

Fishery Management Report No. 11-24

**Chignik Management Area Commercial Salmon
Fishery Harvest Strategy, 2011**

by

Todd J. Anderson

April 2011

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



Symbols and Abbreviations

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Weights and measures (metric)		General		Mathematics, statistics	
centimeter	cm	Alaska Administrative Code	AAC	<i>all standard mathematical signs, symbols and abbreviations</i>	
deciliter	dL	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	alternate hypothesis	H_A
gram	g	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	e
hectare	ha	at	@	catch per unit effort	CPUE
kilogram	kg	compass directions:		coefficient of variation	CV
kilometer	km	east	E	common test statistics	(F, t, χ^2 , etc.)
liter	L	north	N	confidence interval	CI
meter	m	south	S	correlation coefficient	
milliliter	mL	west	W	(multiple)	R
millimeter	mm	copyright	©	correlation coefficient (simple)	r
		corporate suffixes:		covariance	cov
Weights and measures (English)		Company	Co.	degree (angular)	$^\circ$
cubic feet per second	ft ³ /s	Corporation	Corp.	degrees of freedom	df
foot	ft	Incorporated	Inc.	expected value	E
gallon	gal	Limited	Ltd.	greater than	>
inch	in	District of Columbia	D.C.	greater than or equal to	≥
mile	mi	et alii (and others)	et al.	harvest per unit effort	HPUE
nautical mile	nmi	et cetera (and so forth)	etc.	less than	<
ounce	oz	exempli gratia	e.g.	less than or equal to	≤
pound	lb	(for example)		logarithm (natural)	ln
quart	qt	Federal Information Code	FIC	logarithm (base 10)	log
yard	yd	id est (that is)	i.e.	logarithm (specify base)	log ₂ , etc.
		latitude or longitude	lat. or long.	minute (angular)	'
Time and temperature		monetary symbols (U.S.)	\$, ¢	not significant	NS
day	d	months (tables and figures): first three letters	Jan, ..., Dec	null hypothesis	H_0
degrees Celsius	°C	registered trademark	®	percent	%
degrees Fahrenheit	°F	trademark	™	probability	P
degrees kelvin	K	United States (adjective)	U.S.	probability of a type I error (rejection of the null hypothesis when true)	α
hour	h	United States of America (noun)	USA	probability of a type II error (acceptance of the null hypothesis when false)	β
minute	min	U.S.C.	United States Code	second (angular)	"
second	s	U.S. state	use two-letter abbreviations (e.g., AK, WA)	standard deviation	SD
Physics and chemistry				standard error	SE
all atomic symbols				variance	
alternating current	AC			population sample	Var
ampere	A			sample	var
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				

FISHERY MANAGEMENT REPORT NO. 11-24

**CHIGNIK MANAGEMENT AREA COMMERCIAL SALMON FISHERY
HARVEST STRATEGY, 2011**

by

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ABSTRACT

This document provides stakeholders with general information regarding how the Alaska Department of Fish and Game (ADF&G) will manage the 2011 Chignik Management Area (CMA) commercial salmon fishery. The 2011 total sockeye salmon *Oncorhynchus nerka* forecasted run for the Chignik River watershed is 2,323,000 fish. Approximately 1,400,000 sockeye salmon are expected to be harvested in the CMA. The first commercial fishing period in the Chignik Bay, Central, and Eastern districts and the Inner Castle Cape Subsection of the Western District may occur after approximately 20,000 sockeye salmon have passed the Chignik River weir. Two fishing periods of up to 48 hours in length, separated by at least 48 hours, may occur in the Western District concurrent with the Chignik Bay and Central districts during June and early July. All subsequent Western District fishing periods and the first commercial fishing period in the Perryville District may occur on July 6, as long as Chignik River sockeye salmon escapement objectives are expected to be met. From the end of the transition period (approximately June 26 – July 8) until the end of the fishing season, ADF&G shall manage the CMA based on its evaluation of the local pink, chum, and coho salmon runs, as well as the Chignik watershed late-run sockeye salmon escapement.

Key words: Chignik, sockeye salmon, *Oncorhynchus tshawytscha*, *O. gorbuscha*, *O. keta*, *O. kisutch*, Chignik Management Area, CMA, 2011 management plan, subsistence fishing, commercial fishery, SEG, FMR.

INTRODUCTION

This document provides stakeholders with the basic framework of how the Alaska Department of Fish and Game (ADF&G) will manage the 2011 Chignik Management Area (CMA; Area L) commercial salmon fishery. The CMA encompasses all coastal waters and inland drainages of the northwest Gulf of Alaska between Kilokak Rocks and Kupreanof Point (Figure 1). For management purposes, the CMA is divided into five fishing districts: Eastern, Central, Chignik Bay, Western, and Perryville. Each district is further divided into statistical reporting areas (Figure 2).

The 2011 CMA commercial salmon fishery will be managed by ADF&G in accordance with the guidelines established in the Chignik Salmon Management Plan (5 AAC 15.357). The goal of this management plan is to allow commercial fisheries on CMA salmon stocks and to achieve escapement goals for early-run (Black Lake) and late-run (Chignik Lake) sockeye salmon *Oncorhynchus nerka* runs as well as local stocks of pink *O. gorbuscha*, chum *O. keta*, coho *O. kisutch*, and Chinook salmon *O. tshawytscha*. Complete details of this plan are found in the Chignik and Kodiak Areas Commercial Salmon Fishing Regulations booklet (ADF&G 2011) available from regional Alaska Department of Fish and Game offices, or online at: <http://www.adfg.alaska.gov/index.cfm?adfg=fishregulations.commercial> (accessed April 2011).

GEAR DESCRIPTION

Purse and hand purse seines are the only legal commercial salmon fishing gear within the CMA. Legal seine gear must be between 100 and 125 fathoms in length in the Chignik Bay District and between 100 and 225 fathoms in length in all other districts. No seine may be less than three fathoms or more than 375 meshes in depth. Up to 25 meshes of chafing gear with a maximum mesh size of seven inches may be used. Additionally, no lead may be more than 75 fathoms in length. Complete seine specifications are listed in 5 AAC 15.332.

CLOSED WATERS

Closed water areas within the CMA are described in 5 AAC 15.350, and determined using the global positioning system (GPS; 5 AAC 15.206). Where regulatory markers are posted, it is illegal to take salmon for commercial purposes on the streamward side of the markers (5 AAC 39.290 (b)).

REPORTING REQUIREMENTS

Tender and processor reporting requirements are detailed in the CMA commercial fishing regulations (5 AAC 15.355). Processors are required to report the previous day's commercial harvest information to ADF&G staff by 10:00 AM daily, by e-mail, telephone, or radio (SSB or VHF). The preferred method of catch reporting is to e-mail an Excel spreadsheet (template provided by ADF&G) to the Chignik Area Management Biologist (todd.anderson2@alaska.gov). It is the responsibility of the processor to contact ADF&G to determine catch reporting protocols. Failure to report daily catch information in a timely manner is a violation of commercial fishing regulations (5 AAC 15.355).

Commercial fishermen or tenders operating in the Eastern District during June and early July are strongly encouraged to contact the Chignik weir to report the prior day's catch information. Timely and accurate catch information allows for informed and consistent management actions in the outlying fishing districts. Information needs, reporting formats, and timetables will be discussed in detail at the preseason industry/departments fisheries meeting held during early June and/or obtained by contacting the management staff at the Chignik weir.

Commercial fishermen are reminded that all salmon caught must be reported on an ADF&G fish ticket. Fishermen may retain finfish from lawfully taken commercial catch for personal use (home pack), including for use as bait in a commercial fishery (5 AAC 39.010). However, commercially caught salmon retained for personal use must be recorded on the fish ticket and may not be sold or bartered. Fishermen are reminded that it is their responsibility to secure a market for all of their catch before harvesting fish. Discarding commercially caught salmon is prohibited by Alaska Statute (AS 16.05.831), and will be strictly enforced.

EMERGENCY ORDERS AND NEWS RELEASES

Fishing periods will be established by emergency order (EO) when salmon abundance is expected to exceed escapement requirements. News releases will be issued prior to fishery openings to notify the fishermen and processors. When possible, a 24-hour notice will be given before opening or closing commercial fishing periods. News releases will be broadcast over VHF channel 6 and sent via e-mail to interested parties at the time of release. Please contact ADF&G staff at the Chignik weir, or at the Kodiak office in the off season, to be placed on the e-mail list. In addition, catch, escapement, and other fishery data will be broadcast over VHF channel 6 at 9:15 AM and 6:15 PM daily. News releases and related fishery data will also be posted on the Chignik Management Area Salmon Fisheries web page at:

<http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareachignik.salmon> (Accessed April 2011).

2011 SALMON FORECASTS

SOCKEYE SALMON

Preseason salmon forecasts provide fishermen and processors with the expected run strength of Chignik River watershed sockeye salmon for planning purposes. ADF&G also uses these forecasts to formulate a preseason management strategy; however, the fishery is primarily managed based on inseason indicators of actual run strength as they become available.

Total Run

The 2011 total sockeye salmon run for the Chignik River watershed is forecasted to be 2,323,000 fish (Appendix A1; Eggers and Carroll 2011). The total projected commercial harvest for 2011 is 1,723,000 sockeye salmon, of which 1,400,000 are expected to be harvested in the CMA.

Early-Run (Black Lake)

The total early-run forecast is approximately 1,299,000 sockeye salmon (Appendix A1; Eggers and Carroll 2011). The Chignik early-run harvest is projected to be 949,000 fish. The early-run sustainable escapement goal (SEG) range is 350,000–400,000 sockeye salmon through July 4 (Table 1; Nemeth et al. 2010). The early run typically peaks in late June and returns primarily to Black Lake and its tributaries.

Late-Run (Chignik Lake)

The total late-run forecast is approximately 1,024,000 sockeye salmon (Appendix A1; Eggers and Carroll 2011). The Chignik late-run harvest is projected to be 774,000 fish. The late-run SEG range is 200,000–400,000 sockeye salmon from July 5 through the end of the run. To account for inriver subsistence harvest, an inriver run goal of 50,000 sockeye salmon (25,000 sockeye salmon in August and 25,000 in September) is added to the late-run goal resulting, in a total late-run escapement objective range of 250,000–400,000 sockeye salmon (Table 1; Nemeth et al. 2010). The late run typically peaks in late July and returns primarily to Chignik Lake and its tributaries.

OTHER SALMON SPECIES

Past projections for coho, pink, and chum salmon harvests were based on a ten-year average commercial harvest for each species. From 2002–2005, the CMA was managed under the Chignik Management Area Cooperative Purse Seine Management Plan (co-op). From inception, the co-op was legally scrutinized and was ultimately ruled illegal in February 2006 by the Alaska Supreme Court. Harvest averages during the co-op years are not a reliable predictor of future harvests because sockeye salmon were the only species targeted by the co-op fleet and fishing effort in the districts outside of Chignik Bay District was low. Therefore, 2011 harvest projections for coho, pink, and chum salmon are generated by averaging the five post co-op fishery years (2006–2010). The Chinook salmon harvest in the CMA has been relatively consistent over the past decade and a 10 year harvest average was used to project the 2011 Chinook salmon harvest.

Chinook Salmon

The 2011 CMA projected Chinook salmon commercial harvest is 3,200 fish. Chinook salmon harvest in the CMA is mostly dependent upon the amount of commercial fishing time for sockeye salmon in July as there is no targeted Chinook salmon harvest in the CMA. The Chignik River watershed's Chinook salmon lower bound escapement goal is 1,300 spawning fish above the Chignik River weir.

Coho Salmon

The CMA 2011 projected coho salmon commercial harvest is 109,000 fish. The coho salmon commercial harvest may vary depending on the commercial fishing effort directed on local pink salmon and chum salmon runs in the Eastern, Central, Western, and Perryville districts. Market

conditions late in the season may also limit commercial salmon fishing effort when coho salmon are prevalent in Chignik Lagoon.

Pink Salmon

The CMA 2011 projected pink salmon commercial harvest is 1,714,000 fish. Historically, the Western District has provided the largest proportion of the commercial harvest. The magnitude of the Chignik sockeye salmon run and market interest in pink salmon from the outside districts may affect directed pink salmon harvest effort in the CMA. The odd-year area-wide SEG range is 500,000–800,000 pink salmon.

Chum Salmon

The 2011 projected CMA chum salmon commercial harvest is 237,000 fish. Historically, the Western and Perryville districts provided the largest proportion of the commercial harvest. Market interest in late season chum salmon may affect commercial harvest totals in 2011. The lower bound of the area wide SEG is 57,400 chum salmon.

2011 CHIGNIK SALMON MANAGEMENT

JUNE

By regulation, the first commercial salmon fishing period may occur when 20,000 sockeye salmon have escaped past the Chignik River weir. However, if it is determined that a strong buildup of sockeye salmon exists in Chignik Lagoon and 20,000 sockeye salmon are expected to escape into the Chignik River, a commercial fishery may occur before 20,000 sockeye salmon have passed the weir (5 AAC 15.357 (b)(1)). The purpose of this regulation is to allow subsistence fishing opportunity prior to the commercial fishing season and to avoid a large buildup of salmon in the lagoon.

During June, commercial salmon fishing may occur in the Chignik Bay, Central, and Eastern districts, and the Inner Castle Cape Subsection of the Western District (Figure 2). Through approximately June 26, the Chignik Bay, Central, and Eastern districts and the Inner Castle Cape Subsection (273-93) of the Western District (Figure 3) open and close concurrently by regulation (5 AAC 15.357 (c)(1)) and are based upon achieving the early-run interim escapement objectives (Table 1). In addition, the entire Western District may open for two fishing periods of up to 48 hours in length separated by a minimum closure of 48 hours. Both fishing periods in the Western District shall be opened concurrently with fishing periods in the Chignik Bay, Central, and Eastern districts (5 AAC 15.357 (e)).

Within Chignik Lagoon, the area manager will primarily use the Humes Point and the Mensis Point markers to designate closed waters (Figure 4). Alternating between Humes and Mensis Point allows ADF&G to control escapement of sockeye salmon entering the Chignik River. The Pillar Rock markers may be used during periods of high escapement or limited harvest capacity by the fleet (Figure 4).

ADF&G test fishing will likely begin on or about June 7 to assess any salmon buildup in Chignik Lagoon. Test fishing may occur on several days in early June depending on test fish vessel catch rates and escapement levels (Anderson *In prep*). Subsequent commercial fishing periods during June will be based on the evaluation of interim escapement objectives (Table 1), commercial and subsistence catches, and additional test fishing results.

TRANSITION PERIOD

Prior to 2004, scale pattern analysis (SPA) was used to differentiate stock composition during the transition from the early- to late-run sockeye salmon, and the fishery was managed based on the results of this analysis (Witteveen and Botz 2004). Although the program was discontinued in 2004, ADF&G staff found that, on average, the number of early-run sockeye salmon that passed the Chignik River weir after July 4 was approximately equal to the number of late-run sockeye salmon that passed the weir prior to July 4. The 2011 fishery will be managed such that through July 4, fishing periods will be based on achieving the early-run escapement objectives and beginning July 5, fishing periods will be based on achieving the late-run escapement objectives (Table 1).

During the transition period (approximately June 26 through July 8), the Chignik Bay and Central districts will be managed based on escapement objectives for both runs (Table 1). The Eastern District will likely be closed until the strength of the Chignik River watershed sockeye salmon late run can be determined. With the exception of the Inner Castle Cape Subsection of the Western District, the remainder of the Western and Perryville districts will likely remain closed during the transition period.

JULY

During July, the Chignik Bay and Central districts (Figure 2) will be managed primarily based on Chignik River watershed sockeye salmon run strength. However, the department may adjust closed waters in Chignik Lagoon based on Chignik River watershed Chinook salmon escapement goals (1,300–2,700 fish; Nemeth et al. 2010). If Chinook salmon escapement during early July is weak and the escapement goal is unlikely to be met, waters upstream of the Humes Point markers may be closed to improve escapement by removing commercial fishing pressure from areas where Chinook salmon hold before entering the Chignik River (5 AAC 15.357(b)(3); Figure 4).

The Eastern District (Figure 2) will be primarily managed for pink and chum salmon during July. The first commercial salmon fishing period after the transition period in the Eastern District can occur as early as July 9, and will likely be 48 hours in duration. Extensions to this fishing period will depend on pink and chum salmon fishery performance (catch per unit effort; CPUE) as compared to historical catch records, local pink and chum salmon escapements, and Chignik River watershed sockeye salmon escapement levels. The entire district will be opened to commercial salmon fishing only if interim Chignik River watershed sockeye salmon escapement objectives are expected to be met and a harvestable surplus of sockeye salmon is anticipated.

If the Chignik late-run sockeye salmon escapement is lower than expected, fishing periods in terminal areas in the Eastern District may be announced via emergency order to target pink and chum salmon. In these cases, the commercial salmon fishery in the Eastern District may close on short notice if substantial numbers of sockeye salmon are harvested. Closed waters may be expanded around individual streams if pink and chum salmon escapements are not sufficient in those areas.

With the exception of the Inner Castle Cape Section (Figure 3), which opens concurrently with the Chignik Bay and Central districts, commercial fishing periods in the Western and Perryville districts (Figure 2) may be allowed beginning July 6 if Chignik River escapement objectives are expected to be met and surplus Chignik River sockeye salmon are available for harvest.

Depending on expected Chignik River sockeye salmon run strength, those portions of the Chignik Bay and Central districts known as “Jack’s Box” may also be opened concurrently with the Western and Perryville districts (Figure 5). The first commercial salmon fishing period in these districts is likely to be 48 hours in duration. Extensions will depend on pink and chum salmon fishery performance (CPUE) as compared to historical catch records, local pink and chum salmon escapements, and Chignik River watershed sockeye salmon escapement levels.

If surplus Chignik River sockeye salmon are not expected to be available for harvest, the commercial fisheries in the Western and Perryville districts will likely occur north of the Cape Itki line beginning in mid-July to target local pink and chum salmon while avoiding Chignik River-bound sockeye salmon (Figure 6). In these cases, the commercial salmon fishery in the Western and Perryville districts may close on short notice if substantial numbers of sockeye salmon are harvested. Closed waters may be expanded around individual streams if pink and chum salmon escapements are not sufficient in those areas.

AUGUST AND SEPTEMBER

In August and September, the Chignik Bay and Central districts and the Inner Castle Cape Subsection of the Western District (Figure 2) will be managed based on Chignik River watershed sockeye salmon run strength. The CMA will be managed to meet the lower end escapement objectives for the month of August (59,500 sockeye salmon) and from September 1–15 (25,000 sockeye salmon; Table 1).

The Chignik River weir will be removed on or about September 4. After this point, the following methods may be used to assess Chignik River sockeye salmon escapements:

- time series analysis of total run to project post-weir run magnitude;
- comparison of aerial survey data in the sockeye salmon spawning areas in the Chignik River watershed to aerial survey estimates from previous years;
- interviewing commercial and subsistence users regarding the late-season sockeye salmon run strength; and
- commercial and subsistence harvest CPUE, if available.

Beginning September 15, commercial fishing periods in the Chignik Bay and Central districts are limited to a maximum of 48 hours per week, and will be based on the evaluation of the sockeye salmon run strength and the Chignik Lake late-season sockeye salmon subsistence needs (5 AAC 15.357(b)(4)). After September 14, management options include:

- allowing the maximum fishing time of 48 hours per week to be divided into one, two, three, or four commercial fishing periods, depending upon estimated sockeye and/or coho salmon escapements. For example, the fishing time could be distributed over 4 days with 12-hour fishing periods per day within a floating 7-day period;
- a weekly fishing schedule of less than 48 hours, if the sockeye and or coho salmon run strength is determined to be weak; and
- a complete closure.

During August and September, the Eastern District (Figure 2) will be managed based on local pink, chum, and coho salmon abundance (5 AAC 15.357(c)(3)). Fishing times and areas will be

based on actual escapement estimates to local streams. Specific areas may be opened to directed fisheries if pink and chum salmon abundance is sufficient to warrant fisheries in those areas. However, district-wide openings will not be allowed unless Chignik River sockeye salmon escapement objectives are expected to be met and overall pink and chum salmon abundance is sufficient to meet Eastern District escapement objectives.

Until approximately August 20, fishing periods in the Western and Perryville districts (Figure 2) will be based on pink and chum salmon escapement counts to local streams (5 AAC 15.357(d)(2)). Specific areas may be opened to directed fisheries if pink and chum salmon abundance is sufficient to warrant fisheries in those areas. District-wide openings will not be allowed unless Chignik River sockeye salmon escapement objectives are expected to be met and overall pink and chum salmon abundance is sufficient to meet Western and Perryville district's escapement objectives. After August 20, fishing time in the Western and Perryville districts will be based on Chignik River sockeye salmon escapement and local pink, chum, and coho salmon abundance.

2011 SUBSISTENCE SALMON FISHERY

All subsistence salmon fishermen must obtain a subsistence salmon permit for the 2011 season (5 AAC 01.015; Appendix B1). The permits will be available at the Chignik weir facility and from several local vendors. Catch information obtained from subsistence permits is compiled annually and used to assess regional subsistence salmon fisheries.

An Alaskan resident who obtains a state subsistence permit and who does not hold a commercial salmon fishing license (CFEC permit or those with a 2011 crewmember license) may subsistence fish for salmon at any time. Commercial salmon license holders may subsistence fish for salmon during the commercial fishing season at any time except for 12 hours before and 12 hours after a commercial salmon fishing period (5 AAC 01.485).

Subsistence salmon fishing is permitted in the Chignik River. However, salmon may not be taken upstream from the weir to the outlet of Chignik Lake from July 1 to August 31 (5 AAC 01.475(1)). Subsistence fishing in this area is prohibited to protect spawning Chinook salmon. The Chignik River, beginning 100 yards below the weir, is open to subsistence salmon fishing year round. All fishing is prohibited 100 yards upstream and downstream of the weir while it is operational.

The Chignik Lake tributaries of Clark River and Home Creek, starting from their confluence with Chignik Lake upstream one mile, are open to subsistence salmon fishing (5 AAC 01.475(2)). The Alaska Board of Fisheries amended the subsistence regulations to include these tributaries for the purposes of providing additional harvest opportunities for subsistence users.

Subsistence users are reminded that purse seine gear is not allowed for taking of subsistence salmon in Chignik Lake (5 AAC 01.470(a)). Additionally, any gillnet that is fixed, anchored, or otherwise held in place may not obstruct more than one half of the width of any stream open to subsistence fishing. All subsistence salmon fishing gear must be marked with a buoy listing the first initial and last name as well as the address of the person operating the gear (5 AAC 01.010 (h)). Subsistence users must carry their subsistence fishing permit with them while fishing. The adipose fin must be removed from all subsistence-caught salmon immediately after harvest.

REFERENCES CITED

- ADF&G (Alaska Department of Fish and Game). 2008. Chignik and Kodiak areas commercial salmon fishing regulations, 2008-2011 edition. Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau.
- ADF&G (Alaska Department of Fish and Game). 2011. Commercial Fisheries Regulations Summary. Available from: <http://www.adfg.alaska.gov/index.cfm?adfg=fishregulations.commercial> (Accessed April 2011).
- Anderson, T. J. *In prep.* Chignik Lagoon sockeye salmon test fishery operational plan, 2011. [*In*] Salmon operational plans for the Chignik area, 2011. Alaska Department of Fish and Game, Regional Information Report, Kodiak.
- Eggers, D. M. and A. M. Carroll. 2011. Run forecasts and harvest projections for 2011 Alaska salmon fisheries and review of the 2010 season. Alaska Department of Fish and Game, Special Publication No. 11-03, Anchorage.
- Witteveen, M. J. and J. C. Botz. 2004. Chignik lakes scale pattern analysis, run assessment, and sockeye salmon catch sampling results, 2003. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K04-30, Kodiak.
- Nemeth, M. J., M. E. Loewen, H. Finkle, J. S. Schmidt, J. W. Erickson, M. J. Witteveen, and D. Barnard. 2010. Review of salmon escapement goals in the Chignik Management Area, 2010. Alaska Department of Fish and Game, Fishery Manuscript No. 10-08, Anchorage.

TABLES AND FIGURES

Table 1.–Chignik River sockeye salmon interim escapement objectives, 2011.

Date	Escapement		Date	Escapement	
	Lower	Upper		Lower	Upper
June 2	1,200	1,400	August 3	172,500	295,700
June 4	4,000	4,500	August 6	178,700	306,300
June 6	9,800	11,200	August 9	184,600	316,300
June 8	17,900	20,400	August 12	190,600	326,600
June 10	29,500	33,700	August 15	196,200	336,200
June 12	51,200	58,500	August 18	201,900	346,000
June 14	83,000	94,800	August 21	207,400	355,400
June 16	116,000	132,600	August 24	213,300	365,600
June 18	145,300	166,100	August 27	218,800	374,900
June 20	170,900	195,400	August 31	225,000	385,700
June 22	202,100	231,000			
June 25	248,900	284,600	September 3	228,000	391,100
June 28	282,900	323,300	September 5	231,000	393,000
July 1	323,600	369,900	September 7	235,000	395,000
July 4	350,000	400,000 ^a	September 9	239,000	396,800
			September 11	243,000	398,100
July 6	7,000	11,900	September 13	247,000	399,000
July 8	19,900	34,100	September 15	250,000	400,000
July 10	32,600	56,000			
July 12	44,400	76,100			
July 14	58,900	101,000			
July 16	76,400	131,000			
July 19	96,600	165,700			
July 23	122,200	209,500			
July 26	141,800	243,100			
July 29	158,200	271,100			
July 31	165,500	283,700			

Escapement Objectives

Through July 4: 350,000 - 400,000

July 5 - September 15: 250,000 - 400,000^b

^a July 4 is historically the date on which the inseason escapement most closely approximated the early-run escapement as estimated by post-season scale pattern analysis.

^b The late-run escapement objective (July 5–September 15) includes the late-run sockeye salmon sustainable escapement goal (SEG; 200,000–400,000) plus an additional 50,000 sockeye salmon inriver run goal (25,000 in August and 25,000 in September) to meet late-season subsistence needs.

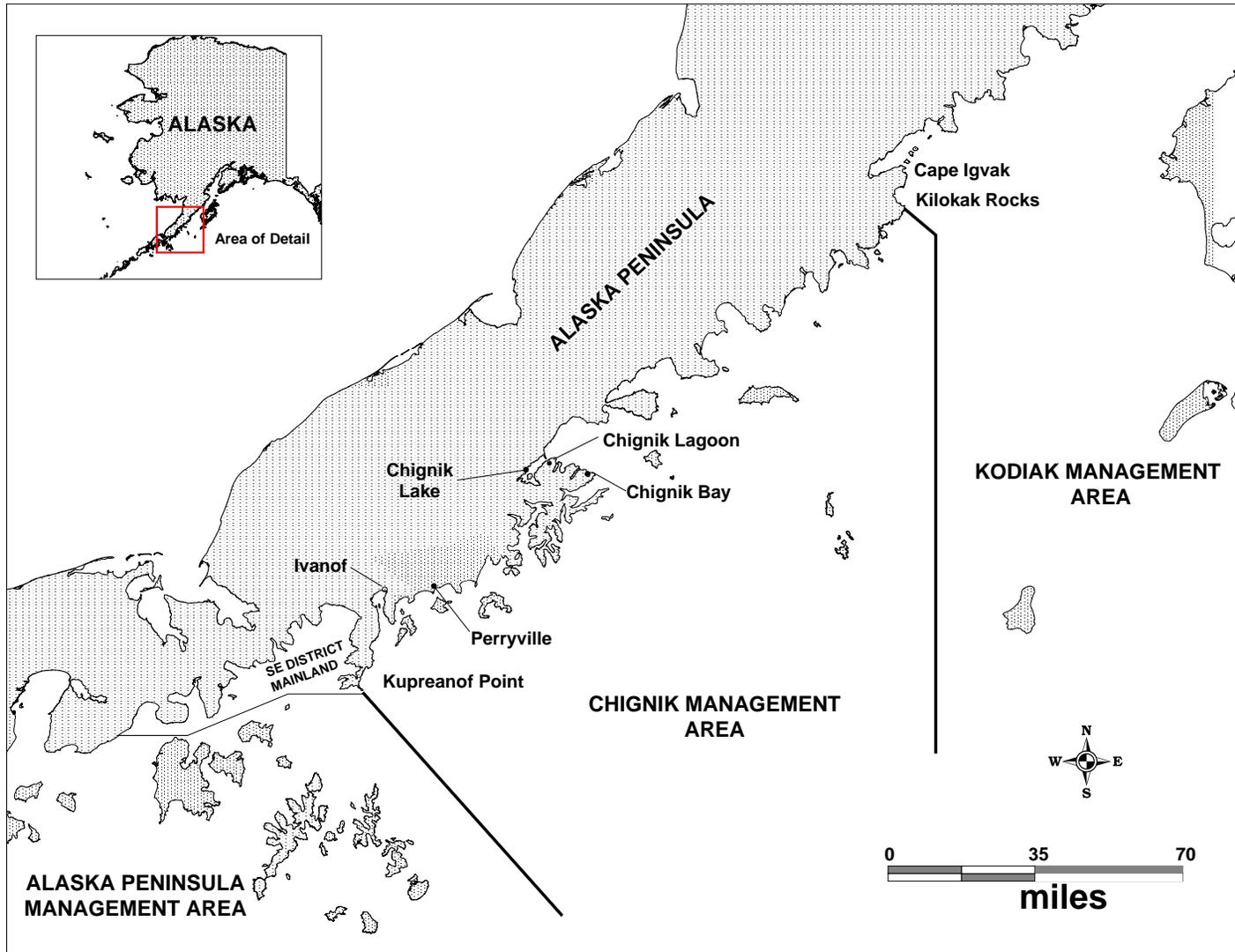


Figure 1.—Map of the Alaska Peninsula and the relative locations of the Chignik, Kodiak, and Alaska Peninsula Management Areas.

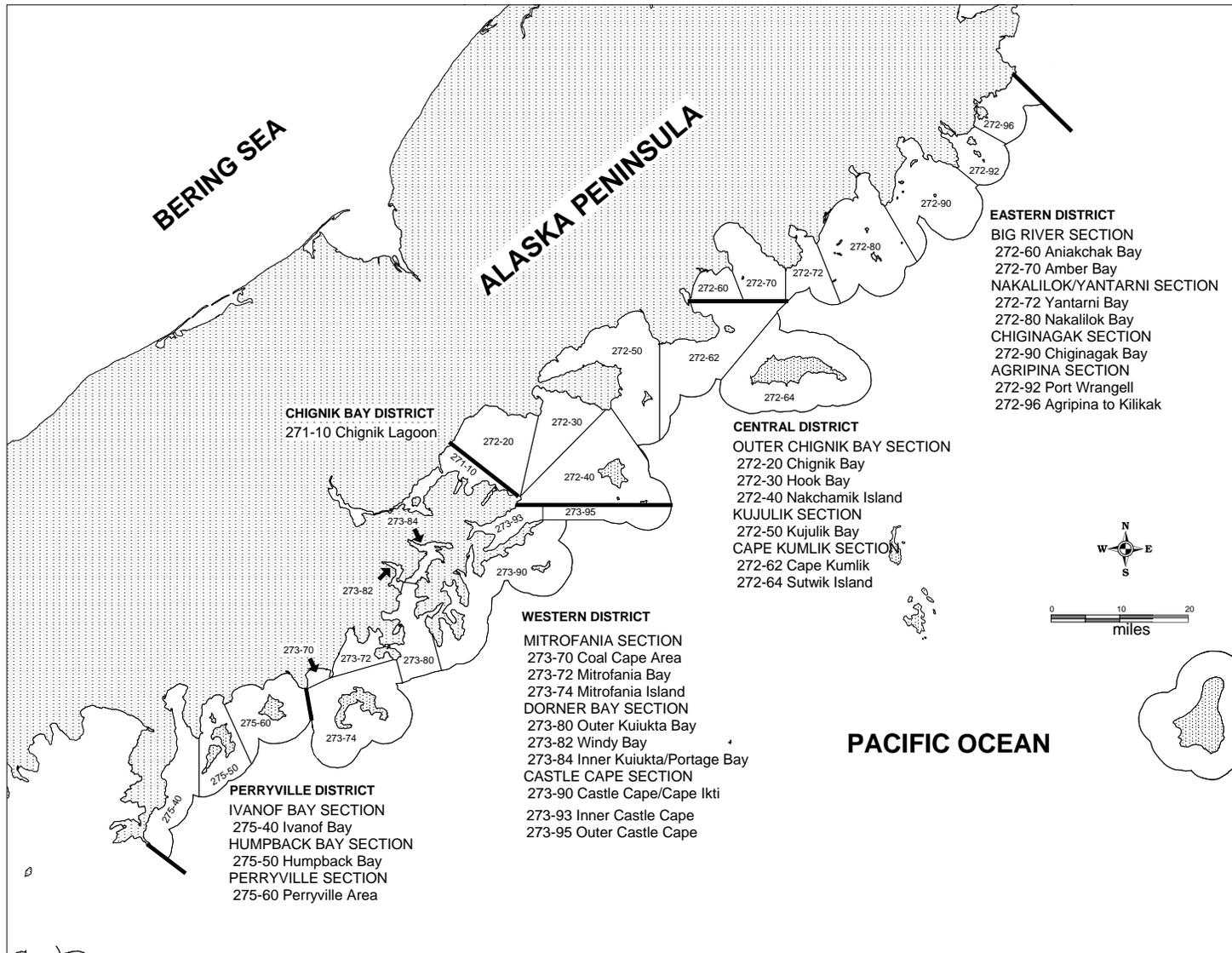


Figure 2.—Map of the Chignik Management Area commercial fishing district boundaries and statistical areas.

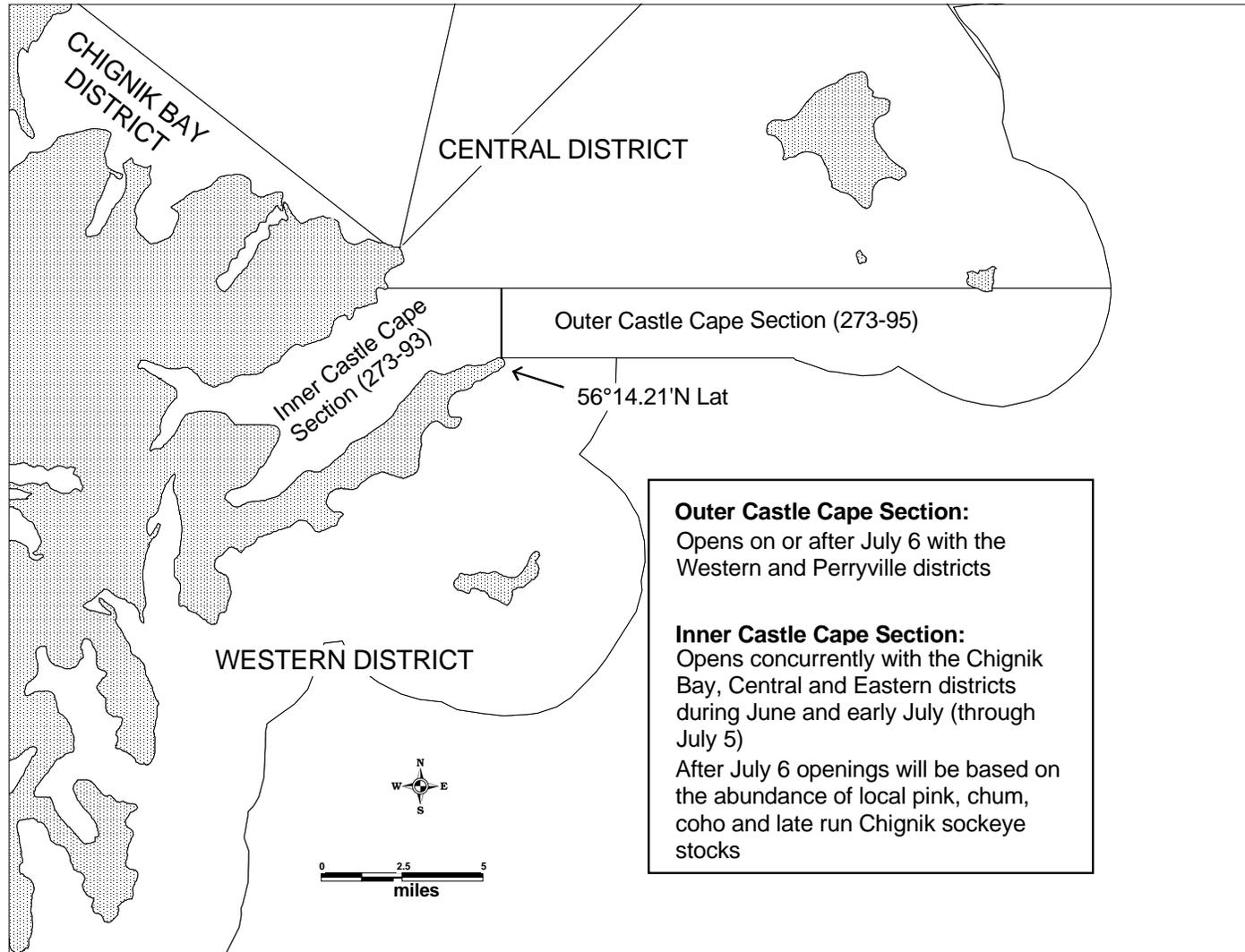


Figure 3.—Map of the Inner (273-93) and Outer Castle Cape (273-95) subsections of the Western District.

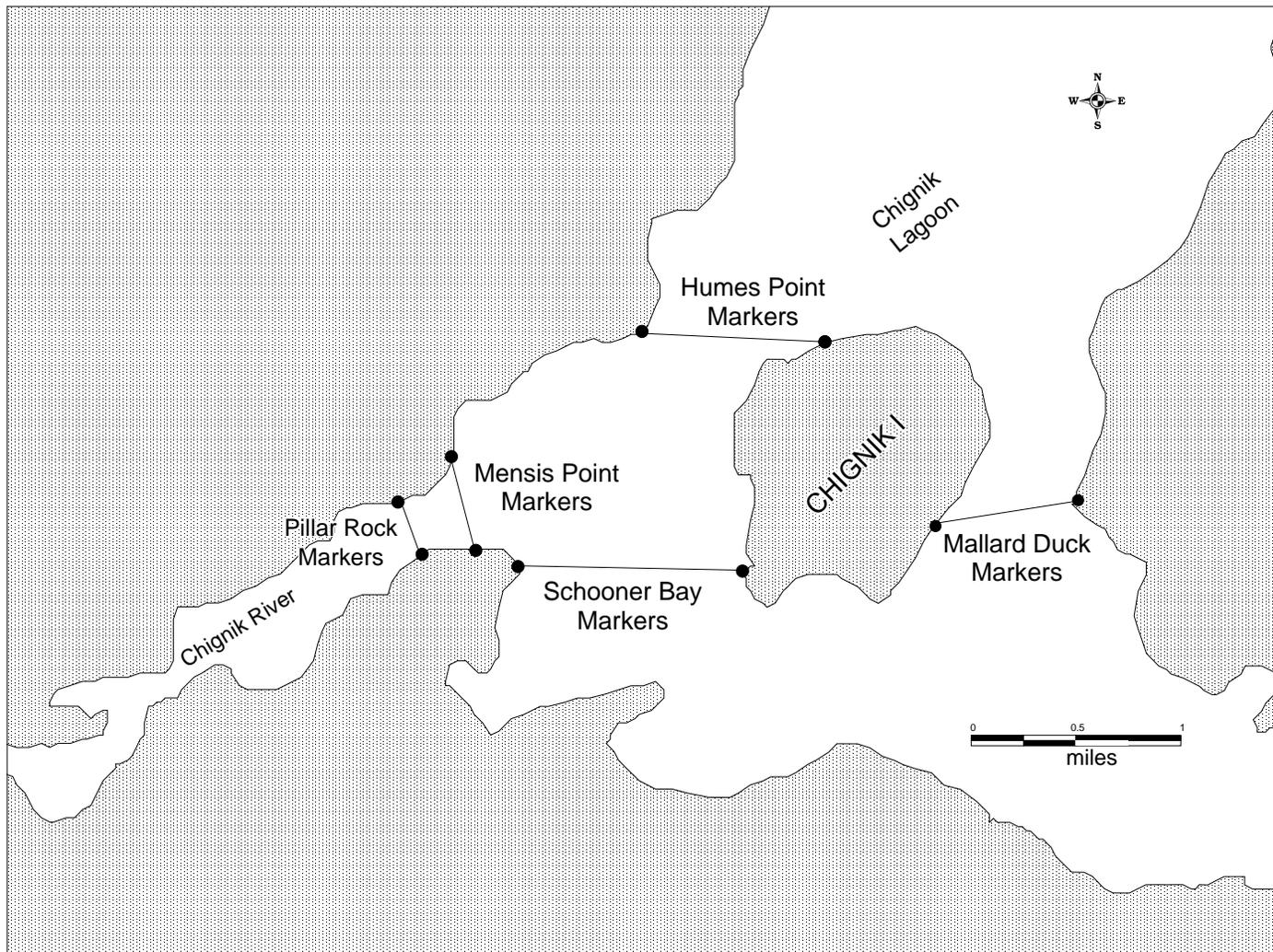


Figure 4.—Map of upper Chignik Lagoon and the location of Pillar Rock, Mensis Point, Humes Point, Mallard Duck, and Schooner Bay marker locations.

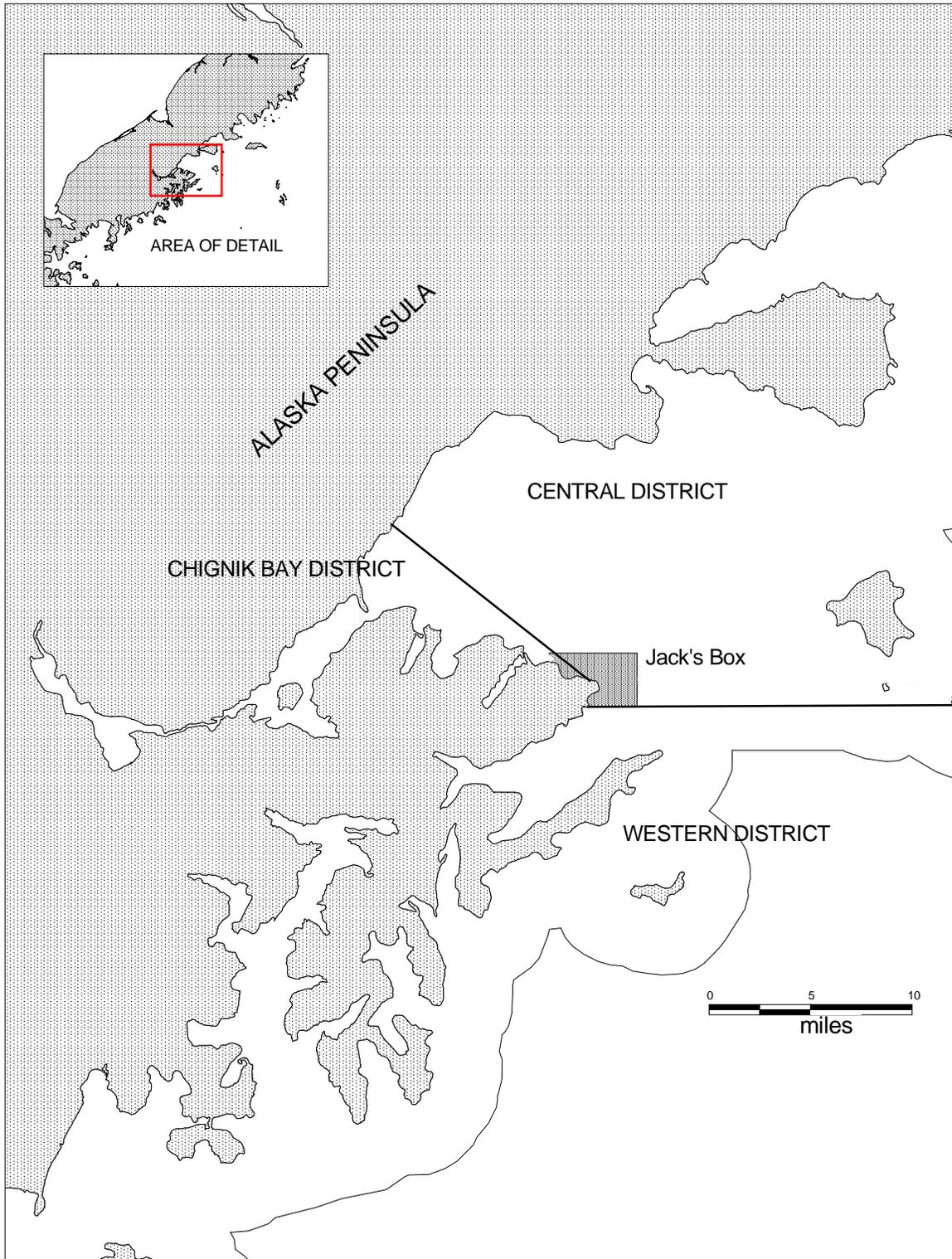


Figure 5.—Map of “Jack’s Box” in the Chignik Bay and Central districts.

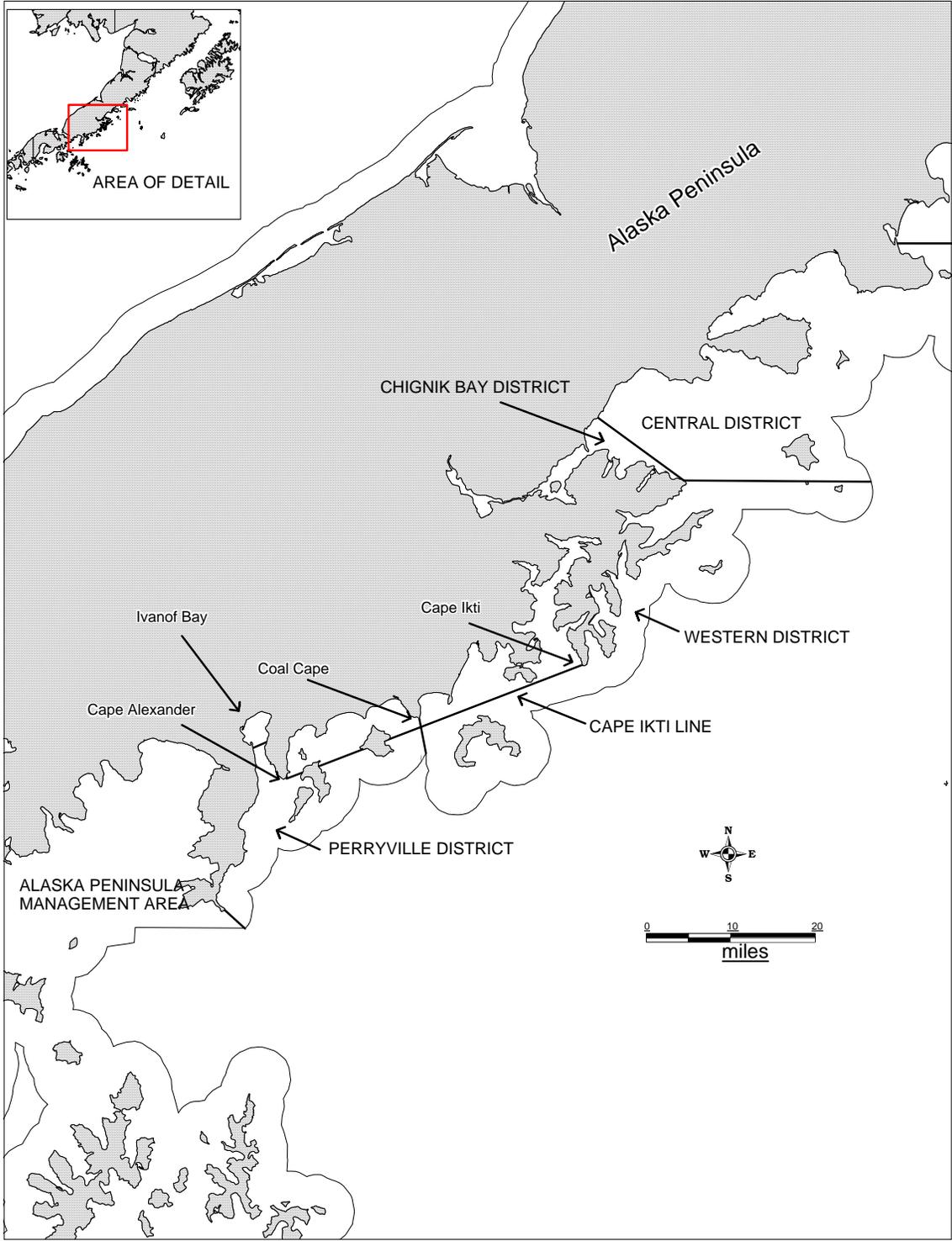


Figure 6.–Map of the “Cape Ikti Line” in the Western and Perryville districts.

**APPENDIX A. 2011 CHIGNIK SOCKEYE
SALMON FORECAST**

FORECAST AREA: CHIGNIK MANAGEMENT AREA, CHIGNIK RIVER

SPECIES: SOCKEYE SALMON

Preliminary Forecast of the 2011 Run		Forecast Estimate (thousands)	Forecast Range (thousands)
TOTAL PRODUCTION			
Early Run (Black Lake)	Total Run Estimate	1,299	608–1,989
	Escapement ^a	350	350–400
	Harvest Estimate ^b	949	
Late Run (Chignik Lake)	Total Run Estimate	1,024	738–1,309
	Escapement ^a	250	250–400
	Harvest Estimate ^b	774	
Total Chignik System	Total Run Estimate	2,323	1,347–3,298
	Escapement ^a	600	600–800
	Harvest Estimate ^b	1,723	

^a The escapement estimate and range are the lower bound and range of the 2011 escapement goals for early (350,000 to 400,000 fish), late (200,000 to 400,000 fish), and combined (600,000 to 800,000 fish) runs. These numbers include an inriver run goal of 50,000 sockeye salmon 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

Forecasts of 2011 early and late Chignik sockeye salmon runs were based on available data from 1977 to the present. Simple and multiple linear regressions were modeled using recent ocean age-class relationships and smolt outmigration data. Each regression model was assessed with standard regression diagnostic procedures. The variance of each estimate was calculated from the error structure of the regression. Regression analyses were examined for serial autocorrelation AR(1).

For the early run, predicted returns of ocean-age-three (3-ocean) sockeye salmon in 2011 were estimated based on the abundance of 2-ocean sockeye salmon in 2010. Following non-significant regression results, the early-run 1-ocean, 2-ocean, and 4-ocean components were predicted by calculating median returns since the 1981 outmigration year.

For the late run, predicted returns in 2011 were estimated using ocean-age-class relationships and smolt outmigration estimates. The 2-ocean sockeye salmon were predicted from prior year’s 1-ocean returns using simple linear regression. Returns of 3-ocean sockeye salmon were predicted by regressing the estimated 1.- and 2.- smolt from the same outmigration year. The 1- and 4-ocean sockeye salmon age classes were predicted by calculating the median returns.

The variances associated with individual regression estimates by age class were used to calculate eighty-percent prediction intervals for those estimates. Prediction intervals for median estimates were calculated using the 10th and 90th percentiles of the data. For each run (early and late), the overall eighty-percent prediction intervals were calculated as the square root of the sum of the squared eighty-percent prediction intervals for each forecasted age class. The early- and late-run regression and median estimates were summed to estimate the total Chignik watershed sockeye salmon run for 2011. The combined early- and late-run eighty-percent prediction interval was calculated by summing the lower prediction bounds and upper prediction bounds of the two runs.

Forecast Discussion

The 2011 sockeye salmon run to the Chignik River is expected to be approximately 2.32 million fish. The early run is expected to be approximately 1.30 million fish. The late run is expected to be approximately 1.02 million fish. The 2011 Chignik sockeye salmon run is expected to be approximately 350 thousand fish more than the recent 10-year average run (1.97 million) and 71 thousand fish less than the 2010 run (2.39 million).

The projected early-run harvest estimate of 949 thousand fish is based on achievement of the lower end of the early-run escapement goal range of 350 thousand fish. The projected late-run harvest estimate of 774 thousand fish is based on achieving the lower end of the late-run inriver run goal range through September 15 (250 thousand sockeye salmon). Harvest estimates for 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.

Available smolt data were analyzed with simple linear regression, using the number of outmigrating age-2 smolt to predict the subsequent 3-ocean adult returns (about 83 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 2011 Chignik total sockeye salmon run is 1.86 million sockeye salmon, which is less (465 thousand fish) than that predicted from ocean-age relationships and median estimates (2.32 million fish).

Time series analysis using 30 years of Chignik sockeye salmon return data, as well as the smolt forecast, approximate the median and ocean-age-class forecasts. Given this ancillary information, our confidence in this forecast is fair.

Mary Loewen, Finfish Research Biologist, Alaska Peninsula

**APPENDIX B. 2011 CHIGNIK SALMON SUBSISTENCE
PERMIT**

SELECT SUBSISTENCE FISHING REGULATIONS

These listed regulations are not inclusive of all the regulations that apply to subsistence salmon fishing in the Chignik Area.

5 AAC 01.015. SUBSISTENCE FISHING PERMITS AND REPORTS. (b)(3) Permits must be retained in the possession of the permittee and be readily available for inspection while taking fish. A person who transports subsistence-taken fish shall have a subsistence fishing permit in their possession.

5AAC 01.460.FISHING SEASONS. Fish, other than rainbow trout and steelhead trout, may be taken at any time, except as may be specified by a subsistence fishing permit. Rainbow trout and steelhead trout, taken incidentally in other subsistence finfish net fisheries, are lawfully taken and may be retained for subsistence purposes.

5 AAC.01.470. LAWFUL GEAR AND GEAR SPECIFICATIONS. (a) Salmon may be taken by seines and gillnets, or with gear specified on a subsistence fishing permit, except that salmon in Chignik Lake may not be taken with purse seines. A gillnet may not be set while staked, anchored, or otherwise fixed in a stream while it obstructs more than one-half of the width of the waterway.

5 AAC 01.475. WATERS CLOSED TO SUBSISTENCE FISHING. Salmon may not be taken (1) from July 1 through August 31, in the Chignik River from a point 300 feet upstream from the Chignik weir to Chignik Lake; (2) in Black Lake or any tributary to Black Lake or Chignik Lake except in Clark River and Home Creek from their confluence with Chignik Lake upstream one mile.

5 AAC 01.480. SUBSISTENCE FISHING PERMITS. (a) Salmon, trout and char may only be taken under the authority of a subsistence fishing permit.

- (b) Not more than 250 salmon may be taken for subsistence purposes unless otherwise specified on the subsistence fishing permit.
- (c) A record of subsistence-caught fish must be kept on the reverse side of the permit. The record must be completed immediately upon taking subsistence-caught fish and must be returned to the local representative of the department no later than December 31 of the year issued.

5 AAC 01.485. RESTRICTIONS ON COMMERCIAL FISHERMEN. (a) In the Chignik Area, a commercial salmon fishing license holder may not subsistence fish for salmon during the 12 hours before the first commercial salmon fishing period and the 12 hours following the closure of a commercial salmon fishing period. However, a commercial salmon fishing license holder may subsistence fish for salmon during a commercial salmon fishing period.

SPECIAL PERMIT PROVISIONS

1. The adipose fin must be removed from all subsistence-caught salmon immediately upon capture.
2. A commercial license holder may not fish for both subsistence and commercial salmon at the same time. Further, a commercial salmon vessel may not carry both subsistence and commercially caught salmon at the same time.
3. A commercial fishing vessel may not simultaneously carry both commercial seine and subsistence gillnet gear.
4. Commercial fishermen may always remove salmon from their commercial catch for home pack. Mark the number of salmon taken by species for home pack use on your fish ticket.
5. This permit can be withdrawn at any time.

NOTICE TO FISHERS:

Before you fish, be sure you know whose land you are on and check the regulations: State regulations apply on all state, private, and federal lands where authorized. Private landowners may restrict entry on their land. Federal lands may be closed to fishing except by certain rural residents. Persons standing on state or private lands should be sure their fishing activities are legal under state regulations. If you have questions regarding the federal subsistence fisheries, please contact the Federal Office of Subsistence Management at (800) 478-1456.
