Fishery Management Report No. 11-50

Pasagshak River Weir Report, 2011

by

Mark J. Witteveen

October 2011

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

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

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)

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

A fish counting weir was installed in the Pasagshak River during 2011 by Alaska Department of Fish and Game to enumerate sockeye salmon *Oncorhynchus nerka* escapement into Lake Rose Teed. Escapement was enumerated through a conventional wood tripod and aluminum panel weir daily from June 9 through August 15. The total estimated sockeye salmon escapement was 13,402 fish with peak passage occurring during late June and early July. Additionally, 113 pink salmon *O. gorbuscha,* and 25 chum salmon *O. keta* were counted through the weir. Sockeye salmon were sampled for age, sex, and length from a trap built onto the weir and from the subsistence gillnet harvest. The average length of Pasagshak River sockeye salmon was 557 mm and the dominant age class was age 0.3 comprising 41.6 percent of the run. The Pasagshak River sockeye salmon run consisted of approximately 45% females and 55% males.

Key words: sockeye salmon, *Oncorhynchus nerka*, ASL, subsistence, Pasagshak River, Lake Rose Teed.

INTRODUCTION

Pasagshak River, located on the Kodiak road system (Figures 1 and 2), has recently supported the largest sockeye salmon *Oncorhynchus nerka* subsistence fishery for Kodiak Island residents (unpublished data from J. Shaker, Fish and Wildlife Technician III, ADF&G, Kodiak; Figures 3 and 4). During the past decade, subsistence harvest of Pasagshak River sockeye salmon has increased disproportionate to escapement. Previous escapement enumeration methodology provided only post-season estimates via aerial and foot surveys of the spawning grounds, making inseason subsistence and sport fisheries management impossible and refinement of an escapement goal for this stock problematic. A conventional wood tripod and aluminum picket weir was constructed near the outlet of the lake by the Alaska Department of Fish and Game (ADF&G) in 2011 to provide timely and accurate escapement information to help maintain the sustainability of this important subsistence and recreational salmon run.

The Pasagshak River is located on the northeast side of Kodiak Island and is accessible by car from the city of Kodiak (Figure 1). Lake Rose Teed (formerly spelled Rose Tead), which drains into the Pasagshak River, is a small, shallow lake (0.94 km^2; 2.1 m average depth). Prior to the 1964 earthquake and subsequent tsunami, Lake Rose Teed had little salmon rearing habitat; however, the earthquake lowered the elevation of the lake, allowing nutrient rich marine water to enter the lake during high-tide cycles, dramatically increasing the salmon rearing potential (Murray 1986). Pasagshak River State Recreational Site is the only designated park land outside of the immediate city area but still within the road system (Figure 2). The mouth of the Pasagshak River is also a prehistoric native settlement site (personal communication, P. Saltonstall, Alutiiq Museum).

Since 1968, Pasagshak River salmon escapement had been estimated post-season using both aerial and foot surveys of the spawning grounds. Although annual survey counts have been highly variable, sockeye salmon production has generally increased since that time (Figure 3). The current escapement goal for Pasagshak River sockeye salmon is a lower-bound sustainable escapement goal of 3,000 fish (Nemeth et al. 2010). Because surveys took place on the spawning grounds, estimates of the escapement were not made until well after the fish escaped the subsistence, sport, and commercial fisheries. Since escapement estimates were not made inseason, no management action to regulate harvests was possible and overharvest could have occurred but not have been detected until any action was too late.

Subsistence harvest of this salmon stock has been increasing since subsistence records were initiated in 1986. During 2008 and 2009 (and likely in 2010), the Pasagshak River was the

largest subsistence salmon fishery in the Kodiak Management Area (Figure 4; unpublished data from J. Shaker, Fish and Wildlife Technician III, ADF&G, Kodiak). During recent years, two other significant sockeye salmon runs near the City of Kodiak, Afognak and Buskin lakes, have experienced significant reductions in run size, restricted fishing opportunities, and total subsistence fishing closures in some years (Baer et al. 2009; Dinnocenzo et al. 2009; Jackson et al. 2010). Such restrictions on those stocks can displace users to other systems (Magdanz et al. 2003), leading to concern that Pasagshak River sockeye salmon will incur increased harvest pressure while ADF&G is unable to monitor escapement inseason.

Timely inseason estimates of Pasagshak River sockeye salmon escapement were made during 2011 through installation of a weir near the outlet of Lake Rose Teed. Age, sex, and length (ASL) data was also collected with a trap attached to the front of the weir.

In addition to the installation and annual operation of the escapement monitoring weir, important information on subsistence effort at the Pasagshak River was obtained through harvester interviews conducted by ADF&G technicians. ASL data obtained from subsistence harvests augmented ASL data obtained from the weir trap, and provided valuable information on the harvest composition, size selectivity, and magnitude relative to escapement.

METHODS

The Pasagshak River weir was installed and fish tight on June 9, 2011, approximately 1 km downstream of the outlet of Lake Rose Teed, and escapement was enumerated through August 15. The gate to allow fish passage was opened daily, approximately every two to three hours between 7:00 AM and 10:00 PM. All species including sockeye, pink *O. gorbuscha*, chum salmon *O. keta*, and Dolly Varden *Salvelinus malma* were enumerated.

During the high tidal cycles (with higher high tides of about 9.3 ft), a strong upstream current took place at the weir location. As a result, some panels were shifted forward causing a small number of fish to escape. Estimates of uncounted fish were made based on the number of fish observed behind the weir before and after the breaches. Metal strapping was bolted across the front of the weir to alleviate this problem before significant numbers of fish began passing the weir in late June and early July.

ASL sampling from sockeye salmon caught in the fish trap was conducted with a weekly goal of 240 fish. Ideally 80 fish were sampled on Wednesday, Friday, and Monday of each statistical week. All scales, when possible, were collected from the preferred area of each fish following procedures outlined by the International North Pacific Fisheries Commission (INPFC 1963). The "preferred scale" (located on the left side of the fish, two rows above the lateral line on the diagonal from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin) was removed with forceps and mounted on a scale "gum" card. The sex and length of the fish (fish length in millimeters from mid eye to tail fork [METF]) was recorded to rugged digital assistants and the data was downloaded to laptop computers daily.

All scales collected were mounted on scale cards and impressions were made on cellulose acetate (Clutter and Whitesel 1956). Fish ages were assigned by examining scale impressions for annual growth increments using a microfiche reader fitted with a 48X lens following designation criteria established by Mosher (1968). Ages were entered directly into the salmon database using European notation (Koo 1962) where a decimal separates the number of winters spent in fresh water (after emergence) from the number of winters spent in salt water.

Peak subsistence effort (number of boats) was estimated daily. Subsistence fishermen were interviewed approximately three times per week and ASL samples of their catch were taken. ADF&G technicians opportunistically contacted sockeye salmon subsistence fishermen on the fishing grounds in front of the Pasagshak River or at Pasagshak State Recreation Area boat landing. Following a set of brief introductory remarks by the technician, all subsistence users who agreed to be interviewed were asked a short series of questions to determine their level of effort at Pasagshak River (Appendix A). An effort was made to conduct interviews in a weekly quantity proportional to subsistence effort.

RESULTS

The total sockeye salmon escapement through the Pasagshak River weir was 12,745 fish. This total included 79 jacks, which were sockeye salmon 400 mm or less in METF (Table 1). In addition 113 pink salmon, and 25 chum salmon (Table 1) passed through the weir. The only in-river estimated count occurred on June 13 when 150 sockeye salmon were observed upstream of the weir after a night where a high tide cycle broke weir panels loose. The daily sockeye salmon escapement peaked in early July although strong escapement continued into August (Figures 5 and 6). Large pulses of daily passage seemed to occur in conjunction with increasing tidal cycles (Figure 5) and sockeye salmon were often observed holding in various portions of the river for several days before they approached and passed through the weir.

Fish passage averaged over 100 fish per day during the last 3 days of weir operation, so a post weir estimate was calculated. Examination of the timing of nearby Saltery River sockeye salmon (Unpublished memo, Foster, M. B. 2004. Saltery Lake Weir. Alaska Department of Fish and Game, Kodiak) revealed that Pasagshak River sockeye salmon have very similar timing and by August 15, 95.1% of the run had escaped. Applying that percentage to the 2011 Pasagshak River sockeye salmon escapement results in a post weir estimate of 657 fish and total season escapement estimate of 13,402 fish.

The dominant age of Pasagshak River sockeye salmon collected at the weir trap was age-0.3 fish which composed about 41.6 percent of the run (Table 2). Temporally, age-0.3 fish dominated the run during the beginning of the season (63.6%), but dropped to about 16% by the end of the season with age-1.2 fish increasing from about 9% to 64%. Age-0.2, -1.1, -1.3, and -2.3 fish were also present.

The age of fish collected from the subsistence fishery was similar to the escapement ages with age-0.3 fish dominating the catch with 51.4%. Since most of the sampling was concentrated at the beginning of the run, the increasing proportion of age-1.2 fish was not observed (Table 3).

Pasagshak River sockeye salmon were large compared to other Kodiak Management Area sockeye salmon with an average length of 551 mm METF from the escapement samples and an average length of 557 mm METF from the subsistence samples (Tables 4 and 5).

Subsistence effort levels remained fairly consistent during late June through mid July with effort tapering off after mid July (Figure 7). It was difficult to obtain significant amounts of subsistence harvest for sampling since most fishermen cleaned fish as they were caught, two to three at a time. Only 179 fish were sampled the whole season. As a result, the number of ASL samples collected is not indicative of the number of fish harvested. To more effectively sample larger numbers of fish, technicians would have to spend larger portions of time at the areas that subsistence fishermen come to shore which would detract from the time they spend counting fish

through the weir. The gear used was consistently 5-1/4" stretched mesh gillnet, which is typical of that used to target sockeye salmon.

DISCUSSION

Passage of sockeye salmon through the Pasagshak River occurred primarily during late June through July, later than most Kodiak area early sockeye salmon runs but earlier than most late sockeye salmon runs (Foster 2011). Daily escapement seemed to be heavily dependent on tidal cycle (Figure 5) with an observed buildup in the lower river and fish passage peaking on increasing high tides.

Age composition of Pasagshak River fish was primarily age-1.2 and -0.3 fish. The high proportion of age-0.3 fish is not typical of most Kodiak area sockeye salmon systems (Foster 2011). Locations that age-0.3 fish are typically found are similar to the Pasagshak system with a significant estuarine environment, areas with significant marine nutrient input, or protected marine rearing environments such as Cinder and Ilnik rivers and Upper Station (Foster 2011; Moore 2011).

Subsistence harvest effort remained relatively consistent throughout the season. While subsistence harvest records are not available until later in the season, anecdotal information collected from Pasagshak area residents suggest effort was significantly reduced from recent years. This is likely due to large runs at Buskin and Afognak rivers and Settler's Cove that may have dispersed a lot of the Kodiak area subsistence harvest compared to recent years. The similarity in size and age between the weir ASL samples and the catch ASL samples suggest very little selectivity is occurring in the subsistence fishery and that the bulk of the subsistence harvest is bound for Pasagshak River.

Pasagshak River sockeye salmon are very large compared with most Kodiak area fish (Foster 2011) and could be the largest sockeye salmon on Kodiak Island.

ACKNOWLEDGEMENTS

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TABLES AND FIGURES

Table 1.–Daily and cumulative counts of salmon passage through the Pasagshak River weir, 2011.

	Number of Salmon						
Date	Sockeye Adults	Sockeye Jacks	Sockeye Cumulative	Pink	Pink Cumulative	Chum	Chum Cumulative
13-Jun	150	0	150	0	0	0	0
14-Jun	1	0	151	0	0	0	0
15-Jun	0	0	151	0	0	0	0
16-Jun	1	0	152	0	0	0	0
17-Jun	0	0	152	0	0	0	0
18-Jun	7	0	159	0	0	0	0
19-Jun	0	0	159	0	0	0	0
20-Jun	0	0	159	0	0	0	0
21-Jun	12	1	172	0	0	0	0
22-Jun	5	0	177	0	0	0	0
23-Jun	42	0	219	0	0	0	0
24-Jun	0	0	219	0	0	0	0
25-Jun	1	0	220	0	0	0	0
26-Jun	8	0	228	0	0	0	0
27-Jun	2	0	230	0	0	0	0
28-Jun	1,379	6	1,615	0	0	0	0
29-Jun	554	2	2,171	0	0	0	0
30-Jun	229	2	2,402	0	0	0	0
1-Jul	77	2	2,481	0	0	0	0
2-Jul	331	16	2,828	0	0	0	0
3-Jul	118	1	2,947	0	0	0	0
4-Jul	180	3	3,130	0	0	0	0
5-Jul	163	2	3,295	0	0	0	0
6-Jul	10	0	3,305	0	0	0	0
7-Jul	46	1	3,352	0	0	0	0
8-Jul	40	2	3,394	0	0	0	0
9-Jul	600	5	3,999	0	0	1	1
10-Jul	442	0	4,441	0	0	0	1
11-Jul	54	0	4,495	0	0	0	1
12-Jul	1,723	1	6,219	0	0	3	4
13-Jul	244	1	6,464	0	0	2	6
14-Jul	442	2	6,908	0	0	0	6
15-Jul	350	9	7,267	0	0	1	7
16-Jul	125	0	7,392	0	0	0	7
17-Jul	320	0	7,712	0	0	0	7
18-Jul	446	1	8,159	0	0	0	7
19-Jul	64	0	8,223	0	0	0	7
20-Jul	100	0	8,323	0	0	0	7
21-Jul	16	0	8,339	0	0	0	7
22-Jul	0	0	8,339	0	0	0	7
23-Jul	45	0	8,384	0	0	0	7
24-Jul	39	0	8,423	0	0	0	7
25-Jul	152	0	8,575	0	0	0	7
26-Jul	314	0	8,889	0	0	0	7
27-Jul	137	0	9,026	0	0	0	7
28-Jul	887	2	9,915	0	0	0	7
29-Jul	229	0	10,144	0	0	1	8
30-Jul	1,006	0	11,150	3	3	2	10
31-Jul	3	0	11,153	0	3	0	10

-continued-

Table 1.–Page 2 of 2.

	Number of Salmon						
Date	Sockeye Adults	Sockeye Jacks	Sockeye Cumulative	Pink	Pink Cumulative	Chum	Chum Cumulative
1-Aug	74	0	11,227	2	5	0	10
2-Aug	173	0	11,400	0	5	0	10
3-Aug	286	4	11,690	0	5	0	10
4-Aug	0	0	11,690	0	5	0	10
5-Aug	30	0	11,720	1	6	0	10
6-Aug	141	1	11,862	1	7	1	11
7-Aug	33	2	11,897	0	7	1	12
8-Aug	57	0	11,954	0	7	0	12
9-Aug	283	4	12,241	10	17	2	14
10-Aug	47	0	12,288	3	20	3	17
11-Aug	68	2	12,358	2	22	2	19
12-Aug	88	2	12,448	8	30	1	20
13-Aug	103	2	12,553	10	40	2	22
14-Aug	78	1	12,632	27	67	0	22
15-Aug	111	2	12,745	46	113	3	25
Total	12,666	79	12,745		113		25
Post Weir Estimate	653	4	657				
Season Estimate	13,319	83	13,402				

Note: Sockeye salmon jacks were fish less than or equal to 400 mm METF.

Table 2.–Age composition of Pasagshak River sockeye salmon interpolated to escapement, 2011.

Stat	Week	Sample Size		Ages 0.2	0.3	1.1	1.2	1.3	2.2	2.3	
24	6/7-6/13	0	Percent	0.0	63.6	0.0	9.1	27.3	0.0	0.0	100.0
			Numbers	0	95	0	14	41	0	0	150
25	6/14-6/20	0	Percent	0.0	63.6	0.0	9.1	27.3	0.0	0.0	100
			Numbers	0	6	0	1	2	0	0	9
26	6/21-6/27	0	Percent	0.0	63.6	0.0	9.1	27.3	0.0	0.0	100
			Numbers	0	45	0	6	19	0	0	71
27	6/28-7/4	11	Percent	0.6	60.9	0.0	13.1	24.8	0.0	0.6	100
			Numbers	9	1,806	0	322	755	0	9	2,900
28	7/5-7/11	138	Percent	2.0	53.8	0.0	21.9	20.5	0.0	1.8	100
			Numbers	30	725	0	314	270	0	27	1,365
29	7/12-7/18	142	Percent	3.7	39.1	0.0	25.2	31.2	0.0	0.8	100
			Numbers	127	1,520	0	901	1,077	0	39	3,664
30	7/19-7/25	118	Percent	2.1	33.2	0.0	41.8	22.7	0.0	0.1	100
			Numbers	9	138	0	175	93	0	1	416
31	7/26-8/1	189	Percent	1.3	30.6	0.5	48.6	18.6	0.4	0.0	100
			Numbers	38	830	9	1,285	478	12	0	2,652
32	8/2-8/8	63	Percent	0.4	21.1	2.5	52.4	23.4	0.2	0.1	100
			Numbers	3	162	17	376	167	1	0	727
33	8/9-8/15	61	Percent	1.3	16.9	0.6	61.6	16.9	1.3	1.3	100
			Numbers	9	135	7	481	140	9	9	791
34	8/16-8/22	0	Percent	1.6	16.4	0.0	63.9	14.8	1.6	1.6	100
			Numbers	11	108	0	420	97	11	11	657
Totals		722	Percent	1.8	41.6	0.2	32.0	23.4	0.3	0.7	100
			Numbers	236	5,570	33	4,294	3,140	34	95	13,402

Table 3.–Age composition of Pasagshak Bay subsistence sockeye salmon catch, 2011.

Stat Week		Ages						Total
		0.2	0.3	1.2	1.3	2.2	2.3	
26 (Jun 21 - Jun 27)	Number	1	34	5	11	0	0	51
	Percent	2.0	66.7	9.8	21.6	0.0	0.0	
27 (Jun 28 - Jul 04)	Number	0	30	12	9	0	0	51
	Percent	0.0	58.8	23.5	17.6	0.0	0.0	
29 (Jul 12 - Jul 18)	Number	0	28	13	33	1	2	77
	Percent	0.0	36.4	16.9	42.9	1.3	2.6	
Total:	Number	1	92	30	53	1	2	179
	Percent	0.6	51.4	16.8	29.6	0.6	1.1	

Table 4.–Age, sex, and length (mm) composition of Pasagshak River sockeye salmon escapement, 2011.

	Ages							Total
	0.2	0.3	1.1	1.2	1.3	2.2	2.3	
Mean Length Females	492	558	0	513	554	513	590	536
Standard Error Females	5.83	1.78	0	1.54	2.46	0	0	1.9
Range Females	451-528	492-602		424-560	445-600	513-513	590-590	424-602
Sample Size Females	11	124	0	171	89	1	1	397
Mean Length Males	575	590	352	540	589	423	581	571
Standard Error Males	20.9	1.68	17.5	2.45	2.9	0	12.15	2.11
Range Males	524-615	545-636	334-369	438-587	490-641	423-423	548-603	334-641
Sample Size Males	4	131	2	110	70	1	4	322
Mean Length	514	574	352	524	570	468	583	551
Standard Error	11.83	1.58	17.5	1.56	2.33	45	9.58	1.43
Range	451-615	492-636	334-369	424-587	445-641	423-513	548-603	334-641
Sample Size	15	255	2	281	159	2	5	719

Table 5.–Age, sex, and length (mm) composition of Pasagshak Bay sockeye salmon catch, 2011.

	Ages						
	0.2	0.3	1.2	1.3	2.2	2.3	Total
Mean Length Females	0	549	510	557	0	564	545
Standard Error Females	0	3.28	5	3.44	0	0	2.72
Range Females		452-584	474-542	515-589		564-564	452-589
Sample Size Females	0	50	14	27	0	1	92
Mean Length Males	510	579	537	582	540	583	571
Standard Error Males	0	2.6	5.03	4.21	0	0	2.82
Range Males	510-510	552-617	508-571	524-612	540-540	583-583	508-617
Sample Size Males	1	41	16	26	1	1	86
Mean Length	510	562	524	569	540	574	557
Standard Error	0	2.65	4.29	3.22	0	9.5	2.16
Range	510-510	452-617	474-571	515-612	540-540	564-583	452-617
Sample Size	1	92	30	53	1	2	179

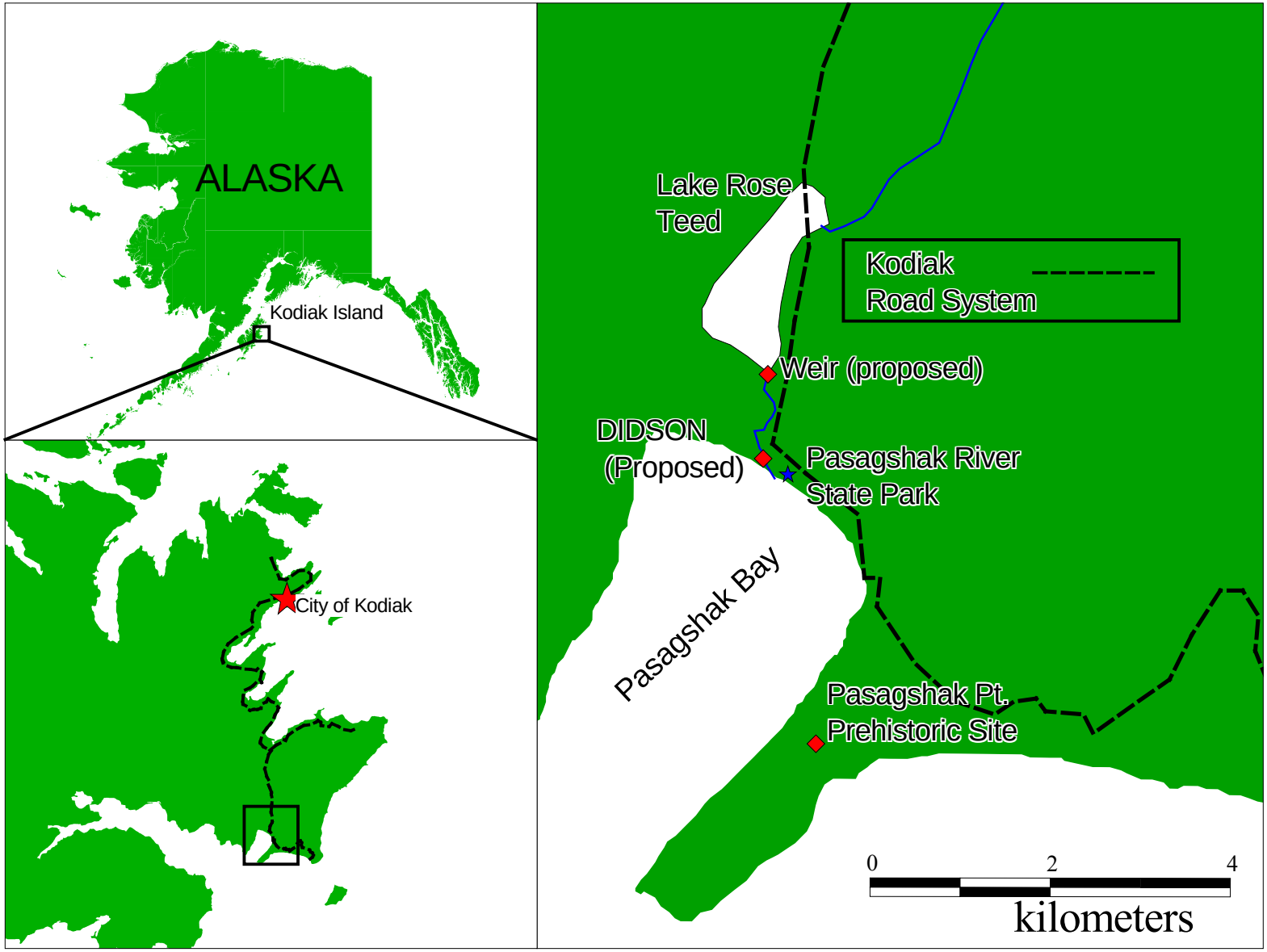

Figure 1.–Map depicting Pasagshak Bay and Lake Rose Teed area on the Kodiak road system.

Figure 2.–Aerial view of Pasagshak River State Recreation Area.

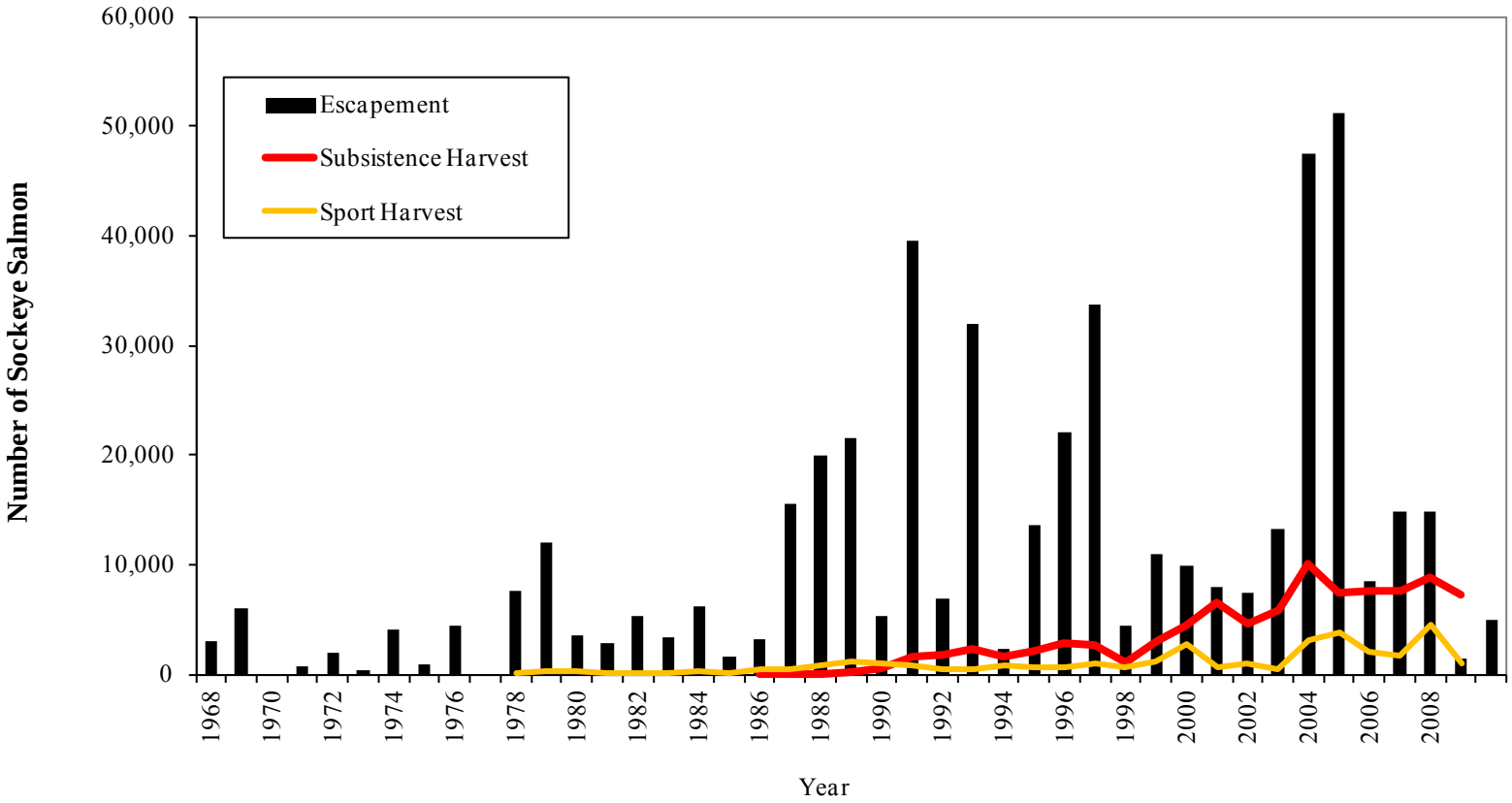

Figure 3.–Historical estimated sockeye salmon escapement and sport and subsistence harvest at Pasagshak River.

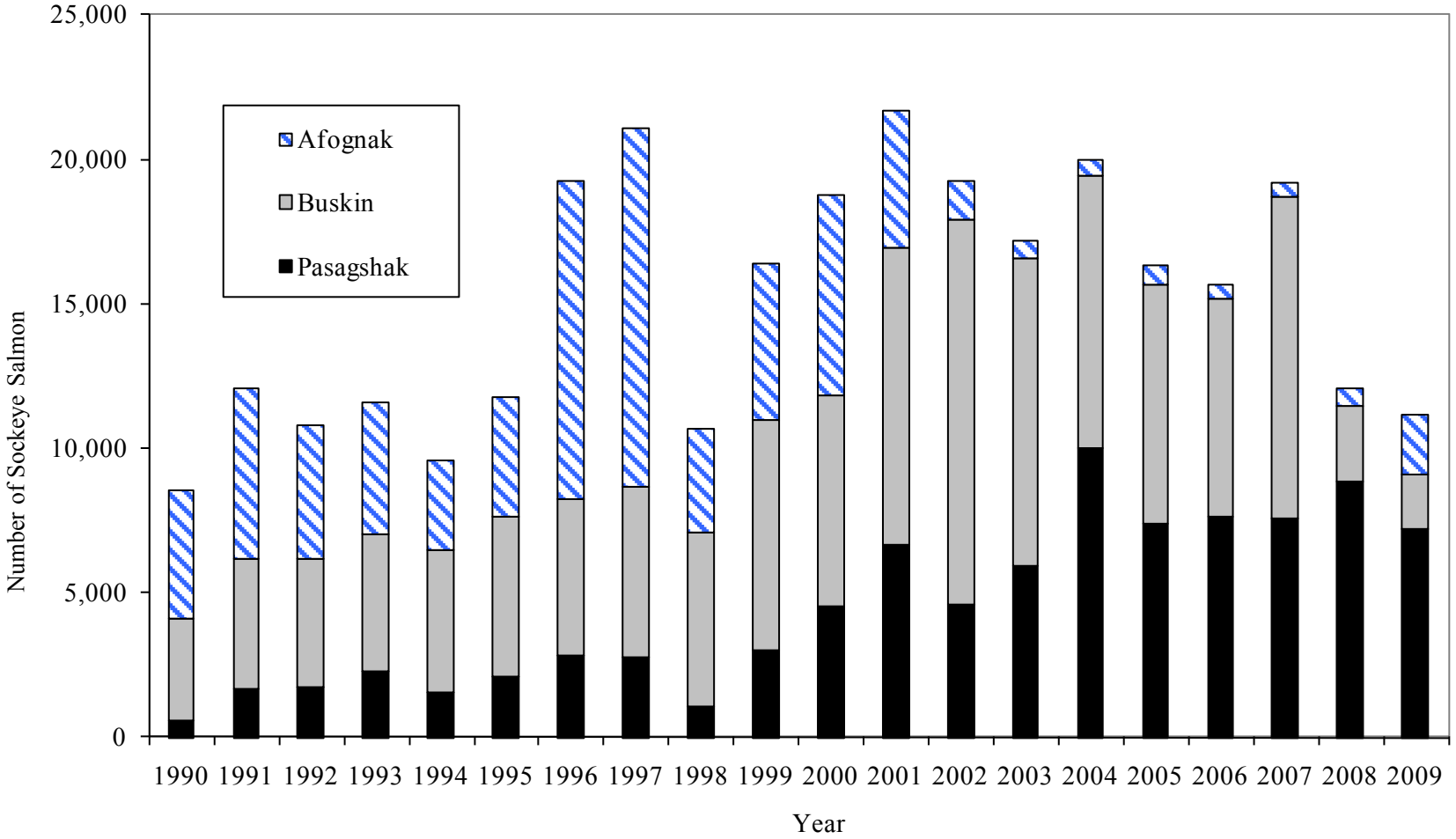

Figure 4.–Historical sockeye salmon subsistence harvest estimates for three important subsistence systems near the City of Kodiak.

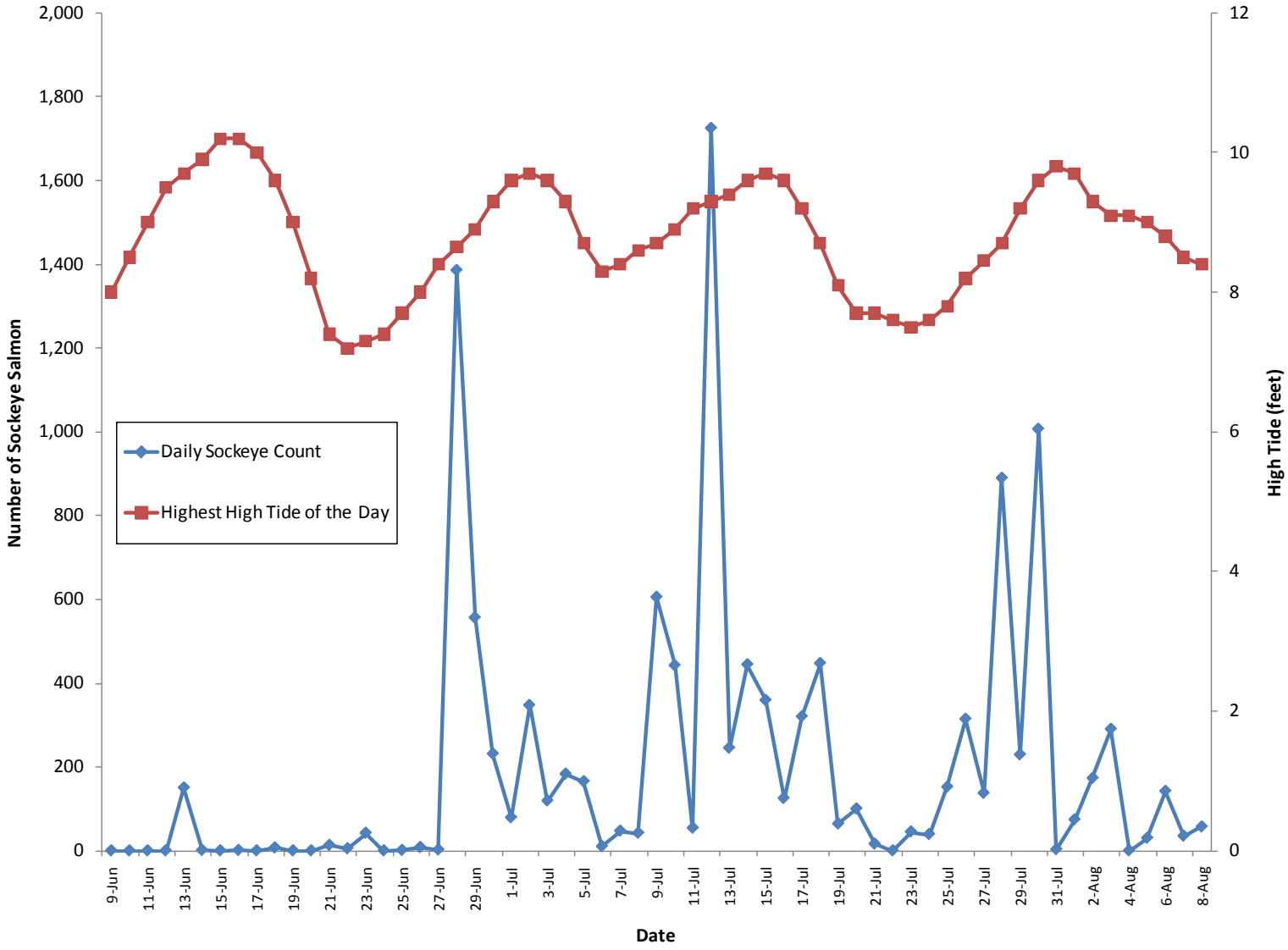

Figure 5.–Daily sockeye salmon passage through the Pasagshak River weir and the corresponding highest high tide of the day, 2011.

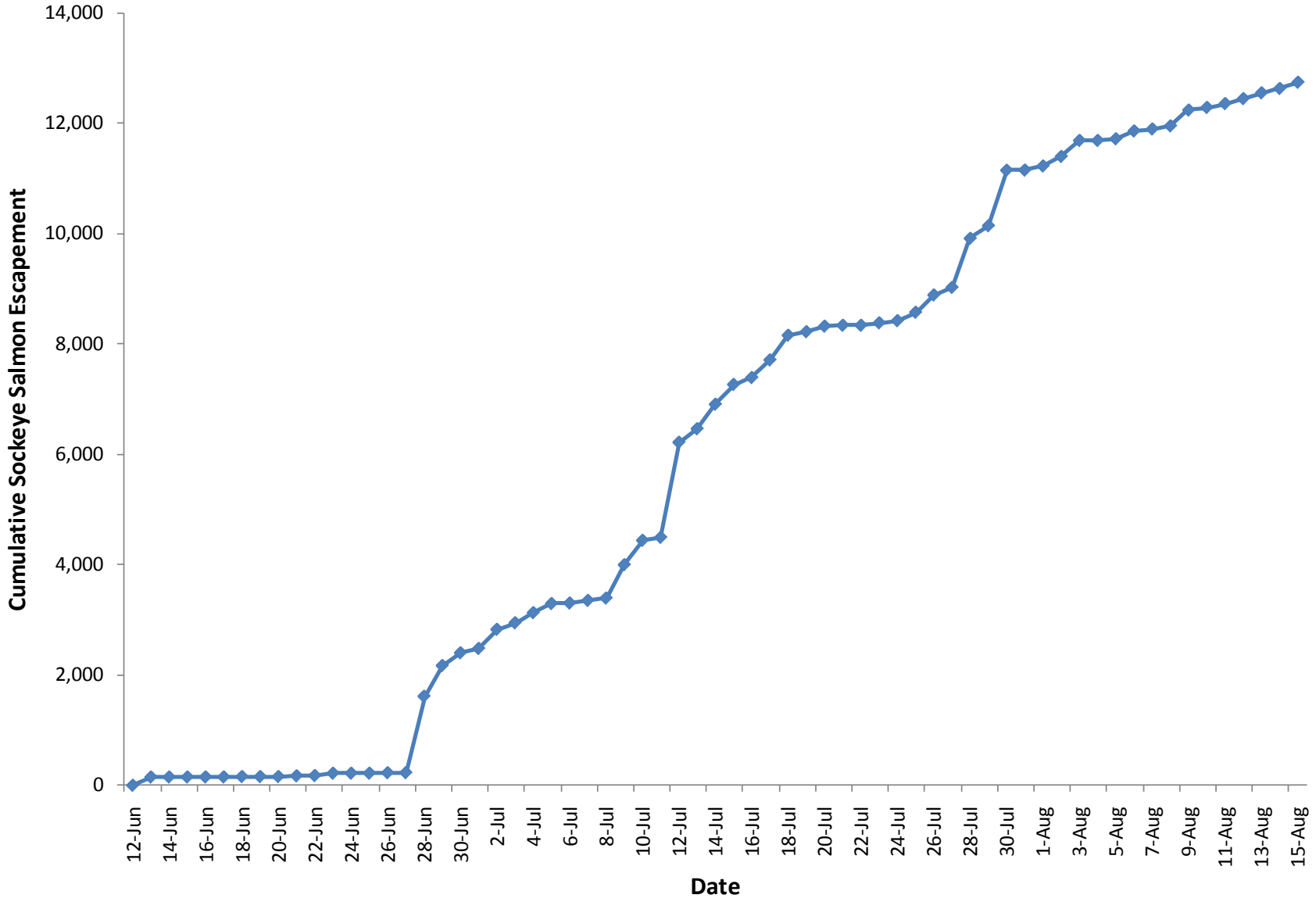

Figure 6.–Pasagshak River sockeye salmon cumulative escapement by day, 2011.

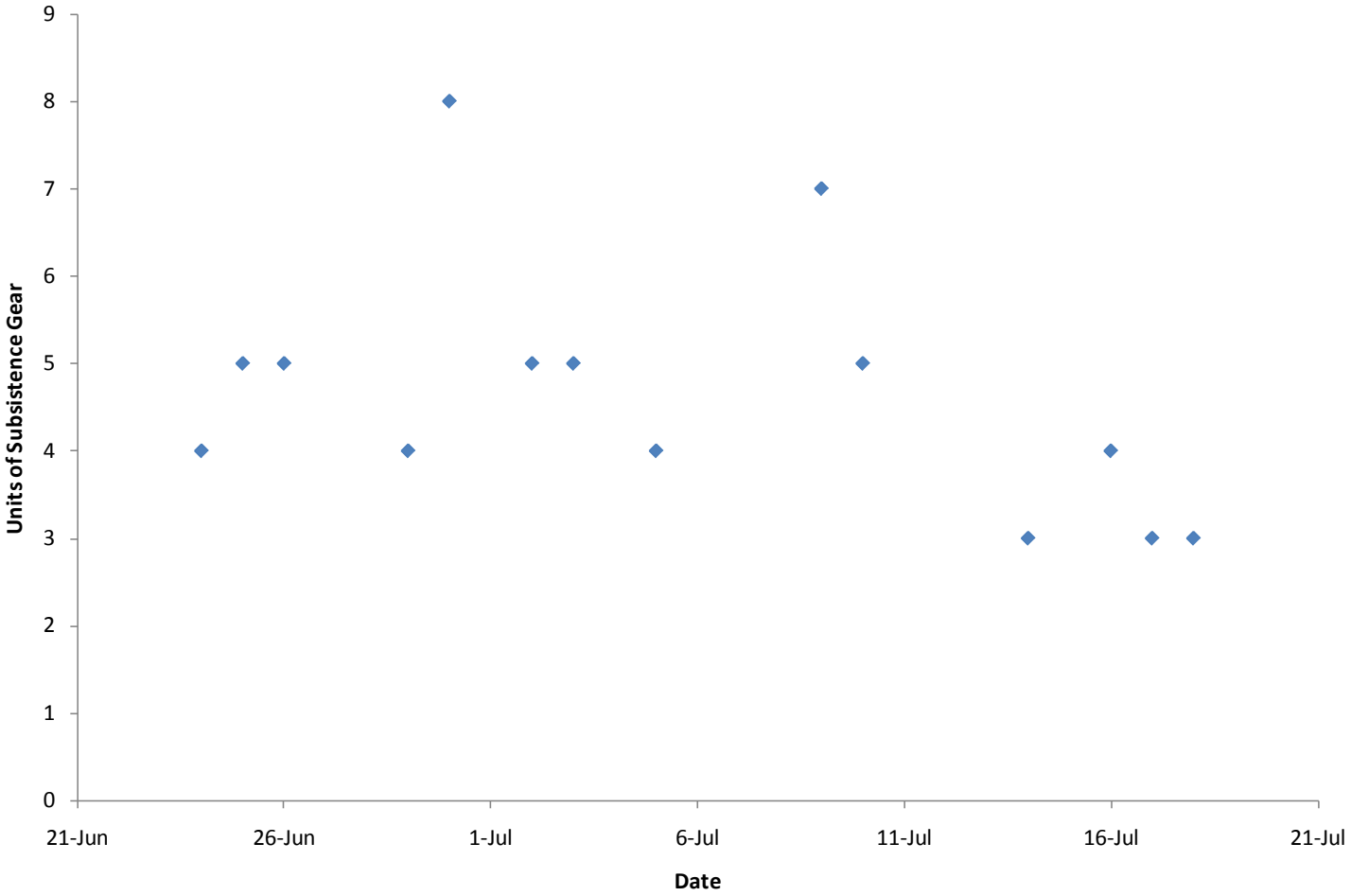

Figure 7.–Estimated daily subsistence fishing effort, measured by number of nets fishing, in Pasagshak Bay, 2011.

APPENDIX A

Daily Pasagshak Subsistence Fishery Data Sheet

Date: ____________________ Personnel: ____________________________________

Wx: ____

Peak Estimate of Effort (Units of gear/boats) [ ]

Fishermen Interviews

Fisherman Name (Optional)	Number of Nets	Mesh Size	Hours Fished	Number of Sockeye Salmon Caught	# Collected For ASL	Card #	Fish #

Fisherman Name (Optional)	Number of Nets	Mesh Size	Hours Fished	Number of Sockeye Salmon Caught	# Collected For ASL	Card #	Fish #

Fisherman Name (Optional)	Number of Nets	Mesh Size	Hours Fished	Number of Sockeye Salmon Caught	# Collected For ASL	Card #	Fish #

Fisherman Name (Optional)	Number of Nets	Mesh Size	Hours Fished	Number of Sockeye Salmon Caught	# Collected For ASL	Card #	Fish #

Fisherman Name (Optional)	Number of Nets	Mesh Size	Hours Fished	Number of Sockeye Salmon Caught	# Collected For ASL	Card #	Fish #

Fisherman Name (Optional)	Number of Nets	Mesh Size	Hours Fished	Number of Sockeye Salmon Caught	# Collected For ASL	Card #	Fish #

Appendix A1.–Subsistence fishery interview form.