

**Larson Lake
Adult Sockeye Salmon
Data Report
2012**

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July 2013**

The Larson Lake Project was made possible through a cooperative agreement (COOP-13-002) with the Alaska Department of Fish and Game, Division of Commercial Fisheries.

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DISCLAIMER

The Cook Inlet Aquaculture Association (CIAA) conducts salmon enhancement and restoration projects in Area H, Cook Inlet, and associated waters. As an integral part of these projects a variety of monitoring and evaluation studies are conducted. The following data report is a synopsis of the monitoring and evaluation studies conducted for Larson Lake. This Larson Lake Data Report encompasses data collected from the 2012 adult sockeye escapement.

The purpose of the data report is to provide a vehicle to distribute the information produced by the monitoring and evaluation studies. Data collected each year are presented with a summary of the information previously collected for comparative purposes. These reports are intended to provide a general description of project activity and are not an exhaustive evaluation of any restoration or enhancement project. The information presented in this report has not undergone an extensive review. As reviews are completed, the information may be updated and presented in other reports.

The Larson Lake Data Report was prepared by CIAA through a cooperative agreement (COOP-13-002) with the Alaska Department of Fish and Game (ADF&G), Division of Commercial Fisheries. The statements, findings, conclusions, and recommendations are those of the author and do not necessarily reflect the views of ADF&G.

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Our equal employment opportunity philosophy applies to all aspects of employment with CIAA including recruiting, hiring, training, transfer, promotion, job benefits, pay, dismissal, and educational assistance.

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ACKNOWLEDGEMENTS

Many individuals and agencies contributed to the success of the 2012 Larson Lake project. Appreciation is extended to the Cook Inlet Aquaculture Association interns Joe Bottoms and Hugo Fairclough, seasonal assistant John Trochta, and full-time staff who invested many hours in planning and executing this project over the years. Special thanks go to the Alaska Department of Fish and Game, Alaska Department of Natural Resources, and the Matanuska-Susitna Borough for the support they provided during this project.

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ABSTRACT

As part of the continued evaluation of lakes in the Susitna River watershed to determine the sockeye salmon (*Oncorhynchus nerka*) abundance in key salmon producing lakes with and without northern pike (*Esox lucius*), Cook Inlet Aquaculture Association (CIAA) and the Alaska Department of Fish and Game (ADF&G) agreed to monitor adult sockeye salmon returns to Larson Lake. Larson Lake adult salmon escapement monitoring has been conducted periodically since 1984 and is not known to have a population of northern pike.

The 2012 Larson Lake adult salmon escapement was enumerated from 2 July and continued daily until 21 August. During this time 16,619 adult sockeye (*O. nerka*) salmon passed through the weir in Larson Creek. During the adult escapement staff collected 411 readable scale samples, which were analyzed for age composition. The age composition of the sockeye salmon escapement was largely comprised of age group 1.2 at 43.06%, followed by age group 1.3 at 30.66%, age group 2.2 at 17.03%, age group 2.3 at 8.28%, age group 1.1 at 0.48%, and age group 1.4 at 0.48%. Male sockeye salmon comprised 46.95% of the escapement with an average length of 533 mm (± 2 SE). Female sockeye salmon comprised 53.04% of the escapement with an average length of 505 mm (± 2 SE).

Staff measured basic environmental conditions from 5 July through 20 August. Accumulated rainfall was measured at 157 mm, water level fluctuated in the creek 0.47 feet, water temperature averaged 18°C, and air temperature averaged 16°C.

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INTRODUCTION AND PURPOSE

To better understand the recent low adult sockeye salmon (*Oncorhynchus nerka*) returns to the Susitna River drainage system, the Cook Inlet Aquaculture Association (CIAA), in cooperation with the Alaska Department of Fish and Game (ADF&G), is assessing sockeye salmon populations at several key salmon producing lakes with and without northern pike (*Esox lucius*) in the Susitna River drainage. The overall objective of this effort is to enumerate the smolt and adult returns and to assess the characteristics of these populations in terms of age composition, sex, and size. Additionally, for some lake systems, environmental conditions and water quality measurements are being collected as well as genetic samples, mark-recapture studies, and performance of hydroacoustic surveys. The goal is to collect sound biological data to provide the foundation on which decisions for management and rehabilitation strategies can be made. Understanding the adult-to-juvenile relationship will allow management biologists to analyze and evaluate the production and rearing condition of each lake.

In recent history, to enumerate sockeye salmon returns to the Susitna River drainage, the enumeration of adult salmon returns to Larson Lake has been conducted since 2005. Larson Lake was chosen for enumeration to provide comparative data of historical adult salmon returns and to compare adult salmon returns for lakes with and without an invasive northern pike population.

From 2009 to 2011, Larson Lake was monitored for adult sockeye salmon returns under an Alaska Sustainable Salmon Fund grant. Results from this evaluation indicated that continual monitoring of returns to Larson Lake would provide essential and important data for managers of the Upper Cook Inlet fisheries. Under a State Legislative Grant, CIAA continued with the assessment for another year (2012).

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PROJECT AREA

Larson Lake, approximately 7.8 miles east of Talkeetna, is located in the Lower Talkeetna River watershed under legal description, S026N003W18. Larson Lake is classified in the Catalog of Waters important for spawning, rearing, or migration of anadromous fishes—Southcentral Region as water body number, 247-41-10200-2370-3080-0010 (Johnson and Blanche, 2010). The lake has a maximum depth of 42.6 m, a mean depth of 16.4 m, and is located at an elevation 186 m above sea level (Figure 2) (Spafard and Edmundson, 2000). The lake discharges north via Larson Creek to the Talkeetna River. Monitoring activities took place near the outlet of the lake in Larson Creek (AWC 247-41-10200-2370-3080).

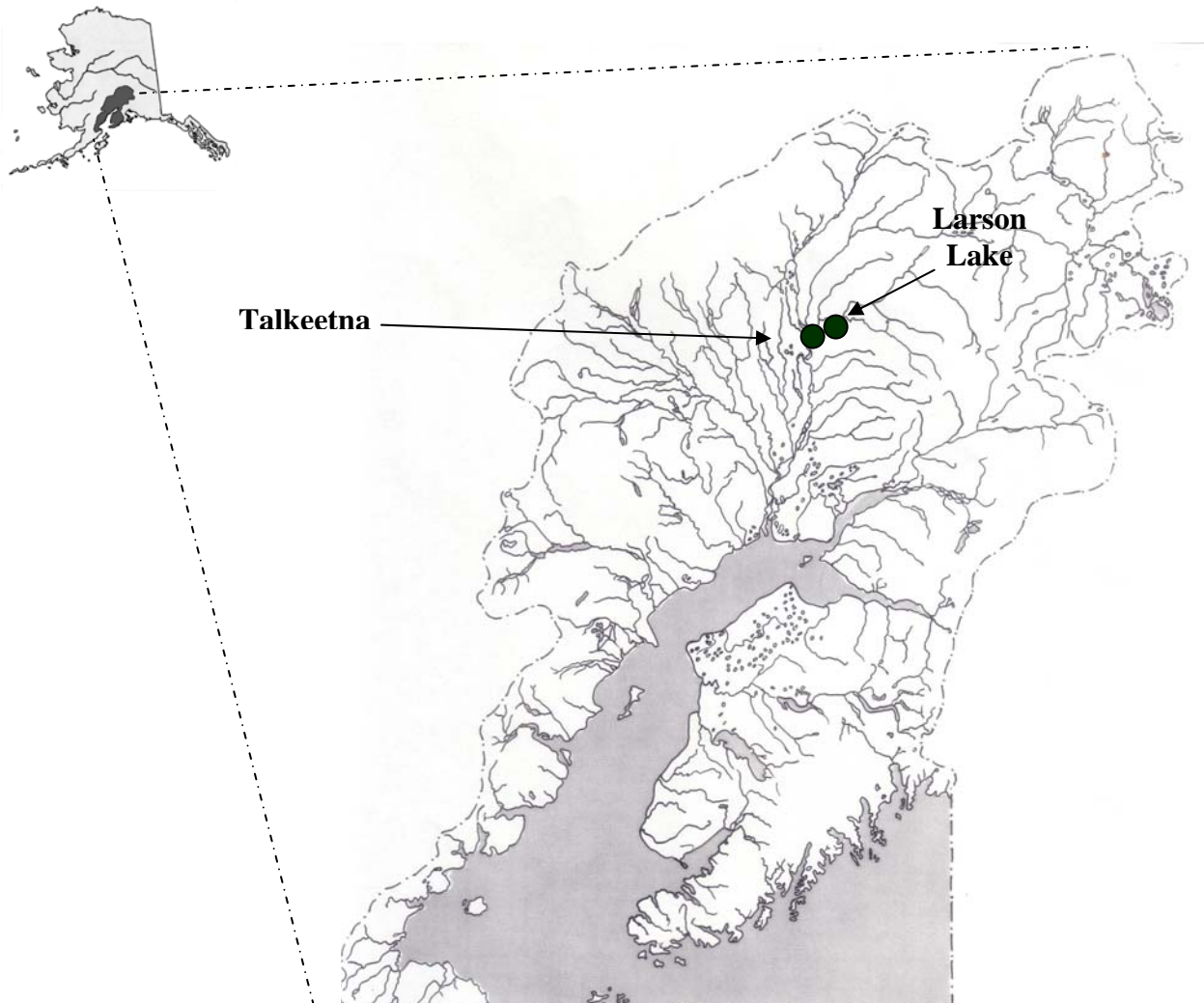


Figure 1. Larson Lake in Relation to Cook Inlet and Alaska

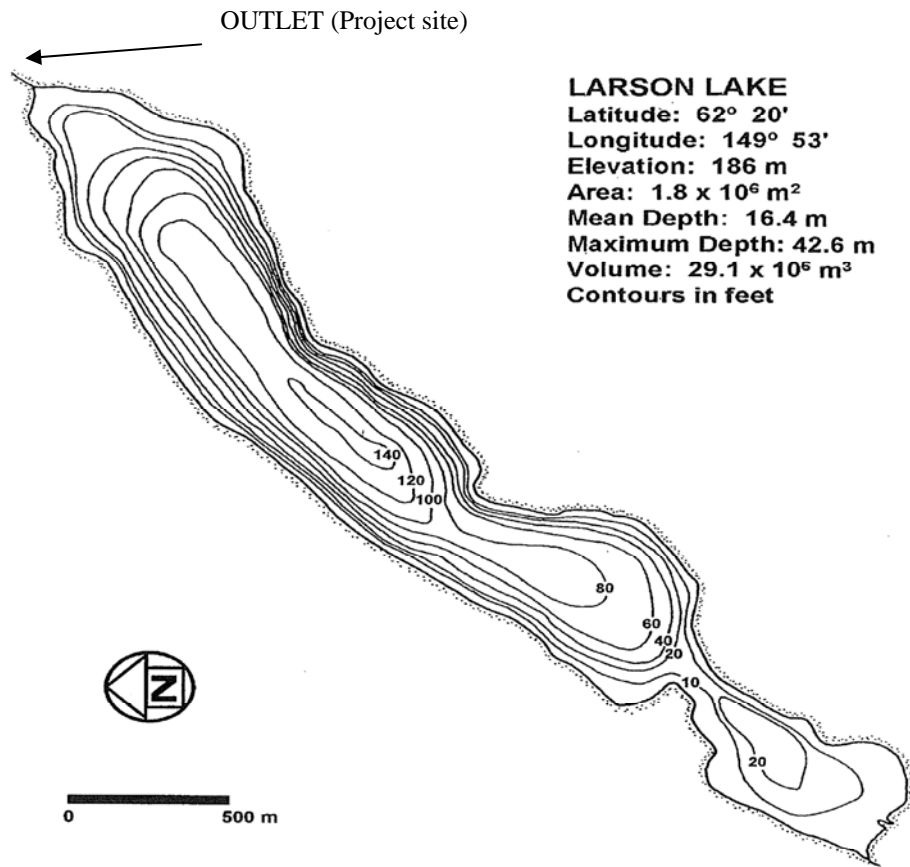


Figure 2. Bathymetric Map of Larson Lake

METHODS

Standard CIAA procedures were followed for collecting data for environmental conditions and adult enumeration (Cook Inlet Aquaculture Association Staff, 2012).

Environmental Conditions

To assess the environmental conditions during the adult sockeye salmon migration to Larson Lake, percent cloud cover was visually estimated, water level was measured to the nearest tenth of a foot, precipitation measured to the nearest millimeter, and water and air temperatures measured to the nearest degree centigrade. All measurements were recorded at 5:00 PM each day.

Adult Enumeration

To enumerate and collect adult salmon returning to Larson Creek, a counting weir was temporarily installed in Larson Creek. The weir was constructed of 1.9 cm galvanized pipe and 7.6 cm aluminum channel. The galvanized pipe was picketed through 1.9 cm holes, spaced 2.54 cm apart, in the aluminum channel.

Field personnel visually identified species and counted the adult fish as they ascended Larson Creek. By removing one or two pickets, fish were permitted to pass through the weir. Initially counts were made at least twice a day. As the number of adult fish passing through the weir increased, counts were made more frequently. Field personnel also visually checked each fish as it passed through the weir for a numbered tag inserted by ADF&G as part of a mark-recapture study. The data were submitted to ADF&G at the end of the year for analysis.

In addition to the enumeration of the adult salmon escapement, the sex, age, and lengths from mid eye to tail fork (METF) of the returning population of sockeye salmon were also assessed by collecting a sample of sockeye salmon as they passed through the weir. The sex of each adult sockeye salmon collected was visually determined and METF measured to the nearest millimeter. For age evaluation, field personnel removed a scale from the primary growth area.¹ All scales were submitted to ADF&G for age determination. All captured fish were unharmed and released upstream.

During the adult salmon escapements, up to 40 adult sockeye salmon were randomly collected for measurements each day. A total of 718 adult sockeye salmon scales were collected of which

¹ *The primary growth area is located above the lateral line on a diagonal from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin.*

411 were analyzed. The large discrepancy between the number of scale samples CIAA staff collected compared with the number of scale samples ADF&G staff analyzed is a result of several factors including, but not limited, to a loss of data during transfer and travel, unreadable scales due to poor scale quality, and/or limited ADF&G staff time to read all scale samples collected.

RESULTS AND DISCUSSION

Environmental Conditions

During the 2012 adult sockeye migration, environmental conditions were monitored from 5 July through 20 August. Water levels fluctuated 0.47 feet during that period and ranged from 5.05 to 4.58 feet. Stream temperatures averaged 18°C and ranged from 15 to 22°C. Air temperatures averaged 16°C and ranged from 10 to 24°C. Nine percent of the days were clear, 40% were partly cloudy, and 51% were completely overcast. Measurable rain was recorded on 31 days during the adult migration. A total of 157 mm of rain fell during that period.

Adult Enumeration

The 2012 Larson Lake adult salmon escapement was enumerated from 2 July and continued daily until 21 August. During this time 16,619 adult sockeye (*O. nerka*) salmon passed through the weir in Larson Creek.

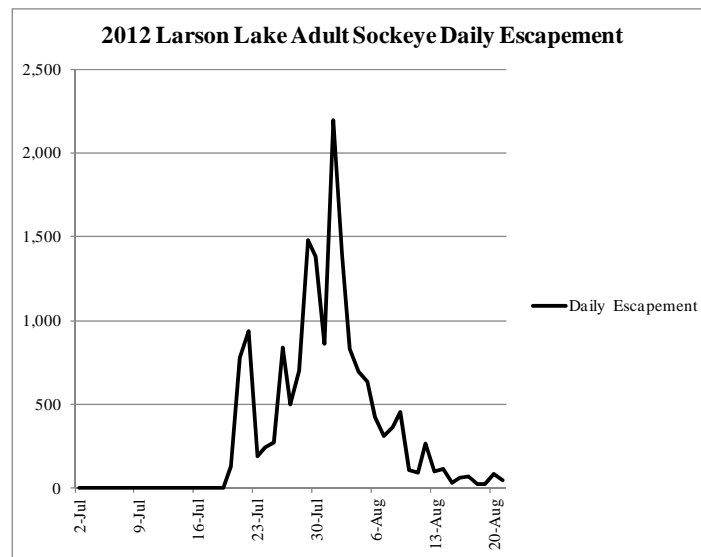


Figure 3. 2012 Larson Lake Adult Sockeye Daily Escapement

Other fish counted through the weir were 4 adult coho salmon (*O. kisutch*), 17 adult pink salmon (*O. gorbuscha*), and 4 adult rainbow trout (*O. mykiss*).

The age composition of the sockeye salmon escapement was largely comprised of age group 1.2 at 43.06%, followed by age group 1.3 at 30.66%, age group 2.2 at 17.03%, age group 2.3 at

8.28%, age group 1.1 at 0.48%, and age group 1.4 at 0.48% (Table 1). Male sockeye salmon comprised 46.95% of the escapement with an average length of 533 mm (± 2 SE). Female sockeye salmon comprised 53.04% of the escapement with an average length of 505 mm (± 2 SE).

Table 1. Summary of Larson Lake Adult Sockeye Salmon Characteristics, 2005–2012.

Year	Escapement	Age Classes																			
		0.2		0.3		1.1		1.2		1.3		2.2		1.4		2.3		2.4		3.2	
		(%)	Lth(mm)	(%)	Lth(mm)	(%)	Lth(mm)	(%)	Lth(mm)	(%)	Lth(mm)	(%)	Lth(mm)	(%)	Lth(mm)	(%)	Lth(mm)	(%)	Lth(mm)	(%)	Lth(mm)
2005	9,955	0.00%	-	0.00%	-	0.00%	-	13.1%	496	24.1%	552	22.5%	499	0.00%	-	40.3%	537	0.00%	-	0.00%	-
2006	56,305	0.00%	-	0.00%	-	0.00%	-	69.32%	505	12.50%	560	14.20%	507	0.00%	-	3.98%	566	0.00%	-	0.00%	-
2007	47,924	0.00%	-	0.00%	-	0.17%	325	13.64%	488	69.77%	561	4.49%	482	0.17%	635	11.74%	561	0.00%	-	0.00%	-
2008	34,595	0.17%	400	0.17%	400	0.00%	-	10.76%	506	65.27%	562	3.13%	508	0.35%	608	20.14%	558	0.17%	601	0.00%	-
2009	40,930	0.00%	-	0.00%	-	0.00%	-	18.10%	512	66.35%	565	4.76%	505	0.00%	-	10.79%	557	0.00%	-	0.00%	-
2010	20,324	0.00%	-	0.00%	-	0.00%	-	42.86%	500	27.67%	555	18.44%	508	0.00%	-	10.67%	556	0.00%	-	0.36%	523
2011	12,225	0.00%	-	0.42%	593	0.21%	361	21.76%	486	51.05%	552	7.11%	492	0.21%	575	19.25%	557	0.00%	-	0.00%	-
2012	16,557	0.00%	-	0.00%	-	0.48%	349	43.06%	492	30.66%	556	17.03%	497	0.48%	595	8.28%	563	0.00%	-	0.00%	-
Mean	29,852	0.02%	400	0.07%	497	0.11%	345	29.08%	498	43.42%	558	11.46%	500	0.15%	603	15.64%	557	0.02%	601	0.05%	523
Min	9,955	0.00%	400	0.00%	400	0.00%	325	10.76%	486	12.50%	552	3.13%	482	0.00%	575	3.98%	537	0.00%	601	0.00%	523
Max	56,305	0.17%	400	0.42%	593	0.48%	361	69.32%	512	69.77%	565	22.50%	508	0.48%	635	40.30%	566	0.17%	601	0.36%	523

RECOMMENDATIONS

Larson Lake is considered to be one of the major sockeye salmon producing lakes in the Susitna River watershed and future monitoring of the adult salmon escapement should continue.

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LITERATURE CITED

Cook Inlet Aquaculture Association Staff. 2012. Larson Lake Procedures Manual. Cook Inlet Aquaculture Association 40610 Kalifornsky Beach Road Kenai, Alaska 99611.

Johnson, J. and P. Blanche. 2010. Catalog of waters important for spawning, rearing, or migration of anadromous fishes – Southcentral Region, Effective June 1, 2010. Alaska Department of Fish and Game, Special Publication No. 10-06, Anchorage, page 237.

Spafard, M. A. and J. A. Edmundson. 2000. A morphometric atlas of Alaskan lakes: Cook Inlet, Prince William Sound, and Bristol Bay areas. Alaska Department of Fish and Game, Commercial Fisheries Division, Regional Information Report No. 2A00-23, page 52.

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APPENDICES

Appendix 1. Larson Lake 2012 – Environmental Conditions

Date	Sky	Precip. (mm)	Water Fluctuation (ft)*	Water Temp. (°C)	Air Temp. (°C)
5-Jul	4	1	4.98	18	11
6-Jul	3	4	5.00	18	23
7-Jul	5	3	5.05	16	11
8-Jul	4	1	5.00	16	13
9-Jul	4	1	4.97	17	14
10-Jul	5	0	4.93	15	11
11-Jul	4	0	4.90	16	14
12-Jul	4	1	4.91	16	13
13-Jul	4	5	4.88	16	14
14-Jul	4	1	4.83	16	14
15-Jul	5	1	4.80	16	11
16-Jul	4	1	4.81	16	15
17-Jul	2	1	4.79	19	21
18-Jul	1	0	4.76	21	20
19-Jul	1	0	4.73	21	23
20-Jul	4	0	4.68	19	17
21-Jul	5	20	4.74	17	13
22-Jul	5	12	4.82	16	13
23-Jul	4	2	4.81	16	14
24-Jul	3	0	4.80	18	15
25-Jul	2	0	4.75	20	21
26-Jul	2	0	4.76	22	24
27-Jul	1	0	4.73	22	24
28-Jul	3	0	4.72	21	20
29-Jul	4	1	4.70	19	15
30-Jul	5	5	4.70	19	14
31-Jul	3	0	4.66	20	17
1-Aug	5	4	4.66	17	12
2-Aug	5	18	4.72	16	10
3-Aug	3	4	4.72	16	14
4-Aug	5	16	4.76	16	13
5-Aug	3	2	4.76	19	15
6-Aug	3	0	4.76	18	16
7-Aug	3	0	4.74	18	17
8-Aug	2	0	4.72	20	23
9-Aug	3	0	4.70	19	19
10-Aug	2	0	4.68	20	20
11-Aug	2	0	4.66	20	21
12-Aug	2	0	4.64	20	20
13-Aug	1	0	4.62	20	21
14-Aug	2	0	4.62	22	22
15-Aug	4	0	4.60	21	18
16-Aug	3	5	4.60	20	16
17-Aug	3	1	4.58	20	16
18-Aug	5	8	4.58	19	13
19-Aug	5	18	4.62	18	12
20-Aug	5	20	4.68	18	13
Total		157			
Avg.		3.3	-	18	16
Min.		0.0	4.58	15	10
Max.		20.0	5.05	22	24

* This data reflects water level fluctuations only.

Summary of Cloud Cover - Percent of Days					
	No. Days	Meas. Rain	Overcast	Partly Cloudy	Clear
Adults	47	66%	51%	40%	9%

- 1 = Clear
- 2 = Cloud Cover <50%
- 3 = Cloud Cover >50%
- 4 = Overcast
- 5 = Rain

ND = No Data

Appendix 2. Larson Lake 2012 – Daily Adult Escapement

Date	Sockeye		Coho	Chinook	Pink	Chum	Rainbow	Dolly Varden
	Daily Escapement	Total Return	Daily Escapement	Daily Escapement	Daily Escapement	Daily Escapement	Daily Escapement	Daily Escapement
2-Jul	0	0	0	0	0	0	0	0
3-Jul	0	0	0	0	0	0	0	0
4-Jul	1	1	0	0	0	0	0	0
5-Jul	0	1	0	0	0	0	0	0
6-Jul	0	1	0	0	0	0	0	0
7-Jul	0	1	0	0	0	0	0	0
8-Jul	0	1	0	0	0	0	0	0
9-Jul	0	1	0	0	0	0	0	0
10-Jul	0	1	0	0	0	0	0	0
11-Jul	0	1	0	0	0	0	0	0
12-Jul	0	1	0	0	0	0	0	0
13-Jul	0	1	0	0	0	0	0	0
14-Jul	0	1	0	0	0	0	0	0
15-Jul	0	1	0	0	0	0	0	0
16-Jul	0	1	0	0	0	0	0	0
17-Jul	0	1	0	0	0	0	0	0
18-Jul	0	1	0	0	0	0	0	0
19-Jul	0	1	0	0	0	0	0	0
20-Jul	128	129	0	0	0	0	0	0
21-Jul	775	904	0	0	0	0	0	0
22-Jul	939	1,843	0	0	0	0	0	0
23-Jul	191	2,034	0	0	0	0	0	0
24-Jul	241	2,275	0	0	0	0	0	0
25-Jul	273	2,548	0	0	0	0	0	0
26-Jul	836	3,384	0	0	0	0	0	0
27-Jul	501	3,885	0	0	0	0	0	0
28-Jul	701	4,586	0	0	0	0	0	0
29-Jul	1481	6,067	0	0	0	0	0	0
30-Jul	1380	7,447	0	0	0	0	0	0
31-Jul	860	8,307	0	0	0	0	0	0
1-Aug	2198	10,505	0	0	0	0	0	0
2-Aug	1389	11,894	0	0	0	0	0	0
3-Aug	830	12,724	0	0	0	0	0	0
4-Aug	695	13,419	0	0	0	0	0	0
5-Aug	638	14,057	0	0	0	0	2	0
6-Aug	426	14,483	0	0	0	0	0	0
7-Aug	307	14,790	0	0	0	0	0	0
8-Aug	361	15,151	0	0	0	0	0	0
9-Aug	454	15,605	0	0	0	0	0	0
10-Aug	105	15,710	0	0	1	0	0	0
11-Aug	94	15,804	0	0	0	0	0	0
12-Aug	265	16,069	0	0	3	0	1	0
13-Aug	102	16,171	0	0	0	0	0	0
14-Aug	115	16,286	0	0	0	0	0	0
15-Aug	29	16,315	0	0	0	0	0	0
16-Aug	62	16,377	0	0	2	0	0	0
17-Aug	66	16,443	0	0	1	0	0	0
18-Aug	23	16,466	0	0	1	0	0	0
19-Aug	25	16,491	0	0	0	0	0	0
20-Aug	84	16,575	1	0	5	0	1	0
21-Aug	44	16,619	3	0	4	0	0	0
Total	16,619		4	0	17	0	4	0

Appendix 3. Larson Lake 2012 – Age, Sex and, Length Composition of Sockeye Salmon Escapement

Sampling Period: 2 July - 21 August	1.1	1.2	1.3	2.2	1.4	2.3	Total
Males	80	2,506	2,750	1,335	80	1,052	7,803
Percent	0.48%	15.08%	16.55%	8.03%	0.48%	6.33%	46.95%
Sample Size	2	62	68	33	2	26	193
Mean Lth (mm)	349	499	568	508	595	564	533
Std. Error	21	4	3	5	32	4	2
Females	0	4,650	2,345	1,496	0	324	8,815
Percent	0.00%	27.98%	14.11%	9.00%	0.00%	1.95%	53.04%
Sample Size	-	115	58	37	-	8	218
Mean Lth (mm)	-	488	541	487	-	560	505
Std. Error	-	3	3	4	-	8	2
Both Sexes	80	7,156	5,095	2,830	80	1,376	16,619
Percent	0.48%	43.06%	30.66%	17.03%	0.48%	8.28%	99.99%
Sample Size	2	177	126	70	2	34	411
Mean Lth (mm)	349	492	556	497	595	563	518
Std. Error	21	2	2	3	32	4	1

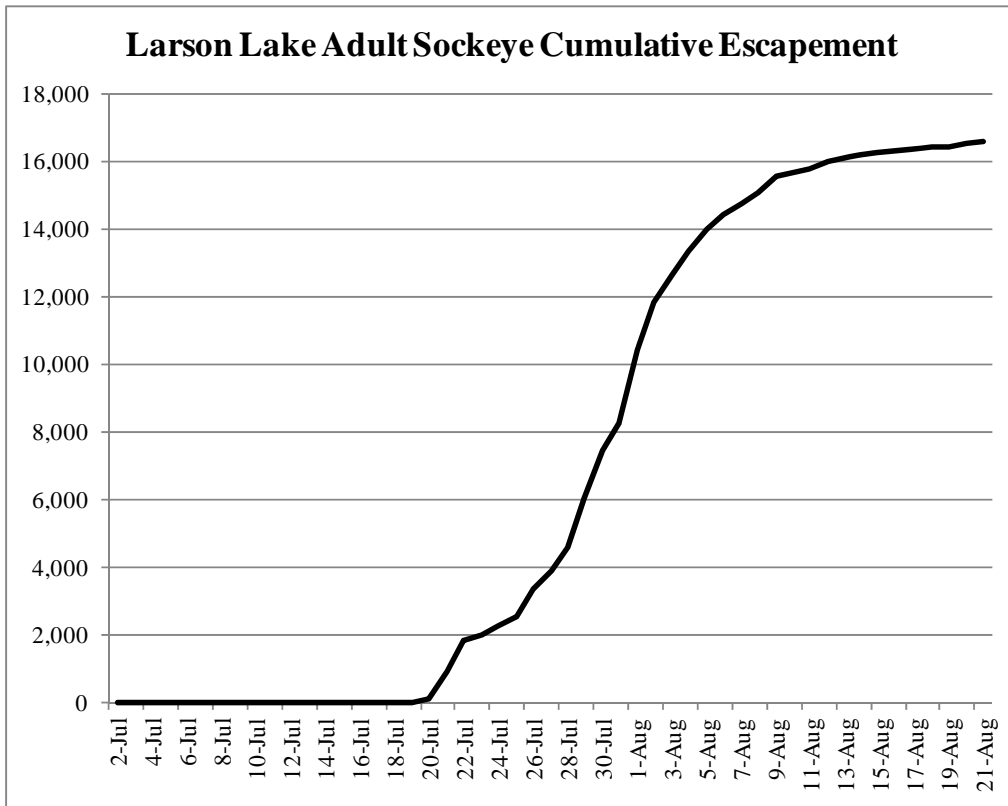
Appendix 4. Larson Lake 2012 – Hourly Adult Sockeye Escapement

Date	AM						PM										AM				
	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	Total Hrs Counted	No. Sockeye Counted
20-Jul	0	0	0	0	0	0	2	6	10	3	9	13	85	0						14	128
21-Jul	0	0	0	0	0	6	8	12	6	22	341	380								12	775
22-Jul	0	0	0	35	52	15	57	40	278	12	32	418								12	939
23-Jul	0	0	0	52	3	23	3	8	5	0	8	0	0	46	43					15	191
24-Jul	0	0	54	15	0	0	13	22	25	0	0	0	0	49	41	0	22			17	241
25-Jul	0	0	48	0	0	0	0	0	0	0	0	0	0	4	0	17	95	109		18	273
26-Jul	0	0	0	98	33	0	67	279	0	20	1	0	92	212	0	0	32			17	834
27-Jul	0	0	74	8	83	42	0	0	0	57	0	0	5	225	0	5	2			17	501
28-Jul	225	0	0	0	18	245	41	6	0	0	159	0	0	7						14	701
29-Jul	0	0	165	0	0	115	260	208	115	0	0	193	0	0	0	178	247			17	1,481
30-Jul	0	0	0	136	0	193	121	0	258	0	220	0	179	0	51	94	0	128		18	1,380
31-Jul	0	0	0	111	59	163	5	219	93	29	71	0	0	0	0	0	97	13		18	860
1-Aug	0	0	184	0	189	0	139	286	119	311	22	355	530	3	0	0	60			17	2,198
2-Aug	0	0	0	85	0	0	5	454	207	145	2	0	77	43	0	371				16	1,389
3-Aug	62			43	23	106	260	0	100	0	73	163	0	0	0					13	830
4-Aug	18	0	0	2	0	49	0	273	3	47	91	212	0	0	0	0				16	695
5-Aug	0	0	0	0	0	99	89	130	77	54	0	0	0	89	0	75	25			17	638
6-Aug	0	0	0	0	0	46	50	4	44	0	107	46	0	60	0	29	0	40		18	426
7-Aug	0	0	0	40	10	0	0	140	57	0	4	26	0	0	0	0	30			18	307
8-Aug	0	0	33	17	0	69	8	60	57	0	44	0	2	21	25	0	0	25		18	361
9-Aug	0	0	15	45	126	7	60	35	29	41	33	2	60	1	0	0	0	0	0	19	454
10-Aug	0	0	0	0	7	17	0	36	8	27	0	0	0	5	0	5	0			17	105
11-Aug	0	0	0	0	0	34	0	12	0	0	0	21	0	0	0	0	27	0		18	94
12-Aug	0	0	26	23	34	16	0	8	40	2	43	35	4	0	10	0	24			17	265
13-Aug	0	0	0	12	0	0	0	8	0	0	0	0	56	0	0	0	26	0		18	102
14-Aug	0	0	27	6	18	22	0	0	0	2	0	0	12	0	17	0	11			17	115
15-Aug	0	0	0	0	0	0	4	0	0	0	0	0	0	21	0	4	0	0		18	29
16-Aug	0	0	21	5	0	0	0	0	0	0	29	0	0	0	0	0	7	0		18	62
17-Aug	0	0	0	0	9	0	0	4	0	0	22	0	0	0	0	0	31	0		18	66
18-Aug	0	0	0	0	0	1	0	0	7	0	0	15	0	0	0	0	0	0		18	23
19-Aug	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	22	0		18	25
20-Aug	0	0	0	0	0	0	0	0	16	0	2	19	12	26	0	0	9	0		18	84
21-Aug	0	0	9	7	0	28														6	44

Appendix 5. Larson Lake 2012 – Update

Misc. Activities		
Ice-out:	NA	(approximate date)
Adult Crew On-site:	2-Jul	
Adult Crew Off-site:	21-Aug	

Adult Migration		
Dates:	2-Jul to	21-Aug
	No.	%
Sockeyes:	16,557	100
Mortalities:	0	
Major Age Classes		
Age 1.1:	79	0.48%
Age 1.2:	7,129	43.06%
Age 1.3:	5,076	30.66%
Age 2.2:	2,820	17.03%
Age 1.4:	79	0.48%
Age 2.3:	1,371	8.28%
Coho:	4	
King:	0	
Pink:	17	
Chum:	0	
Rainbow:	4	
Dolly Varden	0	



Appendix 6. Larson Lake 2012 – Historical Adult Sockeye Salmon Escapement

Date	1984	1985	1986	1987	1997	1998	1999	2000	2005	2006	2007	2008	2009	2010	2011	2012
15-Jun	ND	ND	ND	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
16-Jun	ND	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
17-Jun	ND	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
18-Jun	ND	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
19-Jun	ND	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
20-Jun	ND	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
21-Jun	ND	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
22-Jun	ND	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
23-Jun	ND	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
24-Jun	ND	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
25-Jun	ND	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
26-Jun	ND	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
27-Jun	ND	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	ND	4	ND	ND	ND
28-Jun	ND	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	ND	4	ND	ND	ND
29-Jun	ND	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	ND	4	ND	ND	ND
30-Jun	ND	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	ND	4	ND	ND	ND
1-Jul	1	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	0	4	ND	ND	ND
2-Jul	0	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	125	4	ND	ND	0
3-Jul	0	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	125	4	0	ND	0
4-Jul	0	ND	ND	0	ND	ND	ND	ND	ND	ND	ND	125	4	0	ND	1
5-Jul	0	ND	ND	0	ND	ND	ND	ND	ND	ND	0	186	6	0	ND	1
6-Jul	0	ND	ND	0	ND	ND	ND	ND	ND	ND	1	186	6	0	ND	1
7-Jul	0	ND	ND	5	ND	ND	ND	ND	ND	ND	1	210	6	0	ND	1
8-Jul	0	ND	ND	0	ND	ND	ND	ND	ND	ND	4	210	6	0	ND	1
9-Jul	0	ND	ND	0	ND	ND	ND	ND	ND	ND	5	210	19	0	ND	1
10-Jul	0	ND	ND	0	ND	ND	ND	ND	ND	ND	5	212	25	0	ND	1
11-Jul	1	ND	ND	0	ND	ND	ND	ND	ND	ND	5	212	25	0	ND	1
12-Jul	0	ND	ND	0	ND	ND	ND	ND	ND	ND	7	212	25	0	ND	1
13-Jul	0	ND	ND	0	ND	ND	ND	ND	ND	ND	7	213	25	0	ND	1
14-Jul	0	0	ND	0	ND	ND	ND	ND	ND	3	7	215	42	0	ND	1
15-Jul	0	40	ND	0	0	0	0	0	ND	3	7	218	286	3	ND	1
16-Jul	1	59	ND	0	0	0	0	0	0	3	8	219	287	14	ND	1
17-Jul	1	64	ND	0	0	0	0	0	0	3	8	219	287	14	0	1
18-Jul	1	116	ND	0	0	0	0	0	160	3	26	226	374	24	0	1
19-Jul	2	143	ND	1	0	0	0	0	164	3	28	281	1,146	24	40	1
20-Jul	24	143	ND	12	0	486	0	0	330	3	42	1,389	3,063	45	72	129
21-Jul	755	234	0	18	495	497	0	140	330	4	89	2,724	4,942	54	72	904
22-Jul	2,398	265	39	90	663	970	0	1,021	427	10	234	5,131	8,065	79	148	1,843
23-Jul	5,686	265	39	135	687	2,180	0	3,360	430	127	496	8,942	10,222	1,152	730	2,032
24-Jul	9,653	265	40	482	1,082	5,530	3	5,144	745	411	1,164	11,060	13,901	1,470	2,166	2,263
25-Jul	14,233	414	96	1,732	1,931	10,518	735	6,656	1,045	1,925	2,121	14,603	16,655	2,838	3,797	2,536

Appendix 6 (continued). Larson Lake 2012 – Historical Adult Sockeye Salmon Escapement

Date	1984	1985	1986	1987	1997	1998	1999	2000	2005	2006	2007	2008	2009	2010	2011	2012
26-Jul	16,082	414	154	3,672	1,954	15,157	1,607	7,626	1,547	2,978	3,047	16,429	19,568	4,448	4,232	3,372
27-Jul	18,281	444	256	4,317	3,212	17,945	1,696	8,473	1,958	3,626	6,090	18,389	22,254	5,666	5,203	3,873
28-Jul	19,652	3,815	3,163	4,703	5,371	20,696	2,919	9,173	2,343	6,587	9,095	22,200	23,845	6,389	6,615	4,574
29-Jul	22,495	10,010	6,350	4,950	6,553	21,447	3,300	9,327	2,467	8,167	11,076	25,293	25,471	8,165	7,158	6,055
30-Jul	24,544	13,208	10,274	5,530	8,250	26,660	3,895	9,648	2,619	9,982	13,671	26,259	26,363	9,398	7,354	7,435
31-Jul	26,944	17,186	14,005	6,735	9,561	31,448	4,071	10,227	3,197	15,972	14,822	26,652	26,981	10,746	7,757	8,245
1-Aug	28,538	20,987	18,033	7,329	9,959	34,376	4,783	10,466	4,096	21,624	16,114	26,859	27,617	11,655	8,186	10,443
2-Aug	30,124	24,961	20,533	9,107	10,385	35,372	5,346	10,775	4,798	24,826	18,499	27,500	27,745	12,647	8,543	11,832
3-Aug	31,639	28,487	23,463	9,809	10,828	40,295	6,600	10,958	5,308	28,964	20,600	28,286	27,819	13,389	9,044	12,662
4-Aug	32,567	30,982	25,518	9,856	12,004	43,553	8,439	11,086	5,521	35,328	23,612	28,799	29,240	13,881	9,328	13,357
5-Aug	33,235	32,592	26,748	10,403	13,763	45,332	9,363	11,192	5,936	38,849	26,846	29,667	30,069	14,403	9,812	13,995
6-Aug	33,681	33,694	28,251	11,353	14,898	47,341	11,594	11,255	6,247	42,331	27,883	30,252	30,673	14,556	10,049	14,421
7-Aug	34,021	34,431	29,401	12,500	15,925	50,642	12,808	11,286	6,767	46,081	28,451	30,853	31,553	14,593	10,426	14,728
8-Aug	34,268	35,012	30,315	13,281	16,737	53,581	14,302	11,385	7,317	50,574	30,061	31,099	33,292	15,300	10,667	15,089
9-Aug	34,473	35,429	30,903	13,873	17,818	55,849	15,111	11,428	7,506	52,210	32,594	31,482	35,068	15,947	10,802	15,543
10-Aug	34,598	35,647	31,206	14,042	19,008	57,457	15,698	11,581	7,900	53,579	33,473	32,272	35,630	16,456	10,889	15,648
11-Aug	34,748	35,976	31,423	14,237	20,091	58,937	15,992	11,642	8,108	54,519	35,595	32,886	36,137	16,986	10,952	15,742
12-Aug	34,865	36,242	31,602	14,501	21,370	59,361	16,417	11,712	8,174	55,576	37,290	33,238	37,764	17,273	11,270	16,007
13-Aug	34,984	36,363	31,704	15,336	21,771	60,696	16,569	11,769	8,381	56,411	39,018	33,464	37,808	17,728	11,513	16,109
14-Aug	35,083	36,497	31,820	15,515	22,071	61,378	16,634	11,811	8,569	56,737	40,905	33,644	39,112	18,209	11,815	16,224
15-Aug	35,164	36,603	31,928	15,538	22,630	61,975	17,042	11,822	8,818	57,176	41,786	33,714	39,164	18,455	11,908	16,253
16-Aug	35,204	36,717	32,015	15,656	22,907	62,417	17,285	11,858	8,890	57,347	42,850	34,185	39,204	18,663	12,016	16,315
17-Aug	35,212	36,913	32,078	16,250	23,171	62,512	17,429	11,937	9,030	57,411	44,040	34,339	39,226	18,925	12,116	16,381
18-Aug	35,239	37,087	32,135	16,409	23,768	62,769	17,748	11,987	9,120	57,411	44,742	34,359	39,846	19,024	12,160	16,404
19-Aug	35,254	37,251	32,182	16,554	24,732	62,928	17,915	11,987	9,334	ND	46,006	34,396	40,142	19,033	12,163	16,429
20-Aug	ND	37,377	32,225	16,674	25,731	63,144	18,109	11,987	9,641	ND	46,781	34,476	40,206	19,197	12,165	16,513
21-Aug	ND	37,459	32,243	16,705	26,343	63,274	18,147	11,987	9,806	ND	46,906	34,477	40,281	19,301	12,165	16,557
22-Aug	ND	37,562	32,286	16,731	27,847	63,369	18,301	11,987	9,955	ND	47,102	34,477	40,408	19,452	12,189	ND
23-Aug	ND	37,629	32,305	16,748	28,300	63,514	18,557	11,987	ND	ND	47,257	34,512	40,431	19,605	12,181	ND
24-Aug	ND	37,708	32,317	ND	29,411	ND	18,690	11,987	ND	ND	47,440	34,531	40,543	19,740	12,196	ND
25-Aug	ND	37,759	32,322	ND	31,413	ND	18,811	11,987	ND	ND	47,570	34,555	40,592	19,808	12,196	ND
26-Aug	ND	37,832	ND	ND	33,004	ND	18,943	11,987	ND	ND	47,668	34,571	40,619	19,985	12,196	ND
27-Aug	ND	37,861	ND	ND	34,571	ND	ND	11,987	ND	ND	47,794	34,591	40,696	20,016	12,199	ND
28-Aug	ND	37,874	ND	ND	35,862	ND	ND	11,987	ND	ND	47,868	34,595	40,722	20,059	12,196	ND
29-Aug	ND	ND	ND	ND	37,027	ND	ND	11,987	ND	ND	47,924	ND	40,773	20,155	12,197	ND
30-Aug	ND	ND	ND	ND	37,786	ND	ND	11,987	ND	ND	ND	ND	40,820	20,240	12,197	ND
31-Aug	ND	ND	ND	ND	38,303	ND	ND	11,987	ND	ND	ND	ND	40,857	20,276	12,225	ND
1-Sep	ND	ND	ND	ND	38,607	ND	ND	11,987	ND	ND	ND	ND	40,861	20,315	12,225	ND
2-Sep	ND	ND	ND	ND	38,804	ND	ND	11,987	ND	ND	ND	ND	40,868	20,324	12,225	ND
3-Sep	ND	ND	ND	ND	38,944	ND	ND	11,987	ND	ND	ND	ND	40,888	ND	ND	ND
4-Sep	ND	ND	ND	ND	39,145	ND	ND	11,987	ND	ND	ND	ND	40,895	ND	ND	ND
5-Sep	ND	ND	ND	ND	39,427	ND	ND	11,987	ND	ND	ND	ND	40,898	ND	ND	ND
6-Sep	ND	ND	ND	ND	39,728	ND	ND	11,987	ND	ND	ND	ND	40,915	ND	ND	ND
7-Sep	ND	ND	ND	ND	39,816	ND	ND	11,987	ND	ND	ND	ND	40,919	ND	ND	ND
8-Sep	ND	ND	ND	ND	40,056	ND	ND	11,987	ND	ND	ND	ND	40,930	ND	ND	ND
9-Sep	ND	ND	ND	ND	40,130	ND	ND	11,987	ND	ND	ND	ND	ND	ND	ND	ND
10-Sep	ND	ND	ND	ND	40,163	ND	ND	11,987	ND	ND	ND	ND	ND	ND	ND	ND
11-Sep	ND	ND	ND	ND	40,211	ND	ND	11,987	ND	ND	ND	ND	ND	ND	ND	ND
12-Sep	ND	ND	ND	ND	40,255	ND	ND	11,987	ND	ND	ND	ND	ND	ND	ND	ND
13-Sep	ND	ND	ND	ND	40,282	ND	ND	11,987	ND	ND	ND	ND	ND	ND	ND	ND

ND = No Data