

BLIND CREEK CHINOOK SALMON ENUMERATION WEIR, 2016

CRE-37-16

Prepared for: The Yukon River Panel  
Restoration and Enhancement Fund

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## **ABSTRACT**

A weir was used to enumerate and collect biological data from Chinook salmon returning to Blind Creek in 2016. This was the 14<sup>th</sup> consecutive year of weir operations with funding by the Yukon River Panel, Restoration & Enhancement Fund. Weir monitoring began on July 15 and continued through to August 16. A total of 664 Chinook salmon was counted; 14% above the 2003 - 2015 average of 583 Chinook. The first fish passed through the counting chamber on July 17. The midpoint of the run occurred on July 30 and approximately 90% of the run had passed through the weir by August 9. A total of 500 Chinook salmon (75% of the run) was live sampled for age-sex-length during weir operations. In addition, the sex was recorded of 38 Chinook that were either netted out of the pen without being sampled or escaped from the sampling trough before measurements or scales could be taken. Of the total fish examined, 198 (36.8%) were females and 340 (63.2%) were males. The mean fork length (FL) of females and males sampled was 851.6 mm and 734.2 mm, respectively. All sampling data and scale cards were submitted to DFO Whitehorse stock assessment; scales were subsequently read by the DFO Pacific Biological Station sclerochronology lab. Complete age data was determined from 400 of the Chinook sampled; the remaining 100 samples yielded partial or no ages due to regenerate scales. Of the fish that were successfully aged, 0.5% were age-3, 16.8% were age-4, 51.5% were age-5, 27.3% were age-6 and 4.0% were age-7. The predominant age of females was age-6 (44.6%) and males, age-5 (52.2%).

## **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 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. The 2003 – 2015 average run size was 583 with annual returns ranging from 157 (2012) to 1,155 (2003). 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).

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 as well as facilitating public awareness of the salmon resource, management programs and the role of the Yukon River Panel (YRP). The number of visitors to the weir has increased annually over the years of operation.

## **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 km<sup>2</sup>. 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.

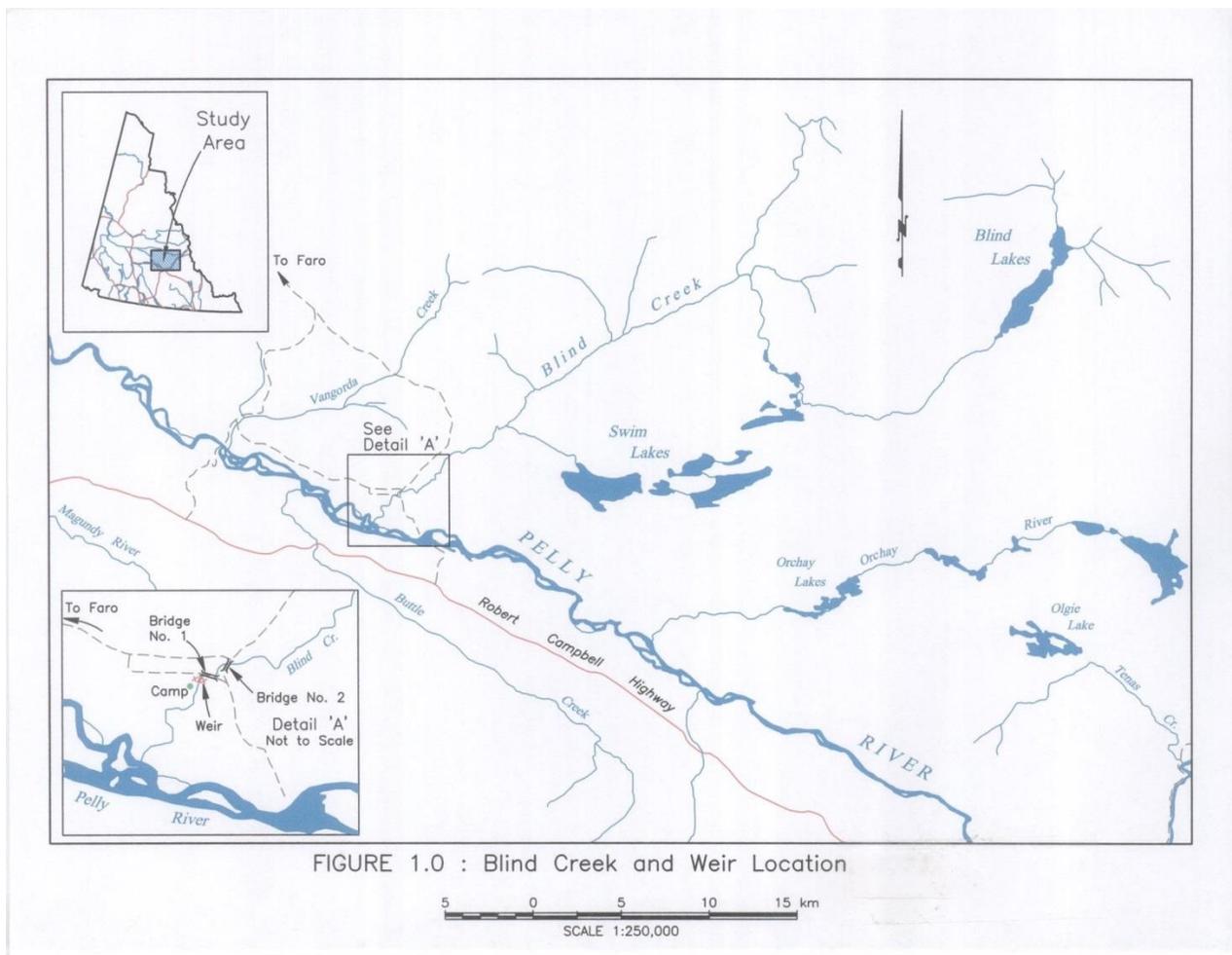


Figure 1. Blind Creek and Weir Location

## OBJECTIVES

The specific objectives of this project are as follows:

- 1) Install and operate a weir to obtain a count of the total 2016 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*

Materials for the camp were transported to the weir site from storage in Whitehorse and Faro on July 12. 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***

Weir construction began on July 13 and was completed (fish tight) by July 15. The weir was placed in the same area used for the past 13 years, approximately 1 km upstream of the creek mouth and 30 m downstream of the first bridge crossing (Figure 2).

As occurred in previous years, the weir was constructed using conduit panels and wooden tripods stored on site from the previous season's operation. Construction began with the placement of the holding pen 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. The fence was constructed of conduit panels and tripods placed downstream of the holding pen in a 'V' configuration to direct fish moving close to the bank towards the staging area. 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 looking upstream.

### ***Weir Operation & Biological Sampling***

Personnel were on site 24 hours a day for the duration of the Chinook run. Commencing July 15, 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. Daily and cumulative counts as well as sampling data were recorded on field notes. The data was transcribed daily to spreadsheets and relayed three times per week by phone to DFO Whitehorse.

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. When Chinook were observed accumulating behind the weir, a proportion was allowed to pass through the pen without being sampled. This helped to expedite the passage of fish 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 was 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. 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.

At the request of DFO, egg samples were obtained from ripe Chinook salmon captured at the weir for use in a Yukon River basin-wide thiamine analysis study<sup>1</sup>. The Blind Creek samples will contribute to assessing Upper Yukon River Chinook salmon thiamine levels. The goal was to collect at least 10 eggs per female and place in separate sampling bags. Eggs were obtained only from ripe females that readily expelled eggs. Samples were immediately placed in a freezer and delivered to DFO, Whitehorse at the end of field operations.

Broodstock were 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). One female and two males were collected by weir staff and held in holding tubes placed upstream of the weir prior to the day of the egg-take. The egg-take was conducted on August 12 by Nick de Graff, 'Stream to Sea' Salmon Stewardship Coordinator for the Ross River and Faro area.

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

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<sup>1</sup> This is a collaborative study undertaken by Alaska Department of Fish & Game (ADF&G), U.S Geological Service (USGS) and National Oceanic and Atmospheric Administration (NOAA) to explore Chinook salmon egg thiamine levels as a potential mechanism contributing to recent low productivity patterns in the Yukon River. R&E Fund project URE-06.

## ***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. The 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 664 Chinook salmon was counted through the weir between July 15 and August 16. This count was 14% above the average of 583 for all years of weir operation (2003 – 2015) (Appendix 6). Daily and cumulative counts are presented in Appendix 1. The midpoint of the run occurred on July 30, approximately 4 days earlier than average, and 90% of the run had passed through the weir by August 9, about 3 days earlier than average.

### ***Biological Sampling***

Of the 664 Chinook that passed through the weir, 500 (75% of the run) were live sampled for age-sex-length data. Complete age, length and sex data is presented in Appendix 2. Attempts were made to conduct sampling that was representative of the overall run (Figure 3). The sex was recorded of an additional 38 Chinook that were either netted out of the pen without being sampled or escaped from the sampling trough before measurements or scales could be taken. The total sample set was comprised of 198 (36.8%) females and 340 (63.2%) males. The percentage of female fish was similar to the 2015 run (35%) but below the average (45.5%) of all years (2003-2015) (Appendix 3). The mean fork length (FL) of females was 851.6 mm and males; 734.2 mm, respectively. The length frequency of female and male Chinook sampled is presented in Figure 4. Complete age data was determined from 400 of the Chinook sampled<sup>2</sup>. The age composition of fish that were successfully aged was 0.5% age-3 (1.1<sup>3</sup>), 16.8% age-4 (1.2), 51.5% age-5 (1.3, 2.2), 27.3% age-6 (1.4, 2.3) and 4.0% age-7(1.5, 2.4). Females were predominately age-6 (44.6%) and males predominantly age-5 (52.2%). Mean length at age data for male and female Chinook sampled is presented in Table 1.

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<sup>2</sup> Partial ages were determined for 90 fish sampled; no age could be determined for 10 of the sampled fish due to regenerate or resorbed scales.

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

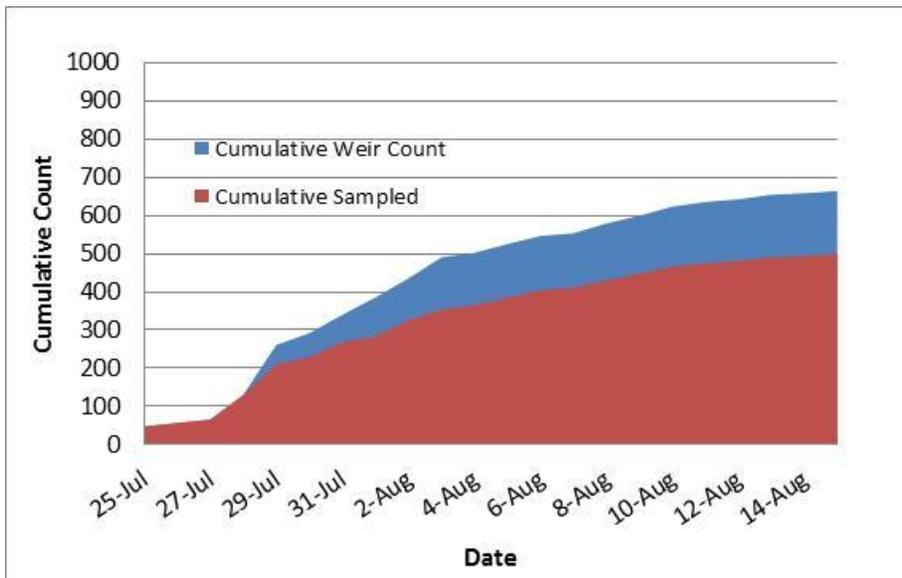


Figure 3. Cumulative proportion of weir counts sampled in 2016.

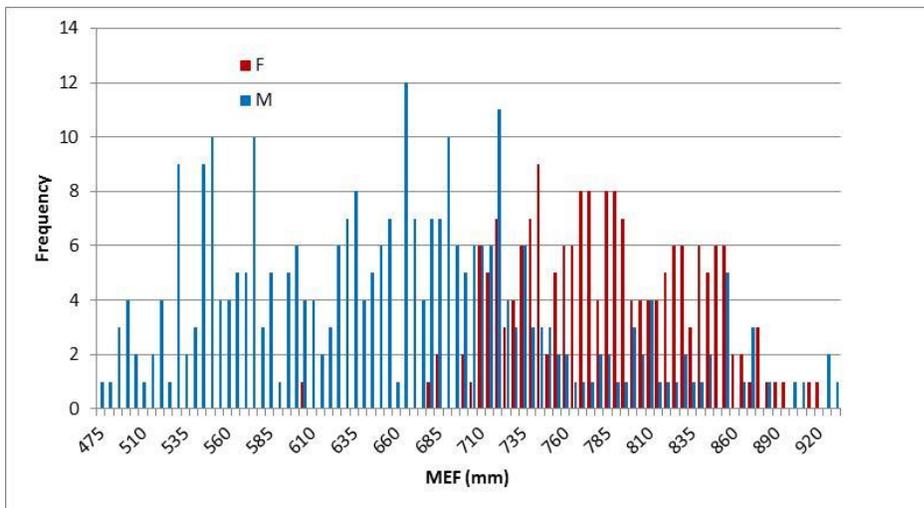


Figure 4. Length frequency of female and male Chinook sampled in 2016.

The majority of Chinook sampled in 2016 appeared in good condition with few showing physiological deterioration such as fin abrasion and fungus. As expected, sexually mature females were more prevalent in the latter part of the run. Gillnet marks were observed on 19 of the fish sampled. The ‘sway-back’ condition, in which the vertebrae column is crooked, was observed in five 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.

Table 1. Mean length at age of Chinook sampled from Blind Creek, 2016.

SEX	AGE	Brood Year	Mean FL (mm)	Count	%
Female	1.3	2011	840	49	10.3%
	2.2	2011	845	1	0.2%
	1.4	2010	864	64	13.4%
	2.3	2010	816	15	3.2%
	1.5	2009	891	2	0.4%
	2.4	2009	888	11	2.3%
	M2		840	1	0.2%
	M3		828	16	3.4%
	M4		854	18	3.8%
Female Total:			851	177	37.2%
Male	1.1	2013	568	2	0.4%
	1.2	2012	627	67	14.1%
	1.3	2011	787	125	26.3%
	2.2	2011	635	31	6.5%
	1.4	2010	913	11	2.3%
	2.3	2010	741	19	4.0%
	2.4	2009	885	3	0.6%
	M1		645	1	0.2%
	M2		626	13	2.7%
	M3		814	22	4.6%
	M4		924	4	0.8%
	M5		1020	1	0.2%
Male Total:				299	62.8%

\*European age format

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. Of the 17 female carcasses that washed up on the fence, four were unspawned with 100% egg retention and two were partially spawned with 25% and 50% egg retention.

### ***Ancillary Observations***

Algal masses were cleaned off the weir panels on a daily basis during the course of the 2016 weir operation. The algae could be seen floating downstream in small clumps before collecting on the weir panels and forming masses similar in texture to wet wool (Figure 5). A frozen sample was delivered to Environment Yukon at the end of the season where it was identified as didymo algae (*Didymosphenia geminata*). This is a single celled organism that can spread and form masses through the production of extracellular stalks. During a bloom, thick mats of didymo can cover streambeds and be very unsightly. This species is known to occur in other drainages of the Yukon River as well as in the Alsek, Peel and Liard drainages often at low densities, although blooms have recently been observed in several drainages in southern Yukon (Milligan, 2015). It isn't known if didymo is invasive or native to Yukon at this time, although there is evidence that

suggests it is native in areas in southern Canada (Milligan, 2015). This species is currently being monitored by Yukon Department of Environment, Fish and Wildlife Branch to determine where it is found in Yukon and whether it is spreading.



Figure 5. Mass of didymo algae (*Didymosphenia geminata*) collected off weir panels.

A total of nine dead adult Arctic Grayling (*Thymallus arcticus*) washed up on the weir fence between July 18 and August 12. Most of these fish exhibited pale and/or diffuse red gill arches and areas of reddening in the skin including around the pectoral fins, vent and operculum. Two specimens were frozen and delivered to Environment Yukon for analysis. Necropsy results were not available at the time of writing this report.

### ***Water Conditions***

The 2016 seasonal stream flows in Blind Creek peaked at 18.3 m<sup>3</sup>/sec on May 26 and fell to a low average daily discharge of 4.2 m<sup>3</sup>/sec by July 8. Frequent rains during the summer resulted in periodic increases in flow rates. The average daily discharge over the period of weir operation was approximately 5.8 m<sup>3</sup>/sec. Discharge measurements from April through September are illustrated in Figure 6. The mean, maximum and minimum discharge in July and August for the period 1992 to 2016 is presented in Appendix 7. Daily weather and water conditions recorded by weir attendants in July and August are presented in Appendix 8.

A maximum water temperature of 15.5°C was reached on July 7. Mean water temperatures in July and August were 12.1° C and 11.0° C, respectively (data from Environment Yukon, Water Resources Branch).

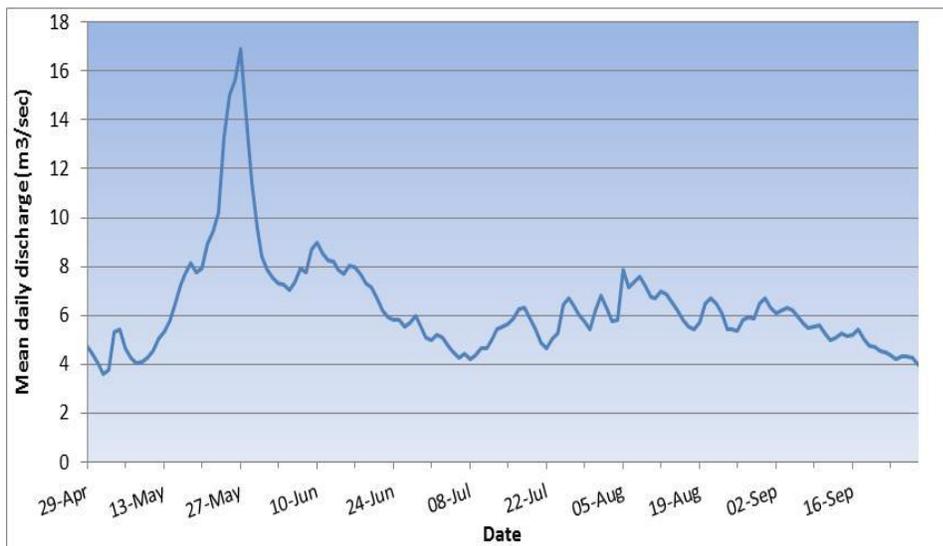


Figure 6. Mean daily discharge in Blind Creek, 2016. (data from: Environment Yukon, Water Resources Branch).

### ***Public Awareness***

At least 91 people visited the Blind Creek weir site over the course of 2016 operations. The visitors included local people as well as tourists visiting the Faro area.

### **DISCUSSION**

The Blind Creek weir project was successful at meeting all the 2016 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. The weir functioned well and remained ‘fish tight’ throughout the operation.

The 2016 Chinook salmon escapement into the Blind Creek drainage was above average which was consistent with above average escapements observed in other Chinook salmon assessment projects in the upper Yukon River (Mercer & Wilson 2017). As occurred in 2014 and 2015, management actions restricted Chinook fisheries along the Yukon River in Alaska and Canada. These management actions are in response to the low Chinook escapements observed in recent years.

A relatively high proportion of the Blind Creek Chinook run was sampled for ASL data in 2016; above the set minimum sample goal of 25% of the run. The proportion of the daily totals sampled ranged from 31% to 100%. Typically a smaller proportion of the fish were sampled during the peak of the run when large numbers of fish accumulated behind the weir and sampling effort was decreased to allow fish passage. 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 future weir operations it may be worthwhile to install a video system that could enable the sex identification of fish that are let through. This could provide an accurate sex ratio of the entire run and help reduce delays in the migration.

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 one generation (7 years) of the Blind Creek Chinook stock and seven years of subsequent recruitment. In addition, a representative ASL data set has been obtained through live sampling at the weir providing 14 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.

## **ACKNOWLEDGEMENTS**

The author would like to thank Akilah Bolton and Michael Fraser for assistance in weir operations. Dylan Button and Shawna Pitts provided occasional assistance during weir set-up and monitoring operations. Streamflow and temperature logger data included in this report was provided by Jonathan Kolot of Environment Yukon, Water Resources Branch.

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Appendix 1. Blind Creek weir Chinook salmon counts, 2016.

Date	Count of fish	Cumulative count	# Fish counted through	# Sampled	Cumulative sampled	# Females sampled	# Females released	Cumulative females	# Male sampled	# Males released	Cumulative males	Cumulative examined fish
15-Jul	0	0	0	0	0	0	0	0	0	0	0	0
16-Jul	0	0	0	0	0	0	0	0	0	0	0	0
17-Jul	3	3	0	3	3	0	0	0	3	0	3	3
18-Jul	0	3	0	0	3	0	0	0	0	0	3	3
19-Jul	5	8	0	5	8	0	0	0	5	0	8	8
20-Jul	1	9	0	1	9	0	0	0	1	0	9	9
21-Jul	0	9	0	0	9	0	0	0	0	0	9	9
22-Jul	4	13	0	4	13	1	0	1	3	0	12	13
23-Jul	1	14	0	1	14	0	0	1	1	0	13	14
24-Jul	25	39	0	25	39	5	0	6	20	0	33	39
25-Jul	9	48	0	9	48	2	0	8	7	0	40	48
26-Jul	9	57	0	9	57	1	0	9	8	0	48	57
27-Jul	9	66	0	9	66	3	0	12	6	0	54	66
28-Jul	65	131	0	64	130	17	0	29	47	1	102	131
29-Jul	130	261	46	80	210	23	0	52	57	4	163	215
30-Jul	31	292	10	20	230	8	0	60	12	1	176	236
31-Jul	48	340	9	39	269	15	0	75	24	0	200	275
1-Aug	45	385	30	14	283	8	0	83	6	1	207	290
2-Aug	50	435	6	43	326	22	0	105	21	1	229	334
3-Aug	55	490	25	28	354	17	1	123	11	1	241	364
4-Aug	12	502	0	11	365	7	0	130	4	1	246	376
5-Aug	23	525	0	20	385	5	0	135	15	3	264	399
6-Aug	21	546	0	19	404	9	0	144	10	2	276	420
7-Aug	7	553	0	7	411	4	0	148	3	0	279	427
8-Aug	26	579	0	19	430	8	3	159	11	4	294	453
9-Aug	20	599	0	18	448	9	1	169	9	1	304	473
10-Aug	24	623	0	18	466	10	4	183	8	2	314	497
11-Aug	12	635	0	9	475	5	1	189	4	2	320	509
12-Aug	7	642	0	6	481	1	0	190	5	1	326	516
13-Aug	12	654	0	9	490	2	0	192	7	3	336	528
14-Aug	4	658	0	4	494	3	0	195	1	0	337	532
15-Aug	6	664	0	6	500	3	0	198	3	0	340	538
<b>TOTAL:</b>	<b>664</b>		<b>126</b>	<b>500</b>		<b>188</b>	<b>10</b>	<b>198</b>	<b>312</b>	<b>28</b>	<b>340</b>	<b>538</b>

Appendix 2. Blind Creek Chinook salmon live sampling results, 2016.

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	CONDITION (Good/Fair/Poor)	COMMENTS
17-Jul	1	M	665	740	1.3	G	
17-Jul	2	M	720	800	1.3	G	
17-Jul	3	M	530	580	1.2	G	
19-Jul	4	M	800	900	NS	G	
19-Jul	5	M	710	800	1.3	G	
19-Jul	6	M	735	820	1.3	G	
19-Jul	7	M	665	730	1F	G	
19-Jul	8	M	680	760	1F	G	gillnet marks
20-Jul	9	M	720	800	1.3	G	
22-Jul	10	M	715	800	1.3	G	
22-Jul	11	M	795	880	1.4	G	
22-Jul	12	F	820	885	1.3	G	
22-Jul	13	M	730	825	1.3	G	
23-Jul	14	M	740	820	2.3	G	
24-Jul	15	M	685	760	1.3	G	
24-Jul	16	M	585	650	2.2	G	
24-Jul	17	M	665	740	1.3	G	
24-Jul	18	M	690	760	M2	F	head gash
24-Jul	19	M	610	675	2.2	G	
24-Jul	20	M	535	590	M2	G	
24-Jul	21	M	670	740	1.3	F	healed wounds & fungal spots
24-Jul	22	F	800	870	M3	G	
24-Jul	23	F	760	820	1.3	G	
24-Jul	24	F	815	880	M4	G	
24-Jul	25	M	625	700	1.3	G	
24-Jul	26	F	735	800	1.3	G	
24-Jul	27	M	570	635	1.2	G	
24-Jul	28	M	530	590	M2	G	
24-Jul	29	M	720	805	1.3	G	
24-Jul	30	M	745	830	1.3	G	
24-Jul	31	M	720	810	M3	G	
24-Jul	32	M	535	600	1.2	G	
24-Jul	33	F	770	845	2.2	G	
24-Jul	34	M	570	640	2.2	G	
24-Jul	35	M	815	915	M4	G	
24-Jul	36	M	560	620	1.2	G	
24-Jul	37	M	575	635	1.2	G	
24-Jul	38	M	720	805	M3	G	
24-Jul	39	M	700	765	2.3	G	small gash
25-Jul	40	F	770	835	2.3	G	
25-Jul	41	M	515	570	2.2	G	
25-Jul	42	M	710	790	M3	G	
25-Jul	43	M	575	635	1.2	G	
25-Jul	44	F	745	810	1.4	G	
25-Jul	45	M	630	705	2.2	G	
25-Jul	46	M	630	705	1.3	G	
25-Jul	47	M	530	585	1.2	G	
25-Jul	48	M	570	635	M2	G	
26-Jul	49	M	705	790	2.3	G	
26-Jul	50	M	685	765	M3	G	

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	CONDITION (Good/Fair/Poor)	
26-Jul	51	M	745	825	1.3	G	gillnet marks
26-Jul	52	M	650	725	1.2	G	
26-Jul	53	M	785	880	1.4	G	
26-Jul	54	M	730	810	M3	G	
26-Jul	55	M	575	630	1.2	G	
26-Jul	56	M	665	740	1.3	P	gillnet marks,heavy scarring, fin decay
26-Jul	57	F	855	925	1.4	G	
27-Jul	58	M	750	835	M3	G	
27-Jul	59	F	770	835	1.4	G	
27-Jul	60	F	735	800	2.3	G	
27-Jul	61	M	615	685	1.3	G	
27-Jul	62	M	530	595	1.2	G	
27-Jul	63	F	795	855	1.4	G	
27-Jul	64	M	575	645	2.2	G	
27-Jul	65	M	625	695	2.3	G	
27-Jul	66	M	580	630	2.2	G	
28-Jul	67	M	705	785	1.4	G	
28-Jul	68	M	840	945	1.3	G	
28-Jul	69	M	770	855	1.3	G	
28-Jul	70	M	935	1055	M3	G	
28-Jul	71	M	695	770	1.2	G	
28-Jul	72	M	735	825	1.3	G	
28-Jul	73	M	635	700	1.3	G	
28-Jul	74	F	795	855	1F	G	
28-Jul	75	F	780	855	M3	G	
28-Jul	76	M	555	615	M2	G	
28-Jul	77	M	690	770	1.3	G	
28-Jul	78	M	525	585	1.2	G	
28-Jul	79	M	550	615	1.2	G	
28-Jul	80	F	725	795	M3	G	tail fin decay
28-Jul	81	M	710	805	1.3	G	
28-Jul	82	M	605	670	2.2	G	
28-Jul	83	M	520	575	1.2	G	
28-Jul	84	M	490	545	1.2	G	
28-Jul	85	M	820	925	1.3	G	
28-Jul	86	M	645	715	1.3	F	head gash
28-Jul	87	M	685	765	1.3	G	
28-Jul	88	M	630	700	1.2	G	
28-Jul	89	M	700	780	1.3	G	
28-Jul	90	M	625	700	1.2	G	
28-Jul	91	M	635	710	1.3	G	
28-Jul	92	F	805	880	1.4	G	
28-Jul	93	M	720	800	1.3	G	
28-Jul	94	M	625	700	1.2	G	
28-Jul	95	F	685	745	M3	G	
28-Jul	96	M	615	680	RG	G	
28-Jul	97	M	655	740	1.3	G	
28-Jul	98	M	680	760	1.3	G	
28-Jul	99	M	545	600	1.2	G	some silver
28-Jul	100	M	625	695	1F	G	

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	COMMENTS	
28-Jul	101	M	520	575	1.2	G	
28-Jul	102	M	600	670	2.2	G	
28-Jul	103	M	595	660	2.2	G	
28-Jul	104	F	740	805	M4	G	
28-Jul	105	M	695	765	1F	G	
28-Jul	106	M	720	800	M3	G	
28-Jul	107	F	725	785	1.4	G	
28-Jul	108	M	790	885	1F	G	
28-Jul	109	M	635	710	1.3	G	
28-Jul	110	F	700	770	2.3	G	
28-Jul	111	F	685	750	M3	G	
28-Jul	112	M	685	770	1.3	G	
28-Jul	113	F	800	865	1.4	G	
28-Jul	114	M	610	680	1.3	G	
28-Jul	115	M	710	790	1.3	G	
28-Jul	116	M	685	760	1.3	G	
28-Jul	117	F	810	880	1.4	F	crooked spine
28-Jul	118	F	845	920	1.4	G	
28-Jul	119	M	715	795	2.3	G	gillnet marks
28-Jul	120	M	655	730	1.3	G	
28-Jul	121	M	670	750	1.3	G	
28-Jul	122	M	870	970	1.4	G	
28-Jul	123	M	620	690	1.3	G	
28-Jul	124	F	755	820	RG	G	
28-Jul	125	F	910	1000	1.3	G	
28-Jul	126	M	575	655	2.2	G	
28-Jul	127	F	740	805	1.4	G	
28-Jul	128	F	800	865	1.4	G	
28-Jul	129	M	585	640	2.2	G	
28-Jul	130	F	715	780	1.3	G	
29-Jul	131	M	740	830	1.3	G	
29-Jul	132	M	560	620	2.2	G	
29-Jul	133	M	750	860	1.3	G	
29-Jul	134	F	860	935	1.4	G	
29-Jul	135	M	605	675	RG	G	
29-Jul	136	M	745	840	1.3	G	
29-Jul	137	M	665	740	2.3	G	
29-Jul	138	M	625	690	1.3	G	
29-Jul	139	M	780	880	M4	G	
29-Jul	140	M	830	910	1.4	G	
29-Jul	141	M	755	850	1.3	G	
29-Jul	142	M	690	770	M3	G	gillnet marks
29-Jul	143	M	735	825	1.3	G	
29-Jul	144	M	810	920	1.4	G	
29-Jul	145	M	580	640	2.2	G	
29-Jul	146	F	850	925	1.4	G	
29-Jul	147	M	655	735	1.3	G	
29-Jul	148	M	715	805	1.3	G	
29-Jul	149	M	560	620	2.2	G	
29-Jul	150	F	850	925	M4	G	

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	Condition (Good/Fair/Poor)	COMMENTS
29-Jul	151	M	680	755	M3	G	
29-Jul	152	F	830	900	M4	G	
29-Jul	153	M	805	900	1.4	G	
29-Jul	154	M	685	770	1.3	G	
29-Jul	155	F	775	845	1F	G	
29-Jul	156	M	685	770	2.3	G	
29-Jul	157	F	790	860	1.3	G	
29-Jul	158	M	675	760	1.3	G	
29-Jul	159	F	840	915	RG	G	
29-Jul	160	M	725	810	1.3	G	
29-Jul	161	M	545	615	M2	G	
29-Jul	162	F	840	920	M4	G	gillnet marks
29-Jul	163	F	875	950	1.4	G	
29-Jul	164	F	875	960	1.3	G	
29-Jul	165	F	785	850	1.4	G	
29-Jul	166	M	550	600	1.2	G	
29-Jul	167	F	825	895	M3	G	
29-Jul	168	M	870	980	2.4	G	
29-Jul	169	M	855	950	1.3	G	
29-Jul	170	M	600	660	2.2	G	
29-Jul	171	M	650	720	2.3	G	
29-Jul	172	M	690	760	1.3	G	
29-Jul	173	M	665	735	1.3	G	
29-Jul	174	M	585	645	M2	G	
29-Jul	175	F	785	850	1.4	G	
29-Jul	176	M	680	745	2.3	G	
29-Jul	177	M	705	790	1.3	G	
29-Jul	178	M	675	740	1.3	G	
29-Jul	179	M	650	730	M3	G	
29-Jul	180	M	650	720	1.3	G	
29-Jul	181	F	605	675	1.4	G	
29-Jul	182	M	620	685	1.2	F	large healed wound
29-Jul	183	M	690	760	1.3	G	
29-Jul	184	M	570	640	1.2	G	
29-Jul	185	M	540	590	1.2	G	
29-Jul	186	M	760	845	1.3	G	
29-Jul	187	M	700	765	1.3	G	
29-Jul	188	M	650	725	2.3	G	
29-Jul	189	M	845	955	1.3	G	
29-Jul	190	F	795	870	1.4	G	
29-Jul	191	F	830	900	1.4	G	
29-Jul	192	F	770	835	1.3	G	
29-Jul	193	M	695	775	2.4	G	
29-Jul	194	F	755	820	1.3	G	
29-Jul	195	F	830	890	2.3	G	
29-Jul	196	M	665	735	1.2	G	
29-Jul	197	F	775	840	M3	G	
29-Jul	198	M	695	780	M3	G	
29-Jul	199	F	740	810	1.4	G	
29-Jul	200	M	600	660	1.2	G	

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	Condition (Good/Fair/Poor)	COMMENTS
29-Jul	201	M	775	870	1.3	G	
29-Jul	202	M	725	810	1.3	G	
29-Jul	203	M	655	720	1.3	G	
29-Jul	204	M	610	670	1.3	G	
29-Jul	205	M	855	965	1.3	G	
29-Jul	206	F	895	970	1.3	G	
29-Jul	207	M	725	820	1.3	G	
29-Jul	208	M	645	715	1.3	G	
29-Jul	209	M	735	820	M3	G	
29-Jul	210	F	805	870	1.3	G	
30-Jul	211	M	640	715	1.3	G	
30-Jul	212	M	845	930	1F	G	
30-Jul	213	M	855	955	1.3	G	
30-Jul	214	F	760	825	1.3	G	
30-Jul	215	M	830	935	1.3	G	
30-Jul	216	F	855	930	2.4	G	
30-Jul	217	M	805	900	1.3	G	
30-Jul	218	M	540	605	1.2	G	
30-Jul	219	F	785	850	M3	G	
30-Jul	220	M	620	700	1.2	G	
30-Jul	221	F	845	915	1.4	G	
30-Jul	222	M	645	710	2.3	G	
30-Jul	223	M	630	695	1.3	G	
30-Jul	224	M	545	615	1.2	G	
30-Jul	225	F	720	780	1.4	G	healed wound
30-Jul	226	F	775	840	1.4	G	
30-Jul	227	M	705	790	1.3	G	
30-Jul	228	F	825	890	1.3	F	abrasive gillnet marks
30-Jul	229	M	550	610	RG	G	
30-Jul	230	F	835	910	1F	G	
31-Jul	231	M	530	590	1.2	G	
31-Jul	232	F	775	840	M4	F	large gash
31-Jul	233	F	785	855	1.5	G	
31-Jul	234	F	720	775	1.3	G	
31-Jul	235	M	585	645	1.2	G	
31-Jul	236	M	505	560	1.2	G	Some silver
31-Jul	237	M	600	660	M2	G	
31-Jul	238	M	695	780	1.3	G	
31-Jul	239	M	545	600	1.2	G	
31-Jul	240	M	600	670	M3	G	
31-Jul	241	M	610	670	M2	G	
31-Jul	242	M	500	545	1.2	G	
31-Jul	243	F	745	805	1.3	G	
31-Jul	244	F	710	770	1.4	G	
31-Jul	245	F	765	830	1.3	G	
31-Jul	246	M	640	710	1.2	G	
31-Jul	247	M	855	945	1.3	G	
31-Jul	248	M	720	800	2F	G	
31-Jul	249	M	510	560	1.2	G	
31-Jul	250	F	855	925	1F	G	

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	Condition (Good/Fair/Poor)	COMMENTS
31-Jul	251	F	825	900	1.4	G	ripe – some eggs expelled
31-Jul	252	M	700	780	1.3	G	
31-Jul	253	M	550	605	1.2	G	
31-Jul	254	M	630	700	1.3	G	
31-Jul	255	M	655	730	2.3	G	
31-Jul	256	M	635	705	1.3	G	
31-Jul	257	F	830	900	1.4	G	
31-Jul	258	M	605	680	1.3	G	
31-Jul	259	M	550	610	2.2	G	
31-Jul	260	M	635	710	1.3	G	
31-Jul	261	M	500	550	1.2	G	
31-Jul	262	M	900	1010	1.4	G	
31-Jul	263	F	860	935	1.4	G	
31-Jul	264	F	750	815	M3	G	
31-Jul	265	M	785	880	1.3	G	
31-Jul	266	F	790	855	M4	G	
31-Jul	267	F	850	925	1.4	G	
31-Jul	268	F	840	910	1.3	G	scab on head
31-Jul	269	F	765	830	1.4	G	
01-Aug	270	M	665	740	1.3	G	
01-Aug	271	F	785	855	M4	G	
01-Aug	272	F	825	900	M3	G	
01-Aug	273	F	810	875	M3	G	
01-Aug	274	F	885	970	2.4	G	
01-Aug	275	M	565	620	1.2	G	
01-Aug	276	F	760	830	M3	G	
01-Aug	277	F	720	780	1.3	G	
01-Aug	278	M	590	660	2.2	G	
01-Aug	279	M	680	750	1.3	G	
01-Aug	280	F	710	770	M4	G	
01-Aug	281	M	670	745	1.3	G	
01-Aug	282	M	665	735	M3	G	
01-Aug	283	F	735	800	1.3	G	
02-Aug	284	F	740	800	1.4	G	
02-Aug	285	M	670	745	2.3	G	
02-Aug	286	F	740	805	M4	G	
02-Aug	287	M	640	710	1.3	G	
02-Aug	288	F	755	820	1.4	G	
02-Aug	289	F	710	775	2.3	G	ripe – some eggs expelled
02-Aug	290	M	540	610	1.2	G	
02-Aug	291	F	825	890	RG	G	
02-Aug	292	F	810	880	1.3	G	
02-Aug	293	F	845	915	1.4	G	
02-Aug	294	F	825	900	2.4	G	
02-Aug	295	F	920	995	1.4	G	
02-Aug	296	F	865	935	1.4	G	
02-Aug	297	M	715	775	M3	G	
02-Aug	298	M	670	740	1F	G	
02-Aug	299	M	545	600	2.2	G	
02-Aug	300	M	680	750	1.3	G	

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	Condition (Good/Fair/Poor)	COMMENTS
02-Aug	301	M	550	610	1.2	G	
02-Aug	302	M	550	615	2.2	G	
02-Aug	303	M	710	795	1.3	G	
02-Aug	304	M	690	770	1.3	G	
02-Aug	305	M	565	630	1.2	G	
02-Aug	306	M	825	925	M3	G	
02-Aug	307	F	820	890	1.4	G	
02-Aug	308	F	835	900	2.4	G	
02-Aug	309	F	765	825	M4	G	
02-Aug	310	F	680	745	M3	G	
02-Aug	311	M	810	905	1.3	G	gillnet marks
02-Aug	312	M	680	760	1.2	G	
02-Aug	313	M	490	535	1.2	G	
02-Aug	314	M	545	600	2.2	G	
02-Aug	315	F	815	885	1F	G	healed wound
02-Aug	316	F	765	825	2.4	G	
02-Aug	317	M	595	660	1.2	G	
02-Aug	318	M	865	970	1.3	G	
02-Aug	319	F	775	840	1.4	G	
02-Aug	320	M	705	780	1.3	G	
02-Aug	321	F	745	810	M4	G	
02-Aug	322	F	810	875	1.4	G	
02-Aug	323	F	845	915	2.4	G	
02-Aug	324	F	840	910	2.4	G	
02-Aug	325	F	840	910	M4	G	
02-Aug	326	M	960	1090	1.4	G	
03-Aug	327	F	830	900	1.4	G	
03-Aug	328	M	670	750	1.3	G	
03-Aug	329	F	735	790	2.4	G	
03-Aug	330	F	755	815	1.3	G	
03-Aug	331	M	545	595	2.2	G	
03-Aug	332	F	785	850	M3	G	
03-Aug	333	M	665	730	2.3	G	gillnet marks
03-Aug	334	M	810	900	2.4	G	
03-Aug	335	M	670	740	1.3	G	
03-Aug	336	F	780	840	2.3	G	
03-Aug	337	F	790	855	1.4	G	
03-Aug	338	F	720	785	RG	G	
03-Aug	339	M	565	630	M2	G	
03-Aug	340	F	740	800	1.3	G	
03-Aug	341	F	740	800	2.3	G	
03-Aug	342	M	555	610	M2	G	
03-Aug	343	F	770	840	M2	G	
03-Aug	344	F	855	920	M4	G	
03-Aug	345	F	855	925	1.4	G	
03-Aug	346	F	820	890	1.4	G	
03-Aug	347	M	800	895	1.3	G	
03-Aug	348	F	830	910	1.3	G	
03-Aug	349	F	795	855	1.3	G	ripe – some eggs expelled
03-Aug	350	F	730	800	1.3	G	

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	Condition (Good/Fair/Poor)	COMMENTS
03-Aug	351	M	750	840	1.3	G	
03-Aug	352	M	550	605	1.2	G	
03-Aug	353	M	935	1060	M4	G	
03-Aug	354	F	730	795	1.3	G	ripe – some eggs expelled
04-Aug	355	F	745	805	2.3	G	some silver
04-Aug	356	M	570	635	1.2	G	
04-Aug	357	M	665	745	1.3	G	
04-Aug	358	F	765	830	1.3	G	
04-Aug	359	F	890	960	1F	G	
04-Aug	360	M	545	605	2.2	G	
04-Aug	361	F	850	920	1.3	G	
04-Aug	362	F	855	920	1.4	G	
04-Aug	363	F	780	845	1.4	G	
04-Aug	364	M	715	800	1.2	G	
04-Aug	365	F	875	950	1.3	G	ripe
05-Aug	366	F	795	860	1.3	G	some silver
05-Aug	367	M	545	600	1.2	G	
05-Aug	368	M	595	655	2.2	G	
05-Aug	369	M	550	615	1.2	G	
05-Aug	370	F	780	850	2.3	F	one eye pecked out
05-Aug	371	M	735	815	1.3	G	
05-Aug	372	M	765	855	1.3	G	
05-Aug	373	M	645	715	1.2	G	
05-Aug	374	M	705	790	2.3	G	
05-Aug	375	M	725	830	1.3	G	
05-Aug	376	M	580	645	1.3	G	
05-Aug	377	M	720	810	1.3	G	
05-Aug	378	M	490	540	M2	G	gillnet marks
05-Aug	379	M	475	525	1.2	G	gillnet marks, some silver
05-Aug	380	M	655	720	1.3	G	gillnet marks
05-Aug	381	M	870	980	1.3	G	
05-Aug	382	M	715	810	1.3	G	
05-Aug	383	F	785	860	1.3	G	
05-Aug	384	F	720	775	1.4	G	some silver
05-Aug	385	F	770	835	M3	G	
06-Aug	386	M	690	765	1.3	G	
06-Aug	387	M	755	870	M3	G	
06-Aug	388	F	760	830	1.3	G	
06-Aug	389	F	770	850	1.3	F	one eye pecked out
06-Aug	390	M	695	770	M3	G	
06-Aug	391	M	605	670	2.2	G	
06-Aug	392	F	760	820	2.3	G	
06-Aug	393	M	565	620	2.2	F	deep gash
06-Aug	394	M	650	730	1.3	G	
06-Aug	395	F	720	780	2.3	G	
06-Aug	396	M	740	830	1.3	G	
06-Aug	397	F	755	820	1.3	G	
06-Aug	398	F	775	850	2.3	G	
06-Aug	399	F	710	780	1.3	G	gillnet marks
06-Aug	400	F	850	930	1.3	G	

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	Condition (Good/Fair/Poor)	COMMENTS
06-Aug	401	M	500	560	1.2	G	
06-Aug	402	F	790	860	1.4	G	
06-Aug	403	M	595	655	1.2	G	
06-Aug	404	M	645	720	1.3	G	some silver
07-Aug	405	M	665	745	1.2	G	
07-Aug	406	M	530	590	1.2	G	
07-Aug	407	M	575	640	2.2	G	
07-Aug	408	F	730	790	1.4	G	
07-Aug	409	F	710	765	RG	G	gillnet marks
07-Aug	410	F	795	860	1.4	G	
07-Aug	411	F	775	840	2.3	G	
08-Aug	412	M	595	645	M1	G	
08-Aug	413	F	745	810	2.3	G	
08-Aug	414	M	655	730	1.3	G	
08-Aug	415	F	700	755	1.3	G	
08-Aug	416	M	760	840	M4	F	crooked spine
08-Aug	417	F	735	800	1.3	G	ripe
08-Aug	418	F	760	815	1.3	G	ripe
08-Aug	419	M	575	630	1.2	G	
08-Aug	420	M	700	775	1.3	G	
08-Aug	421	F	730	790	M3	G	ripe
08-Aug	422	M	575	630	1.2	G	gillnet marks
08-Aug	423	M	585	650	1.2	G	
08-Aug	424	F	715	770	1.3	G	
08-Aug	425	F	745	810	1.3	G	ripe – some eggs expelled
08-Aug	426	M	575	640	2.2	G	
08-Aug	427	F	840	920	1.4	G	
08-Aug	428	M	710	785	1.3	G	
08-Aug	429	M	720	795	1.3	G	
08-Aug	430	M	905	1020	M5	G	
09-Aug	431	M	550	605	1.1	G	
09-Aug	432	F	800	870	1.4	F	ripe, ripped jaw
09-Aug	433	F	790	860	1.4	G	
09-Aug	434	M	575	640	1.2	G	
09-Aug	435	M	565	630	2.2	F	one eye pecked out
09-Aug	436	F	805	865	1.4	G	
09-Aug	437	M	630	695	1.3	G	
09-Aug	438	F	750	815	M4	G	
09-Aug	439	F	870	940	2.4	G	
09-Aug	440	F	705	765	1.3	F	ripe, docile
09-Aug	441	M	635	700	2.3	G	ripe
09-Aug	442	F	725	780	1.4	G	ripe
09-Aug	443	M	690	770	1.3	G	
09-Aug	444	F	815	880	1.4	G	healed wound
09-Aug	445	M	520	570	2.2	G	
09-Aug	446	M	730	825	1.3	G	ripe
09-Aug	447	F	720	780	1.4	G	ripe – some eggs expelled
09-Aug	448	M	690	760	1.3	G	
10-Aug	449	M	635	705	M3	G	
10-Aug	450	M	505	555	1.2	G	

DATE	FISH #	SEX	MEF (mm)	FL (mm)	AGE*	Condition (Good/Fair/Poor)	COMMENTS
10-Aug	451	M	660	735	2.3	G	
10-Aug	452	F	715	775	2.3	G	
10-Aug	453	M	530	590	1.2	G	
10-Aug	454	F	795	860	1.4	G	gillnet marks
10-Aug	455	M	520	575	RG	G	
10-Aug	456	M	555	615	1.2	G	
10-Aug	457	F	785	855	1.3	G	
10-Aug	458	F	820	875	1.4	G	
10-Aug	459	M	640	710	1.3	G	
10-Aug	460	F	790	860	1.3	G	
10-Aug	461	F	735	790	1.3	G	
10-Aug	462	F	715	780	1.3	F	crooked spine
10-Aug	463	F	865	945	1.4	G	
10-Aug	464	F	845	915	1.4	G	
10-Aug	465	F	715	770	1.3	G	
10-Aug	466	M	515	575	M2	G	
11-Aug	467	F	820	890	1.3	G	
11-Aug	468	F	815	885	1.4	G	ripe – some eggs expelled
11-Aug	469	F	790	855	M4	G	
11-Aug	470	M	720	800	1.3	G	
11-Aug	471	M	810	915	M3	P	gillnet marks, fin decay
11-Aug	472	F	745	810	M4	P	one eye pecked out
11-Aug	473	M	635	710	1.2	F	fin decay
11-Aug	474	M	485	530	1.1	F	docile
11-Aug	475	F	765	825	1.4	F	docile
12-Aug	476	F	850	926	1.5	F	docile
12-Aug	477	M	885	1010	M3	G	
12-Aug	478	M	555	610	2.2	G	
12-Aug	479	M	690	765	1.4	G	
12-Aug	480	M	735	820	1.3	G	
12-Aug	481	M	835	930	1.4	G	
13-Aug	482	M	630	700	2.3	G	
13-Aug	483	M	800	890	1.3	F	crooked spine
13-Aug	484	F	745	800	1.3	G	
13-Aug	485	F	775	850	2.4	G	
13-Aug	486	M	500	565	1.2	G	
13-Aug	487	M	600	665	2.3	F	healed wounds, crooked spine
13-Aug	488	M	530	580	1.2	G	
13-Aug	489	M	530	590	1.2	G	
13-Aug	490	M	675	755	1.3	G	
14-Aug	491	M	560	615	1.3	G	
14-Aug	492	F	770	835	2.4	G	gillnet marks
14-Aug	493	F	805	880	M4	G	
14-Aug	494	F	745	820	1.4	G	gillnet marks
15-Aug	495	M	675	750	1.3	G	
15-Aug	496	F	835	920	1.4	G	
15-Aug	497	F	710	770	1.4	F	one eye blind
15-Aug	498	M	780	880	1.3	G	ripe – expressed milt
15-Aug	499	M	855	970	1.3	F	fin decay, docile
15-Aug	500	F	790	845	1.4	G	

\* European age format

**No Ages:** RG= regenerate scale (center missing from scale). **Partial Ages:** F=freshwater stage M=Marine stage

Appendix 3. Sex composition of Chinook salmon sampled in Blind Creek, 2003-2016.

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%
<b>Average</b>	<b>210</b>	<b>89</b>	<b>44.9%</b>	<b>121</b>	<b>55.1%</b>

Appendix 4. Percent composition of age class in sampling years 2006 through 2016.

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%

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

Appendix 5. Blind Creek Chinook Counts from aerial surveys and weir operations, 1989, 1990, 1995-2016.

YEAR	METHOD	CHINOOK COUNTS	START DATE	ARRIVAL OF FIRST FISH	END DATE	50% of Run	90% of Run
1989	Aerial survey <sup>a</sup>	400	Aug 7		Aug 7		
1990	Aerial survey <sup>a</sup>	443	Aug 14		Aug 14		
1995	Weir	826	NR		NR		
1996	Aerial survey <sup>a</sup>	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 <sup>b</sup>	226	Aug 21		Aug 21		
2002	Aerial survey <sup>b</sup>	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

<sup>a</sup> aerial survey conducted by P.A. Harder and Associates Ltd.

<sup>b</sup> aerial survey conducted by RRDC and Jane Wilson & Associates

NR - not reported

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 6. Daily and average Chinook salmon counts in Blind Creek, 1997-1999, 2003-2016

DATE	Daily Count	Daily Average																
	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	1999	1998	1997	
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	3	0	5			0				0	0	0	0	1				1
18-Jul	0	0	2			0				0	0	0	0	1				0
19-Jul	5	0	3			0	0			0	0	0	1	2		0		1
20-Jul	1	0	9			0	0	0		0	0	1	32	0		0		4
21-Jul	0	0	0			0	0	0		0	0	0	5	2		0		1
22-Jul	4	2	5			0	0	0		0	0	1	2	4		0		2
23-Jul	1	2	23			0	0	0		0	0	0	2	2		0		3
24-Jul	25	9	16	0		3	0	0		1	0	0	140	1		0		15
25-Jul	9	0	7	0	0	0	0	0	0	0	0	0	24	10	0	0	122	10
26-Jul	9	0	0	0	0	1	0	0	0	0	0	2	10	17	0	0	85	7
27-Jul	9	21	24	0	0	1	0	2	0	7	0	10	20	495	0	1	66	39
28-Jul	65	13	116	0	2	2	1	8	1	3	2	8	60	2	0	0	73	21
29-Jul	130	9	89	1	2	5	1	27	1	3	9	13	33	68	0	0	64	27
30-Jul	31	29	6	0	0	4	1	12	2	10	27	105	225	95	0	0	70	36
31-Jul	48	45	4	2	3	1	17	106	1	9	26	18	36	7	0	0	44	22
01-Aug	45	366	21	0	3	11	0	84	4	8	67	15	60	45	15	0	49	47
02-Aug	50	48	32	2	4	7	0	25	1	27	8	15	34	0	65	6	77	24
03-Aug	55	19	32	6	7	6	0	24	6	6	109	35	7	7	133	34	38	31
04-Aug	12	29	116	19	6	11	1	0	3	13	25	45	15	201	50	169	60	46
05-Aug	23	102	35	35	2	7	33	22	5	8	131	46	15	75	116	16	22	41
06-Aug	21	64	2	28	8	13	23	106	11	63	19	53	27	50	73	4	33	35
07-Aug	7	41	16	48	10	7	19	67	17	59	47	54	19	12	25	5	20	28
08-Aug	26	26	1	4	33	35	5	30	26	6	63	31	4	18	129	5	43	29
09-Aug	20	20	8	25	17	30	9	110	18	20	44	18	8	1	128	1	19	29
10-Aug	24	17	4	36	13	86	4	28	11	9	14	15	2	0	139	31	21	27
11-Aug	12	28	3	52	2	45	27	20	15	4	16	14	10	8	1	25	5	17
12-Aug	7	22	9	12	6	31	23	9	19	16	28	11	1	4	0	15	16	13
13-Aug	12	9	4	5	9	29	19	7	27	14	19	7	0	18	0	9	5	11
14-Aug	4	5	5	19	7	6	40	6	20	8	11	3	0	2	0	11	1	9
15-Aug	6	15	3	7	8	13	14	13	26	6	6	5	0	2	0	18	13	9
16-Aug	0	4	2	6	9	1	6	3	23	4	5			5	0	7	8	6
17-Aug		11	0	5	4	5	12	4	23		1			0	0	9	3	6
18-Aug		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
<b>TOTAL</b>	<b>664</b>	<b>964</b>	<b>602</b>	<b>312</b>	<b>157</b>	<b>360</b>	<b>270</b>	<b>716</b>	<b>276</b>	<b>304</b>	<b>677</b>	<b>525</b>	<b>792</b>	<b>1155</b>	<b>892</b>	<b>373</b>	<b>957</b>	

Note: shaded areas denote start and end date of weir operations

Appendix 7. Mean, Maximum and Minimum discharge in cubic metres per second for July and August, Blind Creek, 1992-2016.

	JULY Daily Discharge (m <sup>3</sup> /sec)					AUGUST Daily Discharge (m <sup>3</sup> /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	31.1	26/08	4.81	17/08
2009 <sup>a</sup>	3.62	6.49	11/07	1.79	31/07	2.24	4.44	27/08	0.81	07/08
2010	-	-	-	-	-	-	-	-	-	-
2011 <sup>b</sup>	-	-	-	-	-	-	-	-	-	-
2012	14.00	34.4	03/07	7.72	31/07	7.41	12.6	11/08	5.92	08/08
2013	5.7	-	-	-	-	4.5	-	-	-	-
2014	4.8	-	-	-	-	4.1	-	-	-	-
2015	4.1	5.7	04/07	3.1	19/07	4.3	14.6	31/08	2.8	15/08
2016	5.3	6.8	26/07	4.0	08/07	6.4	8.2	05/08	5.2	25/08

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

<sup>a</sup> Preliminary data – February 10, 2009. Discharge data was not available for the period July 3-July 10.

<sup>b</sup> No data available due to equipment malfunction

Note: 1998, 2000 and 2010 data not available

(Source: Environment Yukon, Water Resources Branch).

Appendix 8. Blind Creek weather and water conditions, 2016.

DATE	TIME	AIR TEMP (°C)	WATER TEMP (°C)	WATER LEVEL (cm)	WATER CLARITY	WEATHER
July 12	-	-	-	59		mostly sunny, dark storm clouds move around camp
July 13	-	-	-	59	dark stained	cloudy in a.m., clearing & hot in p.m.
July 14	-	-	-	59	dark stained	mix sun & cloud, Thunderstorm in afternoon with rain
July 15	-	-	-	63	dark stained	mostly sunny, thunderclouds move around camp, rain shower
July 16	9:30	21	13	67	slightly cloudy	sunny & hot, surrounding thunder clouds
July 17	8:00	18	14	68	dark stained	overcast in a.m. clearing to mix of sun & cloud, smoke haze
July 18	8:00	19	14	64	dark stained	some rain overnight, breezy, mix sun and cloud
July 19	8:00	18	13	64	dark stained	foggy, rain most of day
July 20	8:00	15	12	60	dark stained	rain on and off all day
July 21	8:15	9.5	10.5	59	dark stained	light rain all day
July 22	8:00	11	10	61	dark stained	rain all night and all day
July 23	8:00	12	10.5	62	dark stained	foggy a.m. a few patches of blue sky, then rain, rain, rain
July 24	8:00	11	10	72	murky	rained most of night, some blue sky, rain in evening
July 25	8:00	14	10.5	75	murky	mix sun & cloud
July 26	8:00	12	10.5	73	murky	light showers overnight, clearing to mostly sunny
July 27	7:45	14	11	69	clearing, dark stained	mix of sun & cloud
July 28	8:00	16.5	11.5	63	clearing, dark stained	mix of sun & cloud. Light rain in evening
July 29	8:15	12.5	11.5	62	dark stained	overcast, light rain in a.m., windy, clearing in evening
July 30	8:30	17	10	67	slightly cloudy	mix sun & cloud
July 31	8:30	16	10.5	72	murky	sunny!!
Aug. 1	8:00	14	11.5	67	clearing, dark stained	sunny with some cloud
Aug. 2	8:00	12.5	11.5	63	dark stained	sunny and hot
Aug. 3	8:30	14	12.5	63	slightly cloudy	rain overnight, rain showers then downpour with thunder
Aug. 4	8:00	12	11.5	83	muddy	rain overnight, foggy in a.m.
Aug. 5	8:00	14	12.5	80	muddy	rain all night, sunny in morning
Aug. 6	8:00	15	12.5	82	muddy	rainy and cool
Aug. 7	8:15	16	13	80	muddy	mostly sunny
Aug. 8	8:00	13	12.5	78	cloudy, dark stained	mix sun & cloud, light rain late evening
Aug. 9	8:00	13	12.5	76	cloudy, dark stained	rained all night, light rain in a.m. clearing with gusty winds
Aug. 10	8:00	11.5	11.5	76	cloudy, dark stained	rained all night & into morning, light rain showers in p.m.
Aug. 11	8:00	10	10	79	clearing, dark stained	rain overnight and early morning, clearing
Aug. 12	8:30	14	11.5	77	clearing, dark stained	light rain overnight, overcast during day
Aug. 13	8:00	12	11.5	75	dark stained	sunny
Aug. 14	8:00	11	10.5	76	dark stained	mix sun & cloud
Aug. 15	8:15	11	11	70	clear	mix sun & cloud
Aug. 16	8:00	9	9	68	clear	mix sun & cloud, light evening rain shower