

BLIND CREEK CHINOOK SALMON ENUMERATION WEIR, 2018

CRE-37-18

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Restoration and Enhancement Fund

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ABSTRACT

A Chinook salmon enumeration and sampling weir has been operated annually in Blind Creek from 2003 through 2016. In 2017, the weir project was terminated early due to extreme flood conditions and collapse of the weir fence. The weir project resumed in 2018 and was successfully operated for the duration of the Chinook run. The weir site is located approximately 1 km upstream of the confluence with the Pelly River. Weir monitoring began on July 17 and continued through to August 18. A total of 612 Chinook salmon was counted which was 32% above the 10 year average prior to 2017 (2007-2016) and 10% above the average for all years of weir operation (2003-2016). The first fish passed through the counting chamber on July 22. The midpoint of the run occurred on August 6 and approximately 90% of the run had passed through the weir by August 13. A total of 394 (64% of the run) was live sampled for age-sex-length during weir operations. Of the total fish examined, 203 (51.5%) were females and 191 (48.5%) were males. Females were predominately age-6 (63.7%) and males predominantly age-5 (57.3%).

INTRODUCTION

Blind Creek is an important contributor to Chinook salmon (*Onchorynchus tshawytscha*) production in the Pelly River drainage. Radio telemetry studies conducted in 2003 and 2004 indicated that Blind Creek represented 11% (2003) and 9% (2004) of the run in the Pelly River drainage (Mercer 2005, Mercer and Eiler 2004). Blind Creek is accessible by road and its typically moderate flows allow for effective operation of a fish counting and sampling weir; thereby making it a useful Chinook escapement index for the Pelly River drainage.

Chinook escapements in Blind Creek were monitored periodically between 1989 and 2000 through aerial surveys or enumeration weirs. Since 2003 annual weir operations have been conducted (Appendix 1). In 2017, extreme flood conditions during the early part of the Chinook run resulted in the collapse of the weir fence and early termination of the project (Wilson 2018). This was the first year since 2003 that the Chinook escapement in Blind Creek could not be determined. The weir project resumed in 2018 and was successfully operated for the duration of the Chinook run. This report is a summary of the results of the 2018 project.

Chinook salmon have been live sampled at the Blind Creek weir project for age, sex and length (ASL) data since 2003. This information provides biological baseline data on the quality and health of the stock as well as information used by fishery managers to construct sibling based pre-season run forecasts. Whole population ASL data collected over a long term (several brood year cycles) assists in assessing biological trends of Yukon River Chinook.

The weir site is located approximately 10 km southeast of the town of Faro and is accessed from a maintained mining road (Blind Creek Road). The proximity of the weir operation to the town of Faro has created an opportunity for public viewing of migrating Chinook salmon, facilitating public awareness of the salmon resource, management programs and the role of the Yukon River Panel (YRP).

STUDY AREA

Blind Creek flows in a southwesterly direction from its headwaters in the Anvil Range into the Pelly River, approximately 10 km southeast of the Town of Faro (Figure 1). The creek and its tributaries drain an area of approximately 618 km². Major lake systems in the drainage basin include the Blind Lake and Swim Lake chains. A mining access road from the Town of Faro crosses the creek at two locations, approximately 2 km (lower bridge) and 3 km (upper bridge) upstream of its confluence with the Pelly River. The weir site is located approximately 1 km upstream of the creek mouth and 30 m downstream of the lower bridge crossing.

Aerial survey results have shown that Chinook salmon spawning occurs throughout the lower 40 km of the creek with highest concentrations found between 12 and 35 km upstream of the confluence with the Pelly River (Harder 1996; Wilson 2001, 2002).

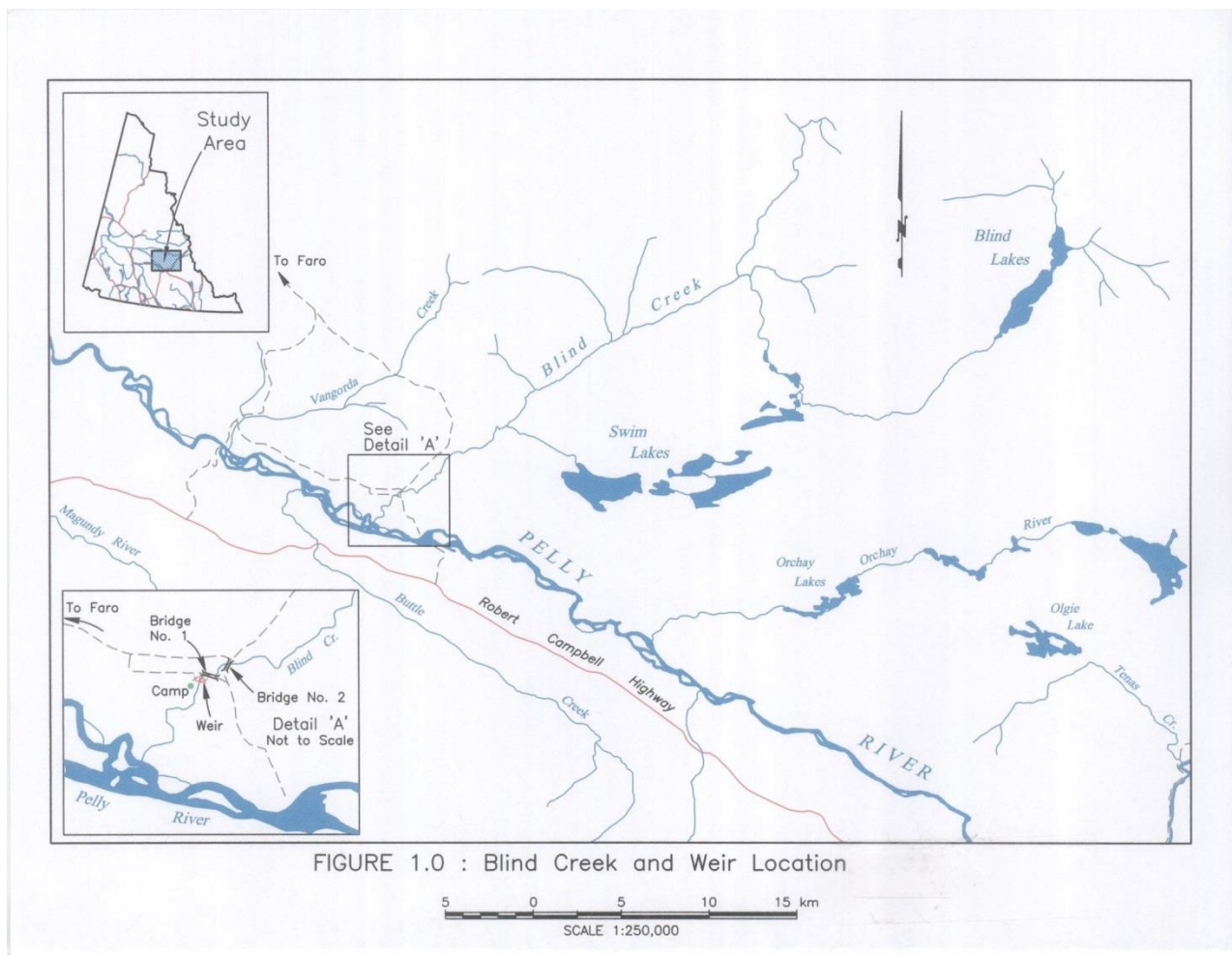


FIGURE 1.0 : Blind Creek and Weir Location

Figure 1. Blind Creek and Weir Location

OBJECTIVES

The specific objectives of this project are as follows:

- 1) Install and operate a weir to obtain a count of the total 2018 Chinook escapement in Blind Creek above the weir;
- 2) Conduct live sampling at the weir to obtain age-sex-length (ASL) data from a representative sample of migrating Chinook with a minimum goal of 25% of the run;
- 3) Provide information about the Chinook weir operation to the Town of Faro Interpretive Centre and on-site interpretation to facilitate public awareness of the salmon resource, management programs and the role of the YRP.

METHODS

Camp Set-up

In order to monitor the weir and salmon passage continually it is necessary to construct a temporary camp near the weir location. Materials for the camp were transported to the weir site from storage in Whitehorse and Faro on July 14. As in previous years, the camp was set up on

the west side of Blind Creek approximately 80 metres from the weir site. The camp was comprised of three wall tents: one to house a kitchen/eating area and two for sleeping quarters.

Weir Construction

Three wooden tripods and five prefabricated conduit panels were constructed in Whitehorse prior to field mobilization to replace those damaged during the 2017 flood event in Blind Creek. These materials along with the remaining weir equipment stored on site were used to construct the weir for the 2018 project.

Weir construction was initiated on July 15 and completed (fish tight) the evening of July 16. The weir was placed in the same area used for the past 15 years, approximately 1 km upstream of the creek mouth and 30 m downstream of the first bridge crossing.

The fence was constructed of conduit panels supported by tripods placed in a 'V' configuration to direct fish moving close to the bank towards the holding pen (Figure 2). The holding pen was placed in the main current and at the upstream apex of the fence location. This pen consisted of conduit panels connected together to form an enclosure measuring 2m (L) X 0.7 m (W) X 1.0 m (H). Two triangular shaped conduit panels, each 2 metres long, were used to connect the pen to the fence and create a staging area for fish moving into the pen. Sand bags were placed along the bottom upstream side of the weir to prevent scouring of the creek substrate and undermining of the structure. A platform was placed alongside the holding pen to facilitate enumeration and biological sampling.



Figure 2. View of fence and sampling station, 2018.

Weir Operation & Biological Sampling

Commencing July 17, the weir was monitored daily from first light until dark and kept closed at night. The weir was checked regularly every 15 to 20 minutes during the early and latter parts of the run and continuously throughout the day on a rotating basis during the peak of the run or when groups of fish were observed behind the weir.

Chinook moving upstream to the weir were allowed access to the holding pen by raising a vertical gate secured to the downstream opening. After Chinook moved into the pen, the gate was closed and the fish were immediately sampled. In the instance where Chinook were observed accumulating in large numbers behind the weir, a few were allowed to pass through the pen without being sampled to avoid delaying the run. After a few fish were counted through the pen, the upstream gate was lowered and the next fish moving in held for sampling.

Sampling events were conducted each day and, when possible, at various times throughout the day in an attempt to obtain a representative sample of the daily run. All fish within the holding pen were either sampled or examined before release in an attempt to avoid bias. Chinook held for sampling were removed from the holding pen by dip net and placed in a v-shaped trough filled with water. Sex and length measurements (fork length (FL) and mid-eye fork (MEF)) were recorded to the nearest 0.5 cm. Five scales were taken from each fish and placed on standard scale cards for age determination. Daily and cumulative counts as well as sampling data were recorded on field notes and transcribed daily to spreadsheets. Scale cards and an electronic copy of ASL data were submitted to DFO, Whitehorse at the completion of field operations. Scales were analyzed for age by the DFO sclerochronology lab at the Pacific Biological Station, Nanaimo, B.C.

Subjective observations of the condition of sampled Chinook were recorded. The overall condition of each fish was rated as good, fair or poor as determined by the presence of fungus and vitality of the fish. The presence of gillnet marks on sampled fish was recorded.

The weir was checked at least twice a day for scouring and areas of possible escape. Debris collecting on the weir was removed as required.

Brood stock was captured at the weir to supply fertilized eggs for classroom incubation programs in local schools (Ross River School and Del van Gorder School in Faro). The egg-take was conducted on August 13 by Nick de Graff, 'Stream to Sea' Salmon Stewardship Coordinator for the Ross River and Faro area and Sebastian Jones, Yukon Conservation Society, Dawson.

Water Conditions

Stream and air temperatures were measured each morning by weir attendants using a hand-held thermometer. Water depth readings were recorded from a staff gauge maintained by Environment Yukon and located about 25 m downstream of the lower bridge along the west bank. Stream discharge and water temperature data was obtained from Environment Yukon (Water Resources Branch, Whitehorse).

Public Awareness

Copies of the salmon brochure produced by the project manager were provided to the Town of Faro Interpretive Centre at the start of the project. This brochure contains information about the salmon resource and weir operation for visitors to the Faro area. On-site interpretation was provided by the project manager and field technicians. A daily record of the number of visitors viewing the weir operation was maintained.

RESULTS

Chinook Counts

A total of 612 Chinook salmon was counted through the weir between July 17 and August 18. This count was 32% above the 10 year average prior to 2017 (2007-2016) and 10% above the average for all years of weir operation (2003-2016). Daily and cumulative counts are presented in Appendix 2. Historical daily Chinook counts are presented in Appendix 3. Chinook run timing was similar to the 2007-2016 average for this stock. The midpoint of the run occurred on August 6 and 90% of the run had passed through the weir by August 13.

Biological Sampling

A total of 394 (64% of the run) Chinook salmon was live sampled for age-sex-length data. Complete age, length and sex data is presented in Appendix 4. The sample set was comprised of 203 (51.5%) females and 191 (48.5%) males. A higher than average (2003-2016) proportion of the sample set was comprised of females (Appendix 5). The mean fork length (FL) of females was 845.3 mm and males, 730.3 mm, respectively. The length frequency of female and male Chinook sampled is presented in Figure 4. Complete age data was determined from 332 of the Chinook sampled¹. The age composition of fish that were successfully aged was 0.3% age-3 (1.1²), 10.8% age-4 (1.2), 42.5% age-5 (1.3, 2.2), 40.7% age-6 (1.4, 2.3) and 5.7% age-7(1.5, 2.4). Females were predominately age-6 (63.7%) and males predominantly age-5 (57.3%). Mean length at age data for male and female Chinook sampled is presented in Table 1. Chinook salmon age and sex percentages for 2003-2018 are presented in Appendix 6.

The majority of Chinook sampled in 2018 appeared in good condition with few showing physiological deterioration such as fin abrasion and fungus. Gillnet marks were observed on 20 of the fish sampled. The ‘sway-back’ condition, in which the vertebrae column is crooked, was observed in two of the fish sampled. Although the exact cause of this condition is not known it may be the result of a genetic disorder, a parasite or a temperature shock during egg development (Milligan et.al., 1985). This condition has been observed in a small number of Blind Creek Chinook sampled each year (1% or less of the total sample) since 2003.

It is typical to have some post spawned Chinook carcasses float downstream and wash up on the weir during the latter part of the season. All female carcasses were examined for egg retention. Two of the females were unspawned with 100% egg retention and three were partially spawned with approximately 40%, 80% and 90% egg retention.

¹ Partial ages were determined for 56 fish sampled; no age could be determined for 5 of the sampled fish due to regenerate or resorbed scales and no scales were obtained from one fish.

² European age format e.g. 1.1 denotes a 3 year old fish with 1+ years freshwater residence and 1 year marine.

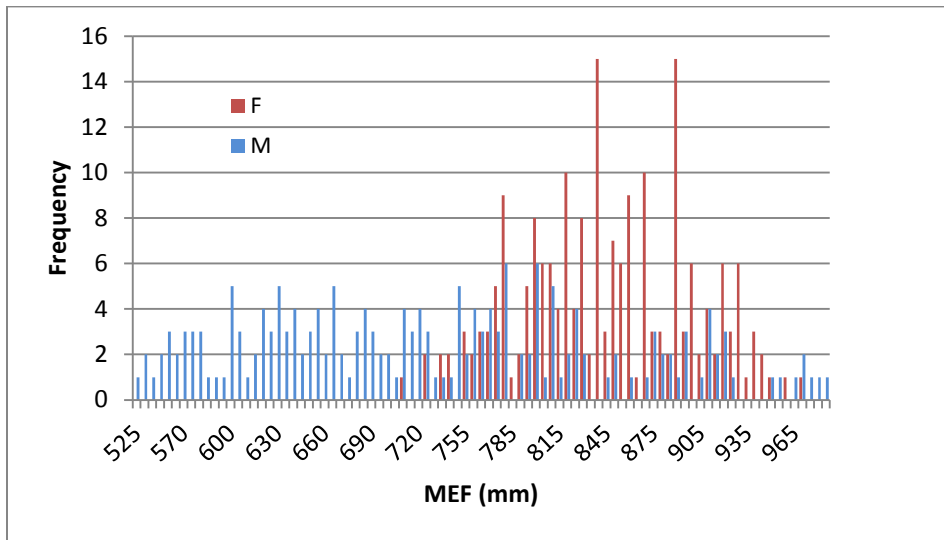


Figure 4. Length frequency of female and male Chinook sampled in 2018.

Table 1. Mean length at age of Chinook sampled from Blind Creek, 2018.

SEX	AGE*	Brood Year	Mean FL (mm)	Count	%
Female	1.3	2013	826	47	12.2%
	1.4	2012	854	100	26.0%
	2.3	2012	833	7	1.8%
	1.5	2011	876	5	1.3%
	2.4	2011	873	9	2.3%
	M3 ^a		775	9	2.3%
	M4		866	18	4.7%
	M5		877	3	0.8%
Female Total:				198	51.6%
Male	1.1	2015	585	1	0.3%
	1.2	2014	619	36	9.4%
	1.3	2013	750	93	24.2%
	2.2	2013	665	1	0.3%
	1.4	2012	838	25	6.5%
	2.3	2012	777	3	0.8%
	1.5	2011	918	2	0.5%
	2.4	2011	885	3	0.8%
	M2		626	9	2.3%
	M3		738	11	2.9%
M4		888	2	0.5%	
Male Total:				186	48.4%

*European age format

^a Partial age M = marine stage

Other Observations

Incidental freshwater fish species captured in the pen or washed up against the weir fence included: Arctic Grayling (*Thymallus arcticus*); Lake Whitefish (*Coregonus clupeaformis*); Longnose Sucker (*Catostomus catostomus*) and Northern Pike (*Esox lucius*) (Appendix 7).

Water Conditions

Water levels remained moderate throughout the duration of the weir operation in 2018. Average daily discharge during the 2018 chinook run in Blind Creek was significantly lower than in 2017 and near the average of previous years of weir operations (2003-2016) (Figure 6). The mean, maximum and minimum discharge in July and August for the period 1992 to 2018 is presented in Appendix 8. Daily weather and water conditions recorded by weir attendants in July and August are presented in Appendix 9.

A maximum water temperature of 15.7°C was reached on July 28. Mean water temperatures in July and August were 11.3° C and 10.1° C, respectively (data from Environment Yukon, Water Resources Branch).

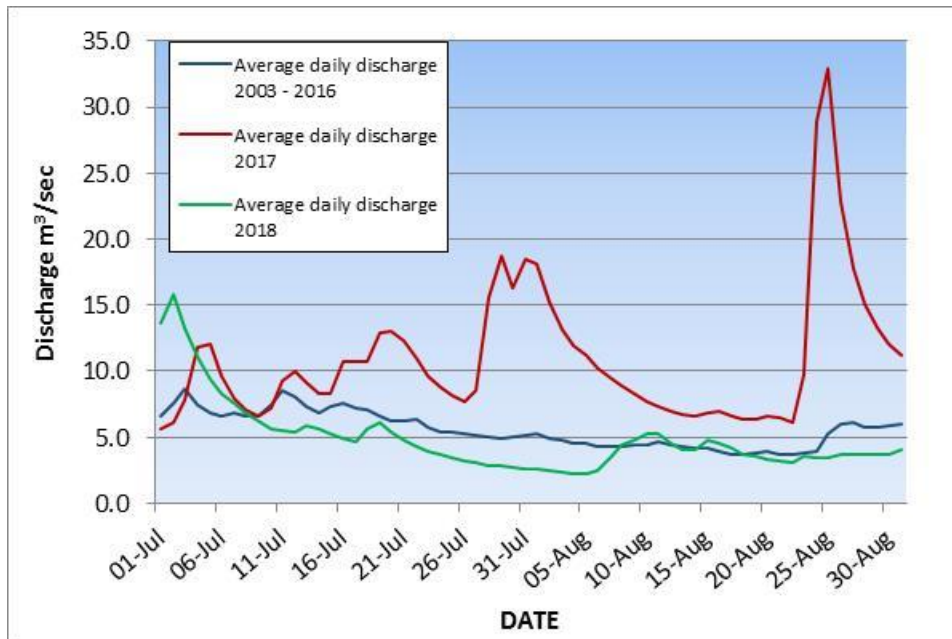


Figure 6. Mean daily discharge in Blind Creek, 2018, 2017 and 2003-2016. (data from: Environment Yukon, Water Resources Branch).

Public Awareness

At least 125 people visited the Blind Creek weir site over the course of the 2018 operation. The visitors included people from the local communities (Faro and Ross River) as well as tourists visiting the Faro area.

DISCUSSION

The Blind Creek weir project was successful at meeting all the 2018 project objectives. The total Chinook escapement into Blind Creek above the weir was obtained and biological data from a large proportion of the run acquired. Water levels in Blind Creek were moderate with no extreme high water events affecting the weir operation.

A high percentage of the Chinook run was sampled for ASL data in 2018; above the set minimum sample goal of 25% of the run. The proportion of the daily totals sampled averaged 72.5% (range 24% to 100%). Typically a lower proportion of the fish were sampled during the peak of the run when large numbers of fish accumulated behind the weir. Sampling activities often resulted in the fish directly behind the weir moving back downstream and holding for extended periods of time. These fish would eventually move back up to the pen entrance but were wary and hesitant to enter the holding pen. In order to avoid delaying the migration at this time a larger proportion of fish were counted through the pen without being sampled.

During the 2018 summer season, the Ross River Dena Council (RRDC) scouted out a site to develop a culture/fish camp in the vicinity of Blind Creek. A suitable site was located by RRDC members approximately 1.5 km east of the weir site along the Blind Creek road. Fishing effort by families attending the camp was minimal. A total of 7 Chinook salmon was captured using gillnets in an area of the creek approximately 1.2 km upstream of the weir site (personal communication, Ryan Bob, RRDC).

The weir project has proven to be a viable and consistent means of obtaining total escapement counts into Blind Creek. The value of stock assessment projects increases with the accumulation of long term data sets. To date, this project has provided escapement counts for two generations (14 years) of the Blind Creek Chinook stock. In addition, a representative ASL data set has been obtained through live sampling at the weir providing 15 years of information on the biological characteristics of the Blind Creek Chinook stock. These types of long term data sets are required to determine the effectiveness of the management strategies developed to conserve Yukon River Chinook stocks.

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Appendix 1. Blind Creek Chinook Counts from aerial surveys and weir operations, 1989, 1990, 1995-2018.

YEAR	METHOD	CHINOOK COUNTS	START DATE	ARRIVAL OF FIRST FISH	END DATE	50% of Run	90% of Run
1989	Aerial survey ^a	400	Aug 7		Aug 7		
1990	Aerial survey ^a	443	Aug 14		Aug 14		
1995	Weir	826	NR		NR		
1996	Aerial survey ^a	422	Aug ?		Aug ?		
1996	Weir	NR	July 28		Aug 17		
1997	Weir	957	July 24	July 25	Aug 22	July 30	Aug 8
1998	Weir	373	July 19	July 27	Aug 19	Aug 4	Aug 15
1999	Weir	892	July 28	Aug 1	Aug 22	Aug 6	Aug 10
2000	Weir	NR	NR		NR		
2001	Aerial survey ^b	226	Aug 21		Aug 21		
2002	Aerial survey ^b	107	Aug 15		Aug 15		
2003	Weir	1,155	July 16	July 17	Aug 18	July 29	Aug 5
2004	Weir	792	July 11	July 19	Aug 15	July 30	Aug 5
2005	Weir	525	July 15	July 20	Aug 15	Aug 4	Aug 10
2006	Weir	677	July 16	July 28	Aug 17	Aug 5	Aug 12
2007	Weir	304	July 17	July 24	Aug 17	Aug 6	Aug 12
2008	Weir	276	July 25	July 28	Aug 19	Aug 12	Aug 17
2009	Weir	716	July 20	July 27	Aug 19	Aug 6	Aug 10
2010	Weir	270	July 19	July 28	Aug 19	Aug 11	Aug 16
2011	Weir	360	July 15	July 24	Aug 18	Aug 10	Aug 13
2012	Weir	157	July 25	July 28	Aug 20	Aug 8	Aug 15
2013	Weir	312	July 24	July 29	Aug 19	Aug 9	Aug 14
2014	Weir	602	July 13	July 17	Aug 17	July 30	Aug 5
2015	Weir	964	July 17	July 22	Aug 19	Aug 1	Aug 11
2016	Weir	664	July 15	July 17	Aug 16	July 31	Aug 9
2017*	Weir	(17)	July 24	July 26	July 28	-	-
2018	Weir	612	July 17	July 22	Aug 18	Aug 6	Aug 13

^a aerial survey conducted by P.A. Harder and Associates Ltd.

^b aerial survey conducted by RRDC and Jane Wilson & Associates

NR - not reported

* Weir installation delayed due to high water. Weir operation suspended on July 28 as a result of flood conditions.

Note: weir operations in 1997, 1998 and 1999 involved enumeration of Chinook salmon only. Sampling conducted in later years resulted in delays in the normal migration timing.

Appendix 2. Blind Creek weir Chinook salmon counts, 2018.

Date	Count of fish	Cumulative count	# Fish sampled	Cumulative sampled	# Females sampled	Cumulative females	# Male sampled	Cumulative males
17-Jul	0	0	0	0	0	0	0	0
18-Jul	0	0	0	0	0	0	0	0
19-Jul	0	0	0	0	0	0	0	0
20-Jul	0	0	0	0	0	0	0	0
21-Jul	0	0	0	0	0	0	0	0
22-Jul	2	2	1	1	1	1	0	0
23-Jul	2	4	2	3	1	2	1	1
24-Jul	7	11	7	10	3	5	4	5
25-Jul	10	21	10	20	6	11	4	9
26-Jul	3	24	2	22	0	11	2	11
27-Jul	18	42	16	38	10	21	6	17
28-Jul	45	87	14	52	7	28	7	24
29-Jul	25	112	6	58	3	31	3	27
30-Jul	6	118	2	60	1	32	1	28
31-Jul	10	128	10	70	4	36	6	34
1-Aug	22	150	21	91	15	51	6	40
2-Aug	23	173	6	97	3	54	3	43
3-Aug	80	253	37	134	23	77	14	57
4-Aug	10	263	6	140	3	80	3	60
5-Aug	18	281	15	155	12	92	3	63
6-Aug	74	355	39	194	22	114	17	80
7-Aug	19	374	12	206	5	119	7	87
8-Aug	50	424	39	245	15	134	24	111
9-Aug	56	480	40	285	26	160	14	125
10-Aug	9	489	9	294	3	163	6	131
11-Aug	11	500	8	302	5	168	3	134
12-Aug	19	519	14	316	6	174	8	142
13-Aug	33	552	29	345	12	186	17	159
14-Aug	26	578	22	367	8	194	14	173
15-Aug	12	590	7	374	1	195	6	179
16-Aug	9	599	9	383	4	199	5	184
17-Aug	11	610	9	392	3	202	6	190
18-Aug	2*	612	2	394	1	203	1	191

* count prior to weir removal initiated at 10:00 a.m.

Appendix 3. Daily and average daily Chinook salmon counts in Blind Creek, 1997-1999, 2003-2018

DATE	Daily Count 2018	Daily Count 2017 *	Daily Count 2016	Daily Count 2015	Daily Count 2014	Daily Count 2013	Daily Count 2012	Daily Count 2011	Daily Count 2010	Daily Count 2009	Daily Count 2008	Daily Count 2007	Daily Count 2006	Daily Count 2005	Daily Count 2004	Daily Count 2003	Daily Count 1999	Daily Count 1998	Daily Count 1997	Daily Average
11-Jul															0					0
12-Jul															0					0
13-Jul					0										0					0
14-Jul					0										0					0
15-Jul			0		0			0						0	0					0
16-Jul			0		0			0					0	0	0	0				0
17-Jul	0		3	0	5			0				0	0	0	0	1				1
18-Jul	0		0	0	2			0				0	0	0	0	1				0
19-Jul	0		5	0	3			0	0			0	0	0	1	2		0		1
20-Jul	0		1	0	9			0	0	0		0	0	1	32	0		0		3
21-Jul	0		0	0	0			0	0	0		0	0	0	5	2		0		1
22-Jul	2		4	2	5			0	0	0		0	0	1	2	4		0		2
23-Jul	2		1	2	23			0	0	0		0	0	0	2	2		0		3
24-Jul	7	0	25	9	16	0		3	0	0		1	0	0	140	1		0		15
25-Jul	10	0	9	0	7	0	0	0	0	0	0	0	0	0	24	10	0	0	122	10
26-Jul	3	9	9	0	0	0	0	1	0	0	0	0	0	2	10	17	0	0	85	7
27-Jul	18	8	9	21	24	0	0	1	0	2	0	7	0	10	20	495	0	1	66	37
28-Jul	45		65	13	116	0	2	2	1	8	1	3	2	8	60	2	0	0	73	21
29-Jul	25		130	9	89	1	2	5	1	27	1	3	9	13	33	68	0	0	64	27
30-Jul	6		31	29	6	0	0	4	1	12	2	10	27	105	225	95	0	0	70	36
31-Jul	10		48	45	4	2	3	1	17	106	1	9	26	18	36	7	0	0	44	22
01-Aug	22		45	366	21	0	3	11	0	84	4	8	67	15	60	45	15	0	49	47
02-Aug	23		50	48	32	2	4	7	0	25	1	27	8	15	34	0	65	6	77	24
03-Aug	80		55	19	32	6	7	6	0	24	6	6	109	35	7	7	133	34	38	31
04-Aug	10		12	29	116	19	6	11	1	0	3	13	25	45	15	201	50	169	60	46
05-Aug	18		23	102	35	2	7	33	22	5	8	131	46	15	75	116	16	22	41	41
06-Aug	74		21	64	2	28	8	13	23	106	11	63	19	53	27	50	73	4	33	35
07-Aug	19		7	41	16	48	10	7	19	67	17	59	47	54	19	12	25	5	20	28
08-Aug	50		26	26	1	4	33	35	5	30	26	6	63	31	4	18	129	5	43	29
09-Aug	56		20	20	8	25	17	30	9	110	18	20	44	18	8	1	128	1	19	29
10-Aug	9		24	17	4	36	13	86	4	28	11	9	14	15	2	0	139	31	21	27
11-Aug	11		12	28	3	52	2	45	27	20	15	4	16	14	10	8	1	25	5	17
12-Aug	19		7	22	9	12	6	31	23	9	19	16	28	11	1	4	0	15	16	13
13-Aug	33		12	9	4	5	9	29	19	7	27	14	19	7	0	18	0	9	5	11
14-Aug	26		4	5	5	19	7	6	40	6	20	8	11	3	0	2	0	11	1	9
15-Aug	12		6	15	3	7	8	13	14	13	26	6	6	5	0	2	0	18	13	9
16-Aug	9		0	4	2	6	9	1	6	3	23	4	5			5	0	7	8	6
17-Aug	11			11	0	5	4	5	12	4	23		1			0	0	9	3	6
18-Aug	2			7		0	2	0	12	3	12					0	14	3		5
19-Aug				1		0		0	3	0	4						4	4		2
20-Aug							0										0			0
21-Aug																	0			0
TOTAL	612	(17)*	664	964	602	312	157	360	270	716	276	304	677	525	792	1155	892	373	957	

Note: shaded areas denote start and end dates

Appendix 4. Blind Creek Chinook salmon live sampling results, 2018.

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	CONDITION (Good/Fair/Poor)	COMMENTS
22-Jul	1	F	875	960	2.4	G	gillnet marks
23-Jul	2	F	855	930	1.4	G	
23-Jul	3	M	825	920	2.4	G	
24-Jul	4	M	640	700	1.3	G	
24-Jul	5	M	860	950	1.3	G	
24-Jul	6	M	800	890	1.3	G	
24-Jul	7	M	820	915	1.3	G	
24-Jul	8	F	775	840	M4	G	
24-Jul	9	F	765	830	M4	G	
24-Jul	10	F	720	795	M3	G	gillnet marks
25-Jul	11	F	785	850	M4	G	
25-Jul	12	M	550	600	1.2	G	
25-Jul	13	F	720	775	1.3	F	dorsal fin shredded
25-Jul	14	F	830	910	M4	G	
25-Jul	15	F	820	890	1.4	G	
25-Jul	16	M	790	875	1.3	G	
25-Jul	17	F	810	875	1.4	G	
25-Jul	18	F	790	855	2.4	G	
25-Jul	19	M	650	715	1.3	G	
25-Jul	20	M	670	745	1.3	G	
26-Jul	21	M	635	720	1.3	G	
26-Jul	22	M	570	630	1.3	G	
27-Jul	23	M	675	750	1.3	G	
27-Jul	24	M	645	720	1.3	G	
27-Jul	25	M	805	895	1.4	G	
27-Jul	26	M	750	825	1.4	G	
27-Jul	27	F	865	945	1.4	G	
27-Jul	28	F	795	860	1.4	G	
27-Jul	29	F	865	930	M4	G	
27-Jul	30	F	820	890	1.4	G	
27-Jul	31	F	820	890	1.4	G	
27-Jul	32	F	785	845	1.4	G	
27-Jul	33	F	780	855	1.5	G	
27-Jul	34	F	835	910	1.3	G	gillnet marks
27-Jul	35	F	685	740	1.3	G	
27-Jul	36	F	805	890	1.3	G	
27-Jul	37	M	690	755	1.4	G	
27-Jul	38	M	915	1000	1.3	G	
28-Jul	39	M	660	725	1.3	G	
28-Jul	40	M	765	845	1.3	G	
28-Jul	41	M	780	875	1.4	G	
28-Jul	42	F	765	820	1.3	G	
28-Jul	43	M	730	810	1.3	G	
28-Jul	44	M	795	880	1.4	G	
28-Jul	45	F	690	745	1.3	G	
28-Jul	46	F	850	920	1.3	G	
28-Jul	47	F	660	725	M3	G	
28-Jul	48	F	815	890	2.4	G	
28-Jul	49	M	590	655	1.4	G	
28-Jul	50	M	690	765	1.4	G	

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	CONDITION (Good/Fair/Poor)	COMMENTS
28-Jul	51	F	815	885	2.3	G	
28-Jul	52	F	780	860	1.3	G	gillnet marks
29-Jul	53	M	730	820	1.3	G	
29-Jul	54	F	845	915	1.4	G	
29-Jul	55	F	765	830	1.4	G	
29-Jul	56	M	685	750	1.3	G	
29-Jul	57	M	775	860	2.3	G	
29-Jul	58	F	775	850	1.4	G	
30-Jul	59	F	820	895	1.4	G	
30-Jul	60	M	810	895	1.3	G	
31-Jul	61	M	695	770	M3	G	
31-Jul	62	M	585	655	1.3	G	
31-Jul	63	M	625	685	1.3	G	
31-Jul	64	M	880	980	1.4	G	gillnet marks
31-Jul	65	F	795	860	2.4	G	
31-Jul	66	M	615	685	1.3	G	
31-Jul	67	F	865	940	1.4	G	
31-Jul	68	M	575	625	1.2	G	
31-Jul	69	F	700	755	1.3	G	
31-Jul	70	F	720	780	1.3	G	
01-Aug	71	M	590	655	1.4	G	
01-Aug	72	M	550	605	M2	G	
01-Aug	73	F	755	815	1.4	G	
01-Aug	74	M	730	815	1.3	G	
01-Aug	75	F	765	830	1.4	G	
01-Aug	76	F	815	890	1.4	G	
01-Aug	77	F	825	885	2.3	G	
01-Aug	78	F	825	895	1.3	G	
01-Aug	79	F	820	890	1.4	G	
01-Aug	80	F	740	795	1.3	G	
01-Aug	81	F	865	945	1.4	G	
01-Aug	82	F	770	830	1.4	G	
01-Aug	83	M	715	800	1.3	G	
01-Aug	84	F	715	775	1.3	G	
01-Aug	85	F	695	755	M3	G	
01-Aug	86	M	510	570	M3	G	
01-Aug	87	M	680	760	1.3	G	
01-Aug	88	F	750	815	1.4	G	
01-Aug	89	F	855	930	M4	G	
01-Aug	90	F	780	840	1.4	G	
01-Aug	91	F	860	935	1.4	G	
02-Aug	92	F	685	740	M3	G	
02-Aug	93	M	720	805	1.4	G	
02-Aug	94	F	775	850	1.3	G	fresh gash
02-Aug	95	M	520	575	1.2	G	
02-Aug	96	M	710	790	1.4	G	
02-Aug	97	F	715	780	M3	G	
03-Aug	98	M	630	710	M3	G	
03-Aug	99	F	855	930	2.4	G	
03-Aug	100	M	710	780	2.3	G	

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	CONDITION (Good/Fair/Poor)	COMMENTS
03-Aug	101	F	820	890	1.4	G	
03-Aug	102	F	825	900	M5	G	
03-Aug	103	M	625	690	1.3	G	
03-Aug	104	F	740	800	1.3	G	
03-Aug	105	M	710	795	1.4	G	ripped adipose fin
03-Aug	106	F	715	775	1.3	G	ripped adipose fin
03-Aug	107	F	755	830	1.3	G	
03-Aug	108	M	795	895	1.3	G	
03-Aug	109	F	860	940	1.4	G	
03-Aug	110	M	645	710	M3	G	
03-Aug	111	M	875	975	1.3	G	
03-Aug	112	F	775	840	1.4	G	
03-Aug	113	M	675	760	1.3	G	
03-Aug	114	M	640	705	1.3	G	
03-Aug	115	M	635	710	1.3	G	
03-Aug	116	F	740	800	M4	G	
03-Aug	117	F	795	870	M4	G	gillnet marks
03-Aug	118	F	765	825	1.4	G	gillnet marks
03-Aug	119	M	585	645	1.2	G	
03-Aug	120	F	825	890	1.3	G	ripe
03-Aug	121	F	755	820	1.4	G	
03-Aug	122	F	830	900	NA	G	gillnet marks
03-Aug	123	F	785	855	M4	G	
03-Aug	124	F	770	830	1.4	G	
03-Aug	125	F	720	780	M3	G	
03-Aug	126	M	780	875	1.3	G	
03-Aug	127	F	830	905	M4	G	gillnet marks
03-Aug	128	F	780	840	1.4	G	
03-Aug	129	F	830	900	1.4	G	
03-Aug	130	M	810	910	1.5	G	
03-Aug	131	F	845	925	M4	G	
03-Aug	132	F	775	840	1.5	G	
03-Aug	133	M	515	570	1.2	G	
04-Aug	134	F	745	810	1.3	G	
04-Aug	135	F	815	890	1.4	G	
04-Aug	136	F	790	870	1.5	G	
04-Aug	137	M	690	760	1.3	G	
04-Aug	138	M	725	800	1.4	G	
04-Aug	139	M	720	800	1.3	G	
04-Aug	140	F	815	900	1.3	G	
05-Aug	141	F	750	820	1.4	G	
05-Aug	142	F	840	920	1.4	G	gillnet marks
05-Aug	143	F	730	800	NA	G	
05-Aug	144	F	730	800	1.3	G	
05-Aug	145	M	560	630	1.3	G	
05-Aug	146	F	775	840	M4	G	
05-Aug	147	F	845	925	1.5	G	gillnet marks
05-Aug	148	F	800	870	1.4	G	
05-Aug	149	F	760	840	1.3	G	ripe – a few eggs expelled
05-Aug	150	F	830	910	1.4	G	

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	Condition (Good/Fair/Poor)	COMMENTS
05-Aug	151	F	745	820	1.4	G	ripe – a few eggs expelled
05-Aug	152	M	685	775	M3	G	
05-Aug	153	F	685	760	2.3	G	
05-Aug	154	M	765	850	1.4	G	
05-Aug	155	F	810	880	1.4	G	
06-Aug	156	F	670	710	1.4	G	
06-Aug	157	F	750	820	1.4	G	
06-Aug	158	F	780	850	1.4	G	
06-Aug	159	M	690	780	1.3	G	
06-Aug	160	F	755	830	NA	G	ripe–eggs expelled. gillnet mrks
06-Aug	161	M	710	800	1.3	G	
06-Aug	162	M	815	910	1.4	G	
06-Aug	163	F	750	820	M4	G	
06-Aug	164	F	770	840	1.4	G	
06-Aug	165	F	815	890	1.5	G	gillnet marks
06-Aug	166	F	760	820	1.4	G	
06-Aug	167	F	885	970	1.4	G	
06-Aug	168	F	750	810	2.4	G	gillnet marks
06-Aug	169	F	740	805	1.4	G	
06-Aug	170	M	710	780	1.3	G	
06-Aug	171	M	745	830	1.3	G	
06-Aug	172	F	700	780	1.4	G	
06-Aug	173	M	855	965	M4	G	
06-Aug	174	M	685	760	1.3	G	
06-Aug	175	F	705	770	1.3	G	
06-Aug	176	F	805	870	1.4	G	
06-Aug	177	M	855	970	1.4	G	
06-Aug	178	M	695	780	M3	G	gillnet marks
06-Aug	179	F	815	890	1.4	G	
06-Aug	180	F	725	795	1.4	G	
06-Aug	181	M	690	770	1.3	G	
06-Aug	182	M	840	925	1.5	G	gillnet marks
06-Aug	183	F	780	860	2.4	G	
06-Aug	184	F	770	850	1.4	G	
06-Aug	185	F	780	855	1.4	G	one eye pecked out – ripped gill
06-Aug	186	M	680	765	1.3	G	
06-Aug	187	F	865	950	1.4	G	
06-Aug	188	M	690	770	1.3	G	
06-Aug	189	M	720	810	1.2	G	
06-Aug	190	M	815	910	1.3	G	
06-Aug	191	M	805	920	1.4	G	2 large healed wounds
06-Aug	192	M	830	920	1.3	G	
06-Aug	193	F	745	820	M5	G	
06-Aug	194	F	760	840	1.4	G	
07-Aug	195	M	665	750	1.3	G	
07-Aug	196	M	645	730	1.3	G	
07-Aug	197	F	720	790	1.4	G	
07-Aug	198	M	570	640	1.2	G	
07-Aug	199	F	755	825	1.4	G	
07-Aug	200	F	710	765	2.3	G	

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	Condition (Good/Fair/Poor)	COMMENTS
07-Aug	201	M	635	715	1.3	G	
07-Aug	202	M	580	640	1.2	G	
07-Aug	203	M	540	600	1.3	G	
07-Aug	204	F	790	855	1.4	G	
07-Aug	205	F	705	765	1.3	G	
07-Aug	206	M	555	620	1.3	G	
08-Aug	207	F	830	900	1.4	G	ripe – a few eggs expelled
08-Aug	208	F	800	870	1.4	G	
08-Aug	209	M	650	720	1.3	G	
08-Aug	210	F	700	755	1.4	G	
08-Aug	211	M	810	910	2.4	G	
08-Aug	212	M	600	665	1.2	G	
08-Aug	213	M	605	665	1.3	G	
08-Aug	214	M	735	825	1.3	G	
08-Aug	215	F	725	780	1.4	G	
08-Aug	216	F	810	870	1.4	G	
08-Aug	217	F	805	870	2.3	G	
08-Aug	218	M	645	715	1.3	G	
08-Aug	219	M	530	580	1.2	G	
08-Aug	220	M	700	770	1.3	G	
08-Aug	221	M	625	680	1.3	G	
08-Aug	222	M	665	740	M3	G	
08-Aug	223	M	560	620	NA	G	
08-Aug	224	M	545	600	1.3	G	
08-Aug	225	M	615	675	M3	G	crooked spine
08-Aug	226	F	735	800	1.4	G	
08-Aug	227	F	755	815	1.4	G	
08-Aug	228	M	580	635	1.3	G	
08-Aug	229	F	730	790	1.4	G	
08-Aug	230	M	685	765	M3	F	some fungal growth
08-Aug	231	F	795	860	1.3	G	
08-Aug	232	M	640	710	1.3	G	
08-Aug	233	F	840	915	1.4	G	
08-Aug	234	M	590	650	M2	G	
08-Aug	235	M	520	580	1.2	G	
08-Aug	236	M	635	700	1.3	G	
08-Aug	237	M	650	720	M3	G	
08-Aug	238	M	555	605	1.2	G	
08-Aug	239	M	505	560	1.3	G	
08-Aug	240	F	795	860	1.4	G	
08-Aug	241	M	595	660	1.3	G	
08-Aug	242	F	715	780	NA	G	
08-Aug	243	M	615	680	M2	G	
08-Aug	244	F	785	850	1.4	G	
08-Aug	245	F	735	795	1.4	G	
09-Aug	246	F	790	860	1.4	G	
09-Aug	247	F	720	780	1.4	G	large healed gash
09-Aug	248	F	805	870	1.4	G	
09-Aug	249	F	770	830	1.4	G	
09-Aug	250	M	535	590	1.2	F	some fin decay

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	Condition (Good/Fair/Poor)	COMMENTS
09-Aug	251	F	765	825	1.4	G	
09-Aug	252	F	755	820	1.4	G	
09-Aug	253	F	845	920	1.4	G	
09-Aug	254	F	775	840	1.3	G	
09-Aug	255	M	545	605	1.2	G	
09-Aug	256	F	850	930	1.3	G	
09-Aug	257	F	845	920	2.4	G	
09-Aug	258	M	535	585	1.1	G	
09-Aug	259	F	760	815	1.3	G	
09-Aug	260	F	775	835	1.3	G	
09-Aug	261	M	790	850	1.3	G	
09-Aug	262	F	740	805	NA	G	
09-Aug	263	M	580	640	1.3	G	
09-Aug	264	M	600	665	1.3	G	
09-Aug	265	F	775	845	1.4	G	
09-Aug	266	F	780	850	1.4	G	
09-Aug	267	F	745	810	1.4	G	
09-Aug	268	F	700	760	1.3	G	
09-Aug	269	F	710	770	M3	G	
09-Aug	270	M	660	725	M2	G	
09-Aug	271	M	575	640	1.3	G	
09-Aug	272	M	505	560	1F	G	
09-Aug	273	F	770	840	1.3	G	
09-Aug	274	F	760	825	M3	G	
09-Aug	275	F	740	805	M3	G	
09-Aug	276	F	855	925	1.4	G	
09-Aug	277	M	730	810	1.3	G	
09-Aug	278	F	770	835	1.4	G	
09-Aug	279	M	500	555	1F	G	
09-Aug	280	M	575	635	1.2	G	
09-Aug	281	F	785	855	1.4	G	gillnet marks
09-Aug	282	M	560	615	1.2	G	
09-Aug	283	F	800	870	1.4	G	
09-Aug	284	M	505	560	M2	G	
09-Aug	285	F	755	810	1.4	G	
10-Aug	286	M	865	970	1.4	F	docile
10-Aug	287	M	705	790	1.3	F	docile. gillnet marks
10-Aug	288	M	575	630	1.3	F	some fin decay
10-Aug	289	F	690	745	1.3	G	gillnet marks
10-Aug	290	M	550	610	1F	G	
10-Aug	291	M	565	620	M2	G	
10-Aug	292	F	745	805	1.4	G	
10-Aug	293	M	590	650	1.2	G	
10-Aug	294	F	785	845	1.4	G	
11-Aug	295	M	675	755	1.3	G	
11-Aug	296	M	710	795	1.3	G	
11-Aug	297	F	810	880	M4	G	
11-Aug	298	F	670	725	1.3	F	docile
11-Aug	299	F	725	785	1.4	F	docile
11-Aug	300	M	530	600	1.2	F	docile

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	Condition (Good/Fair/Poor)	COMMENTS
11-Aug	301	F	805	865	1.4	G	
11-Aug	302	F	825	900	1.4	G	
12-Aug	303	F	725	780	1.3	F	docile
12-Aug	304	F	720	780	1.4	F	docile
12-Aug	305	M	615	685	1.3	G	
12-Aug	306	F	825	890	1.4	G	
12-Aug	307	M	560	620	1.2	G	
12-Aug	308	M	610	670	1.3	G	
12-Aug	309	F	750	810	1.4	G	
12-Aug	310	M	615	690	2.3	G	
12-Aug	311	M	780	885	1.3	G	
12-Aug	312	F	740	805	1.3	G	
12-Aug	313	M	630	695	1.3	G	
12-Aug	314	M	595	660	1.3	G	
12-Aug	315	M	785	870	1.4	G	
12-Aug	316	F	715	775	1.3	F	docile
13-Aug	317	F	740	800	1.4	G	
13-Aug	318	F	810	880	1.3	G	
13-Aug	319	M	820	915	1.3	G	
13-Aug	320	F	840	910	M5	G	
13-Aug	321	F	810	875	1.3	G	
13-Aug	322	F	830	905	M4	G	
13-Aug	323	F	770	840	1.3	G	
13-Aug	324	M	745	825	2.4	G	
13-Aug	325	M	700	780	1.4	G	
13-Aug	326	F	785	840	1.4	G	unhealed gash
13-Aug	327	M	595	655	1.3	G	
13-Aug	328	M	625	690	1.3	G	
13-Aug	329	M	620	685	1.2	G	
13-Aug	330	F	810	870	2.3	G	
13-Aug	331	F	820	890	1.3	G	
13-Aug	332	M	595	650	1.4	G	
13-Aug	333	M	735	825	1.3	G	
13-Aug	334	M	510	565	1.3	G	
13-Aug	335	M	590	645	1.2	G	
13-Aug	336	M	575	630	1.3	G	
13-Aug	337	M	715	800	1.3	G	
13-Aug	338	F	775	840	1.3	G	
13-Aug	339	F	855	920	1.3	G	
13-Aug	340	F	735	800	M4	G	
13-Aug	341	M	650	725	1.3	G	
13-Aug	342	M	525	580	1.2	G	
13-Aug	343	M	605	665	2.2	G	
13-Aug	344	M	730	810	M4	G	
13-Aug	345	M	725	810	1.3	G	
14-Aug	346	F	775	840	1.3	G	
14-Aug	347	F	865	930	1.4	G	
14-Aug	348	M	600	670	1.3	G	
14-Aug	349	M	670	750	1.2	G	
14-Aug	350	M	490	535	1F	G	

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	Condition (Good/Fair/Poor)	COMMENTS
14-Aug	351	M	490	555	1.2	F	docile
14-Aug	352	M	580	635	M2	F	caudal fin wear
14-Aug	353	F	805	875	1.4	G	ripe
14-Aug	354	M	475	530	M2	G	
14-Aug	355	M	755	830	1.4	G	
14-Aug	356	F	740	805	1.3	G	
14-Aug	357	M	560	625	1.2	G	
14-Aug	358	M	535	595	1.2	G	
14-Aug	359	F	755	820	1.3	G	
14-Aug	360	M	625	695	1.3	G	
14-Aug	361	M	520	575	1.2	G	
14-Aug	362	F	795	860	1.4	G	
14-Aug	363	F	825	895	1.4	G	
14-Aug	364	F	750	810	1.4	G	
14-Aug	365	M	570	630	M2	G	
14-Aug	366	M	710	800	1.3	G	
14-Aug	367	M	565	625	1.3	F	crooked spine
15-Aug	368	M	520	570	1.2	G	
15-Aug	369	M	470	530	1.2	G	
15-Aug	370	M	725	820	1.3	G	
15-Aug	371	M	695	775	1.3	F	gillnet marks
15-Aug	372	M	810	905	M3	G	
15-Aug	373	F	825	890	1.4	G	
15-Aug	374	M	800	885	1.4	G	
16-Aug	375	F	735	795	2.3	G	
16-Aug	376	M	550	600	1.2	F	docile
16-Aug	377	M	605	680	1.2	G	
16-Aug	378	M	695	780	1.3	G	
16-Aug	379	F	715	775	M4	G	
16-Aug	380	M	510	565	1.2	G	
16-Aug	381	F	860	940	1.3	G	
16-Aug	382	F	795	860	1.4	F	some fungal growth
16-Aug	383	M	600	665	1.3	F	docile
17-Aug	384	M	525	575	1.2	F	docile
17-Aug	385	M	690	775	1.2	F	docile
17-Aug	386	M	780	880	1.4	F	docile
17-Aug	387	M	675	750	1.3	F	docile
17-Aug	388	F	695	765	1.3	F	docile
17-Aug	389	M	475	525	1.2	F	docile
17-Aug	390	F	700	770	2.4	F	docile
17-Aug	391	M	560	615	1.2	F	large claw like scratches
17-Aug	392	F	835	920	M4	F	docile
18-Aug	393	M	850	955	1.4	F	some fin decay
18-Aug	394	F	735	800	1.4	F	docile

* European age format

NA: No Ages due to regenerate scale (center missing from scale).

Partial Ages: F=freshwater stage M=Marine stage

Appendix 5. Sex composition of Chinook salmon sampled in Blind Creek, 2003-2018.

YEAR	Sample Size	# Females	% of Total	# Males	% of Total
2003	118	54	45.8%	64	54.2%
2004	19	8	42.1%	11	57.9%
2005	161	78	48.4%	83	51.6%
2006	101	41	40.6%	60	59.4%
2007	83	37	44.6%	46	55.4%
2008	191	88	46.1%	103	53.9%
2009	245	106	43.3%	139	56.7%
2010	185	77	41.6%	108	58.4%
2011	203	111	54.7%	92	45.3%
2012	134	65	48.5%	69	51.5%
2013	149	89	59.7%	58	40.3%
2014	219	89	40.6%	130	59.4%
2015	597	211	35.3%	386	64.7%
2016	538	198	36.8%	340	63.2%
2017*	-	-	-	-	-
2018	394	203	51.5%	191	48.5%
Average	222	97	45.3%	125	54.7%

* 2017 weir operation was terminated early due to flood conditions and collapse of the weir fence.

Appendix 6. Percent composition of age class in sampling years 2006 through 2018.

YEAR	TOTAL ESCAPEMENT	# AGED FISH*	% of ESCAPEMENT AGED	% of AGE				
				AGE-3	AGE-4	AGE-5	AGE-6	AGE-7
2006	677	36	5.3 %	0	2.8 %	69.4 %	27.8 %	0
2007	304	61	20.1 %	0	16.4 %	34.4 %	45.9 %	3.3 %
2008	276	146	52.9 %	0	10.3 %	47.9 %	37.0 %	4.8 %
2009	716	147	20.5 %	4.1%	16.3 %	33.3 %	44.9 %	1.4 %
2010	270	127	47.0 %	0	8.7 %	53.5 %	33.1 %	4.7 %
2011	360	165	45.8 %	0	9.7 %	26.1 %	55.8 %	8.5 %
2012	157	105	66.9 %	0	10.5 %	38.1 %	46.7 %	4.8 %
2013	312	99	31.7 %	0	6.1 %	19.2 %	66.6 %	8.1 %
2014	602	186	30.9 %	0	12.4 %	45.2 %	37.7 %	4.8 %
2015	964	444	46.1%	0.2%	17.8%	39.9%	41.2%	0.9%
2016	664	400	60.2%	0.5%	16.8%	51.5%	27.3%	4.0%
2017	-	-	-	-	-	-	-	-
2018	612	332	54.2%	0.3%	10.8%	42.5%	40.7%	5.7%

* Number of Chinook sampled for which complete age was determined.

Note: The 2017 weir operation was terminated early due to flood conditions and collapse of the weir fence.

Appendix 7. Incidental freshwater fish species found on weir fence, July 17 through Aug 18.

Fish species	Total Live	Total Morts	Comments
Longnose Sucker (<i>Catostomus catostomus</i>)	4	0	all released downstream in good condition
Lake Whitefish (<i>Coregonus clupeaformis</i>)	2	1	mort with hemorrhaging on pectoral fins
Arctic Grayling (<i>Thymallus arcticus</i>)	2	2	one mort stuck between conduit in pen,
Northern Pike (<i>Esox lucius</i>)	5	0	length range of fish 46-48 cm. All 5 fish were moribund

Appendix 8. Mean, Maximum and Minimum discharge in cubic metres per second for July and August, Blind Creek, 1992-2018.

	JULY Daily Discharge (m ³ /sec)					AUGUST Daily Discharge (m ³ /sec)				
	Mean	Max.	Max. Day	Min.	Min. Day	Mean	Max.	Max. Day	Min.	Min. Day
1992	9.87	13.06	14/07	6.59	31/07	4.47	6.24	01/08	3.30	27/08
1993	8.93	12.0	11/07	7.41	30/07	7.41	9.18	12/08	6.55	30/08
1994	3.92	5.50	01/07	2.52	27/07	1.48	2.61	01/08	0.94	21/08
1995	4.71	8.09	06/07	2.60	01/07	4.91	5.79	29/08	3.88	15/08
1996	4.80	8.87	12/07	2.67	31/07	3.92	7.62	30/08	2.24	03/08
1997*	4.96	9.66	25/07	2.53	04/07	9.11	10.3	01/08	7.71	03/08
1998	-	-	-	-	-	-	-	-	-	-
1999	4.49	12.5	02/07	2.12	25/07	2.25	3.20	01/08	1.93	27/08
2000	-	-	-	-	-	-	-	-	-	-
2001	8.49	16.2	17/07	5.20	31/07	3.33	5.00	01/08	2.28	18/08
2002	2.85	4.95	06/07	2.25	28/07	2.71	5.81	30/08	1.82	11/08
2003	5.25	14.6	07/07	3.26	29/07	2.49	4.27	01/08	1.37	21/08
2004	3.41	4.56	01/07	3.02	17/07	2.51	3.41	01/08	2.28	26/08
2005	4.28	5.57	19/07	3.23	12/07	2.31	4.48	01/08	1.47	18/08
2006	5.92	10.8	11/07	2.76	31/07	3.46	5.08	15/08	2.50	01/08
2007	5.60	10.8	03/07	3.36	27/07	3.03	4.93	08/08	1.43	31/08
2008	12.55	29.2	16/07	6.26	04/07	9.66	31.10	26/08	4.81	17/08
2009 ^a	3.62	6.49	11/07	1.79	31/07	2.24	4.44	27/08	0.81	07/08
2010	-	-	-	-	-	-	-	-	-	-
2011 ^b	-	-	-	-	-	-	-	-	-	-
2012	14.81	37.54	03/07	6.97	31/07	7.15	14.60	11/08	5.00	08/08
2013	5.72	13.12	22/07	3.12	16/07	4.53	7.76	28/08	2.59	13/08
2014	4.81	7.92	31/07	3.12	28/07	4.06	7.87	01/08	2.99	24/08
2015	4.1	5.74	04/07	3.13	20/07	4.27	14.59	31/08	2.77	17/08
2016	5.39	7.27	31/07	4.01	07/07	6.35	8.20	04/08	5.23	24/08
2017	10.33	20.35	31/07	5.46	02/07	11.54	36.71	25/08	5.92	23/08
2018	6.1	17.0	02/07	2.5	31/07	3.7	5.5	10/08	2.1	04/08

* no data available for period between July 14-July 24 and after August 3.

^a Preliminary data – February 10, 2009. Discharge data was not available for the period July 3-July 10.

^b No data available due to equipment malfunction

Note: 1998, 2000 and 2010 data not available (Source: Environment Yukon, Water Resources Branch).

Appendix 9. Blind Creek weather and water conditions, 2018.

DATE	TIME	AIR TEMP (°C)	WATER TEMP (°C)	WATER LEVEL (cm)	WATER CLARITY	WEATHER
July 15	-	-	-	57	clear	periodic rain showers with sunny breaks
July 16	-	-	-	59	clear	light rain shower in a.m. sunny breaks, rain in evening
July 17	-	-	-	60	slightly murky	rain overnight, mix sun & cloud in afternoon, rain in evening
July 18	-	-	-	63	slightly murky	rain overnight, periodic rain showers during day
July 19	7:45	6.0	9.0	67	slightly murky	fog in morning, sunny, light wind
July 20	7:00	7.0	10.0	63	slightly murky	overcast, light wind
July 21	8:00	12.0	10.0	60	clearing	fog in morning, mix sun & cloud
July 22	8:00	13.0	10.0	58	clearing	mix sun & cloud
July 23	8:00	11.0	10.5	56	clear	mostly sunny
July 24	8:00	10.0	10.0	55	clear	sunny & hot
July 25	8:00	10.0	11.0	54	clear	sunny & hot
July 26	8:00	11.0	11.0	52	clear	sunny & hot
July 27	8:20	15.0	11.5	50	clear	sunny & hot
July 28	8:00	19.0	14.0	49	clear	rain overnight, clearing in a.m., sunny & hot day
July 29	8:05	13.0	12.0	49	clear	light rain showers in a.m. clearing to mix of sun and cloud
July 30	8:10	14.0	10.5	48	clear	sunny & hot
July 31	8:00	10.5	11.0	47	clear	mostly sunny, dark thunder clouds move around camp
Aug. 1	8:00	12.0	11.5	47	clear	sunny & hot
Aug. 2	8:00	11.0	11.5	46	clear	mostly sunny, smoke haze, windy
Aug. 3	8:00	8.0	12.0	45	clear	sunny
Aug. 4	8:00	13.0	13.0	45	clear	overcast
Aug. 5	8:00	14.0	12.0	46	clear	overcast, rain in evening
Aug. 6	8:00	12.0	12.0	46	clear	rain showers throughout day
Aug. 7	8:00	13.0	11.0	51	slightly murky	rain
Aug. 8	8:00	11.0	10.0	58	murky	rain
Aug. 9	8:00	10.0	10.0	59	murky	rain, clearing late afternoon
Aug. 10	8:15	9.0	9.5	62	slightly murky	rain showers with sunny periods, windy
Aug. 11	8:20	1.0	7.0	62	slightly murky	frost in morning, mix sun & cloud
Aug. 12	8:00	8.0	8.5	59	clearing	mostly cloudy
Aug. 13	8:10	12.0	10.0	55	clear	rain in a.m. clearing in afternoon
Aug. 14	8:00	10.0	10.0	55	clear	rain overnight & early a.m. thunder clouds, sunny breaks
Aug. 15	8:00	9.0	9.0	59	clear	rain showers overnight, periodic light showers during day
Aug. 16	8:00	6.0	8.5	58	clear	cool, clearing skies
Aug. 17	8:00	8.0	8.0	57	clear	cold morning, overcast with rain
Aug. 18	8:00	2.0	7.0	54	clear	light frost, fog in a.m. sunny during day