Fishery Management Report No. 09-17

Southeastern District Mainland (Alaska Peninsula Area) Salmon Management Plan, 2009

by

Nicole L. Zeiser

and

Aaron D. Poetter

April 2009

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)

Measures (fisheries)

fork length	FL
mideye to fork	MEF
mideye to tail fork	METF
standard length	SL
total length	TL

Mathematics, statistics

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

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ABSTRACT

The Southeastern District Mainland (SEDM) commercial salmon fishery takes place on the south side of the Alaska Peninsula in Stepovak, Balboa, and Beaver bays. This commercial salmon fishery is managed based on two distinct conditions and time frames: 1) the strength of Chignik River sockeye salmon *Oncorhynchus nerka* stocks during June 1 through July 25, and 2) local pink *O. gorbuscha*, chum *O. keta,* and coho salmon *O. kisutch* stocks from July 26 through the end of the season. The 2009 Chignik early- and late-run forecasted harvest estimates are 496,000 and 285,000 sockeye salmon respectively. 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 Area, sockeye salmon, *Onchorhychus nerka*, chum salmon, *Oncorhynchus keta*, pink salmon, *Oncorhynchus gorbuscha,* coho salmon, *Onchorhynchus 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 2009.

The SEDM fishery takes place on the south side of the Alaska Peninsula in the Alaska Peninsula and Aleutian Islands Management Areas (Area M; Figure 1). The SEDM is bordered by the Chignik Management Area (CMA; Area L) to the east and the South Central District of Area M to the west (Figure 1). Included in this fishery are the Beaver Bay, Balboa Bay, Southwest Stepovak, Northwest Stepovak, East Stepovak, and Stepovak Flats sections (Figure 2). The SEDM fishery is conducted according to the Southeastern District Mainland Salmon Management Plan (Appendix A1; 5 AAC 09.360) which was originally established by the Alaska Board of Fisheries (BOF) in 1980. In 1985, the BOF established the framework of the allocation criteria that the SEDM is currently managed on.

The department will manage the SEDM fishery based on two underlying factors: 1) the strength of Chignik sockeye salmon stocks, and 2) abundance of local pink, chum, and coho salmon stocks. From June 1 through July 25, excluding the Northwest Stepovak Section beginning July 1, the SEDM fishery is allocated 7.6% of the total CMA sockeye salmon *Oncorhynchus nerka* harvest. Beginning July 1, Northwest Stepovak Section (NWSS) is managed based the strength of sockeye salmon returning to Orzinski Lake through July 25. Harvest opportunity during the June 1 through July 25 timeframe has ranged from no commercial fishing opportunity to over 300,000 sockeye salmon harvested (Table 1). After July 25, the fishery is managed based on the abundance of local pink *O. gorbuscha*, chum *O. keta,* and coho salmon *O. kisutch* stocks. All terminal harvest areas within the SEDM (Figure 3) will be managed (from July 22 through July 31) as specified under the South Peninsula Post-June Management Plan (5 AAC 09.366).

FISHING PERIODS

The SEDM fishery is managed independently of other fisheries occurring in Area M through July 25. 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. During July 1 through 25, salmon fishing in the NWSS, excluding Orzinski Bay, may not exceed four days during a seven-day period, with a maximum of two consecutive fishing days (5 AAC 09.360(e)). For the purposes of this fishing schedule, a "day" is considered one 24-hour period. However, if the cumulative sockeye salmon escapement through Orzinski Lake weir exceeds 25,000 sockeye salmon, the NWSS and Orzinski Bay can be opened concurrently to set

gillnet and purse seine gear (5 AAC 09.360(e)(2)). In this situation, set gillnet gear may be permitted to fish continuously in the NWSS and Orzinski Bay. However, seine gear will be restricted to four days per week with no more than two days of continuous fishing.

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 advanced notice will be given prior to opening of any additional fishing periods, unless the announcement extends a current fishing period.

HARVEST REPORTING

Buyers must report the following daily requirements to the ADF&G office in Sand Point by 9:00 AM on the day following the landings (5 AAC 39.130): Salmon harvest reports; including number and pounds of fish by species and number of deliveries by gear type; and statistical area. Contact may be made over VHF radio channels 6 or 73, or on SSB radio frequency 3.320 MHz. 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 E-mail: aaron.poetter@alaska.gov.

Fish tickets must be received in the ADF&G Sand Point office (address provided below) within seven days of the purchase date, unless other arrangements have been made with the 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 broadcast on radio station KSDP AM 830 KHz in Sand Point and rebroadcast over K201DA FM 88.1 MHz in King Cove, marine VHF channels 6 and 73 daily at 9:30 AM and 5:30 PM. The most current fishery announcements may also be obtained by calling the ADF&G recorder phones in Sand Point at (907) 383-2334 (383-ADFG) and Cold Bay at (907)-532-2419.

During the 2009 season, the public is reminded that catch, escapement, and announcements will be available at the Commercial Fisheries website: www.cf.adfg.state.ak.us/region4/rgn4home.php.

2009 MANAGEMENT PLAN

Under the current SEDM Management Plan (5 AAC 09.360; Appendix A):

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. Prior to July 1, 80% of the sockeye salmon caught in the SEDM are considered to be Chignik-bound salmon (Figure 2).
3. Beginning July 1, sockeye salmon caught in the NWSS will be considered 100% local fish and not counted toward the Chignik allocation (Figure 2). Fishing time in the NWSS after June 30 will be based on sockeye salmon escapement into Orzinski Lake and may not be more than four 24-hour periods with no more than 48 hours continuous fishing during a seven-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 four 24-hour periods with no more than 48 hours continuous fishing during a seven-day period.
5. The Stepovak Flats Section will be managed for chum salmon returning to Stepovak Flats streams for the entire season. However, 80% of the sockeye salmon caught in this section through July 25 will be considered Chignik-bound fish (Figure 2).
6. The BOF established a closed waters area encompassing Kupreanof Point from July 6 through August 31 (Figure 4; 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.
7. From July 26 through September 30, the fishery is managed for local pink, chum, and coho salmon stocks.
8. From July 26 through September 30, the fishery will be closed for at least one 36-hour period within a seven-day period.
9. Terminal harvest areas within the SEDM will be managed from July 22 through July 31 as specified under the South Peninsula Post-June Management Plan 5AAC 09.366(g).

CHIGNIK RIVER SOCKEYE SALMON FORECAST AND SEDM ALLOCATION

The 2009 Chignik River forecast for the early-run harvest estimate is 496,000 sockeye salmon, and 285,000 sockeye salmon for the late-run harvest estimate (Volk et al. 2009; Appendix B). The ADF&G will manage the fishery so that the number of sockeye salmon harvested in the CMA, from both runs combined, will be at least 600,000 fish and the harvest 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, the department may close or restrict commercial salmon fishing in the 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 at least 300,000 sockeye salmon, the SEDM may open to commercial salmon fishing.

Northwest Stepovak Section

Beginning July 1, allowable fishing time in the Northwest Stepovak Section will be based on the abundance of local salmon stocks. Also during this time, all sockeye salmon caught in the Northwest Stepovak Section are considered to be 100% Orzinski Lake bound.

A weir was used to count salmon escapements into Orzinski Lake between 1929 and 1941, and again from 1990 through the present (Poetter et al. 2008). The Orzinski Lake sockeye salmon

sustainable escapement goal range is 15,000 to 20,000 adult salmon (Honnold et al. 2007). Based on aerial surveys and weir counts, ADF&G developed interim sockeye salmon escapement objectives for Orzinski Lake (Figure 5). ADF&G intends to operate a weir on the Orzinski Lake system again in 2009.

Sockeye salmon usually begin entering Orzinski Lake in late June and typically 50% of the annual escapement has been achieved by the second week of July. Generally, the Orzinski Lake sockeye salmon escapement is achieved by the first week of August. However, in 2003 and 2004, there were large buildups of sockeye salmon in Orzinski Bay in late June. This led to relatively large escapements in early July and contributed to total season escapements over three times the upper goal of 20,000 fish (Poetter et al. 2008).

Stepovak Flats Section

The Stepovak Flats Section is open to commercial salmon fishing concurrently with the rest of the 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. From July 26 through July 28, the Stepovak Flats Section may be opened based on the strength of pink and chum salmon runs. The Stepovak Flats Section is closed to all commercial fishing from July 29-September 31 to protect schooling chum salmon.

REFERENCES CITED

Honnold, S. G., M. J. Witteveen, I. Vining, H. Finkle, M. B. Foster, and J. J. Hasbrouck. 2007. Review of salmon escapement goals in the Alaska Peninsula Aleutian Islands Management Areas, 2006. Alaska Department of Fish and Game, Fishery Manuscript No. 07-02, Anchorage.

Poetter, A. D., J. V. Jackson, and E. Russ. 2008. South Peninsula annual salmon management report, 2007. Alaska Department of Fish and Game, Fishery Management Report No. 08-15, Anchorage.

Volk, E. C., M. D. Plotnick, and A. M. Carroll. 2009. Run forecasts and harvest projections for 2009 Alaska salmon fisheries and review of the 2008 season. Alaska Department of Fish and Game, Special Publication No. 09-07, Anchorage.

TABLES AND FIGURES

Table 1.–Southeastern District Mainland commercial fishing effort and assignment of sockeye salmon harvests June 1-July 25, 1985-2008.

	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	90,443	63,026	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
Average:												
1985-1991	47	440	28	56	54,248	54,248	0	22,260	88,776	76,507	88,776	165,283
1992-1995	59	702	21	32	84,824	65,189	19,635	23,406	93,623	88,594	113,258	201,852
1999-2008	46	671	14	20	70,359	60,401	9,958	18,525	74,100	78,926	84,058	162,984

[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 production.

[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

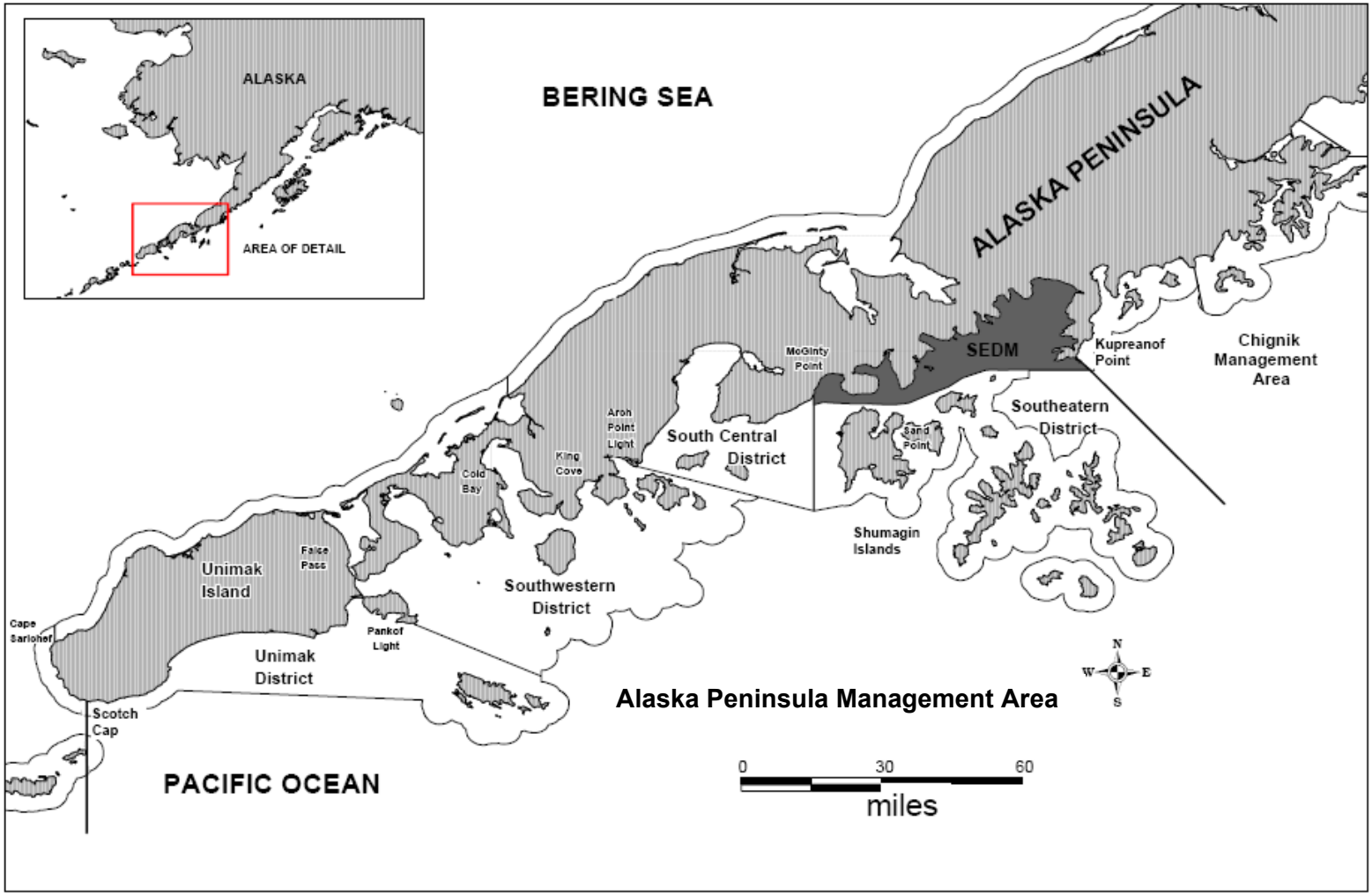

Figure 1.–Map of the South Alaska Peninsula Management Area with the Southeastern District Mainland (SEDM) defined.

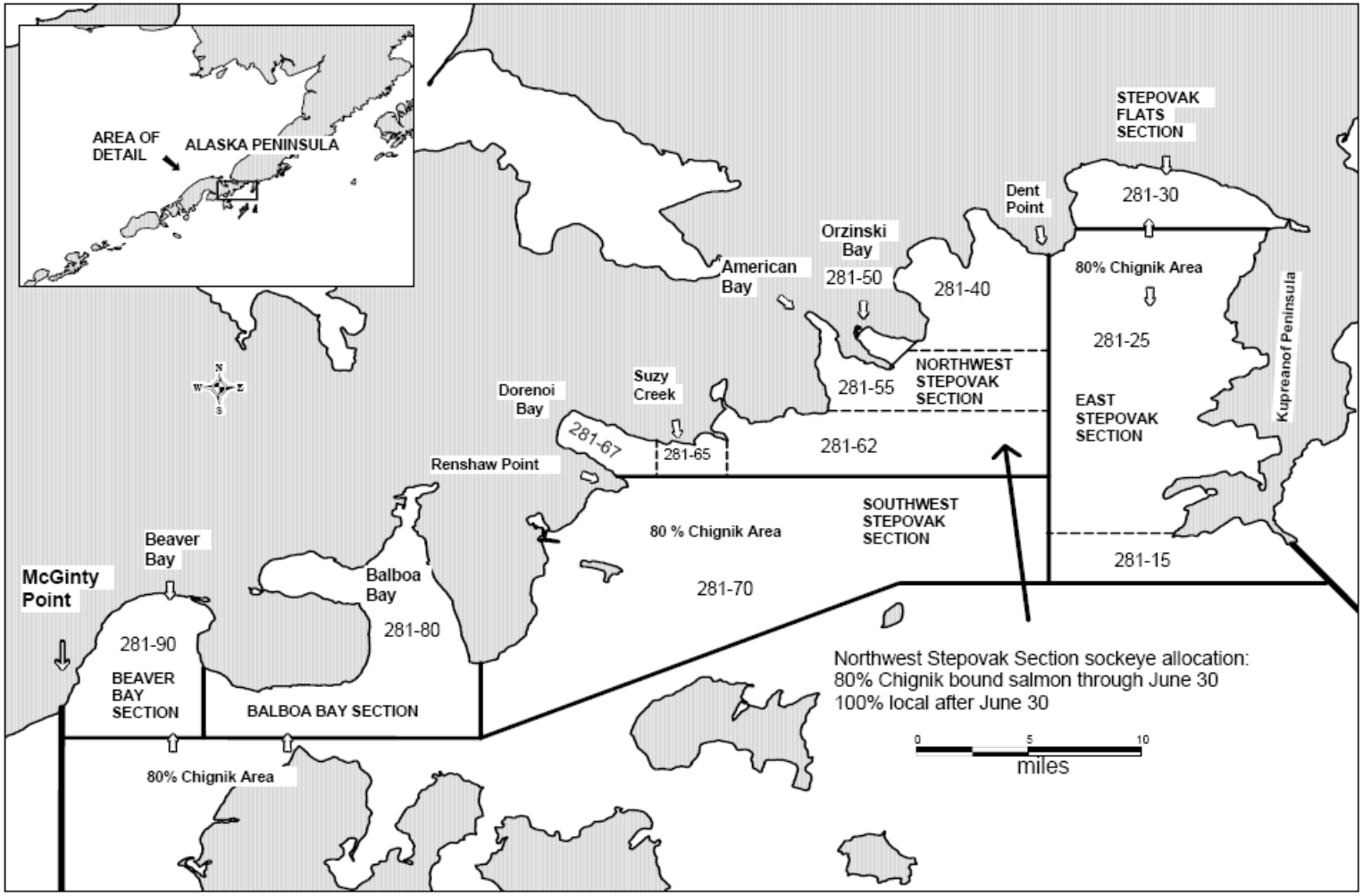

Figure 2.–Map of the Southeastern District Mainland from Kupreanof Point to McGinty Point with the salmon fishery sections defined.

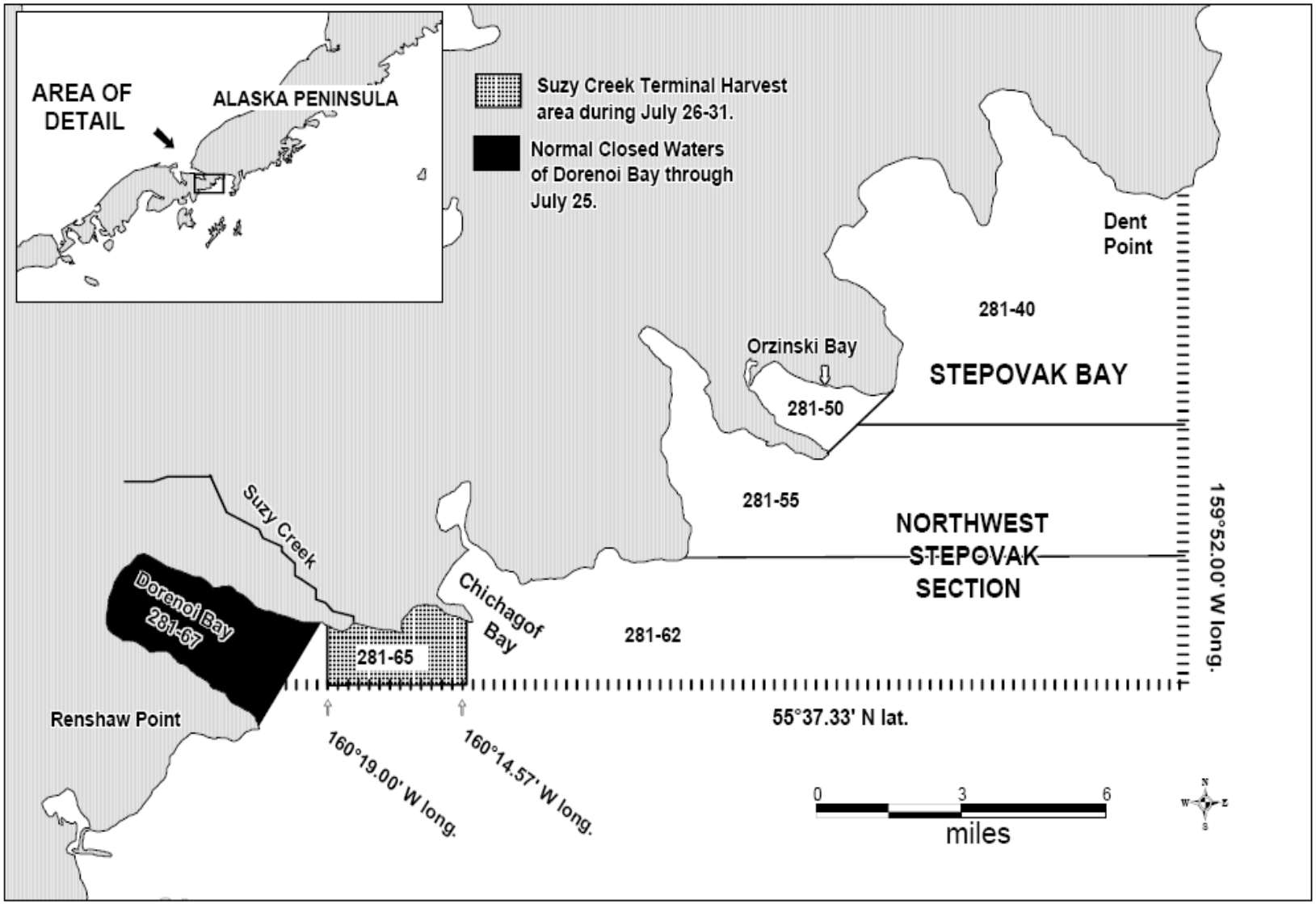

Figure 3.–Map of the Northwest Stepovak Section, emphasizing closed waters of Dorenoi Bay, and the Suzy Creek terminal harvest area.

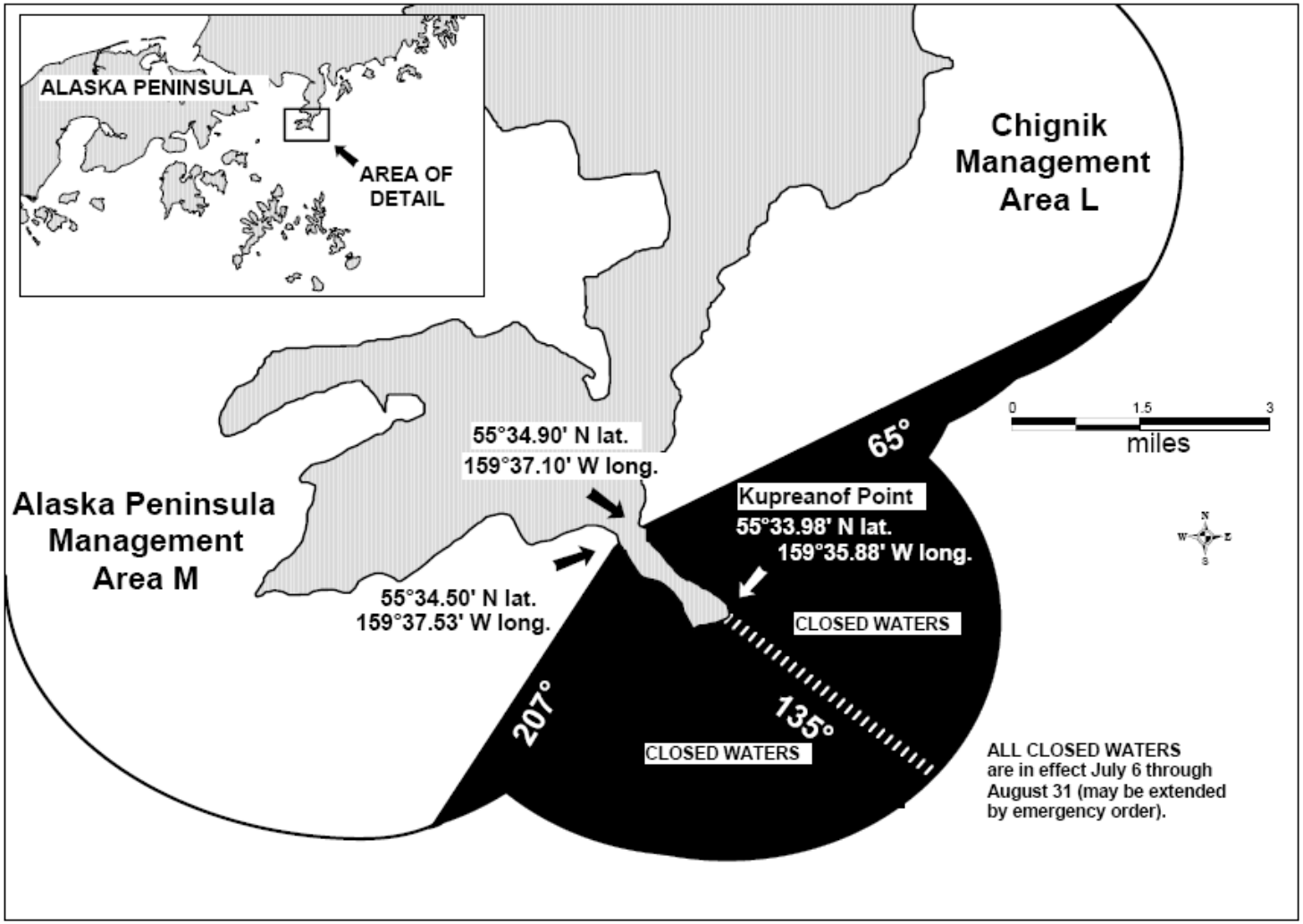

Figure 4.–Map of the Kupreanof Point area closed waters.

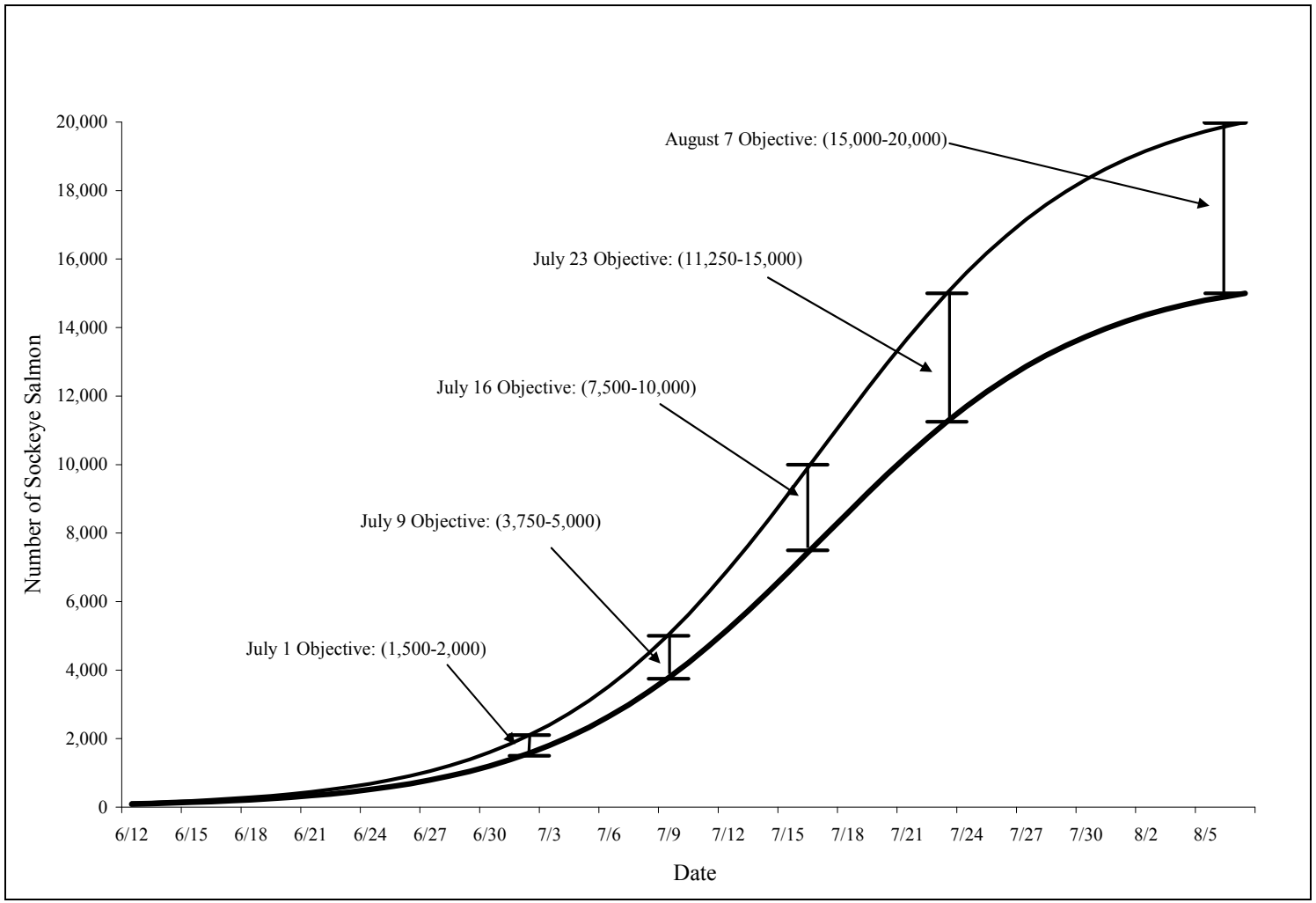

Figure 5.–Graph of the Orzinski Lake interim sockeye salmon escapement objectives by date.

APPENDIX A: SOUTHEASTERN DISTRICT MAINLAND SALMON REGULATIONS

5 AAC 09.360. SOUTHEASTERN DISTRICT MAINLAND SALMON MANAGEMENT PLAN. (a) The purpose of this management plan is to provide guidelines to the department for the management of the interception of Chignik River sockeye salmon caught in the Southeastern District Mainland fishery conducted in the East Stepovak, Stepovak Flats, Northwest Stepovak, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections. Except as specified in 5 AAC 09.330(f)(3), before July 11, only set gillnet gear may used in these sections. For the purpose of the management plan in this section, local runs include only those salmon in the waters

(1) beginning July 1, in the Northwest Stepovak Section described in 5 AAC 09.200(f);

(2) in the Stepovak Flats Section described in 5 AAC 09.200(f).

(b) In years when a harvestable surplus for the first (Black Lake) and second (Chignik Lake) runs of Chignik River system sockeye salmon is expected to be less than 600,000, a commercial salmon fishery is not allowed in the East Stepovak, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections, and in the Northwest Stepovak Section, excluding Orzinski Bay north of a line from Elephant Point at 55° 41.92’ N. lat., 160° 03.20’ W. long. to Waterfall Point at 55° 43.18’ N. lat., 160° 01.13’ W. long., until a harvest of 300,000 sockeye salmon is achieved in the Chignik Area described in 5 AAC 15.100. After July 8, if at least 300,000 sockeye salmon have been harvested in the Chignik Area, and if escapement goals are being met, the department shall manage the fishery so that the number of sockeye salmon harvested in the Chignik Area will be at least 600,000 and the number of sockeye salmon, destined to the Chignik River, harvested in the East Stepovak, Stepovak Flats, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections, and before July 1, in the Northwest Stepovak Section, approaches as near as possible 7.6 percent of the sockeye salmon harvest in the Chignik Management Area.

(c) In years when a harvestable surplus beyond escapement goals for the first and second runs of Chignik River system sockeye salmon is expected to be more than 600,000 but the first run fails to develop as predicted and it is determined that a total sockeye salmon harvest in the Chignik Area of 600,000 or more might not be achieved, the commercial salmon fishery in the East Stepovak, Stepovak Flats, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections, and in the Northwest Stepovak Section, excluding Orzinski Bay north of a line from Elephant Point at 55° 41.92’ N. lat., 160° 03.20’ W. long. to Waterfall Point at 55° 43.18’ N. lat., 160° 01.13’ W. long., shall be curtailed in order to allow a harvest in the Chignik Area of at least 300,000 sockeye salmon through July 8 if that number of fish are determined to be surplus to the escapement goals of the Chignik River system. After July 8, if at least 300,000 sockeye salmon have been harvested in the Chignik Area, and if escapement goals are being met, the department shall manage the fishery so that the number of sockeye salmon harvested in the Chignik Area is at least 600,000 and the number of sockeye salmon, destined to the Chignik River, harvested in the East Stepovak, Stepovak Flats, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections, and before July 1, in the Northwest Stepovak Section, approaches as near as possible 7.6 percent of the sockeye salmon harvest in the Chignik Management Area.

(d) In years when a harvestable surplus beyond the escapement goals for the first and second runs of Chignik River system sockeye salmon is expected to be more than 600,000 and the department determines that the runs are as strong as expected, the department shall manage the fishery so that the number of sockeye salmon, destined to the Chignik River, taken in the East Stepovak, Stepovak Flats, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections, and before July 1, in the Northwest Stepovak Section, approaches as near as possible 7.6 percent of the sockeye salmon harvest in the Chignik Management Area.

-continued-

(e) Beginning July 1, in the Northwest Stepovak Section,

(1) the fishing schedule in the Northwest Stepovak Section, excluding Orzinski Bay north of a line from Elephant Point at 55° 41.92' N. lat., 160° 03.20' W. long. to Waterfall Point at 55° 43.18' N. lat., 160° 01.13' W. long. may not be more than four 24-hour periods with no more than 48-hours continuous fishing during a seven-day period.

(2) However, when the escapement through Orzinski weir exceeds 25,000 sockeye salmon, the commissioner may open the Northwest Stepovak Section, including Orzinski Bay concurrently; fishing periods will be as follows:

(A) set gillnet gear will operate continuously through 12:00 p.m. midnight July 25;

(B) purse seine and hand purse seine gear will operate as specified in (1) of this sub-section.

(f) The estimate of sockeye salmon destined for the Chignik River has been determined to be 80 percent of the sockeye salmon harvested in the East Stepovak, Stepovak Flats, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections, and before July 1 in the Northwest Stepovak Section. Beginning July 1, all sockeye salmon taken in the Northwest Stepovak Section are considered to be destined for Orzinski Bay.

(g) The percentage of sockeye salmon, destined to the Chignik River, harvested in the Southeastern District Mainland fishery may be permitted to fluctuate above or below 7.6 percent of the sockeye salmon harvest in the Chignik Management Area at any time before July 25.

(h) The allocation method described in (a) - (g) of this section is in effect through July 25. The commissioner may not open the first fishing period of the commercial salmon fishing season in the East Stepovak, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections, and before July 1 in the Northwest Stepovak Section, before the first fishing period of the commercial salmon fishing season in the Chignik Area. After July 25, the commissioner may open, by emergency order, commercial salmon fishing in the entire Southeastern District Mainland area for local stocks.

(i) During the period from approximately June 26 through July 8, the strength of the second run of the Chignik River system sockeye salmon cannot be evaluated. In order to prevent overharvest of the second run, the department may disallow or severely restrict commercial salmon fishing in the East Stepovak, Stepovak Flats, Southwest Stepovak, Balboa Bay, and Beaver Bay Sections during this period, and from June 26 through June 30 in the Northwest Stepovak Section.

(j) The commissioner shall open all commercial fishing periods by emergency order. Before commencement of the first commercial salmon fishing period of the season, the department shall give at least 24 hours' notice. For subsequent fishing periods, the department shall give at least 12 hours' notice. If an existing fishing period is extended, the department shall give notice of the extension as soon as possible before the end of the existing fishing period.

(k) Notwithstanding any other provision of this section, from July 1 through July 10, if the department determines that the Orzinski Lake sockeye salmon escapement objectives have been exceeded, in addition to set gillnet gear, the commissioner may open, by emergency order, the waters of Orzinski Bay west of 160º 04.25' W. long. to fishing with purse seine and hand purse seine gear.

(*l*) From July 26 through September 30,

(1) the department shall manage the fishery based on the abundance of local pink, chum, and coho salmon stocks;

(2) there shall be at least one 36-hour closed period within a seven-day period.

APPENDIX B: 2009 CHIGNIK MANAGEMENT AREA SOCKEYE SALMON FORECAST

Appendix B1.–Chignik Management Area sockeye salmon forecast, 2009.

Preliminary Forecast of the 2009 Run		Forecast Estimate (thousands)	Forecast Range (thousands)
Total Production:			
Early Run (Black Lake)	Total Run Estimate	846	240–1,450
	Escapement Goal	350	350–400
	Harvest Estimate [a]	496	
Late Run (Chignik Lake)	Total Run Estimate	535	22–1,050
	Escapement Objective [b]	250	250–400
	Harvest Estimate [a]	285	
Total Chignik System	Total Run Estimate		
	Escapement	1,380	263–2,500
	Objective [b]	600	600–800
	Harvest Estimate [a]	781	

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

[a] These figures include harvests of Chignik-bound sockeye salmon from the Southeastern District Mainland and the Cape Igvak fisheries; approximately 632 thousand sockeye salmon are projected to be harvested in the Chignik Management Area.

[b] The Chignik Lake late-run escapement goal is 200,000 to 400,000 sockeye salmon, resulting in an escapement goal for the entire run of 550,000 to 800,000 fish. However, managers try to achieve an additional inriver goal of 50,000 sockeye salmon in August and September.

Forecast Methods

The forecasts for the 2009 early and late Chignik sockeye salmon runs were based on available data from 1977 to the present. Simple linear regressions were modeled using recent outmigration year ocean age-class relationships. Each regression model was assessed with standard regression diagnostic procedures. Regression estimates were only used in cases where the slope of the regression was significantly different from zero ($P < 0.25$). The variance of each estimate was calculated from the error structure of the regression. Regression analyses were examined for serial autocorrelation AR(1). When detected, an estimate of the bias from the serial autocorrelation was calculated from the regression residuals and applied to the original point estimate.

The predicted 2009 early-run ocean-age-three (3-ocean; ages-0.3, -1.3, -2.3, -3.3, and -4.3) sockeye salmon returns were estimated based on the abundance of prior 2-ocean sockeye salmon (ages-0.2, -1.2, -2.2, and -3.2; $P = 2.9 \times 10^{-5}$). Following non-significant regression results, the early-run 1-ocean (age-0.1, -1.1, -2.1 and -3.1 fish), 2-ocean (age-0.2, -1.2, -2.2, and -3.2 fish), and 4-ocean (age-0.4, -1.4, -2.4, and -3.4 fish) age class components were predicted by calculating the median returns since 1981.

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Ocean-age-class and temperature relationships were analyzed for the late-run forecast. The 2-ocean sockeye salmon were predicted from prior year's 1-ocean returns using simple linear regression, ($P = 1.1\times10^{-4}$). Returns of 3-ocean sockeye salmon were predicted from an index of average summer temperatures ($P = 0.02$). Temperature data were obtained from the Cold Bay Airport climate database. The temperature index was constructed using a five-year average of temperatures from June through August beginning in the year prior to the year of outmigration. The 4-ocean sockeye salmon were predicted from 3-ocean returns using simple linear regression$P = 0.09$). The 1- and 5-ocean (age-2.5 fish) sockeye salmon age classes were predicted by calculating the median return.

The variances associated with individual regression estimates by age class were used to calculate 80 percent prediction intervals for those estimates. Prediction intervals for median estimates were calculated using the 10^{th} and 90^{th} percentiles of the returns. For each run (early and late), the overall 80 percent prediction intervals were calculated as the square root of the sum of the squared 80 percent prediction intervals for each forecasted age class. Prediction intervals were re-estimated utilizing the standard error from a regression of the residuals when serial autocorrelation was detected. The early- and late-run regression and median estimates were summed to estimate the total Chignik watershed sockeye salmon run for 2009. The combined early- and late-run 80 percent prediction interval was calculated by summing the lower prediction bounds and upper prediction bounds of the two runs.

Available smolt data were analyzed and a significant simple linear regression relationship ($P = 0.003$) was found using the number of outmigrating age-2. smolt to predict the subsequent 3-ocean adult returns (about 85 percent of the run). This estimate was then expanded proportionally to account for other ocean ages (1-, 2-, and 4-ocean fish).

Forecast Discussion

The 2009 sockeye salmon run to the Chignik River is expected to be approximately 1.38 million fish. The early run is expected to be approximately 846 thousand fish. The late run is expected to be approximately 535 thousand fish. The 2009 Chignik sockeye salmon run is expected to be approximately 885 thousand fish less than the recent 10-year average run (2.27 million) and 12 thousand fish less than the 2008 run (1.39 million).

The projected harvest estimate for the early run of 496 thousand fish is based on achievement of the lower end of the early-run escapement goal range of 350 to 400 thousand fish. The projected harvest estimate for the late run of 285 thousand fish is based on achievement of the lower end of the late-run goal range of 250 thousand sockeye salmon, which includes the late-run inriver run goal through September 15. Harvest estimates for the both runs include Chignik-bound sockeye salmon harvested in the Cape Igvak Section of the Kodiak Management Area and the Southeastern District Mainland of the Alaska Peninsula Management Area.

The smolt-based forecast of the 2009 Chignik total sockeye salmon run is 1.62 million sockeye salmon, which is greater (236 thousand fish) than that predicted from ocean-age relationships and median estimates (1.38 million).

The smolt forecast approximates the median and ocean-age-class forecasts. Given this ancillary information, our confidence in this forecast is fair.

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Available smolt data were analyzed and a significant simple linear regression relationship (P = 0.009) was found using the number of outmigrating age-2. smolt to predict the subsequent 3-ocean adult returns (about 84 percent of the run). This estimate was then expanded proportionally to account for other ocean ages (1-, 2-, and 4-ocean fish). The smolt-based forecast of the 2008 Chignik total sockeye salmon run is 1.52 million sockeye salmon, which is less (205 thousand) than that predicted from ocean-age relationships and median estimates (1.72 million).

The smolt forecast approximates the median and ocean-age-class forecasts. Given this ancillary information, our confidence in this forecast is fair.

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