Special Publication No. 98-3

Investigations of Methods and Means to Minimize Chinook Salmon Harvest in the East Side Set Net Fishery of Upper Cook Inlet, 1996

by

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and

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August 1998

Alaska Department of Fish and Game Division of Sport Fish

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used in Division of Sport Fish Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications without definition. All others must be defined in the text at first mention, as well as in the titles or footnotes of tables and in figures or figure captions.

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^3/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_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	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)	$log_{2,}$ etc.
mideye-to-fork	MEF
minute (angular)	'
multiplied by	x
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
standard length	SL
total length	TL
variance	Var

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TABLE OF CONTENTS

Page

LIST OF TABLES

Table **Page**

LIST OF FIGURES

LIST OF APPENDICES

Appendix **Page**

LIST OF APPENDICES (Continued)

ABSTRACT

The purpose of this study was to investigate potential methods and means to reduce chinook salmon *Oncorhynchus tshawytscha* harvests, while minimizing lost harvest of commercially targeted sockeye salmon *Oncorhynchus nerka* in the east side set net fishery of Cook Inlet, consistent with operative management plans in 5 AAC 21.359 and 5 AAC 21.363. The study was designed to detect differences in catch rates of chinook and sockeye salmon as affected by time, geographic area, observed tide flow, water depth and vertical distribution of catches in set nets within terminal fishing areas located near the Kenai River entrance. Study areas were stratified into near, mid and offshore locations. The physical condition of captured chinook salmon was evaluated to determine the proportion suitable for release as a potential method for minimizing harvests. Sampling was conducted with the active assistance and cooperation of commercial set net fishermen. Within study areas, catches of chinook and sockeye salmon were enumerated at shore sites and aboard skiffs during each commercial set net opening during 1996. During the study, total catches of 71,697 sockeye salmon and 588 chinook salmon were counted from 95 unique nets during 1,981 net sets. Poisson and logistic regression was used to test for significant differences in observed catches.

Harvest patterns of chinook salmon in the study were found to be significantly affected by the interactions between area and week and between area and distance from shore. Where sampled, offshore nets always caught fewer chinook salmon than either near or midshore nets. The vertical distribution of chinook salmon catches in set nets was found to be essentially uniform in most areas, during all weeks and distances from shore. Sockeye salmon catches were significantly affected by time, area, distance from shore, as well as their interactions. Nearshore nets caught more sockeye salmon than mid or offshore nets during most weeks and in most areas. Offshore nets nearly always caught fewer sockeye salmon than either near or midshore nets. Catches of sockeye salmon, with exceptions, tended to occur disproportionately in the upper 2/3 of set nets in near and mid distances from shore. Approximately 18.5% of chinook salmon were judged suitable for release.

The relative patterns of harvest for chinook and sockeye salmon from the study identified potential avenues for additional research. Harvest patterns, within study areas, suggest that chinook catches are proportionally higher than sockeye salmon catches during the early and late weeks of the fishery. Harvest patterns in the study area also suggest that sockeye salmon catches are disproportionately distributed in the upper $^{2}/_{3}$ of set nets. Further study is necessary to determine if these patterns are common to the entire ESSN fishery, consistent between years and whether or not they provide a potential basis for formulating alternative management strategies.

Key words: chinook salmon, *Oncorhynchus tshawytscha*, sockeye salmon, *Oncorhynchus nerka*, set gill net, Kenai River, Cook Inlet, east side set net fishery, spatial, temporal, harvest patterns.

INTRODUCTION

Cook Inlet hosts one of the largest commercial salmon fisheries within the State of Alaska with mixed-stock harvests of all five species of Pacific salmon. The Upper Cook Inlet commercial management area consists of the portion of Cook Inlet that is north of Anchor Point and is divided into the Central and Northern Districts (Figure 1). The Central District is approximately 75 miles long, averages 32 miles in width and is divided into six subdistricts. Currently, both set and drift gill nets are allowed in the Central District, while only set nets are allowed in the Northern District.

The eastside set net (ESSN) fishery, located along the eastern shore of the Central District between Ninilchik and Boulder Point, historically harvests the majority (61.0%) of commercially caught chinook salmon *Oncorhynchus tshawytscha* in Upper Cook Inlet (Table 1). ESSN commercial harvests are reported by statistical areas comprised of Salamatof Beach (244-40), Kalifonsky Beach (244-30), Cohoe Beach (244-22) and Ninilchik Beach (244-21); see Figure 1. Approximately 75% of all chinook salmon harvested in this fishery are believed to be of Kenai River origin (McBride et al. 1985).

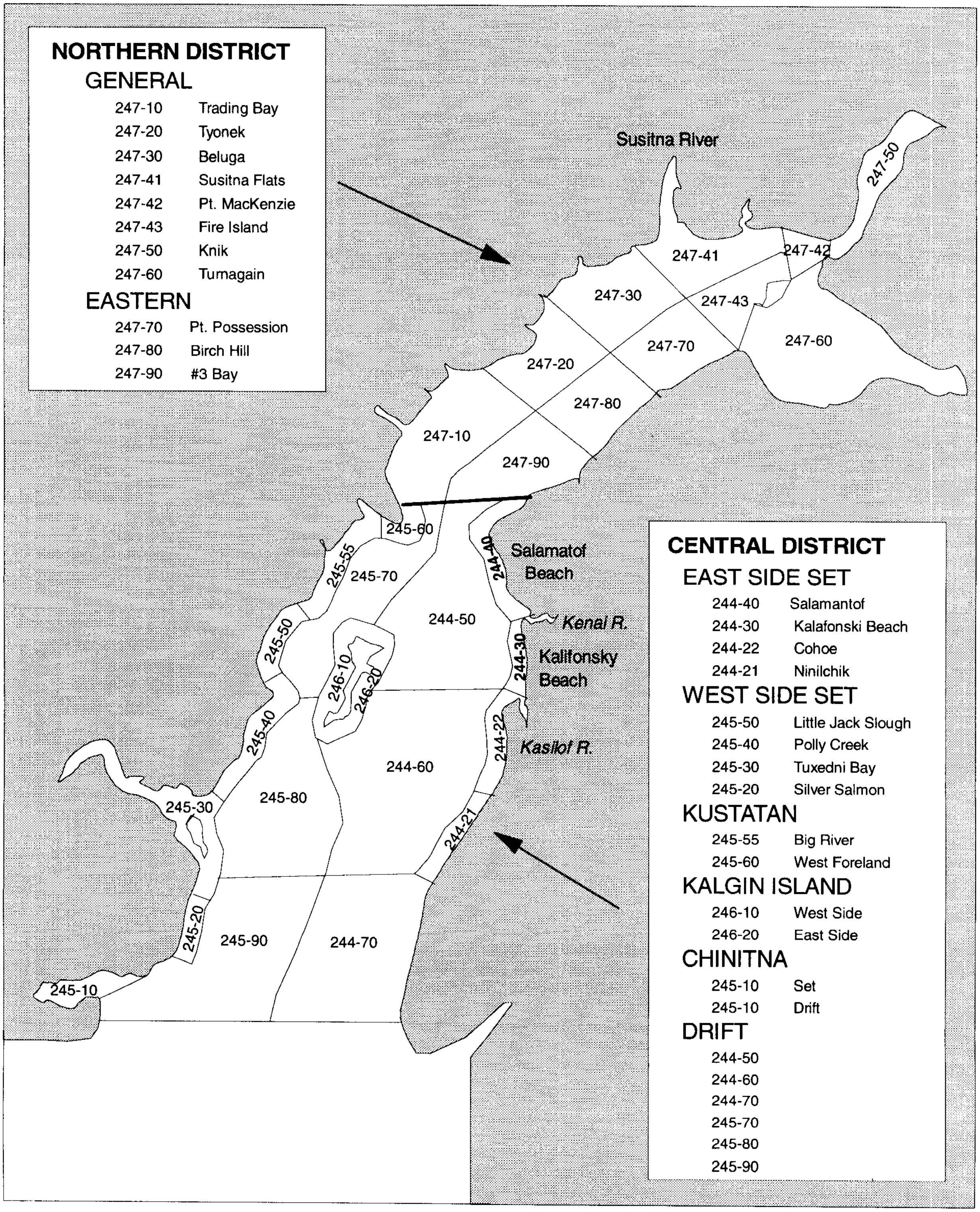


Figure 1.-Map of Cook Inlet showing commercial fishing districts and statistical catch reporting areas.

Table 1.-Upper Cook Inlet commercial chinook salmon harvest by gear type and area, 1966-1996.

	Central District Drift Gill Net		Central District Set Gill Net: East Side Set Net		Central District Set Gill Net: Kalgin/West Side		Northern District Set Gill Net		
Year	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Total
1966	392	4.6	7,329	85.8	401	4.7	422	4.9	8,544
1967	489	6.3	6,646	85.0	500	6.4	184	2.4	7,819
1968	182	4.0	3,304	72.8	579	12.8	471	10.4	4,536
1969	362	2.9	5,834	47.1	3,286	26.5	2,904	23.4	12,386
1970	367	4.4	5,366	64.3	1,152	13.8	1,460	17.5	8,345
1971	237	1.2	7,055	35.7	2,875	14.5	9,598	48.6	19,765
1972	375	2.3	8,599	53.5	2,199	13.7	4,913	30.5	16,086
1973	244	4.7	4,411	84.9	369	7.1	170	3.3	5,194
1974	422	6.4	5,571	84.5	434	6.6	169	2.6	6,596
1975	250	5.2	3,675	76.8	733	15.3	129	2.7	4,787
1976	690	6.4	8,249	75.9	1,469	13.5	457	4.2	10,865
1977	3,411	23.1	9,732	65.8	1,084	7.3	565	3.8	14,792
1978	2,072	12.0	12,468	72.1	2,093	12.1	666	3.8	17,299
1979	1,089	7.9	8,671	63.1	2,264	16.5	1,714	12.5	13,738
1980	889	6.4	9,643	69.9	2,273	16.5	993	7.2	13,798
1981	2,320	19.0	8,358	68.3	837	6.8	725	5.9	12,240
1982	1,293	6.2	13,658	65.4	3,203	15.3	2,716	13.0	20,870
1983	1,125	5.5	15,043	72.9	3,534	17.1	933	4.5	20,635
1984	1,377	13.7	6,165	61.3	1,516	15.1	1,004	10.0	10,062
1985	2,048	8.5	17,723	73.6	2,427	10.1	1,890	7.8	24,088
1986	1,834	4.7	19,810	50.5	2,108	5.4	15,488	39.5	39,240
1987	4,552	11.5	21,379	53.9	1,029	2.6	12,701	32.0	39,661
1988	2,217	7.6	12,870	44.3	1,137	3.9	12,836	44.2	29,060
1989	0	0.0	10,919	40.8	3,092	11.6	12,731	47.6	26,742
1990	621	3.9	4,139	25.7	1,763	10.9	9,582	59.5	16,105
1991	241	1.8	4,891	36.1	1,544	11.4	6,859	50.7	13,535
1992	615	3.6	10,718	62.4	1,284	7.5	4,554	26.5	17,171
1993	746	4.0	13,977	74.7	719	3.8	3,277	17.5	18,719
1994	460	2.3	15,885	78.4	730	3.6	3,185	15.7	20,260
1995	594	3.3	12,032	67.4	1,101	6.2	4,130	23.1	17,857
1996[a]	390	2.8	11,428	80.7	408	2.9	1,943	13.7	14,169
Average[b]	1,087	6.8	9,766	61.0	1,539	9.6	3,610	22.6	16,002

Modified from: Ruesch and Fox (1995)

[a] 1996 data preliminary.

[b] 1989 excluded from average.

The Kenai River hosts the state's most popular recreational chinook salmon fishery (Table 2). Sport fishing is confined to a 50-mile area downstream from Skilak Lake (Figure 2). Chinook salmon return to the Kenai River in two distinct runs, early and late. The early run is present in the river from mid-May through June and the late run is present from early July through mid-August. Studies indicate that early-run stocks are not subject to significant commercial exploitation but late-run stocks are subject to both commercial and sport harvest (McBride et al. 1985, Nelson 1995).

Conflict between recreational and commercial harvesters in Upper Cook Inlet has increased as levels of participation in both fisheries have increased, particularly with regard to late-run Kenai River chinook salmon. The Kenai River Late Run King Salmon Management Plan (5 AAC 21.359) was adopted by the Alaska Board of Fisheries in 1988 and implemented in 1989. It outlines biological management objectives and provides a framework by which competing fisheries are to share the burden of conservation. The Upper Cook Inlet Salmon Management Plan (5 AAC 21.363), adopted as policy in 1977 and into regulation in 1981, stipulates that the Department shall manage salmon stocks in upper Cook Inlet for commercial priority between July 1 and August 15, while minimizing the incidental take of late-run Kenai River chinook salmon.

While these management plans have provided the framework for managing late-run Kenai River chinook salmon stocks, little research had been conducted to describe patterns of harvest in the ESSN fishery. The need for additional research is accentuated by expanded participation in offshore areas of the eastside set net fishery since the mid 1980s (Tarbox et al. 1988). Results from a study conducted by Tarbox et al. (1987), which examined set net harvests of chinook and sockeye salmon *Oncorhynchus nerka* in the eastside set net fishery from 1978 to 1982, suggested that significant reductions in chinook salmon harvests could only be achieved with a correspondingly significant reduction in sockeye salmon harvest. A later study, which examined geographical harvest patterns of coho salmon in the ESSN fishery, concluded that intensive onsite sampling would be required to define harvest patterns and investigate influential factors within the fishery (Fox and Tarbox 1991).

Presently, there are no indications that late-run Kenai River chinook salmon stocks are in biological jeopardy (D. Nelson, Alaska Department of Fish and Game, Soldotna, personal communication), however, additional research into this fishery is necessary to characterize harvest patterns and determine the potential for developing alternative management strategies which better meet the Board's desire to minimize chinook salmon harvests. Specifically, research to identify and investigate potential methods and means to reduce late-run Kenai River chinook salmon harvests, while minimizing impacts upon the ability of the fishery to harvest commercially targeted sockeye salmon.

Study objectives were developed to detect harvest trends of chinook and sockeye salmon near the mouth of the Kenai River by time, distance from shore, water depth, tide flow and vertical distribution in set nets. Identification of trends where chinook salmon harvests are high and sockeye harvests are low could lead to development of alternative time/area management strategies. Examination of the temporal and spatial distribution of harvests as affected by relative water depth (charted water depth relative to mean lower low water [MLLW]), tide flow (flood/ebb) and tidal rise and fall (average water depth during net soak) would provide insight to the influence of these factors and focus for future research and/or potential regulatory action.

Table 2.-Recreational harvest, angler effort and harvest rate, Kenai River late-run chinook salmon fishery, 1974-1996.

Year	Chinook Salmon Harvest	Angler Days Effort	Angler Hours Effort	Harvest/Hour
1974	3,225	12,335	87,162	0.037
1975	2,355	14,943	53,523	0.044
1976	5,353	28,030	114,795	0.047
1977	5,148	47,539	135,082	0.038
1978	5,578	60,636	212,217	0.026
1979	4,634	58,895	205,887	0.023
1980	3,608	38,260	154,435	0.023
1981	5,285	29,906	149,296	0.035
1982	4,810	43,366	197,775	0.024
1983	9,174	56,295	248,519	0.037
1984	7,376	77,462	348,579	0.021
1985	8,055	73,613	294,453	0.027
1986	9,004	75,092	244,440	0.037
1987	12,327	66,403	310,840	0.040
1988	17,512	85,282	361,759	0.048
1989	9,127	71,110	329,051	0.028
1990	6,247	67,101	291,966	0.022[a]
1991	6,849	48,604	229,999	0.030
1992	6,680	40,649	187,415	0.039[a]
1993	15,279	59,434	293,908	0.052
1994	14,388	71,931	354,778	0.041
1995	10,125	65,918	323,982	0.031
1996	6,120	48,139	239,227	0.026

Modified from: Nelson (1995)

[a] Harvest per hour only for periods open to retention of chinook salmon.

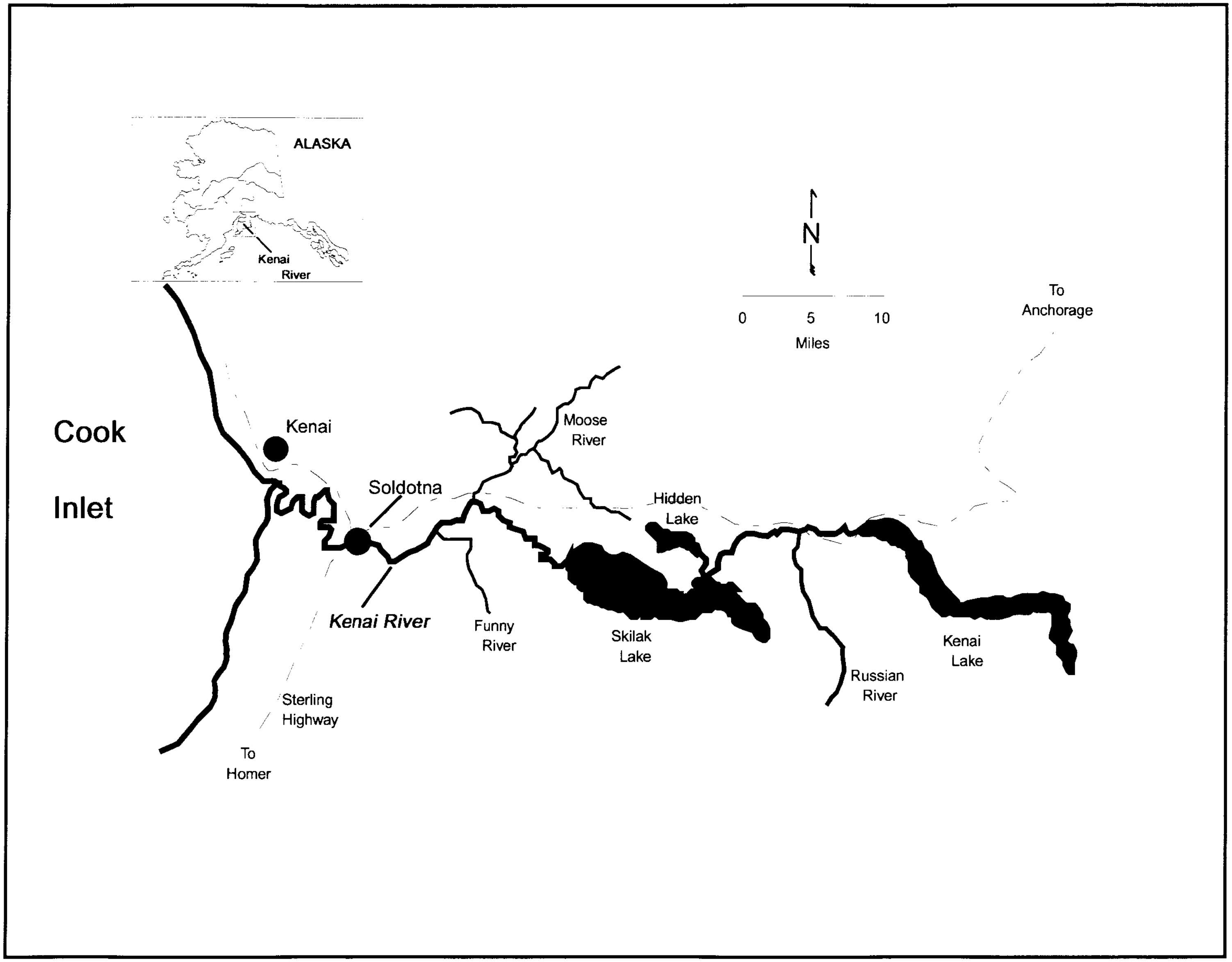


Figure 2.-Map of Kenai River drainage. Late-run chinook salmon fishing occurs downstream from Skilak Lake to the river confluence in Cook Inlet.

Study objectives, within study areas, during 1996 were to:

1. Test the hypothesis that catches of chinook and sockeye salmon are not significantly affected by time, area, distance from shore, tide flow or average water depth.
2. Test the hypothesis that neither time, area, distance from shore, tide flow, vertical distribution in set nets or average water depth during net soak did not significantly affect the proportion of chinook salmon judged suitable for release.
3. Test the hypothesis that the vertical distribution of catches of chinook and sockeye salmon are not significantly affected by time, area, distance from shore, tide flow or average water depth during net soak.
4. Estimate the mean proportion of chinook salmon harvested in set nets which are suitable for release by time, beach, area, distance from shore and observed tide flow.

METHODS

STUDY DESIGN AND DATA COLLECTION

The study area consisted of set net sites on Salamatof and Kalifonsky beaches (Figure 3). These beaches were selected because they are nearest the Kenai River entrance and catches of chinook salmon were thought to be greatest in this area. On Salamatof Beach, the study area extended approximately 3 miles north from the northern regulatory marker at the Kenai River. On Kalifonsky Beach, the study area was extended from the southern regulatory marker to the Blanchard Line (approximately 3.5 miles). Each beach was divided into three equal size areas (A-C on Kalifonsky and D-F on Salamatof). All areas extended seaward to the regulatory limit (1.5 miles on Kalifonsky Beach and 1.0 mile on Salamatof Beach) and were stratified into near, mid and offshore locations. Nearshore was defined as the area where nets were operated from the beach. The remaining area was divided in half to form midshore and offshore locations. Stratification resulted in a total of nine study sites from each beach. A portable GPS receiver (Global Positioning System) was used to locate each net within areas and distances from shore.

The original study design called for random selection of participating fishermen. A questionnaire was sent by mail to all fishermen who participated in the ESSN fishery during 1995 requesting their assistance in conducting the study (Appendices F1, F2). Minimal response negated the possibility of random selection and nearly all positive respondents were included in the study. Given the available pool of volunteer fishermen, we were able to obtain observations of at least two nets in all but three offshore locations; study area C on Kalifonsky Beach and study areas D and E on Salamatof Beach. While fishermen were not chosen randomly, it is assumed that catches from nets included in the study are representative of all nets within the same study sites.

During the study, 94 unique nets were examined. Of these, 92 nets were 45 meshes in depth and 2 were 28 meshes in depth. All were approximately 35 fathoms in length (210 feet). Each net was commonly reset and counted multiple times during the same day. A cycle of setting a net, letting it soak, pulling the net, and picking it is referred to as a single "set." As each set was being picked, technicians enumerated the catch of chinook and sockeye salmon. For mid and offshore nets, technicians were aboard skiffs along with the operator. Salmon from nearshore nets were counted as the net went dry or was otherwise retrieved. The vertical location of capture was visually estimated as either the upper 2/3 of the net, lower 1/3 of the net or

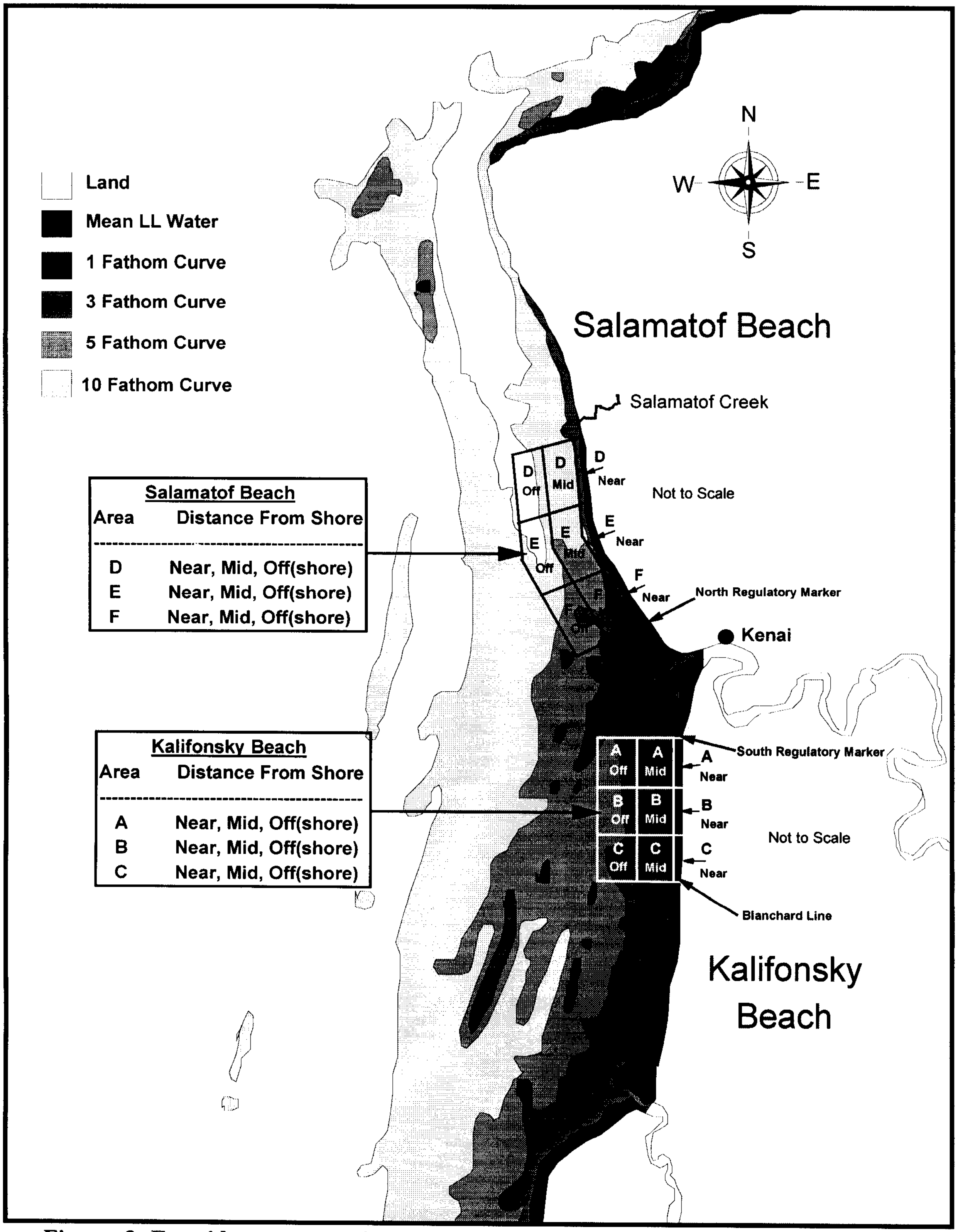


Figure 3.-Eastside setnet study areas, Salamatof and Kalifonsky beaches, Central District, Upper Subdistrict, Cook Inlet, 1996.

Table 3.-Evaluation criteria for determining suitability for release of chinook salmon.

Step No.	Evaluation Criteria	**IF**	**THEN**
1	Fish Dead or Alive	Dead	Not Suitable for Release
		Alive	Continue
2	Bleeding From Gills	Bleeding	Not Suitable for Release
		Not Bleeding	***Suitable for Release***

unknown. Originally, we intended to use a visible mark on the nets to delineate the boundary between the upper and lower sections. Many fishermen felt that such a mark would negatively impact catches, so no mark was employed. The physical condition of all chinook salmon captured was evaluated (Table 3) and the number judged suitable for release was recorded for each set.

Tide flow (flood, ebb or both) and the duration of net soak were recorded for each set. If less than 100% of the net was counted from a given set, technicians estimated the percent of net length counted to the nearest quarter length (25%, 50% or 75%). Water depth was measured at each site at least once during the season using lead lines. Multiple depth measurements were only obtained when disruption to fishing activities was minimal. To ensure consistency and minimize error, depths were measured near the mid point of each net during periods of calm and slack tidal current whenever possible. Depth was measured to the nearest inch and recorded with the corresponding date and time.

Surface water temperature, conductivity, salinity, turbidity and light penetration were measured (Appendix E1). Wind direction, wind velocity, and percent cloud cover were recorded (Appendices E2-E4). Coho, pink and chum salmon were counted as a group (recorded as “other” salmon species) during the month of July. During August, pink and chum salmon catches were counted as a group and coho salmon were enumerated separately. Physical characteristics of setnets fished during the study were also recorded (Appendices E5-E7).

Commercial set net fishing in the study area commenced on Monday, July 1 and ended on Monday, August 12, 1996. Observations were grouped by week beginning July 1 and ending August 15 (Table 4). During the study, 18 technicians counted 588 chinook and 71,697 sockeye salmon, representing a total of 1,981 net sets. To eliminate bias due to partial net counts, all sets where less than 100% of the catch was counted were excluded from all analyses. Approximately 7% of the original data was excluded on this basis, with no more than 8.5% coming from a single beach. This modified data set consisted of 1,837 sets, comprising total catches of 552 chinook and 67,495 sockeye salmon (Table 5).

Regression analysis was used for hypothesis testing. Stepwise model selection procedures were used to identify models that best fit the data. From the original models, all non-significant interactions ($P > 0.05$) were sequentially removed by descending P-value. Non-significant main effects, not involved in significant interactions, were removed by the same procedures.

Table 4.-Seven-day sampling increments, corresponding dates and week numbers.

Dates	Week Number
July 1 - July 6[a]	1
July 7 - July 13	2
July 14 - July 20	3
July 21 - July 27	4
July 28 - August 3	5
August 4 - August 10	6
August 11- August 12[b]	7

[a] Fishery opened June 1

[b] Fishery closed August 12

NET SITE DEPTH AND AVERAGE WATER DEPTH DURING NET SOAK

All mid and offshore nets were anchored in position and not relocated while fishing. To determine net depth relative to MLLW and average net depth during a given soak, tidal prediction tables were developed for each study area (methods consistent with Bowditch 1995, Table 6). Tidal correction factors were derived from predictions published by NOAA (1996) for stations subordinate to Seldovia (Station No. 1967, 59°27´N, 151°43´W). Linear interpolation of water height predictions for the Kenai River Entrance (Station No. 1983, 60°33´N, 151°17´W) and the East Foreland (Station No. 1989, 60°34´N, 151°25´W) were used to estimate correction factors in study areas D, E and F. Correction factors for study areas A, B and C were derived from predictions at the Kenai River Entrance and Cape Ninilchik (Station No. 1979, 60°01´N, 151°43´W). Differences between predicted tidal correction factors and the Kenai River entrance are shown in Table 7. All tidal predictions were computer generated using software from Nautical Software, Inc. (1995). Water depth was measured near the mid point of each net using lead lines several times during the study, and the measured depth was compared with the predicted depth calculated for that net site. Depth at a given net site relative to MLLW was estimated as the average of the estimated differences:

$$\hat{D}_{st} = p_{st} + \frac{\sum_{t=1}^{n_s}(p_{st} - m_{st})}{n_s}, \qquad \text{(Equation 1)}$$

where:

$\hat{D}_{st}$ = estimated water depth relative to MLLW at site s at time t,

p_{st} = predicted water height at site s at time t,

m_{st} = measured water depth at site s at time t, and

n_s = the number of times the depth was measured at a given net site.

Table 5.-Sample sizes and corresponding catches of chinook and sockeye salmon, by week and location.

		Week Number							
Location	**Data**[a]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Total**
A Near	Net Counts	3	13	30	40	19	15	10	130
	Chinook	1	1	8	8	4	4	1	27
	Sockeye	129	113	1,201	2,198	514	207	49	4,411
A Mid	Net Counts	3	13	31	49	8	12	2	118
	Chinook	3	5	16	20	3	6	1	54
	Sockeye	112	86	1,120	940	68	54	8	2,388
A Off	Net Counts	1	34	50	107	19	0	0	211
	Chinook	0	8	15	7	1	0	0	31
	Sockeye	7	37	632	1,388	148	0	0	2,212
B Near	Net Counts	1	5	5	12	4	4	2	33
	Chinook	1	2	2	5	1	1	0	12
	Sockeye	18	58	193	501	55	24	10	859
B Mid	Net Counts	0	4	8	11	1	0	0	24
	Chinook	0	1	6	4	0	0	0	11
	Sockeye	0	17	259	200	1	0	0	477
B Off	Net Counts	6	9	18	30	3	6	0	72
	Chinook	1	0	2	3	0	0	0	6
	Sockeye	20	19	147	327	9	10	0	532
C Near	Net Counts	3	10	16	23	8	6	0	66
	Chinook	2	6	6	4	2	5	0	25
	Sockeye	248	114	630	469	77	45	0	1,583
C Mid	Net Counts	4	37	74	168	48	43	0	374
	Chinook	0	6	32	31	6	11	0	86
	Sockeye	242	64	1,473	1,492	386	140	0	3,797
C Off	Net Counts	0	0	0	0	0	0	0	0
	Chinook	0	0	0	0	0	0	0	0
	Sockeye	0	0	0	0	0	0	0	0
D Near	Net Counts	10	14	38	34	12	14	3	125
	Chinook	4	2	6	2	2	1	0	17
	Sockeye	143	75	3,784	2,143	373	254	16	6,788
D Mid	Net Counts	3	8	10	13	2	4	0	40
	Chinook	4	5	2	3	0	0	0	14
	Sockeye	62	135	797	830	40	30	0	1,894
D Off	Net Counts	0	0	0	0	0	0	0	0
	Chinook	0	0	0	0	0	0	0	0
	Sockeye	0	0	0	0	0	0	0	0
E Near	Net Counts	15	29	49	50	23	3	0	169
	Chinook	5	11	9	9	0	0	0	34
	Sockeye	224	296	7,678	4,083	778	146	0	13,205
E Mid	Net Counts	1	11	29	46	10	0	0	97
	Chinook	5	22	23	48	9	0	0	107
	Sockeye	49	86	4,182	4,189	509	0	0	9,015
E Off	Net Counts	0	0	0	0	0	0	0	0
	Chinook	0	0	0	0	0	0	0	0
	Sockeye	0	0	0	0	0	0	0	0
F Near	Net Counts	17	23	22	38	9	27	12	148
	Chinook	4	20	5	7	0	6	0	42
	Sockeye	285	505	6,241	5,372	727	1,031	160	14,321
F Mid	Net Counts	11	25	37	45	7	24	5	154
	Chinook	8	10	32	9	1	10	0	70
	Sockeye	215	102	2,210	1,702	116	113	13	4,471
F Off	Net Counts	0	7	21	36	12	0	0	76
	Chinook	0	1	11	4	0	0	0	16
	Sockeye	0	12	611	781	138	0	0	1,542
	Total Net Counts	78	242	438	702	185	158	34	1,837
	Total Chinook	38	100	175	164	29	44	2	552
	Total Sockeye	1,754	1,719	31,158	26,615	3,939	2,054	256	67,495

[a] Includes only those counts in which the full length of the net was counted.

Table 6.-Study area tidal correction factors for time and height of water.

	Position		Time Correction[a]		Water Height Correction[a]	
Area	Latitude	Longitude	High	Low	High	Low
A[b]	60.28.70N	151.18.15W	+1:45	+2:10	2.56	0.47
B[b]	60.28.70N	151.18.17W	+1:43	+2:08	2.52	0.46
C[b]	60.27.05N	151.18.20W	+1:41	+2:05	2.48	0.46
D[c]	60.36.30N	151.21.25W	+2:08	+2:32	2.81	0.5
E[c]	60.35.32N	151.20.80W	+2:04	+2:29	2.78	0.5
F[c]	60.34.40N	151.20.00W	+2:00	+2:25	2.75	0.5

[a] Correction factors applied to tidal estimates at Seldovia, Reference Station No. 1967 (59°27´N, 151°43´W) to estimate time and height of tide in respective study areas.

[b] Linear interpolation of time and height predictions for the Kenai River Entrance (Station No. 1983, 60°33´N, 151°17´W) and Cape Ninilchik (Station No. 1979, 60°01´N, 151°43´W) were used to estimate correction factors in study areas A, B and C.

[c] Linear interpolation of time and height predictions for the Kenai River Entrance and the East Foreland (Station No. 1989, 60°34´N, 151°25´W) were used to estimate correction factors in study areas D, E and F.

Table 7.-Differences between estimated study area tidal correction factors and Kenai River Entrance.

		Time Difference		Height Difference	
Beach	Study Area	High	Low	High	Low
Salamatof	D	+0:16	+0:14	0.1	0.0
Salamatof	E	+0:12	+0:11	0.1	0.0
Salamatof	F	+0:08	+0:07	0.1	0.0
Kenai River Entrance[a]		**0:00**	**0:00**	**0.0**	**0.0**
Kalifonsky	A	-0:07	-0:08	-0.1	0.0
Kalifonsky	B	-0.09	-0:10	-0.2	0.0
Kalifonsky	C	-0:11	-0:13	-0.2	0.0

[a] Kenai River Entrance Reference Station No. 1983 (60°33´N, 151°17´W).

Mean water depth during a given set was calculated as the average of estimated site depths from each full 5 minute time increment during which a given net was in the water:

$$\bar{d}_s = \frac{\sum_{t=1}^{n_t} \hat{D}_{st}}{n_t}, \qquad \text{(Equation 2)}$$

where:

$\bar{d}_s$ = mean water depth during a given set at net site s, and

n_t = the number of full 5 minute time increments during a given set.

A graphic presentation of the relationship between variables and a sample calculation of mean water depth is presented in Figure 4. Minimum, maximum and mean depths for each study area and distance from shore are shown in Table 8. To avoid problems associated with potential multicollinearity between average water depth and site depth relative to MLLW, regression analysis was used to test the correlation between these variables. Because they were found to be highly correlated ($r = 0.86$, $P < 0.001$), only the average water depth during a set was used in the analyses. Because onshore nets were commonly moved to stabilize their depth while fishing, sets from these nets were assigned depths relative to MLLW and an average water depth during soak of 1 fathom (6 ft).

CATCH RATES

Poisson regression with a log link function (Agresti 1990, McCullagh and Nelder 1989) was used to test the hypotheses that the number of chinook or sockeye salmon caught in a net is not significantly affected by time, area, distance from shore, tide flow or average water depth. A random component, which followed a negative binomial distribution, was added to the linear model to account for heterogeneity between nets receiving the same treatment and allow the variance to be greater than the mean (a constraint of the Poisson distribution). The original model used was:

$$\log(m_{ijklmn}) = \mu + \lambda_i^W + \lambda_j^A + \lambda_k^D + \lambda_l^T + \lambda_m^M + \lambda_{ij}^{WA} + \lambda_{ik}^{WD} + \lambda_{il}^{WT} +$$

$$\lambda_{im}^{WM} + \lambda_{jk}^{AD} + \lambda_{kl}^{DT} + \lambda_{lm}^{TM} + \varepsilon_{(ijklm)n}, \qquad \text{(Model 1.0)}$$

where:

μ = the mean count of chinook or sockeye salmon in a set,

λ_i^W = the effect of week i,

λ_j^A = the effect of area j,

λ_k^D = the effect of distance k,

λ_l^T = the effect of tide flow l,

λ_{m}^{M} = the effect of average water depth m,

λ_{ij}^{WA} = the effect of week i and area j,

λ_{ik}^{WD} = the effect of week i and distance k,

λ_{il}^{WT} = the effect of week i and tide flow l,

λ_{im}^{WM} = the effect of week i and average water depth m,

λ_{jk}^{AD} = the effect of area j and distance k,

λ_{kl}^{DT} = the effect of distance k and tide flow l,

λ_{lm}^{TM} = the effect of tide flow l and average water depth m, and

$\varepsilon_{(ijklm)n}$ = the random component of the catch in set associated with week, area, distance from shore, tide flow and average water depth.

All categorical effects were considered fixed.

To test the effects of tide flow and average water depth during net soak, only those sets that fished entirely during a flood current or entirely during an ebb current and where average depth was measured were used in the initial chinook and sockeye salmon analysis (Appendix A1). The number of chinook salmon caught ranged from 0 to 9, with the majority of counts (78.1%) being zero. The number of sockeye salmon caught ranged from 0 to 859, with only 5.6% of the sets containing no fish. Because of small sample sizes, week 1 was combined with week 2 and week 6 was combined with week 7. Because of the large percentage of chinook salmon counts that were zero, use of the chi-square deviance test to assess goodness of fit was prohibited in the chinook salmon analysis. Model selection procedures described previously were used to identify the model that best fit the data.

VERTICAL DISTRIBUTION OF CATCH

To test the hypothesis that the vertical distribution of catches of chinook and sockeye salmon were not significantly affected by time, area, distance from shore, tide flow or average water depth during set, the proportion of chinook and sockeye salmon captured in the lower 1/3 of the net was calculated for each area, distance from shore, observed tidal flow and time increment as:

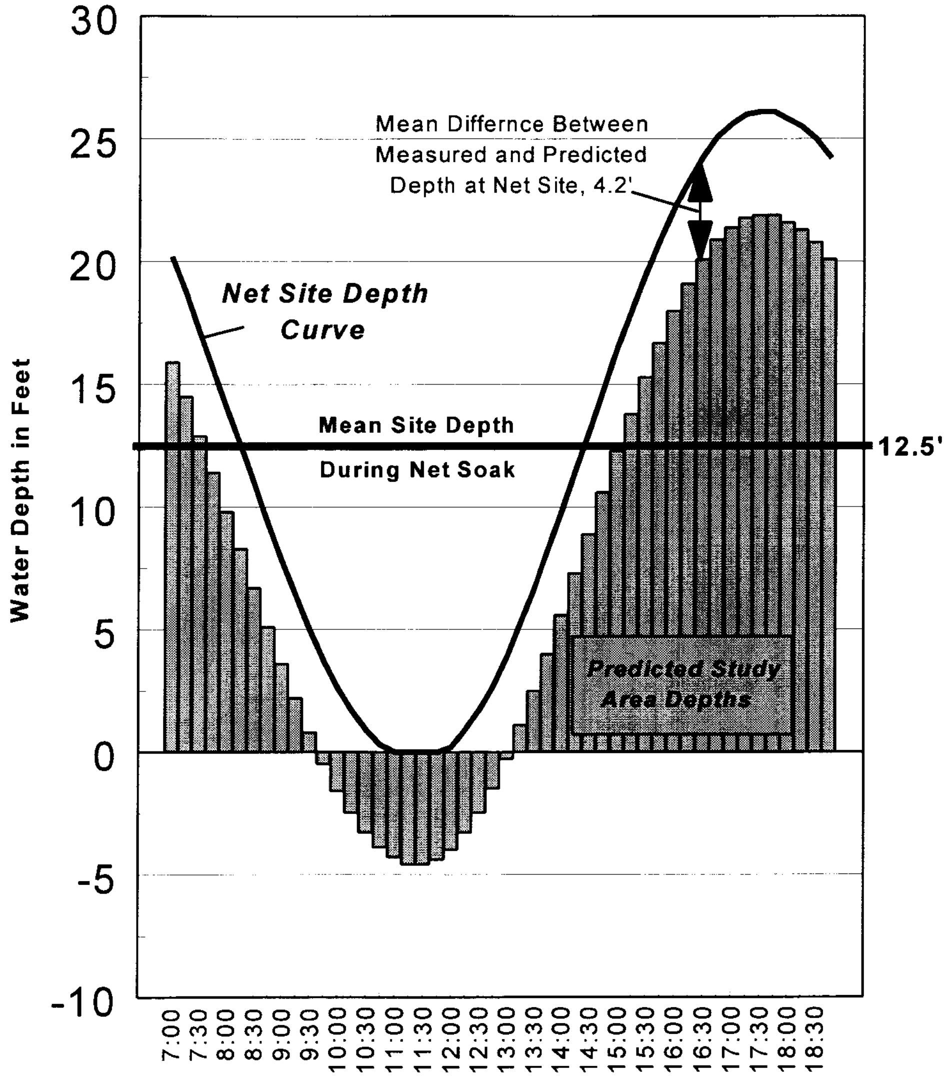
$$\hat{p} = \frac{x}{n}, \qquad \text{(Equation 3)}$$

where:

$\hat{p}$ = the proportion of chinook or sockeye salmon captured in the lower 1/3 of the net;

x = the number of chinook or sockeye salmon captured in the lower 1/3 of the net; and

n = the total number of chinook or sockeye salmon captured in the net for which the vertical location was known.



	Predicted Tide	Mean Difference Between Measured & Predicted	Net Site Water Depth
7:00	15.9	4.2	20.1
7:15	14.5	4.2	18.7
7:30	12.9	4.2	17.1
7:45	11.4	4.2	15.6
8:00	9.8	4.2	14.0
8:15	8.3	4.2	12.5
8:30	6.7	4.2	10.9
8:45	5.1	4.2	9.3
9:00	3.6	4.2	7.8
9:15	2.2	4.2	6.4
9:30	0.8	4.2	5.0
9:45	-0.5	4.2	3.7
10:00	-1.6	4.2	2.6
10:15	-2.5	4.2	1.7
10:30	-3.3	4.2	0.9
10:45	-3.9	4.2	0.3
11:00	-4.3	4.2	0.0
11:15	-4.6	4.2	0.0
11:30	-4.6	4.2	0.0
11:45	-4.4	4.2	0.0
12:00	-4.0	4.2	0.2
12:15	-3.3	4.2	0.9
12:30	-2.5	4.2	1.7
12:45	-1.5	4.2	2.7
13:00	-0.3	4.2	3.9
13:15	1.1	4.2	5.3
13:30	2.5	4.2	6.7
13:45	4.0	4.2	8.2
14:00	5.6	4.2	9.8
14:15	7.3	4.2	11.5
14:30	8.9	4.2	13.1
14:45	10.6	4.2	14.8
15:00	12.3	4.2	16.5
15:15	13.8	4.2	18.0
15:30	15.3	4.2	19.5
15:45	16.7	4.2	20.9
16:00	18.0	4.2	22.2
16:15	19.1	4.2	23.3
16:30	20.1	4.2	24.3
16:45	20.9	4.2	25.1
17:00	21.4	4.2	25.6
17:15	21.8	4.2	26.0
17:30	21.9	4.2	26.1
17:45	21.9	4.2	26.1
18:00	21.6	4.2	25.8
18:15	21.3	4.2	25.5
18:30	20.8	4.2	25.0
18:45	20.1	4.2	24.3
Mean Soak Depth			12.5

Figure 4.-Sample calculation of mean water depth during net soak showing predicted study area depths, predicted net site depths and mean depth at net site from 0700 hours through 1845 hours.

Table 8.-Minimum, maximum and average net site depths, adjusted relative to MLLW, by study area and distance from shore.

	Midshore			Offshore		
Area[a]	Mean	Minimum	Maximum	Mean	Minimum	Maximum
C	12.0	7.4	14.6			
B	17.1	17.1	17.1	25.7	21.6	26.9
A	11.1	-0.9	17.3	23.8	15.8	28.7
F	19.4	-4.9	33.1	30.9	25.0	36.1
E	22.2	7.0	40.5			
D	17.2	9.0	29.5			

[a] Depths in feet.

Logistic regression was used for hypothesis testing. The original model used for each species was:

$$\log\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_i^{W} + \beta_j^{A} + \beta_k^{D} + \beta_l^{T} + \beta_m^{M} + \beta_{ij}^{WA} +$$

$$\beta_{ik}^{WD} + \beta_{il}^{WT} + \beta_{im}^{WM} + \beta_{jk}^{AD} + \beta_{kl}^{DT} + \beta_{lm}^{TM}, \qquad \text{(Model 2.0)}$$

where:

α = constant

β_i^{W} = the effect of week i,

β_j^{A} = the effect of area j,

β_k^{D} = the effect of distance k,

β_l^{T} = the effect of tide flow l,

β_m^{M} = the effect of average water depth m,

β_{ij}^{WA} = the effect of week i and area j,

β_{ik}^{WD} = the effect of week i and distance k,

β_{il}^{WT} = the effect of week i and tide flow l,

β_{im}^{WM} = the effect of week i and average water depth m,

β_{jk}^{AD} = the effect of area j and distance k,

β_{kl}^{DT} = the effect of distance k and tide flow l, and

β_{lm}^{TM} = the effect of tide flow l and average water depth m.

All categorical effects were considered fixed.

To test the effects of time, area, distance from shore, tide flow and average water depth for a set, only those sets where nets were 45 meshes in depth which caught at least one chinook or one sockeye salmon, and the vertical location was known were used in the respective analyses. This excluded 1,537 sets from the chinook salmon analysis and 416 sets from the sockeye salmon analysis. The vertical location of capture was unknown for 2.8% of chinook and 5.4% of sockeye salmon. To test the effects of tide flow and average water depth, only those sets that fished entirely during a flood current or entirely during an ebb current and where average depth was computed, were used in the initial Model 2.0 analysis (Appendix A1). Small sample sizes forced combining data from different weeks. For the chinook salmon analysis, week 1 was combined with week 2 and weeks 4, 5, 6 and 7 were combined to yield a total of three time categories. For the sockeye salmon analysis, week 1 was combined with week 2 and week 6 was combined with week 7 to yield a total of 5 time categories.

To determine if 1/3 the chinook or sockeye salmon were captured in the lower 1/3 of the net, the following hypothesis was tested for each species while controlling for all significant effects from Model 2.0:

$$H_o\colon \hat{p} = \frac{1}{3}$$

$$H_a\colon \hat{p} > \frac{1}{3} \text{ for chinook salmon, and}$$

$$H_a\colon \hat{p} < \frac{1}{3} \text{ for sockeye salmon.}$$

CHINOOK SALMON RELEASE

Logistic regression was used to test the hypothesis that neither area, distance from shore, tide flow, average water depth during soak or time had a significant effect on the proportion of chinook salmon judged suitable for release. The original model used was:

$$\log\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_i^{W} + \beta_j^{A} + \beta_k^{D} + \beta_l^{T} + \beta_m^{M} + \beta_{ij}^{WA} +$$

$$\beta_{ik}^{WD} + \beta_{il}^{WT} + \beta_{im}^{WM} + \beta_{jk}^{AD} + \beta_{kl}^{DT} + \beta_{lm}^{TM}, \qquad \text{(Model 3.0)}$$

where:

α = constant

β_i^{W} = the effect of week i,

β_j^A = the effect of area j,

β_k^D = the effect of distance k,

β_l^T = the effect of tide flow l,

β_m^M = the effect of average water depth m,

β_{ij}^{WA} = the effect of week i and area j,

β_{ik}^{WD} = the effect of week i and distance k,

β_{il}^{WT} = the effect of week i and tide flow l,

β_{im}^{WM} = the effect of week i and average water depth m,

β_{jk}^{AD} = the effect of area j and distance k,

β_{kl}^{DT} = the effect of distance k and tide flow l, and

β_{lm}^{TM} = the effect of tide flow l and average water depth m.

All categorical effects were considered fixed.

To test the effects of time, area, distance from shore, tide flow and average water depth on the proportion of chinook salmon judged suitable for release, only those sets that caught at least one chinook salmon were used in the analysis. Additionally, to test the effects of tide flow and average water depth, only those sets that fished entirely during a flood or an ebb current and where average depth was computed were used in the initial Model 3.0 analysis (Appendix A1). Because of small sample sizes, sets from week 1 were combined with week 2 and sets from weeks 4, 5, 6 and 7 were combined to yield a total of 3 time categories.

The number of chinook salmon judged suitable for release was not recorded by vertical location of capture. As a result, only those nets where all of the chinook salmon were caught in one of the two vertical locations could be used to determine if the proportion of chinook salmon judged suitable for release was significantly different between the upper 2/3 and the lower 1/3 of nets (Appendix A1). Logistic regression was used to test the hypotheses:

$$\log\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_i^V, \qquad \text{(Model 3.1)}$$

where:

α = constant,

β_i^V = the effect of vertical location V (considered to be a fixed effect).

RESULTS

CATCH RATE ANALYSIS

Chinook Salmon

The mean catch rate for study nets from Salamatof Beach (0.36 chinook salmon per set) was greater than study nets from Kalifonsky Beach (0.25 chinook salmon per set) (Figure 5, Appendices B1, B2). The mean catch rate from midshore study nets was greatest (0.41 chinook salmon per set), followed by nearshore (0.23 chinook salmon per set), then offshore nets (0.15 chinook salmon per set) (Figure 6, Appendix B2). Mean catch rates from study nets varied considerably between weeks (Figure 7, Appendix B3).

From original Model 1.0, the influence of tide flow (flood, ebb) on catch rates of chinook salmon was found to be insignificant and the term was removed from the model. All sets where the duration of net soak spanned a period of slack tide were added back into the data set and model selection procedures continued (Appendix A1). The final reduced model describing the catch of chinook salmon was:

$$\log(m_{(ijk)n}) = \mu + \lambda_i^W + \lambda_j^A + \lambda_k^D + \lambda_{ij}^{WA} + \lambda_{jk}^{AD} + \varepsilon_{(ilk)n}\,. \qquad \text{(Model 1.1.C)}$$

Comparisons of goodness of fit criteria from the original Model 1.0 and the final reduced Model 1.1.C, showed little difference between the models (Table 9). Maximum likelihood estimates and associated standard errors are presented in Appendix A2. Likelihood ratio statistics showed significant interactions between the effects of area and week, and between area and distance from shore (Table 10). To better understand these interactions, the following model was run for each study area:

$$\log(m_{(ik)n}) = \mu + \lambda_i^W + \lambda_k^D + \varepsilon_{(ik)n}\,. \qquad \text{(Model 1.2.C)}$$

Model 1.2.C showed that on Salamatof Beach, in area E (where no offshore nets were sampled), chinook salmon catch rates from midshore nets were significantly greater than nearshore nets (Table 11, Figure 8). Although not statistically significant, catch rates from midshore nets in areas D and F were also greater than nearshore nets ($P = 0.092$ and 0.099 respectively, Table 11).

In area A on Kalifonsky Beach, catch rates of chinook salmon from midshore nets were significantly greater than near or offshore nets (Table 11, Figure 8). In area B, no significant differences in catch rates were found between near and midshore nets, however, both near and midshore nets caught significantly more chinook salmon than offshore nets (Table 11, Figure 8).

While not statistically significant, chinook salmon catch rates from area F on Salamatof Beach south to area C on Kalifonsky Beach were highest during week 3 of the study (Table 11, Figure 9). In the two most northern areas on Salamatof Beach (areas D and E), chinook salmon catch rates were highest during the combination of weeks 1 and 2.

Sockeye Salmon

For nets in the study, the mean sockeye salmon catch rate from Salamatof Beach (54.03 sockeye salmon per set) exceeded Kalifonsky Beach (12.55); mean catch rates from nearshore nets were greatest (52.89), followed by midshore (21.75), then offshore nets (9.95) (Appendix C2). Mean catch rates from all study areas on Salamatof Beach exceeded mean catch rates from all areas on

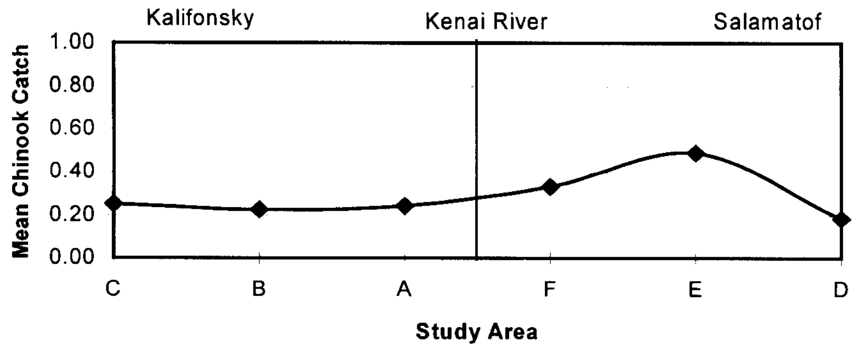


Figure 5.-Mean chinook salmon catch per set, by study area.

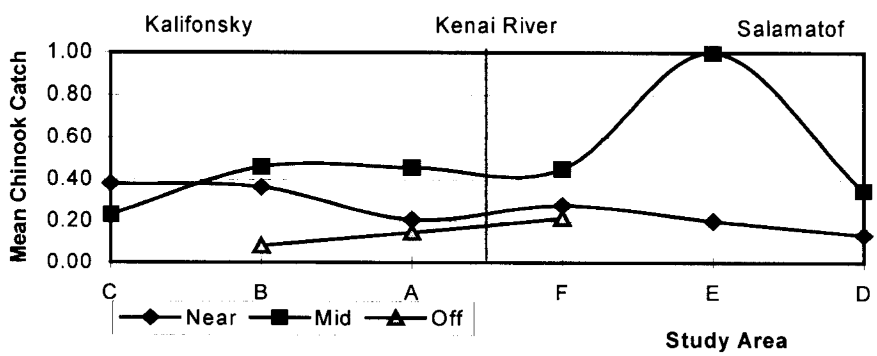


Figure 6.-Mean chinook salmon catch per set, by study area and distance from shore.

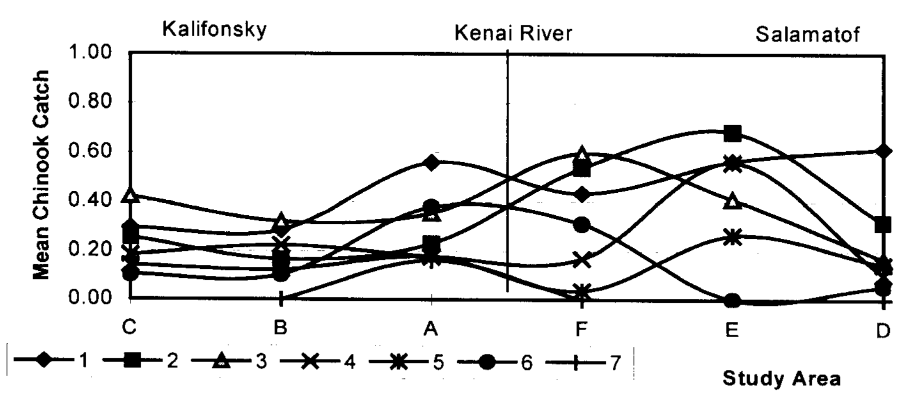


Figure 7.-Mean chinook salmon catch per set, by study area and week.

Table 9.-Comparison of goodness of fit criteria from the original (1.0) and the reduced (1.1.C) model describing chinook salmon catch rates.

Model	df	Deviance	$P>\chi^2$
Original Model 1.0	1,449	952.99	
Reduced Model 1.1.C	1,508	996.70	
Difference	59	43.71	0.932

Table 10.-Type III likelihood ratio statistics for determining significant effects in Model 1.1.C on chinook salmon catch rates.

Effect[a]	df	χ^2	$P>\chi^2$
Week	4	31.31	0.000
Area	5	5.89	0.317
Distance	2	37.23	0.000
Area*Week	20	35.59	0.017
Area*Distance	7	51.31	0.000

[a] Not adjusted for experiment-wise error rate.

Table 11.-Type III likelihood ratio statistics for determining significant effects in Model 1.2.C on chinook salmon catch rates within each study area.

Area	Effect[a]	df	χ^2	$P>\chi^2$
A	Week	4	7.85	0.097
	Distance	2	24.35	0.000
B	Week	4	3.66	0.453
	Distance	2	15.83	0.000
C	Week	4	13.90	0.008
	Distance	1	3.15	0.076
D	Week	4	7.81	0.099
	Distance	1	2.84	0.092
E	Week	4	15.37	0.004
	Distance	1	68.53	0.000
F	Week	4	29.97	0.000
	Distance	2	4.62	0.099

[a] Not adjusted for experiment-wise error rate.

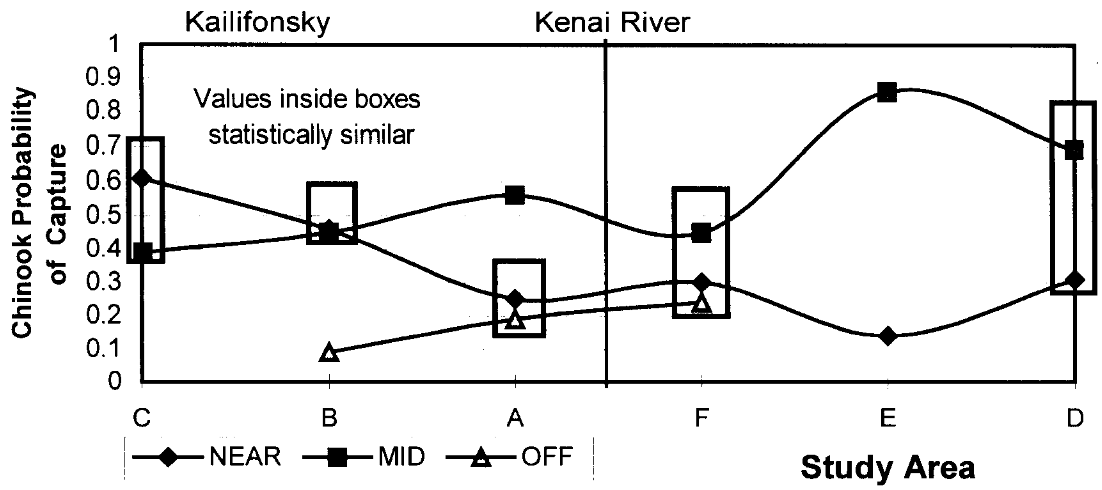


Figure 8.-Estimated probability of chinook salmon capture, near, mid and offshore distances from shore, by study area, chinook salmon model 1.2.C catch rate analysis.

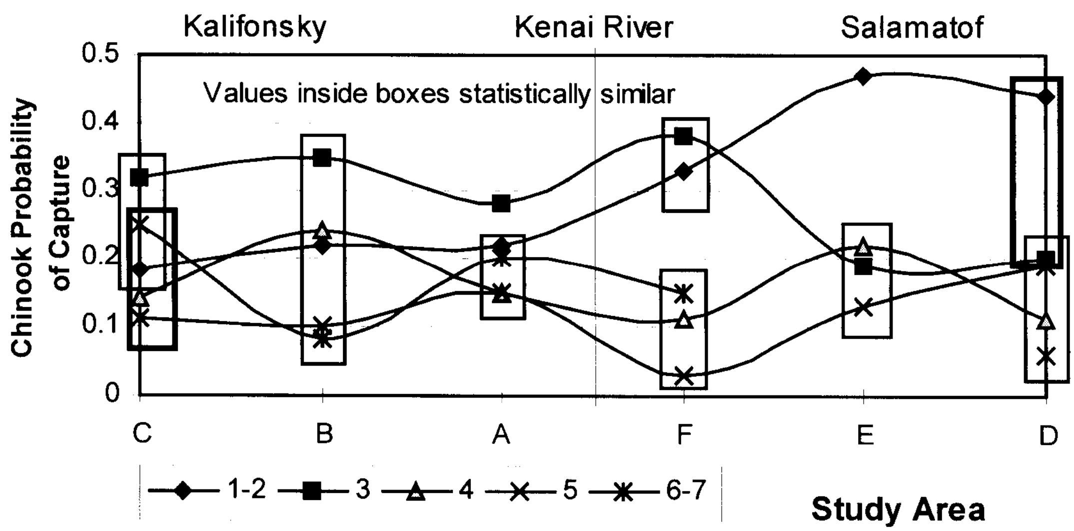


Figure 9.-Estimated chinook salmon probability of capture, by week and study area, chinook salmon model 1.2.C catch rate analysis.

Kalifonsky Beach (Figure 10, Appendix C2). Mean catch rates from nearshore study nets exceeded those from mid or offshore nets in all study areas except area E, on Salamatof Beach (Figure 11, Appendix C2). With the exception of area E on Salamatof Beach, the observed mean catch rates were largest during weeks 3, 4 and 5 (Figure 12, Appendix C1). On Kalifonsky Beach, observed peak catch rates were much smaller and varied considerably by week.

From the original Model 1.0, the influence of tide flow (flood, ebb) on catch rates of sockeye salmon was found to be insignificant and the term was removed from subsequent analyses. All sets in which the duration of the soak spanned a period of slack tide flow were added back into the data set. The range of catches in this modified data set remained from 0 to 859, with a slightly smaller percentage (4.9%) of the total number of net counts comprising counts of zero. After removal of all nonsignificant terms from Model 1.0, the final model describing sockeye salmon catch was:

$$\log(m_{ijklmn}) = \mu + \lambda_i^W + \lambda_j^A + \lambda_k^D + \lambda_m^M + \lambda_{ij}^{WA} + \lambda_{ik}^{WD} + \lambda_{jk}^{AD} + \varepsilon_{(ijklm)n}. \qquad \text{(Model 1.1.S)}$$

Because of the significant interactions of distance from shore with area and week, and the interaction of week with area on sockeye salmon catch rates, results were difficult to interpret (Table 12). The reduced Model 1.1.S fit the data well (Table 13) and all attempts to further simplify the model resulted in significant reductions in goodness of fit. Maximum likelihood estimates and associated standard errors are presented in Appendix A3. To clarify the effects of area and week, the following models were run for each week and study area respectively:

$$\log(m_{(jkm)n}) = \mu + \lambda_j^A + \lambda_k^D + \lambda_m^M + \lambda_{jk}^{AD} + \varepsilon_{(jkm)n}; \qquad \text{(Model 1.2.S)}$$

$$\log(m_{(ikm)n}) = \mu + \lambda_i^W + \lambda_k^D + \lambda_m^M + \lambda_{ik}^{WD} + \varepsilon_{(ikm)n}. \qquad \text{(Model 1.3.S)}$$

Models 1.2.S and 1.3.S continued to show a complex of interactions between variables (Table 14). The effect of average water depth during a set was occasionally significant, dependent upon week, area and distance from shore. Similar complex patterns existed for other variables. However, area proved significant during all weeks except week 2 (Model 1.2.S), and week proved significant in all areas (Model 1.3.S).

When one distance from shore was significantly greater than the other distances from shore, nearshore nets caught more sockeye salmon than nets from other distances from shore 93% of the time (Figure 13). When present, offshore nets caught fewer sockeye salmon than nets from near and midshore nets 92% of the time (statistically significant 38% of the time, Figure 13).

VERTICAL DISTRIBUTION OF CATCH

Chinook Salmon

In nearly all areas, weeks and distances from shore, the upper 2/3 of study nets caught more chinook salmon than the lower 1/3 of study nets (Appendices B8-B11). Appendix B summarizes observed chinook salmon catches during the study.

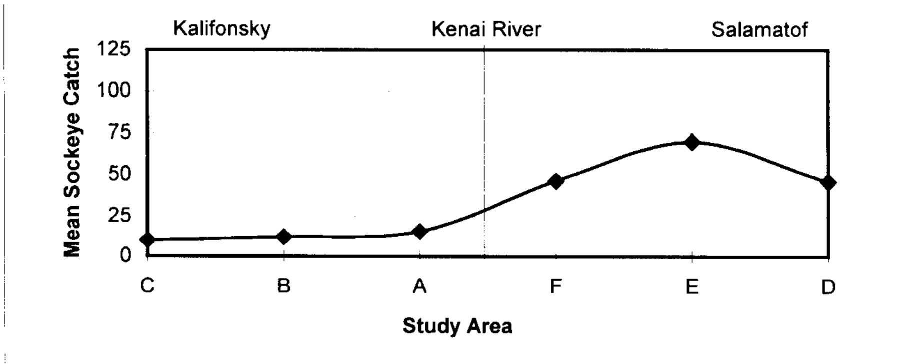


Figure 10.-Mean sockeye salmon catch per set, by study area.

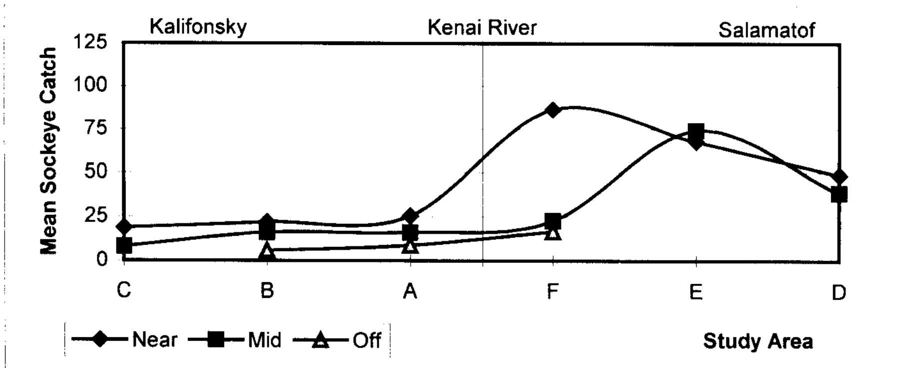


Figure 11.-Mean sockeye salmon catch per set, by study area and distance from shore.

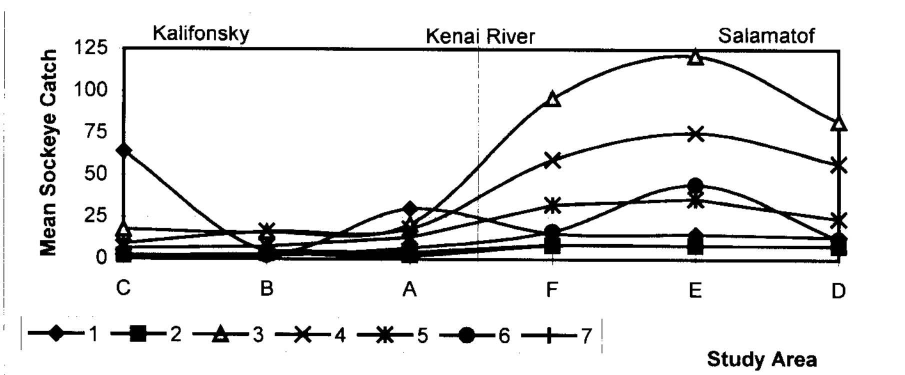


Figure 12.-Mean sockeye salmon catch per set, by study area and week.

Table 12.-Type III likelihood ratio statistics for determining significant effects in Model 1.1.S on sockeye salmon catch rates.

Effect[a]	df	χ^2	$P>\chi^2$
Week	6	455.18	0.000
Area	5	85.03	0.000
Distance	2	15.44	0.000
Avgdepth	1	17.27	0.000
Area*Week	28	117.89	0.000
Distance*Week	11	39.14	0.000
Area*Distance	7	89.46	0.000

[a] Not adjusted for experiment-wise error rate.

Model 2.0 showed that week, distance from shore, tide flow and average water depth during net soak did not significantly affect the proportion of chinook salmon caught in the lower 1/3 of nets. After re-introduction of data previously excluded (sets with missing average water depth and sets spanning a period of slack tide flow), a reduced model was fit to the data (Appendix A1). The final model used to describe the vertical distribution of chinook salmon was:

$$\log\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_j^A . \qquad \text{(Model 2.1.C)}$$

Goodness of fit statistics for Model 2.1.C showed that the model fit the data well (Table 15). Maximum likelihood estimates and associated standard errors are presented in Appendix A4. Model 2.1.C indicated that the proportion of chinook salmon caught in the lower 1/3 of nets was statistically uniform by time, tide flow, distance from shore and average water depth during net soak (Table 16), and with the exception of area E on Salamatof Beach, catches in the lower net were statistically uniform by area (Figure 14).

Table 13.-Evaluation criterion and statistics for goodness of fit, Model 1.1.S analysis, sockeye salmon catch rate analysis.

Criterion	df	Deviance	$P>\chi^2$
Deviance	1,737	1,616.4	0.931
Pearson χ^2	1,737	1,737.1	1.000

Table 14.-Effects from models 1.2.S and 1.3.S analyses, by source, sockeye salmon catch rate analysis.

Model 1.2.S					Model 1.3.S				
Week	Effect[a]	df	χ^2	$P>\chi^2$	Area	Effect[a]	df	χ^2	$P>\chi^2$
2	Area	5	0.95	0.967	A	Week	4	108.190	0.000
	Distance	2	11.42	0.003		Distance	2	25.990	0.000
	Avgdepth	1	0.36	0.550		Avgdepth	1	0.130	0.723
	Area*Distance	7	14.27	0.047		Distance*Week	7	32.230	0.000
3	Area	5	158.93	0.000	B	Week	4	48.000	0.000
	Distance	2	7.66	0.022		Distance	2	0.850	0.652
	Avgdepth	1	25.97	0.000		Avgdepth	1	1.420	0.234
	Area*Distance	7	19.73	0.006		Distance*Week	7	3.410	0.844
4	Area	5	158.93	0.000	C	Week	4	30.470	0.000
	Distance	2	7.66	0.022		Distance	1	0.020	0.897
	Avgdepth	1	25.97	0.000		Avgdepth	1	16.840	0.000
	Area*Distance	7	19.73	0.006		Distance*Week	4	6.790	0.148
5	Area	5	246.24	0.000	D	Week	4	108.100	0.000
	Distance	2	19.63	0.000		Distance	1	0.450	0.500
	Avgdepth	1	3.55	0.060		Avgdepth	1	2.810	0.094
	Area*Distance	6	57.62	0.000		Distance*Week	4	10.810	0.029
6	Area	5	57.38	0.000	E	Week	4	171.900	0.000
	Distance	2	1.11	0.573		Distance	1	31.340	0.000
	Avgdepth	1	6.38	0.012		Avgdepth	1	42.610	0.000
	Area*Distance	3	22.98	0.002		Distance*Week	3	5.120	0.163
					F	Week	4	307.970	0.000
						Distance	2	109.000	0.000
						Avgdepth	1	1.590	0.207
						Distance*Week	8	38.250	0.000

[a] Not adjusted for experiment-wise error rate.

With the exception of area E, all data used for the vertical distribution analysis were pooled and a standard one-sample proportion test was used to test the hypothesis that the proportion of chinook salmon caught in the lower 1/3 of the net was equal to 1/3. The sample proportion of the pooled data was 0.36 (SE = 0.03) which was not significantly different than 1/3 (Z = 0.97, P = 0.17, Table 17, Figure 14). In area E the proportion caught in the lower third was 0.14 (SE = 0.05, Table 17, Figure 14).

Sockeye Salmon

In nearly all areas, weeks and distances from shore, the upper 2/3 of study nets caught more sockeye salmon than the lower 1/3 of study nets (Appendices C8 to C11). Appendix C summarizes observed sockeye salmon catches during the study.

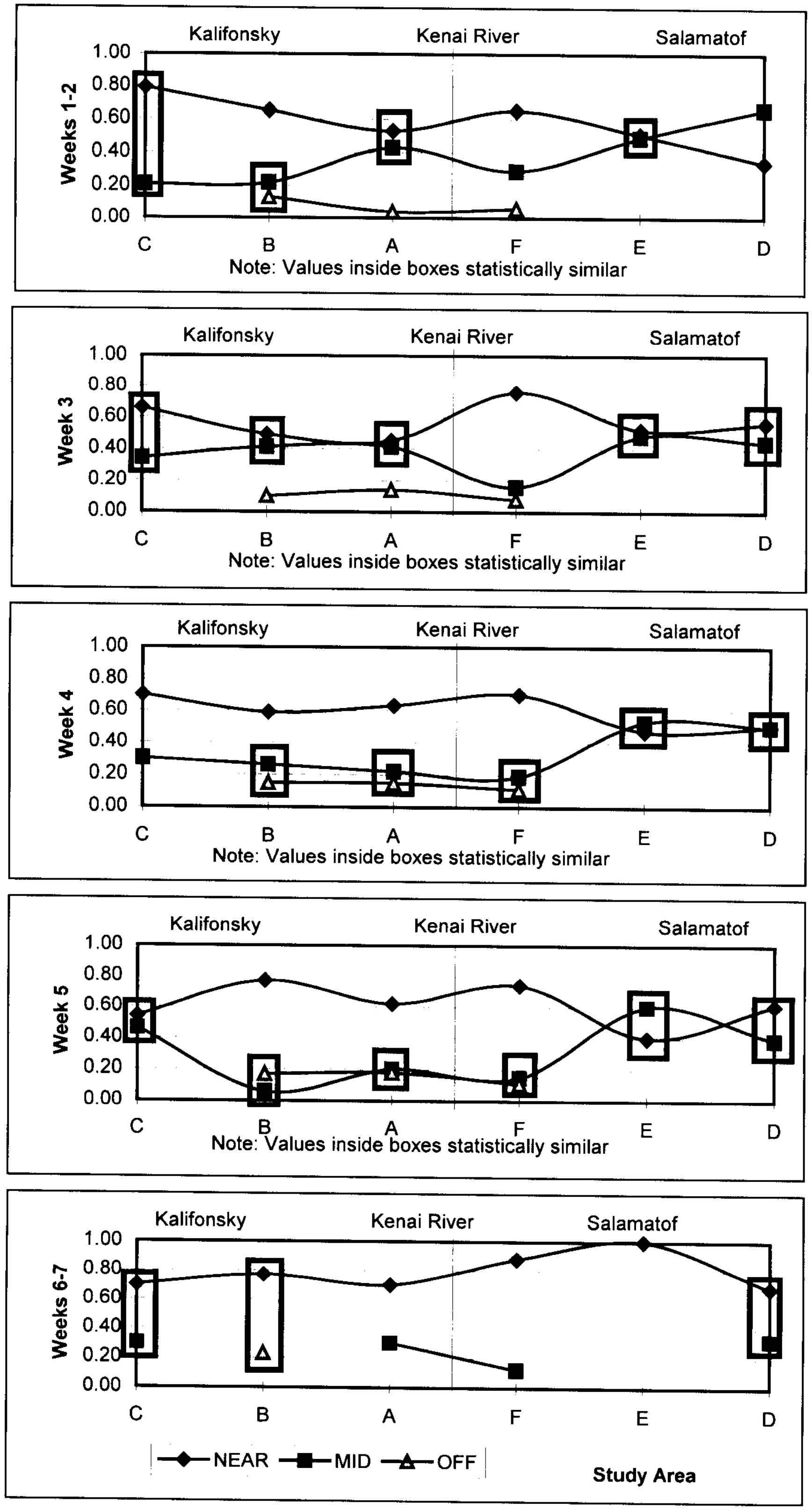


Figure 13.-Sockeye salmon probability of capture, by week, area and distance from shore.

Table 15.-Evaluation criterion and statistics for goodness of fit, Model 2.1.C chinook salmon vertical distribution analysis.

Criterion	df	Value	Value/df
Deviance	353	485.6	1.375
Pearson $\chi 2$	353	405.3	1.148

Table 16.-Effects from Model 2.1.C analysis, chinook salmon vertical distribution analysis.

Effect	df	$\chi 2$	P>$\chi 2$
Area (all areas)	5	32.81	0.000
Area (not including area E)	4	7.34	0.119

Model 2.0.S showed that neither week, tide flow or average water depth during net soak significantly affected the proportion of sockeye salmon caught in the lower 1/3 of nets. Data previously excluded (counts with missing average water depth and counts from nets spanning a period of slack tide flow) were added back into the data set (Appendix A1) and a multiplicative overdispersion factor was added to the model to improve fit (Agresti 1990, McCullagh and Nelder 1989). The final model used to describe the vertical distribution of sockeye salmon was:

$$\log\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_j^{A} + \beta_k^{D} + \beta_{jk}^{AD} + \varepsilon_{ij}. \qquad \text{(Model 2.1.S)}$$

Maximum likelihood estimates and associated standard errors for this model are presented in Appendix A5.

Model 2.1.S indicated that both area, distance from shore and their interaction significantly affected the proportion of sockeye salmon captured in the lower 1/3 of the set nets (Table 18). Offshore nets (when present) were found to always catch a significantly greater proportion of sockeye salmon in the lower 1/3 of nets than mid or nearshore nets (Figure 15). In areas A and C on Kalifonsky Beach, the proportion of sockeye salmon caught in the lower 1/3 of nets was significantly greater in midshore nets than in nearshore nets.

Because of the significant interaction between area and distance, the sample proportions from each area and distance from shore site were tested against 1/3. Except in area D, the catch of sockeye salmon in the lower third of near and midshore nets was significantly less than 1/3 (Table 19, Figure 15).

Table 17.-Proportion of chinook salmon caught in the lower 1/3 of study nets, by area and distance from shore and all areas pooled except area E.

Area	Distance	Sample Proportion	Standard Error
A	NEAR	0.25	0.09
A	MID	0.44	0.09
A	OFF	0.65	0.10
B	NEAR	0.64	0.15
B	MID	0.33	0.24
B	OFF	0.33	0.21
C	NEAR	0.40	0.13
C	MID	0.27	0.05
D	NEAR	0.25	0.13
D	MID	0.60	0.17
E	NEAR	0.07	0.05
E	MID	0.15	0.05
F	NEAR	0.28	0.11
F	MID	0.30	0.07
F	OFF	0.50	0.15
A-F	Pooled	0.36	0.03
E	Pooled	0.14	0.05

CHINOOK SALMON RELEASE

Of the 552 chinook salmon captured during the study, a total of 102, or 18.5% were judged suitable for release (Appendix D1). Overall, the proportion judged suitable for release was highest from offshore nets (28.3%), followed by nearshore (18.5%), and midshore nets (17.0%). A larger proportion was suitable for release from Salamatof (20.3%), than from Kalifonsky Beach (16.3%, see Appendix D2). The proportion found suitable for release ranged from 0.0% during week 7 to 20.0% during week 3 (Appendix D3). The respective proportion of chinook salmon captured during flood and ebb currents that were found suitable for release varied considerably by week on each beach (Appendices D4, D5). Overall, of the 210 chinook salmon captured during flood currents, 17.1% were suitable for release, and of the 259 captured during ebb currents, 19.7% were judged suitable for release (Appendices D6, D7).

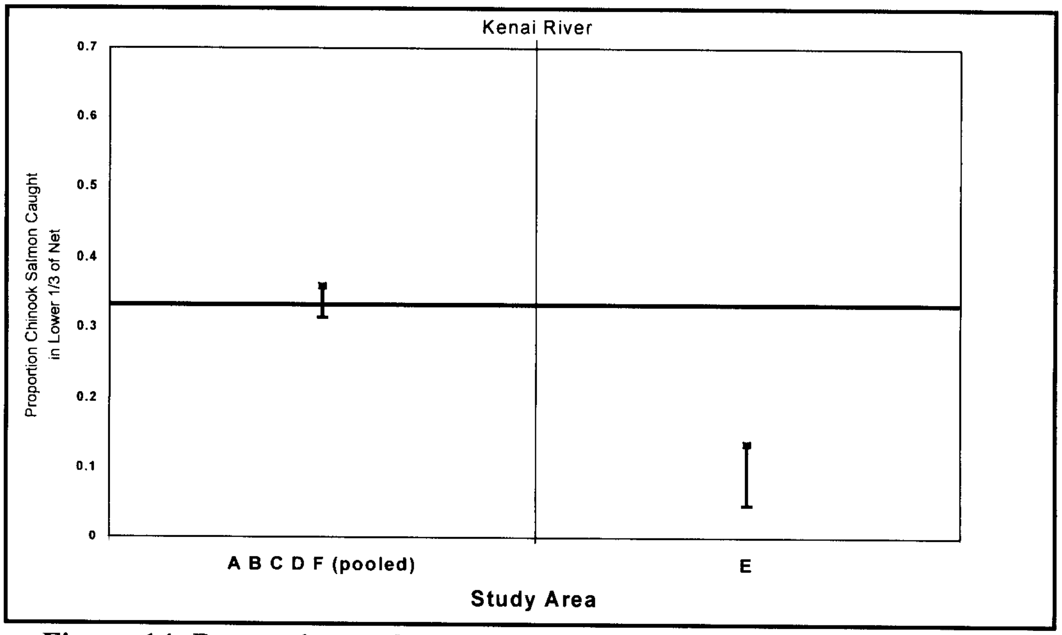


Figure 14.-Proportion and lower 95% confidence limit of chinook salmon caught in the lower 1/3 of nets, distances from shore pooled.

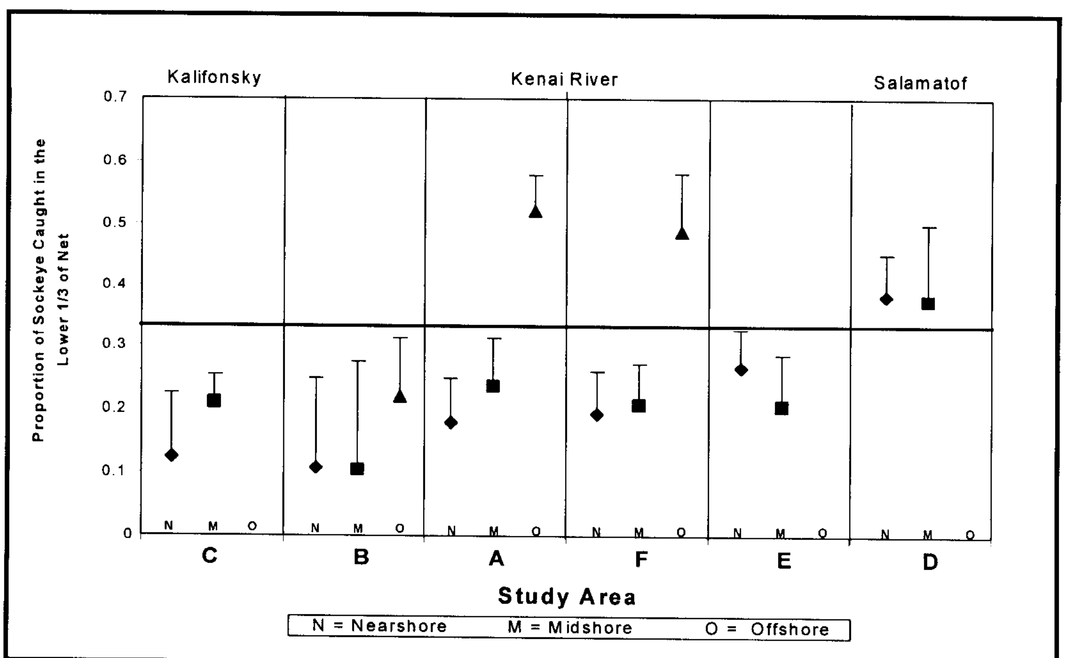


Figure 15.-Proportion and upper 95% confidence limit of sockeye salmon caught in lower 1/3 of nets by study area and distance from shore.

Table 18.-Effects from Model 2.1.S sockeye salmon vertical distribution analysis.

Effect	df	χ^2	P>χ2
Area	5	110.77	0.000
Distance	2	52.86	0.000
Area*Distance	7	24.15	0.001

Table 19.-Proportion of sockeye salmon caught in the lower 1/3 of study nets, by area and distance from shore.

Area	Distance	Sample Proportion	Standard Error
A	NEAR	0.18	0.03
A	MID	0.24	0.04
A	OFF	0.52	0.04
B	NEAR	0.11	0.06
B	MID	0.11	0.07
B	OFF	0.22	0.05
C	NEAR	0.12	0.04
C	MID	0.21	0.02
D	NEAR	0.38	0.04
D	MID	0.38	0.08
E	NEAR	0.27	0.03
E	MID	0.20	0.04
F	NEAR	0.19	0.03
F	MID	0.21	0.03
F	OFF	0.49	0.06

Model 3.0 fit the data reasonably well (Table 20). Model selection procedures did not result in further model simplification. Neither time, area, distance from shore, tide flow or average water depth during net soak significantly affected the proportion of chinook salmon judged suitable for release (Table 21). As a result, data from nets that fished during a changing tide and which had unknown water depth during net soak were allowed back in the analysis (Appendix A1).

Because of small sample sizes, net counts from week 1 were combined with week 2 and counts from weeks 4, 5, 6 and 7 were combined to yield a total of three time categories. Of the 469 chinook salmon in the analysis, 87, or 18.6% were suitable for release.

Model 3.1 was used to test for significant differences between the proportion of chinook salmon judged suitable for release in the upper 2/3 and lower 1/3 of set nets. Only those sets where all chinook salmon were captured entirely in one of the two vertical locations could be used in the analysis because vertical location of capture was not recorded for fish judged suitable for release (Appendix A1).

Model 3.1 found no significant difference between the proportion of chinook salmon suitable for release from the upper 2/3 and lower 1/3 of set nets (Table 22). In the analysis, of the 312 chinook salmon captured in the upper 2/3 of nets, 57, or 18.3% were found suitable for release; of the 119 captured in the lower 1/3 of nets, 22, or 18.5% were found suitable for release.

DISCUSSION

Catch rates indicated that both chinook and sockeye salmon catches varied significantly among weeks, areas and distances from shore. Sockeye salmon catches peaked strongly during the third week of the study with week being significant in all areas and during all weeks. Of importance is the relative magnitude of chinook and sockeye salmon catches throughout the duration of study. Relative catch rates suggest that chinook salmon catches are proportionately greater during the early and late weeks of the fishery (Figure 16).

The vertical distribution of chinook salmon catches was statistically uniform by time, distance from shore and with one exception, statistically uniform by area (Figure 14). Catches of sockeye salmon however, were disproportionately greater in the upper 2/3 of nets in near and midshore distances from shore (Figure 15). Further study of these observed harvest patterns is necessary to determine if they are common to the entire ESSN fishery, consistent between years and whether or not they provide a potential basis for formulating alternative management strategies.

Differences in relative catch rates among study areas and distances from shore do not appear to offer significant potential for reducing chinook salmon harvests. Harvest patterns of chinook and sockeye salmon were similar with respect to distance from shore, e.g. catches of both species were lowest in offshore areas. In general, midshore nets caught the most chinook salmon, followed by nearshore nets, whereas, sockeye salmon catches were generally greatest in nearshore nets, followed by midshore nets.

None of the variables tested were found to significantly affect the proportion of chinook salmon judged suitable for release. Overall, only 18.5% of all chinook salmon captured during the study were suitable for release. This proportion is similar to what many of the participating fishermen had expected prior to the study. Fishermen were not expected to release chinook salmon. The attitudes of fishermen regarding voluntary release of chinook salmon varied. Although not formally part of the study, variations in handling and treatment of captured chinook salmon by participating fishermen did not appear to affect the proportion found suitable for release. From informal observations, what appeared to be of importance was the duration of time that chinook salmon were caught in the net before removal. Those caught in the net for extended periods of time before a net pick appeared least likely to be judged suitable for release.

Table 20.-Evaluation criterion and statistics for goodness of fit, model 3.0 chinook salmon release analysis.

Criterion	df	Value	Value/df
Deviance	302	321.9	1.064
Pearson x^2	302	334.4	1.107

Table 21.-Effects from model 3.0 chinook salmon release analysis.

Effect	df	χ^2	$P>\chi2$
Week	2	4.40	0.111
Area	5	5.83	0.323
Distance	2	2.35	0.309
Tide flow	1	0.49	0.486
Area*Week	10	9.26	0.507
Distance*Week	4	8.02	0.091
Week*Tide flow	2	4.65	0.098
Area*Distance	7	9.51	0.218
Distance*Tide flow	2	1.11	0.574

Table 22.-Effects from model 3.1 chinook salmon release analysis, by vertical capture location.

Effect	df	χ^2	$P>\chi2$
Vertical	1	0.005	0.942

With few exceptions, neither average depth nor tide flow during net soak were found to significantly affect chinook or sockeye salmon harvests. In the case of tide flow, study findings partially contradict anecdotal information. One possible explanation is that the data do not reflect catches that occurred entirely during periods of slack current. Alternatively, the effects of tide flow may be localized, influenced by hydrographic features not detected or addressed by the study. In the case of average depth during set, all nearshore nets were assigned a mid net average depth of 1 fathom (6 feet). This was necessitated by the frequent movement of nearshore nets to

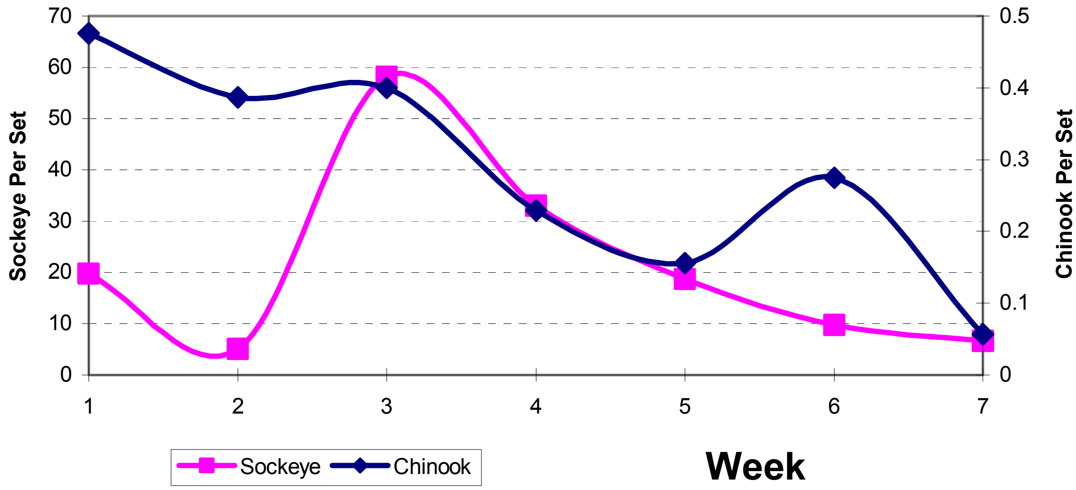


Figure 16.-Mean chinook and sockeye salmon catch per set, by week, Kalifonsky and Salamatof beaches combined.

coincide with changing water heights due to tidal fluctuations. Our inability to accurately measure average depth during set for inshore nets may have biased results from this analysis. Additional study is required to fully assess tidal influences on catches of chinook and sockeye salmon.

An assumption made in the study was that the nets of volunteer fishermen fished in the same manner as other nets in the same area, distance from shore, time and water depth. This assumption permitted extension of results from the actual nets studied to all nets within respective study areas. Critical to this assumption is whether or not fishermen volunteered because their catches of chinook salmon were less than catches of fishermen who did not volunteer for the study. Any bias resulting from use of volunteer fishermen could have reduced observed chinook salmon catches in study nets. Although our assumption could not be tested, the distribution of chinook salmon catch is most likely dependent on the behavior of fish within an area, distance from shore, etc., and is likely less dependent upon the net location(s) of volunteer fishermen within that area and distance from shore. Moreover, the ratio of sockeye to chinook salmon observed during the study (122 sockeye for each chinook salmon) was broadly comparable to preliminary catch figures reported on fish tickets for catches from Salamatof and Kalifonsky beaches (133 sockeye for each chinook salmon).

Sample coverage was only minimally adequate for some analyses. Sampling was not conducted in three of the six offshore areas (C, D, and E). The availability of participating fishermen varied considerably during the fishing season. Some participating fishermen began fishing later and ceased operations earlier, while others participated in the fishery during each commercial opening. Fishermen from offshore nets tended to start later and end earlier than those fishing nets nearer to shore. The combination of these factors limited the spatial and temporal extent of the overall data set.

In the study, the vertical location of catches was determined without use of a mark to clearly delineate the boundary between the upper 2/3 and lower 1/3 of nets. Errors associated with incorrectly assigning the vertical location of catches were likely to have been the same for both species and distributed fairly closely around the desired boundary. The practical implications of such errors are believed to be insufficient to materially affect the outcome of the analysis. However, additional studies, which employ clearly marked vertical boundaries, are necessary to verify and more accurately quantify apparent trends.

The relative abundance of chinook and sockeye salmon was crucial during the study. Observed catch rates of chinook salmon were low enough that it was difficult to detect differences in all cases. Of the 1,981 sets observed, 1,552, or 78.3% caught no chinook salmon. Consequently, future studies designed to quantify relative catch rates in the fishery will require intensive onsite sampling, higher levels of support and cooperation from fishermen and expanded levels of funding.

As conceived, the study was to have been a multiyear study. Results from this study were to provide the basis for recommending and designing future studies. It was not designed to directly suggest potential management or regulatory actions. The vertical distribution of catches of chinook and sockeye salmon appears to offer the best opportunity for minimizing chinook harvests while providing for smaller, proportional reductions in sockeye salmon harvests. It is the authors recommendation that any future allocative research focus on this aspect of the fishery and that such studies incorporate design considerations that address the limitations of the current study.

The study successfully demonstrated the potential for cooperation between the Alaska Department of Fish and Game and commercial fishermen for conducting research to help resolve divisive fisheries issues. Without the assistance and cooperation of participating fishermen, this study would not have been economically feasible. Both the level of participation within the fishing community and the degree of cooperation provided by participating fishermen demonstrates a willingness to assist the department in conducting research to identify ways to minimize chinook salmon harvests in the ESSN fishery.

Although the analytic models and results of this study were complex and somewhat problematic to present, the actual complexity of the ESSN fishery likely exceeds our present scientific modeling capability. Clear establishment of cause and effect relationships for the multitude of variables that influence harvest rates in the ESSN fishery would require both a long-term research commitment and unrealistic levels of annual funding. While additional allocation research designed to quantify vertical distributions of chinook and sockeye salmon in the ESSN fishery may help to resolve existing allocation differences, ultimately, a complete resolution may not be possible within the structure of existing management plans.

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We would like to particularly thank the many eastside set net fishermen who contributed their valuable time, efforts, assistance and cooperation during the course of the study. Without their assistance, this study would not have been possible. Many thanks to Messrs. Karl Kircher and Loren Flagg, of the Kenai Peninsula Fishermen’s Association, for their valuable suggestions and assistance during early design stages of the project. I would like to thank Charlie Stock and Dora

Sigurdsson of ADF&G, Sport Fish Division for their dedication and attention to operational details during field operations. Many thanks to our field technicians who willingly worked the unscheduled hours necessary for the study to succeed. Pat Hansen, study Biometrician and co-author of this report, deserves special recognition for her innovative approaches to the many difficulties encountered during data analysis and particularly for her contributions in adapting logistic regression to our data set. Many thanks to Bob Clark, Kelly Hepler, Doug McBride and Dave Nelson for their assistance and support. A special thanks to the CFM&D Regional and Area staff for their critique of operational plans and the draft report. The leadership of Paul Ruesch and Ken Tarbox provided inspiration throughout.

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APPENDIX A

Appendix A1.-Sample sizes and associated catches for catch rate, vertical distribution and chinook salmon release analyses, by analysis model.

		Chinook		Sockeye	
Analysis	**Model**	**No. Sets**	**No. Fish**	**No. Sets**	**No. Fish**
Catch Rate	1.0c[a]	1,547	469		
Catch Rate	1.0s[a]			1,547	52,920
Catch Rate	1.1c[b]	1,837	552		
Catch Rate	1.1s[b]			1,837	67,495
Catch Rate	1.2c[b]	1,834	552		
Catch Rate	1.2s[b]			1,837	67,495
Catch Rate	1.3s[b]			1,837	67,495
Vertical Distribution	2.0c[c]	300	410		
Vertical Distribution	2.0s[c]			1,421	48,124
Vertical Distribution	2.1c[d]	359	487		
Vertical Distribution	2.1s[d]			1,699	60,814
Chinook Release	3.0[e]	338	469		
Chinook Release	3.1[f]	340	431		

[a] Model 1.0.C, 1.0.S. Samples drawn from master data set (Table 5), includes those sets that fished either entirely during a flood current or entirely during an ebb current for which average depth during set was known.

[b] Models 1.1.C, 1.1.S, 1.2.C, 1.2.S, 1.3.S. Samples drawn from master data set (Table 5), includes those sets for which average depth during set was unknown and sets that spanned a period of slack tide flow.

[c] Models 2.0.C, 2.0.S. Samples drawn from master data set (Table 5); includes only nets 45 meshes in depth and sets that captured at least 1 chinook or 1 sockeye salmon for which the vertical location was known; and sets where the vertical capture location was known; and sets that fished either entirely during a flood current or entirely during an ebb current; and from sets for which average depth during set was known.

[d] Models 2.1.C, 2.1.S. Sample drawn from master data set (Table 5). Includes only nets 45 meshes in depth and sets that captured at least 1 chinook or 1 sockeye salmon for which the vertical location was known. Sets that spanned a period of slack tide flow and sets for which average depth during set was unknown were reintroduced.

[e] Model 3.0. Sample drawn from master data set (Table 5). Includes only those sets that caught at least 1 chinook salmon.

[f] Model 3.1. Sample drawn from master data set (Table 5). Includes only those sets where all of the chinook salmon were caught in one of the two vertical locations.

Appendix A2.-Maximum likelihood estimates and associated standard errors, reduced model 1.1.C analysis, chinook salmon catch rate analysis.

Parameter	Level 1	Level 2	df	Estimate	Std Error	χ2	P-value
Intercept			1	-2.85	0.41	47.89	0.000
Week	2		1	0.82	0.33	6.29	0.012
Week	3		1	0.96	0.33	8.39	0.004
Week	4		1	-0.26	0.37	0.50	0.481
Week	5		1	-1.74	1.05	2.72	0.099
Week	6		0	0.00	0.00		
Area	A		1	-0.02	0.57	0.00	0.972
Area	B		1	-1.78	1.21	2.18	0.140
Area	C		1	0.91	0.46	3.92	0.048
Area	D		1	-1.60	1.07	2.25	0.134
Area	E		1	-20.22	1.11	331.60	0.000
Area	F		0	0.00	0.00		
Distance	Mid		1	0.61	0.32	3.66	0.056
Distance	Near		1	0.21	0.34	0.37	0.544
Distance	Off		0	0.00	0.00		
Area*Week	A	2	1	-0.71	0.54	1.76	0.184
Area*Week	A	3	1	-0.63	0.51	1.56	0.212
Area*Week	A	4	1	-0.07	0.53	0.02	0.890
Area*Week	A	5	1	1.44	1.17	1.51	0.219
Area*Week	A	6	0	0.00	0.00		
Area*Week	B	2	1	0.23	1.21	0.04	0.851
Area*Week	B	3	1	0.55	1.19	0.21	0.645
Area*Week	B	4	1	1.40	1.17	1.43	0.232
Area*Week	B	5	1	2.00	1.82	1.20	0.273
Area*Week	B	6	0	0.00	0.00		
Area*Week	C	2	1	-1.12	0.52	4.60	0.032
Area*Week	C	3	1	-0.71	0.47	2.26	0.132
Area*Week	C	4	1	-0.30	0.50	0.37	0.545
Area*Week	C	5	1	0.91	1.15	0.63	0.428
Area*Week	C	6	0	0.00	0.00		
Area*Week	D	2	1	1.23	1.11	1.22	0.269
Area*Week	D	3	1	0.27	1.14	0.06	0.809
Area*Week	D	4	1	0.96	1.18	0.66	0.417
Area*Week	D	5	1	2.90	1.65	3.11	0.078
Area*Week	D	6	0	0.00	0.00		
Area*Week	E	2	1	20.03	1.12	317.80	0.000
Area*Week	E	3	1	18.96	1.12	286.75	0.000
Area*Week	E	4	1	20.36	1.12	328.38	0.000
Area*Week	E	5	0	21.27	0.00		
Area*Week	E	6	0	0.00	0.00		
Area*Week	F	2	0	0.00	0.00		
Area*Week	F	3	0	0.00	0.00		
Area*Week	F	4	0	0.00	0.00		
Area*Week	F	5	0	0.00	0.00		
Area*Week	F	6	0	0.00	0.00		
Area*Distance	A	MID	1	0.51	0.41	1.59	0.207
Area*Distance	A	NEAR	1	0.12	0.45	0.07	0.790
Area*Distance	A	OFF	0	0.00	0.00		
Area*Distance	B	MID	1	0.99	0.64	2.43	0.119
Area*Distance	B	NEAR	1	1.45	0.64	5.06	0.025
Area*Distance	B	OFF	0	0.00	0.00		
Area*Distance	C	MID	1	-0.86	0.35	6.26	0.012
Area*Distance	C	NEAR	0	0.00	0.00		
Area*Distance	D	MID	1	0.41	0.47	0.79	0.376
Area*Distance	D	NEAR	0	0.00	0.00		
Area*Distance	E	MID	1	1.42	0.33	18.52	0.000
Area*Distance	E	NEAR	0	0.00	0.00		
Area*Distance	F	MID	0	0.00	0.00		
Area*Distance	F	NEAR	0	0.00	0.00		
Area*Distance	F	OFF	0	0.00	0.00		

Appendix A3.-Maximum likelihood estimates and associated standard errors, reduced models 1.1.S analysis, sockeye salmon catch rate analysis.

Parameter	Level 1	Level 2	df	Estimate	Std Error	$\chi2$	P-value
WEEK	1		1	0.19	1.10	0.03	0.863
WEEK	2		1	-0.35	0.83	0.18	0.675
WEEK	3		1	2.65	0.82	10.52	0.001
WEEK	4		1	2.50	0.81	9.53	0.002
WEEK	5		1	1.84	0.84	4.82	0.028
WEEK	6		1	1.05	0.31	11.47	0.001
WEEK	7		0	0.00	0.00		
AREA	A		1	-0.39	0.43	0.83	0.363
AREA	B		1	-0.40	0.83	0.23	0.633
AREA	C		1	-1.04	0.27	14.22	0.000
AREA	D		1	-0.86	0.65	1.72	0.189
AREA	E		1	0.30	0.57	0.28	0.599
AREA	F		0	0.00	0.00		
DISTANCE	MID		1	0.13	0.91	0.02	0.888
DISTANCE	NEAR		1	1.19	0.79	2.26	0.133
DISTANCE	OFF		0	0.00	0.00		
AVGDEPTH			1	-0.02	0.00	17.48	0.000
AREA*WEEK	A	1	1	1.26	0.58	4.67	0.031
AREA*WEEK	A	2	1	0.14	0.45	0.10	0.749
AREA*WEEK	A	3	1	-0.76	0.42	3.21	0.073
AREA*WEEK	A	4	1	-0.31	0.42	0.55	0.459
AREA*WEEK	A	5	1	-0.19	0.47	0.16	0.692
AREA*WEEK	A	6	1	-0.07	0.46	0.02	0.876
AREA*WEEK	A	7	0	0.00	0.00		
AREA*WEEK	B	1	1	0.69	1.10	0.39	0.532
AREA*WEEK	B	2	1	0.49	0.86	0.32	0.571
AREA*WEEK	B	3	1	-0.69	0.84	0.68	0.411
AREA*WEEK	B	4	1	-0.44	0.82	0.29	0.591
AREA*WEEK	B	5	1	-0.95	0.89	1.13	0.288
AREA*WEEK	B	6	1	-0.87	0.95	0.84	0.361
AREA*WEEK	B	7	0	0.00	0.00		
AREA*WEEK	C	1	1	2.04	0.48	18.16	0.000
AREA*WEEK	C	2	1	-0.16	0.32	0.23	0.631
AREA*WEEK	C	3	1	-0.81	0.29	8.00	0.005
AREA*WEEK	C	4	1	-0.89	0.27	11.10	0.001
AREA*WEEK	C	5	1	-0.41	0.39	1.09	0.297
AREA*WEEK	C	6	0	0.00	0.00		
AREA*WEEK	D	1	1	0.33	0.74	0.19	0.661
AREA*WEEK	D	2	1	0.08	0.71	0.01	0.916
AREA*WEEK	D	3	1	-0.18	0.68	0.07	0.794
AREA*WEEK	D	4	1	0.00	0.68	0.00	0.996
AREA*WEEK	D	5	1	-0.03	0.74	0.00	0.968
AREA*WEEK	D	6	1	0.10	0.71	0.02	0.890
AREA*WEEK	D	7	0	0.00	0.00		
AREA*WEEK	E	1	1	-0.66	0.66	1.00	0.318
AREA*WEEK	E	2	1	-1.10	0.61	3.22	0.073
AREA*WEEK	E	3	1	-0.88	0.60	2.18	0.140
AREA*WEEK	E	4	1	-0.86	0.59	2.07	0.150
AREA*WEEK	E	5	1	-0.93	0.64	2.08	0.149
AREA*WEEK	E	6	0	0.00	0.00		
AREA*WEEK	F	1	0	0.00	0.00		
AREA*WEEK	F	2	0	0.00	0.00		
AREA*WEEK	F	3	0	0.00	0.00		
AREA*WEEK	F	4	0	0.00	0.00		
AREA*WEEK	F	5	0	0.00	0.00		
AREA*WEEK	F	6	0	0.00	0.00		
AREA*WEEK	F	7	0	0.00	0.00		
DISTANCE*WEEK	MID	1	1	1.49	1.17	1.62	0.203
DISTANCE*WEEK	MID	2	1	0.80	0.92	0.75	0.386
DISTANCE*WEEK	MID	3	1	0.49	0.90	0.29	0.588
DISTANCE*WEEK	MID	4	1	0.04	0.90	0.00	0.964
DISTANCE*WEEK	MID	5	1	0.01	0.94	0.00	0.992
DISTANCE*WEEK	MID	6	1	-0.47	0.51	0.84	0.360
DISTANCE*WEEK	MID	7	0	0.00	0.00		
DISTANCE*WEEK	NEAR	1	1	0.34	1.04	0.11	0.742
DISTANCE*WEEK	NEAR	2	1	0.88	0.79	1.26	0.261
DISTANCE*WEEK	NEAR	3	1	0.38	0.77	0.25	0.617
DISTANCE*WEEK	NEAR	4	1	-0.01	0.76	0.00	0.990
DISTANCE*WEEK	NEAR	5	1	-0.12	0.79	0.02	0.877
DISTANCE*WEEK	NEAR	6	0	0.00	0.00		
DISTANCE*WEEK	NEAR	7	0	0.00	0.00		
DISTANCE*WEEK	OFF	1	0	0.00	0.00		
DISTANCE*WEEK	OFF	2	0	0.00	0.00		
DISTANCE*WEEK	OFF	3	0	0.00	0.00		
DISTANCE*WEEK	OFF	4	0	0.00	0.00		
DISTANCE*WEEK	OFF	5	0	0.00	0.00		
DISTANCE*WEEK	OFF	6	0	0.00	0.00		
AREA*DISTANCE	A	MID	1	0.07	0.19	0.14	0.704
AREA*DISTANCE	A	NEAR	1	-0.47	0.19	5.95	0.015
AREA*DISTANCE	A	OFF	0	0.00	0.00		
AREA*DISTANCE	B	MID	1	0.14	0.29	0.23	0.629
AREA*DISTANCE	B	NEAR	1	-0.53	0.29	3.40	0.065
AREA*DISTANCE	B	OFF	0	0.00	0.00		
AREA*DISTANCE	C	MID	1	0.43	0.19	5.27	0.022
AREA*DISTANCE	C	NEAR	0	0.00	0.00		
AREA*DISTANCE	D	MID	1	1.49	0.23	42.20	0.000
AREA*DISTANCE	D	NEAR	0	0.00	0.00		
AREA*DISTANCE	E	MID	1	1.42	0.18	61.51	0.000
AREA*DISTANCE	E	NEAR	0	0.00	0.00		
AREA*DISTANCE	F	MID	0	0.00	0.00		
AREA*DISTANCE	F	NEAR	0	0.00	0.00		
AREA*DISTANCE	F	OFF	0	0.00	0.00		

Appendix A4.-Maximum likelihood estimates and associated standard errors, reduced model 2.1.C analysis, chinook salmon vertical distribution analysis.

Parameter	Level 1	df	Estimate	Standard Error	$\chi 2$	P-value
AREA	A	1	0.58	0.30	3.83	0.050
AREA	B	1	0.68	0.46	2.11	0.147
AREA	C	1	-0.09	0.29	0.09	0.761
AREA	D	1	0.29	0.45	0.42	0.518
AREA	E	1	-1.09	0.33	11.24	0.001
AREA	F	0	0.00	0.00		

Appendix A5.-Maximum likelihood estimates and associated standard errors, reduced model 2.1.S sockeye salmon vertical distribution analysis.

Parameter	Level 1	Level 2	df	Estimate	Std. Error	$\chi2$	P-value
AREA	A		1	0.12	0.20	0.40	0.528
AREA	B		1	-1.23	0.34	12.94	0.000
AREA	C		1	-0.54	0.24	5.01	0.025
AREA	D		1	0.95	0.10	87.55	0.000
AREA	E		1	0.42	0.09	20.65	0.000
AREA	F		0	0.00	0.00		
DISTANCE	MID		1	-1.30	0.19	48.70	0.000
DISTANCE	NEAR		1	-1.38	0.16	70.16	0.000
DISTANCE	OFF		0	0.00	0.00		
AREA*DISTANCE	A	MID	1	0.08	0.27	0.08	0.778
AREA*DISTANCE	A	NEAR	1	-0.23	0.25	0.87	0.351
AREA*DISTANCE	A	OFF	0	0.00	0.00		
AREA*DISTANCE	B	MID	1	0.44	0.60	0.55	0.459
AREA*DISTANCE	B	NEAR	1	0.53	0.49	1.20	0.273
AREA*DISTANCE	B	OFF	0	0.00	0.00		
AREA*DISTANCE	C	MID	1	0.55	0.29	3.64	0.056
AREA*DISTANCE	C	NEAR	0	0.00	0.00		
AREA*DISTANCE	D	MID	1	-0.11	0.21	0.28	0.600
AREA*DISTANCE	D	NEAR	0	0.00	0.00		
AREA*DISTANCE	E	MID	1	-0.43	0.17	6.81	0.009
AREA*DISTANCE	E	NEAR	0	0.00	0.00		
AREA*DISTANCE	F	MID	0	0.00	0.00		
AREA*DISTANCE	F	NEAR	0	0.00	0.00		
AREA*DISTANCE	F	OFF	0	0.00	0.00		

APPENDIX B

Appendix B1.-Observed mean chinook salmon catch per set with 95% confidence limits, by beach, study area, week and distance from shore.

			Near				Mid				Off				Distances From Shore Com		
Beach	Area	Week	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL
Kalifonsky	A	1	3	0.351	0.000	1.000	3	1.007	0.000	2.000	1	0.000	0.000	0.000	7	0.582	0.000
Kalifonsky	A	2	13	0.079	0.000	0.231	13	0.383	0.077	0.769	34	0.235	0.088	0.382	60	0.233	0.067
Kalifonsky	A	3	30	0.270	0.100	0.467	31	0.525	0.258	0.871	50	0.304	0.160	0.460	111	0.357	0.171
Kalifonsky	A	4	40	0.200	0.075	0.350	49	0.405	0.245	0.612	107	0.065	0.019	0.112	196	0.178	0.087
Kalifonsky	A	5	19	0.212	0.000	0.474	8	0.378	0.000	0.750	19	0.052	0.000	0.158	46	0.175	0.000
Kalifonsky	A	6	15	0.266	0.067	0.467	12	0.500	0.083	1.000	0				27	0.370	0.074
Kalifonsky	A	7	10	0.096	0.000	0.300	2	0.495	0.000	1.000	0				12	0.162	0.000
Kalifonsky	B	1	1	1.000	1.000	1.000					6	0.171	0.000	0.500	7	0.289	0.143
Kalifonsky	B	2	5	0.393	0.000	0.800	4	0.262	0.000	0.750	9	0.000	0.000	0.000	18	0.167	0.000
Kalifonsky	B	3	5	0.385	0.000	0.800	8	0.741	0.250	1.250	18	0.114	0.000	0.278	31	0.319	0.065
Kalifonsky	B	4	12	0.420	0.167	0.750	11	0.363	0.091	0.636	30	0.100	0.000	0.233	53	0.227	0.057
Kalifonsky	B	5	4	0.238	0.000	0.750	1	0.000	0.000	0.000	3	0.000	0.000	0.000	8	0.119	0.000
Kalifonsky	B	6	4	0.247	0.000	0.750					6	0.000	0.000	0.000	10	0.099	0.000
Kalifonsky	B	7	2	0.000	0.000	0.000					0				2	0.000	0.000
Kalifonsky	C	1	3	0.683	0.000	2.000	4	0.000	0.000	0.000	0				7	0.293	0.000
Kalifonsky	C	2	10	0.616	0.000	1.400	37	0.164	0.054	0.297	0				47	0.260	0.043
Kalifonsky	C	3	16	0.372	0.125	0.688	74	0.432	0.284	0.581	0				90	0.421	0.256
Kalifonsky	C	4	23	0.169	0.000	0.391	168	0.185	0.125	0.256	0				191	0.183	0.110
Kalifonsky	C	5	8	0.246	0.000	0.500	48	0.124	0.021	0.250	0				56	0.141	0.018
Kalifonsky	C	6	6	0.839	0.167	1.667	43	0.255	0.140	0.372	0				49	0.326	0.143
Kalifonsky	C	7	0				0				0				0		
Salamatof	D	1	10	0.402	0.100	0.700	3	1.331	1.000	2.000	0				13	0.617	0.308
Salamatof	D	2	14	0.145	0.000	0.357	8	0.619	0.125	1.250	0				22	0.318	0.045
Salamatof	D	3	38	0.161	0.026	0.368	10	0.197	0.000	0.500	0				48	0.169	0.021
Salamatof	D	4	34	0.058	0.000	0.147	13	0.229	0.000	0.462	0				47	0.105	0.000
Salamatof	D	5	12	0.166	0.000	0.500	2	0.000	0.000	0.000	0				14	0.143	0.000
Salamatof	D	6	14	0.068	0.000	0.214	4	0.000	0.000	0.000	0				18	0.053	0.000
Salamatof	D	7	3	0.000	0.000	0.000					0				3	0.000	0.000
Salamatof	E	1	15	0.329	0.067	0.667	1	4.000	4.000	4.000	0				16	0.558	0.313
Salamatof	E	2	29	0.392	0.103	0.759	11	1.457	0.636	2.455	0				40	0.685	0.250
Salamatof	E	3	49	0.180	0.061	0.306	29	0.799	0.483	1.138	0				78	0.410	0.218
Salamatof	E	4	50	0.183	0.060	0.300	46	0.978	0.652	1.326	0				96	0.564	0.344
Salamatof	E	5	23	0.000	0.000	0.000	10	0.896	0.200	1.700	0				33	0.271	0.061
Salamatof	E	6	3	0.000	0.000	0.000					0				3	0.000	0.000
Salamatof	E	7									0				0		
Salamatof	F	1	17	0.237	0.000	0.647	11	0.726	0.182	1.545	0				28	0.429	0.071
Salamatof	F	2	23	0.829	0.391	1.348	25	0.398	0.160	0.640	7	0.144	0.000	0.429	55	0.546	0.236
Salamatof	F	3	22	0.227	0.045	0.455	37	0.860	0.568	1.162	21	0.514	0.238	0.810	80	0.595	0.338
Salamatof	F	4	38	0.189	0.053	0.395	45	0.197	0.067	0.356	36	0.109	0.028	0.222	119	0.168	0.050
Salamatof	F	5	9	0.000	0.000	0.000	7	0.142	0.000	0.429	12	0.000	0.000	0.000	28	0.035	0.000
Salamatof	F	6	27	0.217	0.037	0.407	24	0.404	0.083	0.792					51	0.305	0.059
Salamatof	F	7	12	0.000	0.000	0.000	5	0.000	0.000	0.000					17	0.000	0.000
All Areas & Weeks			671	0.233	0.057	0.463	807	0.411	0.209	0.646	359	0.147	0.053	0.262	1,837	0.295	0.123

Note: Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix B2.-Observed mean chinook salmon catch per set with 95% confidence limits, all weeks combined, by beach, study area and distance from shore.

		Near				Mid				Off				Distances From Shore Com		
Beach	Area	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL
Kalifonsky	A	130	0.209	0.054	0.408	118	0.459	0.186	0.788	211	0.148	0.062	0.242	459	0.245	0.092
Kalifonsky	B	33	0.360	0.091	0.727	24	0.457	0.125	0.833	72	0.084	0.000	0.208	129	0.224	0.047
Kalifonsky	C	66	0.380	0.045	0.818	374	0.230	0.136	0.334	0				440	0.252	0.123
Kalifonsky Combined		229	0.280	0.057	0.572	516	0.293	0.147	0.461	283	0.131	0.046	0.233	1,028	0.246	0.099
Salamatof	D	125	0.137	0.016	0.320	40	0.347	0.100	0.675	0				165	0.188	0.036
Salamatof	E	169	0.203	0.059	0.367	97	1.001	0.588	1.464	0				266	0.494	0.252
Salamatof	F	148	0.278	0.088	0.527	154	0.450	0.208	0.740	76	0.207	0.079	0.368	378	0.334	0.135
Salamatof Combined		442	0.209	0.057	0.407	291	0.620	0.320	0.973	76	0.207	0.079	0.368	809	0.357	0.153
Beaches Combined		671	0.233	0.057	0.463	807	0.411	0.209	0.646	359	0.147	0.053	0.262	1,837	0.295	0.123

Note: Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix B3.-Observed mean chinook salmon catch per set with 95% confidence limits, by beach, week and distance from shore.

		Near				Mid				Off				Distances From Shore Combined			
Beach	Week	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL
Kalifonsky	1	7	0.586	0.143	1.429	7	0.432	0.000	0.857	7	0.146	0.000	0.429	21	0.388	0.048	0.905
Kalifonsky	2	28	0.327	0.000	0.750	54	0.224	0.056	0.444	43	0.186	0.070	0.302	125	0.234	0.048	0.464
Kalifonsky	3	51	0.313	0.098	0.569	113	0.480	0.274	0.708	68	0.254	0.118	0.412	232	0.377	0.190	0.591
Kalifonsky	4	75	0.226	0.067	0.427	228	0.241	0.149	0.351	137	0.073	0.015	0.139	440	0.186	0.093	0.298
Kalifonsky	5	31	0.224	0.000	0.516	57	0.157	0.018	0.316	22	0.045	0.000	0.136	110	0.154	0.009	0.336
Kalifonsky	6	25	0.401	0.080	0.800	55	0.308	0.127	0.509	6	0.000	0.000	0.000	86	0.314	0.105	0.558
Kalifonsky	7	12	0.080	0.000	0.250	2	0.495	0.000	1.000	0				14	0.139	0.000	0.357
Kalifonsky Weeks Combined		229	0.280	0.057	0.572	516	0.293	0.147	0.461	283	0.131	0.046	0.233	1,028	0.246	0.099	0.423
Salamatof	1	42	0.309	0.048	0.667	15	1.066	0.600	1.800	0				57	0.508	0.193	0.965
Salamatof	2	66	0.492	0.182	0.879	44	0.703	0.273	1.205	7	0.144	0.000	0.429	117	0.551	0.205	0.974
Salamatof	3	109	0.183	0.046	0.358	76	0.749	0.461	1.066	21	0.514	0.238	0.810	206	0.426	0.218	0.665
Salamatof	4	122	0.150	0.041	0.287	104	0.546	0.317	0.798	36	0.109	0.028	0.222	262	0.302	0.149	0.481
Salamatof	5	44	0.045	0.000	0.136	19	0.524	0.105	1.053	12	0.000	0.000	0.000	75	0.159	0.027	0.347
Salamatof	6	44	0.155	0.023	0.318	28	0.347	0.071	0.679	0				72	0.230	0.042	0.458
Salamatof	7	15	0.000	0.000	0.000	5	0.000	0.000	0.000	0				20	0.000	0.000	0.000
Salamatof Weeks Combined		442	0.209	0.057	0.407	291	0.620	0.320	0.973	76	0.207	0.079	0.368	809	0.357	0.153	0.607
Beaches Combined	1	49	0.349	0.061	0.776	22	0.864	0.409	1.500	7	0.146	0.000	0.429	78	0.476	0.154	0.949
Beaches Combined	2	94	0.443	0.128	0.840	98	0.439	0.153	0.786	50	0.180	0.060	0.320	242	0.387	0.124	0.711
Beaches Combined	3	160	0.224	0.062	0.425	189	0.588	0.349	0.852	89	0.315	0.146	0.506	438	0.400	0.203	0.626
Beaches Combined	4	197	0.179	0.051	0.340	332	0.336	0.202	0.491	173	0.080	0.017	0.156	702	0.229	0.114	0.366
Beaches Combined	5	75	0.119	0.000	0.293	76	0.249	0.039	0.500	34	0.029	0.000	0.088	185	0.156	0.016	0.341
Beaches Combined	6	69	0.244	0.043	0.493	83	0.321	0.108	0.566	6	0.000	0.000	0.000	158	0.275	0.076	0.513
Beaches Combined	7	27	0.035	0.000	0.111	7	0.141	0.000	0.286	0				34	0.057	0.000	0.147
Beaches & Weeks Combined		671	0.233	0.057	0.463	807	0.411	0.209	0.646	359	0.147	0.053	0.262	1,837	0.295	0.123	0.504

Note: Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix B4.-Kalifonsky Beach observed mean chinook salmon catch per set with 95% confidence limits, by study area, week, tidal current flow and distance from shore.

			Near				Mid				Off				Distances From Shore Com		
Area	Week	Tidal Flow	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL
A	1	Flood	1	0.000	0.000	0.000	2	1.006	0.000	2.000	0				3	0.671	0.000
		Ebb	2	0.497	0.000	1.000	1	1.000	1.000	1.000	1	0.000	0.000	0.000	4	0.499	0.250
	2	Flood	8	0.122	0.000	0.375	6	0.170	0.000	0.500	18	0.167	0.000	0.389	32	0.156	0.000
		Ebb	4	0.000	0.000	0.000	5	0.617	0.000	1.400	16	0.311	0.063	0.500	25	0.322	0.040
	3	Flood	19	0.159	0.000	0.368	14	0.142	0.000	0.357	29	0.347	0.138	0.586	62	0.243	0.065
		Ebb	10	0.485	0.100	0.900	14	0.650	0.214	1.214	20	0.250	0.050	0.500	44	0.431	0.114
	4	Flood	25	0.124	0.000	0.240	24	0.209	0.042	0.375	41	0.146	0.049	0.268	90	0.157	0.034
		Ebb	15	0.329	0.067	0.667	21	0.619	0.286	1.000	49	0.000	0.000	0.000	85	0.211	0.082
	5	Flood	9	0.108	0.000	0.333	3	0.329	0.000	1.000	6	0.000	0.000	0.000	18	0.109	0.000
		Ebb	10	0.304	0.000	0.700	5	0.390	0.000	0.800	8	0.120	0.000	0.375	23	0.259	0.000
	6	Flood	9	0.336	0.111	0.667	8	0.253	0.000	0.625	0				17	0.297	0.059
		Ebb	4	0.243	0.000	0.750	4	0.957	0.000	2.250	0				8	0.600	0.000
	7	Flood	5	0.000	0.000	0.000	1	1.000	1.000	1.000	0				6	0.167	0.167
		Ebb	5	0.205	0.000	0.600	1	0.000	0.000	0.000	0				6	0.171	0.000
B	1	Flood	1	1.000	1.000	1.000	0				3	0.000	0.000	0.000	4	0.250	0.250
		Ebb	0				0				1	1.000	1.000	1.000	1	1.000	1.000
	2	Flood	2	0.518	0.000	1.000	2	0.000	0.000	0.000	3	0.000	0.000	0.000	7	0.148	0.000
		Ebb	1	0.000	0.000	0.000	2	0.502	0.000	1.000	0				3	0.335	0.000
	3	Flood	4	0.494	0.000	1.000	5	0.772	0.000	1.600	6	0.166	0.000	0.500	15	0.455	0.000
		Ebb	1	0.000	0.000	0.000	3	0.670	0.000	1.000	9	0.111	0.000	0.333	13	0.231	0.000
	4	Flood	6	0.169	0.000	0.500	6	0.333	0.000	0.667	12	0.000	0.000	0.000	24	0.126	0.000
		Ebb	4	0.739	0.250	1.000	3	0.333	0.000	1.000	15	0.196	0.000	0.400	22	0.313	0.045
	5	Flood	1	1.000	1.000	1.000	0				0				1	1.000	1.000
		Ebb	3	0.000	0.000	0.000	1	0.000	0.000	0.000	3	0.000	0.000	0.000	7	0.000	0.000
	6	Flood	3	0.339	0.000	1.000	0				3	0.000	0.000	0.000	6	0.170	0.000
		Ebb	1	0.000	0.000	0.000	0				3	0.000	0.000	0.000	4	0.000	0.000
	7	Flood	1	0.000	0.000	0.000	0				0				1	0.000	0.000
		Ebb	1	0.000	0.000	0.000	0				0				1	0.000	0.000
C	1	Flood	0				0				0				0		
		Ebb	2	0.000	0.000	0.000	3	0.000	0.000	0.000	0				5	0.000	0.000
	2	Flood	6	0.332	0.000	1.000	19	0.157	0.000	0.316	0				25	0.199	0.000
		Ebb	2	0.000	0.000	0.000	15	0.134	0.000	0.333	0				17	0.118	0.000
	3	Flood	10	0.201	0.000	0.500	40	0.126	0.025	0.225	0				50	0.141	0.020
		Ebb	6	0.667	0.167	1.333	26	0.814	0.500	1.115	0				32	0.786	0.438
	4	Flood	8	0.122	0.000	0.375	74	0.162	0.081	0.243	0				82	0.158	0.073
		Ebb	2	0.000	0.000	0.000	50	0.159	0.060	0.280	0				52	0.153	0.058
	5	Flood	4	0.000	0.000	0.000	22	0.045	0.000	0.136	0				26	0.038	0.000
		Ebb	2	0.509	0.000	1.000	9	0.335	0.000	0.778	0				11	0.367	0.000
	6	Flood	4	1.261	0.250	2.000	25	0.121	0.000	0.280	0				29	0.278	0.034
		Ebb	1	0.000	0.000	0.000	17	0.468	0.235	0.706	0				18	0.442	0.222
	7	Flood	0				0				0				0		
		Ebb	0				0				0				0		
All	All	Flood	126	0.223	0.032	0.484	251	0.175	0.036	0.339	121	0.166	0.050	0.314	498	0.185	0.038
All	All	Ebb	76	0.313	0.053	0.632	180	0.434	0.167	0.744	125	0.127	0.024	0.248	381	0.309	0.097

Note: Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix B5.-Salamatof Beach observed mean chinook salmon catch per set with 95% confidence limits, by study area, week, tidal current flow and distance from shore.

			Near				Mid				Off				Distances From Shore Com		
Area	Week	Tidal Flow	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL
D	1	Flood	6	0.337	0.000	0.667	0				0				6	0.337	0.000
		Ebb	4	0.514	0.000	1.000	1	1.000	1.000	1.000	0				5	0.611	0.200
	2	Flood	6	0.164	0.000	0.500	3	1.325	0.000	2.000	0				9	0.551	0.000
		Ebb	6	0.169	0.000	0.500	5	0.201	0.000	0.600	0				11	0.184	0.000
	3	Flood	18	0.284	0.000	0.667	3	0.340	0.000	1.000	0				21	0.292	0.000
		Ebb	19	0.051	0.000	0.158	5	0.201	0.000	0.600	0				24	0.082	0.000
	4	Flood	14	0.000	0.000	0.000	3	0.000	0.000	0.000	0				17	0.000	0.000
		Ebb	12	0.087	0.000	0.250	7	0.292	0.000	0.714	0				19	0.163	0.000
	5	Flood	7	0.000	0.000	0.000	0				0				7	0.000	0.000
		Ebb	5	0.396	0.000	1.200	0				0				5	0.396	0.000
	6	Flood	8	0.000	0.000	0.000	1	0.000	0.000	0.000	0				9	0.000	0.000
		Ebb	4	0.241	0.000	0.750	2	0.000	0.000	0.000	0				6	0.161	0.000
	7	Flood	0				0				0				0		
		Ebb	3	0.000	0.000	0.000	0				0				3	0.000	0.000
E	1	Flood	7	0.423	0.000	1.000	0				0				7	0.423	0.000
		Ebb	6	0.161	0.000	0.500	1	5.000	5.000	5.000	0				7	0.852	0.714
	2	Flood	14	0.497	0.071	1.143	6	2.991	0.500	5.833	0				20	1.245	0.200
		Ebb	15	0.261	0.000	0.600	5	0.788	0.000	1.800	0				20	0.393	0.000
	3	Flood	20	0.248	0.050	0.550	9	0.329	0.000	0.667	0				29	0.273	0.034
		Ebb	23	0.172	0.043	0.348	17	1.110	0.647	1.588	0				40	0.571	0.300
	4	Flood	21	0.094	0.000	0.238	15	1.261	0.733	1.933	0				36	0.580	0.305
		Ebb	15	0.273	0.000	0.600	17	0.942	0.353	1.824	0				32	0.628	0.188
	5	Flood	7	0.000	0.000	0.000	3	0.963	0.000	3.000	0				10	0.289	0.000
		Ebb	8	0.000	0.000	0.000	2	1.994	1.000	3.000	0				10	0.399	0.200
	6	Flood	2	0.000	0.000	0.000	0				0				2	0.000	0.000
		Ebb	1	0.000	0.000	0.000	0				0				1	0.000	0.000
	7	Flood	0				0				0				0		
		Ebb	0				0				0				0		
F	1	Flood	5	0.205	0.000	0.600	6	0.000	0.000	0.000	0				11	0.093	0.000
		Ebb	9	0.319	0.000	1.000	5	1.656	0.600	2.800	0				14	0.797	0.214
	2	Flood	7	0.706	0.143	1.429	9	0.556	0.111	1.000	4	0.000	0.000	0.000	20	0.497	0.100
		Ebb	14	1.079	0.357	1.929	14	0.356	0.071	0.714	3	0.333	0.000	1.000	31	0.680	0.193
	3	Flood	7	0.573	0.143	1.143	12	1.178	0.500	1.917	9	0.555	0.111	1.111	28	0.827	0.286
		Ebb	10	0.000	0.000	0.000	15	0.810	0.400	1.267	9	0.558	0.111	1.000	34	0.505	0.206
	4	Flood	18	0.055	0.000	0.167	14	0.277	0.000	0.643	12	0.084	0.000	0.333	44	0.134	0.000
		Ebb	11	0.251	0.000	0.818	12	0.087	0.000	0.250	15	0.134	0.000	0.333	38	0.153	0.000
	5	Flood	2	0.000	0.000	0.000	3	0.333	0.000	1.000	6	0.000	0.000	0.000	11	0.091	0.000
		Ebb	7	0.000	0.000	0.000	4	0.000	0.000	0.000	6	0.000	0.000	0.000	17	0.000	0.000
	6	Flood	11	0.179	0.000	0.455	11	0.180	0.000	0.455	0				22	0.180	0.000
		Ebb	13	0.315	0.000	0.692	13	0.606	0.077	1.385	0				26	0.461	0.039
	7	Flood	2	0.000	0.000	0.000	1	0.000	0.000	0.000	0				3	0.000	0.000
		Ebb	9	0.000	0.000	0.000	4	0.000	0.000	0.000	0				13	0.000	0.000
All	All	Flood	182	0.208	0.022	0.478	99	0.744	0.212	1.384	31	0.194	0.032	0.451	312	0.377	0.083
All	All	Ebb	194	0.236	0.031	0.541	129	0.676	0.279	1.194	33	0.243	0.030	0.515	356	0.396	0.121

Note: Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix B6.-Observed mean chinook salmon catch per set with 95% confidence limits, all weeks combined, by beach, study area, tidal current flow and distance from shore.

			Near				Mid				Off				Distances From Shore Combined			
Beach	Area	Tidal Flow	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL
Kalifonsky	A	Flood	76	0.146	0.013	0.329	58	0.242	0.035	0.517	94	0.203	0.064	0.372	228	0.194	0.040	0.395
	A	Ebb	50	0.316	0.040	0.680	51	0.627	0.196	1.157	94	0.116	0.021	0.223	195	0.301	0.072	0.585
Kalifonsky	B	Flood	18	0.391	0.111	0.778	13	0.451	0.000	0.923	27	0.037	0.000	0.111	58	0.240	0.034	0.500
	B	Ebb	11	0.269	0.091	0.364	9	0.446	0.000	0.889	31	0.159	0.032	0.322	51	0.233	0.039	0.431
Kalifonsky	C	Flood	32	0.313	0.031	0.688	180	0.133	0.039	0.239	0				212	0.161	0.038	0.307
	C	Ebb	15	0.335	0.067	0.667	120	0.351	0.167	0.558	0				135	0.349	0.156	0.570
Kalifonsky Areas Combined		Flood	126	0.223	0.032	0.484	251	0.175	0.036	0.339	121	0.166	0.050	0.314	498	0.185	0.038	0.369
Kalifonsky Areas Combined		Ebb	76	0.313	0.053	0.632	180	0.434	0.167	0.744	125	0.127	0.024	0.248	381	0.309	0.097	0.559
Salamatof	D	Flood	59	0.138	0.000	0.322	10	0.500	0.000	0.900	0				69	0.190	0.000	0.406
	D	Ebb	53	0.151	0.000	0.415	20	0.253	0.050	0.600	0				73	0.179	0.014	0.466
Salamatof	E	Flood	71	0.237	0.028	0.549	33	1.294	0.424	2.394	0				104	0.573	0.154	1.135
	E	Ebb	68	0.190	0.015	0.427	42	1.138	0.571	1.857	0				110	0.552	0.227	0.973
Salamatof	F	Flood	52	0.249	0.039	0.558	56	0.464	0.125	0.875	31	0.194	0.032	0.451	139	0.323	0.072	0.662
	F	Ebb	73	0.340	0.068	0.740	67	0.512	0.164	0.955	33	0.243	0.030	0.515	173	0.388	0.098	0.780
Salamatof Areas Combined		Flood	182	0.208	0.022	0.478	99	0.744	0.212	1.384	31	0.194	0.032	0.451	312	0.377	0.083	0.763
Salamatof Areas Combined		Ebb	194	0.236	0.031	0.541	129	0.676	0.279	1.194	33	0.243	0.030	0.515	356	0.396	0.121	0.775
Beaches Combined		Flood	308	0.215	0.026	0.481	350	0.336	0.086	0.634	152	0.171	0.046	0.342	810	0.259	0.056	0.521
Beaches Combined		Ebb	270	0.258	0.037	0.567	309	0.535	0.214	0.932	158	0.151	0.025	0.304	737	0.351	0.109	0.663

Note: Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix B7.-Observed mean chinook salmon catch per set with 95% confidence limits, study areas within beach combined, by beach, week, tidal current flow and distance from shore.

			Near				Mid				Off				Distances From Shore Com		
Beach	Week	Tidal Flow	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL
Kalifonsky	1	Flood	2	0.500	0.500	0.500	2	1.006	0.000	2.000	3	0.000	0.000	0.000	7	0.430	0.143
		Ebb	4	0.249	0.000	0.500	4	0.250	0.250	0.250	2	0.500	0.500	0.500	10	0.300	0.200
Kalifonsky	2	Flood	16	0.250	0.000	0.688	27	0.148	0.000	0.333	21	0.144	0.000	0.333	64	0.172	0.000
		Ebb	7	0.000	0.000	0.000	22	0.277	0.000	0.636	16	0.311	0.063	0.500	45	0.246	0.022
Kalifonsky	3	Flood	33	0.212	0.000	0.485	59	0.185	0.017	0.373	35	0.316	0.114	0.571	127	0.228	0.039
		Ebb	17	0.520	0.118	1.000	43	0.750	0.372	1.140	29	0.207	0.034	0.448	89	0.529	0.213
Kalifonsky	4	Flood	39	0.130	0.000	0.308	104	0.182	0.067	0.298	53	0.113	0.038	0.208	196	0.153	0.046
		Ebb	21	0.376	0.095	0.667	74	0.297	0.122	0.514	64	0.046	0.000	0.094	159	0.206	0.069
Kalifonsky	5	Flood	14	0.141	0.071	0.286	25	0.080	0.000	0.240	6	0.000	0.000	0.000	45	0.088	0.022
		Ebb	15	0.271	0.000	0.600	15	0.331	0.000	0.733	11	0.087	0.000	0.273	41	0.244	0.000
Kalifonsky	6	Flood	16	0.568	0.125	1.063	33	0.153	0.000	0.364	3				52	0.272	0.038
		Ebb	6	0.162	0.000	0.500	21	0.561	0.190	1.000	3				30	0.425	0.133
Kalifonsky	7	Flood	6	0.000	0.000	0.000	1	1.000	1.000	1.000	0				7	0.143	0.143
		Ebb	6	0.171	0.000	0.500	1	0.000	0.000	0.000	0				7	0.147	0.000
Kalifonsky	All	Flood	126	0.223	0.032	0.484	251	0.175	0.036	0.339	121	0.166	0.050	0.314	498	0.185	0.038
	All	Ebb	76	0.313	0.053	0.632	180	0.434	0.167	0.744	125	0.127	0.024	0.248	381	0.309	0.097
Salamatof	1	Flood	18	0.333	0.000	0.778	6	0.000	0.000	0.000	0				24	0.250	0.000
		Ebb	19	0.310	0.000	0.842	7	2.040	1.286	2.857	0				26	0.776	0.346
Salamatof	2	Flood	27	0.477	0.074	1.074	18	1.496	0.222	2.778	4	0.000	0.000	0.000	49	0.812	0.122
		Ebb	35	0.573	0.143	1.114	24	0.414	0.042	0.917	3	0.333	0.000	1.000	62	0.500	0.097
Salamatof	3	Flood	45	0.313	0.044	0.689	24	0.754	0.250	1.333	9	0.555	0.111	1.111	78	0.477	0.115
		Ebb	52	0.095	0.019	0.212	37	0.865	0.459	1.324	9	0.558	0.111	1.000	98	0.428	0.194
Salamatof	4	Flood	53	0.056	0.000	0.151	32	0.712	0.344	1.188	12	0.084	0.000	0.333	97	0.276	0.113
		Ebb	38	0.208	0.000	0.553	36	0.531	0.167	1.083	15	0.134	0.000	0.333	89	0.326	0.068
Salamatof	5	Flood	16	0.000	0.000	0.000	6	0.648	0.000	2.000	6	0.000	0.000	0.000	28	0.139	0.000
		Ebb	20	0.099	0.000	0.300	6	0.665	0.333	1.000	6	0.000	0.000	0.000	32	0.187	0.062
Salamatof	6	Flood	21	0.094	0.000	0.238	12	0.165	0.000	0.417	0				33	0.120	0.000
		Ebb	18	0.281	0.000	0.667	15	0.525	0.067	1.200	0				33	0.392	0.030
Salamatof	7	Flood	2	0.000	0.000	0.000	1	0.000	0.000	0.000	0				3	0.000	0.000
		Ebb	12	0.000	0.000	0.000	4	0.000	0.000	0.000	0				16	0.000	0.000
Salamatof	All	Flood	182	0.208	0.022	0.478	99	0.744	0.212	1.384	31	0.194	0.032	0.451	312	0.377	0.083
	All	Ebb	194	0.236	0.031	0.541	129	0.676	0.279	1.194	33	0.243	0.030	0.515	356	0.396	0.121
Combined	1	Flood	20	0.350	0.050	0.750	8	0.252	0.000	0.500	3	0.000	0.000	0.000	31	0.291	0.032
		Ebb	23	0.299	0.000	0.783	11	1.389	0.909	1.909	2	0.500	0.500	0.500	36	0.644	0.306
Combined	2	Flood	43	0.393	0.046	0.930	45	0.687	0.089	1.311	25	0.121	0.000	0.280	113	0.450	0.053
		Ebb	42	0.478	0.119	0.928	46	0.348	0.022	0.783	19	0.314	0.053	0.579	107	0.393	0.066
Combined	3	Flood	78	0.270	0.025	0.603	83	0.350	0.084	0.651	44	0.365	0.113	0.681	205	0.323	0.068
		Ebb	69	0.200	0.043	0.406	80	0.803	0.412	1.225	38	0.290	0.052	0.579	187	0.476	0.203
Combined	4	Flood	92	0.087	0.000	0.218	136	0.307	0.132	0.507	65	0.108	0.031	0.231	293	0.194	0.068
		Ebb	59	0.268	0.034	0.594	110	0.374	0.137	0.700	79	0.063	0.000	0.139	248	0.249	0.069
Combined	5	Flood	30	0.066	0.033	0.133	31	0.190	0.000	0.581	12	0.000	0.000	0.000	73	0.108	0.014
		Ebb	35	0.173	0.000	0.429	21	0.426	0.095	0.809	17	0.056	0.000	0.177	73	0.219	0.027
Combined	6	Flood	37	0.299	0.054	0.595	45	0.156	0.000	0.378	3	0.000	0.000	0.000	85	0.213	0.024
		Ebb	24	0.251	0.000	0.625	36	0.546	0.139	1.083	3	0.000	0.000	0.000	63	0.408	0.079
Combined	7	Flood	8	0.000	0.000	0.000	2	0.500	0.500	0.500	0				10	0.100	0.100
		Ebb	18	0.057	0.000	0.167	5	0.000	0.000	0.000	0				23	0.045	0.000
Combined	All	Flood	308	0.215	0.026	0.481	350	0.336	0.086	0.634	152	0.171	0.046	0.342	810	0.259	0.056
	All	Ebb	270	0.258	0.037	0.567	309	0.535	0.214	0.932	158	0.151	0.025	0.304	737	0.351	0.109

Note: Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix B8.-Kalifonsky Beach observed mean chinook salmon catch per set with 95% confidence limits, by study area, week, vertical net location and distance from shore.

			Near				Mid				Off				Distances From Shore Combined			
Area	Week	Net Location	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL
A	1	Upper 2/3	3	0.000	0.000	0.000	3	0.000	0.000	0.000	1	0.000	0.000	0.000	7	0.000	0.000	0.000
		Lower 1/3	3	0.337	0.000	1.000	3	1.021	0.000	2.000	1	0.000	0.000	0.000	7	0.582	0.000	1.286
A	2	Upper 2/3	13	0.078	0.000	0.231	13	0.224	0.000	0.615	34	0.059	0.000	0.147	60	0.099	0.000	0.267
		Lower 1/3	13	0.000	0.000	0.000	13	0.158	0.000	0.385	34	0.176	0.059	0.324	60	0.134	0.033	0.267
A	3	Upper 2/3	30	0.203	0.067	0.367	31	0.295	0.097	0.548	50	0.059	0.000	0.140	111	0.164	0.045	0.315
		Lower 1/3	30	0.067	0.000	0.167	31	0.097	0.000	0.194	50	0.081	0.020	0.160	111	0.082	0.009	0.171
A	4	Upper 2/3	40	0.123	0.025	0.225	49	0.184	0.082	0.327	107	0.019	0.000	0.047	196	0.081	0.026	0.153
		Lower 1/3	40	0.051	0.000	0.150	49	0.159	0.020	0.327	107	0.046	0.009	0.084	196	0.075	0.010	0.158
A	5	Upper 2/3	19	0.053	0.000	0.158	8	0.000	0.000	0.000	19	0.051	0.000	0.158	46	0.043	0.000	0.131
		Lower 1/3	19	0.056	0.000	0.158	8	0.249	0.000	0.625	19	0.000	0.000	0.000	46	0.066	0.000	0.174
A	6	Upper 2/3	15	0.265	0.067	0.533	12	0.252	0.000	0.500	0				27	0.259	0.037	0.518
		Lower 1/3	15	0.000	0.000	0.000	12	0.171	0.000	0.417	0				27	0.076	0.000	0.185
A	7	Upper 2/3	10	0.103	0.000	0.300	2	0.486	0.000	1.000	0				12	0.167	0.000	0.417
		Lower 1/3	10	0.000	0.000	0.000	2	0.000	0.000	0.000	0				12	0.000	0.000	0.000
B	1	Upper 2/3	1	0.000	0.000	0.000	0				6	0.167	0.000	0.500	7	0.143	0.000	0.429
		Lower 1/3	1	1.000	1.000	1.000	0				6	0.000	0.000	0.000	7	0.143	0.143	0.143
B	2	Upper 2/3	5	0.202	0.000	0.600	4	0.263	0.000	0.750	9	0.000	0.000	0.000	18	0.115	0.000	0.333
		Lower 1/3	5	0.207	0.000	0.600	4	0.000	0.000	0.000	9	0.000	0.000	0.000	18	0.058	0.000	0.167
B	3	Upper 2/3	5	0.000	0.000	0.000	8	0.258	0.000	0.750	18	0.115	0.000	0.278	31	0.133	0.000	0.355
		Lower 1/3	5	0.407	0.000	0.800	8	0.000	0.000	0.000	18	0.000	0.000	0.000	31	0.066	0.000	0.129
B	4	Upper 2/3	12	0.247	0.000	0.500	11	0.091	0.000	0.273	30	0.033	0.000	0.100	53	0.093	0.000	0.226
		Lower 1/3	12	0.084	0.000	0.250	11	0.181	0.000	0.455	30	0.067	0.000	0.167	53	0.095	0.000	0.246
B	5	Upper 2/3	4	0.000	0.000	0.000	1	0.000	0.000	0.000	3	0.000	0.000	0.000	8	0.000	0.000	0.000
		Lower 1/3	4	0.249	0.000	0.750	1	0.000	0.000	0.000	3	0.000	0.000	0.000	8	0.125	0.000	0.375
B	6	Upper 2/3	4	0.000	0.000	0.000	0				6	0.000	0.000	0.000	10	0.000	0.000	0.000
		Lower 1/3	4	0.262	0.000	0.750	0				6	0.000	0.000	0.000	10	0.105	0.000	0.300
B	7	Upper 2/3	2	0.000	0.000	0.000	0				0				2	0.000	0.000	0.000
		Lower 1/3	2	0.000	0.000	0.000	0				0				2	0.000	0.000	0.000
C	1	Upper 2/3	3	0.321	0.000	1.000	4	0.000	0.000	0.000	0				7	0.138	0.000	0.429
		Lower 1/3	3	0.328	0.000	0.667	4	0.000	0.000	0.000	0				7	0.141	0.000	0.286
C	2	Upper 2/3	10	0.495	0.000	1.300	37	0.160	0.054	0.297	0				47	0.231	0.043	0.510
		Lower 1/3	10	0.097	0.000	0.300	37	0.000	0.000	0.000	0				47	0.021	0.000	0.064
C	3	Upper 2/3	16	0.303	0.063	0.625	74	0.297	0.176	0.432	0				90	0.298	0.156	0.466
		Lower 1/3	16	0.065	0.000	0.188	74	0.082	0.027	0.162	0				90	0.079	0.022	0.167
C	4	Upper 2/3	23	0.130	0.000	0.348	168	0.106	0.060	0.161	0				191	0.109	0.053	0.184
		Lower 1/3	23	0.043	0.000	0.130	168	0.076	0.036	0.125	0				191	0.072	0.032	0.126
C	5	Upper 2/3	8	0.125	0.000	0.375	48	0.104	0.021	0.208	0				56	0.107	0.018	0.232
		Lower 1/3	8	0.131	0.000	0.375	48	0.021	0.000	0.063	0				56	0.037	0.000	0.108
C	6	Upper 2/3	6	0.000	0.000	0.000	43	0.208	0.093	0.326	0				49	0.183	0.082	0.286
		Lower 1/3	6	0.809	0.167	1.500	43	0.049	0.000	0.116	0				49	0.142	0.020	0.285
C	7	Upper 2/3	0				0				0				0			
		Lower 1/3	0				0				0				0			
All	All	Upper 2/3	229	0.161	0.022	0.363	516	0.172	0.072	0.300	283	0.043	0.000	0.110	1,028	0.134	0.041	0.262
All	All	Lower 1/3	229	0.101	0.009	0.249	516	0.085	0.017	0.173	283	0.060	0.014	0.117	1,028	0.082	0.015	0.174

Note: Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix B9.-Salamatof Beach observed mean chinook salmon catch per set with 95% confidence limits, by study area, week, vertical net location and distance from shore.

			Near				Mid				Off				Distances From Shore Combined			
Area	Week	Net Location	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL
D	1	Upper 2/3	10	0.097	0.000	0.300	3	0.335	0.000	1.000	0				13	0.152	0.000	0.462
		Lower 1/3	10	0.200	0.000	0.500	3	1.008	0.000	2.000	0				13	0.386	0.000	0.846
D	2	Upper 2/3	14	0.072	0.000	0.214	8	0.126	0.000	0.375	0				22	0.092	0.000	0.273
		Lower 1/3	14	0.076	0.000	0.214	8	0.000	0.000	0.000	0				22	0.048	0.000	0.136
D	3	Upper 2/3	38	0.153	0.026	0.342	10	0.101	0.000	0.300	0				48	0.142	0.021	0.333
		Lower 1/3	38	0.000	0.000	0.000	10	0.101	0.000	0.300	0				48	0.021	0.000	0.063
D	4	Upper 2/3	34	0.030	0.000	0.118	13	0.076	0.000	0.231	0				47	0.043	0.000	0.149
		Lower 1/3	34	0.030	0.000	0.088	13	0.156	0.000	0.385	0				47	0.065	0.000	0.170
D	5	Upper 2/3	12	0.171	0.000	0.500	2	0.000	0.000	0.000	0				14	0.147	0.000	0.429
		Lower 1/3	12	0.000	0.000	0.000	2	0.000	0.000	0.000	0				14	0.000	0.000	0.000
D	6	Upper 2/3	14	0.072	0.000	0.214	4	0.000	0.000	0.000	0				18	0.056	0.000	0.166
		Lower 1/3	14	0.000	0.000	0.000	4	0.000	0.000	0.000	0				18	0.000	0.000	0.000
D	7	Upper 2/3	3	0.000	0.000	0.000	0				0				3	0.000	0.000	0.000
		Lower 1/3	3	0.000	0.000	0.000	0				0				3	0.000	0.000	0.000
E	1	Upper 2/3	15	0.197	0.000	0.400	1	5.000	5.000	5.000	0				16	0.497	0.313	0.688
		Lower 1/3	15	0.000	0.000	0.000	1	0.000	0.000	0.000	0				16	0.000	0.000	0.000
E	2	Upper 2/3	29	0.313	0.069	0.655	11	1.377	0.364	2.455	0				40	0.606	0.150	1.150
		Lower 1/3	29	0.035	0.000	0.103	11	0.609	0.000	1.727	0				40	0.193	0.000	0.550
E	3	Upper 2/3	49	0.165	0.061	0.306	29	0.695	0.379	1.034	0				78	0.362	0.179	0.577
		Lower 1/3	49	0.000	0.000	0.000	29	0.104	0.000	0.241	0				78	0.039	0.000	0.090
E	4	Upper 2/3	50	0.139	0.040	0.260	46	0.870	0.565	1.196	0				96	0.489	0.292	0.709
		Lower 1/3	50	0.020	0.000	0.060	46	0.110	0.022	0.196	0				96	0.063	0.011	0.125
E	5	Upper 2/3	23	0.000	0.000	0.000	10	0.815	0.200	1.500	0				33	0.247	0.061	0.455
		Lower 1/3	23	0.000	0.000	0.000	10	0.101	0.000	0.300	0				33	0.031	0.000	0.091
E	6	Upper 2/3	3	0.000	0.000	0.000	0				0				3	0.000	0.000	0.000
		Lower 1/3	3	0.000	0.000	0.000	0				0				3	0.000	0.000	0.000
E	7	Upper 2/3	0				0				0				0			
		Lower 1/3	0				0				0				0			
F	1	Upper 2/3	17	0.234	0.000	0.588	11	0.445	0.000	1.182	0				28	0.317	0.000	0.821
		Lower 1/3	17	0.000	0.000	0.000	11	0.264	0.000	0.636	0				28	0.104	0.000	0.250
F	2	Upper 2/3	23	0.741	0.304	1.304	25	0.240	0.040	0.440	7	0.140	0.000	0.429	55	0.437	0.145	0.800
		Lower 1/3	23	0.085	0.000	0.217	25	0.162	0.000	0.360	7	0.000	0.000	0.000	55	0.109	0.000	0.254
F	3	Upper 2/3	22	0.087	0.000	0.227	37	0.569	0.297	0.865	21	0.284	0.095	0.524	80	0.362	0.162	0.600
		Lower 1/3	22	0.088	0.000	0.273	37	0.216	0.081	0.351	21	0.140	0.000	0.286	80	0.161	0.037	0.312
F	4	Upper 2/3	38	0.000	0.000	0.000	45	0.153	0.044	0.267	36	0.000	0.000	0.000	119	0.058	0.017	0.101
		Lower 1/3	38	0.080	0.000	0.184	45	0.023	0.000	0.067	36	0.112	0.000	0.222	119	0.068	0.000	0.151
F	5	Upper 2/3	9	0.000	0.000	0.000	7	0.000	0.000	0.000	12	0.000	0.000	0.000	28	0.000	0.000	0.000
		Lower 1/3	9	0.000	0.000	0.000	7	0.000	0.000	0.000	12	0.000	0.000	0.000	28	0.000	0.000	0.000
F	6	Upper 2/3	27	0.000	0.000	0.000	24	0.253	0.083	0.458	0				51	0.119	0.039	0.216
		Lower 1/3	27	0.074	0.000	0.185	24	0.126	0.000	0.333	0				51	0.098	0.000	0.255
F	7	Upper 2/3	12	0.000	0.000	0.000	5	0.000	0.000	0.000	0				17	0.000	0.000	0.000
		Lower 1/3	12	0.000	0.000	0.000	5	0.000	0.000	0.000	0				17	0.000	0.000	0.000
All	All	Upper 2/3	442	0.140	0.034	0.294	291	0.472	0.220	0.766	76	0.091	0.026	0.184	809	0.255	0.100	0.454
All	All	Lower 1/3	442	0.034	0.000	0.091	291	0.140	0.014	0.316	76	0.092	0.000	0.184	809	0.078	0.005	0.181

Note: Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix B10.-Observed mean chinook salmon catch per set with 95% confidence limits, all weeks combined, by beach, study area, vertical net location and distance from shore, ESSN study.

Beach	Area	Net Location	Near				Mid				Off				Distances From Shore Combined			
			NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL
Kalifonsky	A	Upper 2/3	130	0.139	0.031	0.285	118	0.212	0.059	0.415	211	0.038	0.000	0.095	459	0.111	0.024	0.231
	A	Lower 1/3	130	0.047	0.000	0.131	118	0.169	0.008	0.364	211	0.071	0.019	0.133	459	0.089	0.011	0.192
Kalifonsky	B	Upper 2/3	33	0.120	0.000	0.273	24	0.172	0.000	0.500	72	0.056	0.000	0.153	129	0.094	0.000	0.248
	B	Lower 1/3	33	0.216	0.030	0.515	24	0.083	0.000	0.208	72	0.028	0.000	0.069	129	0.086	0.008	0.209
Kalifonsky	C	Upper 2/3	66	0.223	0.015	0.561	374	0.160	0.080	0.251	0				440	0.169	0.070	0.298
	C	Lower 1/3	66	0.150	0.015	0.348	374	0.059	0.021	0.110	0				440	0.073	0.020	0.146
Kalifonsky Areas Combined		Upper 2/3	229	0.161	0.022	0.363	516	0.172	0.072	0.300	283	0.043	0.000	0.110	1,028	0.134	0.041	0.262
Kalifonsky Areas Combined		Lower 1/3	229	0.101	0.009	0.249	516	0.085	0.017	0.173	283	0.060	0.014	0.117	1,028	0.082	0.015	0.174
Salamatof	D	Upper 2/3	125	0.095	0.008	0.256	40	0.100	0.000	0.300	0				165	0.096	0.006	0.267
	D	Lower 1/3	125	0.033	0.000	0.088	40	0.151	0.000	0.350	0				165	0.062	0.000	0.152
Salamatof	E	Upper 2/3	169	0.160	0.041	0.314	97	0.912	0.495	1.361	0				266	0.434	0.207	0.696
	E	Lower 1/3	169	0.012	0.000	0.036	97	0.162	0.010	0.392	0				266	0.067	0.004	0.166
Salamatof	F	Upper 2/3	148	0.155	0.047	0.304	154	0.291	0.104	0.513	76	0.091	0.026	0.184	378	0.198	0.066	0.365
	F	Lower 1/3	148	0.060	0.000	0.155	154	0.123	0.019	0.260	76	0.092	0.000	0.184	378	0.092	0.008	0.204
Salamatof Areas Combined		Upper 2/3	442	0.140	0.034	0.294	291	0.472	0.220	0.766	76	0.091	0.026	0.184	809	0.255	0.100	0.454
Salamatof Areas Combined		Lower 1/3	442	0.034	0.000	0.091	291	0.140	0.014	0.316	76	0.092	0.000	0.184	809	0.078	0.005	0.181
Beaches Combined		Upper 2/3	671	0.147	0.030	0.318	807	0.280	0.125	0.468	359	0.053	0.006	0.125	1,837	0.187	0.067	0.346
Beaches Combined		Lower 1/3	671	0.057	0.003	0.145	807	0.105	0.016	0.224	359	0.067	0.011	0.131	1,837	0.080	0.010	0.177

Note: Means and 95% confidence limits obtained from 1,000 bootstrap samples.

Appendix B11.-Observed mean chinook salmon catch per set with 95% confidence limits, study areas within beach combined, by beach, week, vertical net location and distance from shore.

			Near				Mid				Off				Distances From Shore Combined			
Beach	Week	Net Location	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL
Kalifonsky	1	Upper 2/3	7	0.138	0.000	0.429	7	0.000	0.000	0.000	7	0.144	0.000	0.429	21	0.094	0.000	0.286
		Lower 1/3	7	0.428	0.143	0.857	7	0.437	0.000	0.857	7	0.000	0.000	0.000	21	0.288	0.048	0.571
Kalifonsky	2	Upper 2/3	28	0.249	0.000	0.679	54	0.183	0.037	0.407	43	0.047	0.000	0.116	125	0.151	0.016	0.368
		Lower 1/3	28	0.072	0.000	0.214	54	0.038	0.000	0.093	43	0.139	0.047	0.256	125	0.080	0.016	0.176
Kalifonsky	3	Upper 2/3	51	0.215	0.059	0.412	113	0.294	0.142	0.487	68	0.074	0.000	0.176	232	0.212	0.082	0.379
		Lower 1/3	51	0.100	0.000	0.235	113	0.080	0.018	0.159	68	0.059	0.015	0.118	232	0.078	0.013	0.164
Kalifonsky	4	Upper 2/3	75	0.145	0.013	0.307	228	0.122	0.061	0.202	137	0.022	0.000	0.058	440	0.095	0.034	0.175
		Lower 1/3	75	0.054	0.000	0.160	228	0.099	0.031	0.184	137	0.051	0.007	0.102	440	0.076	0.018	0.154
Kalifonsky	5	Upper 2/3	31	0.064	0.000	0.194	57	0.088	0.018	0.175	22	0.044	0.000	0.136	110	0.072	0.009	0.173
		Lower 1/3	31	0.100	0.000	0.290	57	0.052	0.000	0.140	22	0.000	0.000	0.000	110	0.055	0.000	0.154
Kalifonsky	6	Upper 2/3	25	0.159	0.040	0.320	55	0.218	0.073	0.364	6	0.000	0.000	0.000	86	0.186	0.058	0.326
		Lower 1/3	25	0.236	0.040	0.480	55	0.076	0.000	0.182	6	0.000	0.000	0.000	86	0.117	0.012	0.256
Kalifonsky	7	Upper 2/3	12	0.086	0.000	0.250	2	0.486	0.000	1.000	0				14	0.143	0.000	0.357
		Lower 1/3	12	0.000	0.000	0.000	2	0.000	0.000	0.000	0				14	0.000	0.000	0.000
Kalifonsky	All	Upper 2/3	229	0.161	0.022	0.363	516	0.172	0.072	0.300	283	0.043	0.000	0.110	1,028	0.134	0.041	0.262
	All	Lower 1/3	229	0.101	0.009	0.249	516	0.085	0.017	0.173	283	0.060	0.014	0.117	1,028	0.082	0.015	0.174
Salamatof	1	Upper 2/3	42	0.188	0.000	0.452	15	0.727	0.333	1.400	0				57	0.330	0.088	0.701
		Lower 1/3	42	0.048	0.000	0.119	15	0.395	0.000	0.867	0				57	0.139	0.000	0.316
Salamatof	2	Upper 2/3	66	0.411	0.136	0.788	44	0.503	0.114	0.932	7	0.140	0.000	0.429	117	0.429	0.120	0.821
		Lower 1/3	66	0.061	0.000	0.167	44	0.244	0.000	0.636	7	0.000	0.000	0.000	117	0.126	0.000	0.333
Salamatof	3	Upper 2/3	109	0.145	0.037	0.303	76	0.556	0.289	0.855	21	0.284	0.095	0.524	206	0.311	0.136	0.529
		Lower 1/3	109	0.018	0.000	0.055	76	0.158	0.039	0.303	21	0.140	0.000	0.286	206	0.082	0.014	0.170
Salamatof	4	Upper 2/3	122	0.065	0.016	0.139	104	0.460	0.269	0.673	36	0.000	0.000	0.000	262	0.213	0.114	0.332
		Lower 1/3	122	0.042	0.000	0.107	104	0.078	0.010	0.163	36	0.112	0.000	0.222	262	0.066	0.004	0.145
Salamatof	5	Upper 2/3	44	0.047	0.000	0.136	19	0.429	0.105	0.789	12	0.000	0.000	0.000	75	0.136	0.027	0.280
		Lower 1/3	44	0.000	0.000	0.000	19	0.053	0.000	0.158	12	0.000	0.000	0.000	75	0.013	0.000	0.040
Salamatof	6	Upper 2/3	44	0.023	0.000	0.068	28	0.216	0.071	0.393	0				72	0.098	0.028	0.194
		Lower 1/3	44	0.045	0.000	0.114	28	0.108	0.000	0.286	0				72	0.070	0.000	0.181
Salamatof	7	Upper 2/3	15	0.000	0.000	0.000	5	0.000	0.000	0.000	0				20	0.000	0.000	0.000
		Lower 1/3	15	0.000	0.000	0.000	5	0.000	0.000	0.000	0				20	0.000	0.000	0.000
Salamatof	All	Upper 2/3	442	0.140	0.034	0.294	291	0.472	0.220	0.766	76	0.091	0.026	0.184	809	0.255	0.100	0.454
	All	Lower 1/3	442	0.034	0.000	0.091	291	0.140	0.014	0.316	76	0.092	0.000	0.184	809	0.078	0.005	0.181
Combined	1	Upper 2/3	49	0.181	0.000	0.449	22	0.496	0.227	0.955	7	0.144	0.000	0.429	78	0.266	0.064	0.590
		Lower 1/3	49	0.102	0.020	0.224	22	0.408	0.000	0.864	7	0.000	0.000	0.000	78	0.179	0.013	0.385
Combined	2	Upper 2/3	94	0.363	0.095	0.756	98	0.327	0.072	0.643	50	0.060	0.000	0.160	242	0.286	0.066	0.587
		Lower 1/3	94	0.064	0.000	0.181	98	0.130	0.000	0.337	50	0.120	0.040	0.220	242	0.103	0.008	0.252
Combined	3	Upper 2/3	160	0.167	0.044	0.338	189	0.399	0.201	0.635	89	0.124	0.022	0.258	438	0.259	0.107	0.450
		Lower 1/3	160	0.044	0.000	0.112	189	0.111	0.026	0.217	89	0.078	0.011	0.158	438	0.080	0.014	0.167
Combined	4	Upper 2/3	197	0.095	0.015	0.203	332	0.228	0.126	0.350	173	0.017	0.000	0.046	702	0.139	0.064	0.234
		Lower 1/3	197	0.047	0.000	0.127	332	0.092	0.024	0.177	173	0.064	0.006	0.127	702	0.072	0.013	0.151
Combined	5	Upper 2/3	75	0.054	0.000	0.160	76	0.173	0.040	0.329	34	0.028	0.000	0.088	185	0.098	0.016	0.216
		Lower 1/3	75	0.041	0.000	0.120	76	0.052	0.000	0.145	34	0.000	0.000	0.000	185	0.038	0.000	0.108
Combined	6	Upper 2/3	69	0.072	0.014	0.159	83	0.217	0.072	0.374	6	0.000	0.000	0.000	158	0.146	0.044	0.266
		Lower 1/3	69	0.114	0.014	0.247	83	0.087	0.000	0.217	6	0.000	0.000	0.000	158	0.095	0.006	0.222
Combined	7	Upper 2/3	27	0.038	0.000	0.111	7	0.139	0.000	0.286	0				34	0.059	0.000	0.147
		Lower 1/3	27	0.000	0.000	0.000	7	0.000	0.000	0.000	0				34	0.000	0.000	0.000
Combined	All	Upper 2/3	671	0.147	0.030	0.318	807	0.280	0.125	0.468	359	0.053	0.006	0.125	1,837	0.187	0.067	0.346
	All	Lower 1/3	671	0.057	0.003	0.145	807	0.105	0.016	0.224	359	0.067	0.011	0.131	1,837	0.080	0.010	0.177

Note: Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

APPENDIX C

Appendix C1.-Observed mean sockeye salmon catch per set with 95% confidence limits, by beach, study area, week and distance from shore.

			Near				Mid				Off				Distances From Shore Combined			
Beach	Area	Week	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL
Kalifonsky	A	1	3	34.816	7.858	213.282	3	33.043	0.306	145.201	1	7.000	7.000	7.000	7	30.083	4.499	154.635
Kalifonsky	A	2	13	5.028	1.078	11.877	13	4.160	1.111	9.152	34	0.429	0.135	0.888	60	2.234	0.551	5.060
Kalifonsky	A	3	30	31.895	20.831	45.307	31	27.054	16.630	40.000	50	10.542	8.015	13.415	111	20.924	13.885	29.459
Kalifonsky	A	4	40	39.237	24.801	56.970	49	16.400	12.713	20.556	107	11.165	9.502	12.962	196	18.203	13.427	23.842
Kalifonsky	A	5	19	21.656	12.272	33.686	8	7.798	4.176	12.541	19	6.368	3.736	9.696	46	12.931	7.339	20.100
Kalifonsky	A	6	15	9.310	3.374	18.198	12	3.403	1.322	6.450	0				27	6.685	2.462	12.977
Kalifonsky	A	7	10	4.152	1.919	7.235	2	3.936	1.484	26.896	0				12	4.116	1.846	10.512
Kalifonsky	B	1	1	18.000	18.000	18.000	0				6	2.973	1.070	5.828	7	5.120	3.489	7.567
Kalifonsky	B	2	5	6.493	0.347	32.323	4	2.510	0.704	16.063	9	1.497	0.341	3.469	18	3.110	0.423	14.283
Kalifonsky	B	3	5	35.049	10.917	72.868	8	25.614	7.492	54.537	18	6.197	3.137	10.288	31	15.862	5.516	31.801
Kalifonsky	B	4	12	35.186	17.906	58.247	11	15.406	7.568	26.000	30	9.238	6.501	12.454	53	16.393	9.305	25.634
Kalifonsky	B	5	4	12.735	2.950	29.372	1	1.000	1.000	1.000	3	2.398	0.659	15.280	8	7.392	1.847	20.541
Kalifonsky	B	6	4	3.060	1.964	24.008	0				6	1.588	0.878	2.506	10	2.177	1.313	11.107
Kalifonsky	B	7	2	4.791	13.075	63.900	0				0				2	4.791	13.075	63.900
Kalifonsky	C	1	3	81.495	32.875	151.811	4	50.819	1.993	165.013	0				7	63.965	15.228	159.355
Kalifonsky	C	2	10	5.685	0.338	17.531	37	0.737	0.272	1.429	0				47	1.790	0.286	4.855
Kalifonsky	C	3	16	26.692	10.282	50.785	74	15.666	12.095	19.699	0				90	17.626	11.773	25.225
Kalifonsky	C	4	23	17.744	12.200	24.322	168	7.662	6.757	8.624	0				191	8.876	7.412	10.515
Kalifonsky	C	5	8	8.711	4.398	14.484	48	5.906	4.006	8.174	0				56	6.307	4.062	9.076
Kalifonsky	C	6	6	5.225	0.304	16.159	43	2.265	1.428	3.294	0				49	2.628	1.291	4.870
Kalifonsky	C	7	0				0				0				0			
Salamatof	D	1	10	11.278	4.192	21.800	3	19.963	3.670	49.285	0				13	13.282	4.072	28.143
Salamatof	D	2	14	4.232	2.021	7.251	8	14.543	5.995	26.816	0				22	7.981	3.466	14.365
Salamatof	D	3	38	89.214	70.105	110.623	10	56.454	15.039	124.304	0				48	82.389	58.633	113.473
Salamatof	D	4	34	58.088	46.706	70.709	13	55.635	31.997	85.770	0				47	57.409	42.638	74.874
Salamatof	D	5	12	25.149	11.549	43.977	2	18.660	107.897	362.021	0				14	24.222	25.313	89.411
Salamatof	D	6	14	13.911	6.236	24.625	4	6.983	1.746	15.711	0				18	12.372	5.238	22.644
Salamatof	D	7	3	5.179	1.168	12.045	0				0				3	5.179	1.168	12.045
Salamatof	E	1	15	12.643	7.227	19.565	1	49.000	49.000	49.000	0				16	14.915	9.837	21.404
Salamatof	E	2	29	8.712	6.142	11.730	11	6.632	3.268	11.174	0				40	8.140	5.351	11.577
Salamatof	E	3	49	132.486	101.654	167.395	29	102.175	57.737	159.211	0				78	121.216	85.326	164.352
Salamatof	E	4	50	72.447	58.373	88.040	46	78.715	61.106	98.551	0				96	75.451	59.683	93.077
Salamatof	E	5	23	31.095	23.480	39.778	10	47.444	30.098	68.720	0				33	36.049	25.485	48.548
Salamatof	E	6	3	44.565	0.264	164.804	0				0				3	44.565	0.264	164.804
Salamatof	E	7	0				0				0				0			
Salamatof	F	1	17	14.391	8.863	21.253	11	17.183	9.378	27.334	0				28	15.488	9.066	23.642
Salamatof	F	2	23	15.418	7.818	25.575	25	3.417	2.266	4.803	7	1.137	0.094	3.332	55	8.145	4.311	13.302
Salamatof	F	3	22	251.802	177.049	339.686	37	44.274	28.356	63.724	21	24.283	15.246	35.414	80	96.097	65.805	132.182
Salamatof	F	4	38	133.175	112.079	156.091	45	30.399	21.956	40.212	36	17.794	12.536	23.971	119	59.405	47.885	72.302
Salamatof	F	5	9	77.003	51.712	107.313	7	15.489	8.387	24.751	12	9.263	4.206	16.290	28	32.593	20.521	47.662
Salamatof	F	6	27	27.962	15.992	43.255	24	3.736	2.272	5.561	0				51	16.561	9.536	25.517
Salamatof	F	7	12	11.596	6.404	18.318	5	1.942	0.072	6.348	0				17	8.757	4.542	14.798
All Areas Combined			671	52.889	38.173	72.143	807	21.745	14.479	32.736	359	9.946	7.217	13.344	1,837	30.815	21.715	43.340

Note: Square root transformation was performed on numbers of sockeye salmon per net. Means and 95% confidence limits presented are back transformed values (squared).

Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix C2.-Observed mean sockeye salmon catch per set with 95% confidence limits, all weeks combined, by beach, study area and distance from shore.

		Near				Mid				Off				Distances From Shore Com		
Beach	Area	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL
Kalifonsky	A	130	25.298	15.058	41.674	118	16.157	10.221	25.706	211	8.836	7.109	10.801	459	15.381	10.160
Kalifonsky	B	33	21.839	10.152	48.007	24	16.059	6.125	32.814	72	6.065	3.725	9.526	129	11.960	5.816
Kalifonsky	C	66	18.751	8.851	33.569	374	8.176	6.155	11.106	0				440	9.763	6.559
Kalifonsky Areas Combined		229	22.913	12.562	40.251	516	10.368	7.083	15.454	283	8.131	6.248	10.477	1,028	12.547	8.074
Salamatof	D	125	48.394	36.413	62.687	40	38.232	21.203	87.683	0				165	45.930	32.726
Salamatof	E	169	67.487	51.639	86.670	97	74.024	50.218	103.192	0				266	69.871	51.121
Salamatof	F	148	86.397	63.909	112.889	154	22.651	15.004	31.991	76	16.706	10.824	24.019	378	46.415	33.312
Salamatof Areas Combined		442	68.419	51.442	88.667	291	41.917	27.594	63.380	76	16.706	10.824	24.019	809	54.028	39.048
Beaches Combined		671	52.889	38.173	72.143	807	21.745	14.479	32.736	359	9.946	7.217	13.344	1,837	30.815	21.715

Note: Square root transformation was performed on numbers of sockeye salmon per net. Means and 95% confidence limits presented are back transformed values (squared).

Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix C3.-Observed mean sockeye salmon catch per set with 95% confidence limits, by beach, week and distance from shore.

Beach	Week	Near				Mid				Off				Distances From Shore Combined			
		NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL
Kalifonsky	1	7	52.419	20.028	159.040	7	43.201	1.270	156.522	7	3.549	1.917	5.995	21	33.056	7.739	107.186
Kalifonsky	2	28	5.524	0.683	17.547	54	1.692	0.506	4.372	43	0.652	0.178	1.428	125	2.193	0.433	6.311
Kalifonsky	3	51	30.572	16.550	49.727	113	19.495	13.013	27.735	68	9.392	6.724	12.587	232	18.969	11.947	28.130
Kalifonsky	4	75	31.998	19.834	47.162	228	9.914	8.076	12.027	137	10.743	8.845	12.851	440	13.936	10.320	18.272
Kalifonsky	5	31	17.164	9.038	28.174	57	6.086	3.977	8.661	22	5.826	3.317	10.458	110	9.156	5.271	14.520
Kalifonsky	6	25	7.330	2.411	18.638	55	2.514	1.405	3.983	6	1.588	0.878	2.506	86	3.849	1.661	8.140
Kalifonsky	7	12	4.258	3.778	16.679	2	3.936	1.484	26.896	0				14	4.212	3.451	18.139
Kalifonsky Weeks Combined		229	22.913	12.562	40.251	516	10.368	7.083	15.454	283	8.131	6.248	10.477	1,028	12.547	8.074	19.608
Salamatof	1	42	13.026	7.167	20.780	15	19.860	10.878	33.169	0				57	14.824	8.143	24.040
Salamatof	2	66	10.099	5.852	15.605	44	6.243	3.195	10.398	7	1.137	0.094	3.332	117	8.113	4.508	12.912
Salamatof	3	109	141.482	105.873	182.377	76	67.971	37.815	108.131	21	24.283	15.246	35.414	206	102.414	71.525	140.004
Salamatof	4	122	87.361	71.850	104.406	104	54.924	40.527	71.711	36	17.794	12.536	23.971	262	64.926	51.266	80.376
Salamatof	5	44	38.864	26.001	54.737	19	32.641	30.288	83.395	12	9.263	4.206	16.290	75	32.551	23.600	55.845
Salamatof	6	44	24.623	11.815	45.615	28	4.200	2.197	7.011	0				72	16.681	8.075	30.602
Salamatof	7	15	10.313	5.357	17.063	5	1.942	0.072	6.348	0				20	8.220	4.036	14.385
Salamatof Weeks Combined		442	68.419	51.442	88.667	291	41.917	27.594	63.380	76	16.706	10.824	24.019	809	54.028	39.048	73.498
Beaches Combined	1	49	18.653	9.004	40.532	22	27.287	7.821	72.417	7	3.549	1.917	5.995	78	19.733	8.034	46.426
Beaches Combined	2	94	8.736	4.312	16.183	98	3.736	1.713	7.077	50	0.720	0.166	1.695	242	5.055	2.403	9.502
Beaches Combined	3	160	106.130	77.401	140.095	189	38.988	22.986	60.063	89	12.905	8.734	17.974	438	58.215	39.968	80.746
Beaches Combined	4	197	66.283	52.047	82.613	332	24.013	18.241	30.723	173	12.210	9.613	15.165	702	32.967	25.602	41.450
Beaches Combined	5	75	29.895	18.989	43.758	76	12.724	10.555	27.345	34	7.039	3.631	12.516	185	18.640	12.702	31.273
Beaches Combined	6	69	18.358	8.408	35.840	83	3.082	1.672	5.004	6	1.588	0.878	2.506	158	9.696	4.584	18.376
Beaches Combined	7	27	7.622	4.656	16.893	7	2.512	0.475	12.219	0				34	6.570	3.795	15.931
Beaches & Weeks Combined		671	52.889	38.173	72.143	807	21.745	14.479	32.736	359	9.946	7.217	13.344	1,837	30.815	21.715	43.340

Note: Square root transformation was performed on numbers of sockeye salmon per net. Means and 95% confidence limits presented are back transformed values (squared).

Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix C4.-Kalifonsky Beach observed mean sockeye salmon catch per set with 95% confidence limits, by study area, week, tidal current flow and distance from shore.

			Near				Mid				Off				Distances From Shore Combined			
Area	Week	Tidal Flow	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL
A	1	Flood	1	10.000	10.000	10.000	2	21.458	9.000	39.000	0				3	17.639	9.333	29.333
		Ebb	2	53.073	22.000	97.000	1	64.000	64.000	64.000	1	7.000	7.000	7.000	4	44.287	28.750	66.250
	2	Flood	8	6.315	1.106	17.671	6	5.416	0.926	13.470	18	1.063	0.446	2.016	32	3.192	0.701	8.077
		Ebb	4	2.389	0.250	6.873	5	1.524	0.080	4.734	16	0.057	0.004	0.262	25	0.724	0.059	2.214
	3	Flood	19	23.590	15.995	33.248	14	20.395	12.720	29.499	29	14.415	10.703	18.478	62	18.577	12.780	25.493
		Ebb	10	51.882	26.034	95.200	14	35.417	16.880	65.864	20	6.016	3.900	8.879	44	25.795	13.060	46.629
	4	Flood	25	28.067	18.676	41.076	24	14.401	10.569	18.881	41	12.803	9.687	16.345	90	17.469	12.419	23.891
		Ebb	15	62.113	31.167	115.052	21	16.244	10.325	23.223	49	8.137	6.607	9.943	85	19.665	11.860	31.773
	5	Flood	9	15.927	10.679	21.778	3	4.898	2.000	9.000	6	11.753	8.398	15.542	18	12.698	8.472	17.570
		Ebb	10	27.658	12.883	52.606	5	9.796	5.725	13.523	8	1.976	0.581	3.925	23	14.842	7.048	27.177
	6	Flood	9	8.583	2.341	18.651	8	1.919	0.513	3.953	0				17	5.447	1.481	11.734
		Ebb	4	16.155	4.500	37.180	4	7.719	5.063	10.624	0				8	11.937	4.782	23.902
	7	Flood	5	2.855	2.000	4.406	1	3.000	3.000	3.000	0				6	2.879	2.167	4.172
		Ebb	5	5.664	2.451	11.198	1	5.000	5.000	5.000	0				6	5.553	2.876	10.165
B	1	Flood	1	18.000	18.000	18.000	0				3	2.021	1.000	5.000	4	6.016	5.250	8.250
		Ebb	0				0				1	7.000	7.000	7.000	1	7.000	7.000	7.000
	2	Flood	2	14.431	1.000	41.000	2	5.411	1.000	13.000	3	2.546	1.000	6.000	7	6.760	1.000	18.000
		Ebb	1	0.000	0.000	0.000	2	0.746	0.000	3.000	0				3	0.497	0.000	2.000
	3	Flood	4	33.477	13.625	55.996	5	19.569	7.728	43.907	6	2.589	1.361	4.649	15	16.486	6.754	31.428
		Ebb	1	45.000	45.000	45.000	3	36.941	14.000	109.000	9	5.185	3.093	8.089	13	15.576	8.834	34.215
	4	Flood	6	28.557	10.498	71.968	6	12.493	4.952	23.068	12	7.243	4.504	10.075	24	13.884	6.115	28.797
		Ebb	4	35.632	24.982	46.847	3	18.324	11.000	29.000	15	8.954	5.246	13.810	22	15.082	9.619	21.888
	5	Flood	1	5.000	5.000	5.000	0				0				1	5.000	5.000	5.000
		Ebb	3	16.066	9.000	23.000	1	1.000	1.000	1.000	3	2.381	1.000	7.000	7	8.049	4.429	13.000
	6	Flood	3	4.055	0.000	21.000	0				3	1.897	1.000	3.000	6	2.976	0.500	12.000
		Ebb	1	1.000	1.000	1.000	0				3	1.297	1.000	2.000	4	1.223	1.000	1.750
	7	Flood	1	3.000	3.000	3.000	0				0				1	3.000	3.000	3.000
		Ebb	1	7.000	7.000	7.000	0				0				1	7.000	7.000	7.000
C	1	Flood	0				0				0				0			
		Ebb	2	69.554	61.000	78.000	3	49.91	4.000	94.000	0				5	57.768	26.800	87.600
	2	Flood	6	9.288	1.083	26.381	19	0.834	0.176	2.055	0				25	2.863	0.394	7.893
		Ebb	2	0.000	0.000	0.000	15	0.474	0.130	1.030	0				17	0.418	0.115	0.909
	3	Flood	10	15.166	7.618	24.268	40	14.838	12.265	17.827	0				50	14.904	11.336	19.115
		Ebb	6	51.114	15.085	122.712	26	15.461	9.192	25.158	0				32	22.146	10.297	43.449
	4	Flood	8	21.279	10.973	34.387	74	6.895	5.972	7.921	0				82	8.298	6.460	10.503
		Ebb	2	8.897	7.000	11.000	50	5.703	4.155	7.434	0				52	5.826	4.264	7.571
	5	Flood	4	6.412	3.843	9.967	22	6.396	3.827	10.135	0				26	6.398	3.829	10.109
		Ebb	2	5.862	4.000	8.000	9	3.895	1.108	9.437	0				11	4.253	1.634	9.176
	6	Flood	4	10.222	5.000	16.985	25	3.378	2.215	4.801	0				29	4.322	2.599	6.482
		Ebb	1	0.000	0.000	0.000	17	1.006	0.344	2.330	0				18	0.950	0.325	2.201
	7	Flood	0				0				0				0			
		Ebb	0				0				0				0			
All	All	Flood	126	17.950	10.065	30.211	251	9.036	6.431	12.557	121	9.541	6.919	12.614	498	11.414	7.469	17.037
All	All	Ebb	76	34.931	17.715	64.075	180	11.433	6.244	19.341	125	5.934	4.264	8.171	381	14.316	7.883	24.599

Note: Square root transformation was performed on numbers of sockeye salmon per net. Means and 95% confidence limits presented are back transformed values (squared).

Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix C5.-Salamatof Beach observed mean sockeye salmon catch per set with 95% confidence limits, by study area, week, tidal current flow and distance from shore.

			Near				Mid				Off				Distances From Shore Com		
Area	Week	Tidal Flow	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL
D	1	Flood	6	14.308	6.407	23.832	0				0				6	14.308	6.407
		Ebb	4	7.805	1.000	19.950	1	23.000	23.000	23.000	0				5	10.844	5.400
	2	Flood	6	7.858	4.882	12.369	3	22.631	7.000	52.000	0				9	12.782	5.588
		Ebb	6	2.769	1.419	4.924	5	10.428	6.159	15.534	0				11	6.250	3.574
	3	Flood	18	90.777	65.489	124.664	3	74.055	8.000	206.000	0				21	88.388	57.276
		Ebb	19	85.616	60.665	112.691	5	58.110	20.579	137.569	0				24	79.886	52.314
	4	Flood	14	51.010	39.074	62.752	3	26.846	10.000	55.000	0				17	46.746	33.943
		Ebb	12	69.162	45.165	94.985	7	49.884	24.578	80.446	0				19	62.060	37.580
	5	Flood	7	22.696	12.285	33.948	0				0				7	22.696	12.285
		Ebb	5	28.685	7.597	72.394	0				0				5	28.685	7.597
	6	Flood	8	14.694	5.066	30.443	1	4.000	4.000	4.000	0				9	13.506	4.948
		Ebb	4	18.457	5.905	30.992	2	10.831	8.000	14.000	0				6	15.915	6.603
	7	Flood	0				0				0				0		
		Ebb	3	5.242	3.000	7.000	0				0				3	5.242	3.000
E	1	Flood	7	9.584	3.834	18.315	0				0				7	9.584	3.834
		Ebb	6	11.465	6.829	16.991	1	49.000	49.000	49.000	0				7	16.827	12.853
	2	Flood	14	10.758	6.721	15.129	6	6.490	3.695	9.510	0				20	9.478	5.813
		Ebb	15	6.972	4.532	10.151	5	6.757	1.359	14.038	0				20	6.918	3.739
	3	Flood	20	105.945	71.264	151.201	9	77.339	23.811	189.678	0				29	97.067	56.537
		Ebb	23	151.244	107.180	202.130	17	108.588	58.422	179.238	0				40	133.115	86.458
	4	Flood	21	65.772	44.800	88.641	15	71.528	46.628	105.980	0				36	68.170	45.562
		Ebb	15	71.222	42.476	103.027	17	77.528	54.306	106.500	0				32	74.572	48.761
	5	Flood	7	15.434	10.897	20.869	3	33.607	25.000	56.000	0				10	20.886	15.128
		Ebb	8	43.497	32.155	55.858	2	25.613	20.000	32.000	0				10	39.920	29.724
	6	Flood	2	54.188	27.000	91.000	0				0				2	54.188	27.000
		Ebb	1	28.000	28.000	28.000	0				0				1	28.000	28.000
	7	Flood	0				0				0				0		
		Ebb	0				0				0				0		
F	1	Flood	5	13.158	5.989	22.845	6	17.798	8.850	31.966	0				11	15.689	7.550
		Ebb	9	13.361	7.280	21.995	5	17.031	9.511	26.691	0				14	14.672	8.077
	2	Flood	7	12.331	3.649	26.176	9	4.158	2.241	7.157	4	2.636	1.400	3.737	20	6.714	2.566
		Ebb	14	16.475	7.241	34.283	14	2.703	1.543	4.119	3	0.111	0.000	1.000	31	8.672	3.967
	3	Flood	7	199.932	82.342	402.791	12	18.265	7.505	34.642	9	21.942	8.558	43.986	28	64.864	26.553
		Ebb	10	296.815	215.534	404.355	15	37.539	20.811	59.948	9	26.843	16.524	41.509	34	110.965	76.948
	4	Flood	18	119.826	88.145	158.344	14	11.530	7.530	16.323	12	12.971	8.659	18.172	44	56.226	40.817
		Ebb	11	126.604	99.431	156.472	12	16.866	11.668	23.327	15	14.442	9.909	19.858	38	47.675	36.379
	5	Flood	2	106.773	94.000	120.000	3	11.739	4.000	23.000	6	12.503	4.594	26.606	11	29.435	20.688
		Ebb	7	69.431	44.536	87.996	4	18.830	13.982	27.421	6	6.683	4.091	9.815	17	35.379	23.072
	6	Flood	11	26.478	11.478	50.882	11	1.510	0.468	2.888	0				22	13.994	5.973
		Ebb	13	34.649	17.403	62.741	13	6.392	4.770	8.207	0				26	20.521	11.087
	7	Flood	2	17.503	17.000	18.000	1	1.000	1.000	1.000	0				3	12.002	11.667
		Ebb	9	8.458	5.100	12.139	4	2.195	0.250	4.486	0				13	6.531	3.608
All	All	Flood	182	60.110	39.034	88.886	99	28.899	13.907	55.223	31	14.151	6.906	25.436	312	45.640	27.869
All	All	Ebb	194	69.887	47.805	96.929	129	39.459	23.234	62.209	33	15.111	9.754	22.222	356	53.783	35.374

Note: Square root transformation was performed on numbers of sockeye salmon per net. Means and 95% confidence limits presented are back transformed values (squared).

Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix C6.-Observed mean sockeye salmon catch per set with 95% confidence limits, all weeks combined, by beach, study area, tidal current flow and distance from shore.

			Near				Mid				Off				Distances From	
Beach	Area	Tidal Flow	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN
Kalifonsky	A	Flood	76	19.017	12.064	28.893	58	12.752	8.076	18.734	94	10.985	8.149	14.208	228	14.112
	A	Ebb	50	38.715	18.639	72.601	51	19.479	11.204	31.619	94	5.774	4.398	7.525	195	17.805
Kalifonsky	B	Flood	18	20.682	8.083	45.933	13	14.125	5.411	29.534	27	4.513	2.638	7.066	58	11.685
	B	Ebb	11	22.157	16.357	28.126	9	18.698	8.444	46.778	31	6.420	3.856	10.128	51	11.981
Kalifonsky	C	Flood	32	13.880	6.432	24.496	180	7.471	5.975	9.340	0				212	8.438
	C	Ebb	15	31.688	15.634	62.018	120	7.468	3.971	12.065	0				135	10.159
Kalifonsky Areas Combined		Flood	126	17.950	10.065	30.211	251	9.036	6.431	12.557	121	9.541	6.919	12.614	498	11.414
Kalifonsky Areas Combined		Ebb	76	34.931	17.715	64.075	180	11.433	6.244	19.341	125	5.934	4.264	8.171	381	14.316
Salamatof	D	Flood	59	46.738	32.544	64.760	10	37.459	7.900	94.300	0				69	45.393
	D	Ebb	53	51.650	33.542	73.533	20	36.827	17.237	68.982	0				73	47.589
Salamatof	E	Flood	71	55.412	36.863	78.219	33	57.840	30.633	106.723	0				104	56.182
	E	Ebb	68	74.945	51.419	101.816	42	78.523	47.909	120.018	0				110	76.311
Salamatof	F	Flood	52	81.698	49.361	130.825	56	10.315	5.123	17.896	31	14.151	6.906	25.436	139	37.875
	F	Ebb	73	78.415	54.793	109.363	67	15.756	9.556	23.949	33	15.111	9.754	22.223	173	42.073
Salamatof Areas Combined		Flood	182	60.110	39.034	88.886	99	28.899	13.907	55.223	31	14.151	6.906	25.436	312	45.640
Salamatof Areas Combined		Ebb	194	69.887	47.805	96.929	129	39.459	23.234	62.209	33	15.111	9.754	22.222	356	53.783
Beaches Combined		Flood	308	42.863	27.183	64.883	350	14.654	8.546	24.625	152	10.481	6.917	15.229	810	24.597
Beaches Combined		Ebb	270	60.047	39.335	87.681	309	23.133	13.337	37.237	158	7.851	5.411	11.105	737	33.380

Note: Square root transformation was performed on numbers of sockeye salmon per net. Means and 95% confidence limits presented are back transformed values (squared).

Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix C7.-Observed mean sockeye salmon catch per set with 95% confidence limits, study areas within beach combined, by beach, week, tidal current flow and distance from shore.

			Near				Mid				Off				Distances From Shore Com		
Beach	Week	Tidal Flow	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL
Kalifonsky	1	Flood	2	14.000	14.000	14.000	2	21.458	9.000	39.000	3	2.021	1.000	5.000	7	10.997	7.000
		Ebb	4	61.313	41.500	87.500	4	53.432	19.000	86.500	2	7.000	7.000	7.000	10	47.298	25.600
Kalifonsky	2	Flood	16	8.444	1.084	23.854	27	2.191	0.404	5.402	21	1.275	0.525	2.585	64	3.454	0.614
		Ebb	7	1.365	0.143	3.928	22	0.737	0.107	2.051	16	0.057	0.004	0.262	45	0.593	0.076
Kalifonsky	3	Flood	33	22.236	13.169	33.284	59	16.558	11.988	22.807	35	12.388	9.102	16.107	127	16.884	11.500
		Ebb	17	51.206	23.285	101.957	43	23.457	12.031	44.261	29	5.758	3.650	8.634	89	22.990	11.450
Kalifonsky	4	Flood	39	26.750	15.838	44.457	104	8.950	6.974	11.324	53	11.544	8.514	14.925	196	13.193	9.154
		Ebb	21	52.001	27.687	92.150	74	9.206	6.183	12.789	64	8.328	6.288	10.849	159	14.505	9.065
Kalifonsky	5	Flood	14	12.428	8.321	17.205	25	6.216	3.608	9.999	6	11.753	8.398	15.542	45	8.887	5.713
		Ebb	15	22.433	10.922	40.737	15	5.669	2.640	10.236	11	2.087	0.696	4.764	41	10.841	5.148
Kalifonsky	6	Flood	16	8.144	2.567	18.675	33	3.025	1.803	4.595	3	1.897	1.000	3.000	52	4.535	1.992
		Ebb	6	10.936	3.167	24.953	21	2.285	1.243	3.910	3	1.297	1.000	2.000	30	3.916	1.604
Kalifonsky	7	Flood	6	2.880	2.167	4.171	1	3.000	3.000	3.000	0				7	2.897	2.286
		Ebb	6	5.887	3.209	10.498	1	5.000	5.000	5.000	0				7	5.760	3.465
Kalifonsky	All	Flood	126	17.950	10.065	30.211	251	9.036	6.431	12.557	121	9.541	6.919	12.614	498	11.414	7.469
	All	Ebb	76	34.931	17.715	64.075	180	11.433	6.244	19.341	125	5.934	4.264	8.171	381	14.316	7.883
Salamatof	1	Flood	18	12.151	5.290	21.412	6	17.798	8.850	31.966	0				24	13.563	6.180
		Ebb	19	11.592	5.815	19.984	7	22.451	17.079	29.351	0				26	14.516	8.848
Salamatof	2	Flood	27	10.522	5.516	17.379	18	8.014	3.519	15.415	4	2.636	1.400	3.737	49	8.957	4.446
		Ebb	35	10.053	5.082	18.908	24	5.157	2.466	8.563	3	0.111	0.000	1.000	62	7.677	3.823
Salamatof	3	Flood	45	114.498	70.678	179.722	24	47.391	13.682	114.200	9	21.942	8.558	43.986	78	83.170	45.973
		Ebb	52	155.259	111.021	208.340	37	72.963	38.060	125.246	9	26.843	16.524	41.509	98	112.395	74.796
Salamatof	4	Flood	53	80.231	58.009	105.475	32	41.090	26.089	61.976	12	12.971	8.659	18.172	97	58.998	41.374
		Ebb	38	86.603	59.812	115.958	36	51.932	34.313	73.710	15	14.442	9.909	19.858	89	60.417	41.087
Salamatof	5	Flood	16	30.028	21.892	38.983	6	22.673	14.500	39.500	6	12.503	4.594	26.606	28	24.697	16.601
		Ebb	20	48.871	30.349	71.240	6	21.091	15.988	28.947	6	6.683	4.091	9.815	32	35.752	22.733
Salamatof	6	Flood	21	24.628	10.513	46.917	12	1.718	0.762	2.980	0				33	16.297	6.967
		Ebb	18	30.682	15.436	53.756	15	6.984	5.201	8.979	0				33	19.910	10.784
Salamatof	7	Flood	2	17.503	17.000	18.000	1	1.000	1.000	1.000	0				3	12.002	11.667
		Ebb	12	7.654	4.575	10.855	4	2.195	0.250	4.486	0				16	6.289	3.494
Salamatof	All	Flood	182	60.110	39.034	88.886	99	28.899	13.907	55.223	31	14.151	6.906	25.436	312	45.640	27.869
	All	Ebb	194	69.887	47.805	96.929	129	39.459	23.234	62.209	33	15.111	9.754	22.222	356	53.783	35.374
Combined	1	Flood	20	12.336	6.161	20.671	8	18.713	8.888	33.725	3	2.021	1.000	5.000	31	12.983	6.365
		Ebb	23	20.239	12.021	31.726	11	33.717	17.778	50.132	2	7.000	7.000	7.000	36	23.622	13.501
Combined	2	Flood	43	9.749	3.867	19.788	45	4.520	1.650	9.407	25	1.493	0.665	2.769	113	5.840	2.276
		Ebb	42	8.605	4.259	16.411	46	3.043	1.338	5.449	19	0.066	0.003	0.379	107	4.698	2.247
Combined	3	Flood	78	75.464	46.347	117.767	83	25.474	12.478	49.234	44	14.342	8.991	21.810	205	42.105	24.616
		Ebb	69	129.623	89.405	182.130	80	46.354	24.069	81.717	38	10.752	6.699	16.420	187	69.844	44.647
Combined	4	Flood	92	57.560	40.132	79.609	136	16.512	11.472	23.242	65	11.807	8.541	15.524	293	28.357	19.821
		Ebb	59	74.287	48.378	107.484	110	23.189	15.389	32.727	79	9.489	6.976	12.560	248	30.981	20.557
Combined	5	Flood	30	21.815	15.559	28.820	31	9.401	5.716	15.709	12	12.128	6.496	21.074	73	14.951	9.889
		Ebb	35	37.540	22.023	58.167	21	10.075	6.454	15.582	17	3.709	1.894	6.547	73	21.761	12.857
Combined	6	Flood	37	17.500	7.077	34.704	45	2.676	1.525	4.164	3	1.897	1.000	3.000	85	9.101	3.923
		Ebb	24	25.746	12.369	46.555	36	4.243	2.892	6.022	3	1.297	1.000	2.000	63	12.294	6.412
Combined	7	Flood	8	6.536	5.875	7.628	2	2.000	2.000	2.000	0				10	5.629	5.100
		Ebb	18	7.065	4.120	10.736	5	2.756	1.200	4.589	0				23	6.128	3.485
Combined	All	Flood	308	42.863	27.183	64.883	350	14.654	8.546	24.625	152	10.481	6.917	15.229	810	24.597	15.327
	All	Ebb	270	60.047	39.335	87.681	309	23.133	13.337	37.237	158	7.851	5.411	11.105	737	33.380	21.162

Note: Square root transformation was performed on numbers of sockeye salmon per net. Means and 95% confidence limits presented are back transformed values (squared).

Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix C8.-Kalifonsky Beach observed mean sockeye salmon catch per set with 95% confidence limits, by study area, week, vertical net location and distance from shore.

			Near				Mid				Off				Distances From Shore Combined			
Area	Week	Net Location	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL
A	1	Upper 2/3	3	23.684	5	70	3	16.429	3.000	31.543	1	6.000	6.000	6.000	7	18.048	4.286	44.376
		Lower 1/3	3	11.362	5	27	3	15.958	6.000	25.000	1	1.000	1.000	1.000	7	11.851	4.857	22.429
A	2	Upper 2/3	13	4.827	1.687	9.794	13	3.246	1.221	6.435	34	0.116	0.031	0.288	60	1.815	0.648	3.679
		Lower 1/3	13	0.095	0.000	0.663	13	0.552	0.059	1.681	34	0.125	0.015	0.388	60	0.211	0.021	0.728
A	3	Upper 2/3	30	19.311	11.932	28.309	31	13.373	6.907	23.105	50	1.710	0.842	2.865	111	9.724	5.533	15.394
		Lower 1/3	30	1.526	0.502	3.294	31	2.146	0.544	5.359	50	3.825	2.091	6.097	111	2.735	1.229	5.133
A	4	Upper 2/3	40	20.542	13.396	30.399	49	12.293	9.257	15.475	107	4.781	3.774	5.981	196	9.876	7.108	13.338
		Lower 1/3	40	3.810	1.865	6.790	49	1.727	0.861	2.974	107	4.060	2.998	5.232	196	3.426	2.233	4.985
A	5	Upper 2/3	19	18.277	11.071	28.649	8	6.999	4.563	9.697	19	3.923	2.284	5.673	46	10.387	6.310	15.863
		Lower 1/3	19	1.995	0.686	4.000	8	0.274	0.000	1.185	19	1.939	0.971	3.286	46	1.673	0.684	3.216
A	6	Upper 2/3	15	7.009	3.063	13.813	12	2.882	1.413	4.885	0				27	5.175	2.330	9.845
		Lower 1/3	15	1.348	0.350	3.233	12	0.307	0.028	0.909	0				27	0.885	0.207	2.200
A	7	Upper 2/3	10	3.503	2.262	5.245	2	2.000	2.000	2.000	0				12	3.253	2.218	4.704
		Lower 1/3	10	0.318	0.010	1.198	2	1.880	1.000	3.000	0				12	0.578	0.175	1.498
B	1	Upper 2/3	1	8.000	8.000	8.000	0				6	0.442	0.111	1.000	7	1.522	1.238	2.000
		Lower 1/3	1	10.000	10.000	10.000	0				6	1.695	0.222	4.297	7	2.881	1.619	5.112
B	2	Upper 2/3	5	4.405	0.557	13.371	4	1.847	0.188	5.199	9	1.381	0.444	2.583	18	2.325	0.419	6.161
		Lower 1/3	5	1.746	0	8.533	4	0.328	0.000	2.813	9	0.021	0.000	0.222	18	0.568	0.000	3.106
B	3	Upper 2/3	5	16.951	2.160	41.457	8	14.421	3.415	34.586	18	5.160	2.886	8.887	31	9.452	2.905	20.772
		Lower 1/3	5	1.634	0.080	5.387	8	0.555	0.000	3.700	18	0.672	0.254	1.333	31	0.797	0.160	2.598
B	4	Upper 2/3	12	32.627	19.920	52.483	11	12.993	7.165	20.993	30	6.325	3.984	9.011	53	13.664	8.252	21.341
		Lower 1/3	12	1.510	0.547	2.762	11	0.613	0.082	1.599	30	2.034	1.426	2.721	53	1.620	0.948	2.497
B	5	Upper 2/3	4	11.195	5.396	19.342	1	1.000	1.000	1.000	3	2.151	1.000	6.000	8	6.529	3.198	12.046
		Lower 1/3	4	0.372	0.000	1.457	1	0.000	0.000	0.000	3	0.104	0.000	1.000	8	0.225	0.000	1.104
B	6	Upper 2/3	4	2.327	0.125	9.341	0				6	1.171	0.407	2.262	10	1.633	0.294	5.094
		Lower 1/3	4	0.481	0.000	3.938	0				6	0.028	0.000	0.250	10	0.209	0.000	1.725
B	7	Upper 2/3	2	3.726	2.000	6.000	0				0				2	3.726	2.000	6.000
		Lower 1/3	2	1.000	1.000	1.000	0				0				2	1.000	1.000	1.000
C	1	Upper 2/3	3	64.607	44.000	94.000	4	41.292	10.563	71.499	0				7	51.284	24.893	81.142
		Lower 1/3	3	15.999	15.330	17.000	4	8.099	1	20.988	0				7	11.485	7.141	19.279
C	2	Upper 2/3	10	4.703	0.823	12.400	37	0.503	0.158	1.071	0				47	1.397	0.299	3.481
		Lower 1/3	10	0.700	0.060	2.442	37	0.085	0.014	0.223	0				47	0.216	0.024	0.695
C	3	Upper 2/3	16	19.144	7.931	37.491	74	11.365	8.561	14.719	0				90	12.748	8.449	18.767
		Lower 1/3	16	2.700	1.084	5.119	74	2.965	2.204	3.877	0				90	2.918	2.005	4.098
C	4	Upper 2/3	23	15.935	11.126	21.669	168	5.670	4.917	6.467	0				191	6.906	5.665	8.298
		Lower 1/3	23	1.073	0.494	1.857	168	1.312	1.046	1.631	0				191	1.283	0.980	1.658
C	5	Upper 2/3	8	7.825	4.797	11.891	48	4.936	3.403	6.803	0				56	5.349	3.602	7.530
		Lower 1/3	8	0.624	0.125	1.406	48	0.488	0.198	0.947	0				56	0.507	0.188	1.013
C	6	Upper 2/3	6	4.790	1.164	10.742	43	2.070	1.352	3.006	0				49	2.403	1.329	3.953
		Lower 1/3	6	0.072	0.000	0.750	43	0.032	0.002	0.115	0				49	0.037	0.002	0.193
C	7	Upper 2/3	0				0				0				0			
		Lower 1/3	0				0				0				0			
All	All	Upper 2/3	229	15.699	9.016	25.804	516	7.312	5.014	10.232	283	3.508	2.396	4.939	1,028	8.133	5.185	12.244
All	All	Lower 1/3	229	2.068	0.953	4.142	516	1.412	0.841	2.320	283	2.656	1.746	3.813	1,028	1.901	1.115	3.137

Note: Square root transformation was performed on numbers of sockeye salmon per net. Means and 95% confidence limits presented are back transformed values (squared).

Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix C9.-Salamatof Beach observed mean sockeye salmon catch per set with 95% confidence limits, by study area, week, vertical net location and distance from shore.

			Near				Mid				Off				Distances From Shore Combined			
Area	Week	Net Location	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL
D	1	Upper 2/3	10	7.583	2.896	13.459	3	11.411	6.000	18.000	0				13	8.466	3.612	14.507
		Lower 1/3	10	2.397	0.679	5.448	3	8.456	5.000	11.000	0				13	3.795	1.676	6.729
D	2	Upper 2/3	14	2.237	0.881	4.528	8	7.989	4.269	13.044	0				22	4.329	2.113	7.625
		Lower 1/3	14	1.073	0.366	2.219	8	5.512	1.947	11.181	0				22	2.687	0.941	5.478
D	3	Upper 2/3	38	51.871	38.990	65.988	10	31.539	10.527	66.716	0				48	47.635	33.060	66.140
		Lower 1/3	38	27.350	18.536	39.376	10	19.416	6.662	39.867	0				48	25.697	16.062	39.478
D	4	Upper 2/3	34	32.106	24.640	41.279	13	33.776	21.038	49.826	0				47	32.568	23.644	43.643
		Lower 1/3	34	20.312	14.738	26.766	13	19.306	10.656	31.834	0				47	20.034	13.609	28.168
D	5	Upper 2/3	12	13.512	7.264	22.262	2	9.951	8.000	12.000	0				14	13.003	7.369	20.796
		Lower 1/3	12	6.852	1.581	15.236	2	0.488	0.000	2.000	0				14	5.943	1.355	13.345
D	6	Upper 2/3	14	9.298	4.921	15.624	4	3.731	1.457	7.000	0				18	8.061	4.151	13.708
		Lower 1/3	14	3.581	1.190	7.444	4	2.842	1.400	5.466	0				18	3.417	1.237	7.004
D	7	Upper 2/3	3	5.226	3.000	7.000	0				0				3	5.226	3.000	7.000
		Lower 1/3	3	0.000	0.000	0.000	0				0				3	0.000	0.000	0.000
E	1	Upper 2/3	15	9.114	5.378	13.983	1	34.000	34.000	34.000	0				16	10.669	7.167	15.234
		Lower 1/3	15	2.391	0.862	4.549	1	15.000	15.000	15.000	0				16	3.179	1.746	5.202
E	2	Upper 2/3	29	6.075	3.878	8.987	11	5.673	3.048	8.410	0				40	5.964	3.650	8.828
		Lower 1/3	29	0.442	0.15	0.929	11	0.591	0.121	1.482	0				40	0.483	0.142	1.081
E	3	Upper 2/3	49	83.733	63.327	107.763	29	49.169	26.698	78.227	0				78	70.882	49.709	96.782
		Lower 1/3	49	28.193	17.562	41.885	29	13.724	4.260	31.565	0				78	22.814	12.616	38.048
E	4	Upper 2/3	50	47.595	36.960	59.787	46	65.460	50.876	83.446	0				96	56.155	43.628	71.124
		Lower 1/3	50	11.654	7.184	17.017	46	6.624	4.434	9.241	0				96	9.244	5.866	13.291
E	5	Upper 2/3	23	18.680	12.521	25.810	10	42.513	30.427	57.940	0				33	25.902	17.947	35.546
		Lower 1/3	23	3.477	1.513	6.331	10	4.052	1.671	7.598	0				33	3.651	1.561	6.715
E	6	Upper 2/3	3	35.550	18.000	78.000	0				0				3	35.550	18.000	78.000
		Lower 1/3	3	7.683	3.000	13.000	0				0				3	7.683	3.000	13.000
E	7	Upper 2/3	0				0				0				0			
		Lower 1/3	0				0				0				0			
F	1	Upper 2/3	17	12.385	7.952	18.034	11	12.676	6.346	21.904	0				28	12.499	7.321	19.554
		Lower 1/3	17	1.019	0.259	2.437	11	2.48	0.907	5.063	0				28	1.593	0.514	3.469
F	2	Upper 2/3	23	11.204	6.214	19.214	25	2.752	1.781	3.974	7	0.083	0	0.327	55	5.947	3.408	9.883
		Lower 1/3	23	2.666	0.934	5.555	25	0.121	0.022	0.357	7	0.297	0.02	1.137	55	1.208	0.403	2.630
F	3	Upper 2/3	22	175.066	116.431	238.971	37	32.946	21.764	47.059	21	13.758	8.79	19.988	80	66.992	44.392	92.729
		Lower 1/3	22	22.791	6.576	51.392	37	6.798	3.759	11.014	21	8.761	4.782	14.975	80	11.711	4.802	23.158
F	4	Upper 2/3	38	65.897	49.826	84.170	45	23.160	16.925	30.363	36	8.161	5.455	11.547	119	32.270	23.961	41.853
		Lower 1/3	38	9.902	4.929	17.707	45	5.873	4.004	8.287	36	8.886	6.205	12.211	119	8.071	4.965	12.482
F	5	Upper 2/3	9	55.799	29.337	81.922	7	12.199	7.630	17.398	12	3.003	1.344	5.683	28	22.272	11.913	33.117
		Lower 1/3	9	2.311	0.111	8.005	7	2.814	1.641	4.241	12	6.021	3.289	10.088	28	4.027	1.856	7.957
F	6	Upper 2/3	27	17.127	10.978	25.474	24	2.400	1.278	3.875	0				51	10.197	6.413	15.310
		Lower 1/3	27	1.736	0.492	4.456	24	0.373	0.141	0.750	0				51	1.095	0.327	2.712
F	7	Upper 2/3	12	5.705	2.332	10.665	5	1.637	0.299	3.383	0				17	4.509	1.734	8.523
		Lower 1/3	12	0.456	0	1.915	5	0.159	0.000	0.640	0				17	0.369	0.000	1.540
All	All	Upper 2/3	442	42.232	30.166	56.428	291	29.095	19.608	41.298	76	8.149	5.225	11.920	809	34.305	24.025	46.804
All	All	Lower 1/3	442	11.418	6.575	18.439	291	6.417	3.253	11.356	76	7.608	4.782	11.620	809	9.261	5.211	15.250

Note: Square root transformation was performed on numbers of sockeye salmon per net. Means and 95% confidence limits presented are back transformed values (squared).

Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix C10.-Observed mean sockeye salmon catch per set with 95% confidence limits, all weeks combined, by beach, study area, vertical net location and distance from shore.

			Near				Mid				Off				Distances From Shore Co		
Beach	Area	Net Location	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL
Kalifonsky	A	Upper 2/3	130	15.556	9.305	24.666	118	10.195	6.356	15.195	211	3.230	2.352	4.297	459	8.512	5.351
	A	Lower 1/3	130	2.268	0.947	4.588	118	1.829	0.679	3.687	211	3.165	2.110	4.461	459	2.567	1.413
Kalifonsky	B	Upper 2/3	33	17.207	8.688	31.475	24	11.112	4.495	22.059	72	4.322	2.522	6.821	129	8.881	4.466
	B	Lower 1/3	33	1.528	0.575	4.131	24	0.521	0.037	2.435	72	1.166	0.676	1.915	129	1.139	0.531
Kalifonsky	C	Upper 2/3	66	15.227	8.612	25.210	374	6.158	4.623	7.907	0				440	7.518	5.221
	C	Lower 1/3	66	1.944	1.156	3.269	374	1.337	0.944	1.881	0				440	1.428	0.976
Kalifonsky Areas Combined		Upper 2/3	229	15.699	9.016	25.804	516	7.312	5.014	10.232	283	3.508	2.396	4.939	1,028	8.133	5.185
Kalifonsky Areas Combined		Lower 1/3	229	2.068	0.953	4.142	516	1.412	0.841	2.320	283	2.656	1.746	3.813	1,028	1.901	1.115
Salamatof	D	Upper 2/3	125	27.823	20.206	36.927	40	22.186	11.319	38.131	0				165	26.456	18.052
	D	Lower 1/3	125	15.210	10.024	22.231	40	13.174	6.033	24.021	0				165	14.716	9.056
Salamatof	E	Upper 2/3	169	43.384	32.463	56.614	97	51.119	35.942	70.237	0				266	46.205	33.732
	E	Lower 1/3	169	12.520	7.579	18.835	97	7.884	3.717	14.925	0				266	10.829	6.171
Salamatof	F	Upper 2/3	148	53.087	35.955	72.685	154	17.017	11.473	23.893	76	8.149	5.225	11.920	378	29.357	19.802
	F	Lower 1/3	148	6.956	2.514	14.784	154	3.737	2.238	5.818	76	7.608	4.782	11.619	378	5.776	2.858
Salamatof Areas Combined		Upper 2/3	442	42.232	30.166	56.428	291	29.095	19.608	41.298	76	8.149	5.225	11.920	809	34.305	24.025
Salamatof Areas Combined		Lower 1/3	442	11.418	6.575	18.439	291	6.417	3.253	11.356	76	7.608	4.782	11.620	809	9.261	5.211
Beaches Combined		Upper 2/3	671	33.177	22.948	45.976	807	15.166	10.276	21.434	359	4.490	2.995	6.417	1,837	19.659	13.482
Beaches Combined		Lower 1/3	671	8.227	4.656	13.560	807	3.217	1.711	5.578	359	3.704	2.388	5.466	1,837	5.142	2.919

Note: Square root transformation was performed on numbers of sockeye salmon per net. Means and 95% confidence limits presented are back transformed values (squared).

Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

Appendix C11.-Observed mean sockeye salmon catch per set with 95% confidence limits, study areas within beach combined, by beach, week, vertical net location and distance from shore.

			Near				Mid				Off				Distances From Shore Combined			
Beach	Week	Net Location	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL	NETS	MEAN	95% LCL	95% UCL
Kalifonsky	1	Upper 2/3	7	38.982	22.143	71.429	7	30.637	7.321	54.375	7	1.236	0.952	1.714	21	23.618	10.139	42.506
		Lower 1/3	7	13.155	10.141	20.286	7	11.467	3.143	22.707	7	1.596	0.333	3.826	21	8.739	4.539	15.606
Kalifonsky	2	Upper 2/3	28	4.707	1.177	11.364	54	1.263	0.416	2.668	43	0.380	0.118	0.768	125	1.731	0.484	3.962
		Lower 1/3	28	0.606	0.021	2.703	54	0.215	0.024	0.766	43	0.103	0.012	0.354	125	0.264	0.019	1.058
Kalifonsky	3	Upper 2/3	51	19.027	9.718	32.479	113	12.132	7.743	18.426	68	2.623	1.383	4.459	232	10.861	6.313	17.421
		Lower 1/3	51	1.905	0.643	4.071	113	2.570	1.593	4.271	68	2.990	1.605	4.836	232	2.547	1.388	4.393
Kalifonsky	4	Upper 2/3	75	21.063	13.744	31.255	228	7.446	5.958	9.104	137	5.119	3.820	6.644	440	9.043	6.619	12.114
		Lower 1/3	75	2.603	1.234	4.633	228	1.368	0.960	1.918	137	3.616	2.654	4.682	440	2.278	1.534	3.241
Kalifonsky	5	Upper 2/3	31	14.666	8.720	23.124	57	5.157	3.524	7.108	22	3.681	2.109	5.718	110	7.542	4.705	11.344
		Lower 1/3	31	1.432	0.453	3.002	57	0.450	0.167	0.964	22	1.689	0.838	2.974	110	0.975	0.382	1.940
Kalifonsky	6	Upper 2/3	25	5.727	2.137	12.361	55	2.247	1.365	3.416	6	1.171	0.407	2.262	86	3.184	1.523	5.936
		Lower 1/3	25	0.903	0.210	2.750	55	0.092	0.008	0.288	6	0.028	0.000	0.250	86	0.323	0.066	1.001
Kalifonsky	7	Upper 2/3	12	3.540	2.218	5.371	2	2.000	2.000	2.000	0				14	3.320	2.187	4.889
		Lower 1/3	12	0.432	0.175	1.165	2	1.880	1.000	3.000	0				14	0.639	0.293	1.427
Kalifonsky	All	Upper 2/3	229	15.699	9.016	25.804	516	7.312	5.014	10.232	283	3.508	2.396	4.939	1,028	8.133	5.185	12.244
	All	Lower 1/3	229	2.068	0.953	4.142	516	1.412	0.841	2.320	283	2.656	1.746	3.813	1,028	1.901	1.115	3.137
Salamatof	1	Upper 2/3	42	10.074	5.829	15.498	15	13.845	8.120	21.930	0				57	11.066	6.432	17.191
		Lower 1/3	42	1.837	0.574	3.908	15	4.510	2.665	6.913	0				57	2.540	1.124	4.699
Salamatof	2	Upper 2/3	66	7.048	4.056	11.605	44	4.434	2.550	6.732	7	0.083	0.000	0.327	117	5.648	3.247	9.098
		Lower 1/3	66	1.351	0.469	2.815	44	1.219	0.397	2.606	7	0.297	0.020	1.137	117	1.238	0.415	2.636
Salamatof	3	Upper 2/3	109	91.060	65.561	119.682	76	38.951	22.168	61.539	21	13.758	8.790	19.988	206	63.955	43.765	88.068
		Lower 1/3	109	26.809	15.684	42.929	76	11.101	4.333	22.652	21	8.761	4.782	14.975	206	19.174	10.385	32.598
Salamatof	4	Upper 2/3	122	48.979	37.534	62.224	104	43.196	32.456	56.275	36	8.161	5.455	11.547	262	41.075	31.111	52.899
		Lower 1/3	122	13.521	8.587	19.949	104	7.884	5.026	11.652	36	8.886	6.205	12.211	262	10.647	6.846	15.592
Salamatof	5	Upper 2/3	44	24.863	14.527	36.320	19	27.917	19.668	38.168	12	3.003	1.344	5.683	75	22.139	13.720	31.886
		Lower 1/3	44	4.159	1.245	9.102	19	3.220	1.484	5.772	12	6.021	3.289	10.088	75	4.219	1.633	8.416
Salamatof	6	Upper 2/3	44	15.892	9.530	25.922	28	2.590	1.303	4.322	0				72	10.719	6.331	17.522
		Lower 1/3	44	2.728	0.885	5.990	28	0.725	0.320	1.423	0				72	1.949	0.665	4.214
Salamatof	7	Upper 2/3	15	5.609	2.466	9.932	5	1.637	0.299	3.383	0				20	4.616	1.924	8.295
		Lower 1/3	15	0.365	0.000	1.532	5	0.159	0.000	0.640	0				20	0.314	0.000	1.309
Salamatof	All	Upper 2/3	442	42.232	30.166	56.428	291	29.095	19.608	41.298	76	8.149	5.225	11.920	809	34.305	24.025	46.804
	All	Lower 1/3	442	11.418	6.575	18.439	291	6.417	3.253	11.356	76	7.608	4.782	11.620	809	9.261	5.211	15.250
Combined	1	Upper 2/3	49	14.204	8.160	23.488	22	19.188	7.866	32.253	7	1.236	0.952	1.714	78	14.446	7.430	24.006
		Lower 1/3	49	3.454	1.941	6.248	22	6.724	2.817	11.938	7	1.596	0.333	3.826	78	4.209	2.044	7.635
Combined	2	Upper 2/3	94	6.351	3.198	11.533	98	2.687	1.374	4.493	50	0.338	0.101	0.706	242	3.625	1.820	6.445
		Lower 1/3	94	1.129	0.336	2.782	98	0.666	0.191	1.592	50	0.130	0.013	0.464	242	0.735	0.211	1.821
Combined	3	Upper 2/3	160	68.099	47.761	91.886	189	22.916	13.544	35.762	89	5.250	3.131	8.123	438	35.832	23.927	50.648
		Lower 1/3	160	18.871	10.890	30.543	189	6.000	2.695	11.662	89	4.352	2.355	7.228	438	10.367	5.619	17.658
Combined	4	Upper 2/3	197	38.351	28.477	50.434	332	18.645	14.259	23.880	173	5.752	4.160	7.664	702	20.998	15.760	27.336
		Lower 1/3	197	9.364	5.788	14.118	332	3.409	2.234	4.967	173	4.713	3.393	6.249	702	5.402	3.517	7.851
Combined	5	Upper 2/3	75	20.648	12.127	30.866	76	10.847	7.560	14.873	34	3.442	1.839	5.706	185	13.460	8.360	19.672
		Lower 1/3	75	3.032	0.918	6.581	76	1.143	0.496	2.166	34	3.218	1.703	5.485	185	2.290	0.889	4.566
Combined	6	Upper 2/3	69	12.209	6.851	21.009	83	2.363	1.344	3.722	6	1.171	0.407	2.262	158	6.617	3.714	11.216
		Lower 1/3	69	2.067	0.640	4.816	83	0.306	0.113	0.671	6	0.028	0.000	0.250	158	1.064	0.339	2.465
Combined	7	Upper 2/3	27	4.689	2.356	7.905	7	1.741	0.785	2.988	0				34	4.082	2.032	6.893
		Lower 1/3	27	0.395	0.078	1.369	7	0.651	0.286	1.314	0				34	0.447	0.121	1.358
Combined	All	Upper 2/3	671	33.177	22.948	45.976	807	15.166	10.276	21.434	359	4.490	2.995	6.417	1,837	19.659	13.482	27.464
	All	Lower 1/3	671	8.227	4.656	13.560	807	3.217	1.711	5.578	359	3.704	2.388	5.466	1,837	5.142	2.919	8.472

Note: Square root transformation was performed on numbers of sockeye salmon per net. Means and 95% confidence limits presented are back transformed values (squared).

Means and 95% confidence limits were obtained from 1,000 bootstrap samples.

APPENDIX D

Appendix D1.-Observed chinook salmon catch, numbers and percent of chinook salmon judged suitable for release, by beach, study area, week and distance from shore.

			Near				Mid				Off				Distances From Shore Combined			
Beach	Area	Week	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%
Kalifonsky	A	1	3	1	0	0.0	3	3	2	66.7	1	0	0		7	4	2	50.0
Kalifonsky	A	2	13	1	0	0.0	13	5	0	0.0	34	8	3	37.5	60	14	3	21.4
Kalifonsky	A	3	30	8	3	37.5	31	16	1	6.3	50	15	2	13.3	111	39	6	15.4
Kalifonsky	A	4	40	8	1	12.5	49	20	6	30.0	107	7	1	14.3	196	35	8	22.9
Kalifonsky	A	5	19	4	1	25.0	8	3	0	0.0	19	1	0	0	46	8	1	12.5
Kalifonsky	A	6	15	4	0	0.0	12	6	0	0.0	0				27	10	0	0.0
Kalifonsky	A	7	10	1	0	0.0	2	1	0	0.0	0				12	2	0	0.0
Kalifonsky	B	1	1	1	0	0.0	0				6	1	1	100.0	7	2	1	50.0
Kalifonsky	B	2	5	2	1	50.0	4	1	1	100.0	9	0	0		18	3	2	66.7
Kalifonsky	B	3	5	2	0	0.0	8	6	0	0.0	18	2	2	100.0	31	10	2	20.0
Kalifonsky	B	4	12	5	1	20.0	11	4	0	0.0	30	3	1	33.3	53	12	2	16.7
Kalifonsky	B	5	4	1	1	100.0	1	0	0		3	0	0		8	1	1	100.0
Kalifonsky	B	6	4	1	0	0.0	0				6	0	0		10	1	0	0.0
Kalifonsky	B	7	2	0	0		0				0				2	0	0	
Kalifonsky	C	1	3	2	0	0.0	4	0	0		0				7	2	0	0.0
Kalifonsky	C	2	10	6	0	0.0	37	6	0	0.0	0				47	12	0	0.0
Kalifonsky	C	3	16	6	0	0.0	74	32	6	18.8	0				90	38	6	15.8
Kalifonsky	C	4	23	4	2	50.0	168	31	3	9.7	0				191	35	5	14.3
Kalifonsky	C	5	8	2	0	0.0	48	6	1	16.7	0				56	8	1	12.5
Kalifonsky	C	6	6	5	0	0.0	43	11	1	9.1	0				49	16	1	6.3
Kalifonsky	C	7	0				0				0				0			
Salamatof	D	1	10	4	2	50.0	3	4	1	25.0	0				13	8	3	37.5
Salamatof	D	2	14	2	0	0.0	8	5	0	0.0	0				22	7	0	0.0
Salamatof	D	3	38	6	1	16.7	10	2	1	50.0	0				48	8	2	25.0
Salamatof	D	4	34	2	1	50.0	13	3	1	33.3	0				47	5	2	40.0
Salamatof	D	5	12	2	0	0.0	2	0	0		0				14	2	0	0.0
Salamatof	D	6	14	1	0	0.0	4	0	0		0				18	1	0	0.0
Salamatof	D	7	3	0	0		0				0				3	0	0	
Salamatof	E	1	15	5	0	0.0	1	5	0	0.0	0				16	10	0	0.0
Salamatof	E	2	29	11	2	18.2	11	22	4	18.2	0				40	33	6	18.2
Salamatof	E	3	49	9	2	22.2	29	23	6	26.1	0				78	32	8	25.0
Salamatof	E	4	50	9	3	33.3	46	48	10	20.8	0				96	57	13	22.8
Salamatof	E	5	23	0	0		10	9	2	22.2	0				33	9	2	22.2
Salamatof	E	6	3	0	0		0				0				3	0	0	
Salamatof	E	7	0				0				0				0			
Salamatof	F	1	17	4	0	0.0	11	8	0	0.0	0				28	12	0	0.0
Salamatof	F	2	23	20	5	25.0	25	10	0	0.0	7	1	1	100.0	55	31	6	19.4
Salamatof	F	3	22	5	1	20.0	37	32	7	21.9	21	11	3	27.3	80	48	11	22.9
Salamatof	F	4	38	7	0	0.0	45	9	1	11.1	36	4	1	25.0	119	20	2	10.0
Salamatof	F	5	9	0	0		7	1	0	0.0	12	0	0		28	1	0	0.0
Salamatof	F	6	27	6	2	33.3	24	10	4	40.0	0				51	16	6	37.5
Salamatof	F	7	12	0	0		5	0	0		0				17	0	0	
All Areas & Weeks Combined			671	157	29	18.5	807	342	58	17.0	359	53	15	28.3	1,837	552	102	18.5

Appendix D2.-Observed chinook salmon catch, numbers and percent of chinook salmon judged suitable for release, all weeks combined, by beach, area and distance from shore.

		Near				Mid				Off				Distances From Shore Combined			
Beach	Area	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%
Kalifonsky	A	130	27	5	18.5	118	54	9	16.7	211	31	6.0	19.4	459	112	20	17.9
Kalifonsky	B	33	12	3	25.0	24	11	1	9.1	72	6	4.0	66.7	129	29	8	27.6
Kalifonsky	C	66	25	2	8.0	374	86	11	12.8	0				440	111	13	11.7
Kalifonsky Areas Comb		229	64	10	15.6	516	151	21	13.9	283	37	10.0	27.0	1,028	252	41	16.3
Salamatof	D	125	17	4	23.5	40	14	3	21.4	0				165	31	7	22.6
Salamatof	E	169	34	7	20.6	97	107	22	20.6	0				266	141	29	20.6
Salamatof	F	148	42	8	19.0	154	70	12	17.1	76	16	5.0	31.3	378	128	25	19.5
Salamatof Areas Combi		442	93	19	20.4	291	191	37	19.4	76	16	5.0	31.3	809	300	61	20.3
Beaches Combined		671	157	29	18.5	807	342	58	17.0	359	53	15.0	28.3	1,837	552	102	18.5

Appendix D3.-Observed chinook salmon catch, numbers and percent of chinook salmon judged suitable for release, study areas within beaches combined, by beach, week and distance from shore.

		Near				Mid				Off				Distances From Shore Combined			
Beach	Week	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%
Kalifonsky	1	7	4	0	0.0	7	3	2	66.7	7	1	1	100.0	21	8	3	37.5
Kalifonsky	2	28	9	1	11.1	54	12	1	8.3	43	8	3	37.5	125	29	5	17.2
Kalifonsky	3	51	16	3	18.8	113	54	7	13.0	68	17	4	23.5	232	87	14	16.1
Kalifonsky	4	75	17	4	23.5	228	55	9	16.4	137	10	2	20.0	440	82	15	18.3
Kalifonsky	5	31	7	2	28.6	57	9	1	11.1	22	1	0	0.0	110	17	3	17.6
Kalifonsky	6	25	10	0	0.0	55	17	1	5.9	6	0	0		86	27	1	3.7
Kalifonsky	7	12	1	0	0.0	2	1	0	0.0	0				14	2	0	0.0
Kalifonsky Weeks Combined		229	64	10	15.6	516	151	21	13.9	283	37	10	27.0	1,028	252	41	16.3
Salamatof	1	42	13	2	15.4	15	17	1	5.9	0				57	30	3	10.0
Salamatof	2	66	33	7	21.2	44	37	4	10.8	7	1	1	100.0	117	71	12	16.9
Salamatof	3	109	20	4	20.0	76	57	14	24.6	21	11	3	27.3	206	88	21	23.9
Salamatof	4	122	18	4	22.2	104	60	12	20.0	36	4	1	25.0	262	82	17	20.7
Salamatof	5	44	2	0	0.0	19	10	2	20.0	12	0	0		75	12	2	16.7
Salamatof	6	44	7	2	28.6	28	10	4	40.0	0				72	17	6	35.3
Salamatof	7	15	0	0		5	0	0		0				20	0	0	
Salamatof Weeks Combined		442	93	19	20.4	291	191	37	19.4	76	16	5	31.3	809	300	61	20.3
Beaches Co	1	49	17	2	11.8	22	20	3	15.0	7	1	1	100.0	78	38	6	15.8
Beaches Co	2	94	42	8	19.0	98	49	5	10.2	50	9	4	44.4	242	100	17	17.0
Beaches Co	3	160	36	7	19.4	189	111	21	18.9	89	28	7	25.0	438	175	35	20.0
Beaches Co	4	197	35	8	22.9	332	115	21	18.3	173	14	3	21.4	702	164	32	19.5
Beaches Co	5	75	9	2	22.2	76	19	3	15.8	34	1	0	0.0	185	29	5	17.2
Beaches Co	6	69	17	2	11.8	83	27	5	18.5	6	0	0		158	44	7	15.9
Beaches Co	7	27	1	0	0.0	7	1	0	0.0	0				34	2	0	0.0
Beaches & Weeks Combined		671	157	29	18.5	807	342	58	17.0	359	53	15	28.3	1,837	552	102	18.5

Appendix D4.-Observed Kalifonsky Beach chinook salmon catch, numbers and percent of chinook salmon judged suitable for release, by study area, week, tidal current flow and distance from shore.

			Near				Mid				Off				Distances From Shore Combined			
Area	Week	Tidal Flow	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%
A	1	Flood	1	0	0		2	2	2	100.0	0				3	2	2	100.0
		Ebb	2	1	0	0.0	1	1	0	0.0	1	0	0		4	2	0	0.0
	2	Flood	8	1	0	0.0	6	1	0	0.0	18	3	1	33.3	32	5	1	20.0
		Ebb	4	0	0		5	3	0	0.0	16	5	2	40.0	25	8	2	25.0
	3	Flood	19	3	1	33.3	14	2	1	50.0	29	10	1	10.0	62	15	3	20.0
		Ebb	10	5	2	40.0	14	9	0	0.0	20	5	1	20.0	44	19	3	15.8
	4	Flood	25	3	1	33.3	24	5	1	20.0	41	6	0	0.0	90	14	1	7.1
		Ebb	15	5	0	0.0	21	13	5	38.5	49	0	0		85	18	5	27.8
	5	Flood	9	1	0	0.0	3	1	0	0.0	6	0	0		18	2	0	0.0
		Ebb	10	3	1	33.3	5	2	0	0.0	8	1	0	0.0	23	6	1	16.7
	6	Flood	9	3	0	0.0	8	2	0	0.0	0				17	5	0	0.0
		Ebb	4	1	0	0.0	4	4	0	0.0	0				8	5	0	0.0
	7	Flood	5	0	0		1	1	0	0.0	0				6	1	0	0.0
		Ebb	5	1	0	0.0	1	0	0		0				6	1	0	0.0
B	1	Flood	1	1	0	0.0	0				3	0	0		4	1	0	0.0
		Ebb	0				0				1	1	1	100.0	1	1	1	100.0
	2	Flood	2	1	0	0.0	2	0	0		3	0	0		7	1	0	0.0
		Ebb	1	0	0		2	1	1	100.0	0				3	1	1	100.0
	3	Flood	4	2	0	0.0	5	4	0	0.0	6	1	1	100.0	15	7	1	14.3
		Ebb	1	0	0		3	2	0	0.0	6	1	1	100.0	13	3	1	33.3
	4	Flood	6	1	0	0.0	6	2	0	0.0	12	0	0		24	3	0	0.0
		Ebb	4	3	1	33.3	3	1	0	0.0	15	3	1	33.3	22	7	2	28.6
	5	Flood	1	1	1	100.0	0				0				1	1	1	100.0
		Ebb	3	0	0		1	0	0		3	0	0		7	0	0	
	6	Flood	3	1	0	0.0	0				3	0	0		6	1	0	0.0
		Ebb	1	0	0		0				3	0	0		4	0	0	
	7	Flood	1	0	0		0				0				1	0	0	
		Ebb	1	0	0		0				0				1	0	0	
C	1	Flood	0				0				0				0			
		Ebb	2	3	0	0.0	3	0	0		0				5	0	0	
	2	Flood	6	2	0	0.0	19	3	0	0.0	0				25	5	0	0.0
		Ebb	2	0	0		15	2	0	0.0	0				17	2	0	0.0
	3	Flood	10	2	0	0.0	40	5	2	40.0	0				50	7	2	28.6
		Ebb	6	4	0	0.0	26	21	3	14.3	0				32	25	3	12.0
	4	Flood	8	1	1	100.0	74	12	3	25.0	0				82	13	4	30.8
		Ebb	2	0	0		50	8	0	0.0	0				52	8	0	0.0
	5	Flood	4	0	0		22	1	0	0.0	0				26	1	0	0.0
		Ebb	2	1	0	0.0	9	3	1	33.3	0				11	4	1	25.0
	6	Flood	4	5	0	0.0	25	3	0	0.0	0				29	8	0	0.0
		Ebb	1	0	0		17	8	1	12.5	0				18	8	1	12.5
	7	Flood	0				0				0				0			
		Ebb	0				0				0				0			
All	All	Flood	126	28	4	14.3	251	44	8	18.2	121	20	3	15.0	498	92	15	16.3
All	All	Ebb	76	24	4	16.7	180	78	11	14.1	152	16	6	37.5	381	118	21	17.8

Appendix D5.-Observed Salamatof Beach chinook salmon catch, numbers and percent of chinook salmon judged suitable for release, by study area, week, tidal current flow and distance from shore.

			Near				Mid				Off				Distances From Shore Combined			
Area	Week	Tidal Flow	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%
D	1	Flood	6	2	1	50.0	0				0				6	2	1	50.0
		Ebb	4	2	1	50.0	1	1	0	0.0	0				5	3	1	33.3
	2	Flood	6	1	0	0.0	3	4	0	0.0	0				9	5	0	0.0
		Ebb	6	1	0	0.0	5	1	0	0.0	0				11	2	0	0.0
	3	Flood	18	5	1	20.0	3	1	1	100.0	0				21	6	2	33.3
		Ebb	19	1	0	0.0	5	1	0	0.0	0				24	2	0	0.0
	4	Flood	14	0	0		3	0	0		0				17	0	0	
		Ebb	12	1	0	0.0	7	2	0	0.0	0				18	3	0	0.0
	5	Flood	7	0	0		0				0				7	0	0	
		Ebb	5	2	0	0.0	0				0				5	2	0	0.0
	6	Flood	8	0	0		1	0	0		0				9	0	0	
		Ebb	4	1	0	0.0	2	0	0		0				6	1	0	0.0
	7	Flood	0				0				0				0			
		Ebb	3	0	0		0				0				3	0	0	
E	1	Flood	7	3	0	0.0	0				0				7	3	0	0.0
		Ebb	6	1	0	0.0	1	5	0	0.0	0				7	6	0	0.0
	2	Flood	14	7	1	14.3	6	18	3	16.7	0				20	25	4	16.0
		Ebb	15	4	1	25.0	5	4	1	25.0	0				2	8	2	25.0
	3	Flood	20	5	2	40.0	9	3	2	66.7	0				29	8	4	50.0
		Ebb	23	4	1	25.0	17	19	4	21.1	0				40	23	4	17.4
	4	Flood	21	2	1	50.0	15	19	4	21.1	0				36	21	5	23.8
		Ebb	15	4	0	0.0	17	16	4	25.0	0				32	20	4	20.0
	5	Flood	7	0	0		3	3	0	0.0	0				10	3	0	0.0
		Ebb	8	0	0		2	4	1	25.0	0				10	4	1	25.0
	6	Flood	2	0	0		0				0				2	0	0	
		Ebb	1	0	0		0				0				1	0	0	
	7	Flood	0				0				0				0			
		Ebb	0				0				0				0			
F	1	Flood	5	1	0	0.0	6	0	0		0				11	1	0	0.0
		Ebb	9	3	0	0.0	5	8	0	0.0	0				14	11	0	0.0
	2	Flood	7	5	0	0.0	9	5	0	0.0	4	0	0		20	10	0	0.0
		Ebb	14	15	5	33.3	14	5	0	0.0	3	1	1	100.0	31	21	6	28.6
	3	Flood	7	4	0	0.0	12	4	3	75.0	9	5	1	20.0	28	23	4	17.4
		Ebb	10	0	0		15	12	4	33.3	9	5	1	20.0	34	17	5	29.4
	4	Flood	18	1	0	0.0	14	4	0	0.0	12	1	0	0.0	44	6	0	0.0
		Ebb	11	3	0	0.0	12	1	1	100.0	15	2	1	50.0	38	6	2	33.3
	5	Flood	2	0	0		3	1	0	0.0	6	0	0		11	1	0	0.0
		Ebb	7	0	0		4	0	0		6	0	0		17	0	0	
	6	Flood	11	2	1	50.0	11	2	1	50.0	0				22	4	1	25.0
		Ebb	13	4	1	25.0	13	8	4	50.0	0				26	12	5	41.7
	7	Flood	2	0	0		1	0	0		0				3	0	0	
		Ebb	9	0	0		4	0	0		0				13	0	0	
All	All	Flood	182	38	7	18.4	99	74	13	17.6	31	6	1	16.7	312	118	21	17.8
All	All	Ebb	194	46	8	17.4	129	87	19	21.8	33	8	3	37.5	356	141	30	21.3

Appendix D6.-Observed chinook salmon catch, numbers and percent of chinook salmon judged suitable for release, all weeks combined, by beach, area, tidal current flow and distance from shore.

			Near				Mid				Off				Distances From Shore Combined			
Beach	Area	Tidal Flow	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%
Kalifonsky	A	Flood	76	11	2	18.2	58	14	3	21.4	94	19	2	10.5	228	44	7	15.9
	A	Ebb	50	16	3	18.8	51	32	5	15.6	94	11	3	27.3	195	59	11	18.6
Kalifonsky	B	Flood	18	7	1	14.3	13	6	0	0.0	27	1	1	100.0	58	14	2	14.3
	B	Ebb	11	3	1	33.3	9	4	1	25.0	31	5	3	60.0	51	12	5	41.7
Kalifonsky	C	Flood	32	10	1	10.0	180	24	5	20.8	0				212	34	6	17.6
	C	Ebb	15	5	0	0.0	120	42	5	11.9	0				135	47	5	10.6
Kalifonsky Areas Combined		Flood	126	28	4	14.3	251	44	8	18.2	121	20	3	15.0	498	92	15	16.3
Kalifonsky Areas Combined		Ebb	76	24	4	16.7	180	78	11	14.1	125	16	6	37.5	381	118	21	17.8
Salamatof	D	Flood	59	8	2	25.0	10	5	1	20.0	0				69	13	3	23.1
	D	Ebb	53	8	1	12.5	20	5	0	0.0	0				73	13	1	7.7
Salamatof	E	Flood	71	17	4	23.5	33	43	9	20.9	0				104	60	13	21.7
	E	Ebb	68	13	1	7.7	42	48	10	20.8	0				110	61	11	18.0
Salamatof	F	Flood	52	13	1	7.7	56	26	3	11.5	31	6	1	16.7	139	45	5	11.1
	F	Ebb	73	25	6	24.0	67	34	9	26.5	33	8	3	37.5	173	67	18	26.9
Salamatof Areas Combined		Flood	182	38	7	18.4	99	74	13	17.6	31	6	1	16.7	312	118	21	17.8
Salamatof Areas Combined		Ebb	194	46	8	17.4	129	87	19	21.8	33	8	3	37.5	356	141	30	21.3
Beaches Combined		Flood	308	66	11	16.7	350	118	21	17.8	152	26	4	15.4	810	210	36	17.1
Beaches Combined		Ebb	270	70	12	17.1	309	165	30	18.2	158	24	9	37.5	737	259	51	19.7

Appendix D7.-Observed chinook salmon catch, numbers and percent of chinook salmon judged suitable for release, study areas within beach combined, by beach, week, tidal current flow and distance from shore.

			Near				Mid				Off				Distances From Shore Combined			
Beach	Week	Tidal Flow	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%	Nets	Chinook	Releasable	%
Kalifonsky	1	Flood	2	1	0	0.0	2	2	2	100.0	3	0	0		7	3	2	66.7
		Ebb	4	1	0	0.0	4	1	0	0.0	2	1	1	100.0	10	3	1	33.3
Kalifonsky	2	Flood	16	4	0	0.0	27	4	0	0.0	21	3	1	33.3	64	11	1	9.1
		Ebb	7	0	0		22	6	1	16.7	16	5	2	40.0	45	11	3	27.3
Kalifonsky	3	Flood	33	7	1	14.3	59	11	3	27.3	35	11	2	18.2	127	29	6	20.7
		Ebb	17	9	2	22.2	43	32	3	9.4	29	6	2	33.3	89	47	7	14.9
Kalifonsky	4	Flood	39	5	2	40.0	104	19	3	15.8	53	6	0	0.0	196	30	5	16.7
		Ebb	21	8	1	12.5	74	22	5	22.7	64	3	1	33.3	159	33	7	21.2
Kalifonsky	5	Flood	14	2	1	50.0	25	2	0	0.0	6	0	0		45	4	1	25.0
		Ebb	15	4	1	25.0	15	5	1	20.0	11	1	0	0.0	41	10	2	20.0
Kalifonsky	6	Flood	16	9	0	0.0	33	5	0	0.0	3	0	0		52	14	0	0.0
		Ebb	6	1	0	0.0	21	12	1	8.3	3	0	0		30	13	1	7.7
Kalifonsky	7	Flood	6	0	0		1	1	0	0.0	0				7	1	0	0.0
		Ebb	6	1	0	0.0	1	0	0		0				7	1	0	0.0
Kalifonsky	All	Flood	126	28	4	14.3	251	44	8	18.2	121	20	3	15.0	498	92	15	16.3
	All	Ebb	76	24	4	16.7	180	78	11	14.1	125	16	6	37.5	381	118	21	17.8
Salamatof	1	Flood	18	6	1	16.7	6	0	0		0				24	6	1	16.7
		Ebb	19	6	1	16.7	7	14	0	0.0	0				26	20	1	5.0
Salamatof	2	Flood	27	13	1	7.7	18	27	3	11.1	4	0	0		49	40	4	10.0
		Ebb	35	20	6	30.0	24	10	1	10.0	3	1	1	100.0	62	31	8	25.8
Salamatof	3	Flood	45	14	3	21.4	24	18	6	33.3	9	5	1	20.0	78	37	10	27.0
		Ebb	52	5	0	0.0	37	32	8	25.0	9	5	1	20.0	98	42	9	21.4
Salamatof	4	Flood	53	3	1	33.3	32	23	4	17.4	12	1	0	0.0	97	27	5	18.5
		Ebb	38	8	0	0.0	36	19	5	26.3	15	2	1	50.0	89	29	6	20.7
Salamatof	5	Flood	16	0	0		6	4	0	0.0	6	0	0		28	4	0	0.0
		Ebb	20	2	0	0.0	6	4	1	25.0	6	0	0		32	6	1	16.7
Salamatof	6	Flood	21	2	1	50.0	12	2	0	0.0	0				33	4	1	25.0
		Ebb	18	5	1	20.0	15	8	4	50.0	0				33	13	5	38.5
Salamatof	7	Flood	2	0	0		1	0	0		0				3	0	0	
		Ebb	12	0	0		4	0	0		0				16	0	0	
Salamatof	All	Flood	182	38	7	18.4	99	74	13	17.6	31	6	1	16.7	312	118	21	17.8
	All	Ebb	194	46	8	17.4	129	87	19	21.8	33	8	3	37.5	356	141	30	21.3
Combined	1	Flood	20	7	1	14.3	8	2	2	100.0	3	0	0		31	9	3	33.3
		Ebb	23	7	1	14.3	11	15	0	0.0	2	1	1	100.0	36	23	2	8.7
Combined	2	Flood	43	17	1	5.9	45	21	3	14.3	25	3	1	33.3	113	51	5	9.8
		Ebb	42	20	6	30.0	46	16	2	12.5	19	6	3	50.0	107	42	11	26.2
Combined	3	Flood	78	21	4	19.0	83	29	9	31.0	44	16	3	18.8	205	66	16	24.2
		Ebb	69	14	2	14.3	80	64	11	17.2	38	11	3	27.3	187	89	16	18.0
Combined	4	Flood	92	8	3	37.5	136	42	7	16.7	65	7	0	0.0	293	57	10	17.5
		Ebb	59	16	1	6.3	110	41	10	24.4	79	5	2	40.0	248	62	13	21.0
Combined	5	Flood	30	2	1	50.0	31	6	0	0.0	12	0	0		73	8	1	12.5
		Ebb	35	6	1	16.7	21	9	2	22.2	17	1	0	0.0	73	16	3	18.8
Combined	6	Flood	37	11	1	9.1	45	7	0	0.0	3	0	0		85	18	1	5.6
		Ebb	24	6	1	16.7	36	20	5	25.0	3	0	0		63	26	6	23.1
Combined	7	Flood	8	0	0		2	1	0	0.0	0				10	1	0	0.0
		Ebb	18	1	0	0.0	5	0	0		0				23	1	0	0.0
Combined	All	Flood	308	66	11	16.7	350	118	21	17.8	152	26	4	15.4	810	210	36	17.1
	All	Ebb	270	70	12	17.1	309	165	30	18.2	158	24	9	37.5	737	259	51	19.7

APPENDIX E

Appendix E1.-Water quality and chemistry measurements, by study area and distance from shore, Kalifonsky and Salamatof beaches.

Beach	Study Area	Distance From Shore	Secchi Disk Observations	Mean Secchi Disk	Turbidity Observations	Mean Turbidity	Conductivity Observations	Mean Conductivity	Temperature Observations	Mean Temperature
Kalifonsky	A	Near	28	9.79	48	166.42	48	35.95	60	57.6
Kalifonsky	A	Mid	64	13.48	75	52.17	75	32.38	93	56.4
Kalifonsky	A	Off	46	22.61	101	29.16	101	33.62	81	55.4
Kalifonsky	B	Near	1	11.00	13	96.15	13	35.72	16	57.4
Kalifonsky	B	Mid	3	15.17	9	38.17	9	35.49	12	56.5
Kalifonsky	B	Off	17	43.03	37	23.23	37	34.51	46	56.9
Kalifonsky	C	Near	8	10.31	22	194.83	22	37.99	38	56.2
Kalifonsky	C	Mid	34	16.76	131	46.39	131	35.72	107	57.4
Salamatof	D	Near	11	9.77	35	167.09	35	34.14	42	57.1
Salamatof	D	Mid	5	12.70	20	63.66	20	39.48	22	56.6
Salamatof	E	Near	62	4.65	71	274.11	71	36.21	85	56.7
Salamatof	E	Mid	48	9.89	43	93.37	43	39.11	57	56.5
Salamatof	F	Near	27	10.81	45	251.56	45	35.92	58	56.4
Salamatof	F	Mid	48	15.43	55	52.77	55	39.33	64	55.5
Salamatof	F	Off	25	18.22	27	41.47	27	40.49	36	54.8

Appendix E2.-Frequency of wind velocity and direction, Kalifonsky Beach.

	Wind Velocity						
Wind Direction[a]	0-5	6-10	11-15	16-20	21-25	Total	Percent
Var	28	1	0	3	0	32	2.8
N	27	7	23	3	0	60	5.3
NE	35	9	1	0	0	45	4.0
E	17	1	0	0	0	18	1.6
SE	51	7	0	0	0	58	5.2
S	49	19	7	2	0	77	6.9
SW	351	240	109	64	0	764	68.0
W	19	3	0	0	0	22	2.0
NW	35	13	0	0	0	48	4.3
Grand Total	612	300	140	72	0	1,124	100.0
Percent	54.4	26.7	12.5	6.4	0.0	100.0	

[a] Wind velocity and direction estimated by field observation.

Appendix E3.-Frequency of wind velocity and direction, Salamatof Beach.

	Wind Velocity						
Wind Direction[a]	0-5	6-10	11-15	16-20	21-25	Total	Percent
Var	127	0	0	0	0	127	14.8
N	82	9	0	0	0	91	10.6
NE	15	1	0	0	0	16	1.9
E	2	2	0	0	0	4	0.5
SE	37	17	6	5	0	65	7.6
S	120	52	27	10	2	211	24.6
SW	156	54	45	10	0	265	30.9
W	42	5	0	0	0	47	5.5
NW	28	3	0	0	0	31	3.6
Grand Total	609	143	78	25	2	857	100.0
Percent	71.1	16.7	9.1	2.9	0.2	100.0	

[a] Wind velocity and direction estimated by field observation.

Appendix E4.-Frequency of wind velocity and direction, Salamatof and Kalifonsky Beach combined.

	Wind Velocity						
Wind Direction[a]	0-5	6-10	11-15	16-20	21-25	Total	Percent
Var	155	1	0	3	0	159	8.0
N	109	16	23	3	0	151	7.6
NE	50	10	1	0	0	61	3.1
E	19	3	0	0	0	22	1.1
SE	88	24	6	5	0	123	6.2
S	169	71	34	12	2	288	14.5
SW	507	294	154	74	0	1029	51.9
W	61	8	0	0	0	69	3.5
NW	63	16	0	0	0	79	4.0
Grand Total	1221	443	218	97	2	1981	100.0
Percent	61.6	22.4	11.0	4.9	0.1	100.0	

[a] Wind velocity and direction estimated by field observation.

Appendix E5.-Mesh size and web color frequency, by beach and distance from shore.

		Kalifonsky				Salamatof				
nce From	Mesh Size	CLEAR	BLUE	GREEN	WHITE	CLEAR	BLUE	GREEN	WHITE	Grand Tota
Near	5.125	0	0	75	0	0	6	83	0	164
Near	5.250	0	0	185	0	0	0	244	0	429
Near	5.375	0	0	0	0	0	0	110	0	110
Near	5.500	0	0	0	0	0	0	35	0	35
Near-Subtotal		0	0	260	0	0	0	472	0	732
Mid	5.125	0	0	75	139	0	0	98	0	312
Mid	5.250	11	0	184	0	0	0	105	0	300
Mid	5.375	0	0	169	0	0	0	99	0	268
Mid	5.500	0	0	0	0	0	0	0	0	0
Mid-Subtotal		11	0	428	139	0	0	302	0	880
Off	5.125	0	0	21	0	0	0	0	0	21
Off	5.250	0	0	265	0	0	0	77	0	342
Off	5.375	0	0	0	0	0	0	0	0	0
Off	5.500	0	0	0	0	0	0	0	0	0
Off-Subtotal		0	0	286	0	0	0	77	0	363
Grand Total		11	0	974	139	0	6	851	0	1,981

[a] As reported by participating fishermen.

Appendix E6.-Leadline weight frequency, by weight category, beach and distance from shore.

	Kalifonsky[ab]				Salamatof[ab]				
Distance From Shore	Light	Medium	Heavy	Subtotal	Light	Medium	Heavy	Subtotal	Grand Total
Near	258	2	0	260	64	179	235	478	738
Mid	337	241	0	578	129	102	71	302	880
Off	279	7	0	286	77	0	0	77	363
Total	874	250	0	1,124	270	281	306	857	1,981

[a] Light (1-4 lb/fathom), medium (5-8 lb/fathom), heavy (9-12 lb/fathom)

[b] As reported by participating fishermen.

Appendix E7.-Net webbing weight frequency, by weight category, beach and distance from shore.

	Kalifonsky[ab]				Salamatof[ab]				
Distance From Shore	Light	Medium	Heavy	Subtotal	Light	Medium	Heavy	Subtotal	Grand Total
Near	149	80	31	260	0	0	478	478	738
Mid	206	67	305	578	0	0	302	302	880
Off	0	3	283	286	0	0	77	77	363
Total	355	150	619	1,124	0	0	857	857	1,981

[a] Light (1-29), medium (30-62), heavy (63-103)

[b] As reported by participating fishermen.

APPENDIX F

Appendix F1.-Letter mailed to commercial ESSN fishermen May 28, 1996, explaining research project and requesting assistance.

STATE OF ALASKA

TONY KNOWLES, GOVERNOR

DEPARTMENT OF FISH AND GAME

DIVISION OF SPORT FISH

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Anchorage, AK 99518
PHONE: (907) 267-2148
FAX: (907) 267-2424

May 28, 1996

Dear Cook Inlet Set Net Fisher,

As you may be aware, the Alaska Department of Fish & Game will be conducting a research project on the east side beaches of Cook Inlet during this coming season. The purpose of this letter is to briefly explain the project and solicit your willingness to assist the department in this study.

The primary purpose of our study is to characterize harvest patterns of chinook and sockeye salmon in that portion of the east side set net fishery adjacent to the Kenai River mouth. This information will be used to increase our understanding of factors that affect harvests of chinook and sockeye salmon and better refine the nature and direction of potential studies in the future. The goal is to investigate alternative management strategies intended to reduce incidental harvests of chinook salmon while maintaining your ability to harvest sockeye salmon. If successful, you stand to gain in future years by reducing the likelihood of having to implement the restrictive provisions of the Kenai River Late Run Chinook Salmon Management Plan (5AAC 21.359).

A simple report of progress from this year's study will be presented to the Board of Fisheries in November. Future funding for the project will be contingent upon successfully fielding this year's study and the nature of our results. If this year's study clearly identifies promising avenues of future research, then that information will be used to further refine future studies and justify requests for additional funding. Even if results look promising, we do not see any circumstances where staff would recommend using this year's preliminary results as conclusive evidence to develop new regulations at this year's Board of Fisheries meeting. If, however, results are not promising, then funding for additional studies will be unlikely.

During 1996, study areas will encompass set net sites on Salamatof and Kalifonsky Beaches. Sampling will consist of enumerating your catches at set net sites within 18 study areas (see enclosed map). These enumerated harvests will be used to characterize the relationship between chinook salmon harvests and harvests of other salmon species in the fishery. We will examine catches of chinook salmon in relation to other salmon species during each commercial opening, by study area, vertical capture location in the net, average surrounding water depth at site of set and other variables such as water temperature, salinity and tidal currents. Additionally, technicians will evaluate the condition of captured chinook salmon to determine what proportion might be suitable for release.

On behalf of the Alaska Department of Fish & Game, we would like to take the opportunity to request your assistance and cooperation in conducting this study. Your assistance and active cooperation is absolutely vital if the

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Appendix F1.-(Page 2 of 2).

Department is to successfully field this study. The desired assistance and cooperation will include your permission to allow a fisheries technician to accompany you aboard your skiff or at your shore site to enumerate harvests and evaluate the condition of captured chinook salmon when you harvest your gear during commercial fishing periods in 1996. By committing your cooperation and assistance you would be demonstrating, outside the Board of Fisheries process, your resolve to work with the Department towards finding a scientific resolution to the debate over chinook salmon interception in the east side set net fishery.

We are aware that this is asking a lot of those wishing to participate. During earlier stages of planning, we examined the possibility of monetary compensation for participating fishermen. After examining available levels of funding, it was quickly determined that the project had insufficient funds to accomplish this and that we would not be able to pay cooperating fishermen for their efforts. What we can do, is do our best to minimize any impact upon your operations and respond to your suggestions on how to best minimize impact and promote safety while aboard your skiff, or at your site. We will provide transportation to and from mutually agreed upon meeting locations for each sampling day. We do not ask that you provide shelter or any other provision to technicians, this will be provided by the State. We have consulted with the Department of Administration and have a ruling concerning liability. Risks of injury to Departmental technicians while boarding or aboard your skiffs or at your fishing sites is assumed by the State of Alaska under normal insurance coverage's provided our employees. Written assurances to this effect can be provided to each participating fishermen.

We request that each recipient of this letter please take the time and complete the attached questionnaire indicating to what degree (number of openings, most convenient dates etc.) you might be willing to assist and indicate in what area(s) you anticipate fishing during 1996 (see map). On the attached map, please clearly mark the approximate location of nets you plan on fishing during 1996. Please return the enclosed questionnaire and map showing your net locations by mail or fax no later than June 11. We have enclosed a self addressed, postage paid envelope for your convenience. The Project Leader, Mike Bethe can be reached at 267-2148 to answer any of your specific questions. Representatives from the Department of Fish and Game will attend the annual KPFA membership meeting on June 26th to update members and answer remaining questions. Thank you very much for your time and consideration.

Very Sincerely,

Mike Bethe
Research Project Leader
Sport Fish Division

Doug McBride
Regional Supervisor
Sport Fish Division
Region II

Appendix F2.-Information and request for assistance questionnaire mailed to commercial ESSN fishermen May 28, 1996.

1996
East Side Set Net Project
Fishermen Assistance
Questionnaire

Last Name:______________________ First Name:_______________________ MI:_____

Address: ____ Street/PO Box

__________________________ City _____________ State ___________ Zip

Contact Phone: ________ Area Code _______-______________ Number _________Ext

Alternate Phone: _______ Area Code _______-______________ Number _________Ext

What hours would be most convenient for phoning? ________________________________

Do you anticipate fishing in one of the study areas? _________ Yes _________ No

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Would you be willing to assist ADF&G in this study? _________ Yes _________ No

If yes, which study area(s) do you anticipate fishing in? __________________ (A, B, C etc.)

How many nets will be located at shore sites? ______________

How many nets will be located at offshore sites? ______________

Would you be willing to permit a Fishery Technician to accompany you aboard your skiff or at your shore site while you are harvesting your nets? _________ Yes _________ No

If yes, for how many commercial openings would you be willing to assist? _____________

Do you have dates of preference? If so, which would be best for you? _________________

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