Regional Information Report No. 4K21-05

South Alaska Peninsula Salmon Management Strategy, 2021

by

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and

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May 2021

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

Symbols and Abbreviations

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

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Mathematics, statistics

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

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May 2021

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., T. D. Lawson, and R. L. Renick. 2021. South Alaska Peninsula salmon management strategy, 2021. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 4K21-05, 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 up to 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 2021.

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: the *South Unimak and Shumagin Islands June Salmon Management Plan* (5 AAC 09.365), 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 Northwestern District (Figures 2 and 3). 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). 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 fishery participants 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 2021 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	
Ross Renick	E-mail: ross.renick@alaska.gov	
Cold Bay	Phone: 907-532-2419	Fax: 907-532-2470
Tyler Lawson	E-mail: tyler.lawson@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 (BOF) 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 6:00 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, commercial fishing by 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 3 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 BOF 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 lat 55°01.88'N, long 162°24.80'W, and Bold Cape at lat 55°01.24'N, long 162°16.40'W, and the South Central District to purse seine gear in June (Figure 2).

The BOF 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 1 of the vessels, or to allow a registered salmon fishing vessel to have aboard it no more than 2 legal limits of set gillnet fishing gear in the aggregate to transport gear during a closed fishing period, if the 2 permit holders are on board the vessel. Additional gear may be transported to another district under conditions specified by ADF&G.

The BOF 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. 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.

2021 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 and 2) as described in 5 AAC 09.200(f)(3).

Fishing periods for the 2021 June fishery will be as follows (Figure 7):

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

In addition to the scheduled fishing periods during the month of June, the harvest of sockeye salmon in the "Dolgoi Island area" (as described in the Western Alaska Salmon Stock Identification Program) 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 fishery participants operating in the South Central and Southwestern Districts during June are advised that short-notice closure of the designated "Dolgoi Island area" will occur in the likely event the harvest of sockeye salmon approaches the 191,000 fish. ADF&G will, to the extent practical, give a minimum of 6 hours notice of closure to all gear types.

Commercial fishery participants 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 Salmon 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 salmon test fishery. July fishing periods begin at 6:00 AM on July 6, and end on July 31 at 6:00 PM (5 AAC 09.366(d); 9).

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

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

Under the current management plan, commercial salmon fishing is permitted to occur concurrently in both terminal and nonterminal 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, Morzhovoi Bay, 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 fishery participants 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 191,000 fish (Figures 8 and 9). ADF&G will, to the extent practical, give 6-hours of 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 inseason management of the South Alaska Peninsula commercial salmon fishery. Aerial survey methods can be found in Fox et al. *In prep*.

Pink and chum salmon escapements will be estimated with the indexed total escapement method, and sockeye salmon escapements will be estimated using peak escapement observations from 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. There are 3 sockeye salmon SEGs in the South Alaska Peninsula: 15,000–20,000 fish at Orzinski Lake, 3,200–6,400 fish at Mortensens Lagoon, and 14,000–28,000 fish at Thin Point Lake (Schaberg et al. 2018). The 2021 pink salmon SEG range for the South Alaska Peninsula is 1,750,000–4,000,000 fish. The 2021 chum salmon management objectives using the indexed total escapement method are 106,400–212,800 fish in the Southeastern District, 89,800–179,600 fish in the South Central District, and 133,400–266,800 fish in the Southwestern District.

New escapement goal ranges for chum salmon were developed during the February 2019 Alaska Peninsula, Aleutian Islands, and Chignik BOF meeting. New lower chum salmon SEGs were established for each district that utilize 1) specific index streams in a district rather than all streams in a district, and 2) the single peak aerial survey method rather than the indexed total escapement method (incorporates 21-day stream life, carcasses, mouth counts; Fox et al. *In prep*) to estimate escapement (Schaberg et al. 2018). Using the Southeastern District's 26 index streams, the SEG is 62,500–151,900 fish. Using the South Central District's 10 index streams, the SEG is 68,900–99,200 fish. Using the Southwestern District's 19 index streams, the SEG is 86,900–159,500 fish.

SOUTHEASTERN DISTRICT MAINLAND SALMON FISHERY

Under the current *Southeastern District Mainland Salmon Management Plan* (5 AAC 09.360), the following items are in effect.

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 BOF 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 15,000–20,000 fish (Schaberg et al. 2018). 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 2021.

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 *Southeastern District Mainland Salmon Management Plan* (5 AAC 09.360). 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 2021 South Alaska Peninsula harvest estimate is 12.9 million pink salmon, and the total run estimate is 16.9 million pink salmon (Appendix A1). ADF&G will manage the commercial fishery according to the June and post-June schedules through July 31, after 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 SOUTHEASTERN DISTRICT MAINLAND ALLOCATION

The 2021 Chignik River forecast for the early-run harvest estimate is 37,000 sockeye salmon, and the late-run harvest estimate is 156,000 sockeye salmon (Appendix A2). ADF&G will manage the fisheries so that the number of sockeye salmon harvested in 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.

If the Chignik River early run fails to develop as predicted, ADF&G 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, ADF&G 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)).

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FIGURES

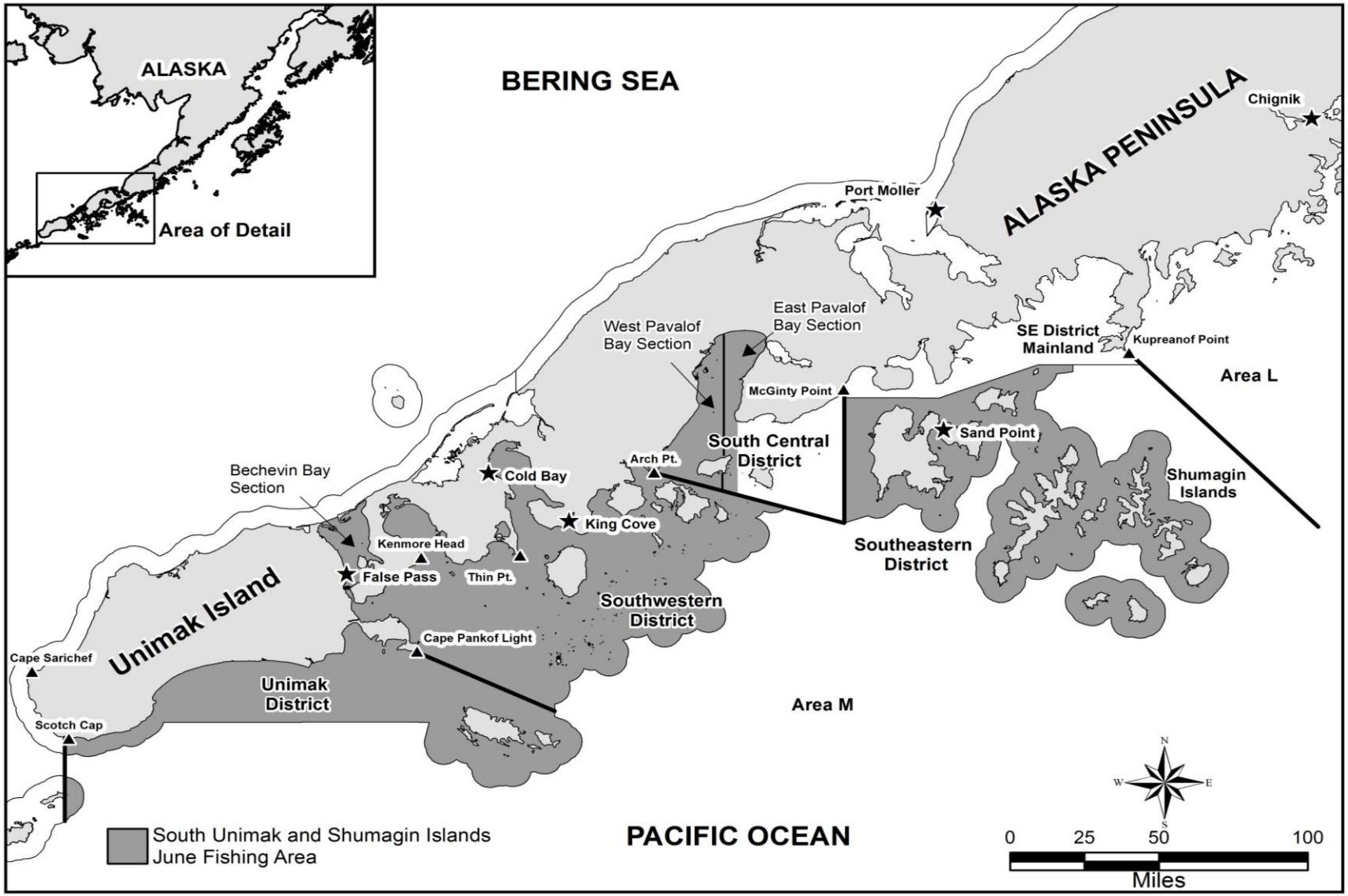

Figure 1.–Map of the South Alaska Peninsula Management Area and the locations of the South Unimak and Shumagin Islands June fisheries.

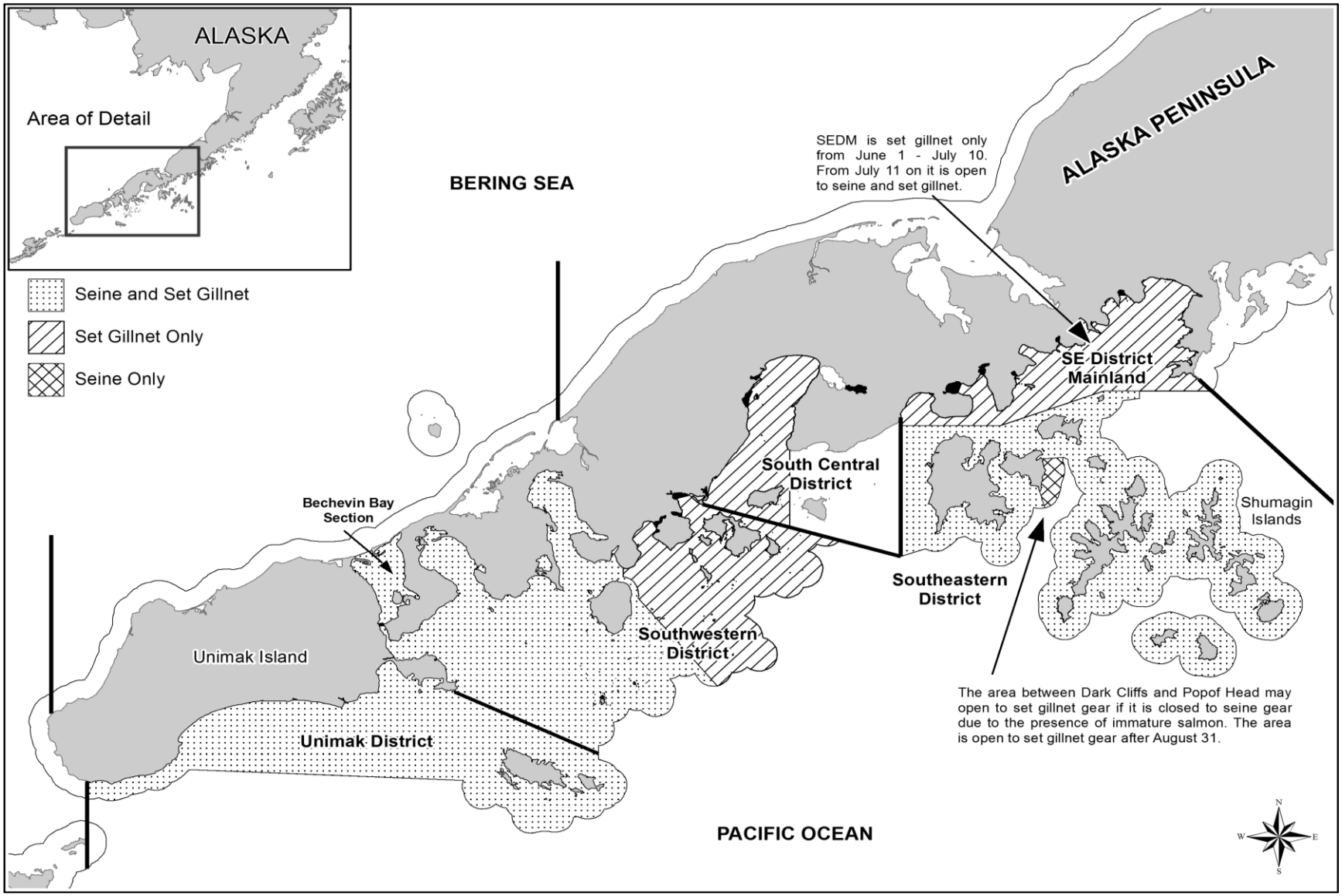

Figure 2.–Map depicting the locations of June South Alaska Peninsula fisheries for purse seine and set gillnet gear.

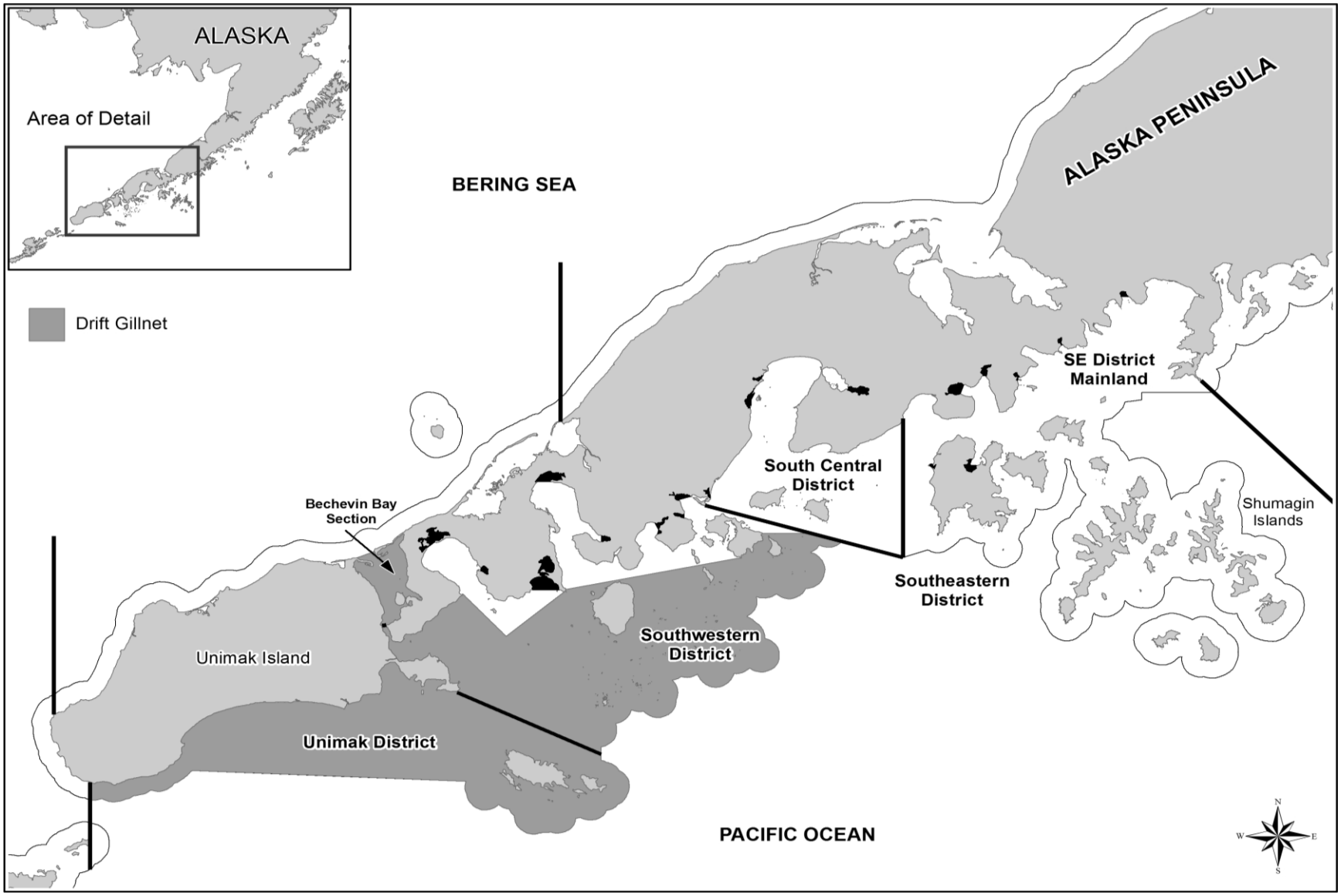

Figure 3.–Map depicting the locations of June South Alaska Peninsula fishery for drift gillnet gear.

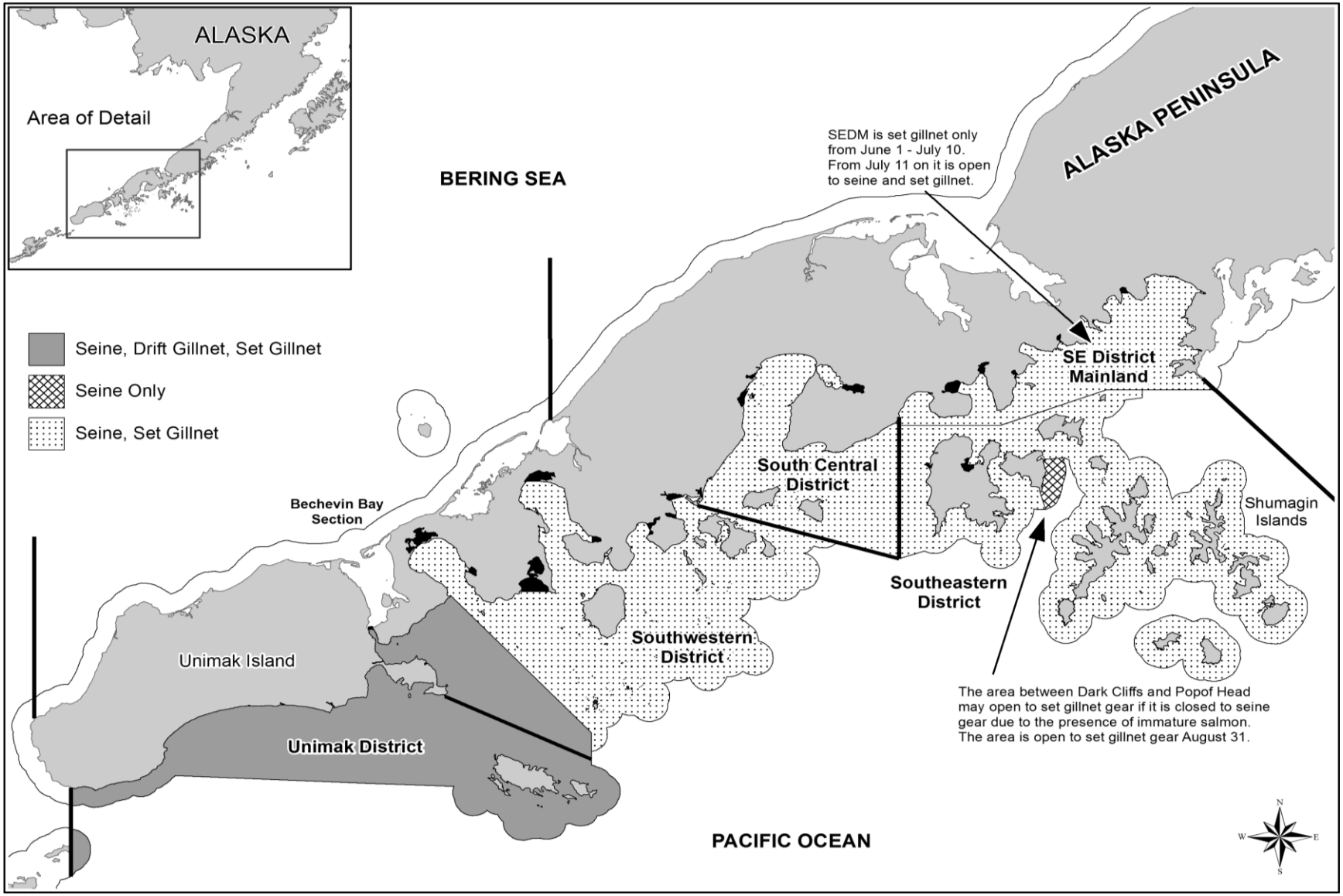

Figure 4.–Map depicting the locations of post-June South Alaska Peninsula fisheries and permitted gear types.

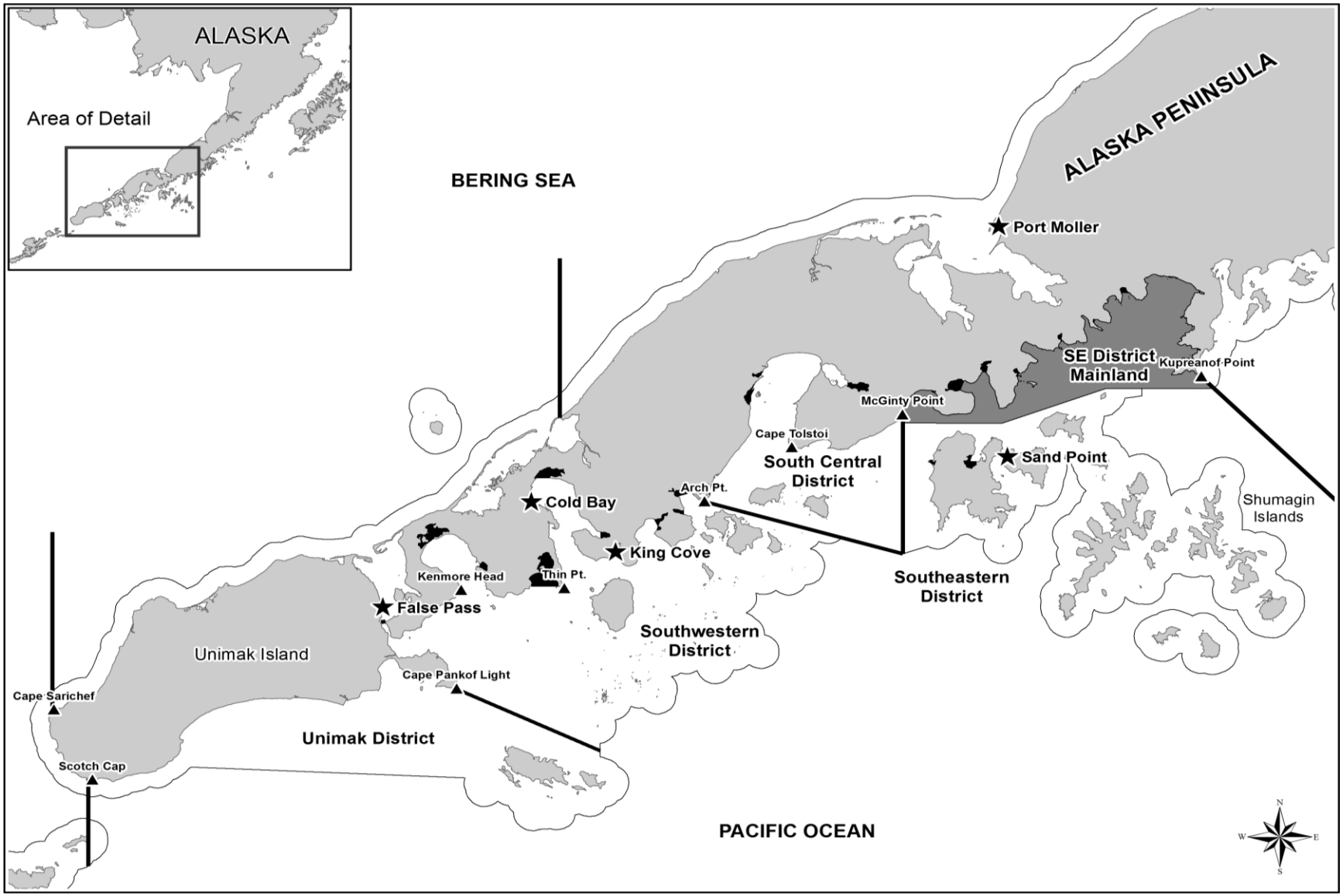

Figure 5.–Map of the South Alaska Peninsula Management Area with the Southeastern District Mainland defined.

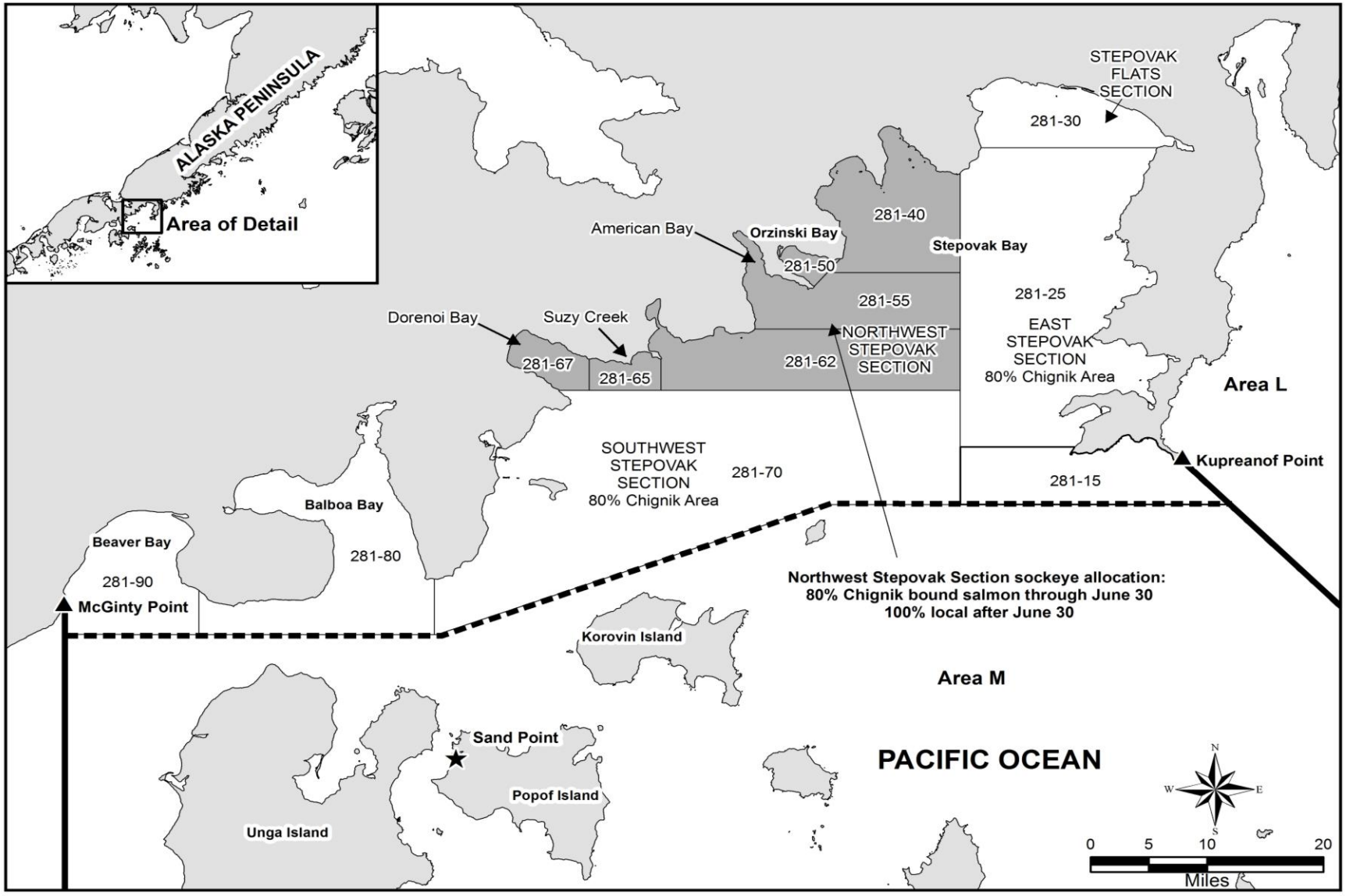

Figure 6.–Map of the Southeastern District Mainland from Kupreanof Point to McGinty Point with the commercial salmon fishery sections defined.

June 2021 All Gear Types Schedule

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
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 remaining fishing periods are 88 hours for all gear types.						
6	7	8	9	10	11	12
6:00 AM Open 64 hours (Set Gillnet Gear Only) 10:00 PM				6:00 AM Open 88 hours		
13	14	15	16	17	18	19
10:00 PM		6:00 AM Open 88 hours			10:00 PM	
20	21	22	23	24	25	26
6:00 AM Open 88 hours			10:00 PM		6:00 AM Open 88 hours	
27	28	29	30			
10:00 PM						

Figure 7.–All gear types fishing periods in the South Unimak and Shumagin Islands June fisheries, 2021.

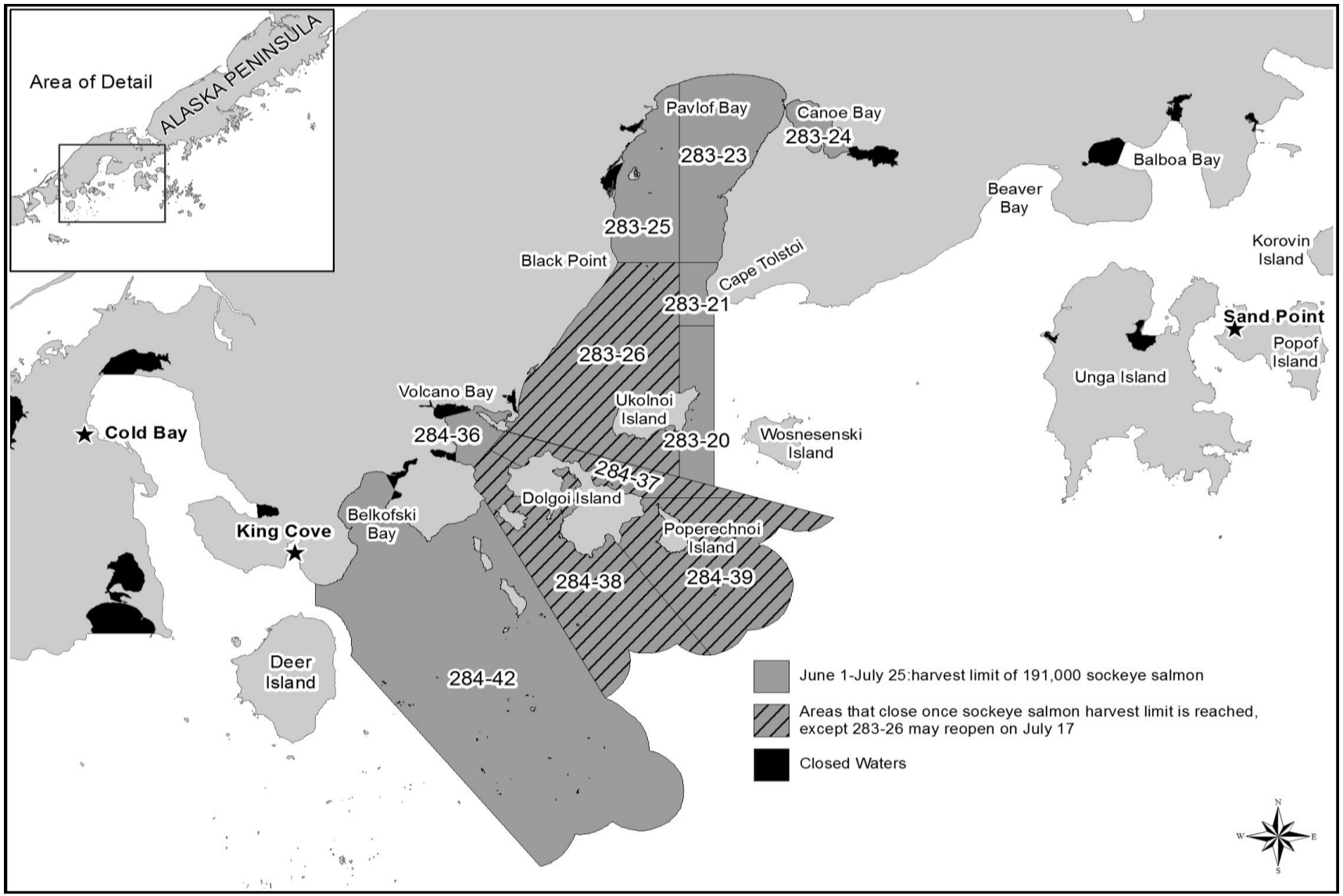

Figure 8.–Map depicting the statistical areas (283-20 through 283-26 and 284-36 through 284-42) that contribute to the "Dolgoi Island area" sockeye salmon harvest for the June Management Plan, and the areas that will close once 191,000 sockeye salmon have been harvested.

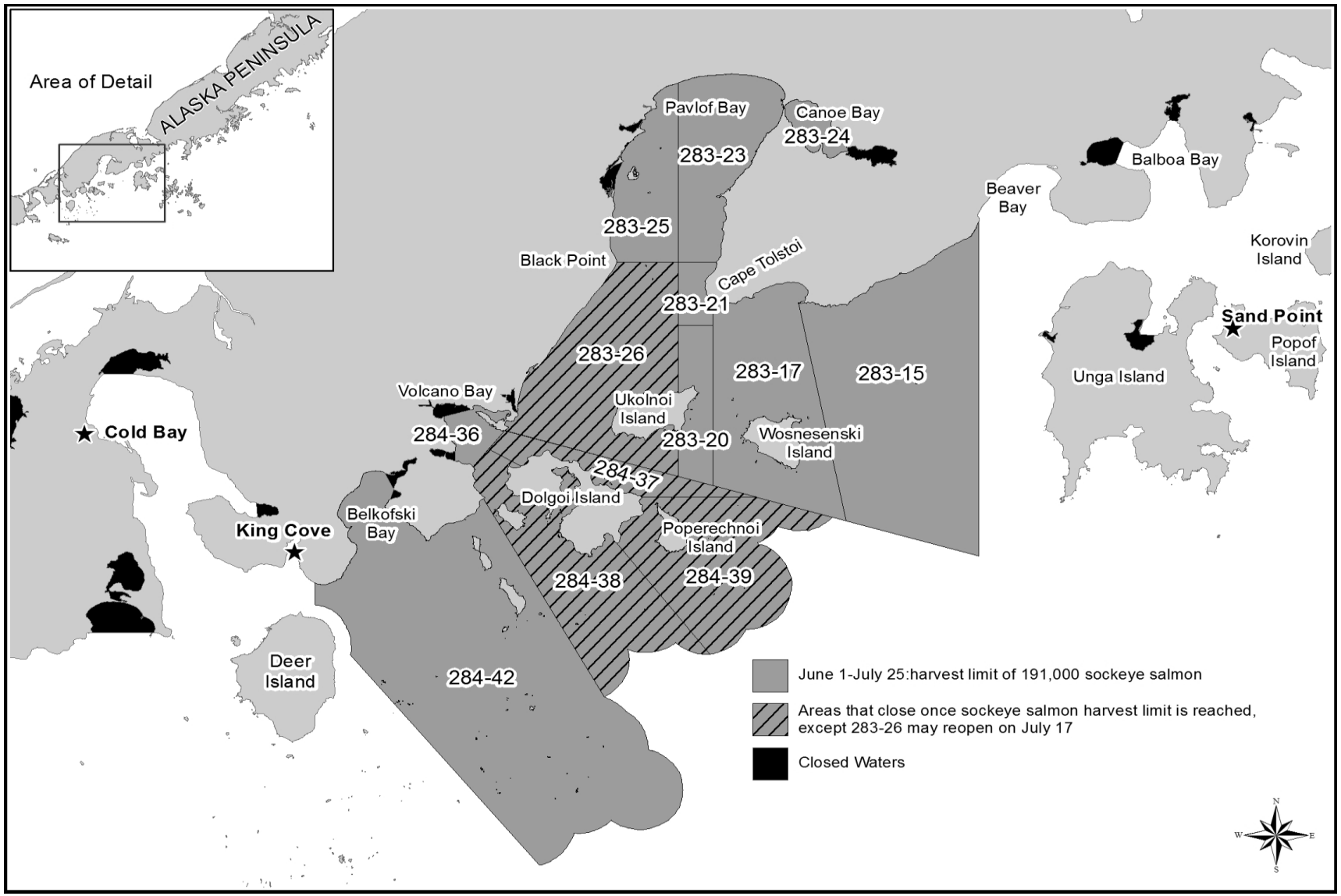

Figure 9.–Map depicting the statistical areas (283-15 through 283-26 and 284-36 through 284-42) that contribute to the "Dolgoi Island area" sockeye salmon harvest for the post-June Management Plan, and the areas that will close once 191,000 sockeye salmon have been harvested.

July 2021 All Gear Types Schedule

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
Note: All fishing periods start at 6:00 AM. All fishing periods are for all gear types.						
4	5	6	7	8	9	10
		6:00 AM 33 Hours 3:00 PM				6:00 AM 36 Hours
11	12	13	14	15	16	17
6:00 PM			6:00 AM 36 hours 6:00 PM			
18	19	20	21	22	23	24
6:00 AM 36 hours 6:00 PM				6:00 AM 36 hours 6:00 PM		
25	26	27	28	29	30	31
	6:00 AM 36 hours 6:00 PM				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, 2021.

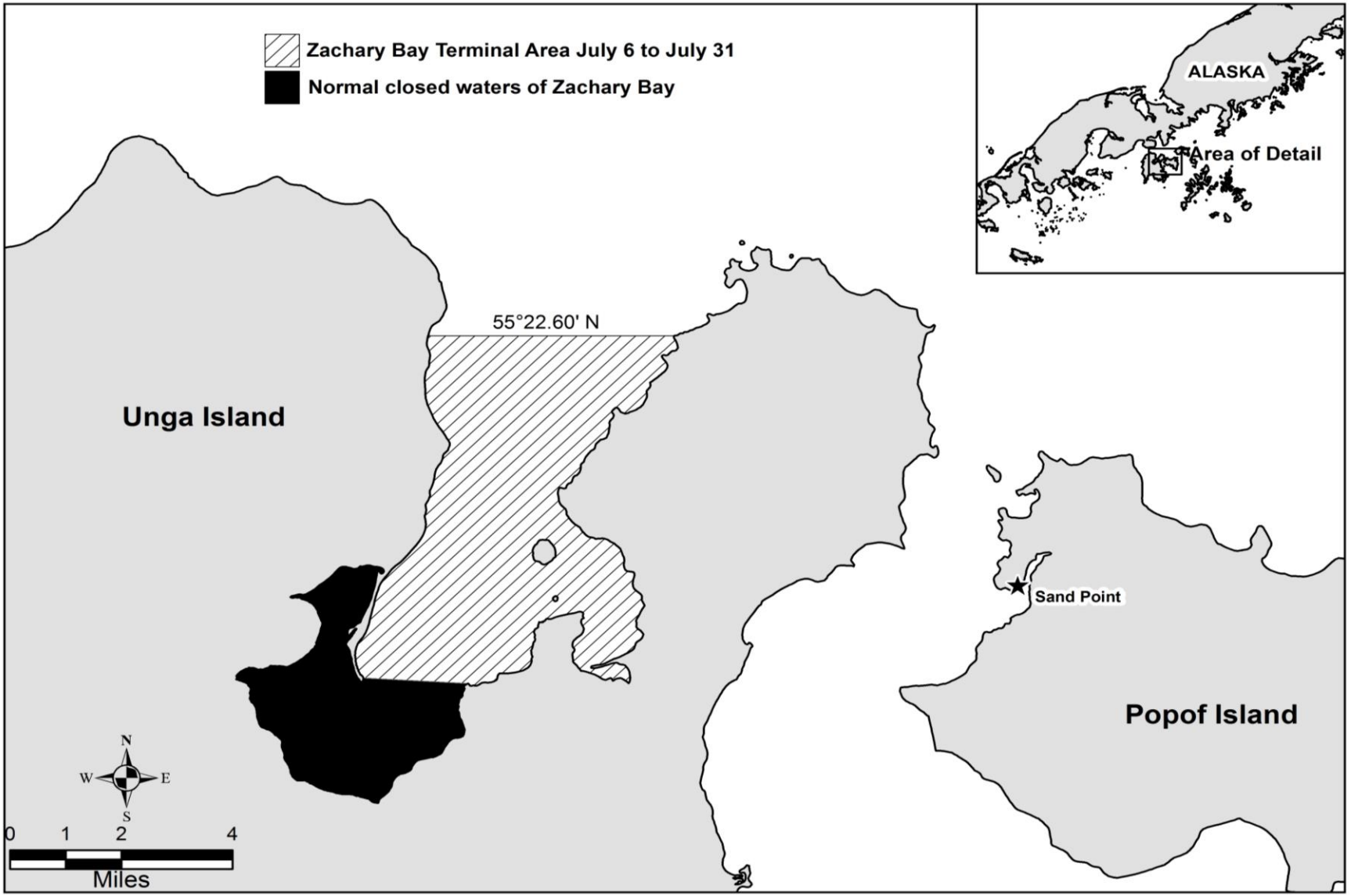

Figure 11.–Zachary Bay closed waters and post-June terminal fishing area.

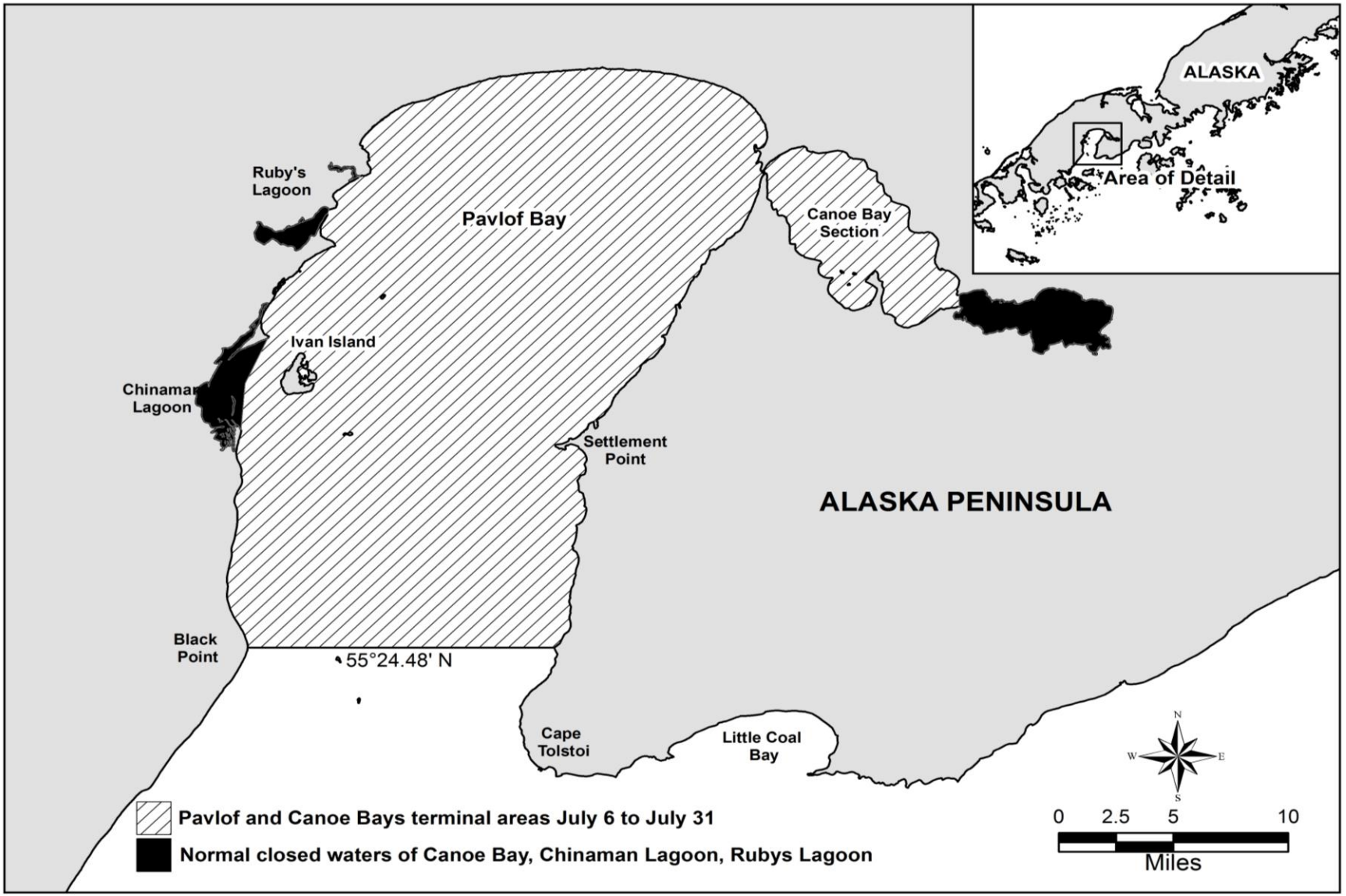

Figure 12.–Canoe Bay Section and Upper Pavlof Bay closed waters and post-June terminal fishing areas.

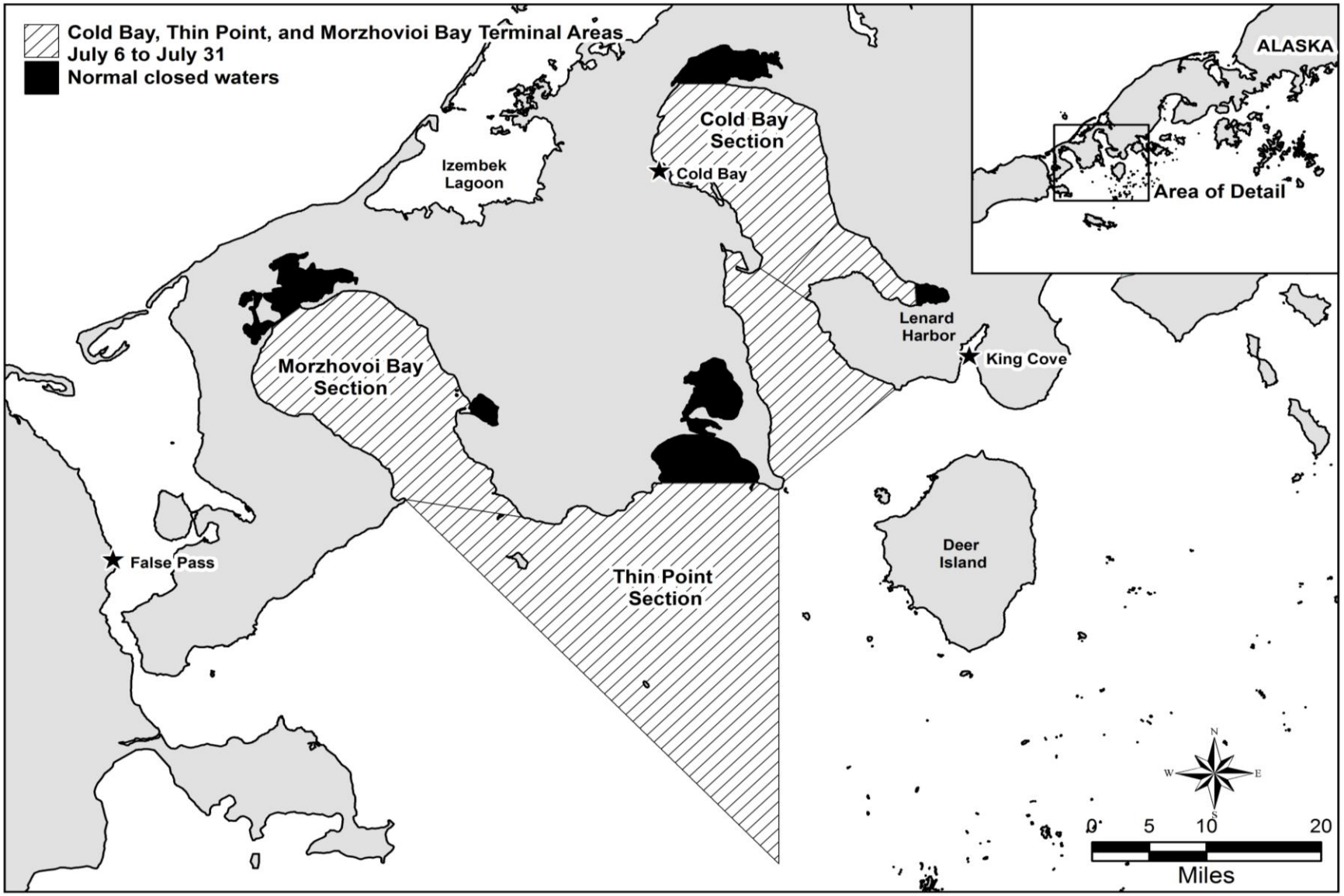

Figure 13.–Cold Bay, Thin Point, and Morzhovoi Bay Sections closed waters and post-June terminal fishing areas.

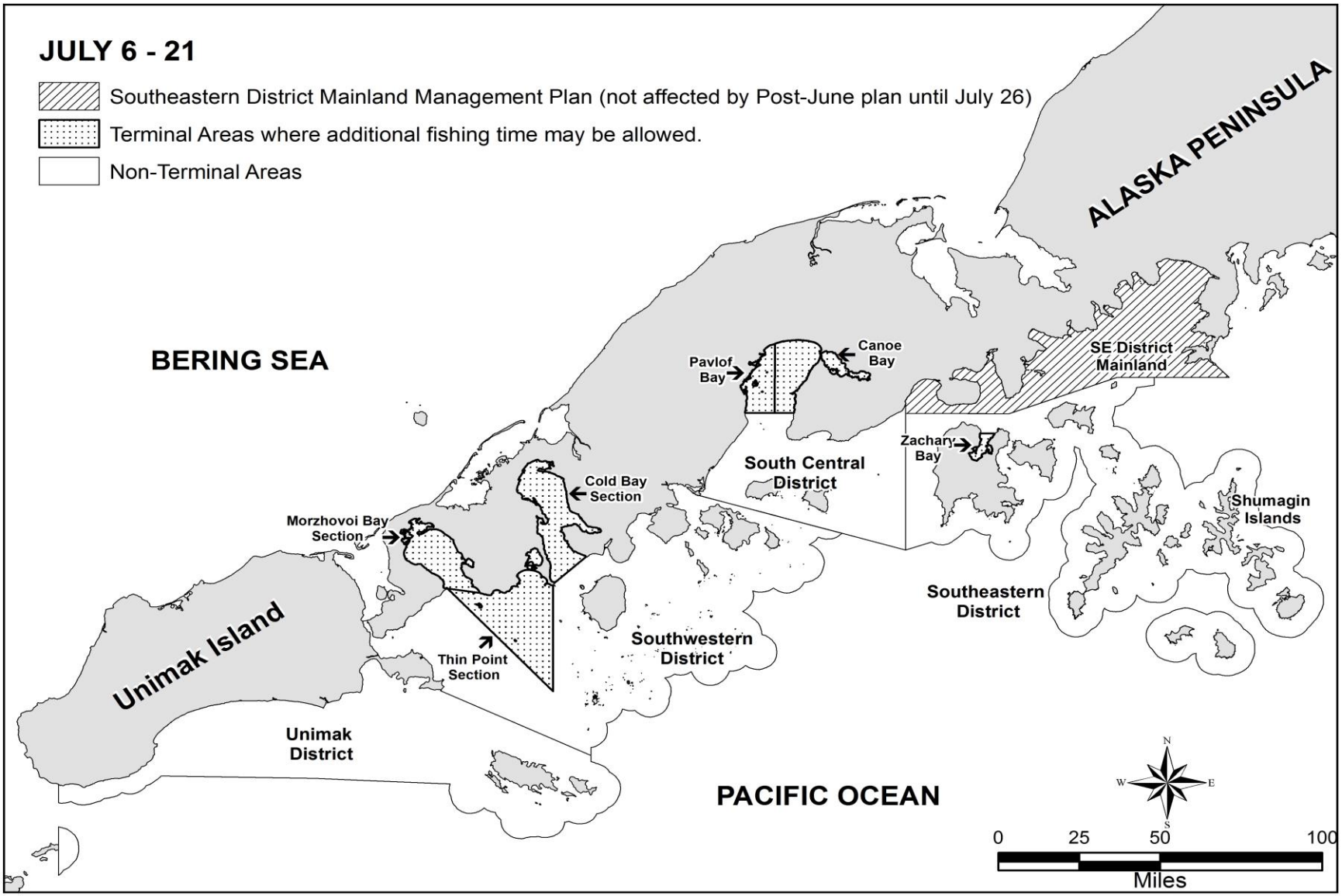

Figure 14.–South Alaska Peninsula post-June terminal fishing areas from July 6 through July 21.

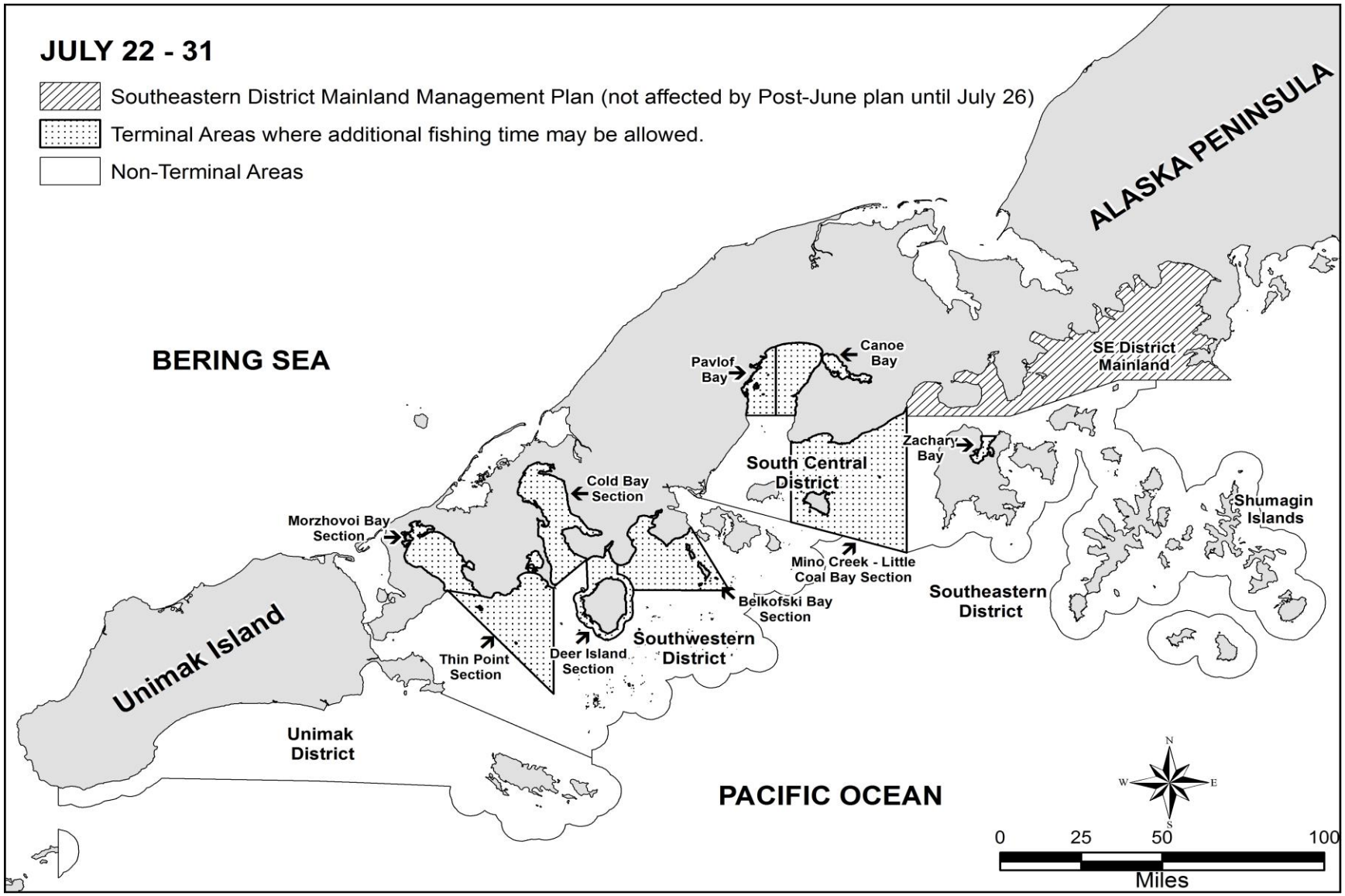

Figure 15.–South Alaska Peninsula post-June terminal fishing areas from July 22 through July 31.

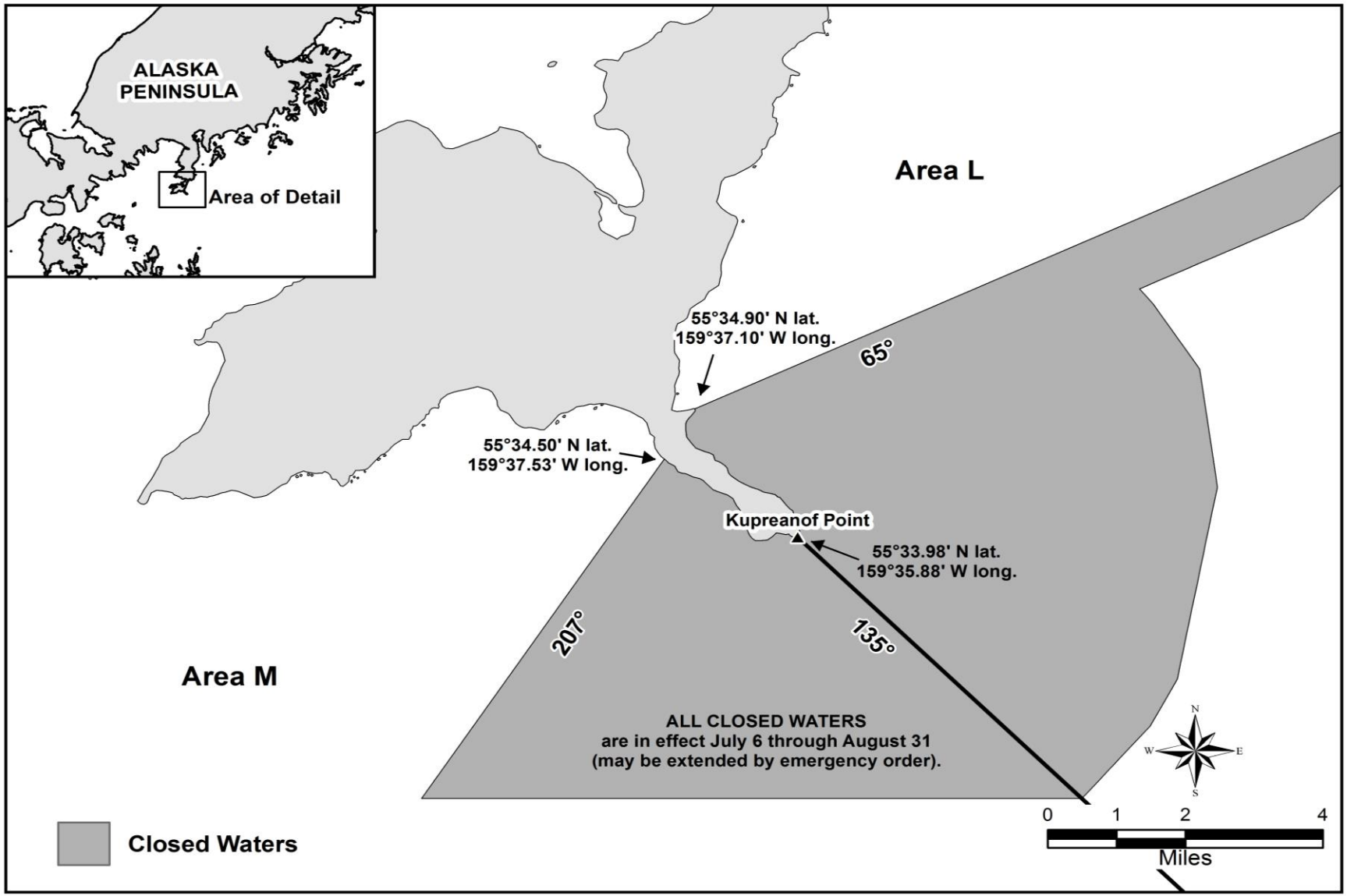

Figure 16.–Map of Kupreanof Point area closed waters.

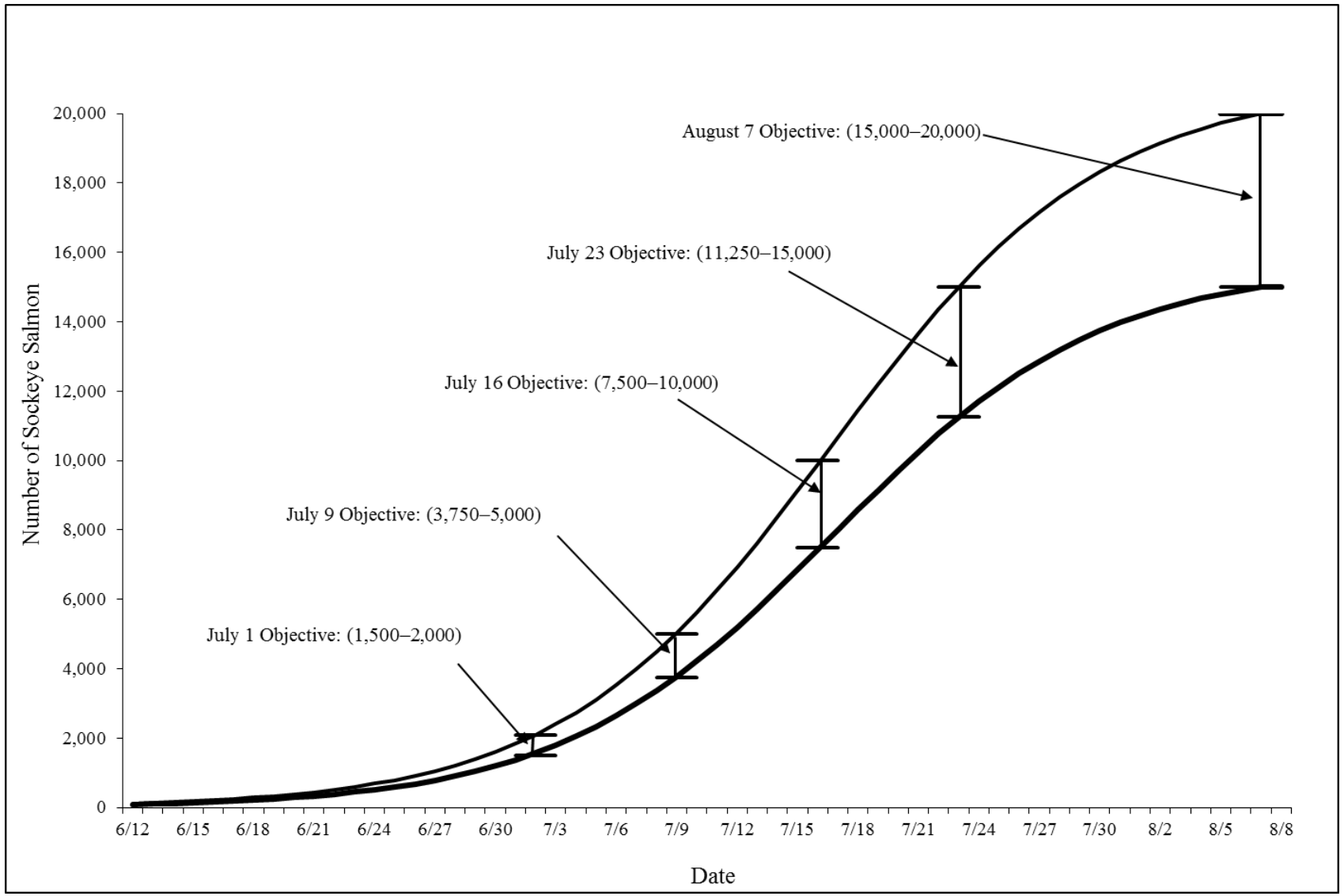

Figure 17.–Orzinski Lake interim sockeye salmon escapement objectives by date. Interim escapement objectives are general guidelines for inseason management and are subject to adjustment based on run timing of sockeye salmon returns in a given year.

APPENDIX A. 2021 SALMON FORECASTS

Appendix A1.–2021 South Alaska Peninsula pink salmon forecast.

Forecast Area: Alaska Peninsula, South Alaska Peninsula Aggregate
Species: Pink Salmon

Preliminary forecast of the 2021 run (Brenner et al. 2021)

Total production	Forecast estimate (millions)	Forecast range (millions)
Total run estimate[a]	16.9	7.8–32.1
Escapement goal[b]	4.0	1.75–4.0
Post-June harvest estimate	12.9	3.8–28.1

[a] Post-June harvest and escapement.

[b] The escapement estimate is the upper bound of the aggregate goal range (1.75–4.0 million) in 2021.

The 2021 South Alaska Peninsula predicted pink salmon harvest is expected to be in the *Excellent* category with a point estimate of 12.9 million fish (range of 3.8–28.1 million fish). Harvest categories were calculated from the 20th, 40th, 60th, and 80th percentiles of historical post-June commercial harvest on the South Alaska Peninsula from 1981 to 2020.

South Peninsula harvest category	Range (millions)	Percentile
Poor	Fewer than 2.0	Less than 20th
Weak	2.0 to 4.0	20th to 40th
Average	4.0 to 6.7	40th to 60th
Strong	6.7 to 9.3	60th to 80th
Excellent	Greater than 9.3	80th to 100th

Forecast Methods: The 2021 South Alaska Peninsula pink salmon harvest forecast is derived from a total run forecast minus the upper end (4 million fish) of the annual South Alaska Peninsula escapement goal range. The forecasted total run was fit with a damped Holt model and odd-year South Alaska Peninsula pink salmon returns from 1963 through 2019. The damped Holt time series model takes trends into account but limits their effects.

Forecast Discussion: June harvest of pink salmon has been omitted from the South Alaska Peninsula aggregate pink salmon forecast due to the variability of pink salmon harvest that occurs during the June fishery, and the origin of these fish are unknown. The 5-year odd-year average harvest of pink salmon in June is approximately 2.5 million fish.

The estimated 2021 South Alaska Peninsula pink salmon total harvest (12.9 million fish) is predicted to be *Excellent*. Strong escapement and favorable freshwater spawning environmental conditions in 2019 support the predicted forecast. 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 both outside the ranges of the historical dataset; therefore, the forecast's predictive power has been diminished. Due to this, confidence in the forecast is fair.

Forecast by Tyler Lawson, Assistant Area Management Biologist, ADF&G, Alaska Peninsula–Aleutian Islands; and Sarah Power, Biometrician, ADF&G, Juneau.

Appendix A2.–2021 Chignik Management Area sockeye salmon forecast.

Forecast Area: Chignik
Species: Sockeye Salmon

Preliminary Forecast of the 2021 Run (Brenner et al. 2021)

Total production		Forecast estimate (thousands)	Forecast range (thousands)
Early run (Black Lake)	Total run estimate	437	145–1,320
	Escapement goal[a]	400	350–450
	Harvest estimate	37	
Late run (Chignik Lake)	Total run estimate	438	37–1,042
	Escapement goal[a]	310	220–400
	Harvest estimate	128	
Total Chignik system	Total run estimate	875	182–2,362
	Harvest estimate[b]	165	
	Chignik Area	165	
	SEDM Area	0	
	Cape Igvak Section	0	

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 20,000 sockeye salmon is added to the lower bound of the late-run escapement goal.

[b] A harvestable surplus of Chignik River system sockeye salmon is forecast to be below 600,000 fish in the Chignik Area; therefore, as outlined in regulations 5 AAC 09.360 and 5 AAC 18.360, no commercial fisheries are anticipated in the Southeastern District Mainland and Cape Igvak during the regulatory timeframes, thus the harvest of Chignik-bound sockeye salmon in those areas is projected to be zero.

*Forecast Methods***:** Simple linear regressions models using age-class relationships were used to forecast the 2021 early and late Chignik sockeye salmon runs. Each regression model was assessed with standard regression diagnostic procedures. Data were log transformed to address nonnormality or unequal variance. 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 log-transformed age-.2 returns predicted log-transformed age-.3 returns using data from the 1995 outmigration year to the present. Prior year early-run age-.1 returns predicted log-transformed age-.2 returns (outmigration years 1998 to present). For the late run, prior year age-.2 returns predicted age-.3 returns using data from the 2007 outmigration year to the present.

The early- and late-run regression and median estimates were summed to estimate the total Chignik River sockeye salmon run for 2021. The combined early- and late-run 80% prediction interval was calculated by summing the lower and upper prediction bounds of the 2 runs.

-continued-

Forecast Discussion: The 2021 Chignik sockeye salmon early run is forecasted to be 437,000 fish, which is 747,000 fewer fish than the 10-year average run of 1.18 million fish and almost 300,000 fish more than the 2020 early run of 137,000 fish. The early run is predicted to be composed of approximately 59% age-.3 and 39% age-.2 fish. The late run is forecasted to be 438,000 fish, which is approximately 473,000 fewer fish than the 10-year average run of 911,000 fish and 244,000 fish more than the 2020 late run of 194,000 fish. The 2021 late run is predicted to be composed of approximately 72% age-.3 and 26% age-.2 fish. The 2021 total Chignik sockeye salmon run is expected to be 875,000 fish, which is approximately 1.22 million fewer fish than the 10-year average of 2.10 million, and roughly 544,000 fish more than the 2020 total run of 331,000 fish.

The projected 2021 early-run total harvest estimate of 37,000 fish is based on achieving the midpoint of the early-run escapement goal range. The projected late-run harvest estimate of 128,000 fish is based on achieving the midpoint (310,000 fish) of the late-run goal, which includes the inriver run goal of 20,000 fish added to the lower bound (200,000 fish) of the escapement goal. For 2021, it is projected that sockeye salmon harvests for both early and late runs in the Chignik Management Area will not exceed a 600,000 fish surplus beyond escapement goals and, by regulation, preclude commercial fisheries from harvesting Chignik-bound fish in the Cape Igvak Section of the Kodiak Management Area and in the Southeastern District Mainland of the Alaska Peninsula Management Area during the regulatory period through July 5.

The wide confidence intervals around the point estimate of the 2021 forecasts reflect the uncertainty inherent in the forecast models. Given the sibling relationships used for forecasting both runs and the poor 2020 age-.3 returns, the 2021 forecast may overestimate returns if environmental variables, which are unknown at this time, remain spurious. Due to the range of variation in the relationships used in these forecasts and their historical accuracy, our confidence in them is fair.

Forecast by Heather Finkle, Finfish Research Biologist, ADF&G, Westward Region.