

**Annual Project Report No. FIS 07-402**  
**USFWS Office of Subsistence Management**  
**Fishery Information Services Division**

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## **Stock Assessment of Sockeye Salmon from the Buskin River, Kodiak, Alaska, 2007**

by

**Donn Tracy**  
and  
**Julia Schmidt**

May 2008

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Alaska Department of Fish and Game

Division of Sport Fish



## 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
metric ton	mt
milliliter	ml
millimeter	mm

### Weights and measures (English)

cubic feet per second	ft <sup>3</sup> /s
foot	ft
gallon	gal
inch	in
mile	mi
ounce	oz
pound	lb
quart	qt
yard	yd
Spell out acre and ton.	

### Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
hour (spell out for 24-hour clock)	h
minute	min
second	s
Spell out year, month, and week.	

### Physics and chemistry

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

### General

All commonly accepted abbreviations.	e.g., Mr., Mrs., a.m., p.m., etc.
All commonly accepted professional titles.	e.g., Dr., Ph.D., R.N., etc.
and	&
at	@
Compass directions:	
east	E
north	N
south	S
west	W
Copyright	©

### Corporate suffixes:

Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
et alii (and other people)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.,
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
number (before a number)	# (e.g., #10)
pounds (after a number)	# (e.g., 10#)
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S. state and District of Columbia abbreviations	use two-letter abbreviations (e.g., AK, DC)

### Mathematics, statistics, fisheries

alternate hypothesis	H <sub>A</sub>
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	F, t, $\chi^2$ , etc.
confidence interval	C.I.
correlation coefficient	R (multiple)
correlation coefficient	r (simple)
covariance	cov
degree (angular or temperature)	°
degrees of freedom	df
divided by	÷ or / (in equations)
equals	=
expected value	E
fork length	FL
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 <sub>2</sub> , etc.
mid-eye-to-fork	MEF
minute (angular)	'
multiplied by	x
not significant	NS
null hypothesis	H <sub>0</sub>
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	$\alpha$
probability of a type II error (acceptance of the null hypothesis when false)	$\beta$
second (angular)	"
standard deviation	SD
standard error	SE
standard length	SL
total length	TL
variance	Var

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RIVER, KODIAK, ALASKA, 2007**

By

Donn Tracy  
and  
Julia S. Schmidt

*Division of Sport Fish, Kodiak*

May 2008

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## Annual Report Summary Page

**Title:** Stock assessment of sockeye salmon from the Buskin River, Kodiak, Alaska, 2007

**Study Number:** FIS 07-402

**Investigator(s)/Affiliation(s):** Donn Tracy, Len Schwarz and Suzanne Schmidt, Alaska Department of Fish and Game, Division of Sport Fish, 211 Mission Road, Kodiak, AK 99615-6399, USA.

**Management Regions:** Kodiak Area, Bristol Bay/Alaska Peninsula/Kodiak Region

**Information Type:** Stock Status and Trends

**Issue Addressed:** Data collected from the project will be used for inseason management and development of an escapement goal for this sockeye salmon stock.

**Study Cost:** \$67,800

**Study Duration:** June 1 – August 15, 2007

**Key Words:** Age composition, Buskin River, Kodiak Island, sockeye salmon, *Oncorhynchus nerka*, subsistence harvest, weir.

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## ABSTRACT

Salmon weirs were operated on the Buskin River drainage on Kodiak Island, Alaska, from May 7 – September 30, 2007 to enumerate sockeye salmon *Oncorhynchus nerka*. A total of 16,502 sockeye salmon were counted into Buskin Lake. A total of 1,676 sockeye salmon were also counted into the Lake Louise tributary. The midpoint of the Buskin Lake run occurred on June 16; the midpoint of the Lake Louise tributary run occurred on August 27. Most sockeye salmon in the Buskin and Louise lakes escapement were aged 1.3. The preliminary 2007 subsistence harvest was 9,557 sockeye salmon, most of which were aged 1.3.

Key words: Buskin River, Kodiak Island, sockeye salmon, *Oncorhynchus nerka*, weir, subsistence harvest, age composition.

## INTRODUCTION

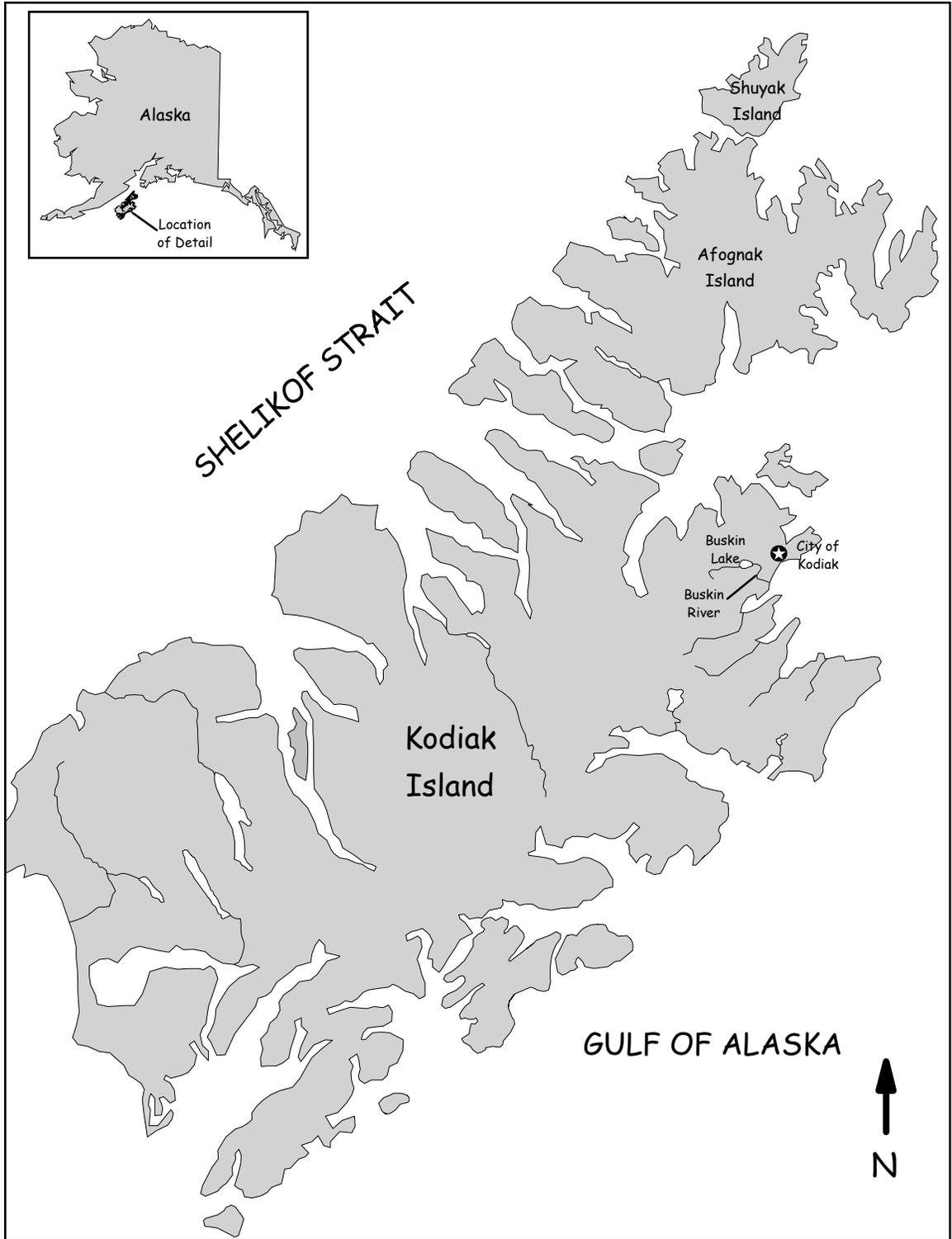
The Buskin River drainage (Figure 1), located approximately 2 miles from the city of Kodiak, supports a subsistence fishery which occurs in marine waters near the mouth of the Buskin River and harvests relatively large numbers of sockeye salmon *Oncorhynchus nerka*. Between 1990 and 1997 annual subsistence harvests averaged approximately 5,000 sockeye salmon, but more recently have increased substantially, ranging as high as 13,000 fish from 1998 – 2007 and averaging around 9,000 during the same period (Table 1). Currently, the Buskin River is the single largest source of subsistence salmon harvests in federally managed waters within the Kodiak area.

Sockeye salmon from the Buskin River are also harvested by a sport fishery which has been monitored since 1980. Sport harvests have averaged approximately 1,750 sockeye salmon between 1997-2006 (Table 2) and angler effort on the Buskin River has recently represented an average of nearly 35% of the annual freshwater sport fishing effort in the Kodiak Management Area (Schwarz et al. *in prep*), although this statistic also represents sport fishing effort targeting all species present in the drainage. Buskin River sockeye salmon are also harvested commercially, but to a much lesser degree than by subsistence and sport fisheries, at less than 100 fish annually during recent years.

Annual escapements of sockeye salmon returning to the Buskin River have been monitored since 1980. Between 1980 and 1984 escapements were indexed using aerial survey counts and since 1985 a weir has been used to enumerate total inriver returns. From 1998-2007 sockeye salmon escapements into the Buskin Lake have averaged more than 17,000 fish (Table 3).

Although sockeye salmon harvests and escapements have been monitored historically, age data from returns of adult fish have been collected consistently only since 1993 (Schwarz and Clapsadl 2000). Consequently, at the present time there is a continuing need for information necessary to assess productivity of this salmon stock and to evaluate the current biological escapement goal (BEG).

The Buskin River is fed primarily by Buskin Lake, although the Buskin drainage is also comprised of two other tributaries that converge with Buskin River and terminate in small lakes. Along with Buskin Lake, these small lakes are utilized by adult sockeye salmon for spawning and by juvenile fish for rearing. Since 1990 the ADF&G weir has been operated near the outlet of Buskin Lake (previously the weir was located approximately 1.5 miles downstream), to avoid weir washouts resulting from frequent inriver flooding. Consequently, the inriver return of sockeye salmon to the down river tributaries was not documented. Since 2002 installation of a second weir on the main tributary from Lake Louise to the Buskin River has



**Figure 1.-Map of Kodiak Island showing Buskin River drainage.**

provided complete escapement counts of sockeye salmon returning to the drainage. Operation of this tributary weir will continue annually for the duration of the stock assessment study.

Estimates of total return by age from sampling the escapement and subsistence harvest are needed in order to reconstruct the run and develop brood tables to evaluate the BEG. Cumulative weir counts are needed for comparison to historic time of entry data in order to ensure fisheries are managed so that the current BEG is achieved. Results from this project will ensure that the health of the Buskin River sockeye salmon stock is maintained, and also that any harvestable surpluses are available to subsistence, recreational, or commercial fisheries.

**Table 1.- Subsistence harvests of Buskin River sockeye salmon, 1998-2007.**

Year	Reported Subsistence Fishery Harvest
1998	6,011
1999	7,985
2000	7,315
2001	10,260
2002	13,588
2003	10,728
2004	9,421
2005	6,454
2006	7,813
2007	9,557
Average	8,913

Source: ADF&G Commercial Fisheries Division, Kodiak; 2007 data preliminary.

**Table 2.- Estimated sport fishery harvest of Buskin River sockeye salmon, 1997-2006.**

Year	Estimated Sport Fishery Harvest
1997	1,843
1998	1,983
1999	1,467
2000	2,041
2001	826
2002	1,903
2003	3,012
2004	1,380
2005	1,540
2006	1,570
Average	1,757

Source: 1997-2000, Schwarz et al. 2002; 2001-2006 Schwarz et al. *in prep.*

**Table 3.- Escapement of sockeye salmon into Buskin Lake, 1998-2007.**

Year	Escapement
1998	14,767
1999	10,812
2000	11,233
2001	20,556
2002	17,174
2003	23,870
2004	22,023
2005	15,601
2006	17,734
2007	16,502
Average	17,027

Sources: 1998-2000 data from Schwarz et al 2002; 2001-2007 data from Schwarz et al. *in prep.*

**Table 4.- Escapement of sockeye salmon into Lake Louise, 2002-2007.**

Year	Escapement
2002	3,242
2003	4,488
2004	2,086
2005	2,028
2006	4,586
2007	1,676
Average	3,018

Source: Schwarz et al. *in prep.*

During 2007 the objectives of the stock assessment study were to census the sockeye salmon escapement into the Buskin River drainage and to estimate the age composition of the escapement and subsistence fishery harvest. This information, along with historic data and sport and commercial harvest estimates, will be used to augment a brood table in development for evaluation of the sockeye salmon BEG.

## **METHODS**

### **BUSKIN RIVER WEIR**

In 2007 the spawning escapement of sockeye salmon was censused through a weir at the outlet of Buskin Lake from May 7 – August 3 (Table 5; Figure 2). Fish migrating upstream were enumerated as they passed through the weir. Daily counts of sockeye salmon at both locations were entered on salmon weir count data forms. After August 3 the Buskin Lake weir was

relocated downstream to also enumerate escapement of coho salmon, and remained in operation through September 30.

A second weir was operated in the tributary stream flowing into the Buskin River from the Lake Louise portion of the drainage beginning on June 4 (Table 6; Figure 3). The return of sockeye salmon to the Lake Louise tributary was monitored daily through September 30, after which the weir was removed for the year.

### **AGE-SEX-LENGTH SAMPLING**

Sockeye salmon were sampled from the Buskin River escapement during each of five temporal strata: 16-31 May, 1-15 June, 16-30 June, 1-15 July and 16-31 July. Ideally, sampling was conducted on two days, one week apart, during each stratum. All fish captured on selected days were sampled, even if the daily sample goal was exceeded. On occasions when large numbers of sockeye salmon were observed behind the weir, fish were ideally sampled during the early, middle and late portions of the time interval required for their passage upstream.

Sockeye salmon were also sampled at the Lake Louise weir site during each during each of four temporal strata: 1 June – 15 July, 16-31 July, 1-15 August and 16-31 August. All fish captured on selected days were sampled, even if the daily sample goal was exceeded.

The subsistence harvest was sampled for age, sex, and length during each of two temporal strata, 1-15 June and 16-30 June, to account for any significant changes in these attributes over the course of the run. Harvested fish were sampled from subsistence fishers opportunistically within each time stratum. Sampling was conducted either from a boat on the fishing grounds or dockside at local boat harbors.

Fish lengths were measured from mid-eye to fork-of-tail and sex determined. Two scales were taken from each fish and mounted on a gum card. Scales were taken 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 (Clutter and Whitesel 1956). Scales were taken proximal to the preferred region when necessary, although only within the area bounded dorsally by the fourth row of scales above the lateral line, ventrally by the lateral line, and between lines drawn vertically from the posterior insertion of the dorsal fin and the anterior insertion of the anal fin. If scales were not available in the preferred region on the left side of the fish, scales were collected from the preferred region on the right side. Age was interpreted from scales using the criteria of Clutter and Whitesel (1956).

### **DATA ANALYSIS**

Chi-squared statistics were used to test for differences in age and sex composition among temporal strata within each source (i.e., escapement or subsistence harvests) and also between each source. If differences were detected, estimates were stratified to minimize bias. If differences were not detected, age data were pooled to improve precision. The proportion of sockeye salmon from source  $h$  (escapement or subsistence harvest) during stratum  $i$  ( $i = 1,2,3,4$ ) in age/sex class  $j$  was estimated as a binomial proportion by:

$$\hat{p}_{hij} = \frac{n_{hij}}{n_{hi}} \quad (1)$$

and its variance by:

$$\hat{V}(\hat{p}_{hij}) = \left[ \frac{N_{hi} - n_{hi}}{N_{hi}} \right] \frac{\hat{p}_{hij}(1 - \hat{p}_{hij})}{n_{hi} - 1}, \quad (2)$$

where:

$n_{hij}$  = the number of sockeye salmon from source h during stratum i that were in age/sex class j,

$n_{hi}$  = the number of sockeye salmon sampled from source h during stratum i, and

$N_{hi}$  = the total number of sockeye salmon in source h during stratum i.

Weir counts and permit returns of subsistence harvests were treated as censuses with no variance. In the event that temporal stratification was required for the subsistence harvest,  $N_{Si}$  (total number of subsistence sockeye salmon harvested during stratum i) was calculated by multiplying the total subsistence harvest by the proportion of the sockeye salmon run passing through the weir in temporal stratum i.

The number of fish from source h during stratum i of age/sex class j was estimated by:

$$\hat{N}_{hij} = N_{hi} \hat{p}_{hij}, \quad (3)$$

where  $N_{hi}$  = the total number of sockeye salmon from source h during stratum i;

and its variance by:

$$\hat{V}(\hat{N}_{hij}) = N_{hi}^2 \hat{V}(\hat{p}_{hij}). \quad (4)$$

The total number of fish from source h of age/sex class j was estimated as:

$$\hat{N}_{hj} = \sum_{i=1}^t \hat{N}_{hij} \quad (5)$$

where t = the number of strata; and the variance was estimated as the sum of the variances as:

$$V(\hat{N}_{hj}) = \sum V(\hat{N}_{hij}). \quad (6)$$

The proportion of sockeye salmon age/sex class j for the total of source h was estimated as:

$$\hat{p}_{hj} = \frac{\hat{N}_{hj}}{N_h}, \quad (7)$$

where  $N_h$  = the total for source h.

The variance of the proportion was estimated by:

$$V(\hat{p}_{hj}) = \frac{V(\hat{N}_{hj})}{N_h^2}. \quad (8)$$

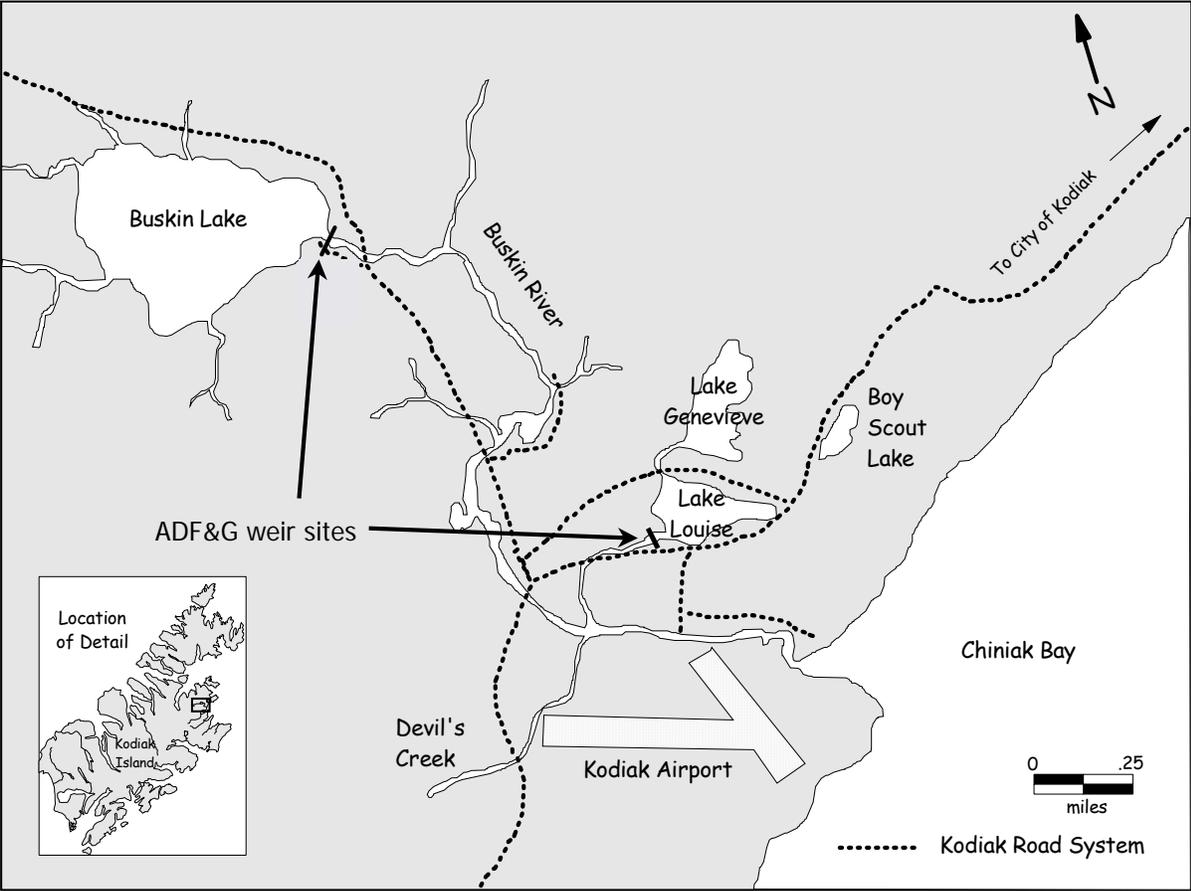
## RESULTS

At the conclusion of the 2007 sockeye salmon stock assessment project a total of 15,948 adult fish were counted through the weir located at the outlet of Buskin Lake (Table 5). The entire 2007 escapement (including fish counted after August 15 at the lower weir site) eventually totaled 16,502 (Table 3). The highest daily count of 2,248 sockeye salmon occurred on June 11 and the midpoint of the run occurred on approximately June 16 (Table 5; Figure 3). Age, length and sex data were collected from 324 sampled fish, and sex and length only data from an additional 35 fish. Age compositions were significantly different by temporal strata ( $\chi^2 = 10.00$ ,  $df = 3$ ,  $P = 0.04$ ) and were subsequently stratified. Fish comprising the escapement were primarily aged 1.3 (Appendix A1). Mean length of females in the escapement was 529 mm (SE = 30); mean length of males was 564 mm (SE = 30).

A total of 1,676 sockeye salmon were counted through the weir located on the Lake Louise tributary stream (Table 4). The single highest daily count of 531 sockeye salmon occurred on August 28, with nearly 80% of the run complete (Table 6; Figure 4). Age, length and sex data were collected from 229 sampled fish and sex and length only data from an additional 23 fish. Age compositions were not significantly different by temporal strata ( $\chi^2 = 5.28$ ,  $df = 3$ ,  $P = 0.15$ ) and were subsequently pooled. Most fish bound for Lake Louise were age 1.3. (Appendix A2). Mean length of Lake Louise females was 503mm (SE = 41), while mean length for males was 505 mm (SE = 84).

At the time of this report, a preliminary tally of more than 9,557 sockeye salmon reported taken in the 2007 subsistence harvest likely reflects an incomplete accounting of the total harvest. There was not a significant difference in age compositions of fish sampled from the harvest by temporal strata ( $\chi^2 = .08$ ,  $df = 1$ ,  $P = 0.77$ ). Most fish in the subsistence harvest were ages 1.3 (Appendix A3). Mean length of females was 542 mm (SE = 23), and 572 mm (SE = 22) for males.

The age composition of the Buskin River escapement was not significantly different from the subsistence harvest ( $\chi^2 = 1.45$ ;  $df = 1$ ;  $P = .22$ ).



**Figure 2.-Location of the Buskin River drainage weirs, 2007.**

**Table 5.-Immigration of sockeye salmon through the Buskin Lake outlet weir by date through August 15, 2007.**

Date	Daily Count	Cumulative Count	% of Total	Date	Daily Count	Cumulative Count	% of Total
21-May	0	0	0%	5-Jul	118	13,069	79%
22-May	0	0	0%	6-Jul	551	13,620	83%
23-May	10	10	0%	7-Jul	39	13,659	83%
24-May	38	48	0%	8-Jul	10	13,669	83%
25-May	9	57	0%	9-Jul	218	13,887	84%
26-May	4	61	0%	10-Jul	263	14,150	86%
27-May	0	61	0%	11-Jul	63	14,213	86%
28-May	0	61	0%	12-Jul	45	14,258	86%
29-May	0	61	0%	13-Jul	204	14,462	88%
30-May	0	61	0%	14-Jul	3	14,465	88%
31-May	2	63	0%	15-Jul	1	14,466	88%
1-Jun	1	64	0%	16-Jul	108	14,574	88%
2-Jun	48	112	1%	17-Jul	5	14,579	88%
3-Jun	268	380	2%	18-Jul	62	14,641	89%
4-Jun	107	487	3%	19-Jul	21	14,662	89%
5-Jun	440	927	6%	20-Jul	36	14,698	89%
6-Jun	392	1,319	8%	21-Jul	78	14,776	90%
7-Jun	753	2,072	13%	22-Jul	53	14,829	90%
8-Jun	331	2,403	15%	23-Jul	43	14,872	90%
9-Jun	304	2,707	16%	24-Jul	263	15,135	92%
10-Jun	295	3,002	18%	25-Jul	200	15,335	93%
11-Jun	2,248	5,250	32%	26-Jul	0	15,335	93%
12-Jun	1,101	6,351	38%	27-Jul	0	15,335	93%
13-Jun	328	6,679	40%	28-Jul	350	15,685	95%
14-Jun	113	6,792	41%	29-Jul	89	15,774	96%
15-Jun	607	7,399	45%	30-Jul	37	15,811	96%
16-Jun	1,024	8,423	51%	31-Jul	11	15,822	96%
17-Jun	445	8,868	54%	1-Aug	5	15,827	96%
18-Jun	353	9,221	56%	2-Aug	52	15,879	96%
19-Jun	107	9,328	57%	3-Aug	69	15,948	97%
20-Jun	329	9,657	59%	4-Aug	31	15,979	97%
21-Jun	358	10,015	61%	5-Aug	34	16,013	97%
22-Jun	331	10,346	63%	6-Aug	34	16,047	97%
23-Jun	161	10,507	64%	7-Aug	26	16,073	97%
24-Jun	88	10,595	64%	8-Aug	12	16,085	97%
25-Jun	309	10,904	66%	9-Aug	19	16,104	98%
26-Jun	196	11,100	67%	10-Aug	28	16,132	98%
27-Jun	814	11,914	72%	11-Aug	14	16,146	98%
28-Jun	0	11,914	72%	12-Aug	16	16,162	98%
29-Jun	125	12,039	73%	13-Aug	13	16,175	98%
30-Jun	106	12,145	74%	14-Aug	22	16,197	98%
1-Jul	98	12,243	74%	15-Aug	20	16,217	98%
2-Jul	76	12,319	75%				
3-Jul	401	12,720	77%				
4-Jul	231	12,951	78%				

**Table 6.-Immigration of sockeye salmon through the Lake Louise weir by date through August 31, 2007.**

Date	Daily Count	Cumulative Count	% of Total	Date	Daily Count	Cumulative Count	% of Total
3-Jun	0	0	0%	19-Jul	0	206	12%
4-Jun	0	0	0%	20-Jul	0	206	12%
5-Jun	0	0	0%	21-Jul	0	206	12%
6-Jun	0	0	0%	22-Jul	0	206	12%
7-Jun	0	0	0%	23-Jul	0	206	12%
8-Jun	0	0	0%	24-Jul	0	206	12%
9-Jun	0	0	0%	25-Jul	78	284	17%
10-Jun	0	0	0%	26-Jul	0	284	17%
11-Jun	0	0	0%	27-Jul	3	287	17%
12-Jun	0	0	0%	28-Jul	0	287	17%
13-Jun	0	0	0%	29-Jul	32	319	19%
14-Jun	0	0	0%	30-Jul	21	340	20%
15-Jun	0	0	0%	31-Jul	10	350	21%
16-Jun	0	0	0%	1-Aug	36	386	23%
17-Jun	0	0	0%	2-Aug	13	399	24%
18-Jun	0	0	0%	3-Aug	0	399	24%
19-Jun	0	0	0%	4-Aug	0	399	24%
20-Jun	0	0	0%	5-Aug	0	399	24%
21-Jun	0	0	0%	6-Aug	0	399	24%
22-Jun	0	0	0%	7-Aug	1	400	24%
23-Jun	0	0	0%	8-Aug	0	400	24%
24-Jun	0	0	0%	9-Aug	0	400	24%
25-Jun	0	0	0%	10-Aug	0	400	24%
26-Jun	0	0	0%	11-Aug	0	400	24%
27-Jun	0	0	0%	12-Aug	0	400	24%
28-Jun	0	0	0%	13-Aug	0	400	24%
29-Jun	0	0	0%	14-Aug	3	403	24%
30-Jun	0	0	0%	15-Aug	0	403	24%
1-Jul	0	0	0%	16-Aug	0	403	24%
2-Jul	0	0	0%	17-Aug	0	403	24%
3-Jul	0	0	0%	18-Aug	97	500	30%
4-Jul	0	0	0%	19-Aug	210	710	42%
5-Jul	0	0	0%	20-Aug	8	718	43%
6-Jul	0	0	0%	21-Aug	0	718	43%
7-Jul	0	0	0%	22-Aug	5	723	43%
8-Jul	0	0	0%	23-Aug	53	776	46%
9-Jul	0	0	0%	24-Aug	2	778	46%
10-Jul	0	0	0%	25-Aug	0	778	46%
11-Jul	0	0	0%	26-Aug	0	778	46%
12-Jul	41	41	2%	27-Aug	17	795	47%
13-Jul	24	65	4%	28-Aug	531	1,326	79%
14-Jul	0	65	4%	29-Aug	141	1,467	88%
15-Jul	1	66	4%	30-Aug	33	1,500	89%
16-Jul	0	66	4%	31-Aug	11	1,511	90%
17-Jul	140	206	12%				
18-Jul	0	206	12%				

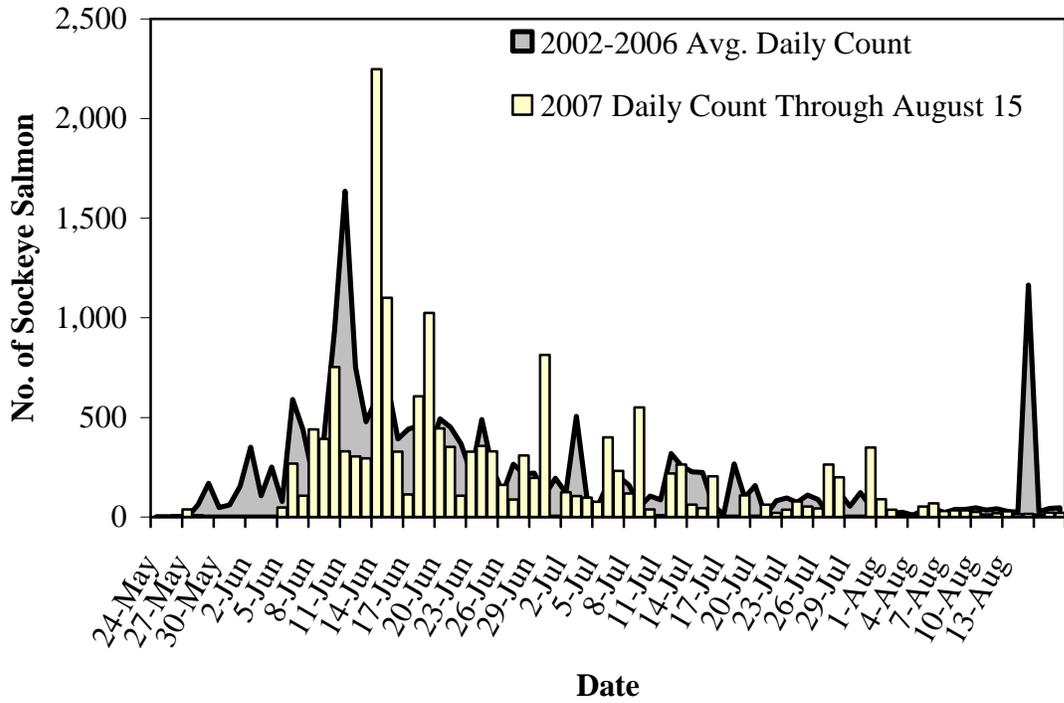


Figure 3.-Buskin River average daily sockeye salmon weir count, 2002-2006 and daily weir count through August 15, 2007.

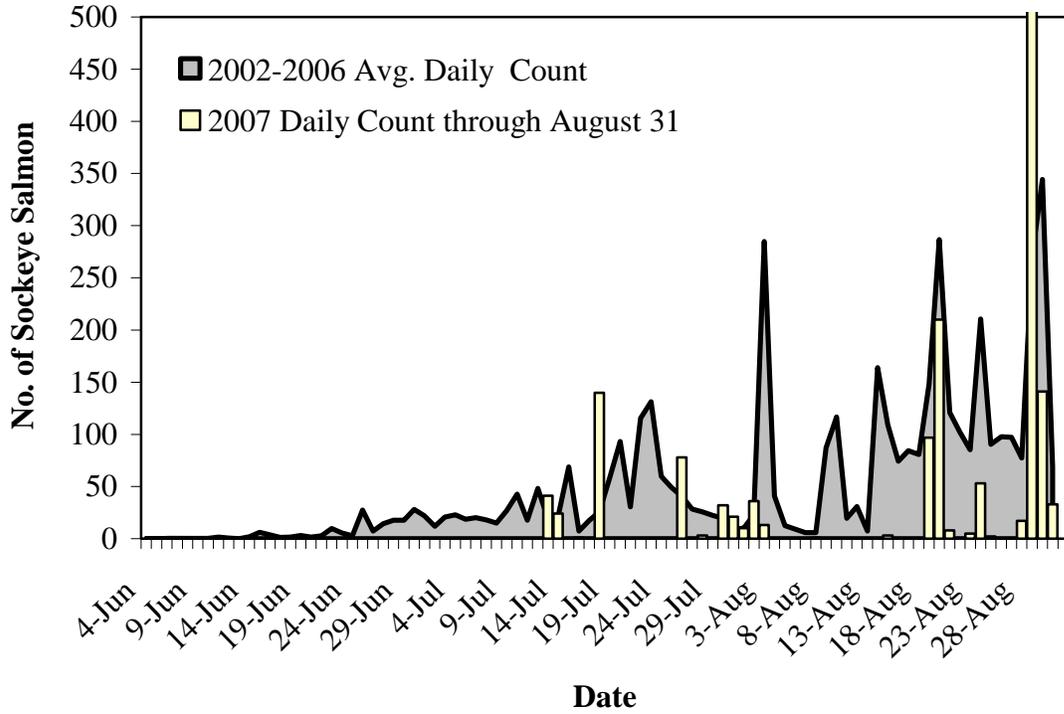


Figure 4.-Lake Louise daily and cumulative sockeye salmon escapement through August 31, 2007.

## DISCUSSION

The 2007 escapement of sockeye salmon into Buskin Lake was very close to the most recent 10-year average. As mentioned previously, the 2007 subsistence harvest of nearly 10,000 fish is likely a partial count of the total harvest, which typically is tallied from receipt of additional harvest reports in exchange for renewed subsistence permits. It's probable that the final 2007 harvest will reflect the continuing trend of increased activity in this fishery. Information obtained from the stock assessment project through 2007 has been used to complete an updated analysis for triennial evaluation of the sockeye salmon BEG, the results of which are presented in Schmidt et al. *in press*. Data results from the 2007 project, including escapements, subsistence harvests and corresponding age composition estimates will be used along with sport and commercial harvest data to refine this analysis through expanded development of a sockeye salmon brood table.

## ACKNOWLEDGMENTS

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## **APPENDIX A. SUPPORTING DATA**

**Appendix A1.-Estimated age composition of Buskin River sockeye salmon escapement, 2007.**

Run Component	Age								Total
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	
<u>Females</u>									
Sample Proportion	0.0	1.5	34.4	0.6	0.0	0.9	7.1	0.0	44.6
SE	0.0	0.1	0.4	0.1	0.0	0.1	0.2	0.0	0.4
Estimated Escapement	0	255	5,671	102	0	153	1,175	0	7,357
SE	0	16	61	10	0	12	33	0	64
<u>Males</u>									
Sample Proportion	0.0	2.8	44.9	0.9	0.0	0.6	7.1	0.0	56.3
SE	0.0	0.1	0.4	0.1	0.0	0.1	0.2	0.0	0.4
Estimated Escapement	0	460	7,408	153	0	102	1,175	0	9,298
SE	0	21	64	12	0	10	33	0	64
<u>Total</u>									
Sample Proportion	0.0	4.3	79.3	1.5	0.0	1.2	13.6	0.0	100.0
SE	0.0	0.2	0.3	0.1	0.0	0.1	0.3	0.0	
Estimated Escapement	0	715	13,079	255	0	204	2,248	0	16,502
SE	0	26	52	16	0	14	44	0	

**Appendix A2.-Estimated age composition of Lake Louise sockeye salmon escapement, 2007.**

Run Component	Age								Total
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	
<u>Females</u>									
Sample Proportion	0.0	6.6	31.9	0.0	0.0	4.4	5.7	0.0	48.5
SE	0.0	0.6	1.1	0.0	0.0	0.5	0.6	0.0	1.2
Estimated Escapement	0	110	534	0	0	73	95	0	812
SE	0	10	19	0	0	8	9	0	20
<u>Males</u>									
Sample Proportion	3.1	9.6	29.7	1.3	3.1	4.4	0.4	0.0	51.5
SE	0.4	0.7	1.1	0.3	0.4	0.5	0.2	0.0	1.2
Estimated Escapement	51	161	498	22	51	73	7	0	864
SE	7	12	19	5	7	8	3	0	20
<u>Total</u>									
Sample Proportion	3.1	16.2	61.6	1.3	3.1	8.7	6.1	0.0	100.0
SE	0.4	0.9	1.2	0.3	0.4	0.7	0.6	0.0	0.0
Estimated Escapement	51	271	1,032	22	51	146	102	0	1,676
SE	7	15	20	5	7	12	10	0	0

**Appendix A3.-Estimated sample age composition of Buskin River sockeye salmon subsistence harvest, 2007.**

Run Component	Age								Total
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	
<u>Females</u>									
Sample Proportion	0.0	0.0	41.9	0.0	0.0	0.9	5.3	0.9	48.9
SE	0.0	0.0	0.5	0.0	0.0	0.1	0.2	0.1	0.5
Estimated Harvest	0	0	4,004	0	0	84	506	84	4,678
SE	0	0	48	0	0	9	22	9	49
<u>Males</u>									
Sample Proportion	0.0	0.0	44.5	0.9	0.0	0.0	5.7	0.0	51.1
SE	0.0	0.0	0.5	0.1	0.0	0.0	0.2	0.0	0.5
Estimated Harvest	0	0	4,257	84	0	0	548	0	4,889
SE	0	0	49	9	0	0	23	0	49
<u>Total</u>									
Sample Proportion	0.0	0.0	86.3	0.9	0.0	0.9	11.0	0.9	100.0
SE	0.0	0.0	0.4	0.1	0.0	0.1	0.3	0.1	0.0
Estimated Harvest	0	0	8,260	84	0	84	1,054	84	9,567
SE	0	0	34	9	0	9	31	9	0