

South Alaska Peninsula Commercial Salmon Management Strategy, 2019

by

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April 2019

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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Weights and measures (metric)		General		Mathematics, statistics	
centimeter	cm	Alaska Administrative		<i>all standard mathematical</i>	
deciliter	dL	Code	AAC	<i>signs, symbols and</i>	
gram	g	all commonly accepted		<i>abbreviations</i>	
hectare	ha	abbreviations	e.g., Mr., Mrs.,	alternate hypothesis	H _A
kilogram	kg		AM, PM, etc.	base of natural logarithm	e
kilometer	km	all commonly accepted		catch per unit effort	CPUE
liter	L	professional titles	e.g., Dr., Ph.D.,	coefficient of variation	CV
meter	m		R.N., etc.	common test statistics	(F, t, χ^2 , etc.)
milliliter	mL	at	@	confidence interval	CI
millimeter	mm	compass directions:		correlation coefficient	
		east	E	(multiple)	R
		north	N	correlation coefficient	
		south	S	(simple)	r
		west	W	covariance	cov
		copyright	©	degree (angular)	°
		corporate suffixes:		degrees of freedom	df
		Company	Co.	expected value	E
		Corporation	Corp.	greater than	>
		Incorporated	Inc.	greater than or equal to	≥
		Limited	Ltd.	harvest per unit effort	HPUE
		District of Columbia	D.C.	less than	<
		et alii (and others)	et al.	less than or equal to	≤
		et cetera (and so forth)	etc.	logarithm (natural)	ln
		exempli gratia		logarithm (base 10)	log
		(for example)	e.g.	logarithm (specify base)	log ₂ , etc.
		Federal Information		minute (angular)	'
		Code	FIC	not significant	NS
		id est (that is)	i.e.	null hypothesis	H ₀
		latitude or longitude	lat or long	percent	%
		monetary symbols		probability	P
		(U.S.)	\$, ¢	probability of a type I error	
		months (tables and		(rejection of the null	
		figures): first three		hypothesis when true)	α
		letters	Jan,...,Dec	probability of a type II error	
		registered trademark	®	(acceptance of the null	
		trademark	™	hypothesis when false)	β
		United States		second (angular)	"
		(adjective)	U.S.	standard deviation	SD
		United States of		standard error	SE
		America (noun)	USA	variance	
		U.S.C.	United States	population	Var
			Code	sample	var
		U.S. state	use two-letter		
			abbreviations		
			(e.g., AK, WA)		
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	pH				
(negative log of)					
parts per million	ppm				
parts per thousand	ppt,				
	‰				
volts	V				
watts	W				

REGIONAL INFORMATION REPORT NO. 4K19-08

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MANAGEMENT STRATEGY, 2019**

by
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April 2019

The Regional Information Report Series was established in 1987 and was redefined in 2007 to meet the Division of Commercial Fisheries regional need for publishing and archiving information such as area management plans, budgetary information, staff comments and opinions to Alaska Board of Fisheries proposals, interim or preliminary data and grant agency reports, special meeting or minor workshop results and other regional information not generally reported elsewhere. Reports in this series may contain raw data and preliminary results. Reports in this series receive varying degrees of regional, biometric and editorial review; information in this series may be subsequently finalized and published in a different department reporting series or in the formal literature. Please contact the author or the Division of Commercial Fisheries if in doubt of the level of review or preliminary nature of the data reported. Regional Information Reports are available through the Alaska State Library and on the Internet at: <http://www.adfg.alaska.gov/sf/publications/>.

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This document should be cited as follows:

Fox, E. K. C., L. K. Stumpf, and C. J. Whiteside. 2019. South Alaska Peninsula commercial salmon management strategy, 2019. Alaska Department of Fish and Game, Regional Information Report No. 4K19-08, Anchorage.

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ABSTRACT

The South Alaska Peninsula Management Area (Area M) commercial salmon fisheries are regulated by 3 management plans. The South Unimak and Shumagin Islands June fisheries occur from June 6 through June 28 and target sockeye salmon *Oncorhynchus nerka*. The June fisheries commence according to one schedule that combines all gear types. The Post-June fishery may occur from July 6 through October 31 and is guided by the results of an immature salmon test fishery and the strength of local sockeye, chum *O. keta*, pink *O. gorbuscha*, and coho salmon *O. kisutch* returns. The Southeastern District Mainland (SEDM) is managed independently from the remainder of the South Alaska Peninsula fisheries from June 1 through October 31. A sockeye salmon allocation exists between the Chignik Management Area (CMA) and the SEDM where 7.6% of the sockeye salmon harvested in the CMA may be harvested in the SEDM. Of the sockeye salmon harvested in the SEDM during the allocation timeframe (June 1 through July 25, excluding the Northwest Stepovak Section from July 1 through July 25), 80% are attributed to the allocation. After July 25, the SEDM is managed strictly on local stocks. This document summarizes the management strategy of the South Alaska Peninsula fisheries and outlines the requirements for industry participation in 2019.

Key words: Alaska Peninsula, Area M, Shumagin Islands, South Unimak, June fishery, post-June, Southeastern District Mainland, SEDM, commercial salmon fisheries, sockeye salmon, *Oncorhynchus nerka*, chum salmon, *O. keta*, pink salmon, *O. gorbuscha*, coho salmon, *O. kisutch*, management plan, Alaska Department of Fish and Game, Fishery Management Report, CMA, Chignik, forecasts

INTRODUCTION

The South Alaska Peninsula Salmon Management Area consists of those waters south of the Alaska Peninsula bounded on the west by Scotch Cap and on the east by Kupreanof Point (Figure 1). Three management plans guide the Alaska Department of Fish and Game's (ADF&G) approach to managing salmon fisheries in this area annually; they are the *South Unimak and Shumagin Islands June Salmon Management Plan* (5 AAC 09.365¹), the *Post-June Salmon Management Plan for the South Alaska Peninsula* (5 AAC 09.366), and the *Southeastern District Mainland Salmon Management Plan* (5 AAC 09.360). Three gear types are fished in the South Alaska Peninsula fisheries; purse seine, set gillnet, and drift gillnet (Figures 2 and 3).

The South Unimak and Shumagin Islands June commercial salmon fisheries target sockeye salmon *Oncorhynchus nerka* and are in effect from June 6 through June 28. The South Unimak June fishery occurs in the Unimak and Southwestern districts, a portion of the South Central District, and the Bechevin Bay Section of the Northwest District (Figures 1 and 2). The Shumagin Islands June fishery includes the Shumagin Islands Section of the Southeastern District (Figure 1).

The *Post-June Salmon Management Plan for the South Alaska Peninsula* covers all waters of the South Alaska Peninsula Management Area (except the Southeastern District Mainland) from July 1 through October 31 (Figure 4).

The Southeastern District Mainland (SEDM) fishery occurs in the northern portion of the Southeastern District between McGinty Point in the west and Kupreanof Point in the east (Figures 5 and 6). The SEDM is further subdivided into 6 sections: The Beaver Bay, Balboa Bay, Southwest Stepovak, Northwest Stepovak, East Stepovak, and Stepovak Flats sections (Figure 6).

¹ ADF&G. 2016. 2016–2019 Alaska Peninsula, Atka–Amlia Islands, Aleutian Islands, and Chignik Areas Commercial Salmon Fishing Regulations. Alaska Department of Fish and Game, Juneau.

ADF&G will manage the SEDM fishery according to 3 distinct conditions and timeframes: 1) the strength of Chignik sockeye salmon stocks, 2) the strength of Orzinski Lake sockeye salmon escapement in the Northwest Stepovak Section (NWSS) from July 1 through July 25, and 3) abundance of local coho *O. kisutch*, pink *O. gorbuscha*, and chum salmon *O. keta* 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 Chignik Management Area (CMA) sockeye salmon harvest. From July 1 through July 25, the NWSS is managed based on the strength of sockeye salmon returning to Orzinski Lake.

This document provides commercial fishermen and processors with the ADF&G harvest strategy for the South Alaska Peninsula salmon fisheries. It also outlines the requirements of the industry to participate in these fisheries as well as how to provide information to ADF&G.

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, as well as on marine VHF channels 6 and 73 daily at 9:30 AM and 5:00 PM. Recorded information may also be obtained by calling the ADF&G recorder phone in Sand Point at (907) 383-2334 (383-ADFG) and in Cold Bay at (907) 532-2419. During the 2019 season, inseason harvest reports and fishery announcements will be available at the Commercial Fisheries website:

<http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareaakpeninsula.salmon>.

HARVEST REPORTING

As required by 5 AAC 39.130(c), buyers, transporters, and catcher/processors must report their daily salmon harvest/purchases by species (in both numbers of fish and pounds), statistical area, and number of deliveries by gear type to the ADF&G office in Sand Point or Cold Bay by 10:00 AM the day following the delivery. Timely and accurate reporting is appreciated and helps to manage an orderly fishery. Buyers may contact ADF&G offices in Cold Bay or Sand Point with their harvest information by phone, email, fax, and VHF channels 6 and 73.

Sand Point	Phone: 907-383-2066	Fax: 907-383-2606
Lisa Fox	E-mail: elisabeth.fox@alaska.gov	
Lucas Stumpf	E-mail: lucas.stumpf@alaska.gov	

Cold Bay	Phone: 907-532-2419	Fax: 907-532-2470
Cassandra Whiteside	E-mail: cassandra.whiteside@alaska.gov	

Fish tickets must be received in the ADF&G office in Sand Point or Cold Bay (listed below) within 7 days of the purchase date (5 AAC 39.130(c)). Properly filled out fish tickets are essential to the management of these fisheries and an informational packet containing detailed instructions for filling out and submitting fish tickets is available to all fish transporters, tender operators, and processor/buyers at ADF&G offices in Sand Point and Cold Bay.

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

Alaska Department of Fish and Game
P.O. Box 50
Cold Bay, AK 99571

ALASKA BOARD OF FISHERIES REGULATION CHANGES FROM THE FEBRUARY 2019 MEETING

During the February 2019 Alaska Peninsula, Aleutian Islands, and Chignik meeting, the Alaska Board of Fisheries (board) made changes to the *South Unimak and Shumagin Islands June Salmon Management Plan* (5AAC 09.365) by amending subsection (d) that establishes the June fishing schedule. The first commercial fishing period will begin on June 6 at 10:00 AM and close at 10:00 PM on June 8, a 64-hour fishing period for set gillnet gear only. Beginning at 6:00 AM June 10 all gear types will be allowed for an 88-hour fishing period which will end at 10:00 PM on June 13. This fishing period will be followed by a closure of 32-hours for all gear types. The commercial salmon fishery will reopen for three more 88-hour fishing periods, followed by closures of 32-hours. The final commercial fishing period in June ends at 10:00 PM on June 28 (Figure 7).

Additionally, the board added a new subsection to the *South Unimak and Shumagin Islands June Salmon Management Plan* (5 AAC 09.365(g)) to close the waters of the Volcano Bay Section of the Southwestern District, the Belkofski Bay Section of the Southwestern District, excluding those waters inside of a line between Vodapoini Point at 55° 01.88' N. lat., 162°24.80' W. long., and Bold Cape at 55° 01.24' N. lat., 162° 16.40'W. long., and the South Central District to purse seine gear (Figure 2).

The board amended 5 AAC 09.330. *Gear*, subsection (g) to allow a registered salmon fishing vessel, when it has set gillnet gear on board, to tow another registered salmon fishing vessel with set gillnet gear on board if the permit holder for the vessel being towed is on board one of the vessels, or a registered salmon fishing vessel may transport no more than two legal limits of set gillnet fishing gear in the aggregate during a closed fishing period if the two permit holders are on board the vessel. Gear may be transported to another district only after receiving authorization from the department.

The board also amended 5 AAC 09.331. *Gillnet specifications and operations*, to remove minimum mesh size regulations for set gillnets.

The escapement goal ranges for chum salmon were changed and a new criterion for escapement assessment was adopted. The single peak aerial survey method was chosen, utilizing specific index streams in a district, rather than all the streams in a district. This lowered the ranges of the chum salmon sustainable escapement goals (SEGs) for the Southwestern, South Central, and Southeastern districts. The Southeastern District will now use 26 index streams with an SEG of 62,500–151,900 chum salmon. The South Central District will now use 10 index streams with an SEG of 68,900–99,200 chum salmon. The Southwestern District will now use 19 index streams with an SEG of 86,900–159,500 (Schaberg et al. 2019). While the 55 streams will be monitored in order to provide an escapement index, the previously monitored streams will continue to be monitored to assess quality and spatial distribution of the runs.

2019 MANAGEMENT PLANS

JUNE SALMON FISHERY

The *South Unimak and Shumagin Islands June Salmon Management Plan* (5 AAC 09.365) is in effect from June 6 through June 28. Complete details can be found in the Alaska Peninsula commercial salmon fishing regulations (5 AAC 09.365) available at ADF&G offices.

The South Unimak June fishery includes the following locations (Figures 1–3):

- a. Unimak District as described in 5 AAC 09.200(c),
- b. Bechevin Bay Section as described in 5 AAC 09.200(b)(2),
- c. Southwestern District as described in 5 AAC 09.200(d), and
- d. West Pavlof Bay and East Pavlof Bay sections of the South Central District as described in 5 AAC 09.200(e)(1) and (2).

The Shumagin Islands fishery includes the Shumagin Islands Section of the Southeastern District (Figures 1–2) as described in 5 AAC 09.200(f)(3).

Fishing periods for the 2019 June fishery will be as follows (Figure 7):

<u>Dates and Times</u>	<u>Duration</u>
Set gillnet only:	
6:00 AM Thursday, June 6 until 10:00 PM Saturday June 8	64 hours
All gear types:	
6:00 AM Monday, June 10 until 10:00 PM Thursday, June 13	88 hours
6:00 AM Saturday, June 15 until 10:00 PM Tuesday, June 18	88 hours
6:00 AM Thursday, June 20 until 10:00 PM Sunday, June 23	88 hours
6:00 AM Tuesday, June 25 until 10:00 PM Friday, June 28	88 hours

In addition to the scheduled fishing periods during the month of June, the harvest of sockeye salmon in the Western Alaska Salmon Stock Identification Program (WASSIP) described “Dolgoi Island area” will be monitored through fish ticket information. Once the harvest of sockeye salmon reaches 191,000 fish, the waters of the West Pavlof Bay Section south of Black Point and the waters of the Volcano Bay Section will close to commercial salmon fishing for the remainder of the June fisheries (Figures 8 and 9). Commercial fishermen operating in the South Central and Southwestern districts during June are advised that the short notice closure of the designated “Dolgoi Island area” will occur in the event the harvest of sockeye salmon approaches 191,000 fish. The department will to the extent practical give a minimum of 6 hours’ notice of closure to all gear types.

Fishermen should be aware that waters closed to commercial salmon fishing, as specified under 5 AAC 09.350 are in effect during June.

Latitude and longitude coordinates in the Alaska Peninsula Management Area will be determined and enforced using the Global Positioning System (GPS; North American Datum of 1983).

POST-JUNE SALMON FISHERY

Immature Test Fishery

In order to assess the abundance of immature salmon and reduce incidental harvest ADF&G will conduct a purse seine test fishery in the Shumagin Islands Section in early July, before the post-June fishery begins. If 100 or more immature salmon, per set, are present, the commercial fishery will be closed to purse seine gear in an area to be determined by ADF&G (5 AAC 09.366(i)). For the purpose of this management plan, “immature salmon, per set, are present” is defined as the number of Chinook *O. tshawytscha*, sockeye, coho, and chum salmon that are observed to be gilled in the seine web (5 AAC 09.366(i)). Test fishing is standardized to purse seine gear, conducting two 20-minute sets at Popof Head, Middle Set, and Red Bluff located on Popof Island. The commercial fishery may be constrained based on the abundance of immature salmon observed during the test fishery. Gillnet gear is permitted to fish in these areas during the presence of immature salmon because the larger mesh size permits immature salmon to pass through the nets.

Harvest Strategy for July

Commercial salmon fishing opportunities during the month of July will consist of one 33-hour fishing period, followed by a 63-hour closure, followed by six 36-hour fishing periods, separated by 60-hour closures (5 AAC 09.366(d)). The first post-June fishing period will be on July 6, pending the results from the immature test fishery. The first commercial fishing period of the July 6 through July 31 periods will begin at 6:00 AM on July 6 (5 AAC 09.366(d)).

The post-June fishery July fishing schedule will be as follows (Figure 10):

<u>Dates and Times</u>	<u>Duration</u>
All gear types:	
6:00 AM Saturday, July 6 until 3:00 PM Sunday, July 7	33 hours
6:00 AM Wednesday, July 10 until 6:00 PM Thursday, July 11	36 hours
6:00 AM Sunday, July 14 until 6:00 PM Monday, July 15	36 hours
6:00 AM Thursday, July 18 until 6:00 PM Friday, July 19	36 hours
6:00 AM Monday, July 22 until 6:00 PM Tuesday, July 23	36 hours
6:00 AM Friday, July 26 until 6:00 PM Saturday, July 27	36 hours
6:00 AM Tuesday, July 30 until 6:00 PM Wednesday, July 31	36 hours

Under the current management plan, commercial salmon fishing is permitted to occur concurrently in both terminal and non-terminal areas during the scheduled openings for the month of July in all areas of the South Alaska Peninsula. Terminal harvest areas are depicted in Figures 11 through 15.

Additional fishing time in terminal harvest areas may also be provided during closures in the July fishing schedule based on local salmon stock strength which is evaluated from harvest data, escapement counts, and aerial surveys. From July 6 through July 21 terminal harvest areas are: Zachary Bay, Canoe Bay, Cold Bay, Thin Point, and Morzhovoi Bay sections and the East and West Pavlof Bay sections north of the latitude of Black Point (Figures 11–14). Terminal harvest areas during the July 22 through July 31 time period include those areas specified for the July 6

through July 21 period, as well as the Deer Island, Belkofski Bay, and Mino Creek-Little Coal Bay sections (Figure 15).

In addition to the scheduled fishing periods during the month of July, the harvest of sockeye salmon in the “Dolgoi Island area” will be monitored through fish ticket information from the opening of the commercial salmon season through July 25 (Figures 8 and 9). Once the harvest of sockeye salmon reaches 191,000 fish, based on fish tickets, the waters of the West Pavlof Bay Section south of Black Point and the waters of the Volcano Bay Section will close until July 26. However, the portion of the West Pavlof Bay Section south of Black Point will reopen to commercial salmon fishing on July 17 consistent with scheduled fishing periods during the post-June fishery. Commercial fishermen operating in the South Central and Southwestern districts prior to July 25 are advised that short notice closure of the designated “Dolgoi Island area” will occur in the event the harvest of sockeye salmon approaches the 191,000 fish (Figures 8 and 9). The department will to the extent practical give 6-hours’ notice of closure to all gear types.

Harvest Strategies after July

From August 1 through August 31, fishing periods in the South Alaska Peninsula will be based on the strength of local sockeye, coho, pink, and chum salmon runs.

From September 1 through October 31, fishing periods will be based primarily on coho salmon abundance, although late pink and chum salmon run strength may be considered when determining fishing time. Fishing effort typically declines during the fall fishery.

In an effort to allow enforcement activities during daylight hours, with minimum impact to legal fishing activities, fishing periods in August will open at 8:00 AM and close at 9:00 PM (5 AAC 09.366(c)(2)), and fishing periods in September and October will open at 9:00 AM and close at 8:00 PM (5 AAC 09.366(c)(3)).

Salmon Escapement Goals

Aerial surveys will be conducted by ADF&G staff to estimate the escapement of sockeye, coho, pink, and chum salmon on the South Alaska Peninsula. Information from these surveys will be used for in season management of the South Alaska Peninsula commercial salmon fishery. Aerial survey methods can be found in Fox et al. 2018.

Pink and chum salmon escapements are estimated using an indexed total escapement method, while sockeye salmon escapements are estimated using peak escapements beginning in mid-July through mid-September. Due to the late run timing of coho salmon, limited survey data is gathered, and no indexed total escapement can be calculated. The 2019 pink salmon SEG range for the South Alaska Peninsula is 1,750,000 to 4,000,000 fish. The 2019 chum SEG ranges are 62,500 to 151,900 fish in the Southeastern District, 68,900 to 99,200 fish in the South Central District, and 86,900 to 159,500 fish in the Southwestern District (Table 1). There are three sockeye salmon SEGs in the South Alaska Peninsula; 15,000 to 20,000 fish at Orzinski Lake, 3,200 to 6,400 fish at Mortensens Lagoon, and 14,000 to 28,000 fish at Thin Point Lake (Schaberg et al. 2019; Table 1).

SOUTHEASTERN DISTRICT MAINLAND SALMON FISHERY

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 after July 1.
3. Beginning July 1, sockeye salmon caught in NWSS will not be counted toward the Chignik allocation. Fishing periods in 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, 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 board established a closed waters area encompassing Kupreanof Point from July 6 through August 31 (Figure 16, 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 SEG range is 15,000 to 20,000 fish (Schaberg et al. 2019; Table 1). Based on aerial surveys and weir counts, ADF&G developed interim sockeye salmon escapement objectives for Orzinski Lake (Figure 17). ADF&G has operated a weir on the Orzinski Lake system every year since 1990 and plans to do so again in 2019.

Stepovak Flats Section

The Stepovak Flats Section is open to commercial salmon fishing concurrently with the rest of SEDM (Figure 6). 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.

FORECAST AND ALLOCATION

SOUTH ALASKA PENINSULA PINK SALMON FORECAST

The 2019 South Alaska Peninsula harvest estimate is 20.6 million pink salmon and the total run estimate is 24.6 million fish (Appendix A1). ADF&G will manage the commercial fishery according to the June and post-June schedules through July 31, at which time the commercial salmon fishing periods will be based upon strength of local pink and chum salmon stocks.

CHIGNIK RIVER SOCKEYE SALMON FORECAST AND SEDM ALLOCATION

The 2019 Chignik River forecast for the early-run harvest estimate is 429,000 sockeye salmon, and the late-run harvest estimate is 571,000 sockeye salmon (Appendix A2). Because ADF&G has forecasted both runs combined will be at least 600,000 and if the run is as strong as expected then the department will manage SEDM so that 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.

If the Chignik River early run fails to develop as predicted, the department will curtail fishing in the SEDM, excluding Orzinski Bay, until at least 300,000 sockeye salmon have been harvested in the CMA through July 8. From approximately June 26 through July 8, the strength of the Chignik River 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, if at least 300,000 sockeye salmon have been harvested in the CMA and escapement objectives are being met for the Chignik late-run, the department will manage the fishery so that the number of sockeye salmon harvested in the CMA is at least 600,000. The number of sockeye salmon harvested in the SEDM before July 25 (before July 1 in the NWSS) will be managed so that 7.6% of the total harvest of Chignik River sockeye salmon is taken in the SEDM. 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

- Fox, E. K. C., L. K. Stumpf, and C. J. Whiteside. 2018. South Alaska Peninsula salmon annual management report, 2018 and the 2017 subsistence fisheries in the Alaska Peninsula, Aleutian Islands, and Atka-Amlia Islands management areas. Alaska Department of Fish and Game, Regional Information Report No. 4K19-01, Kodiak.
- Schaberg, K. L., H. Finkle, M. B. Foster, A. St. Saviour, and M. L. Wattum. 2019. Review of salmon escapement goals in the Alaska Peninsula and Aleutian Islands Management Areas, 2018. Alaska Department of Fish and Game, Fishery Manuscript No. 19-01, Anchorage.

TABLES AND FIGURES

Table 1.—South Alaska Peninsula pink, chum, and sockeye salmon escapement goals for 2019.

	Range
Pink Salmon (SEG)	
South Peninsula Total	1,750,000 to 4,000,000
Chum Salmon (SEGs)	
Southeastern District	62,500 to 151,900
South Central District	68,900 to 99,200
Southwestern District	86,900 to 159,500
Sockeye Salmon (SEGs)	
Orzinski Lake	15,000 to 20,000
Mortensens Lagoon	3,200 to 6,400
Thin Point Lake	14,000 to 28,000

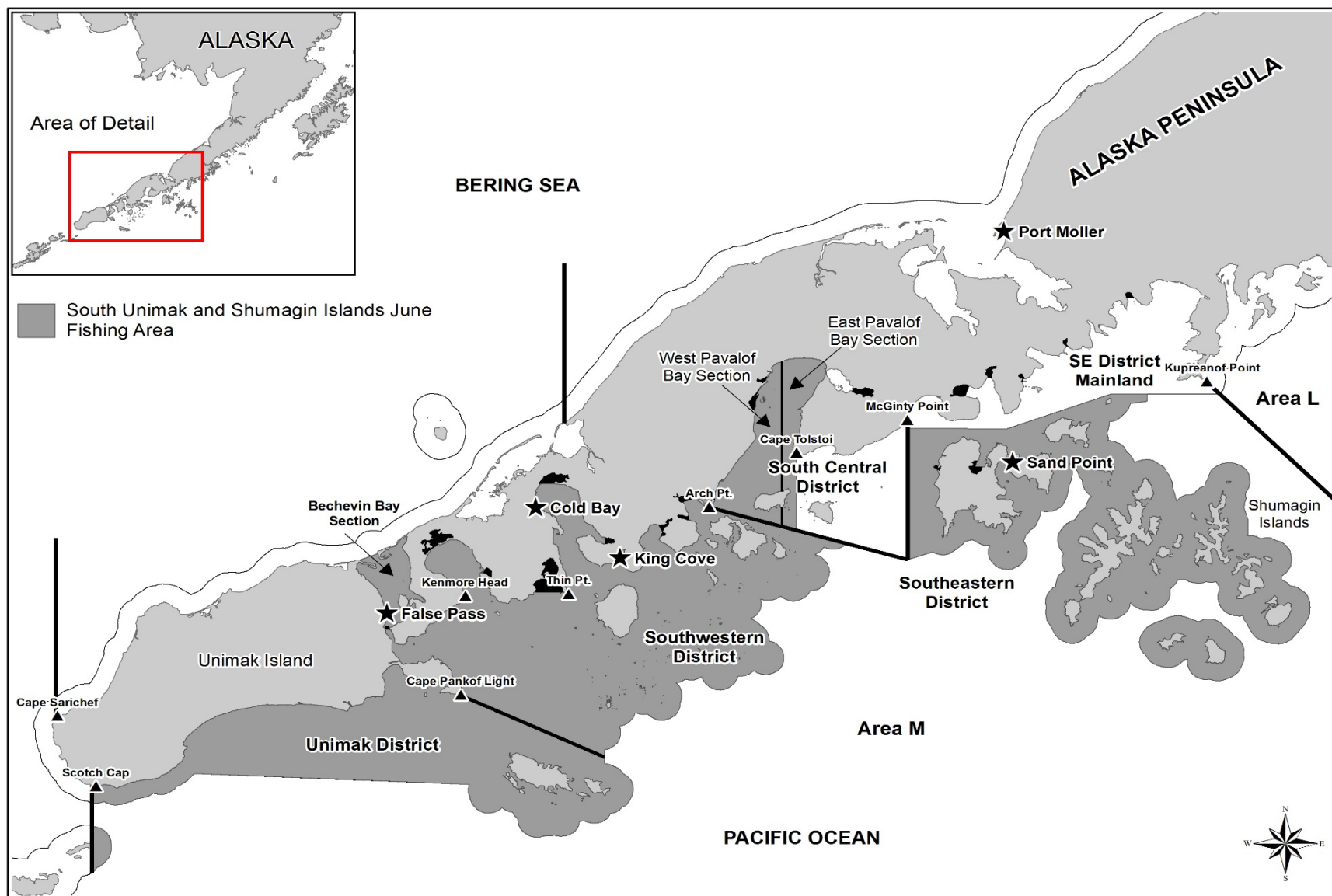


Figure 1.—Map of the South Alaska Peninsula Management Area and the locations of the South Unimak and Shumagin Islands June fisheries.

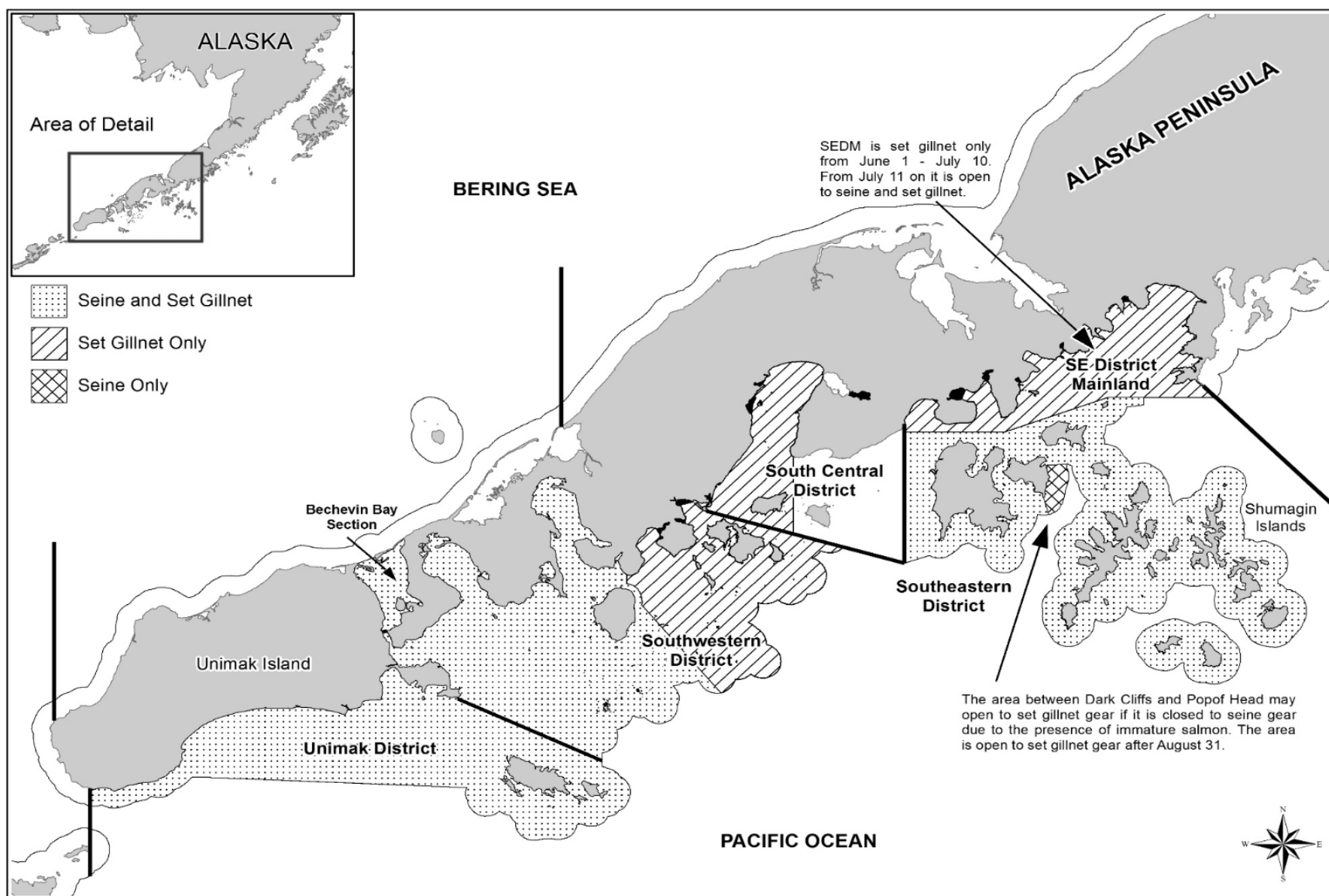


Figure 2.—Map depicting the locations of June South Alaska Peninsula fisheries for purse seine and set gillnet gear.

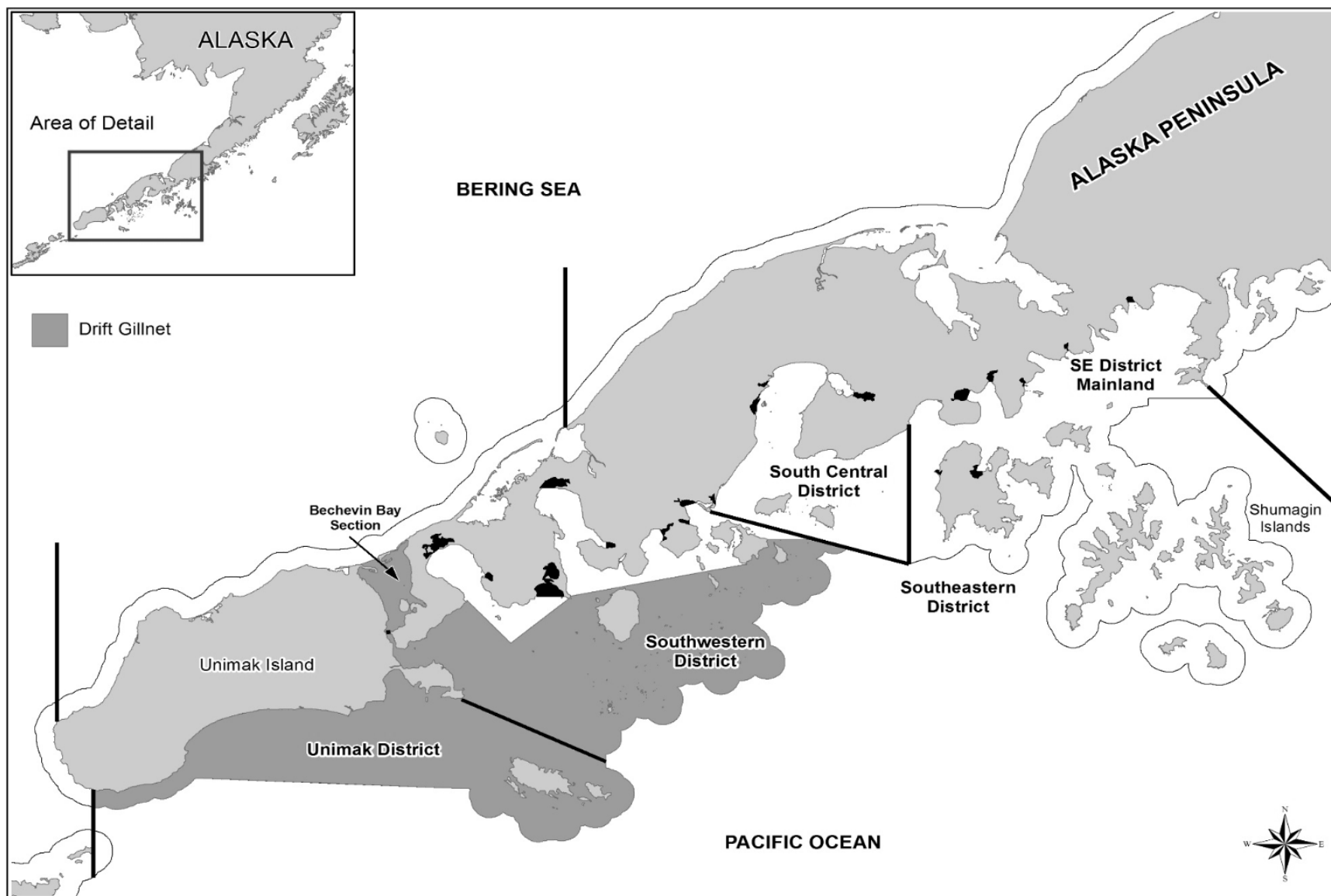


Figure 3.—Map depicting the locations of June South Alaska Peninsula fishery for drift gillnet gear.

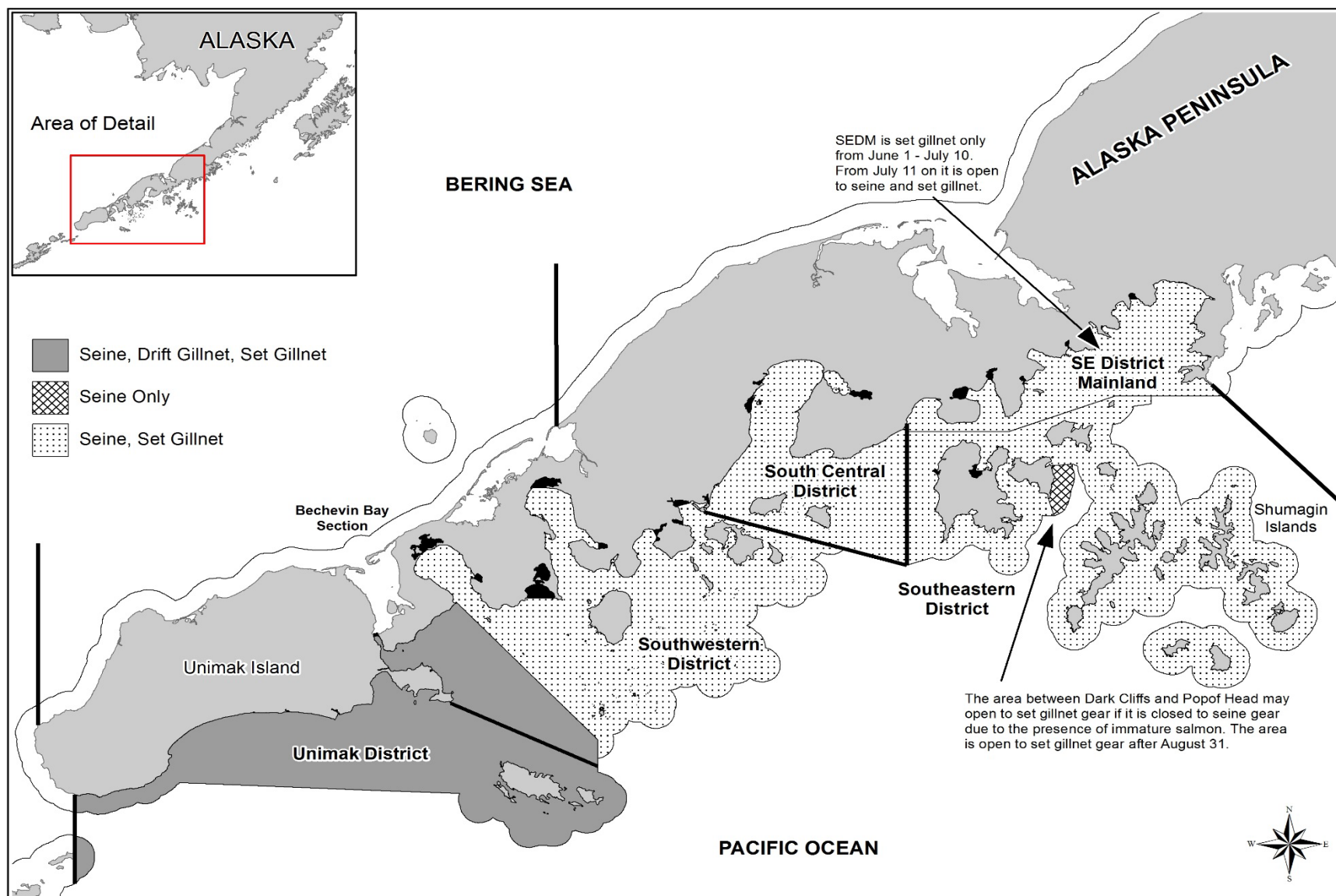


Figure 4.—Map depicting the locations of post-June South Alaska Peninsula fisheries and permitted gear types

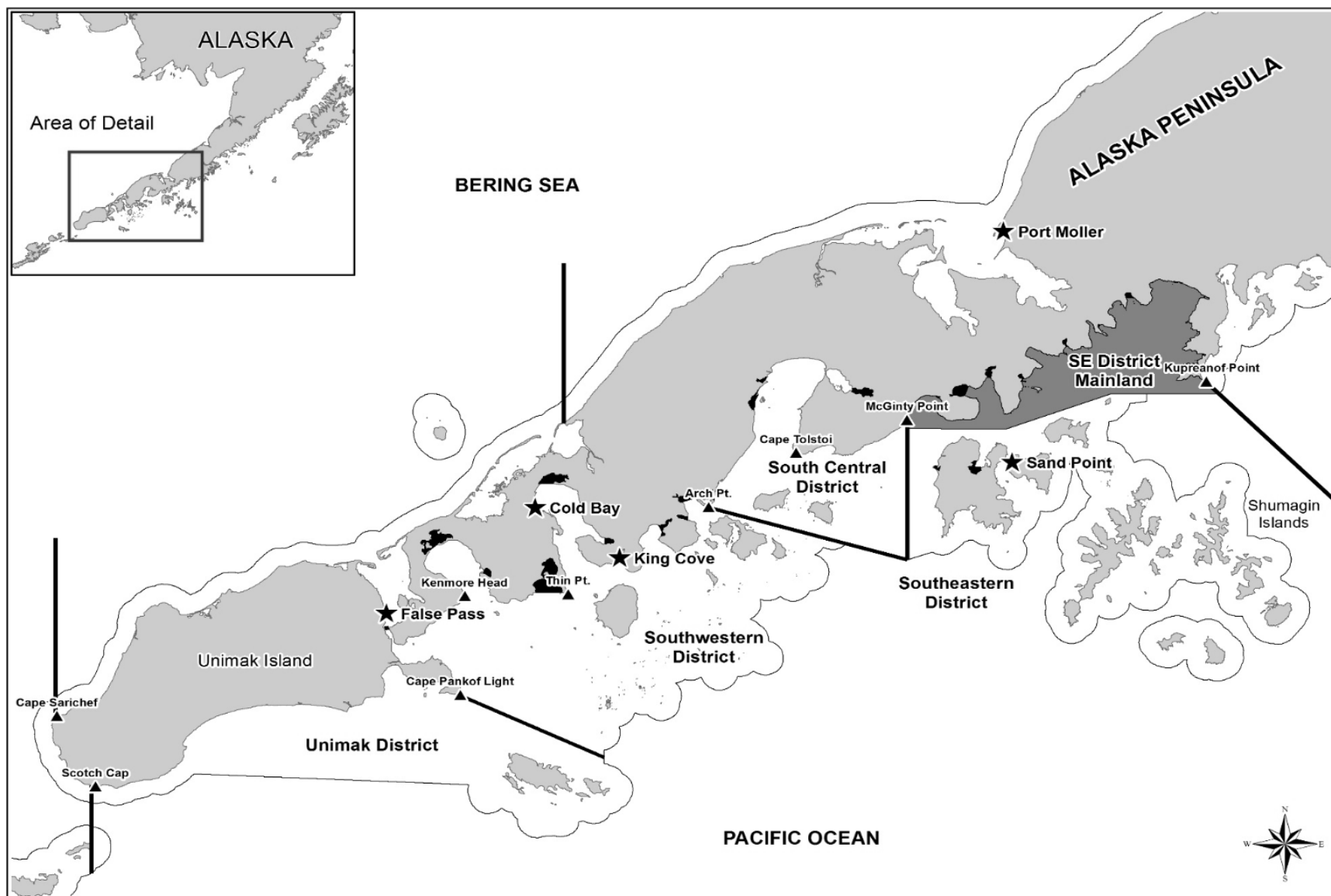


Figure 5.—Map of the South Alaska Peninsula Management Area with the Southeastern District Mainland defined.

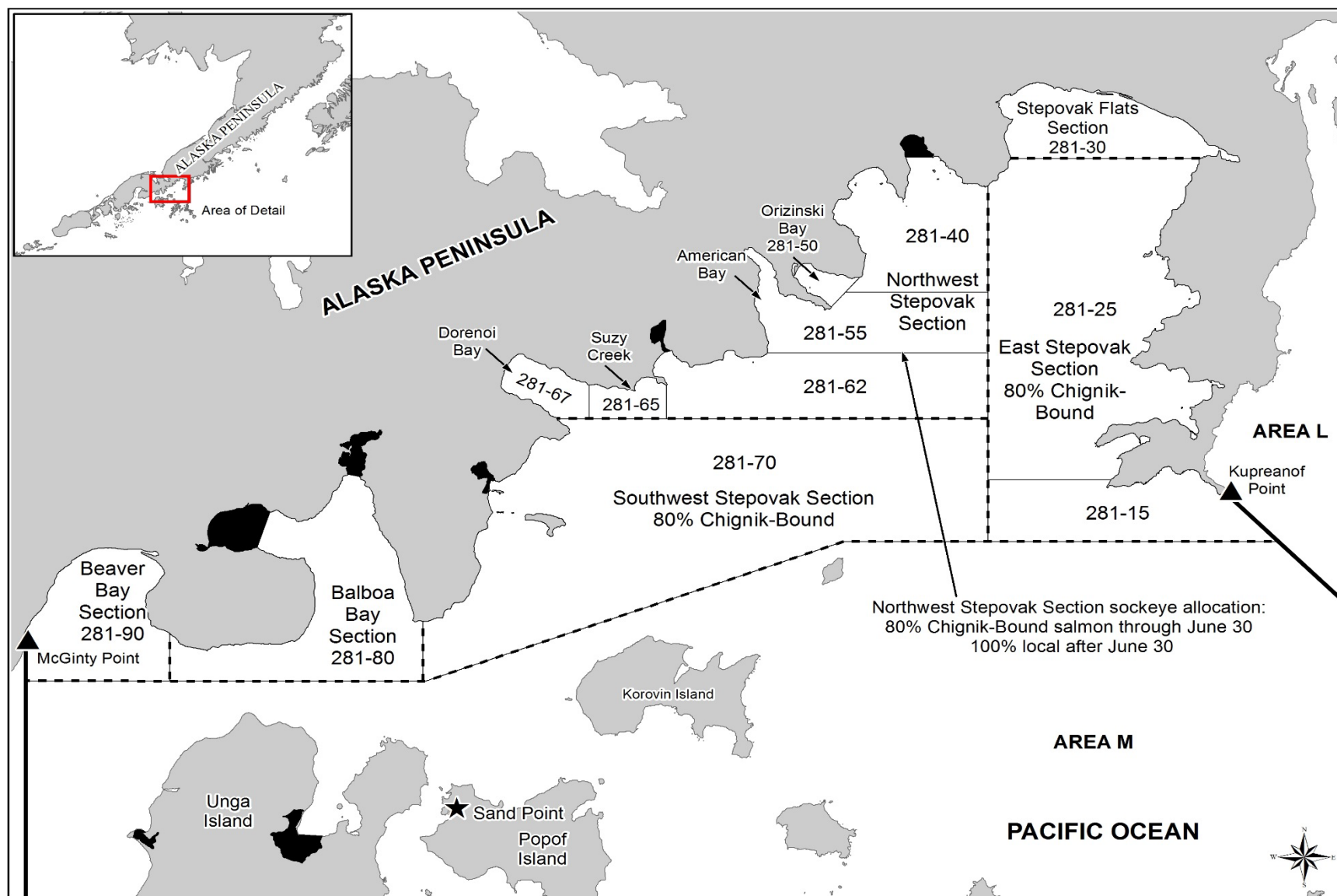


Figure 6.—Map of the Southeastern District Mainland from Kupreanof Point to McGinty Point with the commercial salmon fishery sections defined.

June 2019 All Gear Types Schedule						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Notes: All fishing periods start at 6:00 AM and end at 10:00 PM, closures between periods are 32 hours. The first fishing period is 64 hours, <u>for set gillnet gear only</u> . The remaning fishing periods are 88 hours, for all gear types.						1
2	3	4	5	6	7	8
				6:00 AM	Open 64 hours (<u>Set Gillnet Gear Only</u>)	10:00 PM
9	10	11	12	13	14	15
	6:00 AM	Open 88 hours				10:00 PM
16	17	18	19	20	21	22
Open 88 hours			10:00 PM	6:00 AM	Open 88 hours	
23	24	25	26	27	28	29/30
10:00 PM		6:00 AM	Open 88 hours			10:00 PM

Figure 7.–All gear types fishing periods in the South Unimak and Shumagin Islands June fisheries, 2019.

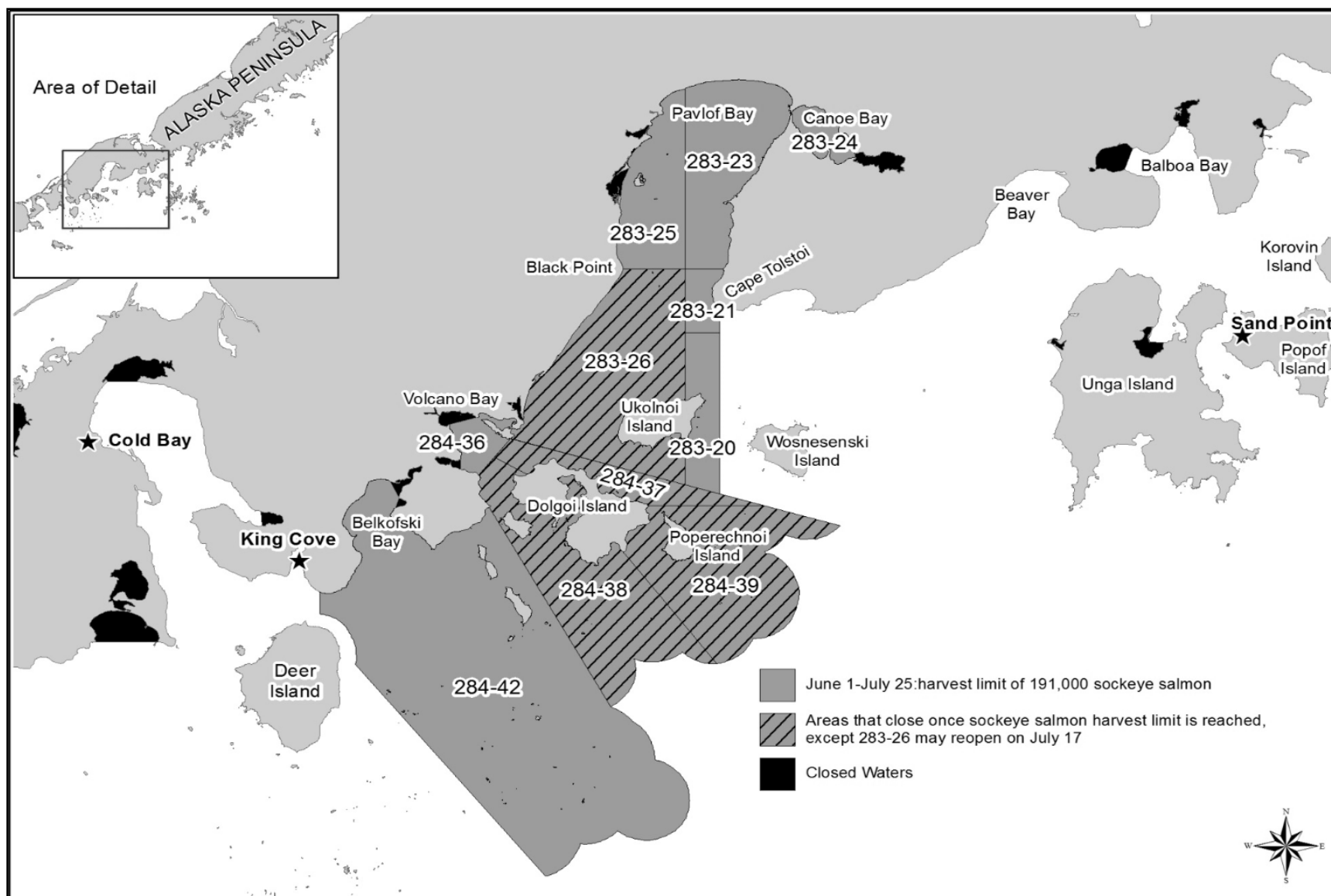


Figure 8.—Map depicting the statistical areas (283-20 through 283-26 and 284-36 through 284-42) that contribute to the “Dolgoi Island area” sockeye salmon harvest for the June Management Plan, and the areas that will close once 191,000 sockeye salmon have been harvested.

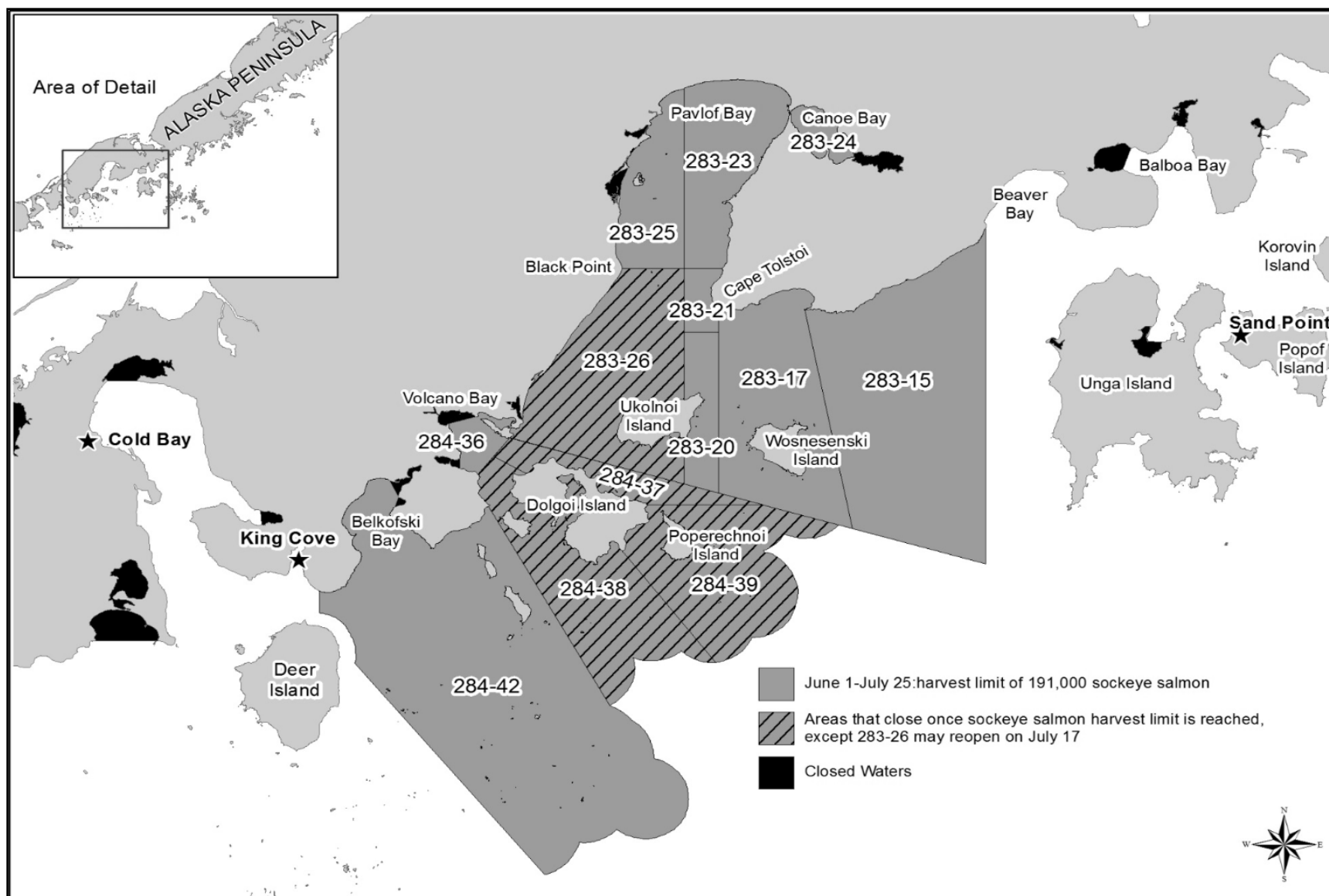


Figure 9.—Map depicting the statistical areas (283-15 through 283-26 and 284-36 through 284-42) that contribute to the “Dolgoi Island area” sockeye salmon harvest for the post-June Management Plan, and the areas that will close once 191,000 sockeye salmon have been harvested.

July 2019 All Gear Types Schedule						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
						6:00 AM 33 Hours
7	8	9	10	11	12	13
3:00 PM			6:00 AM 36 Hours 6:00 PM			
14	15	16	17	18	19	20
6:00 AM 36 Hours 6:00 PM				6:00 AM 36 Hours 6:00 PM		
21	22	23	24	25	26	27
	6:00 AM 36 Hours 6:00 PM				6:00 AM 36 Hours 6:00 PM	
28	29	30	31	Note: All fishing periods start at 6:00 AM. All fishing periods are for all gear types.		
		6:00 AM 36 Hours 6:00 PM				

Figure 10.—All gear types fishing periods in the South Unimak and Shumagin Islands post-June fisheries, 2019.

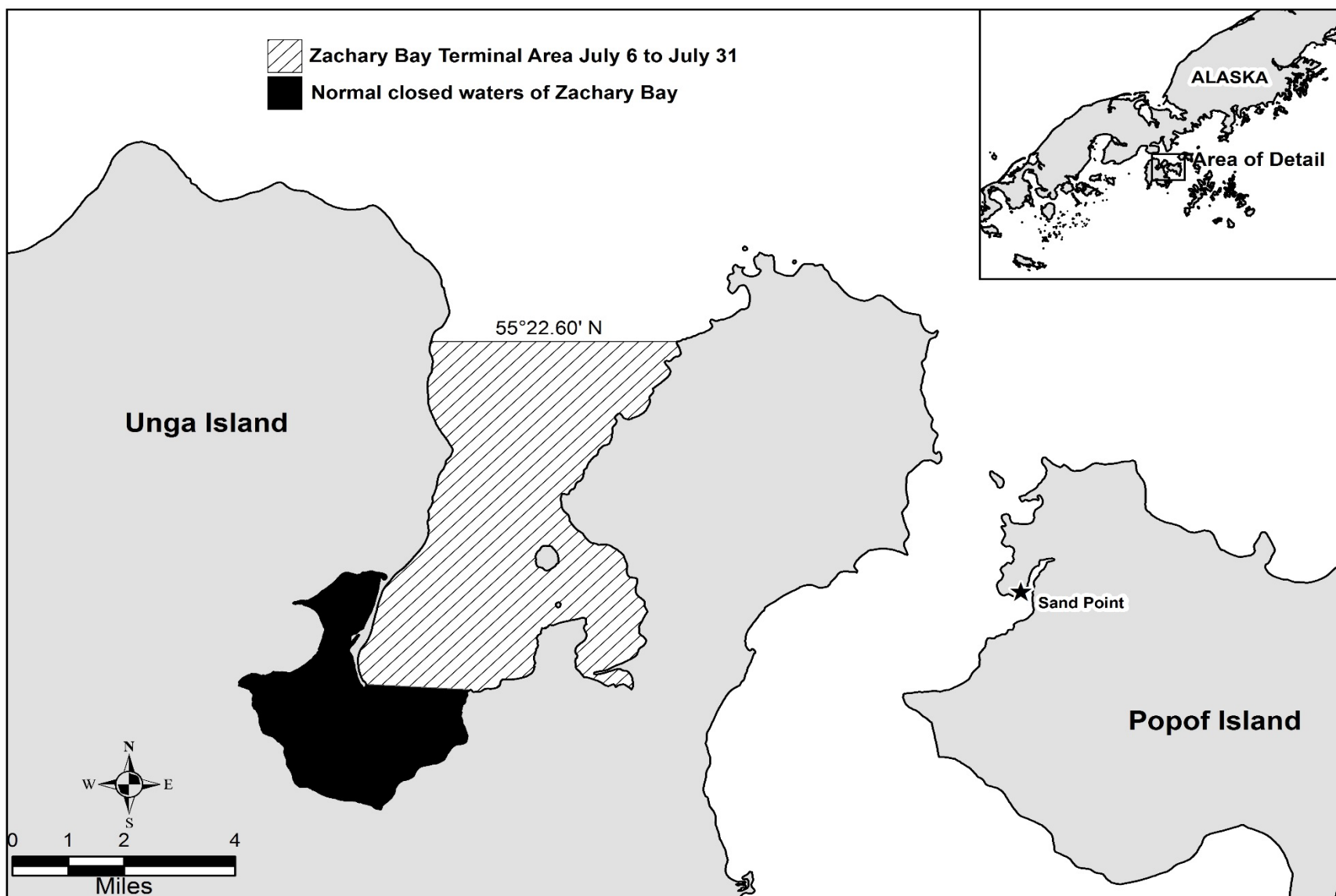


Figure 11.—Zachary Bay closed waters and post-June terminal fishing area.

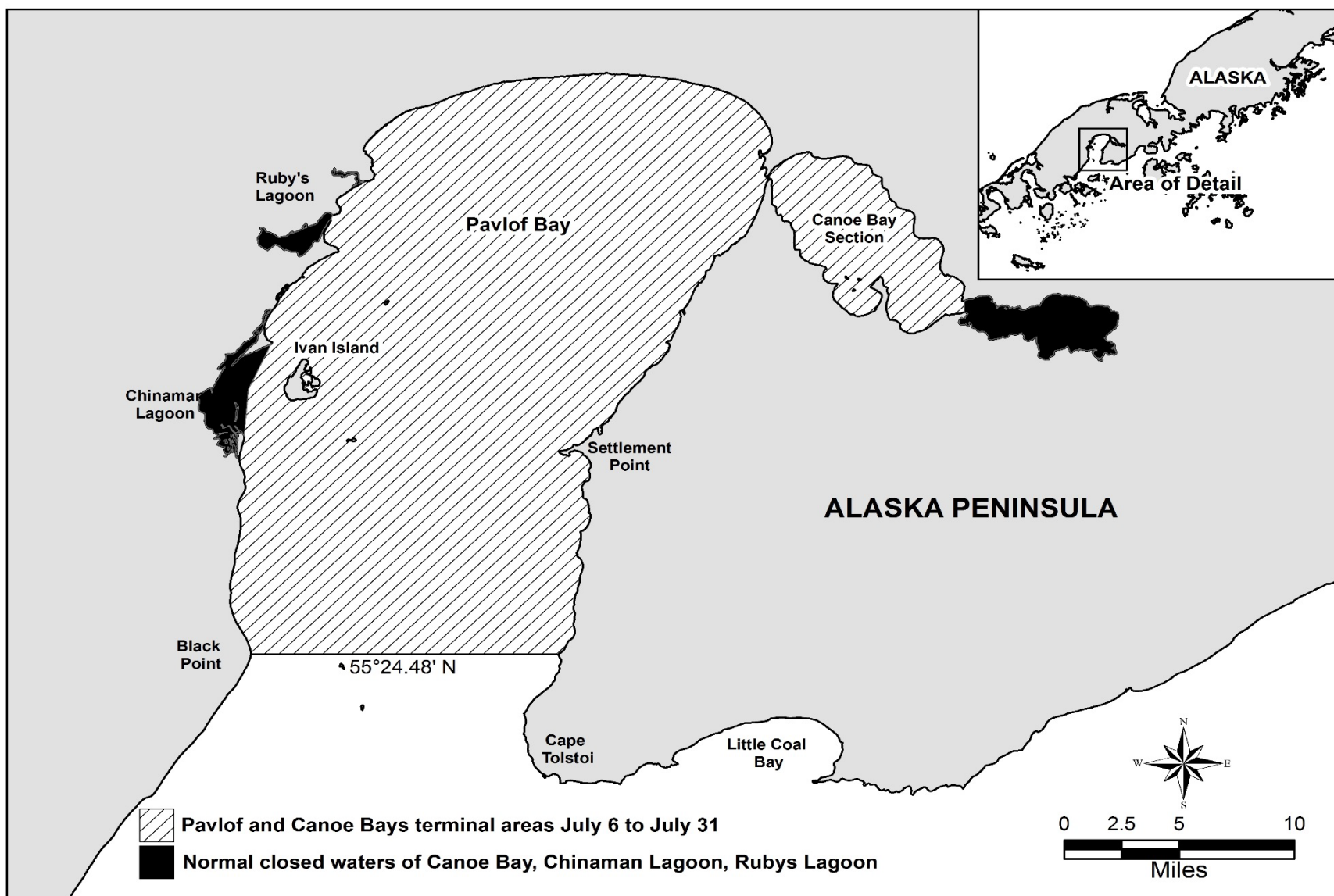


Figure 12.—Canoe Bay Section and upper Pavlof Bay closed waters and post-June terminal fishing areas.

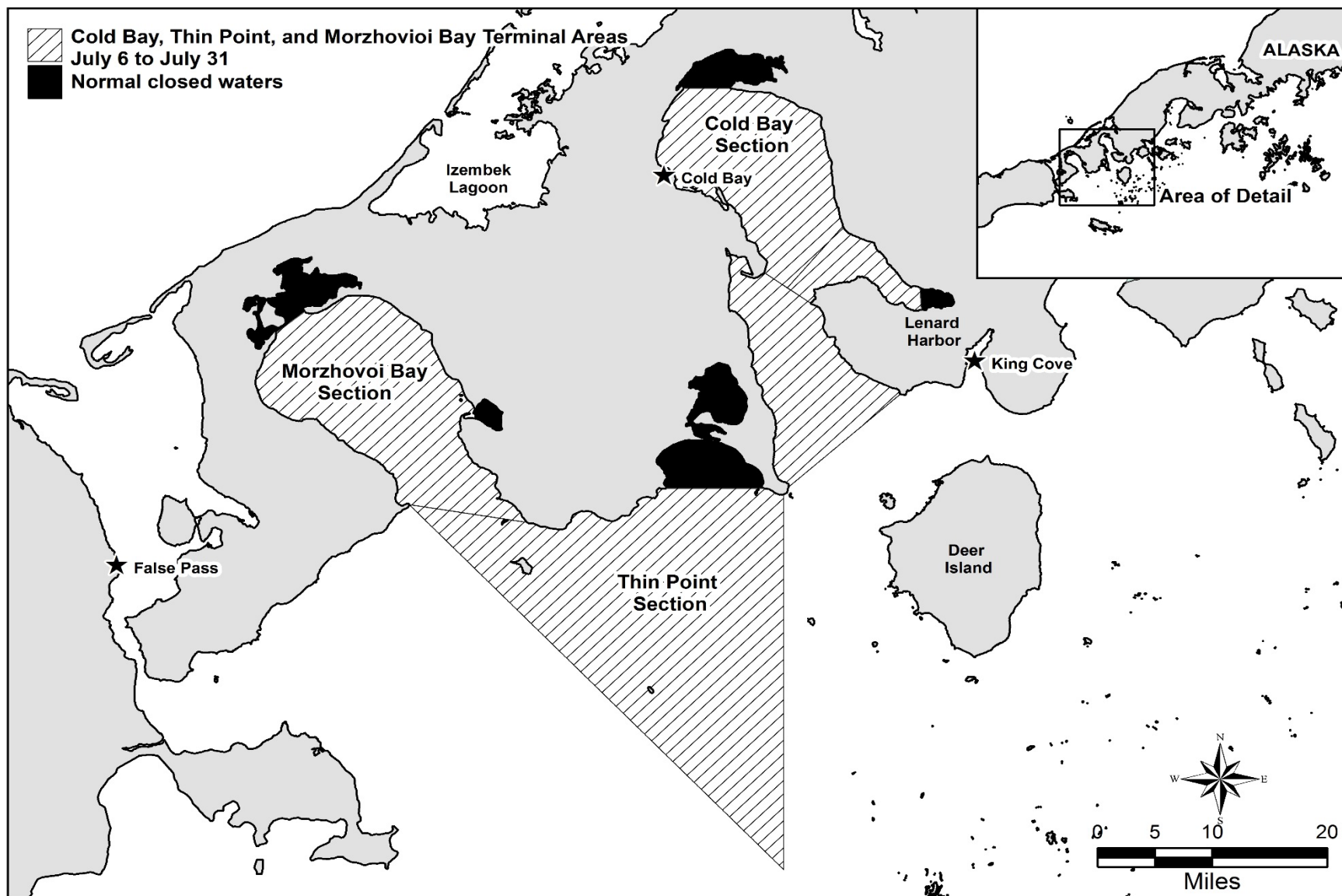


Figure 13.—Cold Bay, Thin Point, and Morzhovoi Bay sections closed waters and post-June terminal fishing areas.

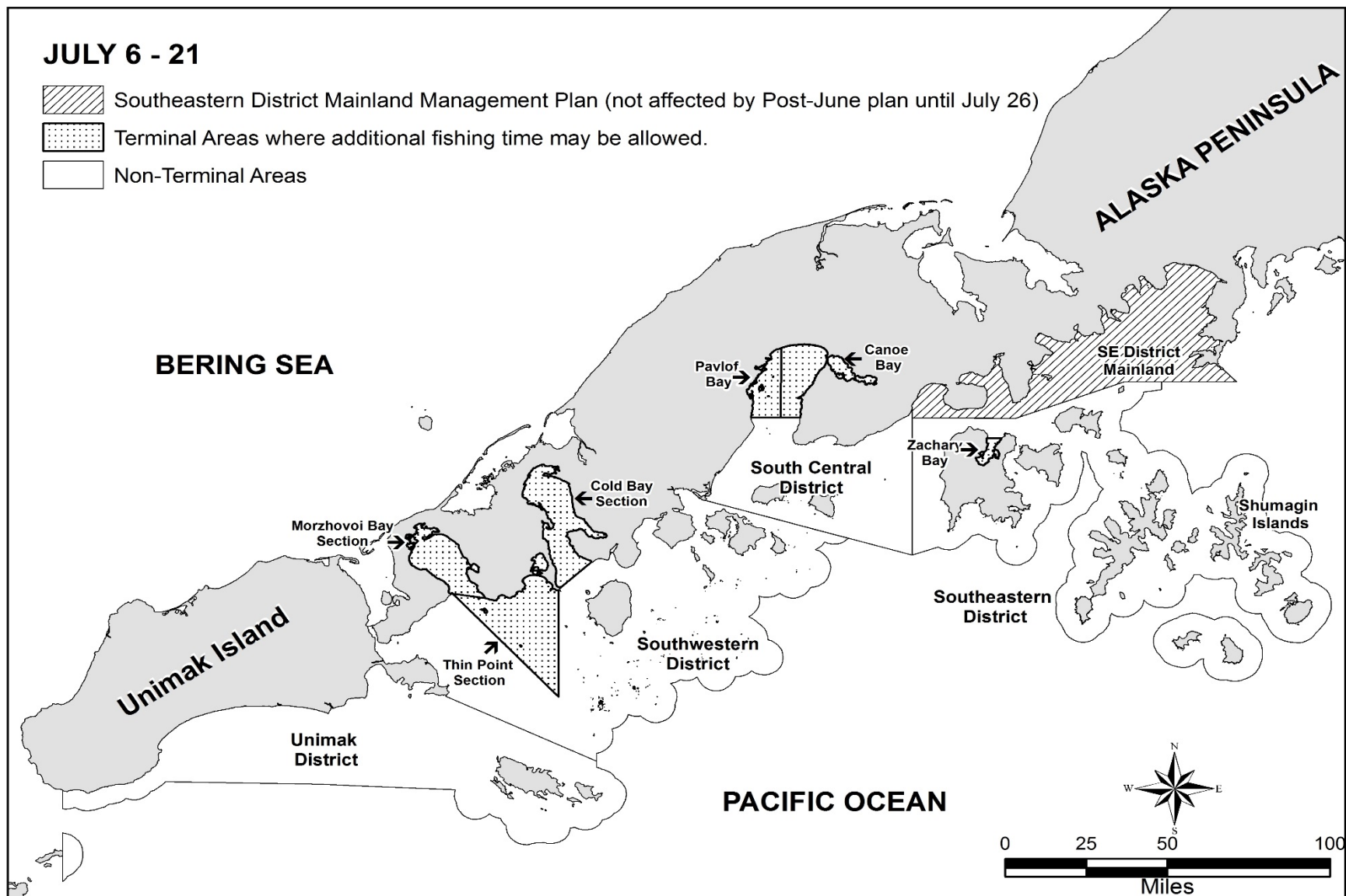


Figure 14.—South Alaska Peninsula post-June terminal fishing areas from July 6 through July 21.

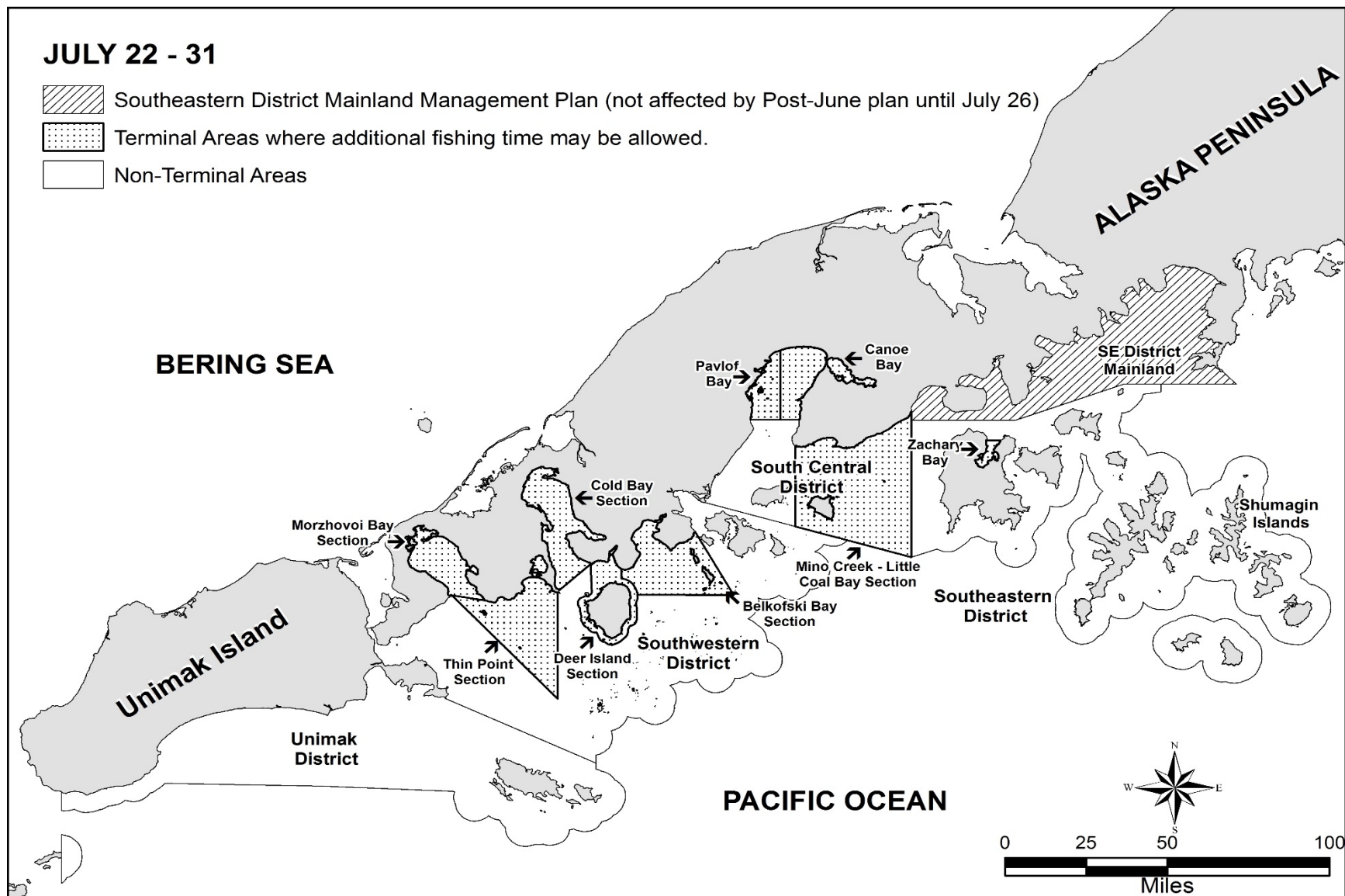


Figure 15.—South Alaska Peninsula post-June terminal fishing areas from July 22 through July 31.

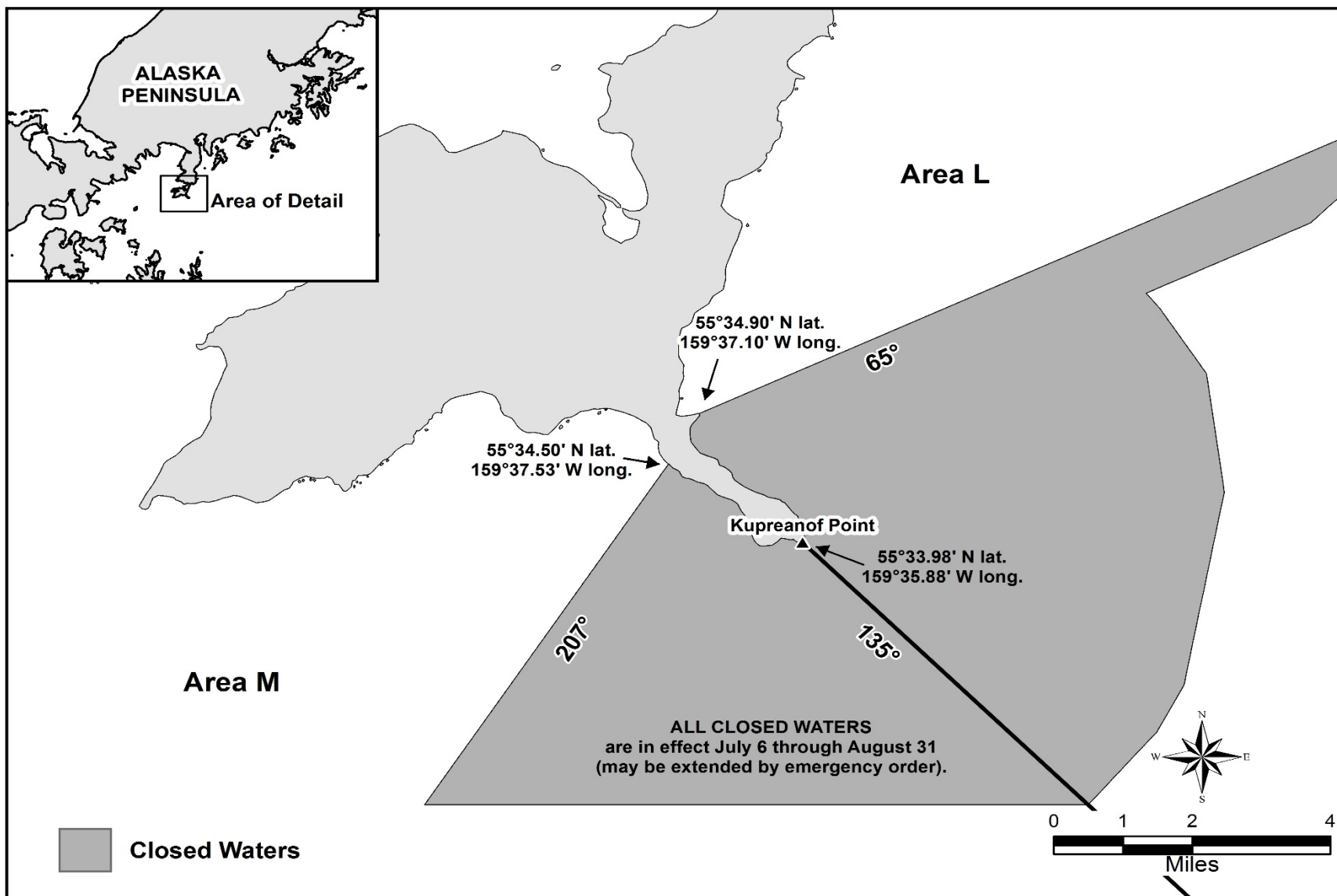


Figure 16.—Map of Kupreanof Point area closed waters.

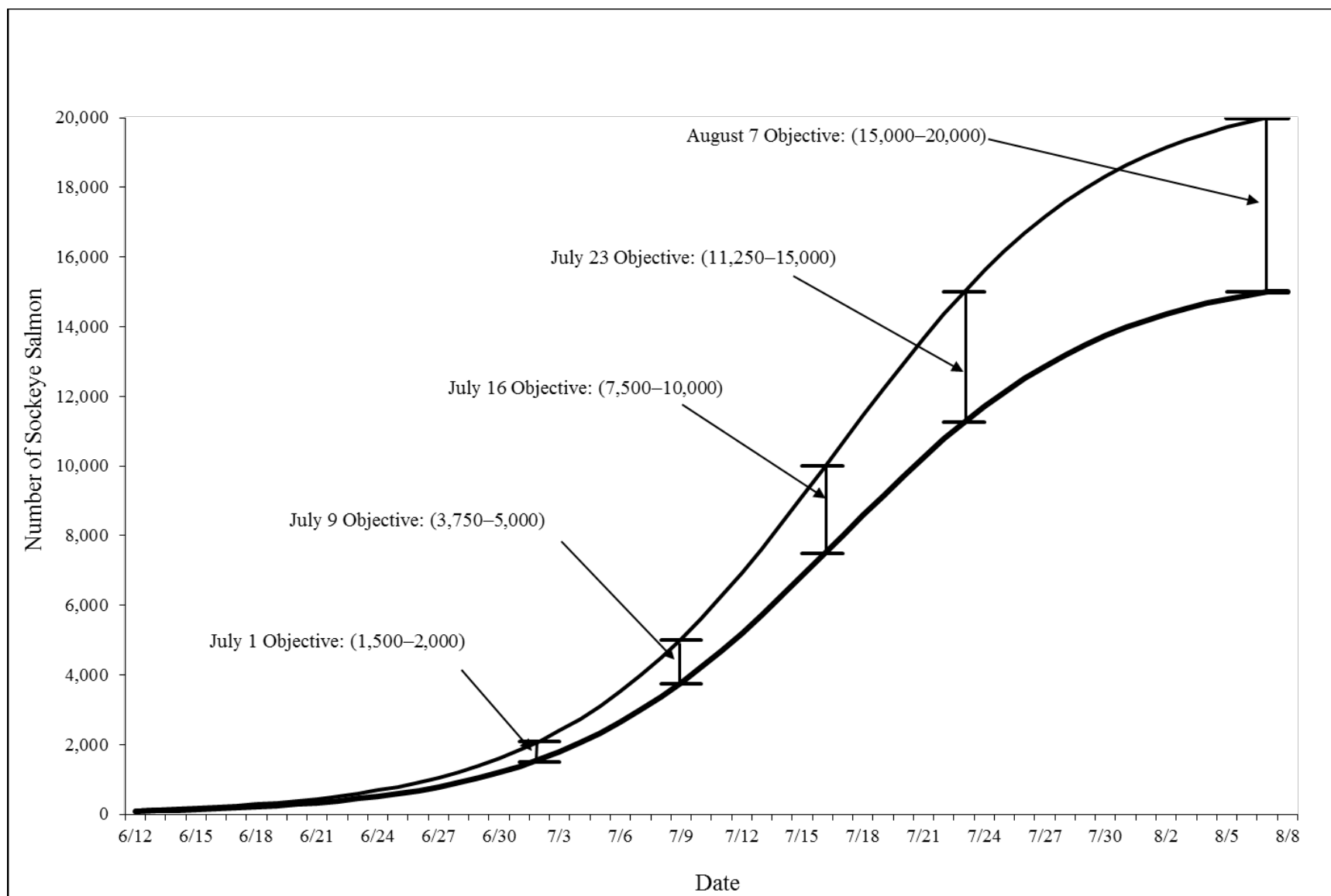


Figure 17.—Orzinski Lake interim sockeye salmon escapement objectives by date. Interim escapement objectives are general guidelines for inseason management and are subject to adjustment based on run timing of sockeye salmon returns in a given year.

APPENDIX A. 2019 SALMON FORECASTS

Forecast Area: Alaska Peninsula, South Alaska Peninsula Aggregate**Species: Pink Salmon****Preliminary forecast of the 2019 run**

Total Production	Forecast Estimate (millions)	Forecast Range (millions)
Total Run Estimate	24.6	7.5–41.9
Escapement Goal ^a	4	1.75–4.0
Harvest Estimate	20.6	5.75–37.9

^aThe escapement estimate is the upper end of the aggregate goal range (1.75–4.0 million) in 2019.

The 2019 South Alaska Peninsula predicted pink salmon harvest is expected to be in the *excellent* category with a point estimate of 24.6 (5.75 to 37.9) million fish. Harvest categories were calculated from the 20th, 40th, 60th, and 80th percentiles of historical commercial harvest on the South Alaska Peninsula from 1984 to 2018.

S. Pen Harvest Category	Range (millions)	Percentile
<i>Poor</i>	Less than 2.6	Less than 20 th
<i>Weak</i>	2.7 to 4.3	21 st to 40 th
<i>Average</i>	4.4 to 7.6	41 st to 60 th
<i>Strong</i>	7.7 to 9.8	61 st to 80 th
<i>Excellent</i>	Greater than 9.9	81 st to 100 th

Forecast Methods

The 2019 South Alaska Peninsula pink salmon harvest forecast is derived from a total run forecast minus the upper-bound (4 million fish) of the combined even- and odd-year South Alaska Peninsula escapement goal range. The total run was forecasted with an exponential smoothing model using the Holt method. The model was fit to odd-year South Peninsula pink salmon returns from 1964 through 2017.

Forecast Discussion

The 2019 South Alaska Peninsula pink salmon total harvest (20.6 million fish) is predicted to be excellent. Although forecasts of pink salmon returns to the South Alaska Peninsula have only been published since 2011, odd-year forecasts of pink salmon on the South Alaska Peninsula have generally been more accurate than even years. This has been emphasized with changing ocean conditions and recent years' average temperatures have been outside the ranges in the historical dataset; therefore, the forecast's predictive power has been diminished. Pink salmon that migrated to sea in 2016 returned in 2017 in numbers well above forecasted returns, and it is likely that pink salmon that went to sea in 2018 experienced similar conditions and the 2019 return is expected to also be excellent. Due to the relative strength of the predictive model, but accounting for uncertainty in changing environmental conditions, confidence in the forecast is fair.

Lucas Stumpf, Alaska Peninsula–Aleutian Islands Asst. Area Management Biologist

Heather Finkle & Birch Foster, Region IV Finfish Research Biologists

Sarah Power, Region I Biometrician

Species: Sockeye Salmon

Preliminary Forecast of the 2019 Run

Total Production		Forecast Estimate (thousands)	Forecast Range (thousands)
Early Run (Black Lake)	Total Run Estimate	829	0–1,747
	Escapement Goal ^a	400	350–450
	Harvest Estimate ^b	429	
Late Run (Chignik Lake)	Total Run Estimate	909	380–1,438
	Escapement Goal ^a	338	275–400
	Harvest Estimate ^b	571	
Total Chignik System	Total Run Estimate	1,739	380–3,185
	Harvest Estimate ^b	1,001	
	Chignik Area	827	
	SEDM Area	56	
	Cape Igvak Section	118	

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

^a Harvest represents the midpoint of the escapement goal. An inriver run goal of 75,000 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 models using age-class relationships were used to forecast the 2019 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. Age class returns not estimated with statistical models utilized pooled medians with data from 1995 to the present; median prediction intervals were calculated from the 10th and 90th percentiles of the data.

For the early run, prior year ocean-age-2 returns predicted log transformed ocean-age-3 returns using data from the 1995 outmigration year to the present. Prior year early-run ocean-age-1 returns predicted log transformed ocean-age-2 returns (outmigration years 1998 to present). For the late run, prior year ocean-age-2 sockeye salmon returns predicted ocean-age-3 returns using data from the 2000 outmigration year to the present. Prior year ocean-age-1 early- and late-run returns were combined to predict late-run ocean-age-2 returns (outmigration years 1988 to present).

The early- and late-run regression and median estimates were summed to estimate the total Chignik River sockeye salmon run for 2019. The prediction interval range was 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 and upper prediction bounds of the two runs.

-continued-

Forecast Discussion

The 2019 Chignik sockeye salmon early run is forecasted to be 829,000 fish, which is 512,000 fish less than the 10-year average run of 1.34 million and almost 565,000 fish more than the 2018 early run of 264,000 fish. The early run is predicted to be composed of approximately 84% ocean-age-3 and 16% ocean-age-2 fish. The late run is forecasted to be 909,000 fish, which is approximately 128,000 fish less than the 10-year average run of 1.04 million fish and 634,000 fish more than the 2018 late run of 276,000 fish. The 2019 late run is predicted to be composed of approximately 85% ocean-age-3, 13% ocean-age-2, and 1% ocean-age-1 and -4 fish. The 2019 total Chignik sockeye salmon run is expected to be 1.74 million fish, which is approximately 641,000 fish less than the 10-year average of 2.38 million and roughly 1.20 million fish more than the 2018 total run of 540,000 fish.

The projected 2019 early-run total harvest estimate of 429,000 fish is based on achievement of the mid-point of the early-run escapement goal range. The projected late-run harvest estimate of 1.00 million fish is based on achieving the mid-point (338,000 fish) of the late-run goal, which includes the inriver run goal of 75,000 fish added to the lower bound (200,000 fish) of the escapement goal. 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.

The wide confidence intervals around the point estimate of the 2019 forecasts reflect the uncertainty inherent in the forecast models. The early run is typically more variable than the late run, resulting in wider confidence intervals for the early run. Exploratory analysis using other sibling relationships and environmental variables corroborated this formal forecast. Similar methods have been used for forecasting the early and late runs since 2004. Due to the range of variation in the relationships used in these forecasts and their historical accuracy, our confidence in them is fair.

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Sarah Power, Commercial Fisheries Biometrician