Fishery Data Series No. 07-50

Stock Assessment of Sockeye Salmon of Buskin River, 2004-2006

Final Report for Study 04-414

USFWS Office of Subsistence Management

Fishery Information Service Division

by

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August 2007

Alaska Department of Fish and Game **Divisions of Sport Fish and Commercial Fisheries**

Symbols and Abbreviations

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Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Measures (fisheries)

fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	*e*
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	*E*
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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ABSTRACT

Since 1990, the Alaska Department of Fish and Game, Division of Sport Fish, has assessed the annual runs of the sockeye salmon *Oncorhynchus nerka* stock of the Buskin River, Kodiak Island, Alaska. This report presents age, sex, length and run-size data collected between 2004 and 2006.

In 2004, the weir count of sockeye salmon at Buskin Lake and Lake Louise was 22,023 and 2,086, respectively. Estimated spawning escapement was 24,109 sockeye salmon. Reported subsistence harvest was 9,034. Age 1.3 and 2.3 fish comprised 60.7% of the escapement and 86.7.0% of the subsistence harvest, but only 48.2% of the Lake Louise escapement. The male-female ratio of the Buskin Lake weir count was 1.0:1.0 and the subsistence harvest 1.2:1.0. The male-female ratio of the Lake Louise weir count was 1.0:1.0.

In 2005, the weir count of sockeye salmon at Buskin Lake and Lake Louise was 15,468 and 2,028, respectively. Estimated spawning escapement was 17,496 sockeye salmon. Reported subsistence harvest was 8,055. Age 1.3 and 2.3 fish comprised 70.6% of the Buskin Lake escapement and 89.0% of the subsistence harvest, but only 28.7% of the Lake Louise escapement. The male-female ratio of the Buskin Lake weir count was 0.9:1.0 and of the subsistence harvest 1.5:1.0. The male-female ratio of the Lake Louise weir count was 1.0:1.0.

In 2006, the weir count of sockeye salmon at Buskin Lake and Lake Louise was 17,734 and 4,586, respectively. Estimated spawning escapement was 22,320 sockeye salmon. The total reported subsistence harvest was not yet available. Age 1.3 and 2.3 fish comprised 55.2% of the Buskin Lake escapement, 67.5% of the subsistence harvest, and 15.2% of the Lake Louise escapement. The male-female ratio of the Buskin Lake weir count was 0.8:1.0 and the subsistence harvest 1.0:1.0. The male-female ratio of the Lake Louise weir count was 0.9:1.0.

Key words: sockeye salmon, *Oncorhynchus nerka*, escapement, Buskin River, age, length, sex composition, sport harvest, spawner recruit, subsistence harvest, stock assessment.

INTRODUCTION

The Buskin River drainage, located on the northeast end of Kodiak Island (Figure 1), contains one of only three native populations of sockeye salmon *Oncorhynchus nerka* found on the Kodiak road system. The drainage supports one of the largest subsistence salmon fisheries in the Kodiak Archipelago and the single largest subsistence fishery within the Kodiak/Aleutian Islands Federal Subsistence Region. The subsistence fishery occurs in nearshore marine waters adjacent to the river mouth and targets several species of salmon. Sockeye salmon typically comprise as much as 80% of the total subsistence salmon harvest, with reported harvests ranging from approximately 5,900–10,800 fish from 1997–2006 (Table 1; Figure 2). Since 1997, the Buskin River subsistence harvest averaged 45% of the total sockeye salmon subsistence harvest reported for the region. Harvest in this fishery is documented through subsistence permits issued by the Alaska Department of Fish and Game, Division of Commercial Fisheries (CF).

The Buskin River is also the most popular recreational fishing stream on Kodiak Island, recently representing approximately 30% of the total freshwater recreational fishing effort in the Kodiak Management Area (Jennings et al. 2004, 2006a-b, 2007, *in prep* a). Recreational fishing effort on the Buskin River is directed primarily toward sockeye salmon *O. nerka* and coho salmon *O. kisutch*, but also steelhead and rainbow trout (both *O. mykiss*), pink salmon *O. gorbuscha* and Dolly Varden *Salvelinus malma*. From 1997–2005, sport harvest of sockeye salmon from the Buskin River ranged from about 800–3,000 fish and averaged more than 1,800 (Table 1, Figure 2). Sport harvest of sockeye salmon and fishing effort on the Buskin River are estimated by the Alaska Department of Fish and Game, Division of Sport Fish, Statewide Harvest Survey (SWHS).

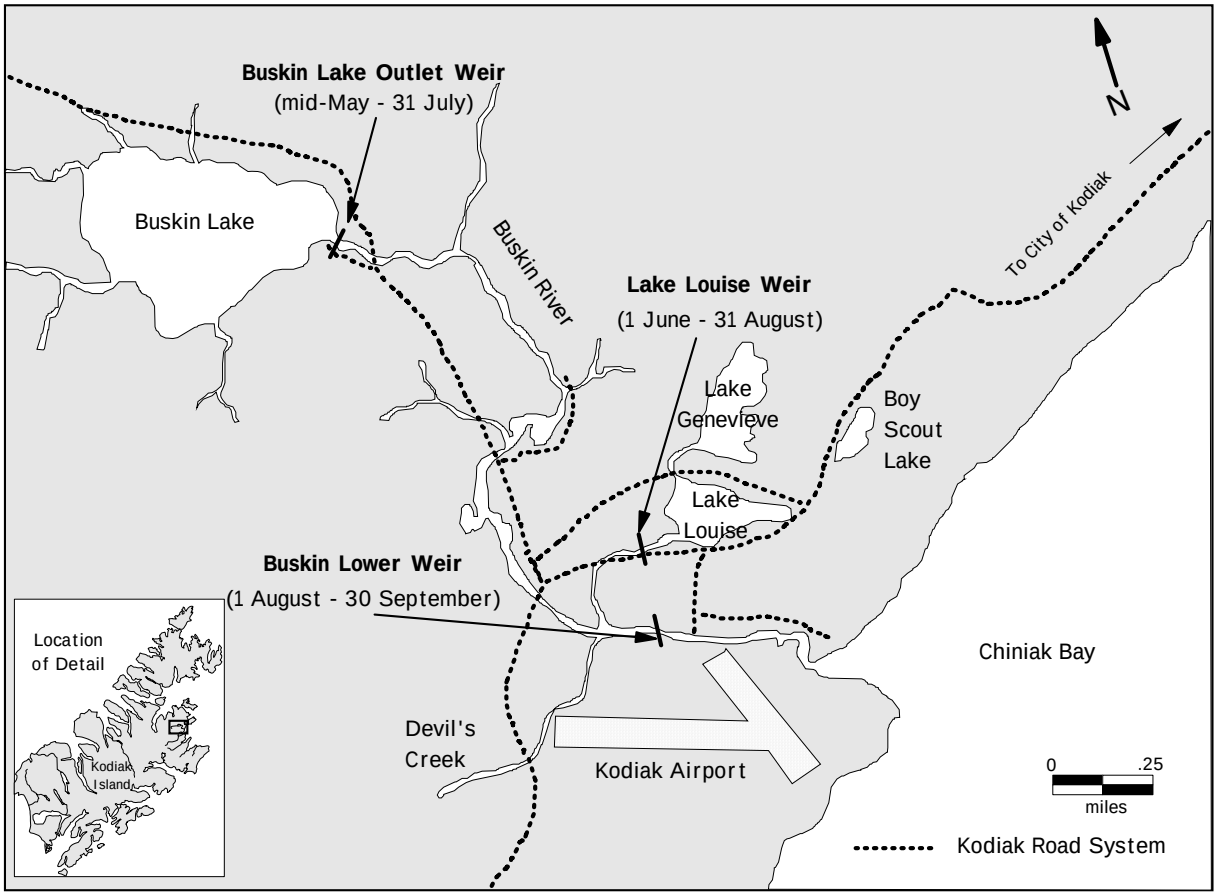

Figure 1.–Locations of the Buskin River weirs, 2004–2006.

Table 1.–Total weir counts and sources of harvest for Buskin River drainage sockeye salmon, 1997-2006.

			Weir Count [c]		Sport Fishing Estimates [d]		
Year	Commercial Harvest [a]	Subsistence Harvest [b]	Buskin Lake	Lake Louise	Harvest	Catch	Angler Days[e]
1997	0	5,892	9,840	-	1,843	2,524	10,734
1998	2	6,011	14,767	-	1,983	2,533	14,332
1999	1	7,985	10,812	-	1,467	2,284	19,382
2000	0	7,315	11,233	-	2,041	3,322	21,002
2001	0	10,262	20,556	-	827	1,488	9,539
2002	0	10,804	17,174	3,541	2,204	3,794	18,450
2003	6	10,673	23,870	4,488	3,017	3,906	14,311
2004	1,098	9,034	22,023	2,086	1,379	3,620	17,549
2005	0	8,055	15,468	2,028	1,540	2,851	17,575
2006[f]	6	na	17,734	4,586	na	na	na
Average	111	8,448	16,348	3,346	1,811	2,925	15,875

[a] Source: ADF&G, Division of Commercial Fisheries (CF), fish ticket database system. Includes all sockeye salmon harvested annually at the entrance of Buskin River in Womens Bay, statistical area 259-22.

[b] Source: Subsistence harvest records maintained by CF Westward Region; includes all reported harvest in Buskin River.

[c] Sources: Spalinger 2006; Caldentey 2007.

[d] Sources: Howe et al. 2001b-c; Walker et al. 2003; Jennings et al. 2004, 2006a-b, 2007, *in prep* a.

[e] Units are angler-days. Includes effort directed toward other species.

[f] Preliminary data. na = not available.

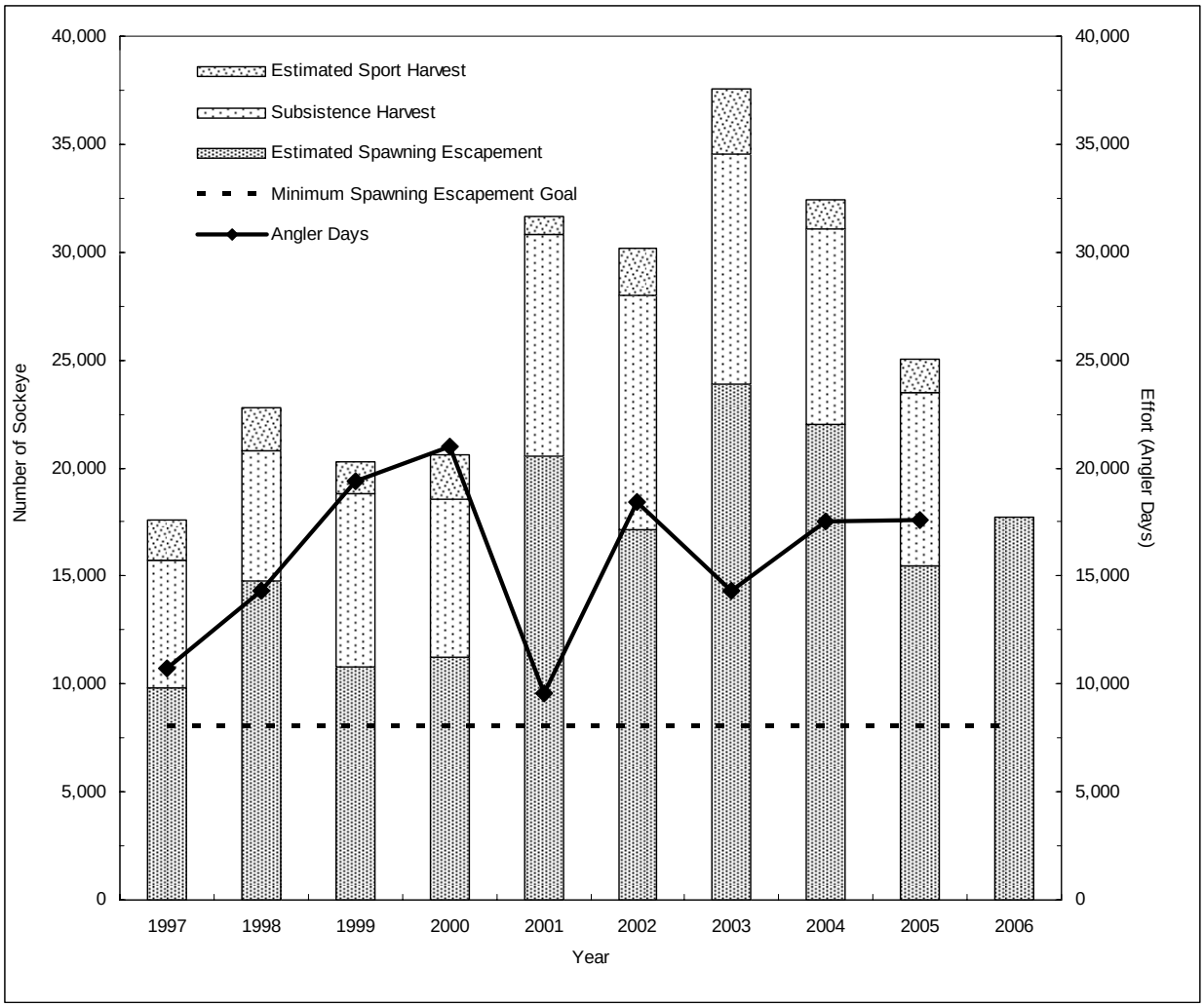

Figure 2.–Buskin Lake spawning escapement, estimated sport and subsistence harvest of sockeye salmon and sport fishing effort (angler days) directed towards all species at the Buskin River drainage, 1997–2006. Subsistence and sport harvest unavailable for 2006.

A relatively minor commercial harvest of Buskin River sockeye salmon periodically occurs in adjacent marine waters of Chiniak Bay. These harvests are small and, during some years, nonexistent. Fish ticket harvest receipts available from CF indicate that between 1997 and 2006, harvest was 1,098 Buskin River sockeye in 2004 and less than 10 fish in other years.

Inriver returns of sockeye salmon are monitored at a salmon counting weir, operated annually on the Buskin River by the Alaska Department of Fish and Game (ADF&G) since the mid 1980s to ensure the sustainability and long-term health of the stock. Counts of adult fish entering Buskin Lake are obtained between late May and late September, with the peak daily escapements typically occurring during the second week of June. Inriver returns of sockeye salmon are also monitored at a salmon counting weir, operated annually on the Lake Louise tributary by ADF&G since 2002. Escapement into Lake Louise is monitored between early June and late August with peak daily escapements typically occurring during August and also corresponding with high water events.

The Buskin River weir is traditionally operated from 25 May to 31 July at Buskin Lake outlet, and subsequently moved downstream to a site approximately 0.6 river miles upstream from the Buskin River mouth to count coho salmon. The lower weir is operated from 1 August to 30 September.

The current sockeye salmon escapement goal for the Buskin River, based on historical weir counts, is 8,000–13,000 fish. The escapement goal is used to guide inseason management of the subsistence, sport and commercial fisheries so that a sustained yield from the resource can be assured. If inseason weir counts indicate a minimum escapement of less than 8,000 fish the fisheries are restricted in a manner to increase the probability of achieving this goal. Restrictions are first enacted for sport and commercial harvesters, and, if necessary, subsequently also placed on the subsistence fishery.

To improve management of Buskin River sockeye salmon for the benefit of users it is essential to establish an escapement goal that accurately reflects the production capacity of the stock. Since 2000, ADF&G has obtained funding from the U.S. Fish and Wildlife Service, Office of Subsistence Management (OSM) to continue collecting the data needed to evaluate the current sockeye salmon biological escapement goal (BEG). Evaluation of the BEG requires construction of brood tables and completion of a spawner recruit analysis based on that table. The brood table is dependent on annual size and age composition of each of the spawning escapements, subsistence harvests, and commercial catches as well as the estimated sport harvests. Evaluation of the escapement goal using results from this ongoing study will allow for maximum production and harvest opportunity by users and ensure sustainability of the sockeye salmon resource.

Historical data collected from 1990–2003 were compiled and previously reported (Schmidt et al. 2005). Available harvest data compiled for 2004–2006 were published in Dinnocenzo et al. (2007). Sport fishery harvest estimates were published in the SWHS (Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2004, 2006a-b, 2007, *in prep* a).

This report presents results of the 2004-2006 study period funded by the OSM, including detailed descriptive statistics of age composition by fish size and sex. Elements of this report satisfy provisions of the OSM funding contract.

STUDY OBJECTIVES

During 2004-2006 objectives for the stock assessment study of Buskin River sockeye salmon consisted of the following:

1. Census the sockeye salmon escapement into Buskin Lake and Lake Louise.
2. Estimate the length, age and sex composition of the sockeye salmon escapement into the Buskin drainage and the length, age and sex composition of the subsistence harvest of sockeye salmon escapement in Chiniak Bay.
3. Update the Buskin River sockeye salmon brood table with data collected in 2004–2006.

METHODS

DATA COLLECTION

Weir Counts

From 2004–2006, ADF&G operated an approximately 125 ft long conventional design weir at the outlet of Buskin Lake (Figure 1). The weir was constructed with a superstructure framework of wooden tripods weighted with sandbags, aluminum cross stringers and a boardwalk. Rigid aluminum panels (measuring 6.6 ft in height and 2.5 ft in width, constructed from 1-in diameter schedule-40 pipe sections spaced 1 in apart, and welded into aluminum t-bar channel) provided structural continuity and created a barrier to uncontrolled passage of fish. Four counting gates integrated into the panel array allowed for the controlled passage of fish over a submerged white-colored background medium to assist in species identification. A funnel entrance trap structure constructed of aluminum panels and attached to one of the counting gates was installed to capture upstream migrating fish.

The Buskin River weir operated annually at two different locations. From mid-May to 31 July, the weir was operated on Buskin River at the outlet of Buskin Lake. Then the weir was moved downstream about 1.5 miles, to a site approximately 0.6 miles upstream from Buskin River mouth, and operated from 1 August to 30 September. During each year of the study, all species of immigrant and outmigrant anadromous fish passing through the Buskin Lake weir were enumerated. The weir was typically operated continuously from mid-May through July, although in 2006, approximately 7% of the total sockeye salmon count was estimated when high water precluded the controlled passage of fish. This estimate was based on a combination of observation and subsequent calculation using the corresponding average daily escapements from the most recent 5-year period. Annual counts of sockeye salmon obtained from the weir were considered a close approximation of total spawning escapement, as removals of sport caught fish do not occur within Buskin Lake or its tributaries.

During the reported period, a second weir was operated on a major tributary stream flowing into the Buskin River from Lake Louise (Figure 1). Materials utilized in construction of the Lake Louise weir were similar to those used at Buskin Lake. However, all fish traveling upstream passed directly into a funnel entrance trap structure attached to a series of bridge culverts spanning the stream channel approximately ¼ mile upstream of the Buskin River confluence. Since this area was frequented by bears, the trap live box was completely enclosed and secured by tensioned steel wire.

Annual sockeye salmon counts obtained from the instream trap provided a close approximation of total spawning escapement into Lake Louise since removals of sport caught fish do not occur in this portion of the Buskin River watershed. All other species of anadromous fish passing through the trap structure were also counted during dates of operation within the 2004–2006 reporting period.

Both weirs were monitored throughout the day for accumulating salmon, steelhead and Dolly Varden. Whenever necessary, gates in the weirs were opened and passing fish were enumerated and identified by species.

Fishery Harvests

Annual subsistence harvests of Buskin drainage sockeye salmon were estimated from returns of completed permits received by the CF Kodiak office. From 2000–2005, annual return rates of completed permits ranged between 84%–98% and averaged 90% (J. Shaker, ADF&G, Kodiak, personal communication). It was not possible to adequately determine the portion of permit holders harvesting Buskin River sockeye salmon who failed to return permits.

The sport fishery harvest of sockeye salmon was estimated by the SWHS (Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2004, 2006a-b, 2007, *in prep* a). Sport fishing effort in the Buskin River, as reported in the SWHS was used in this report. Commercial harvests were obtained from the CF fish ticket database system.

Age, Sex, and Length Composition Sampling

In 2004 and 2005 sockeye salmon age, sex and length composition (ASL) sample periods for the Buskin Lake run component were stratified into four 2-week intervals between 1 June and 31 July. In 2006 an additional sample period was added, 16 May to 31 May. Samples from inriver returns of sockeye salmon to Buskin Lake were obtained from weir traps. Sampling typically was conducted 3 days a week. Whenever possible all sockeye salmon captured in the live box trap were sampled. In 2004–2006, ASL sampling of the Lake Louise escapement was divided into four temporal strata between 1 June and 15 August (1 June–15 July, 16–31 July, 1–15 August and 16–31 August). Lake Louise sockeye salmon normally were sampled every other day. Whenever possible all sockeye salmon captured in the live box trap were sampled.

From 2004 through 2006, ASL sampling of the subsistence harvest was stratified into three 2-week intervals (1–15 June, 16–30 June, and 1–15 July). Sampling was conducted on the fishing grounds during good weather, and also dockside at the local boat harbor. Samples were obtained opportunistically within each time interval. Sport and commercial harvests were not sampled for ASL and were assumed to equal that of the escapement.

Length from mid-eye to fork-of-tail (METF) was recorded to the nearest millimeter for each fish sampled. Sex was determined through external morphology such as head shape and presence of ovipositor. Whenever possible, two scales were removed from the left side of the body, at a point on a diagonal line from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin, two rows above the lateral line (Welander 1940). Sampled scales were placed on a gummed card for subsequent analysis. Scales not available from the preferred area were taken in the same linear plane but in from the third or fourth row above the lateral line. Scales not available in either preferred area on the left side of the fish were collected from the same region on the opposite side. Ages of sampled sockeye salmon were determined from scales using criteria described in Mosher (1969).

DATA ANALYSIS

Age and Sex Composition

Escapement

Chi-squared statistics were used to test for differences in age and sex composition among temporal strata at the weirs. When differences were detected, the estimates were stratified to minimize bias. If differences were not detected, the data were pooled to improve precision of the estimates. The proportion of sockeye salmon in age or sex class *j* during stratum *i* for the escapement was estimated as a binomial proportion (Cochran 1977) by:

$$\hat{p}_{ij} = \frac{n_{ij}}{n_i}, \tag{1}$$

and its variance by:

$$\text{var}(\hat{p}_{ij}) = \left[\frac{N_i - n_i}{N_i}\right]\frac{\hat{p}_{ij}(1-\hat{p}_{ij})}{n_i - 1}, \tag{2}$$

where:

n_{ij} = the number of sockeye salmon in age or sex class *j* during stratum *i*,

n_i = the total number of sockeye salmon sampled during stratum *i*, and

N_i = the number of sockeye salmon in the weir count during stratum *i*.

The number of fish by age or sex class *j* in stratum *i* was estimated by:

$$\hat{N}_{ij} = N_i \hat{p}_{ij}, \tag{3}$$

and its variance by:

$$\text{var}(\hat{N}_{ij}) = N_i^2 \text{ var}(\hat{p}_{ij}). \tag{4}$$

When differences among strata were detected at $\alpha = 0.05$, the estimated total number of sockeye salmon of each age or sex class *j* ($\hat{N}_j$) in the escapement, and its variance [$\text{var}(\hat{N}_j)$], were calculated as the sum of the individual stratum estimates. The overall proportion of sockeye salmon of age or sex class *j* was calculated as:

$$\hat{p}_j = \frac{\hat{N}_j}{N}, \tag{5}$$

and its variance estimated as:

$$\text{var}(\hat{p}_j) = \frac{\text{var}(\hat{N}_j)}{N^2}. \tag{6}$$

When no difference among strata in age/sex composition was detected, data were pooled across strata and the above equations 1-4 used with deletion of subscript *i*.

Subsistence Harvest

Chi-squared statistics were used to test for differences in age and sex composition among temporal strata. Harvest estimates were not stratified, because subsistence harvest was only

reported seasonally, with no reliable method of stratification available. Pooled estimates of age and sex composition were therefore calculated as for the unstratified escapement estimates described above.

Sport Harvest

The number of sockeye salmon in the sport harvest by age or sex class *j* was estimated by:

$$\hat{N}_{SFj} = \hat{N}_{SF}\,\hat{p}_j\,, \tag{7}$$

where:

$\hat{N}_{SF}$ = the SWHS estimate of total sport harvest, and

$\hat{p}_j$ = the proportion of age or sex class *j* derived from escapement sampling (sport harvest was not sampled for age or sex).

The variance of the number of fish in the sport harvest of age or sex class *j* was estimated according to Goodman (1960):

$$\mathrm{var}(\hat{N}_{SFj}) = \hat{N}_{SF}^2\ \mathrm{var}(\hat{p}_j) + \hat{p}_j^2\ \mathrm{var}(\hat{N}_{SF}) - \mathrm{var}(\hat{p}_j)\,\mathrm{var}(\hat{N}_{SF})\,, \tag{8}$$

where:

$\hat{V}\left(\hat{N}_{SF}\right)$ = estimated variance of harvest, estimated from the SWHS.

Run Size Estimation

Weir counts, permit returns of subsistence harvests, and fish ticket tallies of commercial harvests were treated as censuses (and thus have no variance). Although unaccounted harvests from the small number of non-returned subsistence permits probably affected development of brood tables and spawner recruit analyses, formally estimating subsistence harvests was not part of this study.

The number of sockeye salmon of age class *j* in the overall run ($\hat{N}_j$) to Buskin Lake and its variance were estimated by summing the component estimates from the escapement, subsistence harvest and sport fishery, with $\hat{V}(\hat{N}_j)$ estimated by summing the respective variances estimates. A covariance will exist between the sport harvest estimate of the age class *j* and the escapement estimates of age class *j* (through $\hat{p}_j$); however, the covariances will be small because the sport harvest was relatively small.

Exploitation Rate Estimation

Exploitation rates (*E*) for the subsistence and sport fishery were estimated as:

$$\hat{E} = \frac{H}{\hat{T}} \tag{9}$$

where *H* was either the subsistence harvest or sport harvest estimate and *T* was the total run. The variance estimate of the subsistence exploitation rate was calculated as:

$$\mathrm{var}(\hat{E}) = H^2\,\frac{1}{\hat{T}^4}\,\mathrm{var}(\hat{T})\,. \tag{10}$$

The variance of the sport fish exploitation rate was estimated as:

$$\mathrm{var}(\hat{E}) = \left(\frac{\hat{H}}{\hat{T}}\right)^2 \left(\frac{\mathrm{var}(\hat{H})}{\hat{H}^2} + \frac{\mathrm{var}(\hat{H})}{\hat{T}^2}\right). \quad (11)$$

Spawning Escapement

Because sport fishery harvests or other known removals of sockeye salmon were very small and did not occur upriver of the weirs at Buskin Lake and Lake Louise, the sum of counts taken at the weirs was considered a census of the spawning escapement (and thus has no variance).

RESULTS

YEAR 2004

Buskin Lake Weir

The Buskin Lake weir was installed on 16 May and it operated continuously through 30 July. The daily cumulative count of sockeye salmon at Buskin Lake weir through 30 July was 21,247 fish, 50% of which were enumerated by June 12 (Appendix A1). A final weir count of 22,023 was achieved when the lower weir was removed for the season on 29 September.

Age was determined for 433 of 509 sockeye salmon sampled at the weir (Table 2). Age and sex compositions were not significantly different among temporal strata (Appendix B1; age: χ^2 = 7.1, df = 6, P = 0.32; sex: χ^2 = 7.8, df = 3, P = 0.05); therefore data were pooled across temporal strata.

Over 60% of the sockeye salmon escapement into Buskin Lake reared in the ocean for 3 years: age 1.3 (27.3%) and age 2.3 (33.5%) (Table 2). Most of the remaining escapement reared in the ocean for 2 years. Age composition was similar between males and females. Males and females were observed in equal numbers at a ratio of 1.0:1.0. On average, males (535 mm) were longer than females (501 mm).

Lake Louise Weir

The Lake Louise tributary stream weir was in operation from 4 June–31 August, 2004, during which 2,086 sockeye salmon were counted, 50% of which passed through the weir by 29 July (Appendix A2).

Age was determined for 459 of 515 sockeye salmon sampled (Table 3). Age composition was significantly different among temporal strata (Appendix C1; χ^2 = 50.7, df = 9, P < 0.001); therefore, estimates were stratified into four time periods: 1 June–15 July, 16–31 July, 1–15 August, and 16–31 August. Sex composition was not significantly different among temporal strata (χ^2 = 0.84, df =3, P = 0.84).

Over 46% reared in the ocean for 2 years: age 1.2 (36.5%) and age 2.2. (10.5%) (Table 3); 46% reared in the ocean for 3 years, age 1.3 (36.7%) and age 2.3 (11.4%). Age composition was similar between males and females. Males and females were observed in equal numbers at a ratio of 1.0:1.0. On average, males (510 mm) were slightly longer than females (501 mm).

Table 2.–Estimated age and sex compositions and mean length at age of the sockeye salmon escapement at Buskin Lake weir, 2004.

	Age										
Run Component[a]	1.1	0.3	1.2	1.3	1.4	2.1	2.2	2.3	3.2	2.4	Total[b]
Females											
Number sampled	0	0	22	53	1	1	68	66	0	2	253
Percent	0.0	0.0	5.1	12.2	0.2	0.2	15.7	15.2	0.0	0.5	49.7
SE Percent	0.0	0.0	1.0	1.6	0.2	0.2	1.7	1.7	0.0	0.3	2.2
Total Escapement	0	0	1,119	2,696	51	51	3,459	3,357	0	102	10,947
SE Return	0	0	230	344	50	50	382	377	0	71	483
Mean Length (mm)			478	523	528	438	469	529		529	501
SE Mean Length (mm)			6	3			4	3		13	2
Minimum Length (mm)			451	467	528	438	303	454		516	303
Maximum Length (mm)			549	567	528	438	527	581		541	581
Males											
Number sampled	0	0	16	65	0	6	52	79	0	2	256
Percent	0.0	0.0	3.7	15.0	0.0	1.4	12.0	18.2	0.0	0.5	50.3
SE Percent	0.0	0.0	0.9	1.7	0.0	0.6	1.5	1.8	0.0	0.3	2.2
Total Escapement	0	0	814	3,306	0	305	2,645	4,018	0	102	11,076
SE Return	0	0	198	375	0	123	341	405	0	71	483
Mean Length (mm)			476	554		342	507	563		532	535
SE Mean Length (mm)			13	5		16	6	2		89	3
Minimum Length (mm)			345	410		287	401	503		443	287
Maximum Length (mm)			539	602		398	621	617		621	621
All											
Number sampled	0	0	38	118	1	7	120	145	0	4	509
Percent	0.0	0.0	8.8	27.3	0.2	1.6	27.7	33.5	0.0	0.9	
SE Percent	0.0	0.0	1.3	2.1	0.2	0.6	2.1	2.2	0.0	0.5	
Total Escapement	0	0	1,933	6,002	51	356	6,103	7,375	0	203	22,023
SE Return	0	0	297	467	50	132	470	495	0	100	
Mean Length (mm)			477	540	528	356	485	548		530	518
SE Mean Length (mm)			6	3		19	4	2		37	2
Minimum Length (mm)			345	410	528	287	303	424		443	287
Maximum Length (mm)			549	602	528	438	621	617		621	621

[a] All estimates from unweighted analysis.

[b] Sex/age components do not necessarily sum to sex pooled over age or age pooled over sex due to missing sex for age data and missing age for sex data.

Table 3.–Estimated age and sex compositions, and mean length at age, of the sockeye salmon escapement at Lake Louise weir, 2004.

	Age										
Run Component[a]	1.1	0.3	1.2	1.3	1.4	2.1	2.2	2.3	3.2	2.4	Total[b]
Females											
Number sampled	1	1	88	96	4	0	20	23	0	0	258
Percent	0.2	0.2	18.5	21.0	0.9	0.0	4.4	5.1	0.0	0.0	50.0
SE Percent	0.1	0.2	1.6	1.7			0.9	0.9	0.0	0.0	1.9
Total Escapement	4	5	387	439	18	0	92	106	0	0	1,043
SE Return	3	5	33	36	8	0	18	20	0	0	40
Mean Length (mm)	350	495	475	526	517		466	530			501
SE Mean Length (mm)			3	3	5		7	5			3
Minimum Length (mm)	350	495	410	410	506		427	479			350
Maximum Length (mm)	350	495	558	579	528		539	568			583
Males											
Number sampled	10	0	84	68	1	8	28	27	0	2	258
Percent	2.0	0.0	17.8	15.5	0.2	1.4	6.1	6.3	0.0	0.5	50.0
SE Percent	0.5	0.0	1.5	1.5	0.2	0.4	1.0	1.1	0.0	0.3	1.9
Total Escapement	41	0	371	323	4	29	126	131	0	11	1,043
SE Return	11	0	32	32	3	9	21	22	0	7	40
Mean Length (mm)	395		496	548	520	351	501	536		546	510
SE Mean Length (mm)	22		5	3		4	8	6		25	4
Minimum Length (mm)	319		320	482	520	330	390	468		521	319
Maximum Length (mm)	530		598	602	520	367	576	595		571	602
All[b]											
Number sampled	11	1	172	164	5	8	48	50	0	0	515
Percent	2.1	0.3	36.5	36.7	1.0	1.4	10.5	11.4	0.0	0	
SE Percent	0.6	0.2	1.9	2.0	0.4	0.4	1.3	1.4	0.0	0	
Total Escapement	45	5	761	766	22	29	219	238	0	0	2,086
SE Return	12	5	40	41	9	9	27	29	0	7	
Mean Length (mm)	391	495	485	535	518	351	487	533		546	506
SE Mean Length (mm)	21		3	2	4	4	6	4		25	2
Minimum Length (mm)	319	495	320	410	503	330	390	468		521	319
Maximum Length (mm)	530	495	598	602	528	367	576	595		571	602

[a] Estimates for age and age by sex from weighted analysis with sex from unweighted analysis.

[b] Sex/age components do not necessarily sum to sex pooled over age or age pooled over sex due to missing sex for age data and missing age for sex data.

Age composition of Lake Louise sockeye salmon was significantly different than Buskin Lake sockeye salmon (χ^2 = 169.9, df = 3, P = <0.001), with age 2.3 fish comprising 33.5% of Buskin Lake escapement, versus 11.4% of Lake Louise escapement. Sockeye salmon sampled from Lake Louise averaged 506 mm (SE = 2) in length while fish sampled from Buskin Lake averaged 518 mm (SE = 2). Sex composition between run components was not significantly different (χ^2 = 0.009, df = 1, P = 0.92).

Subsistence Harvest

The reported sockeye salmon subsistence harvest for the Buskin system in 2004 was 9,034 fish (Table 4). Age was determined for 196 of 219 fish sampled from the harvest. Age and sex compositions were not significantly different among temporal strata (age: χ^2 = 0.45, df = 2, P = 0.80; sex: χ^2 = 0.80, df = 2, P = 0.67).

Over 86% of sockeye salmon harvested in the subsistence fishery reared in the ocean for 3 years; ages 1.3 and 2.3 fish comprised the dominant age groups (Table 4). Most of the remaining fish reared in the ocean for 2 years. Age composition was similar between males and females. There were slightly more males (53.9%) than females (46.1%), for a male: female ratio of 1.2:1.0. On average, males (550 mm) were longer than females (528 mm).

Age composition of the subsistence harvest of 3-ocean fish (83.0%) was significantly different (χ^2 = 46.8, df = 3, P < 0.001) from Buskin Lake escapement (60.8%). Sex composition between run components was not significantly different (χ^2 =0.79, df = 1, P = 0.37). Sockeye salmon harvested by subsistence fishers averaged 540 mm (SE = 2) in length compared to fish sampled at the Buskin Lake weir averaging 518 mm (SE = 2).

Sport and Commercial Fisheries

In 2004, anglers fishing the Buskin River system caught an estimated 3,620 (SE = 728) sockeye salmon and harvested 1,379 (SE = 448) sockeye, expending 17,549 (SE = 2,738) angler-days of effort for all species during the entire year (Table 1).

Fish ticket harvest receipts available from the CF indicate that 1,098 sockeye salmon were harvested at the entrance to Buskin River in Womens Bay, statistical area 259-22, during 2004.

For sockeye salmon harvested in the sport and commercial fishery combined 60.7% had reared in the ocean 3 years with ages 1.3 and 2.3 predominating (Table 5). Most of the remaining harvest consisted of sockeye that had reared in the ocean for 2 years.

YEAR 2005

Buskin Lake Weir

The Buskin Lake weir was installed on 17 May and operated continuously through 1 August. The daily cumulative count of sockeye salmon at Buskin Lake weir was 15,033 fish through 1 August, 50% of which were enumerated by 14 June (Appendix A1). A final weir count of 15,468 was achieved when the lower weir was removed for the season on 5 October.

Age was determined for 449 of 500 sockeye salmon sampled (Table 6). Age composition was not significantly different among temporal strata (Appendix B2; χ^2 = 5.1, df = 6, P = 0.53); therefore, sample data were pooled across temporal strata. Sex composition (χ^2 = 12.6, df = 3, P = 0.005) differed between time periods.

Table 4.–Estimated age and sex compositions, and mean length at age, of the reported sockeye salmon subsistence harvest for the Buskin River drainage, 2004.

	Age										
Run Component[a]	1.1	0.3	1.2	1.3	1.4	2.1	2.2	2.3	3.2	2.4	Total[b]
Females											
Number sampled	0	1	1	50	2	0	3	35	0	1	101
Percent	0.0	0.5	0.5	25.5	1.0	0.0	1.5	17.9	0.0	0.5	46.1
SE Percent	0.0	0.5	0.5	3.1	0.7	0.0	0.9	2.7	0.0	0.5	3.3
Total Harvest	0	46	46	2,305	92	0	138	1,613	0	46	4,166
SE Return	0	46	46	279	64	0	79	245	0	46	301
Mean Length (mm)		536	481	532	498		464	529		517	528
SE Mean Length (mm)				3	13		6	3			2
Minimum Length (mm)		536	481	451	485		458	494		517	451
Maximum Length (mm)		536	481	581	510		470	562		517	581
Males											
Number sampled	0	0	7	35	0	0	10	50	0	1	118
Percent	0.0	0.0	3.6	17.9	0.0	0.0	5.1	25.5	0.0	0.5	53.9
SE Percent			1.3	2.7	0.0	0.0	1.6	3.1	0.0	0.5	3.3
Total Harvest	0	0	323	1613	0	0	461	2,305	0	46	4,868
SE Return	0	0	119	245	0	0	141	279	0	46	301
Mean Length (mm)			518	559			490	556		603	550
SE Mean Length (mm)			5	4			5	3			3
Minimum Length (mm)			491	481			467	484		603	467
Maximum Length (mm)			533	614			527	607		603	614
All											
Number sampled	0	1	8	85	2	0	13	85	0	2	219
Percent	0.0	0.5	4.1	43.4	1.0	0.0	6.6	43.4	0.0	1.0	
SE Percent	0.0	0.5	1.3	3.4	0.7	0.0	1.7	3.4	0.0	0.7	
Total Harvest	0	46	369	3,918	92	0	599	3,918	0	92	9,034
SE Return	0	46	127	317	64	0	159	317	0	64	
Mean Length (mm)		536	514	543	498		486	545		560	540
SE Mean Length (mm)			7	3	13		5	3		43	2
Minimum Length (mm)		536	481	451	485		458	484		517	451
Maximum Length (mm)		536	533	614	510		527	607		603	614

[a] Estimates from unweighted analysis.

[b] Sex/age components do not necessarily sum to sex pooled over age or age pooled over sex due to missing sex for age data and missing age for sex data.

Table 5.–Estimated age and sex compositiond, and mean length at age, of the sockeye salmon sport and commercial harvest combined for the Buskin River drainage, 2004.

	Age										
Run Component[a]	1.1	0.3	1.2	1.3	1.4	2.1	2.2	2.3	3.2	2.4	Total[b]
Females											
Percent	0.0	0.0	5.1	12.2	0.2	0.2	15.7	15.2	0.0	0.5	49.7
SE Percent	0.0	0.0	1.0	1.6	0.2	0.2	1.7	1.7	0.0	0.3	2.2
Total Harvest	0	0	126	303	6	6	389	378	0	11	1,231
SE Return	0	0	32	59	6	6	71	70	0	8	189
Males											
Percent	0.0	0.0	3.7	15.0	0.0	1.4	12.0	18.2	0.0	0.5	50.3
SE Percent	0.0	0.0	0.9	1.7	0.0	0.6	1.5	1.8	0.0	0.3	2.2
Total Harvest	0	0	92	372	0	34	297	452	0	11	1,246
SE Return	0	0	26	69	0	15	58	80	0	8	191
All[b]											
Percent	0.0	0.0	8.8	27.3	0.2	1.6	27.7	33.5	0.0	0.9	
SE Percent	0.0	0.0	1.3	2.1	0.2	0.6	2.1	2.2	0.0	0.5	
Total Harvest	0	0	217	675	6	40	686	829	0	23	2,477
SE Return	0	0	46	112	6	16	114	134	0	12	

[a] Estimates from age/sex proportions of Buskin River escapement.

[b] Sex/age components do not necessarily sum to sex pooled over age or age pooled over sex due to missing sex for age data and missing age for sex data.

Over 70% of the sockeye salmon escapement into Buskin Lake reared in the ocean for 3 years: age 1.3 (31.2%) and age 2.3 (39.4%) (Table 6). Most of the remaining escapement reared in the ocean for 2 years. Age composition was similar between males and females. There were less males (47.1%) than females (52.9%) for a male: female ratio of 0.8:1.0. On average, males (521 mm) were longer than females (500 mm). Fish sampled at Buskin Lake averaged 500 mm (SE = 2).

Lake Louise Weir

The Lake Louise tributary stream weir was operated from 4 June-31 August, 2005, during which 2,028 sockeye salmon were counted, of which over 50% had passed through the weir by 3 August (Appendix A2).

Age was determined for 415 of 443 sockeye salmon sampled (Table 7). Age composition was significantly different among temporal strata (Appendix C2; χ^2 = 30.7, df = 9, P =0.0002); therefore, estimates were stratified into four time periods: 1 June–15 July, 16–31 July, 1–15 August, and 16–31 August. Sex composition (χ^2 = 6.42, df =3, P = 0.09) did not differ between time periods.

Sockeye salmon escapement into Lake Louise consisted of 29% reared in the ocean for 3 years: age 1.3 (24.6%) and age 2.3 (4.1%); 43.5% reared in the ocean for 2 years: age 1.2 (20.7%) and age 2.2 (22.8%) (Table 7). Over 24% of the total escapement was age 1.1. Age composition

was similar between males and females with the exception that 23% of males spent one year in the ocean compared to 6% of the females. Males equaled the number of females at a ratio of 1.01.0. On average, males (462 mm) were shorter than females (484 mm).

Age composition of Lake Louise sockeye salmon was significantly different from Buskin Lake sockeye salmon (χ^2 = 120.7, df = 3, P < 0.001), with age 2.3 fish comprising 39.4% of Buskin Lake escapement, versus only 4.1% of Lake Louise escapement. Lake Louise sockeye salmon averaged 473 mm (SE = 3) in length while Buskin Lake sockeye salmon averaged 510 mm (SE = 2). Sex composition between run components was not significantly different (χ^2 =0.91, df = 1, P =0.34).

Subsistence Harvest

The reported sockeye salmon subsistence harvest from the Buskin system in 2005 was 8,055 fish (Table 8).

Age was determined for 191 of 203 sockeye salmon sampled from the harvest. Age and sex compositions were not significantly different among temporal strata (age: χ^2 = 2.9, df = 2, P = 0.23; sex: χ^2 = 2.7, df = 2, P = 0.27).

Over 89% of sockeye salmon harvested in the subsistence fishery reared in the ocean for 3 years: age 1.3 (42.4%) and age 2.3 (46.6%) fish were the dominant age groups (Table 8). Most of the remaining fish reared in the ocean for 2 years. Age composition was similar between males and females. There were significantly more males (60.5%) than females (39.5%) for a male: female ratio 1.5:1.0. On average, males (548 mm) were longer than females (529 mm).

Age composition of the subsistence harvest of 3-ocean fish (89.0%) was significantly different (χ^2 = 23.6, df = 3, P < 0.001) from Buskin Lake escapement (70.6%). Sockeye salmon harvested by subsistence fishers averaged 540 mm (SE = 2) in length compared to 500 mm (SE = 2) for the Buskin Lake escapement.

Sport and Commercial Fisheries

In 2005, anglers fishing the Buskin River system caught an estimated 2,851 (SE = 482) sockeye salmon and harvested 1,540 (SE = 287) of these, expending 17,575 (SE = 1,195) angler-days of effort for all species during the entire year (Table 1).

Fish ticket harvest receipts available from the CF indicate that no sockeye salmon were harvested in front of Buskin River in Womens Bay, statistical area 259-22, during 2005.

Over 70% of sockeye salmon harvested by the sport and commercial fisheries combined had reared in the ocean for 3 years: the dominant age groups were ages 1.3 and 2.3 (Table 9).

YEAR 2006

Buskin Lake Weir

The Buskin Lake weir was installed on 16 May and was operated 16 May - 7 June, 9 June -20 July, and 22 July until 31 July. High water events on June 8 and July 21 prevented continuous operation on these dates. Daily sockeye salmon escapements were estimated on both of these occasions.

Table 6.–Estimated age and sex compositions, and mean length at age, of the sockeye salmon escapement at Buskin Lake weir, 2005.

	Age										
Run Component[a]	1.1	0.3	1.2	1.3	1.4	2.1	2.2	2.3	3.2	2.4	Total[b,c]
Females											
Number sampled	0	0	22	78	0	2	38	94	0	1	265
Percent	0.0	0.0	4.9	17.4	0.0	0.4	8.5	20.9	0.0	0.2	52.9
SE Percent	0.0	0.0	1.0	1.8	0.0	0.3	1.3	1.9	0.0	0.2	2.3
Total Escapement	0	0	758	2,687	0	69	1,309	3,238	0	34	8,183
SE Return	0	0	155	273	0	48	200	293	0	34	357
Mean Length (mm)			468	511		335	470	516		520	500
SE Mean Length (mm)			7	4		3	5	3			2
Minimum Length (mm)			386	414		332	393	429		520	332
Maximum Length (mm)			535	568		338	587	584		520	587
Males											
Number sampled	9	0	14	62	0	3	42	83	0	1	235
Percent	2.0	0.0	3.1	13.8	0.0	0.7	9.4	18.5	0.0	0.2	47.1
SE Percent	0.7	0.0	0.8	1.6	0.0	0.4	1.4	1.8	0.0	0.2	2.3
Total Escapement	310	0	482	2,136	0	103	1,447	2,859	0	34	7,285
SE Return	101	0	125	248	0	59	210	280	0	34	357
Mean Length (mm)	342		510	552		355	479	547		509	521
SE Mean Length (mm)	7		14	3		6	7	3			4
Minimum Length (mm)	312		408	471		345	392	439		509	312
Maximum Length (mm)	375		574	609		367	553	594		509	609
All											
Number sampled	9	0	36	140	0	5	80	177	0	2	500
Percent	2.0	0.0	8.0	31.2	0.0	1.1	17.8	39.4	0.0	0.4	
SE Percent	0.7	0.0	1.3	2.2	0.0	0.5	1.8	2.3	0.0	0.3	
Total Escapement	310	0	1,240	4,823	0	172	2,756	6,098	0	69	15,468
SE Return	101	0	196	334	0	76	276	352	0	48	
Mean Length (mm)	342		484	529		347	475	531		515	500
SE Mean Length (mm)	7		7	3		6	4	2		6	2
Minimum Length (mm)	312		386	414		332	392	429		509	332
Maximum Length (mm)	375		574	609		367	587	594		520	587

[a] Age/age by sex estimates from unweighted analysis with sex from weighted analysis.

[b] Sex/age components do not necessarily sum to sex pooled over age or age pooled over sex due to missing sex for age data and missing age for sex data.

[c] Total female mean length includes 30 fish for which age was not estimated, total male mean length includes 21 fish for which age was not estimated, total sockeye salmon mean length includes 51 fish for which age was not estimated.

Table 7.–Estimated age sex compositions, and mean length at age, of the sockeye salmon escapement at Lake Louise weir, 2005.

	Age										
Run Component[a]	1.1	0.3	1.2	1.3	1.4	2.1	2.2	2.3	3.2	2.4	Total[b]
Females											
Number sampled	13	0	48	86	0	5	48	12	0	0	220
Percent	3.0	0.0	11.8	13.8	0.0	1.1	16.5	1.6	0.0	0.0	49.9
SE Percent	1.2	0.0	2.3	2.2	0.0	0.7	2.8	0.7	0.0	0.0	2.1
Inriver Return	62	0	240	280	0	23	336	32	0	0	1,012
SE Return	25	0	48	44	0	15	57	15	0	0	43
Mean Length (mm)	370		470	516		441	466	519			484
SE Mean Length (mm)	13		4	3		24	3	5			3
Minimum Length (mm)	326		424	427		368	427	496			326
Maximum Length (mm)	506		529	567		503	524	551			567
Males											
Number sampled	66	0	39	54	0	6	22	14	0	0	221
Percent	20.6	0.0	9.0	11.0	0.0	2.4	6.4	2.5	0.0	0.0	50.1
SE Percent	3.0	0.0	2.1	2.2	0.0	1.2	1.8	1.0	0.0	0.0	2.1
Inriver Return	418	0	183	223	0	49	131	51	0	0	1,016
SE Return	61	0	42	44	0	25	37	21	0	0	43
Mean Length (mm)	367		483	528		378	474	544			462
SE Mean Length (mm)	4		5	4		6	8	7			5
Minimum Length (mm)	321		428	421		358	338	494			321
Maximum Length (mm)	479		586	597		397	526	578			597
All											
Number sampled	81	0	87	140	0	11	70	26	0	0	443
Percent	24.3	0.0	20.7	24.6	0.0	3.5	22.8	6.1	0.0	0.0	
SE Percent	3.2	0.0	2.9	2.9	0.0	1.4	3.1	1.2	0.0	0.0	
Inriver Return	493	0	420	500	0	72	462	83	0	0	2,028
SE Return	64	0	59	58	0	28	63	25	0	0	
Mean Length (mm)	367		476	521		407	469	532			473
SE Mean Length (mm)	4		3	2		15	3	5			3
Minimum Length (mm)	321		424	421		358	338	494			321
Maximum Length (mm)	506		586	597		503	526	578			597

[a] Age/age by sex from weighted analysis with sex from unweighted analysis.

[b] Sex/age components do not necessarily sum to sex pooled over age or age pooled over sex due to missing sex for age data and missing age for sex data.

[c] Total female mean length includes eight fish for which age was not estimated, total male mean length includes 20 fish for which age was not estimated, total sockeye salmon mean length includes 28 fish for which age was not estimated.

Table 8.–Estimated age and sex compositions, and mean length at age, of the reported sockeye salmon subsistence harvest for the Buskin River drainage, 2005.

	Age										
Run Component[a]	1.1	0.3	1.2	1.3	1.4	2.1	2.2	2.3	3.2	2.4	Total[b]
Females											
Number sampled	0	1	4	37	0	0	4	28	0	0	79
Percent	0.0	0.5	2.1	19.7	0.0	0.0	2.1	14.9	0.0	0.0	39.5
SE Percent	0.0	0.5	1.0	2.8	0.0	0.0	1.0	2.6	0.0	0.0	3.4
Total Harvest	0	43	171	1,585	0	0	171	1,200	0	0	3,182
SE Return	0	42	83	230	0	0	83	206	0	0	276
Mean Length (mm)		534	486	534			517	532			529
SE Mean Length (mm)			21	3			20	4			3
Minimum Length (mm)		534	434	498			460	493			434
Maximum Length (mm)		534	522	573			549	589			589
Males											
Number sampled	0	0	7	42	0	0	5	60	0	0	121
Percent	0.0	0.0	3.7	22.3	0.0	0.0	2.7	31.9	0.0	0.0	60.5
SE Percent	0.0	0.0	1.4	3.0	0.0	0.0	1.2	3.3	0.0	0.0	3.4
Total Harvest	0	0	300	1,800	0	0	214	2,571	0	0	4,873
SE Return	0	0	109	241	0	0	93	269	0	0	276
Mean Length (mm)			538	553			481	549			548
SE Mean Length (mm)			10	3			20	3			2
Minimum Length (mm)			498	498			404	499			404
Maximum Length (mm)			572	594			522	590			594
All											
Number sampled	0	1	11	81	0	0	9	89	0	0	203
Percent	0.0	0.5	5.8	42.4	0.0	0.0	4.7	46.6	0.0	0.0	
SE Percent	0.0	0.5	1.7	3.5	0.0	0.0	1.5	3.6	0.0	0.0	
Total Harvest	0	42	464	3,416	0	0	380	3,753	0	0	8,055
SE Return	0	42	135	285	0	0	122	288	0	0	
Mean Length (mm)		534	519	544			497	543			540
SE Mean Length (mm)			12	2			15	2			2
Minimum Length (mm)		534	434	498			404	493			404
Maximum Length (mm)		534	572	594			549	590			594

[a] Estimates from unweighted analysis.

[b] Sex/age components do not necessarily sum to sex pooled over age or age pooled over sex due to missing sex for age data and missing age for sex data.

[c] Total female mean length includes five fish for which age was not estimated, total male mean length includes seven fish for which age was not estimated, total sockeye salmon mean length includes 12 fish for which age was not estimated.

Table 9.–Estimated age and sex compositions, and mean length at age, of the sockeye salmon sport and commercial harvest combined for the Buskin River drainage, 2005.

	Age										
Run Component[a]	1.1	0.3	1.2	1.3	1.4	2.1	2.2	2.3	3.2	2.4	Total[b]
Females											
Percent	0.0	0.0	4.9	17.4	0.0	0.4	8.5	20.9	0.0	0.2	52.9
SE Percent	0.0	0.0	1.0	1.8	0.0	0.3	1.3	1.9	0.0	0.2	2.3
Harvest	0	0	75	268	0	7	130	322	0	3	815
SE Return	0	0	26	81	0	5	42	97	0	3	237
Males											
Percent	2.0	0.0	3.1	13.8	0.0	0.7	9.4	18.5	0.0	0.2	47.1
SE Percent	0.7	0.0	0.8	1.6	0.0	0.4	1.4	1.8	0.0	0.2	2.3
Harvest	31	0	48	213	0	10	144	285	0	3	725
SE Return	13	0	18	66	0	6	46	86	0	3	211
All											
Percent	2.0	0.0	8.0	31.2	0.0	1.1	17.8	39.4	0.0	0.4	
SE Percent	0.7	0.0	1.3	2.2	0.0	0.5	1.8	2.3	0.0	0.3	
Harvest	31	0	123	480	0	17	274	607	0	7	1,540
SE Return	13	0	40	142	0	9	83	178	0	5	

[a] Estimates from age/sex proportions of Buskin River escapement.

[b] Sex/age components do not necessarily sum to sex pooled over age or age pooled over sex due to missing sex for age data and missing age for sex data.

The daily cumulative count of sockeye salmon at Buskin Lake weir through July 31 was 16,081 fish, 50% of which were enumerated by 18 June (Appendix A1). A final weir count of 17,734 was achieved when the lower weir was removed for the season on 21 September.

Age was determined for 371 of 403 sockeye salmon sampled (Table 10). Age and sex composition were not significantly different among temporal strata (Appendix B3; age: χ^2 = 11.41, df = 6, P = 0.8; sex: χ^2 =4.1 , df = 3 , P = 0.25); therefore sample data were pooled across temporal strata.

Only 55.2% of the sockeye salmon escapement reared in the ocean for 3 years: age 1.3 (20.5%) and age 2.3 (34.7%) (Table 10). Most (43.0%) of the remaining fish reared in the ocean for 2 years. Age composition was similar between males and females. There were fewer males (45.7%) than females (54.3%) for a male: female ratio of 0.8:1.0. On average, males (515 mm) were longer than females (492 mm).

Lake Louise Weir

The Lake Louise tributary stream weir was in operation from 3 June–31 August, 2006, during which 4,586 sockeye salmon were counted, over 50% of which passed through the weir by 20 August (Appendix A2).

Age was determined for 315 of 346 sockeye salmon sampled (Table 11). Age and sex compositions were not significantly different among temporal strata (Appendix C3; age:

χ^2 = 5.3, df = 3, P = 0.15; sex: χ^2 = 4.19, df = 3, P = 0.24); therefore, data were pooled across temporal strata.

At Lake Louise, 15.2% of the sockeye salmon escapement had reared in the ocean for 3 years, age 1.3 (8.4%) and age 2.3 (6.8%); and 82.6% reared in the ocean for 2 years: age 1.2 (72.0%) and age 2.2 (10.6%) (Table 11). Age composition was similar between males and females. There were fewer males (46.4%) than females (53.6%) for a male: female ratio of 0.9:1.0. On average, males (480 mm) were slightly larger than females (471 mm).

Age of Lake Louise escapement was significantly different from Buskin Lake escapement (χ^2 = 97.3, df = 3, P < 0.001), with age 2.3 fish comprising 34.7% of Buskin Lake escapement, versus 9.5% of Lake Louise escapement. Lake Louise sockeye salmon averaged 475 mm (SE = 2) in length while Buskin Lake sockeye salmon averaged 502 mm (SE = 2). Sex composition between run components was not significantly different (χ^2 = 0.04, df = 1, P = 0.85).

Subsistence Harvest

A complete report of sockeye salmon subsistence harvest from the Buskin system in 2006 is not yet available. Age was determined for 191 of 215 sockeye salmon sampled from the 2006 harvest (Table 12). Age and sex compositions were not significantly different among temporal strata (age: χ^2 = 2.66, df = 4, P = 0.62; sex: χ^2 = 3.01, df = 2, P = 0.22).

Of sockeye salmon harvested in the subsistence fishery, 67.5% reared in the ocean for 3 years: age 1.3 (20.9%) and age 2.3 (46.6%) fish predominated (Table 12). Most of the remaining fish reared in the ocean for 2 years. Age composition was similar between males and females. Males nearly equaled the number of females resulting in a male: female ratio of 1.0:1.0. On average, males (537 mm) were larger than females (507 mm).

Age composition of the subsistence harvest of 3-ocean fish (67.5%) was significantly different (χ^2 = 12.03, df = 3, P = 0.007) than Buskin Lake escapement (55.2%). Sockeye salmon harvested by subsistence fishers averaged 522 mm (SE = 2) in length while Buskin Lake sockeye salmon averaged 502 mm (SE = 2).

Sport and Commercial Fisheries

The 2006 estimate of harvest of sockeye salmon from the Buskin River system was not yet available from the SWHS.

Fish ticket harvest receipts available from ADF&G CF indicate that six sockeye salmon were harvested in front of Buskin River in Womens Bay, statistical area 259-22, during 2006 (Table 1).

TOTAL RUN, EXPLOITATION RATES, AND BROOD TABLE

The estimated total run was 33,534 sockeye in 2004 and 25,063 in 2005 (Table 13). Total run for 2006 could not be calculated because the 2006 sport harvest estimate was not yet available. Three-ocean sockeye salmon (ages 2.3 and 1.3) were consistently dominant, followed by 2-ocean fish (ages 2.2 and 1.2). Age composition estimates of the four major age classes all had a coefficient of variation of less than 15%.

Annual subsistence exploitation rates were 26.9% in 2004 and 32.1% in 2005, substantially higher than the annual sport and commercial fishery combined exploitation rates, which were 7.4% in 2004 and 6.1% in 2005 (Table 14). Standard errors of total exploitation rates were low

(<2%) and were driven by variability in the SWHS estimates of harvest. Exploitation rate for 2006 could not be calculated because the 2006 sport harvest estimate was not yet available.

A brood table for Buskin River sockeye salmon was developed with all available data through 2006 (Table 15). Age 5 fish have been the dominant age class averaging over 50% in this run since the 1993 brood year. Age 6 fish typically comprise 30% or more of the annual run.

DISCUSSION

One surprising finding from this project is the timing of the Lake Louise run, which has been consistently much later than the Buskin Lake run, on average about 1½ months later (Figure 3). A later Lake Louise run raises some interesting issues, one of which is whether this run is genetically distinct from the Buskin Lake run and would consequently warrant a separate management strategy. Another consequence of the later Lake Louise run is that the long-held assumption that the subsistence fishery primarily targets Buskin Lake sockeye salmon appears to be correct. Unless the Lake Louise run holds for a long period in the lower river before passing through the weir, the subsistence fishery would be well over before that run began. Anecdotal evidence regarding net-marked fish supports the view that Lake Louise fish are not significantly impacted by the subsistence fishery, as a much higher observed incidence of net-marked fish is observed at Buskin Lake.

Previous spawner recruit analyses produced estimates of optimal Buskin Lake sockeye salmon spawning escapements that approximate the current biological escapement goal (BEG) range of 8,000 to 13,000 (Schmidt et al. 2005). Therefore, adjustments to the current BEG are not yet warranted. However, updated spawner-recruit analyses incorporating the 2004-2006 data are scheduled for completion in 2008, and will be used to evaluate the BEG. Since this stock assessment project will continue at least through 2010, data from these years will be available for BEG analyses as well.

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Table 10.–Estimated age and sex compositions, and mean length at age, of the sockeye salmon escapement at Buskin Lake weir, 2006.

	Age										
Run Component[a]	1.1	0.3	1.2	1.3	1.4	2.1	2.2	2.3	3.2	2.4	Total[b]
Females											
Number sampled	0	0	62	38	0	0	26	76	1	1	220
Percent	0.0	0.0	16.8	10.3	0.0	0.0	7.0	20.5	0.3	0.3	54.3
SE Percent	0.0	0.0	1.9	1.6	0.0	0.0	1.3	2.1	0.3	0.3	2.4
Total Escapement	0	0	2,972	1,821	0	0	1,246	3,643	48	48	9,633
SE Return	0	0	341	277	0	0	233	369	47	47	434
Mean Length (mm)			465	510			466	513	491		492
SE Mean Length (mm)			3	4			6	3			2
Minimum Length (mm)			406	411			408	468	491		406
Maximum Length (mm)			514	568			523	583	491		583
Males											
Number sampled	0	0	61	36	3	0	15	49	0	2	185
Percent	0.0	0.0	16.5	9.7	0.8	0.0	4.1	13.2	0.0	0.5	45.7
SE Percent	0.0	0.0	1.9	1.5	0.5	0.0	1.0	1.7	0.0	0.4	2.4
Total Escapement	0	0	2,924	1,725	144	0	719	2,349	0	96	8,101
SE Return	0	0	339	271	82	0	180	310	0	67	434
Mean Length (mm)			479	532	531		489	546		546	515
SE Mean Length (mm)			5	5	5		12	4		29	3
Minimum Length (mm)			385	434	522		424	493		517	385
Maximum Length (mm)			560	594	538		563	588		574	594
All											
Number sampled	0	0	124	74	3	0	41	125	1	3	403
Percent	0.0	0.0	31.3	20.5	0.9	0.0	11.2	34.7	0.5	1.0	
SE Percent	0.0	0.0	2.3	2.2	0.6	0.0	1.7	2.5	0.5	0.6	
Total Escapement	0	0	5,546	3,629	163	0	1,986	6,161	81	169	17,734
SE Return	0	0	416	386	98	0	298	452	80	102	
Mean Length (mm)			472	521	531		474	526	491	546	502
SE Mean Length (mm)			3	3	5		6	3		29	2
Minimum Length (mm)			385	411	522		408	468	491	517	385
Maximum Length (mm)			560	594	538		536	588	491	574	594

[a] Age by sex and sex estimates from unweighted analysis with age from weighted analysis.

[b] Sex/age components do not necessarily sum to sex pooled over age or age pooled over sex due to missing sex for age data and missing age for sex data.

[c] Total female mean length includes 16 fish for which age was not estimated, total male mean length includes 19 fish for which age was not estimated, total sockeye salmon mean length includes 35 fish for which age was not estimated.

Table 11.–Estimated age and sex compositions, and mean length at age, of the sockeye salmon escapement at Lake Louise weir, 2006.

	Age										
Run Component[a]	1.1	0.3	1.2	1.3	1.4	2.1	2.2	2.3	3.2	2.4	Total[b]
Females											
Number sampled	1	0	122	15	2	0	14	12	0	0	185
Percent	0.3	0.0	45.3	3.2	0.1	0.0	6.8	2.0	0.0	0.0	53.6
SE Percent	0.3	0.0	4.0	1.2	0.1	0.0	2.3	0.6	0.0	0.0	2.6
Inriver Return	13	0	2,077	145	5	0	312	92	0	0	2,459
SE Return	12	0	184	56	3	0	107	29	0	0	119
Mean Length (mm)	342		465	498	492		465	507			471
SE Mean Length (mm)			2	5	8		6	6			2
Minimum Length (mm)	342		356	470	484		438	486			342
Maximum Length (mm)	342		533	548	499		508	553			553
Males											
Number sampled	3	0	94	19	0	1	13	18	0	0	160
Percent	1.5	0.0	26.7	5.3	0.0	0.3	3.8	4.8	0.0	0.0	46.4
SE Percent	1.1	0.0	3.4	1.7	0.0	0.3	1.6	1.6	0.0	0.0	2.6
Inriver Return	70	0	1,225	242	0	13	173	219	0	0	2,127
SE Return	50	0	157	76	0	12	72	75	0	0	119
Mean Length (mm)	341		477	506		363	483	498			480
SE Mean Length (mm)	9		3	5			7	6			3
Minimum Length (mm)	323		372	456		363	545	429			323
Maximum Length (mm)	353		533	537		363	550	529			550
All											
Number sampled	4	0	217	34	2	1	27	30	0	0	346
Percent	1.8	0.0	72.0	8.4	0.1	0.3	10.6	6.8	0.0	0.0	
SE Percent	1.1	0.0	3.6	2.0	0.1	0.3	2.7	1.7	0.0	0.0	
Inriver Return	82	0	3,304	387	5	13	485	311	0	0	4,586
SE Return	52	0	164	93	3	12	125	80	0	0	
Mean Length (mm)	342		470	502	492	363	473	501			475
SE Mean Length (mm)	7		2	4	8		5	4			2
Minimum Length (mm)	323		356	456	484	363	438	429			323
Maximum Length (mm)	353		533	548	499	363	550	553			553

[a] Age/age by sex from weighted analysis with sex from unweighted analysis.

[b] Sex/age components do not necessarily sum to sex pooled over age or age pooled over sex due to missing sex for age data and missing age for sex data.

[c] Total female mean length includes 19 fish for which age was not estimated, total male mean length includes 12 fish for which age was not estimated, total sockeye salmon mean length includes 31 fish for which age was not estimated.

Table 12.–Estimated age and sex compositions, and mean length at age, of the reported sockeye salmon subsistence harvest for the Buskin River drainage, 2006.

	Age										
Run Component[a]	1.1	0.3	1.2	1.3	1.4	2.1	2.2	2.3	3.2	2.4	Total[b]
Females											
Number sampled	0	1	19	21	0	0	8	51	0	0	108
Percent	0.0	0.5	9.9	11.0	0.0	0.0	4.2	26.7	0.0	0.0	50.2
SE Percent	0.0	0.5	2.1	2.2	0.0	0.0	1.4	3.1	0.0	0.0	3.3
Total Harvest	0	14	258	285	0	0	109	693	0	0	1,303
SE Return	0	13	54	57	0	0	36	80	0	0	85
Mean Length (mm)		526	473	512			494	519			507
SE Mean Length (mm)			7	6			7	3			3
Minimum Length (mm)		526	383	419			453	448			383
Maximum Length (mm)		526	517	549			517	584			584
Males											
Number sampled	0	1	26	19	2	0	5	38	0	0	107
Percent	0.0	0.5	13.6	9.9	1.0	0.0	2.6	19.9	0.0	0.0	49.8
SE Percent	0.0	0.5	2.4	2.1	0.7	0.0	1.1	2.8	0.0	0.0	3.3
Total Harvest	0	14	353	258	27	0	68	516	0	0	1,291
SE Return	0	13	62	54	18	0	29	72	0	0	85
Mean Length (mm)		573	501	550	607		501	550			537
SE Mean Length (mm)			5	7	21		16	4			4
Minimum Length (mm)		573	431	507	586		442	485			431
Maximum Length (mm)		573	504	606	627		533	596			627
All											
Number sampled	0	2	45	40	2	0	13	89	0	0	215
Percent	0.0	1.0	23.6	20.9	1.0	0.0	6.8	46.6	0.0	0.0	
SE Percent	0.0	0.7	3.0	2.8	0.7	0.0	1.8	3.5	0.0	0.0	
Total Harvest	0	27	611	543	27	0	177	1,209	0	0	2,594
SE Return	0	18	77	74	18	0	46	90	0	0	
Mean Length (mm)		550	489	530	607		497	532			522
SE Mean Length (mm)		24	5	6	21		7	3			2
Minimum Length (mm)		526	383	419	586		442	448			383
Maximum Length (mm)		573	554	606	627		533	596			627

[a] Estimates from unweighted analysis.

[b] Sex/age components do not necessarily sum to sex pooled over age or age pooled over sex due to missing sex for age data and missing age for sex data.

[c] Total female mean length includes eight fish for which age was not estimated, total male mean length includes 16 fish for which age was not estimated, total sockeye salmon mean length includes 24 fish for which age was not estimated.

Table 13.–Estimated total run of sockeye salmon to Buskin Lake by age class, 2004-2005.

	Age Class										All
Estimate	1.1	0.3	1.2	2.1	1.3	2.2	1.4	2.3	3.2	2.4	Ages
2004											
Total Run	0	46	2,519	396	10,594	7,389	149	12,122	0	319	33,534
SE	0	46	326	133	576	509	82	603	0	120	
2005											
Total Run	341	42	1,828	189	8,719	3,410	0	10,458	0	76	25,063
SE	102	42	241	76	461	313	0	488	0	48	

Table 14.–Estimated exploitation rates (%) of sockeye salmon migrating to Buskin Lake by fishery, 2004-2005.

Year	Subsistence Fishery	Sport and Commercial Fishery	Total Estimate	SE
2004	26.9	7.4	34.3	1.1
2005	32.1	6.1	38.3	1.9

Table 15.–Brood table for sockeye salmon migrating to Buskin Lake, 1991–2003 brood years.

		Age / Proportion / Return Year					
Brood Year	Escapement	Age 3 (0.2, 1.1)	Age 4 (0.3, 1.2, 2.1)	Age 5 (1.3, 2.2,)	Age 6 (1.4, 2.3, 3.2)	Age 7 (2.4, 3.3)	Total Return
1991	9,789	182	2,291	8,368	11,364	436	22,641
		0.01	0.10	0.37	0.50	0.02	
		1994	1995	1996	1997	1998	
1992	9,782	14	600	3,362	5,185	192 [a]	9,353
		0.00	0.06	0.36	0.55	0.02 [a]	
		1995	1996	1997	1998	1999	
1993	9,526	12	2,653	15,693	8,682 [a]	49	27,089
		0.00	0.10	0.58	0.32 [a]	0.00	
		1996	1997	1998	1999	2000	
1994	13,146	0	1,357	9,450 [a]	7,004	204	18,015
		0.00	0.08	0.52 [a]	0.39	0.01	
		1997	1998	1999	2000	2001	
1995	15,520	91	1,890 [a]	11,057	6,631	0	19,669
		0.00	0.10 [a]	0.56	0.34	0.00	
		1998	1999	2000	2001	2002	
1996	10,277	51 [a]	2,472	23,007	12,038	250	37,819
		0.00 [a]	0.07	0.61	0.32	0.01	
		1999	2000	2001	2002	2003	
1997	9,840	0	1,803	17,237	8,870	319	28,229
		0.00	0.06	0.61	0.31	0.01	
		2000	2001	2002	2003	2004	
1998	14,767	20	3,419	18,298	12,271 [b]	76	34,083
		0.00	0.10	0.54	0.36 [b]	0.00	
		2001	2002	2003	2004	2005	
1999	10,812	116	7,201	17,984 [b]	10,458 [b]		35,759
		0.00	0.20	0.54 [b]	0.29 [b]	0.00	
		2002	2003	2004	2005	2006	
2000	11,226	226	2,961	12,129			
		2003	2004	2005	2006	2007	
2001	20,556	0	2,059				
		2004	2005	2006	2007	2008	
2002	17,174	341					
		2005	2006	2007	2008	2009	
2003	23,870						
		2006	2007	2008	2009	2010	
Average Maturity schedule:		0.00	0.09	0.47	0.43	0.01	1.00

Note: All footnoted entries in this table are substituted (imputed) values.

[a] Imputed values for 1999 return year = the product of average return year maturities (1993-2003) and total 1999 return.

[b] Imputed values for age 5 (2004 return year) and age 6 (2004-2005 return years) derived from average brood year maturities and available age class estimates for the brood year.

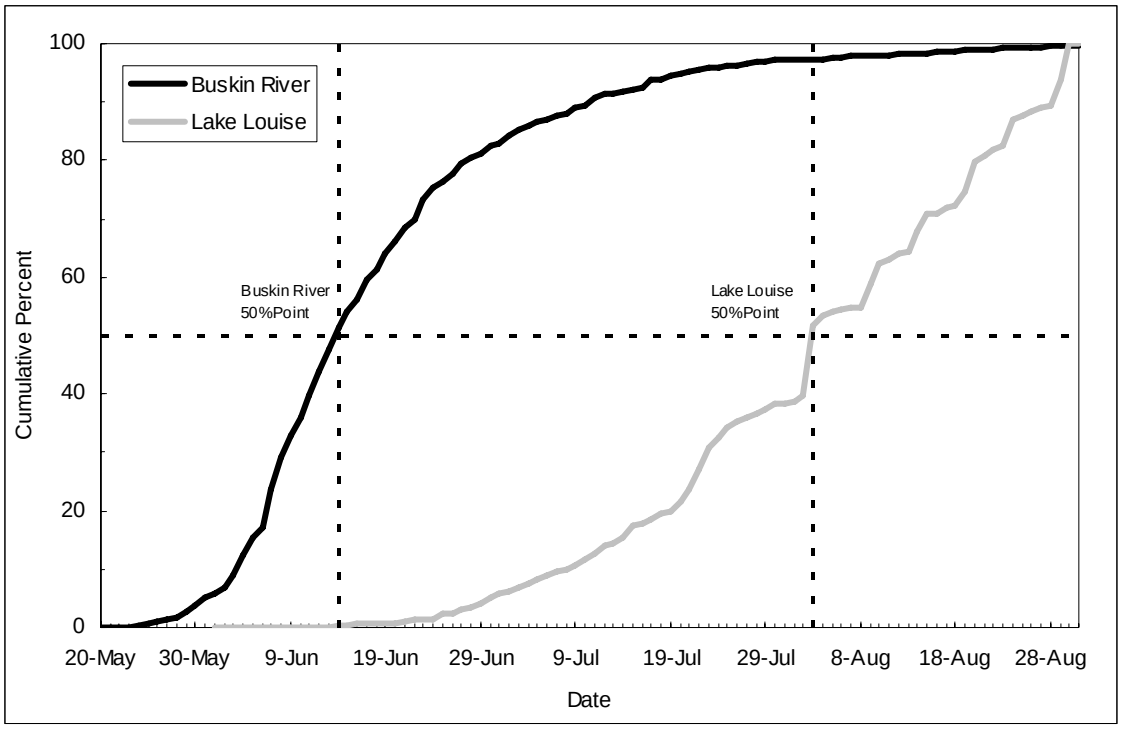

Figure 3.–Average run timing of sockeye salmon returning to Buskin Lake (1997–2006) and Lake Louise (2002–2006).

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APPENDIX A.
COUNTS OF SOCKEYE SALMON AT THE BUSKIN LAKE AND LAKE LOUISE TRIBUTARY WEIRS, 2004-2006

Appendix A1.–Daily cumulative counts (N) of sockeye salmon passage through Buskin Lake weir, 20 May through 31 August, 1997-2006.

Operating	1997		1998		1999		2000		2001		2002		2003		2004		2005		2006 [b]		1997-2006	
Dates [a]	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	Avg %
20-May	0	0	0	0	0	0	0	0	0	0					2	0	0	0	1	0	0	0
21-May	0	0	0	0	0	0	0	0	0	0					2	0	0	0	10	0	2	0
22-May	0	0	0	0	0	0	0	0	0	0					2	0	0	0	20	0	3	0
23-May	0	0	0	0	0	0	0	0	0	0	44	0	66	0	48	0	0	0	20	0	18	0
24-May	0	0	0	0	0	0	0	0	0	0	47	0	69	0	396	2	181	1	20	0	71	0
25-May	0	0	0	0	0	0	0	0	12	0	146	1	69	0	604	3	218	1	20	0	107	1
26-May	0	0	0	0	44	0	0	0	56	0	268	2	70	0	976	4	424	3	20	0	186	1
27-May	0	0	0	0	202	2	2	0	133	1	280	2	80	0	979	4	491	3	20	0	219	1
28-May	0	0	0	0	249	2	2	0	311	2	674	4	132	1	1,040	5	661	4	20	0	309	2
29-May	93	1	0	0	266	2	2	0	467	2	1,658	10	591	2	1,252	6	676	4	20	0	503	3
30-May	217	2	154	1	449	4	5	0	939	5	1,738	10	822	3	1,498	7	851	6	20	0	669	4
31-May	227	2	506	3	562	5	186	2	1,657	8	2,048	12	1,036	4	1,580	7	1,114	7	20	0	894	5
1-Jun	280	3	580	4	625	6	202	2	1,955	10	2,051	12	1,169	5	2,250	10	1,136	7	20	0	1,027	6
2-Jun	395	4	782	5	754	7	202	2	2,452	12	2,191	13	1,497	6	2,562	12	1,136	7	20	0	1,199	7
3-Jun	673	7	1,190	8	857	8	408	4	2,723	13	2,303	13	1,546	6	3,790	17	2,003	13	148	1	1,564	9
4-Jun	1,139	12	1,304	9	1,087	10	862	8	3,323	16	2,513	15	3,150	13	4,405	20	2,774	18	406	2	2,096	12
5-Jun	1,260	13	1,606	11	1,277	12	1,296	12	4,824	23	3,688	21	4,372	18	4,922	22	2,779	18	431	2	2,646	15
6-Jun	1,531	16	1,981	13	1,479	14	1,296	12	5,440	26	4,319	25	5,123	21	5,209	24	2,930	19	434	2	2,974	17
7-Jun	2,171	22	3,214	22	1,728	16	2,555	23	5,940	29	5,870	34	6,445	27	6,171	28	4,795	31	723	4	3,961	24
8-Jun	2,382	24	3,414	23	2,482	23	3,294	29	7,308	36	6,584	38	6,903	29	8,296	38	5,380	35	3,004	17	4,905	29
9-Jun	2,622	27	4,094	28	2,939	27	3,910	35	7,827	38	7,315	43	7,223	30	8,627	39	6,240	40	4,104	23	5,490	33
10-Jun	2,747	28	4,367	30	3,219	30	4,046	36	10,065	49	7,490	44	8,395	35	8,893	40	6,652	43	4,607	26	6,048	36
11-Jun	2,937	30	5,238	35	3,535	33	4,657	41	11,173	54	7,637	44	9,019	38	10,419	47	6,748	44	5,188	29	6,655	40
12-Jun	3,174	32	5,625	38	3,959	37	5,897	52	11,815	57	8,162	48	9,342	39	11,646	53	7,268	47	5,976	34	7,286	44
13-Jun	5,040	51	5,828	39	4,134	38	6,309	56	13,023	63	8,295	48	9,942	42	12,263	56	7,406	48	6,268	35	7,851	48
14-Jun	5,528	56	6,093	41	4,834	45	6,318	56	14,037	68	8,839	51	11,300	47	12,790	58	7,691	50	7,091	40	8,452	51
15-Jun	5,867	60	6,270	42	5,622	52	6,779	60	14,316	70	8,941	52	11,926	50	13,257	60	8,089	52	7,512	42	8,858	54
16-Jun	5,896	60	7,077	48	5,767	53	6,784	60	15,008	73	9,342	54	12,196	51	13,939	63	8,334	54	7,812	44	9,216	56
17-Jun	6,239	63	7,674	52	6,463	60	7,034	63	15,483	75	10,175	59	12,743	53	14,151	64	8,838	57	8,665	49	9,747	60
18-Jun	6,333	64	7,979	54	7,099	66	7,103	63	15,629	76	10,459	61	12,879	54	14,539	66	8,974	58	9,116	51	10,011	61
19-Jun	6,465	66	8,340	56	7,440	69	7,743	69	15,946	78	10,839	63	13,601	57	14,713	67	9,767	63	9,337	53	10,419	64
20-Jun	6,515	66	8,729	59	7,763	72	8,471	75	16,502	80	10,990	64	13,929	58	14,758	67	9,921	64	9,635	54	10,721	66
21-Jun	7,166	73	8,917	60	8,041	74	8,631	77	16,608	81	11,392	66	14,186	59	15,101	69	9,933	64	11,091	63	11,107	69
22-Jun	7,344	75	9,115	62	8,364	77	8,773	78	16,721	81	11,456	67	14,645	61	15,236	69	10,336	67	11,148	63	11,314	70
23-Jun	7,440	76	10,258	69	8,834	82	8,772	78	17,346	84	12,030	70	17,339	73	15,562	71	10,419	67	11,154	63	11,915	73
24-Jun	7,475	76	10,489	71	8,933	83	9,877	88	17,994	88	12,481	73	17,497	73	15,729	71	10,505	68	11,388	64	12,237	75
25-Jun	7,545	77	10,610	72	9,229	85	10,014	89	18,078	88	12,832	75	17,544	73	15,905	72	10,509	68	11,626	66	12,389	76

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Operating	1997		1998		1999		2000		2001		2002		2003		2004		2005		2006 [b]		1997-2006	
Dates [a]	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	Avg %
26-Jun	7,656	78	11,126	75	9,284	86	10,300	92	18,602	90	12,916	75	17,586	74	15,964	72	10,825	70	11,779	66	12,604	78
27-Jun	7,834	80	11,683	79	9,431	87	10,334	92	18,897	92	12,948	75	18,421	77	16,013	73	10,974	71	11,939	67	12,847	79
28-Jun	7,871	80	11,721	79	9,716	90	10,440	93	18,914	92	13,257	77	18,498	77	16,238	74	11,210	72	12,225	69	13,009	80
29-Jun	7,884	80	12,097	82	10,016	93	10,458	93	18,976	92	13,279	77	18,575	78	16,261	74	11,211	72	12,375	70	13,113	81
30-Jun	7,911	80	12,254	83	10,229	95	10,484	93	18,995	92	13,518	79	18,633	78	18,167	82	11,274	73	12,405	70	13,387	83
1-Jul	7,935	81	12,369	84	10,363	96	10,484	93	19,015	93	13,616	79	18,814	79	18,194	83	11,362	73	12,442	70	13,459	83
2-Jul	8,011	81	13,250	90	10,612	98	10,582	94	19,065	93	13,740	80	18,865	79	18,223	83	11,416	74	12,467	70	13,623	84
3-Jul	8,018	81	13,667	93	10,666	99	10,680	95	19,470	95	14,062	82	18,943	79	18,336	83	11,667	75	12,671	71	13,818	85
4-Jul	8,070	82	13,667	93	10,752	99	10,836	96	19,534	95	14,233	83	18,966	79	18,362	83	11,693	76	13,108	74	13,922	86
5-Jul	8,070	82	13,677	93	10,770	100	10,876	97	19,865	97	14,305	83	19,067	80	18,422	84	12,087	78	13,123	74	14,026	87
6-Jul	8,076	82	13,834	94	10,794	100	10,885	97	19,885	97	14,383	84	19,268	81	18,438	84	12,190	79	13,136	74	14,089	87
7-Jul	8,076	82	13,905	94	10,794	100	10,885	97	19,891	97	14,402	84	20,017	84	18,526	84	12,437	80	13,142	74	14,208	88
8-Jul	8,123	83	13,920	94	10,794	100	10,887	97	19,928	97	14,421	84	20,399	85	18,721	85	12,470	81	13,239	75	14,290	88
9-Jul	8,123	83	13,931	94	10,794	100	10,887	97	19,977	97	15,126	88	20,419	86	18,974	86	12,512	81	14,201	80	14,494	89
10-Jul	8,131	83	13,931	94	10,794	100	10,889	97	19,978	97	15,168	88	20,486	86	19,085	87	12,550	81	14,368	81	14,538	89
11-Jul	8,145	83	13,971	95	10,794	100	11,066	99	19,994	97	15,208	89	21,978	92	19,242	87	12,685	82	14,938	84	14,802	91
12-Jul	8,145	83	13,983	95	10,794	100	11,085	99	20,033	97	15,329	89	22,043	92	19,278	88	13,420	87	15,019	85	14,913	91
13-Jul	8,145	83	14,011	95	10,794	100	11,087	99	20,055	98	15,338	89	22,124	93	19,357	88	13,444	87	15,032	85	14,939	92
14-Jul	8,145	83	14,031	95	10,794	100	11,089	99	20,104	98	15,718	92	22,183	93	19,360	88	13,457	87	15,059	85	14,994	92
15-Jul	8,159	83	14,057	95	10,794	100	11,090	99	20,119	98	15,727	92	22,257	93	20,002	91	13,498	87	15,061	85	15,076	92
16-Jul	8,159	83	14,059	95	10,794	100	11,090	99	20,179	98	15,737	92	22,262	93	20,223	92	13,500	87	15,218	86	15,122	92
17-Jul	9,084	92	14,062	95	10,794	100	11,092	99	20,179	98	15,741	92	22,265	93	20,231	92	14,109	91	15,221	86	15,278	94
18-Jul	9,121	93	14,062	95	10,794	100	11,092	99	20,198	98	15,803	92	22,327	94	20,233	92	14,125	91	15,224	86	15,298	94
19-Jul	9,220	94	14,066	95	10,794	100	11,092	99	20,465	100	15,821	92	22,406	94	20,234	92	14,125	91	15,489	87	15,371	94
20-Jul	9,226	94	14,447	98	10,794	100	11,092	99	20,472	100	15,932	93	22,448	94	20,557	93	14,126	91	15,531	88	15,463	95
21-Jul	9,237	94	14,617	99	10,794	100	11,175	99	20,491	100	16,012	93	22,523	94	20,564	93	14,199	92	15,631	88	15,524	95
22-Jul	9,237	94	14,628	99	10,794	100	11,177	100	20,493	100	16,332	95	22,656	95	20,913	95	14,203	92	15,637	88	15,607	96
23-Jul	9,240	94	14,632	99	10,794	100	11,177	100	20,521	100	16,377	95	22,681	95	20,942	95	14,204	92	15,637	88	15,621	96
24-Jul	9,247	94	14,632	99	10,794	100	11,177	100	20,523	100	16,389	95	22,705	95	20,946	95	14,204	92	15,637	88	15,625	96
25-Jul	9,255	94	14,632	99	10,794	100	11,177	100	20,544	100	16,395	95	22,760	95	20,964	95	14,361	93	15,940	90	15,682	96
26-Jul	9,269	94	14,638	99	10,794	100	11,179	100	20,544	100	16,433	96	22,797	96	21,071	96	14,457	93	15,951	90	15,713	96
27-Jul	9,290	94	14,640	99	10,794	100	11,180	100	20,544	100	16,437	96	22,818	96	21,076	96	14,885	96	15,972	90	15,764	97
28-Jul	9,290	94	14,659	99	10,794	100	11,180	100	20,544	100	16,477	96	22,824	96	21,185	96	14,910	96	16,031	90	15,789	97
29-Jul	9,495	96	14,659	99	10,794	100	11,180	100	20,544	100	16,480	96	22,865	96	21,218	96	14,935	97	16,078	91	15,825	97
30-Jul	9,495	96	14,659	99	10,794	100	11,180	100	20,544	100	16,494	96	22,914	96	21,247	96	14,976	97	16,079	91	15,838	97

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Operating	1997		1998		1999		2000		2001		2002		2003		2004		2005		2006 [b]		1997-2006	
Dates [a]	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	Avg %
31-Jul	9,495	96	14,659	99	10,794	100	11,180	100	20,544	100	16,503	96	22,930	96	21,273	97	15,031	97	16,081	91	15,849	97
1-Aug	9,495	96	14,659	99	10,794	100	11,180	100	20,544	100	16,558	96	22,946	96	21,286	97	15,033	97	16,094	91	15,859	97
2-Aug	9,495	96	14,659	99	10,794	100	11,180	100	20,544	100	16,580	97	22,959	96	21,320	97	15,035	97	16,146	91	15,871	97
3-Aug	9,495	96	14,659	99	10,794	100	11,180	100	20,544	100	16,584	97	22,962	96	21,404	97	15,035	97	16,207	91	15,886	97
4-Aug	9,495	96	14,659	99	10,794	100	11,180	100	20,544	100	16,588	97	22,975	96	21,432	97	15,035	97	16,264	92	15,897	97
5-Aug	9,495	96	14,659	99	10,794	100	11,180	100	20,544	100	16,604	97	23,042	97	21,462	97	15,035	97	16,380	92	15,920	98
6-Aug	9,495	96	14,659	99	10,794	100	11,180	100	20,544	100	16,625	97	23,090	97	21,498	98	15,035	97	16,479	93	15,940	98
7-Aug	9,495	96	14,659	99	10,794	100	11,180	100	20,544	100	16,630	97	23,251	97	21,523	98	15,045	97	16,606	94	15,973	98
8-Aug	9,495	96	14,659	99	10,794	100	11,180	100	20,544	100	16,630	97	23,283	98	21,589	98	15,055	97	16,663	94	15,989	98
9-Aug	9,495	96	14,659	99	10,794	100	11,180	100	20,544	100	16,630	97	23,304	98	21,630	98	15,067	97	16,776	95	16,008	98
10-Aug	9,495	96	14,659	99	10,794	100	11,180	100	20,544	100	16,630	97	23,315	98	21,685	98	15,086	98	16,818	95	16,021	98
11-Aug	9,495	96	14,659	99	10,794	100	11,180	100	20,544	100	16,630	97	23,323	98	21,692	98	15,114	98	16,876	95	16,031	98
12-Aug	9,495	96	14,659	99	10,794	100	11,180	100	20,544	100	16,639	97	23,327	98	21,705	99	15,136	98	16,918	95	16,040	98
13-Aug	9,495	96	14,659	99	10,794	100	11,180	100	20,544	100	16,667	97	23,352	98	21,751	99	15,164	98	16,963	96	16,057	98
14-Aug	9,495	96	14,659	99	10,794	100	11,180	100	20,544	100	16,693	97	23,409	98	21,774	99	15,185	98	17,017	96	16,075	98
15-Aug	9,513	97	14,663	99	10,794	100	11,180	100	20,544	100	16,696	97	23,515	99	21,803	99	15,214	98	17,059	96	16,098	98
16-Aug	9,522	97	14,663	99	10,794	100	11,180	100	20,544	100	16,721	97	23,569	99	21,824	99	15,238	99	17,077	96	16,113	99
17-Aug	9,563	97	14,665	99	10,794	100	11,180	100	20,544	100	16,734	97	23,600	99	21,841	99	15,269	99	17,109	96	16,130	99
18-Aug	9,581	97	14,673	99	10,794	100	11,180	100	20,546	100	16,757	98	23,614	99	21,890	99	15,285	99	17,150	97	16,147	99
19-Aug	9,611	98	14,673	99	10,794	100	11,180	100	20,546	100	16,778	98	23,645	99	21,923	100	15,303	99	17,186	97	16,164	99
20-Aug	9,624	98	14,677	99	10,795	100	11,181	100	20,547	100	16,786	98	23,679	99	21,939	100	15,323	99	17,238	97	16,179	99
21-Aug	9,652	98	14,685	99	10,798	100	11,182	100	20,547	100	16,792	98	23,691	99	21,954	100	15,338	99	17,281	97	16,192	99
22-Aug	9,698	99	14,685	99	10,799	100	11,182	100	20,549	100	16,801	98	23,697	99	21,961	100	15,354	99	17,304	98	16,203	99
23-Aug	9,702	99	14,699	100	10,801	100	11,185	100	20,550	100	16,814	98	23,721	99	21,968	100	15,366	99	17,332	98	16,214	99
24-Aug	9,708	99	14,702	100	10,803	100	11,187	100	20,550	100	16,825	98	23,757	100	21,977	100	15,379	99	17,457	98	16,235	99
25-Aug	9,718	99	14,702	100	10,803	100	11,189	100	20,550	100	16,827	98	23,779	100	21,978	100	15,390	99	17,495	99	16,243	99
26-Aug	9,729	99	14,703	100	10,803	100	11,190	100	20,551	100	16,828	98	23,790	100	21,993	100	15,393	100	17,522	99	16,250	99
27-Aug	9,774	99	14,703	100	10,804	100	11,192	100	20,551	100	16,831	98	23,814	100	21,997	100	15,397	100	17,571	99	16,263	99
28-Aug	9,785	99	14,703	100	10,805	100	11,192	100	20,552	100	16,836	98	23,818	100	22,003	100	15,403	100	17,586	99	16,268	100
29-Aug	9,788	99	14,713	100	10,805	100	11,193	100	20,552	100	16,847	98	23,829	100	22,005	100	15,404	100	17,607	99	16,274	100
30-Aug	9,789	99	14,739	100	10,809	100	11,193	100	20,552	100	16,854	98	23,835	100	22,006	100	15,404	100	17,656	100	16,284	100
31-Aug	9,798	100	14,746	100	10,809	100	11,194	100	20,553	100	17,174	100	23,837	100	22,008	100	15,408	100	17,668	100	16,320	100
Yearly Total	9,840		14,767		10,812		11,233		20,556		17,174		23,870		22,023		15,468		17,734		16,348	

[a] From mid-May through July, the weir was operated continuously at the outlet of Buskin Lake. From early August through September, the weir was operated about 0.6 miles downstream from Buskin Lake outlet.

[b] The weir was not operated continuously on 8 June and 21 July 2006 due to high water events.

[c] The yearly total includes counts from 1-30 September. However since these totals are so low, the daily counts for September are not shown.

Appendix A2.–Daily cumulative count of sockeye salmon passage through the Lake Louise weir, 1 June through 31 August, 2002-2006.

	2002		2003		2004		2005		2006	
Date	Number	%	Number	%	Number	%	Number	%	Number	%
1-Jun	0	0	0	0						
2-Jun	0	0	0	0	0	0				
3-Jun	0	0	0	0	0	0			0	0
4-Jun	0	0	0	0	0	0	0	0	0	0
5-Jun	0	0	0	0	0	0	0	0	0	0
6-Jun	0	0	0	0	1	0	0	0	0	0
7-Jun	2	0	0	0	1	0	0	0	0	0
8-Jun	2	0	1	0	1	0	0	0	0	0
9-Jun	2	0	2	0	2	0	0	0	0	0
10-Jun	2	0	2	0	2	0	2	0	0	0
11-Jun	2	0	4	0	4	0	3	0	0	0
12-Jun	2	0	5	0	5	0	3	0	2	0
13-Jun	2	0	5	0	5	0	3	0	3	0
14-Jun	3	0	7	0	11	1	3	0	3	0
15-Jun	3	0	14	0	32	2	5	0	3	0
16-Jun	3	0	18	0	47	2	5	0	3	0
17-Jun	4	0	18	0	51	2	5	0	3	0
18-Jun	4	0	18	0	54	3	7	0	3	0
19-Jun	4	0	2	0	63	3	8	0	5	0
20-Jun	4	0	3	0	68	3	9	0	8	0
21-Jun	7	0	8	0	72	3	10	0	8	0
22-Jun	41	1	11	0	82	4	10	0	9	0
23-Jun	53	1	17	0	92	4	10	0	10	0
24-Jun	55	2	28	1	92	4	10	0	10	0
25-Jun	171	5	37	1	93	4	21	1	10	0
26-Jun	194	5	38	1	98	5	26	1	10	0
27-Jun	243	7	39	1	102	5	37	2	13	0
28-Jun	316	9	40	1	108	5	45	2	20	0
29-Jun	377	11	43	1	128	6	47	2	20	0
30-Jun	462	13	53	1	149	7	69	3	22	0
1-Jul	523	15	66	1	171	8	83	4	24	1
2-Jul	553	15	68	2	184	9	96	5	24	1
3-Jul	603	17	91	2	210	10	98	5	26	1
4-Jul	628	18	148	3	234	11	107	5	28	1
5-Jul	661	18	189	4	247	12	113	6	28	1
6-Jul	705	20	219	5	260	12	126	6	28	1
7-Jul	732	20	240	5	290	14	138	7	28	1
8-Jul	741	21	289	6	301	14	142	7	28	1
9-Jul	768	21	342	8	352	17	142	7	29	1
10-Jul	778	22	374	8	418	20	143	7	32	1
11-Jul	785	22	408	9	461	22	146	7	154	3
12-Jul	791	22	621	14	483	23	146	7	155	3
13-Jul	819	23	639	14	509	24	151	7	155	3
14-Jul	820	23	657	15	590	28	157	8	171	4
15-Jul	1,064	30	689	15	654	31	160	8	175	4
16-Jul	1,067	30	709	16	660	32	167	8	177	4
17-Jul	1,073	30	737	16	671	32	207	10	177	4
18-Jul	1,090	30	758	17	740	35	212	10	179	4
19-Jul	1,110	31	760	17	752	36	212	10	196	4
20-Jul	1,134	32	835	19	774	37	216	11	453	10

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	2002		2003		2004		2005		2006	
Date	Number	%	Number	%	Number	%	Number	%	Number	%
21-Jul	1,238	35	837	19	784	38	219	11	794	17
22-Jul	1,536	43	858	19	910	44	226	11	828	18
23-Jul	2,048	57	898	20	944	45	226	11	953	21
24-Jul	2,253	63	917	20	958	46	226	11	1,024	22
25-Jul	2,387	67	926	21	985	47	251	12	1,085	24
26-Jul	2,487	69	928	21	1,012	49	274	14	1,135	25
27-Jul	2,535	71	929	21	1,012	49	279	14	1,223	27
28-Jul	2,594	72	930	21	1,012	49	283	14	1,287	28
29-Jul	2,635	74	930	21	1,039	50	298	15	1,315	29
30-Jul	2,661	74	930	21	1,072	51	312	15	1,339	29
31-Jul	2,689	75	932	21	1,074	51	314	15	1,351	29
1-Aug	2,728	76	932	21	1,075	52	323	16	1,353	30
2-Aug	2,758	77	932	21	1,082	52	399	20	1,355	30
3-Aug	2,775	77	932	21	1,083	52	1,444	71	1,717	37
4-Aug	2,777	78	932	21	1,087	52	1,605	79	1,754	38
5-Aug	2,781	78	932	21	1,087	52	1,654	82	1,763	38
6-Aug	2,786	78	932	21	1,088	52	1,682	83	1,775	39
7-Aug	2,791	78	932	21	1,088	52	1,693	83	1,788	39
8-Aug	2,792	78	932	21	1,095	52	1,705	84	1,797	39
9-Aug	2,794	78	932	21	1,513	73	1,715	85	1,802	39
10-Aug	3,097	86	1117	25	1,582	76	1,737	86	1,806	39
11-Aug	3,122	87	1152	26	1,588	76	1,755	87	1,820	40
12-Aug	3,235	90	1168	26	1,588	76	1,775	88	1,825	40
13-Aug	3,242	91	1173	26	1,597	77	1,789	88	1,827	40
14-Aug	3,242	91	1679	37	1,601	77	1,794	88	2,131	46
15-Aug	3,581	100	1810	40	1,602	77	1,808	89	2,192	48
16-Aug	3,581	100	1832	41	1,603	77	1,817	90	2,192	48
17-Aug	3,581	100	1832	41	1,608	77	1,894	93	2,193	48
18-Aug	3,581	100	1834	41	1,613	77	1,917	95	2,227	49
19-Aug	3,581	100	2,074	46	1,743	84	1,930	95	2,245	49
20-Aug	3,581	100	3,027	67	1,743	84	1,940	96	2,376	52
21-Aug	3,581	100	3,268	73	1,748	84	1,950	96	2,386	52
22-Aug	3,581	100	3,408	76	1,755	84	1,964	97	2,396	52
23-Aug	3,581	100	3,445	77	1,773	85	1,980	98	2,412	53
24-Aug	3,581	100	3,467	77	2,040	98	1,990	98	2,827	62
25-Aug	3,581	100	3,470	77	2,063	99	1,999	99	2,906	63
26-Aug	3,581	100	3,483	78	2,073	99	2,004	99	3,028	66
27-Aug	3,581	100	3,486	78	2,077	100	2,004	99	3,168	69
28-Aug	3,581	100	3,488	78	2,086	100	2,013	99	3,196	70
29-Aug	3,581	100	4,488	100	2,086	100	2,021	100	3,206	70
30-Aug	3,581	100	4,488	100	2,086	100	2,023	100	4,586	100
31-Aug	3,581	100	4,488	100	2,086	100	2,028	100	4,586	100
Yearly Total	3,581		4,488		2,086		2,028		4,586	

APPENDIX B.
TEMPORALLY STRATIFIED AGE COMPOSITIONS OF THE BUSKIN RIVER SOCKEYE SALMON ESCAPEMENT, 2004–2006

Appendix B1.–Estimated age composition by temporal stratum of the sockeye salmon escapement to the Buskin River, 2004.

Statistic	No Age	Age Class 1.1	0.3	1.2	2.1	1.3	2.2	1.4	2.3	3.2	2.4	Total
1-15 June												
Sample Size	23	0	0	11	1	52	44	1	59	0	2	170
Proportion		0.00	0.00	0.06	0.01	0.31	0.26	0.01	0.35	0.00	0.01	1.00
SE		0.0	0.0	0.2	0.1	0.4	0.4	0.1	0.4	0.0	0.1	
Estimate		0	0	858	78	4,055	3,431	78	4,601	0	156	13,257
SE		0	0	2,577	777	5,595	5,148	777	5,959	0	1,099	
16-30 June												
Sample Size	33	0	0	16	1	38	49	0	48	0	2	154
Proportion		0.00	0.00	0.10	0.01	0.25	0.32	0.00	0.31	0.00	0.01	1.00
SE		0.0	0.0	0.3	0.1	0.4	0.4	0.0	0.4	0.0	0.1	
Estimate		0	0	510	32	1,212	1,562	0	1,530	0	64	4,910
SE		0	0	1,259	315	1,938	2,200	0	2,178	0	445	
1-15 July												
Sample Size	10	0	0	6	5	21	16	0	19	0	0	67
Proportion		0.00	0.00	0.09	0.07	0.31	0.24	0.00	0.28	0.00	0.00	1.00
SE		0.0	0.0	0.4	0.3	0.7	0.6	0.0	0.6	0.0	0.0	
Estimate		0	0	164	137	575	438	0	520	0	0	1,835
SE		0	0	663	605	1,239	1,082	0	1,179	0	0	
>15 July												
Sample Size	10	0	0	5	0	7	11	0	19	0	0	42
Proportion		0.00	0.00	0.12	0.00	0.17	0.26	0.00	0.45	0.00	0.00	1.00
SE		0.0	0.0	0.5	0.0	0.6	0.8	0.0	1.0	0.0	0.0	
Estimate		0	0	241	0	337	529	0	914	0	0	2,021
SE		0	0	1,077	0	1,274	1,596	0	2,096	0	0	

Appendix B2.–Estimated age composition by temporal stratum of the sockeye salmon escapement to the Buskin River, 2005.

	No	Age Class												
Statistics	Age	0.2	1.1	0.3	1.2	2.1	1.3	2.2	1.4	2.3	3.2	2.4	3.3	Total
1-15 June														
Sample Size	15	0	0	0	8	0	66	30	0	83	0	0	0	187
Proportion		0.00	0.00	0.00	0.04	0.00	0.35	0.16	0.00	0.44	0.00	0.00	0.00	1.00
SE		0.0	0.0	0.0	0.1	0.0	0.4	0.3	0.0	0.5	0.0	0.0	0.0	
Estimate		0	0	0	346	0	2,855	1,298	0	3,590	0	0	0	8,089
SE		0	0	0	1,212	0	3,477	2,346	0	3,897	0	0	0	
16-30 June														
Sample Size	16	0	5	0	13	3	35	23	0	48	0	2	0	129
Proportion		0.00	0.04	0.00	0.10	0.02	0.27	0.18	0.00	0.37	0.00	0.02	0.00	1.00
SE		0.0	0.2	0.0	0.3	0.1	0.5	0.4	0.0	0.5	0.0	0.1	0.0	
Estimate		0	123	0	321	74	864	568	0	1,185	0	49	0	3,185
SE		0	543	0	875	420	1,434	1,163	0	1,679	0	343	0	
1-15 July														
Sample Size	13	0	3	0	11	2	27	19	0	38	0	0	0	100
Proportion		0.00	0.03	0.00	0.11	0.02	0.27	0.19	0.00	0.38	0.00	0.00	0.00	1.00
SE		0.0	0.2	0.0	0.3	0.1	0.5	0.4	0.0	0.6	0.0	0.0	0.0	
Estimate		0	67	0	245	44	600	423	0	845	0	0	0	2,224
SE		0	378	0	724	309	1,134	951	0	1,344	0	0	0	
> 15 July														
Sample Size	7	0	1	0	4	0	12	8	0	8	0	0	0	33
Proportion		0.00	0.03	0.00	0.12	0.00	0.36	0.24	0.00	0.24	0.00	0.00	0.00	1.000
SE		0.0	0.3	0.0	0.6	0.0	1.1	0.9	0.0	0.9	0.0	0.0	0.0	
Estimate		0	60	0	239	0	716	478	0	478	0	0	0	1,970
SE		0	601	0	1,202	0	2,079	1,698	0	1,698	0	0	0	

Appendix B3.–Estimated age composition by temporal stratum of the sockeye salmon escapement to the Buskin River, 2006.

	No	Age Class										
Statistic	Age	1.1	0.3	1.2	2.1	1.3	2.2	1.4	2.3	3.2	2.4	Total
1-15 June												
Sample Size	11	0	0	43	0	31	20	0	49	0	1	144
Proportion		0.00	0.00	0.30	0.00	0.22	0.14	0.00	0.34	0.00	0.01	1.00
SE		0.0	0.0	0.5	0.0	0.4	0.3	0.0	0.5	0.0	0.1	
Estimate		0	0	2,243	0	1,617	1,043	0	2,556	0	52	7,512
SE		0	0	3,395	0	2,883	2,317	0	3,623	0	518	
16-30 June												
Sample Size	11	0	0	44	0	22	11	2	41	0	0	120
Proportion		0.00	0.00	0.37	0.00	0.18	0.09	0.02	0.34	0.00	0.00	1.00
SE		0.0	0.0	0.5	0.0	0.4	0.3	0.1	0.5	0.0	0.0	
Estimate		0	0	1,794	0	897	449	82	1,672	0	0	4,893
SE		0	0	2,678	0	1,895	1,341	572	2,585	0	0	
1-15 July												
Sample Size	8	0	0	33	0	13	7	0	20	0	1	74
Proportion		0.00	0.00	0.45	0.00	0.18	0.09	0.00	0.27	0.00	0.01	1.00
SE		0.0	0.0	0.8	0.0	0.5	0.4	0.0	0.6	0.0	0.1	
Estimate		0	0	1,184	0	467	251	0	718	0	36	2,656
SE		0	0	2,042	0	1,284	942	0	1,591	0	356	
> 15 July												
Sample Size	5	0	0	4	0	8	3	1	15	1	1	33
Proportion		0.00	0.00	0.12	0.00	0.24	0.09	0.03	0.45	0.03	0.03	1.00
SE		0.0	0.0	0.6	0.0	0.9	0.5	0.3	1.2	0.3	0.3	
Estimate		0	0	324	0	648	243	81	1,215	81	81	2,673
SE		0	0	1,634	0	2,309	1,415	817	3,159	817	817	

APPENDIX C.
TEMPORALLY STRATIFIED AGE COMPOSITIONS OF THE SOCKEYE SALMON ESCAPEMENT IN THE LAKE LOUISE TRIBUTARY, 2004–2006

Appendix C1.–Estimated age composition by temporal stratum of the sockeye salmon escapement to Lake Louise, 2004.

	No	Age Class												
Statistic	Age	0.2	1.1	0.3	1.2	2.1	1.3	2.2	1.4	2.3	3.2	2.4	3.3	Total
1 June - 15 July														
Sample Size	15	0	1	0	21	0	60	15	1	17	0	1	0	116
Proportion		0.00	0.01	0.00	0.18	0.00	0.52	0.13	0.01	0.15	0.00	0.01	0.00	1.00
SE		0.0	0.1	0.0	0.4	0.0	0.6	0.3	0.1	0.3	0.0	0.1	0.0	
Estimate		0	6	0	118	0	338	85	6	96	0	6	0	654
SE		0	51	0	235	0	397	199	51	212	0	51	0	
16 - 31 July														
Sample Size	11	0	4	0	37	5	52	11	2	8	0	0	0	119
Proportion		0.00	0.03	0.00	0.31	0.04	0.44	0.09	0.02	0.07	0.00	0.00	0.00	1.00
SE		0.0	0.1	0.0	0.4	0.2	0.5	0.2	0.1	0.2	0.0	0.0	0.0	
Estimate		0	14	0	131	18	184	39	7	28	0	0	0	420
SE		0	60	0	182	67	216	99	42	85	0	0	0	
1 - 15 Aug.														
Sample Size	7	0	1	1	50	0	29	7	1	12	0	1	0	102
Proportion		0.00	0.01	0.01	0.49	0.00	0.28	0.07	0.01	0.12	0.00	0.01	0.00	1.00
SE		0.0	0.1	0.1	0.6	0.0	0.5	0.2	0.1	0.3	0.0	0.1	0.0	
Estimate		0	5	5	259	0	150	36	5	62	0	5	0	528
SE		0	47	47	330	0	251	124	47	162	0	47	0	
16 - 31 Aug.														
Sample Size	23	0	5	0	64	3	23	15	1	13	0	0	0	124
Proportion		0.00	0.04	0.00	0.52	0.02	0.19	0.12	0.01	0.10	0.00	0.00	0.00	1.00
SE		0.0	0.2	0.0	0.6	0.1	0.3	0.3	0.1	0.3	0.0	0.0	0.0	
Estimate		0	20	0	250	12	90	59	4	51	0	0	0	484
SE		0	0	0	270	0	162	131	34	122	0	0	0	

Appendix C2.–Estimated age composition by temporal stratum of the sockeye salmon escapement to Lake Louise, 2005.

	No	Age Class												
Statistics	Age	0.2	1.1	0.3	1.2	2.1	1.3	2.2	1.4	2.3	3.2	2.4	3.3	Total
1 June - 15 July														
Sample Size	3	0	9	0	22	1	40	8	0	11	0	0	0	91
Proportion		0.00	0.10	0.00	0.24	0.01	0.44	0.09	0.00	0.12	0.00	0.00	0.00	1.00
SE		0.0	0.2	0.0	0.3	0.1	0.5	0.2	0.0	0.2	0.0	0.0	0.0	
Estimate		0	16	0	39	2	70	14	0	19	0	0	0	160
SE		0	35	0	54	12	73	33	0	38	0	0	0	
16 - 31 July														
Sample Size	6	0	19	0	28	2	41	13	0	8	0	0	0	111
Proportion		0.00	0.17	0.00	0.25	0.02	0.37	0.12	0.00	0.07	0.00	0.00	0.00	1.00
SE		0.0	0.2	0.0	0.3	0.1	0.3	0.2	0.0	0.1	0.0	0.0	0.0	
Estimate		0	26	0	39	3	57	18	0	11	0	0	0	154
SE		0	32	0	39	10	47	27	0	21	0	0	0	
1 - 15 Aug.														
Sample Size	12	0	27	0	21	4	20	26	0	3	0	0	0	101
Proportion		0.00	0.27	0.00	0.21	0.04	0.20	0.26	0.00	0.03	0.00	0.00	0.00	1.00
SE		0.0	0.5	0.0	0.4	0.2	0.4	0.5	0.0	0.2	0.0	0.0	0.0	
Estimate		0	399	0	311	59	296	385	0	44	0	0	0	1,494
SE		0	745	0	657	287	641	731	0	249	0	0	0	
16 - 31 Aug.														
Sample Size	7	0	26	0	16	4	39	23	0	4	0	0	0	112
Proportion		0.00	0.23	0.00	0.14	0.04	0.35	0.21	0.00	0.04	0.00	0.00	0.00	1.00
SE		0.0	0.3	0.0	0.3	0.1	0.4	0.3	0.0	0.1	0.0	0.0	0.0	
Estimate		0	51	0	31	8	77	45	0	8	0	0	0	220
SE		0	0	0	55	28	86	66	0	28	0	0	0	

Appendix C3.-Estimated age composition by temporal stratum of the sockeye salmon escapement to Lake Louise, 2006.

	No	Age Class												
Statistics	Age	0.2	1.1	0.3	1.2	2.1	1.3	2.2	1.4	2.3	3.2	2.4	3.3	Total
1 June - 15 July														
Sample Size	1	0	0	0	39	0	11	9	2	12	0	0	0	73
Prop		0.00	0.00	0.00	0.53	0.00	0.15	0.12	0.03	0.16	0.00	0.00	0.00	1.00
SE		0.0	0.0	0.0	0.6	0.0	0.3	0.3	0.1	0.4	0.0	0.0	0.0	
Estimate		0	0	0	85	0	24	20	4	26	0	0	0	160
SE		0	0	0	101	0	54	49	23	56	0	0	0	
16 - 31 July														
Sample Size	6	0	2	0	61	1	11	7	0	12	0	0	0	94
Prop		0.00	0.02	0.00	0.65	0.01	0.12	0.07	0.00	0.13	0.00	0.00	0.00	1.00
SE		0.0	0.1	0.0	0.5	0.1	0.2	0.2	0.0	0.2	0.0	0.0	0.0	
Estimate		0	3	0	100	2	18	11	0	20	0	0	0	154
SE		0	15	0	80	10	34	27	0	36	0	0	0	
1 - 15 Aug.														
Sample Size	7	0	1	0	81	0	9	4	0	4	0	0	0	99
Prop		0.00	0.01	0.00	0.82	0.00	0.09	0.04	0.00	0.04	0.00	0.00	0.00	1.00
SE		0.0	0.1	0.0	0.9	0.0	0.3	0.2	0.0	0.2	0.0	0.0	0.0	
Estimate		0	15	0	1,222	0	136	60	0	60	0	0	0	1,494
SE		0	147	0	1,314	0	439	293	0	293	0	0	0	
16 - 31 Aug.														
Sample Size	17	0	1	0	36	0	3	7	0	2	0	0	0	49
Prop		0.00	0.02	0.00	0.73	0.00	0.06	0.14	0.00	0.04	0.00	0.00	0.00	1.00
SE		0.0	0.2	0.0	1.1	0.0	0.3	0.5	0.0	0.3	0.0	0.0	0.0	
Estimate		0	4	0	162	0	13	31	0	9	0	0	0	220
SE		0	40	0	239	0	69	106	0	57	0	0	0	