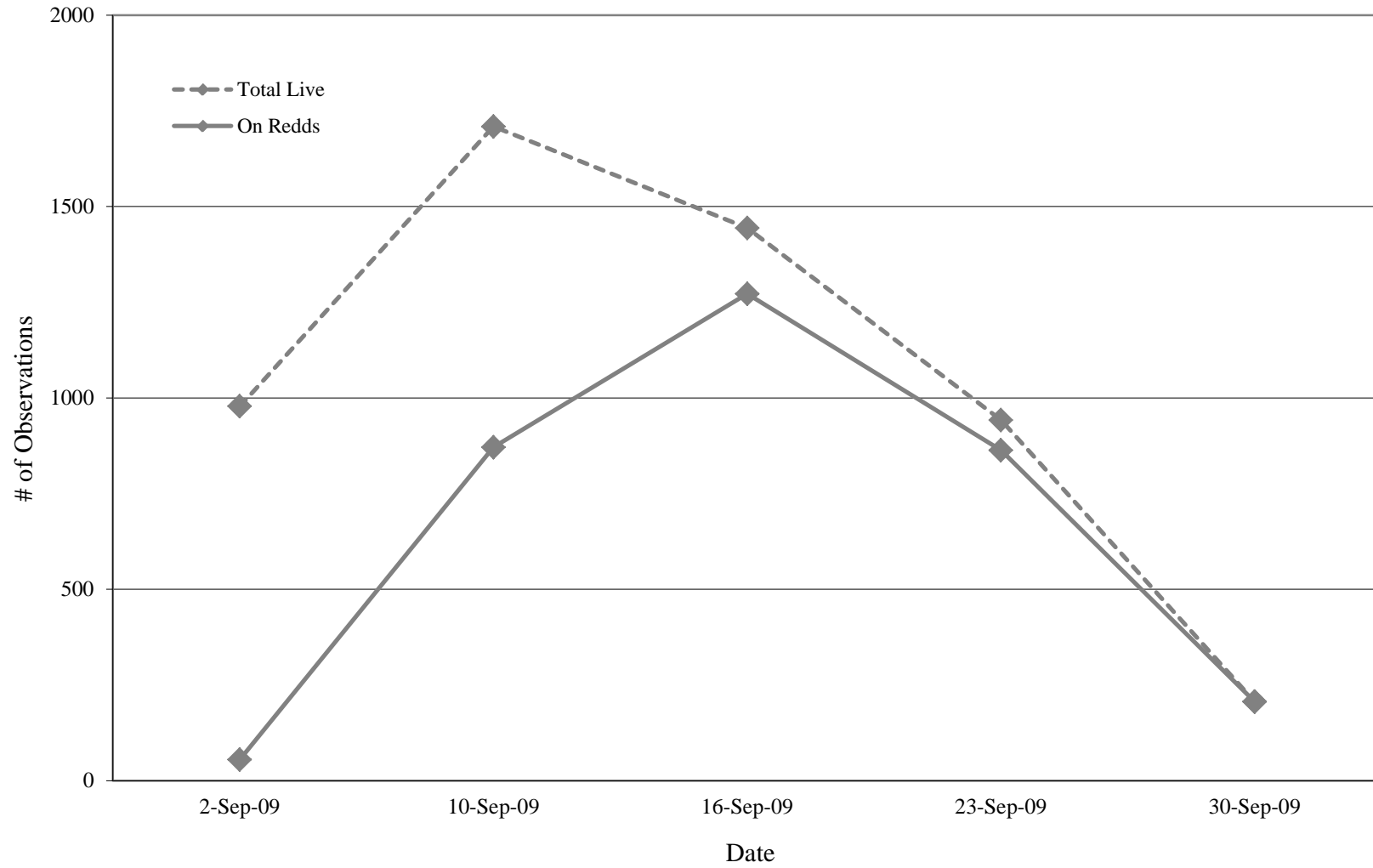
Nechako River Chinook Aerial Counts, 2007



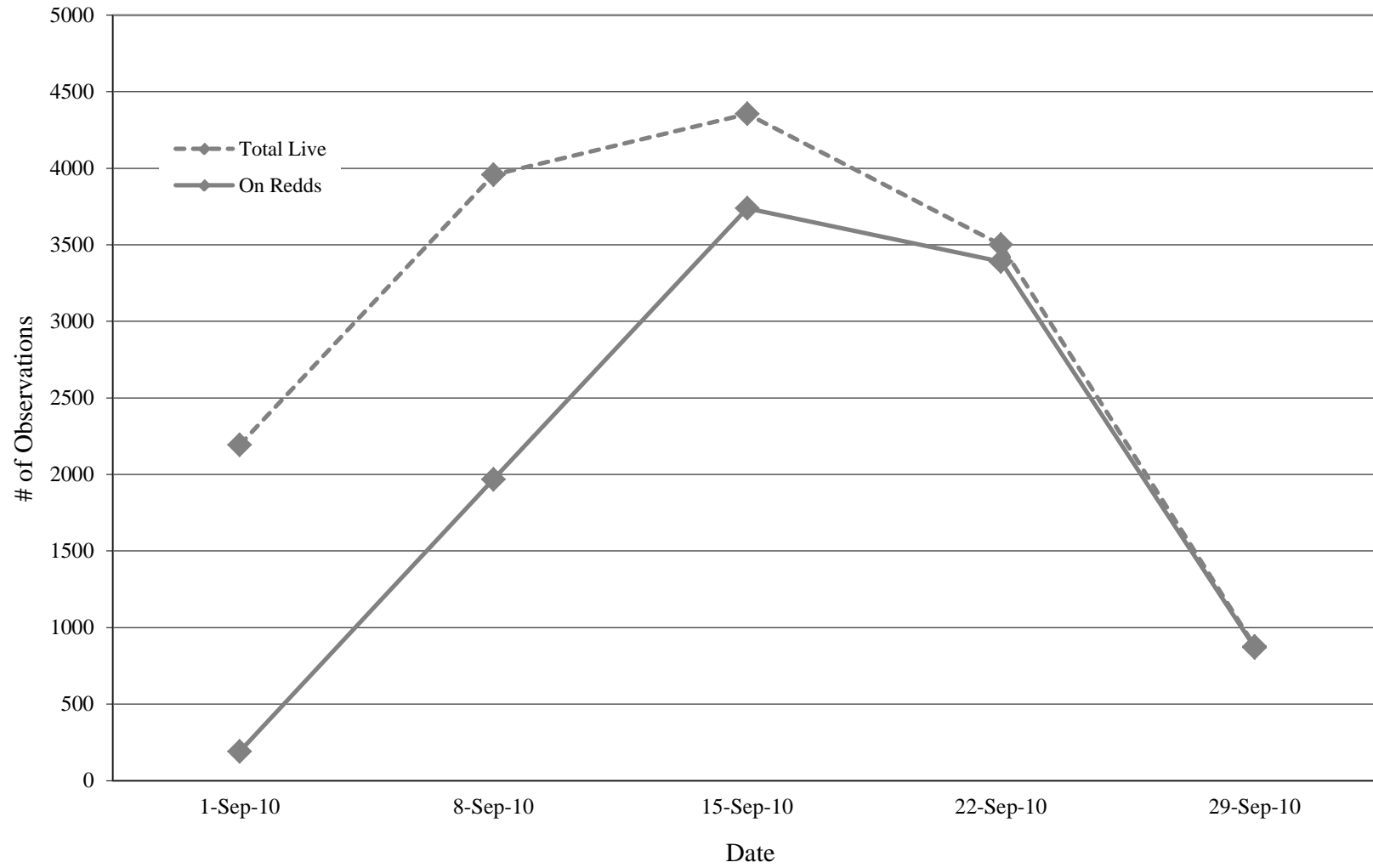
Nechako River Chinook Aerial Counts, 2008



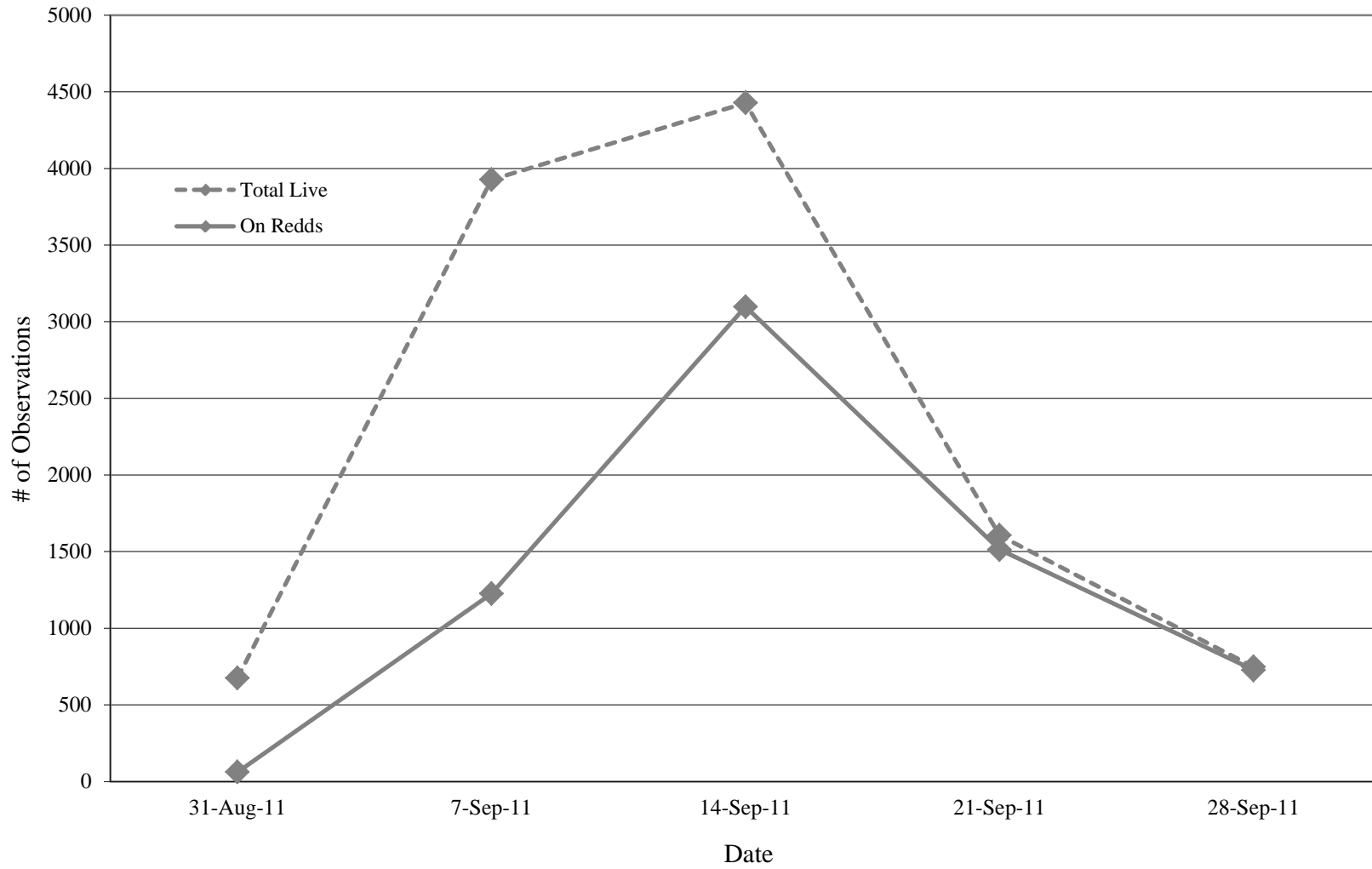
Nechako River Chinook Aerial Counts, 2009



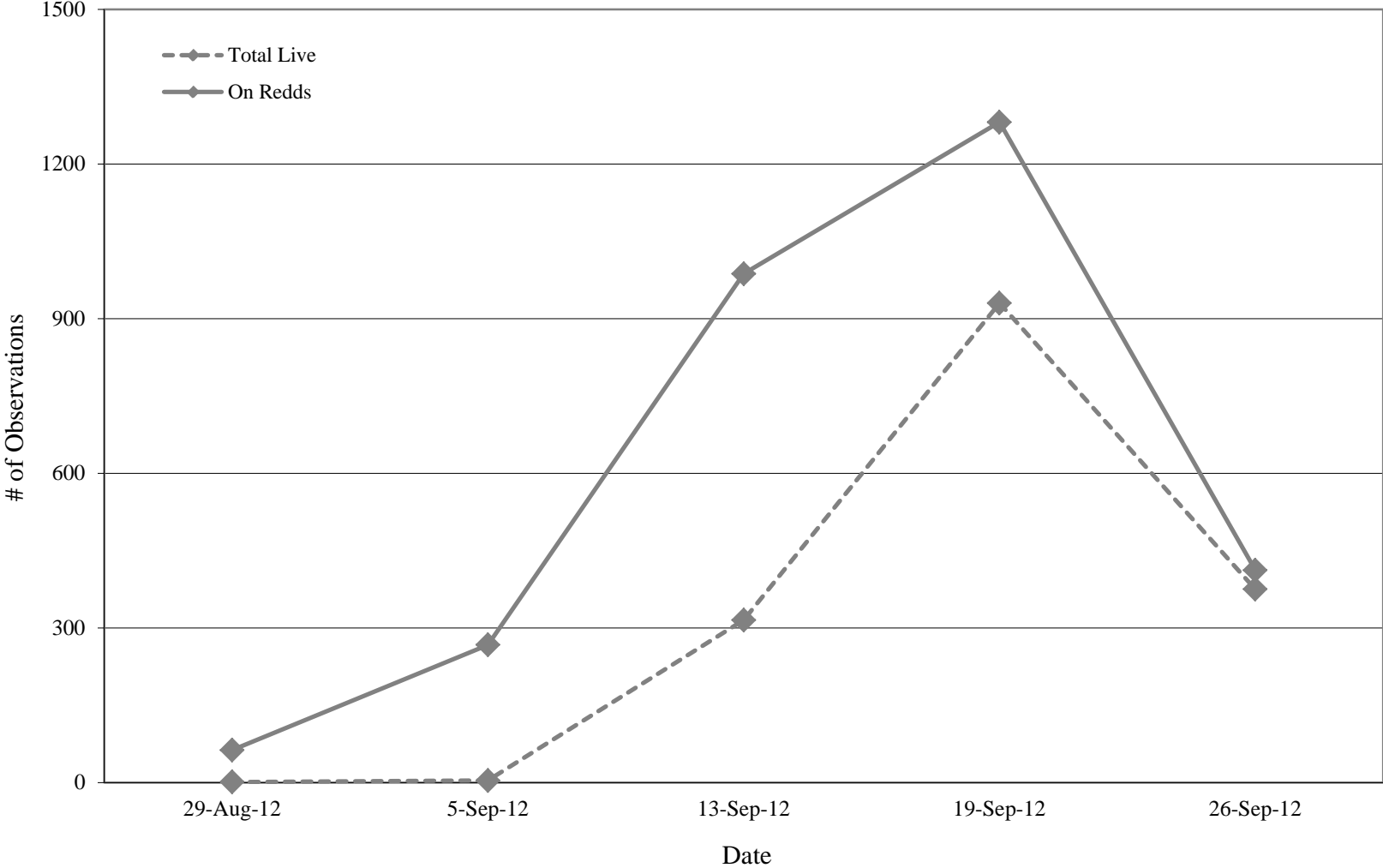
Nechako River Chinook Aerial Counts, 2010



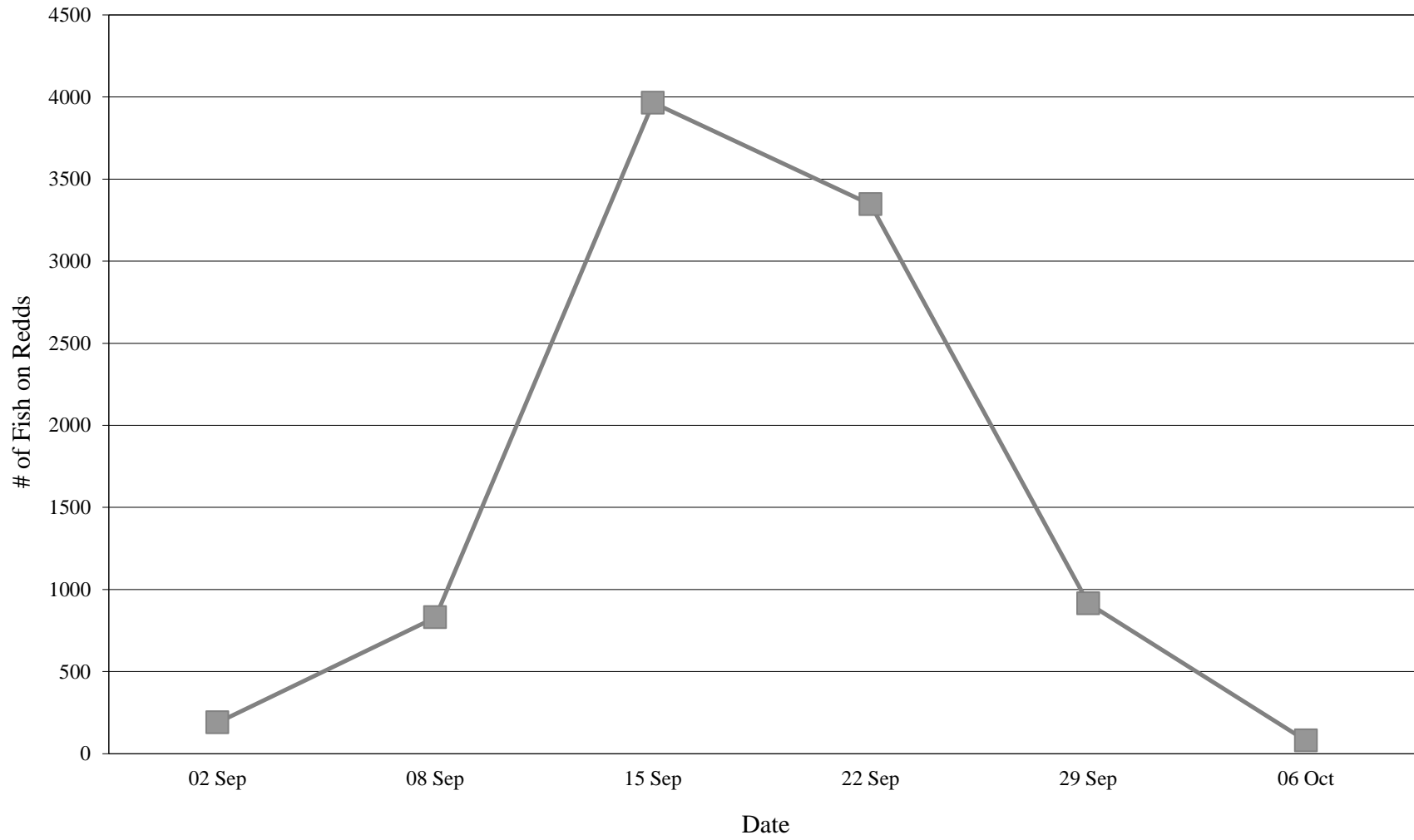
Nechako River Chinook Aerial Counts, 2011



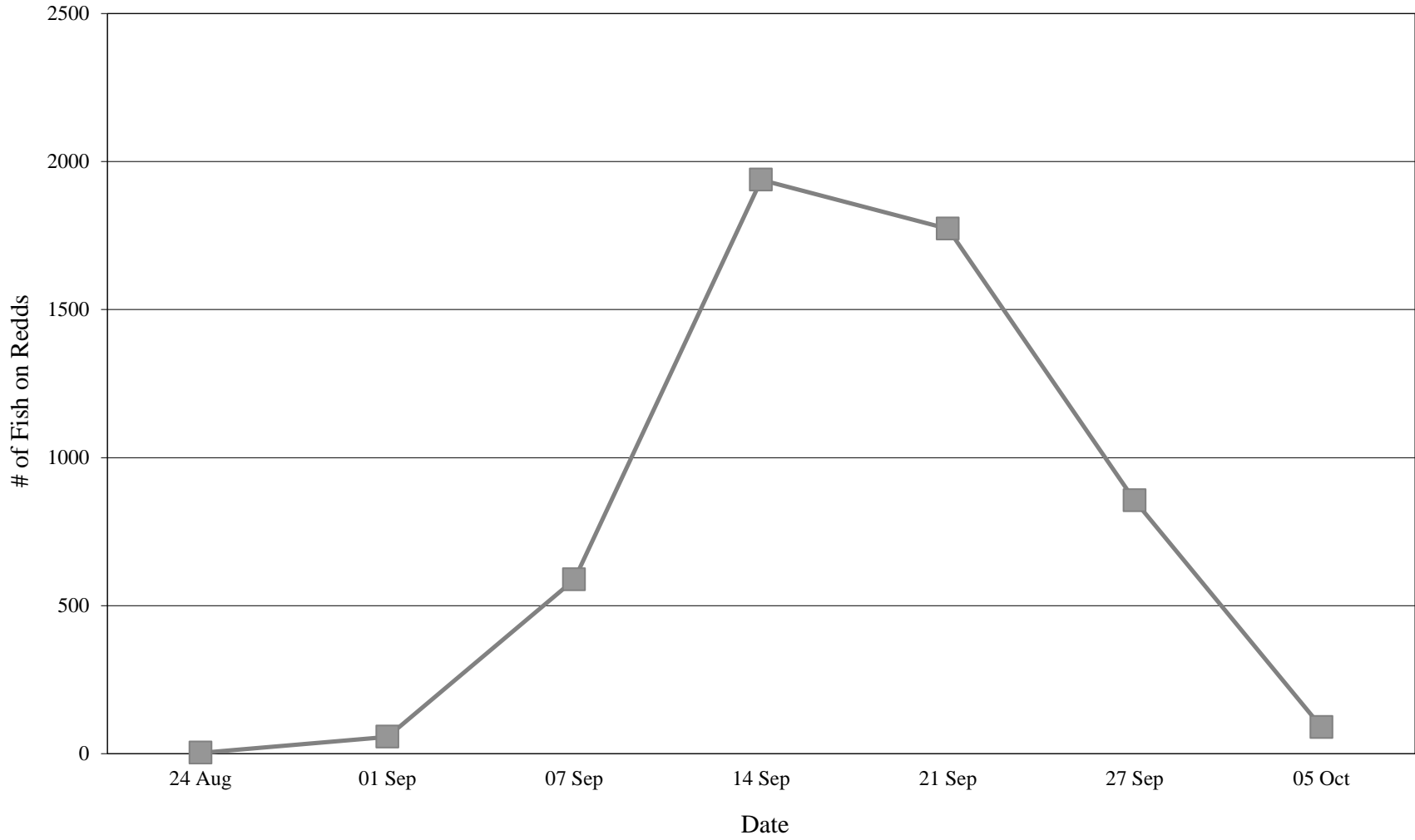
Nechako River Chinook Aerial Counts, 2012



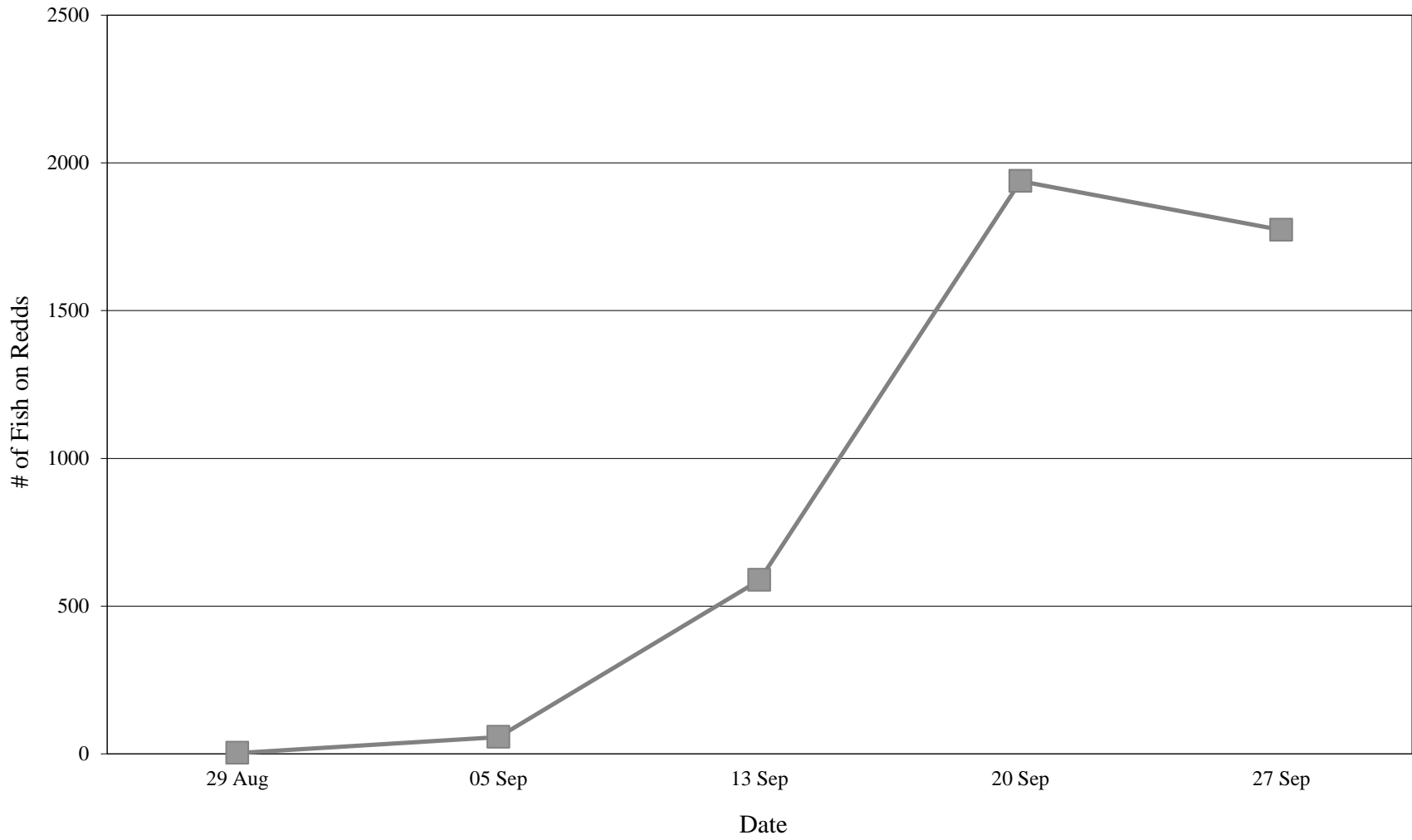
Nechako River Chinook Area-Under-the-Curve, 2004



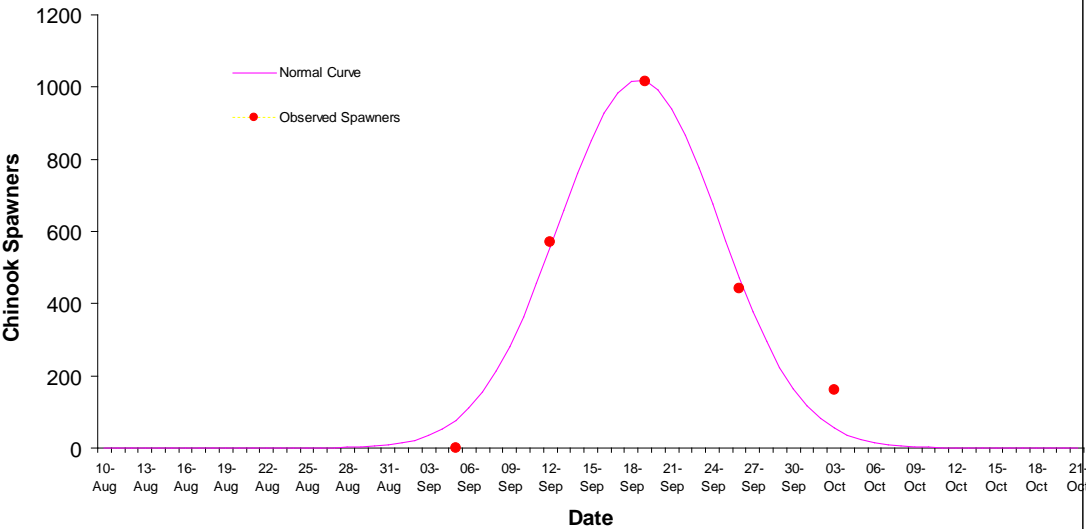
Nechako River Chinook Area-Under-the-Curve, 2005



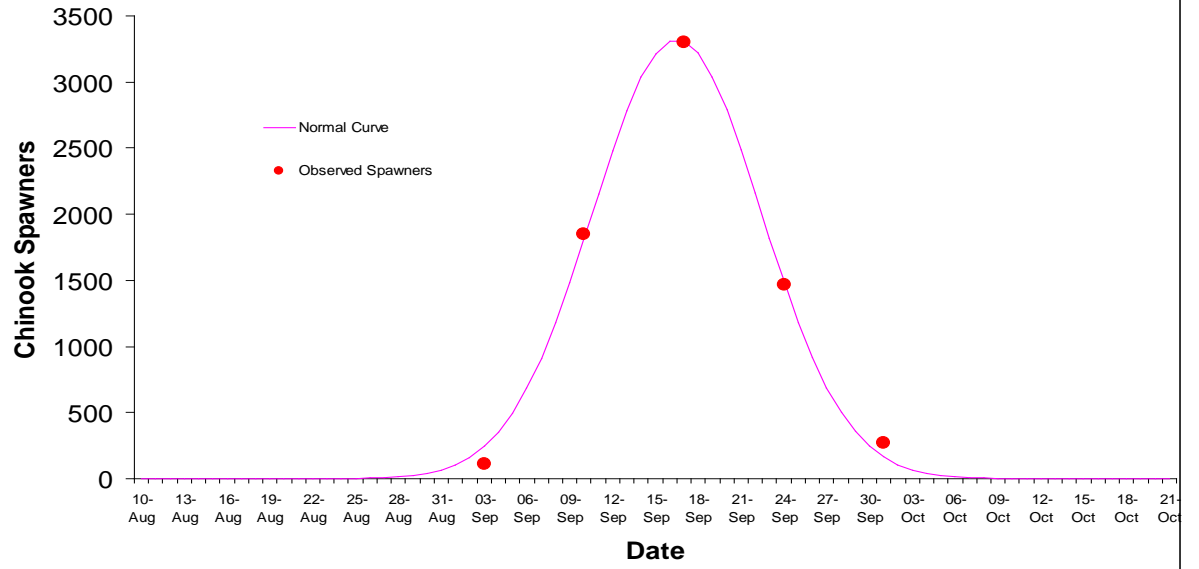
Nechako River Chinook Area-Under-the-Curve, 2006



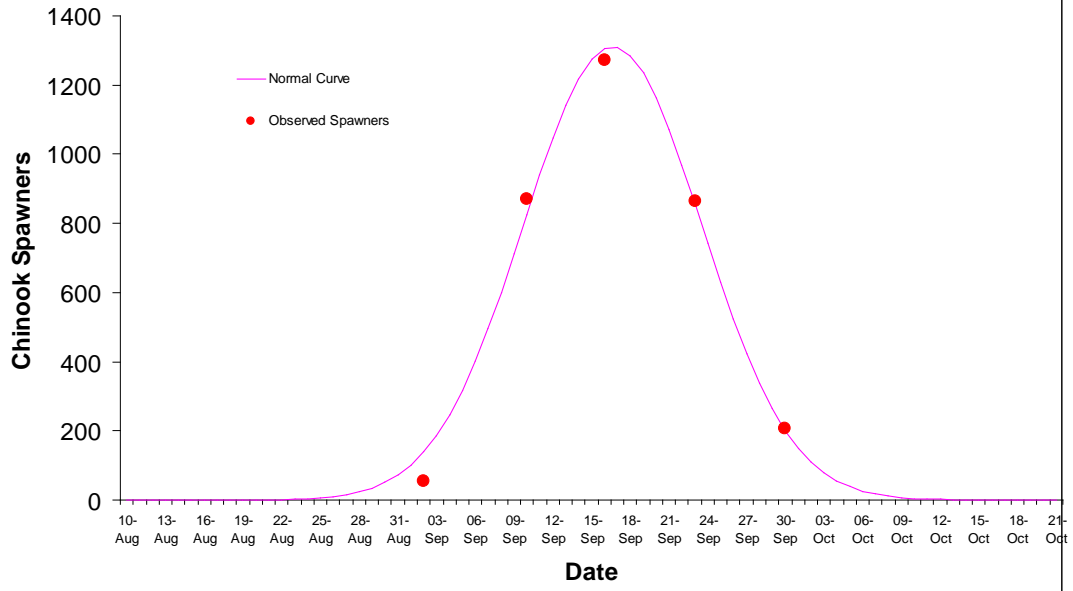
Nechako Chinook M/L Spawner Curve, 2007



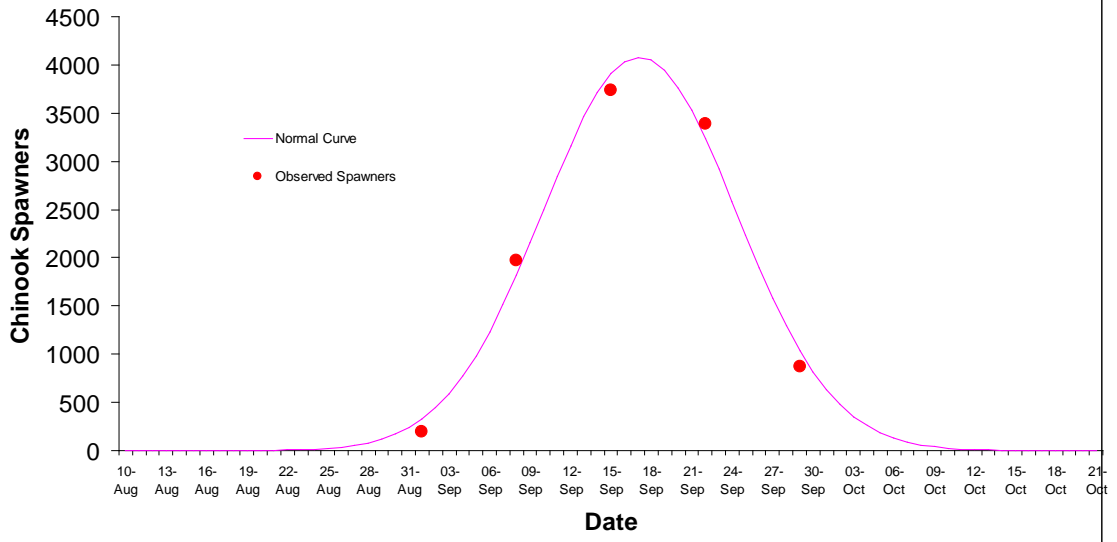
Nechako Chinook M/L Spawner Curve, 2008



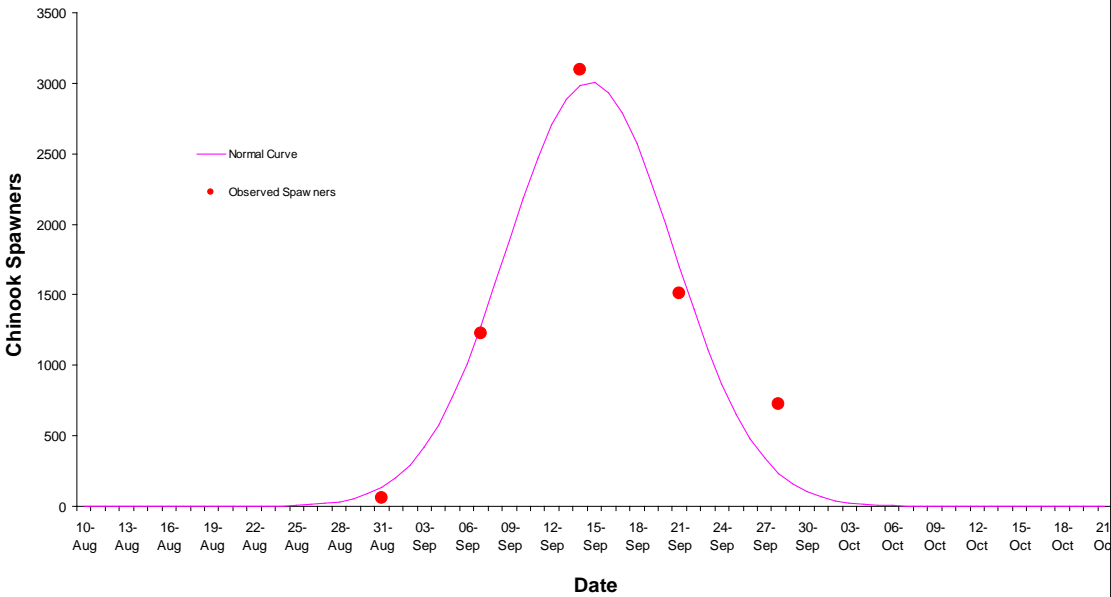
Nechako Chinook M/L spawner Curve, 2009



Nechako Chinook M/L Spawner Curve, 2010



Nechako Chinook M/L Spawner Curve, 2011



Nechako Chinook M/L Spawner Curve, 2012

