Fishery Management Report No. 13-14

Southeastern District Mainland (Alaska Peninsula Area) Salmon Management Plan, 2013

by

Nathaniel W. Nichols

April 2013

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

Symbols and Abbreviations

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

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Mathematics, statistics

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

FISHERY MANAGEMENT REPORT NO. 13-14

SOUTHEASTERN DISTRICT MAINLAND (ALASKA PENINSULA AREA) SALMON MANAGEMENT PLAN, 2013

by
Nathaniel W. Nichols
Alaska Department of Fish and Game, Division of Commercial Fisheries, Kodiak

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1565

April 2013

The Fishery Management Reports series was established in 1989 by the Division of Sport Fish for the publication of an overview of management activities and goals in a specific geographic area, and became a joint divisional series in 2004 with the Division of Commercial Fisheries. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Fishery Management Reports are available through the Alaska State Library and on the Internet: http://www.adfg.alaska.gov/sf/publications/. This publication has undergone regional peer review.

Nathaniel W. Nichols
Alaska Department of Fish and Game, Division of Commercial Fisheries
351 Research Court, Kodiak, AK 99615, USA

This document should be cited as:
Nichols, N. W. 2013. Southeastern District Mainland (Alaska Peninsula Area) salmon management plan, 2013. Alaska Department of Fish and Game, Fishery Management Report No. 13-14, Anchorage.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABSTRACT

The Southeastern District Mainland (SEDM) commercial salmon fishery takes place on the south side of the Alaska Peninsula from Kupreanof Point to McGinty Point. This commercial salmon fishery is managed based on 3 distinct conditions and time frames: 1) the strength of Chignik River sockeye salmon *Oncorhynchus nerka* stocks from June 1 through July 25, 2) the strength of Orzinski Lake sockeye salmon in the Northwest Stepovak Section (NWSS) from July 1 through July 25, and 3) local pink *O. gorbuscha*, chum *O. keta*, and coho salmon *O. kisutch* stocks from July 26 through the end of the season. The 2013 Chignik early- and late-run forecasted harvest estimates are 2,417,000 and 797,000 sockeye salmon, respectively. Therefore, fishing time is anticipated in the Southeastern District Mainland. This report summarizes the Southeastern District Mainland Salmon Management Plan and is intended as a guide for commercial salmon harvesters, buyers, transporters, and tenders.

Key words: Southeastern District Mainland, commercial salmon fishery, management plan, Alaska Peninsula Management Area, sockeye salmon, *Oncorhynchus nerka*, chum salmon, *Oncorhynchus keta*, pink salmon, *Oncorhynchus gorbuscha*, coho salmon, *Oncorhynchus kisutch*, SEDM, Area M, CMA, Chignik, forecasts

INTRODUCTION

The purpose of this document is to provide commercial harvesters and processors with information and guidelines that will be used by the Alaska Department of Fish and Game (ADF&G) to manage the Southeastern District Mainland (SEDM) commercial salmon fishery during 2013.

The Southeastern District Mainland fishery takes place on the south side of the Alaska Peninsula and Aleutian Islands Management areas (Area M; Figure 1). The Chignik Management Area (CMA; Area L) lies immediately to the east of SEDM and the South Central District of Area M lies immediately to the west (Figure 1). There are 6 distinct fishing sections within SEDM: the Beaver Bay, Balboa Bay, Southwest Stepovak, Northwest Stepovak, East Stepovak, and Stepovak Flats sections (Figure 2). The *Southeastern District Mainland Salmon Management Plan* (5 AAC 09.360) was originally established by the Alaska Board of Fisheries (BOF) in 1980. In 1985, the BOF established the framework of the allocation criteria that SEDM is currently managed on.

ADF&G will manage the SEDM fishery based on 3 distinct conditions and timeframes: 1) the strength of Chignik sockeye salmon *Oncorhynchus nerka* stocks, 2) the strength of Orzinski Lake sockeye salmon in the Northwest Stepovak Section (NWSS; Figure 2) from July 1 through July 25, and 3) abundance of local coho *O. kisutch*, pink *O. gorbuscha*, and chum *O. keta*, salmon stocks after July 25. From June 1 through July 25, (June 1 through June 30 in the NWSS), the SEDM fishery is allocated 7.6% of the total CMA sockeye salmon harvest. From July 1 through July 25, NWSS is managed based on the strength of sockeye salmon returning to Orzinski Lake. In NWSS, harvest during the June 1 through July 25 timeframe has ranged from no commercial salmon harvest to over 300,000 sockeye salmon harvested (Table 1).

ALASKA BOARD OF FISHERIES REGULATION CHANGES FROM FEBRUARY 2013 MEETING

During the February 2013 meeting, the Alaska Board of Fisheries (BOF) made changes to the *Southeastern District Mainland Salmon Management Plan* (5 AAC 09.360) fishing schedule. Beginning July 1, in the NWSS, excluding Orzinski Bay, commercial fishing periods may not be open for more than an aggregate of 96 hours of fishing time during a 7-day period (5 AAC 09.360(e)(1)).

FISHING PERIODS

The SEDM fishery is managed independently of other fisheries in Area M. ADF&G will attempt to have fishing periods in the NWSS and Stepovak Flats Section concurrent with fishing periods in the remainder of the SEDM area to avoid concentrating fishing gear. From July 1 through July 25, salmon fishing in the NWSS, excluding Orzinski Bay, may not exceed 96 hours of fishing time in a 7-day period (5 AAC 09.360(e)(1)). If the cumulative sockeye salmon escapement through Orzinski Lake weir exceeds 25,000 fish, the NWSS and Orzinski Bay sections may be opened continuously to set gillnet and seine gear, through midnight July 25 (5 AAC 09.360(e)(2)(A)) while seine gear will be restricted to no more than 96 hours of fishing time during a 7-day period. (5 AAC 09.360(e)(2)(B)).

All fishing periods will be established by emergency order. A minimum of 24 hours notice will be given prior to the first commercial fishing period of the season. At least 12 hours of advance notice will be given prior to any additional fishing periods, unless the announcement extends a current fishing period (5 AAC 09.360(j)).

HARVEST REPORTING

Buyers must provide salmon harvest reports to the ADF&G office in Sand Point by 9:30 AM on the day following the landings (5 AAC 39.130). These salmon harvest reports must include number and pounds of fish by species, number of deliveries by gear type, and statistical area of the harvest. Buyers may phone, e-mail, or fax their reports to the ADF&G office in Sand Point:

Sand Point	Phone: 907-383-2066	Fax: 907-383-2602
Aaron Poetter	E-mail: aaron.poetter@alaska.gov, or	
Nathaniel Nichols	E-mail: nathaniel.nichols@alaska.gov	
Cold Bay	Phone: 907-532-2419	Fax: 907-532-2470
	E-mail: aaron.poetter@alaska.gov	

Fish tickets must be received in the ADF&G Sand Point office (address provided below) within 7 days of the purchase date, unless other arrangements have been made with ADF&G. Mail fish tickets to:

Alaska Department of Fish and Game
P.O. Box 129
Sand Point, AK 99661

INSEASON ANNOUNCEMENTS

Inseason announcements will be broadcast on radio station KSDP AM 830 KHz in Sand Point and rebroadcast over K201DA FM 88.1 MHz in King Cove. Announcements will also be broadcast on marine VHF channels 6 and 73 daily at 9:30 AM and 5:00 PM. The most current fishery announcements may also be obtained by calling the ADF&G's recorder phones in Sand Point at 907-383-2334 (383-ADFG) and Cold Bay at 907-532-2419. During the 2013 season, catches, escapements, and announcements will be available at the Commercial Fisheries website: (http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareaakpeninsula.salmon).

2013 MANAGEMENT PLAN

Under the current SEDM Salmon Management Plan (5 AAC 09.360):

1. The percentage of Chignik-bound sockeye salmon allocated to the SEDM fishery is 7.6% of the total number of sockeye salmon harvested in the CMA through July 25.
2. From June 1 through July 25, 80% of the sockeye salmon caught in the SEDM are considered to be Chignik-bound salmon, excluding NWSS (Figure 2) after July 1.
3. Beginning July 1, sockeye salmon caught in the NWSS will not be counted toward the Chignik allocation. Fishing periods in the NWSS after June 30 will be based on sockeye salmon escapement into Orzinski Lake and there may not be more than 96 hours of fishing time during a 7-day period.
4. If the Orzinski Lake escapement meets or exceeds 25,000 sockeye salmon, the NWSS and Orzinski Bay may be opened as follows:
   (a) set gillnet gear may be operated continuously until MIDNIGHT July 25;
   (b) purse seine and hand purse seine gear may not be operated for more than 96 hours during a 7-day period.
5. The BOF established a closed waters area encompassing Kupreanof Point from July 6 through August 31 (Figure 3; 5 AAC 09.350 (37)). ADF&G may extend the Kupreanof Point closed waters area through the end of the season by emergency order when the waters specified in 5 AAC 15.350 (20) are closed to conserve coho salmon.
6. From July 26 through October 31, the fishery is managed for local pink, chum, and coho salmon stocks.
7. From July 26 through October 31, the fishery will be closed for at least one 36-hour period within a 7-day period.

NORTHWEST STEPOVAK SECTION

The Orzinski Lake sockeye salmon sustainable escapement goal range is 15,000–20,000 fish (Sagalkin and Erickson 2013). Based on aerial surveys and weir counts, ADF&G developed interim sockeye salmon escapement objectives for Orzinski Lake (Figure 4). ADF&G has operated a weir on the Orzinski Lake system every year since 1990 and plans to do so again in 2013.

STEPOVAK FLATS SECTION

The Stepovak Flats Section is open to commercial salmon fishing concurrently with the rest of SEDM. Of the sockeye salmon harvested in the Stepovak Flats Section prior to July 26, 80% are assigned to the 7.6% allocation criteria stated in the current SEDM salmon management plan. The Stepovak Flats Section is closed to all commercial fishing from July 29 through October 31 to protect schooling chum salmon.

CHIGNIK RIVER SOCKEYE SALMON FORECAST AND SEDM ALLOCATION

The 2013 Chignik River forecast for the early-run harvest estimate is 2,417,000 sockeye salmon, and the late-run harvest estimate is 797,000 sockeye salmon (Appendix A1). ADF&G will manage the fishery so that the number of sockeye salmon harvested in the CMA, for both runs combined, will be at least 600,000 fish and the harvest of sockeye salmon considered to be Chignik bound in the SEDM will approach, as near as possible, 7.6% of the total CMA sockeye salmon harvest through July 25.

From June 26 through July 8, the strength of the Chignik sockeye salmon late-run cannot be accurately evaluated due to the mixing of early- and late-run stocks. During this transition period, ADF&G may close or restrict commercial salmon fishing in SEDM until the strength of the late-run has been determined. After July 8, the SEDM fishery will be managed based on the strength of the Chignik late-run and the total Chignik Area sockeye salmon harvest through July 25. After July 8, if the late-run interim escapement objectives are being met in the Chignik Area and the total CMA harvest is projected to be at least 300,000 sockeye salmon, SEDM may open to commercial salmon fishing. However, the harvest in SEDM at any time before July 25 may be permitted to fluctuate above or below 7.6% of the Chignik Area harvest (5 AAC 09.360 (g)).

REFERENCES CITED

Sagalkin, N. H. and J. W. Erickson. 2013. Review of salmon escapement goals in the Alaska Peninsula and Aleutian Islands Management Areas, 2012. Alaska Department of Fish and Game, Fishery Manuscript No. 13-01, Anchorage.

TABLES AND FIGURES

Table 1.–Southeastern District Mainland commercial fishing effort and assignment of sockeye salmon harvests during the June 1–July 25 period, 1985–2012.

	Effort				Northwest Stepovak			SEDM minus Northwest Stepovak		SEDM		
	Set gillnet		Seine									Total
Year	Permits	Landings	Permits	Landings	Total	"Local"	"Non-local"	"Local"	"Non-local"	"Local"	"Non-local"	Catch
1985[a]	49	367	23	51	16,681	16,681	0	12,855	51,421	29,536	51,421	80,957
1986	42	616	18	29	59,025	59,025	0	29,501	118,006	88,526	118,006	206,532
1987	53	528	6	9	61,287	61,287	0	36,722	146,886	98,009	146,886	244,895
1988	41	300	16	45	57,010	57,010	0	4,830	19,320	61,840	19,320	81,160
1989	42	248	25	54	83,618	83,618	0	1,121	4,485	84,739	4,485	89,224
1990	46	277	69	131	3,279	3,279	0	32,609	128,599	35,888	128,599	164,487
1991	59	747	39	71	98,834	98,834	0	38,179	152,714	137,013	152,714	289,727
1992[b]	59	650	6	14	113,430	101,198	12,232	20,403	81,613	121,599	93,845	215,444
1993	64	763	53	82	73,747	54,955	18,792	27,436	109,744	82,391	128,536	210,927
1994	56	678	0	0	89,522	52,880	36,642	26,427	105,708	79,307	142,350	221,657
1995	58	718	26	30	62,598	51,723	10,875	19,357	77,426	71,079	88,301	159,380
1996[c]	64	1,164	25	46	137,925	127,645	10,280	29,230	116,921	156,875	127,201	284,076
1997	57	1,173	12	23	304,865	304,865	0	0	0	304,865	0	304,865
1998	45	340	18	23	33,515	33,515	0	16,723	66,893	50,238	66,893	117,131
1999	63	649	27	30	32,884	6,577	26,307	36,828	147,313	43,405	173,620	217,025
2000	64	1,163	26	31	89,857	76,500	13,357	22,516	90,062	99,016	103,419	202,435
2001	51	551	16	20	42,681	42,681	0	12,785	51,141	55,466	51,141	106,607
2002	53	1,001	12	25	85,086	76,767	8,319	13,677	54,706	90,444	63,025	153,469
2003	48	1,035	11	20	142,410	136,391	6,019	16,006	64,025	152,397	70,044	222,441
2004	42	763	2	10	150,399	143,161	7,238	12,029	48,117	155,190	55,355	210,545
2005	43	474	21	30	58,243	29,865	28,378	37,382	149,528	67,247	177,906	245,153
2006	24	102	13	15	0	0	0	15,503	62,010	15,503	62,010	77,513
2007[d]												
2008	27	299	1	3	31,669	31,669	0	0	0	31,669	0	31,669
2009	44	701	17	41	91,363	91,363	0	12,080	48,322	103,443	48,322	151,765
2010	45	906	16	32	70,131	62,964	7,167	19,525	78,100	82,489	85,267	167,756
2011	52	1,498	14	18	52,695	31,914	20,781	33,964	135,856	65,878	156,637	222,515
2012	48	1,065	17	35	78,251	64,448	13,803	28,070	112,280	92,518	126,083	218,601
Average:				11								
1985–1991	47	440	28	9	54,248	54,248	0	22,260	88,776	76,507	88,776	165,283
1992–1995	59	702	21	8	84,824	65,189	19,635	23,406	93,623	88,594	113,258	201,852
1996–1997	61	1,169	19	6	221,395	216,255	5,140	14,615	58,461	230,870	63,601	294,471
2002–2011	38	678	11	19	68,200	60,409	7,790	16,017	64,066	76,426	71,857	148,283

-continued-

[a] From 1985 through 1991, the Chignik contribution was 80% of the sockeye salmon harvested in Beaver Bay, Balboa Bay, Southwest Stepovak, Stepovak Flats, and East Stepovak sections.

[b] From 1992 through 1995, the Chignik contribution was 80% of the sockeye salmon harvested in the Southeastern District Mainland fishery, except Orzinski Bay where 100% of the sockeye salmon are considered local.

[c] Since 1996, the Chignik contribution is 80% of the sockeye harvested in Southeastern District Mainland fishery, except in the Northwest Stepovak Section where beginning July 1, 100% of the sockeye salmon are considered local.

[d] No fishery.

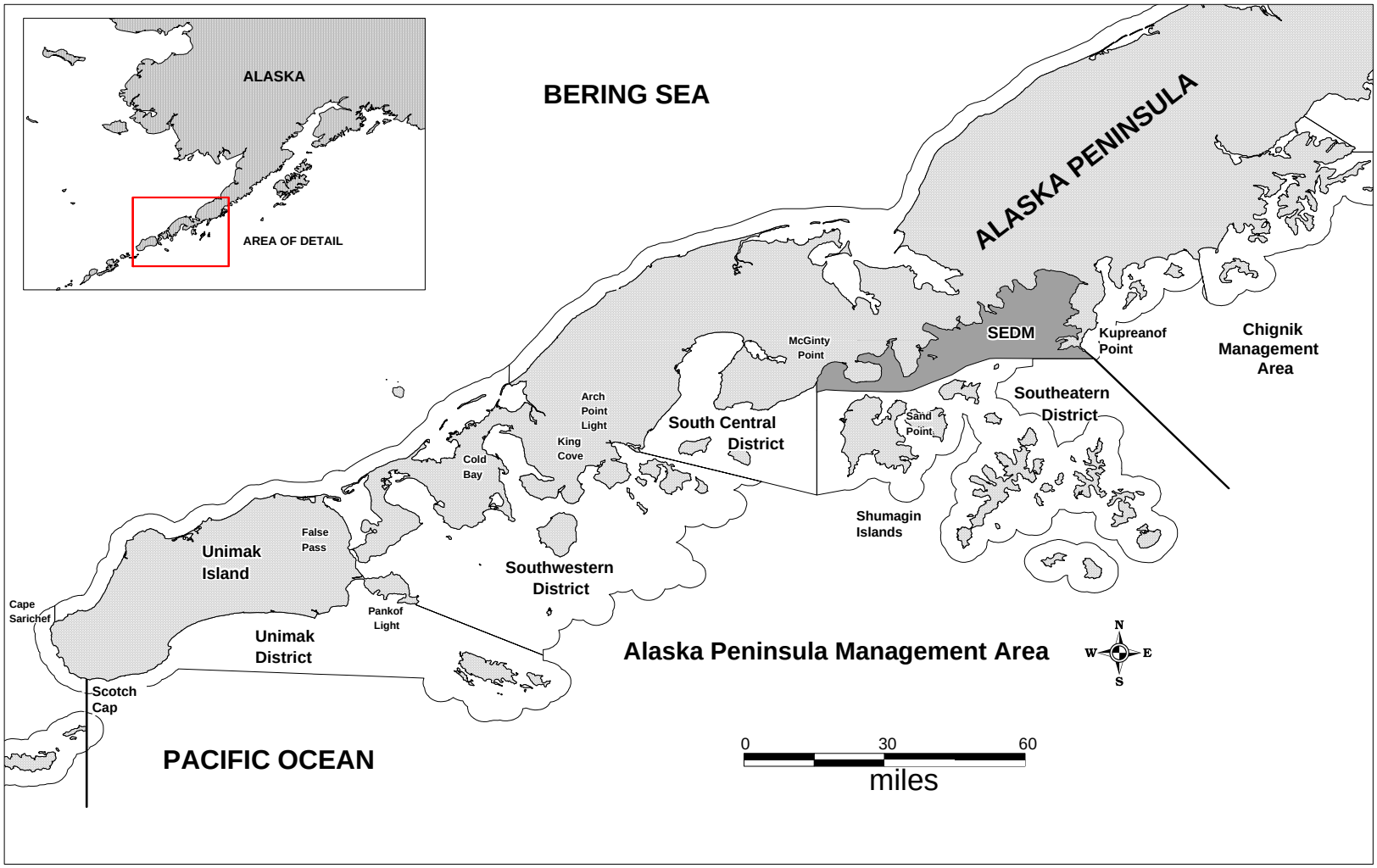

Figure 1.–Map of the South Alaska Peninsula Management Area with the Southeastern District Mainland defined.

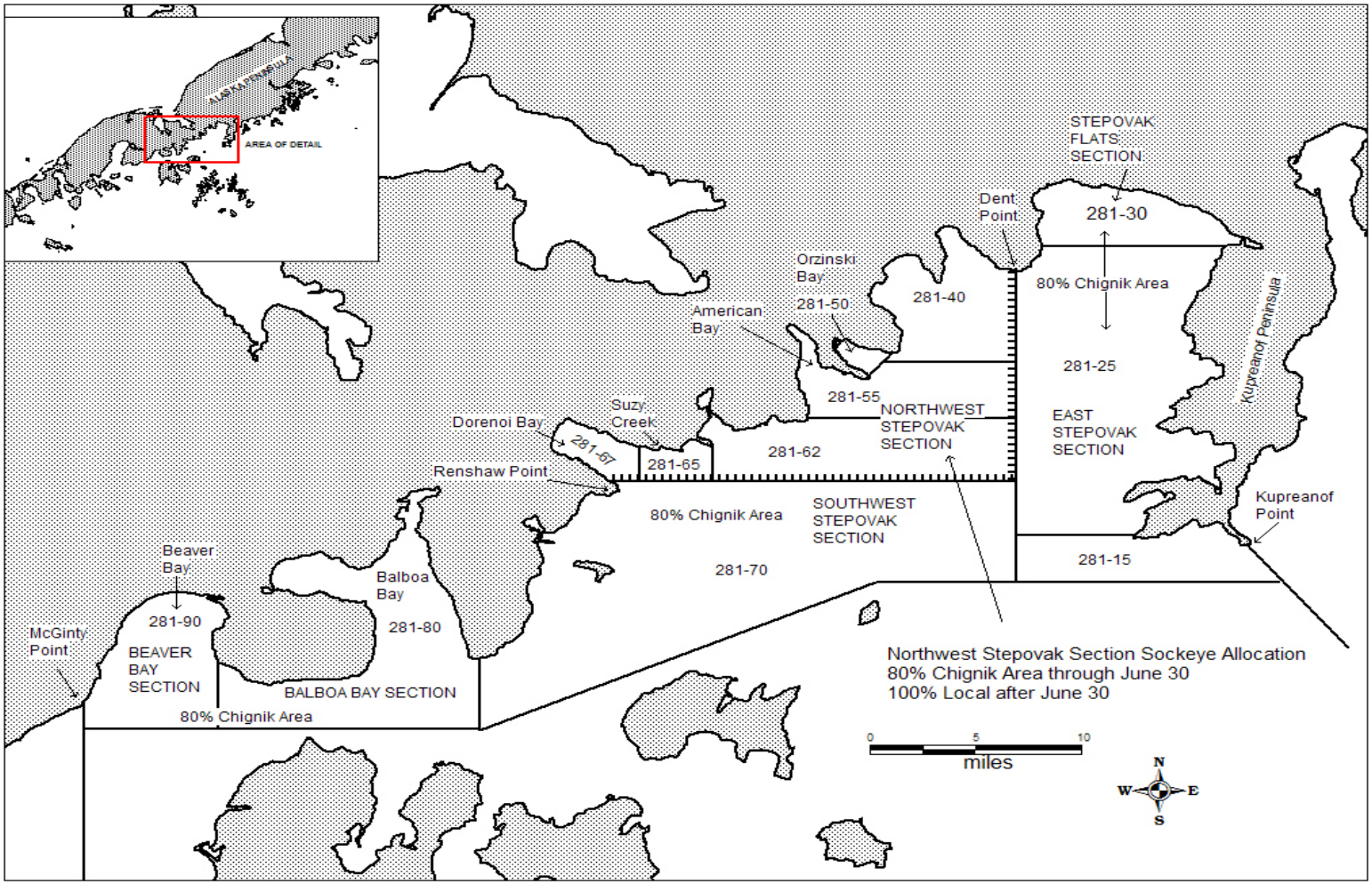

Figure 2.–Map of the Southeastern District Mainland from Kupreanof Point to McGinty Point with the commercial salmon fishery sections defined.

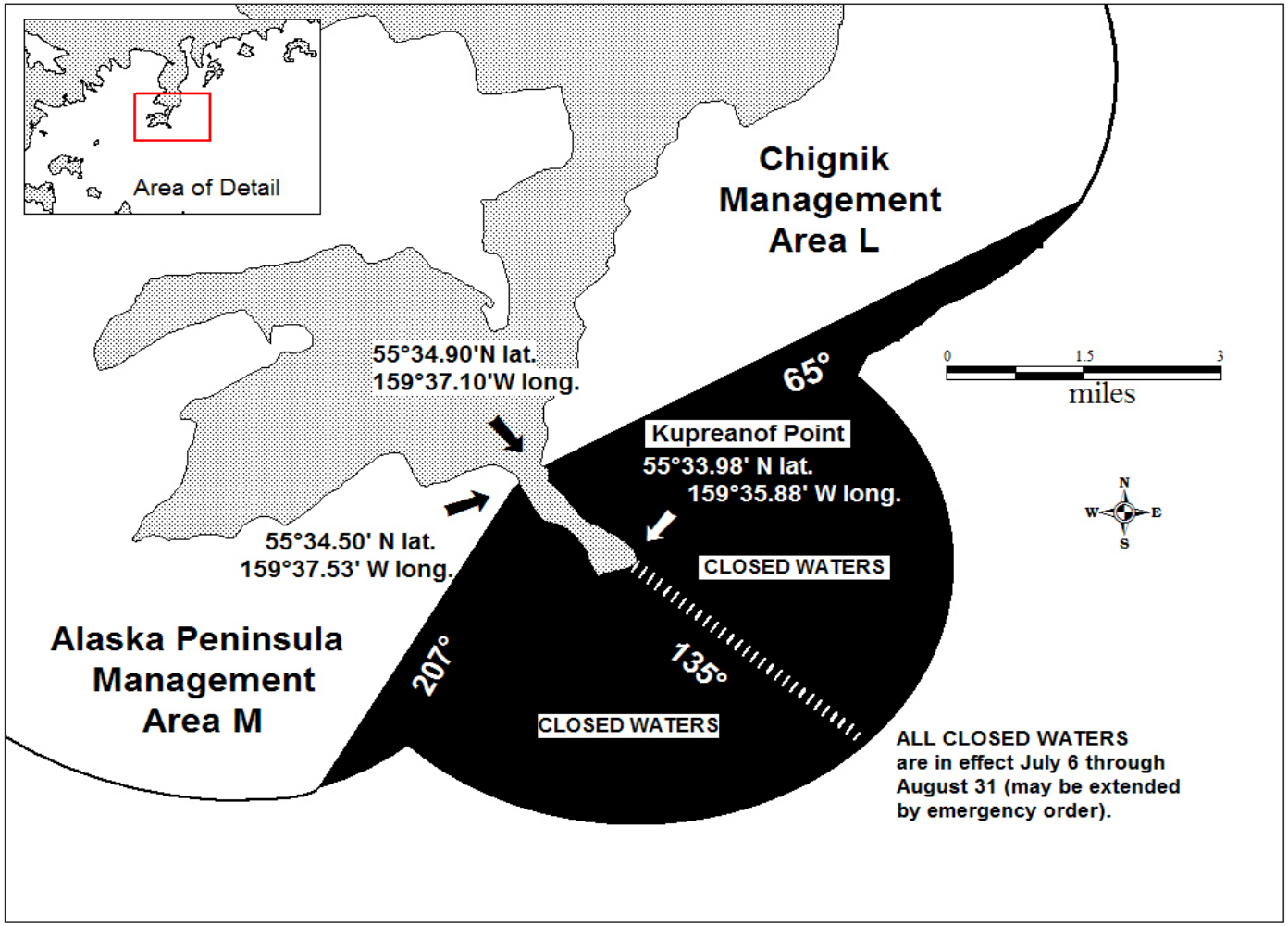

Figure 3.–Map of the Kupreanof Point area closed waters.

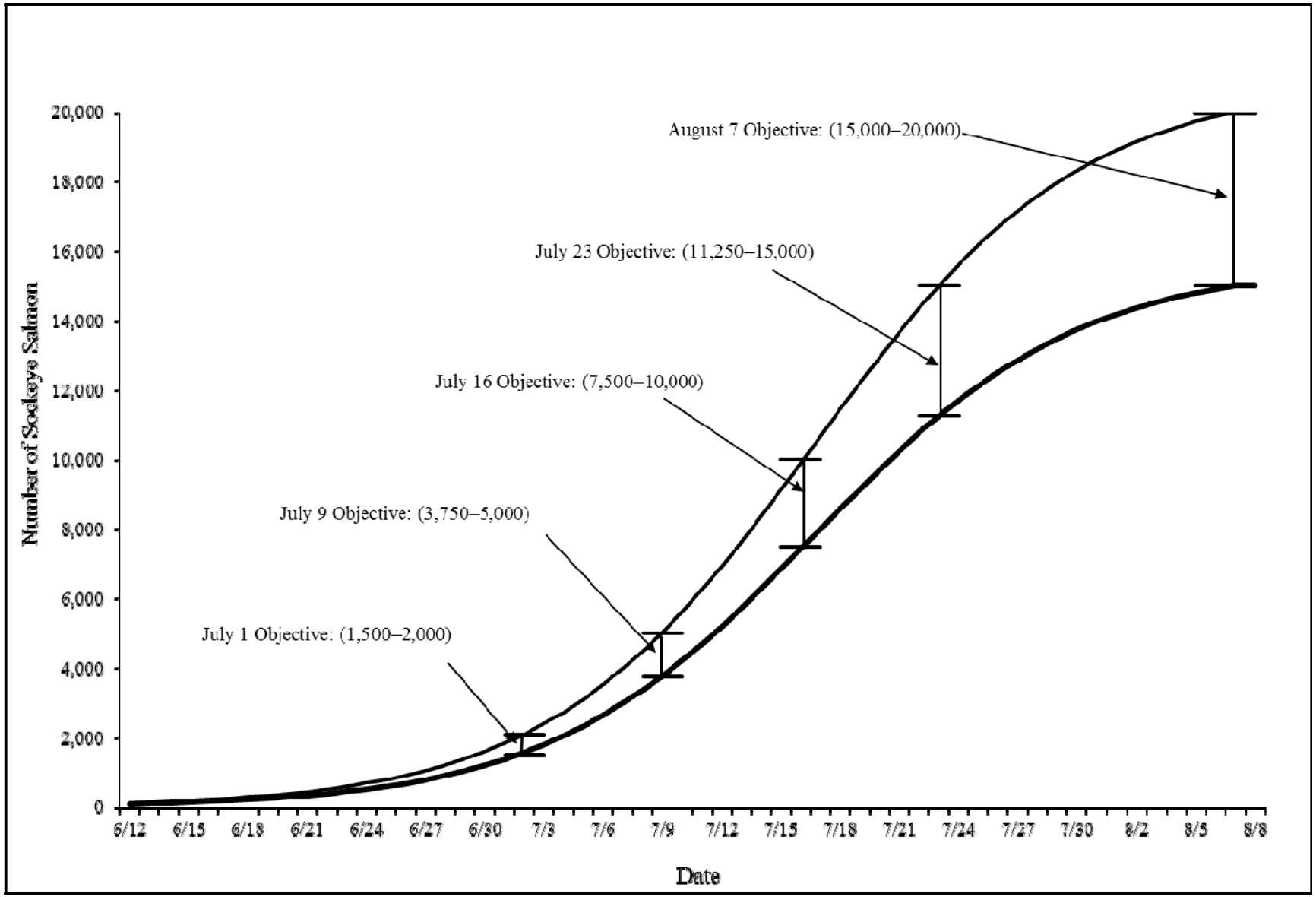

Figure 4.–Orzinski Lake interim sockeye salmon escapement objectives by date.

APPENDIX A. 2013 CHIGNIK MANAGEMENT AREA SOCKEYE SALMON FORECAST

Forecast Area: Chignik
Species: Sockeye Salmon

Preliminary Forecast of the 2013 Run

TOTAL PRODUCTION		Forecast Estimate (thousands)	Forecast Range (thousands)
Early Run (Black Lake)	Total Run Estimate	2,767	1,981–3,554
	Escapement Goal [a]	350	350–400
	Harvest Estimate [b]	2,417	
Late Run (Chignik Lake)	Total Run Estimate	1,047	707–1,387
	Escapement Goal [a]	250	250–400
	Harvest Estimate [b]	797	
Total Chignik System	Total Run Estimate	3,814	2,688–4,941
	Escapement Objective [b]	600	600–800
	Harvest Estimate	3,214	
	Chignik Area	2,581	
	SEDM Area	181	
	Cape Igvak Section	452	

Note: Column numbers may not total or correspond exactly with numbers in text due to rounding.

[a] Targeted escapement and range are the lower bound and range of the 2013 escapement goals for early (350,000 to 400,000 fish), late (200,000 to 400,000 fish), and combined (600,000 to 800,000 fish) runs. An inriver run goal of 50,000 sockeye salmon is added to the lower bound of the late-run escapement goal.

[b] Includes anticipated harvests of Chignik-bound fish in Southeastern District Mainland and Cape Igvak fisheries.

Forecast Methods

Simple linear regressions and generalized Ricker models using age-class relationships, escapement, and environmental data from 1977 to the present were used to forecast the 2013 early- and late- Chignik sockeye salmon runs. Each regression model was assessed with standard regression diagnostic procedures. Prediction intervals (80%) for the regression estimates were calculated using the variances of the regression models. The age classes that could not be estimated with one of these models were estimated using pooled medians and the 10^{th} and 90^{th} percentiles of the data were used to calculate the prediction interval of the median estimates.

For the early run, simple linear regression of sibling relationships was used to predict age-1.3 and -2.3 sockeye salmon which make up a vast majority of the run. Age-1.3 fish were predicted based on the abundance of age-1.2 fish from the prior year. Age-2.3 sockeye salmon were predicted from age-2.2 fish from the prior year. Remaining age-class components of the run were predicted by calculating median returns since the 1981 outmigration year (7.4% of the run).

The 2013 late run was predicted using ocean-age-class relationship, parental escapement, sea surface temperature (SST) anomalies from the Kaplan SST model, and precipitation recorded at the Cold Bay Airport. Ocean-age-2 sockeye salmon were predicted from the prior year ocean-age-1 fish using simple linear regression; ocean-age-4 fish were predicted from the prior year ocean-age-3 fish by the same method. A generalized Ricker model was used to predict ocean-

-continued-

age-3 fish from averaged parental escapement corresponding with age-1.3 and -2.3 returns (5- and 6-year-old fish), southern Alaska Peninsula June SST anomalies at the time of parental escapement, and Cold Bay precipitation anomalies corresponding with freshwater rearing of age-1.3 and -2.3 fish. Remaining age-class components of the run were predicted by calculating median returns since the 1981 outmigration year (0.4% of the run).

The early- and late-run regression and median estimates were summed to estimate the total Chignik River sockeye salmon run for 2013. The range was estimated as the overall 80% prediction intervals and calculated as the square root of the sum of the squared 80% prediction intervals for each age class forecasted. The combined early- and late-run 80% prediction interval was calculated by summing the lower prediction bounds and upper prediction bounds of the 2 runs.

Forecast Discussion

The 2013 Chignik sockeye salmon early run is expected to be 2.77 million fish, which is 1.56 million fish more than the 10-year average of 1.21 million, and 1.20 million more than the 2012 early run of 1.57 million. The late run is expected to be 1.05 million fish, which is 102,000 more than the 10-year average of 945,000 but 345,000 fish less than the 2012 late run of 1.39 million. The total Chignik sockeye salmon run is expected to be 3.82 million fish, which is approximately 1.66 million fish more than the 10-year average of 2.16 million and 850,000 fish more than the 2012 total run.

The projected early-run harvest estimate of 2.42 million fish is based on achievement of the lower end of the early-run escapement goal range of 350,000 fish. The projected late-run harvest estimate of 797,000 fish is based on achieving the lower end of the late-run goal of 250,000 sockeye salmon plus the in-river run goal of 50,000. Sockeye salmon harvest estimates for both runs include fish harvested in the Chignik Management Area, Chignik-bound fish harvested in the Cape Igvak Section of the Kodiak Management Area, and in the Southeastern District Mainland of the Alaska Peninsula Management Area.

Exploratory analysis using smolt outmigration data and other sibling relationships yielded results similar to this formal forecast. Due to the range of variation in the relationships used in these forecasts, our confidence in them is fair to good.

Adam St.Saviour and Heather Finkle, Finfish Research Biologists, Alaska Peninsula