

**Fishery Management Report No. 06-23**

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**Chignik Management Area Commercial Salmon  
Fishery Harvest Strategy, 2006**

by

**Kenneth A. Bouwens**

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April 2006

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries





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HARVEST STRATEGY, 2006**

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April 2006

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## **ABSTRACT**

This paper provides stakeholders with general information about how the Alaska Department of Fish and Game will manage the 2006 Chignik salmon fishery. The 2006 total sockeye salmon forecasted run for the Chignik River watershed is 1,490,000 fish. The total projected commercial harvest for both runs is 887,000 sockeye salmon. Approximately 703,000 sockeye salmon are expected to be harvested in the Chignik Management Area (CMA) and the remainder are expected to be harvested in the Southeastern District Mainland and Cape Igvak fisheries. The early run is expected to be strong in comparison to the late run. The first commercial fishing period in the Chignik Bay, Central, and Eastern districts will occur when approximately 20,000 sockeye salmon have passed the Chignik River weir. The first commercial fishing period in the Western and Perryville districts can occur on July 6, as long as Chignik River sockeye salmon escapement objectives are expected to be met. Subsistence salmon fishing permits will be available at the Chignik weir and from several other local vendors.

Key words: Chignik, sockeye salmon, Chinook salmon, pink salmon, chum salmon, coho salmon, Chignik Management Area, 2006 management.

## **INTRODUCTION**

This document was written to provide stakeholders with the basic framework of how the Alaska Department of Fish and Game (ADF&G) will manage the 2006 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). The CMA is divided into five fishing districts: Eastern, Central, Chignik Bay, Western, and Perryville, which are further divided into statistical reporting areas (5 AAC 15.200; Figure 2). The ADF&G manages the commercial salmon fisheries within the CMA to achieve escapement objectives for all salmon species while allowing for the harvest of fish surplus to the escapement objectives.

The Chignik cooperative salmon fishery management plan has been legally scrutinized since its adoption by the Alaska Board of Fisheries (BOF) in January 2002. In March of 2005, the Alaska Supreme Court ruled that the original regulation (5 AAC 15.359) contradicted the intent of the Limited Entry Act, and it was subsequently repealed. During May 2005, the BOF adopted an emergency regulation (5 AAC 15.358) that reestablished the Chignik cooperative. The emergency regulation attempted to address the concerns of the court by defining active participation by requiring a cooperative member to make a minimum of 10 deliveries in order to receive economic benefit from the fishery. The emergency regulation was then challenged in the Anchorage Superior Court, where the trial court judge ruled that the emergency regulation still violated the spirit and purposes of the Limited Entry Act, as described in the Alaska Supreme Court decision. However, the state appealed the Anchorage Superior Court decision to the Alaska Supreme Court and moved for stay of the decision until after the 2005 season, which was granted. The emergency regulation remained in effect for the 2005 fishing season. The BOF met again in November of 2005 and adopted the emergency management plan (with some modification) into regulation. In February of 2006 the Alaska Supreme Court ruled that the emergency regulation, and therefore the newly adopted cooperative plan, was not legal. Hence, the 2006 Chignik commercial salmon fishery will not be managed under a cooperative management plan.

## **GEAR DESCRIPTION**

Purse and hand purse seines are the only legal commercial salmon fishing gear within the CMA. Legal seine gear may 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. More specific seine specifications concerning the CMA are listed in 5 AAC 15.332.

## **CLOSED WATERS**

Closed water areas within the CMA are described in 5 AAC 15.350. All boundaries will be 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; the actual posted marker location supersedes the closed waters description as published in regulation (5 AAC 39.290).

## **REPORTING REQUIREMENTS**

The tender and processor requirements are detailed in the Chignik Area commercial fishing regulations (5 AAC 15.355). Processors are required to report the prior day's catch information to the ADF&G by 10:00 AM daily by e-mail, telephone, or radio (SSB or VHF). The preferred method of catch reporting is e-mailing an Excel spreadsheet (a template will be provided) to Chignik weir staff (kenneth\_bouwens@fishgame.state.ak.us). 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).

Fishermen are reminded that all salmon caught must be reported on an ADF&G fish ticket. Commercially caught salmon kept for personal use shall be recorded as such on the fish ticket. 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), which will be strictly enforced.

## **EMERGENCY ORDERS AND NEWS RELEASES**

Fishing periods will be established by emergency order when salmon abundance is expected to exceed escapement requirements. News releases will be issued prior to fishery openings to notify the fishermen and processors of any impending commercial fishing period. News releases will be broadcast over VHF channel 6 and sent via e-mail to interested parties at the time of release. Please contact the Chignik weir to be placed on the e-mail list. In addition, information including catch, escapement, and other fishery data will be broadcast over VHF channel 6 at 9:15 AM and 6:15 PM daily, and data will also be posted at the Region IV web page [www.cf.adfg.state.ak.us/region4/finfish/salmon/salmhom4.php](http://www.cf.adfg.state.ak.us/region4/finfish/salmon/salmhom4.php).

## **2006 SALMON FORECASTS**

### **SOCKEYE SALMON**

Preseason salmon forecasts are created to provide fishermen and industry personnel information concerning the expected run strength for the upcoming season for planning purposes. ADF&G utilized these forecasts to formulate a general preseason management strategy; however, the fishery is managed based on inseason indicators of actual run strength as they become available.

## **Total Run**

The 2006 total sockeye salmon *Oncorhynchus nerka* run for the Chignik River watershed is forecasted at 1,490,000 fish (Appendix A1; Eggers 2006). The early run peaks in late June and returns primarily to Black Lake. The late run peaks in late July and returns primarily to Chignik Lake. The total projected commercial harvest for both runs is 887,000 sockeye salmon, of which approximately 703,000 sockeye salmon are expected to be harvested in the CMA. The remainder are expected to be harvested in the Southeastern District Mainland (SEDM) and Cape Igvak fisheries (5 AAC 09.360 and 5 AAC 18.360).

## **Black Lake (Early Run)**

The early run is projected to be 1,210,000 sockeye salmon (Appendix A1; Eggers 2006). The escapement goal range for the early run is from 350,000 to 400,000 sockeye salmon (Table 1; Witteveen et al. 2005).

## **Chignik Lake (Late Run)**

The late run is projected to be approximately 282,000 sockeye salmon (Appendix A1). The escapement goal range for the late run is 200,000 to 250,000 sockeye salmon (Witteveen et al. 2005). At the November 2004 BOF meeting, the BOF directed ADF&G to escape an additional 25,000 sockeye salmon in August (75,000 total) in addition to the 25,000 sockeye salmon the department had been attempting to escape from September 1 to 15 to meet late-season subsistence requirements. Therefore, the department will manage for a late-run escapement of 250,000 to 300,000 sockeye salmon through September 15 (Table 1). Because of the forecasted small late-run size, the late-run sockeye salmon commercial harvest is expected to be very low.

## **OTHER SALMON SPECIES**

Forecasts for the Chignik Management Area Chinook *O. tshawytscha*, pink *O. gorbuscha*, chum *O. keta*, and coho *O. kisutch* salmon harvests have been based on historic harvest levels. Historical harvest averages are currently not a reliable predictor of future harvests because only sockeye salmon have been targeted by the commercial fishery in recent years. Therefore, no harvest projections are reported for species other than sockeye salmon.

# **2006 CHIGNIK SALMON MANAGEMENT**

## **JUNE**

By regulation, the first commercial salmon fishing period can occur when 20,000 sockeye salmon have escaped past the Chignik River weir (5 AAC 15.357 (b)(1)). However, if ADF&G determines that a strong buildup of sockeye salmon exists in Chignik Lagoon and that 20,000 sockeye salmon will escape into the Chignik River, the department may open the commercial fishery before 20,000 sockeye salmon have passed the weir. The purpose of this regulation is to allow subsistence fishing opportunity prior to the commercial fishing season while avoiding a large buildup of salmon in the lagoon. The department will likely begin test fishing on or about June 2 to assess any salmon buildup in Chignik Lagoon. The department may test fish several times in early June depending on test fish vessel catch rates and escapement levels (Poetter and Bouwens *In prep*).

The first commercial fishing period is likely to last 48 hours. It will begin using the Humes Point markers, and then possibly moving to the Mensis Point markers after 24 hours. During the 2006 salmon season, opening and closing commercial salmon fishing between the Humes and Mensis

Point markers may be utilized as a management tool for providing quality salmon and for assessing the run strength. The Pillar Rock markers will not be used in 2006 (Figure 3).

Subsequent commercial fishing periods will be determined through the evaluation of several factors, including the achievement of interim escapement objectives, commercial and subsistence catches, and test fishing results (Table 1). During June, commercial salmon fishing may only be allowed in the Chignik Bay, Central, and Eastern districts (Figure 2). Through approximately June 26, these districts are required to open and close concurrently (5 AAC 15.357 (c)(1)).

## **TRANSITION PERIOD**

The transition between the early and late runs typically takes place in late June and early July. Prior to 2004, scale pattern analysis (SPA) was used to differentiate stock composition during this time, and the fishery was managed based on the results of this analysis. This program was discontinued prior to the 2004 season. It was found that, on average, the number of early-run sockeye salmon that passed the Chignik weir after July 4 was approximately equal to the number of late-run sockeye salmon that passed the weir prior to July 4. During the transition period the 2006 fishery will be managed based on the achievement of interim escapement objectives targeting the early-run escapement goal of 350,000 to 400,000 ending at MIDNIGHT July 4 (Table 1).

The Chignik Bay and Central districts will be managed based on Chignik River interim sockeye salmon escapement objectives (Figure 2). The Eastern District will likely be closed during the transition period until the strength of Chignik River sockeye salmon late run can be determined. The Western and Perryville districts will also remain closed during the transition period.

## **JULY**

The Chignik Bay and Central districts (Figure 2) will be primarily managed based on Chignik River sockeye salmon run strength in July (Table 1). The Chignik River sockeye salmon escapement objectives for July range from 150,000 to 200,000 sockeye salmon (Table 1). The Chignik River Chinook salmon escapement goal is 1,300 to 2,700 fish (Witteveen et al. 2005). If Chinook salmon escapement in early July is weak and the escapement goal is unlikely to be met, the areas above the Humes Point markers may be closed to improve Chinook salmon escapement by removing commercial fishing pressure from areas where they may mill in the Chignik Lagoon before entering the Chignik River (Figure 3).

In July, the Eastern District (Figure 2) will be managed for pink and chum salmon. The first commercial salmon fishing period after the transition period in the Eastern District can occur as early as July 8, 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 expected Chignik River sockeye salmon escapement levels. The entire district will be opened to commercial salmon fishing only if interim Chignik River sockeye salmon escapement objectives are expected to be met and a harvestable surplus of sockeye salmon is expected.

If surplus Chignik River sockeye salmon are not expected to be available for harvest, then fishing periods in terminal areas in the Eastern District (Figure 2) 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 streams.

Pink and chum salmon 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 expected to be available for harvest. These early July periods will likely take place south of a line drawn from Cape Itki to Coal Cape to Cape Alexander, and outside of Ivanof Bay south of Alexander Point (the Cape Itki Line; Figure 4). Depending on expected Chignik River sockeye salmon run strength, those portions of the Central, Chignik Bay, and Western districts known as “Jacks 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 to this time will depend on pink and chum salmon fishery performance (CPUE) as compared to historical catch records and expected Chignik River sockeye salmon escapements. No more than 60,000 coho salmon may be taken from July 22 to 31 in the Western and Perryville districts south of the Cape Itki line (5 AAC 15.357). If coho salmon harvest approaches this number, these districts will be closed until August.

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 4). 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 streams.

## **AUGUST AND SEPTEMBER**

The Chignik Bay and Central districts (Figure 2) will be managed based on Chignik River sockeye salmon run strength. The CMA will be managed to meet the escapement objectives for August of 75,000 sockeye salmon, and for September 1-15 of 25,000 sockeye salmon (Table 1). If the late run returns as forecasted, it is unlikely there will be any commercial salmon fisheries in the Chignik Bay or Central districts in August and September.

The Chignik weir will be removed on 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 can be 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). Post-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;
- Allowing a weekly fishing schedule of less than 48 hours, if the sockeye and or coho salmon run strength is determined to be weak; and
- Allowing for a complete closure.

After July, the Eastern District (Figure 2) will be managed based on local pink, chum, and coho salmon abundance. Fishing times and areas will be based on actual escapement counts to local streams. Individual areas may be opened to directed fisheries if production surplus to escapement needs is evident in local 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 escapement objectives.

Until approximately August 20, the Western and Perryville districts (Figure 2) will be managed based on local pink and chum salmon abundance. Fishing times and areas will be based on pink and chum escapement counts to local streams. Individual areas may be opened to directed fisheries if production surplus to escapement needs is evident. District-wide openings will not be possible unless Chignik River sockeye salmon escapement objectives are expected to be met and overall pink and chum salmon abundance is sufficient to meet escapement objectives. After August 20, fishing time in the Western and Perryville districts will be dependent on Chignik River sockeye salmon escapement and local coho salmon abundance.

## **2006 SUBSISTENCE SALMON FISHERY**

All subsistence salmon fishermen must obtain a subsistence salmon permit for the 2006 season (5 AAC 01.015; Appendix B1). The permits will be available at the Chignik weir and from several local vendors. It is imperative that users report their catches on the permit; these data are used by ADF&G to assess the subsistence salmon fishery.

A person who does not hold a commercial salmon fishing license (CFEC permit or those with a 2006 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 during the 12 hours before or after a commercial salmon fishing period.

The BOF opened waters of the Chignik River to subsistence salmon fishing at their November 2004 meeting. However, the reach of river beginning 100 yards upstream of the Chignik weir to Chignik Lake will be closed to subsistence salmon fishing from July 1 to August 31 to protect spawning Chinook salmon. The reach of the Chignik River below the weir is open to subsistence salmon fishing year round. The Chignik River is closed to all fishing 100 yards upstream and downstream of the weir when the weir is installed.

Subsistence fishermen are reminded that purse-seine gear is not allowed for the taking of subsistence salmon in Chignik Lake. Also, 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)), and that subsistence fishermen must carry their subsistence fishing permit with them while fishing. The adipose fin must be removed from all subsistence-caught salmon.

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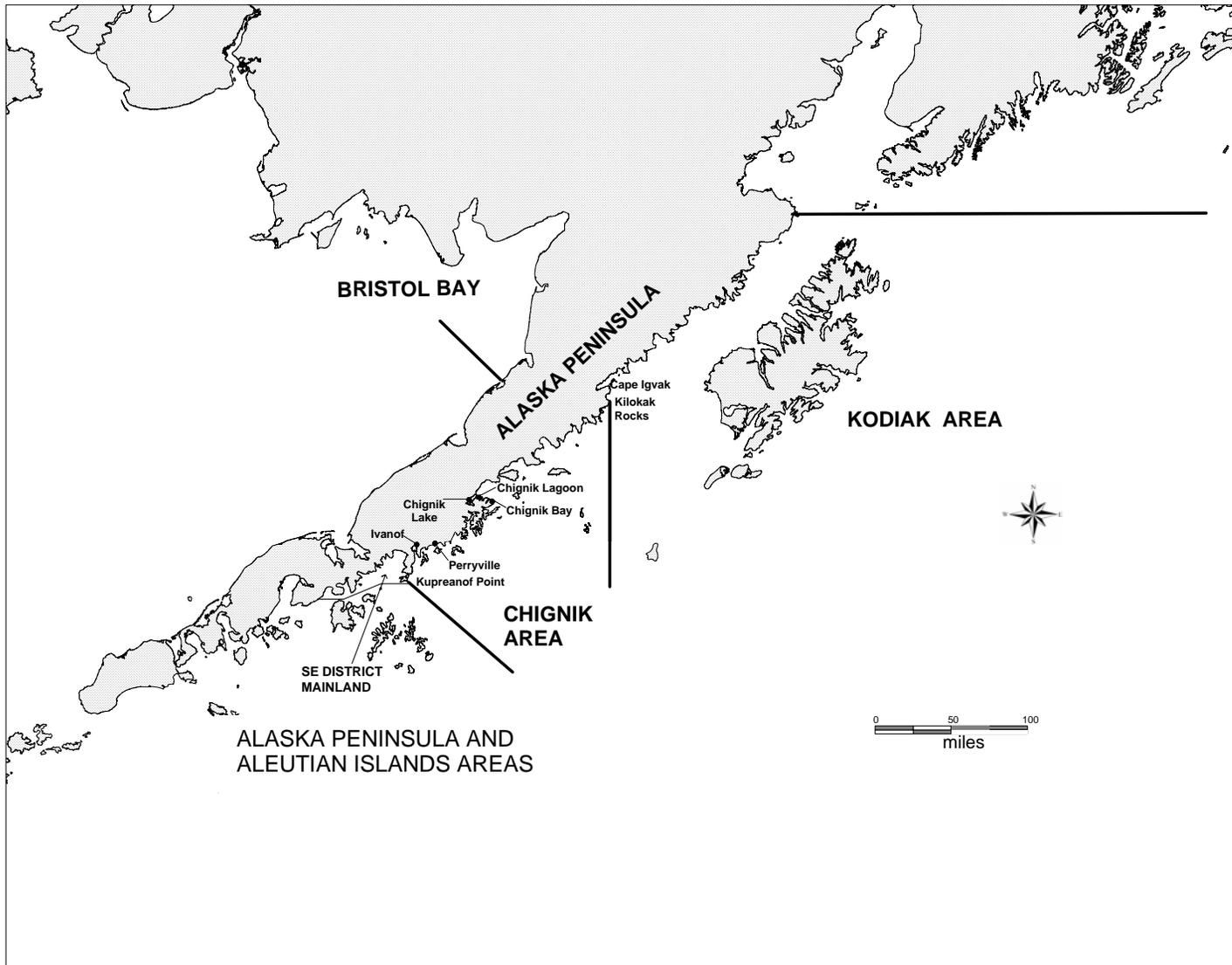


## **TABLES AND FIGURES**

**Table 1.-Chignik River sockeye salmon interim escapement objectives, 2006.**

Date	Escapement		Date	Escapement	
	Lower	Upper		Lower	Upper
June 2	500	- 1,000	August 3	4,500	- 10,500
June 4	2,000	- 3,000	August 6	8,250	- 21,750
June 6	5,000	- 7,000	August 9	15,000	- 30,000
June 8	10,000	- 14,000	August 12	22,500	- 37,500
June 10	20,000	- 25,000	August 15	30,000	- 45,000
June 12	30,000	- 40,000	August 18	37,500	- 52,500
June 14	50,000	- 70,000	August 21	45,000	- 60,000
June 16	75,000	- 110,000	August 24	53,250	- 66,750
June 18	125,000	- 160,000	August 27	64,500	- 70,500
June 20	175,000	- 220,000	August 31	75,000	- 75,000
June 22	225,000	- 275,000			
June 25	275,000	- 325,000	September 3	3,000	- 4,000
June 28	300,000	- 350,000	September 5	6,000	- 8,000
July 1	325,000	- 375,000	September 7	10,000	- 12,000
July 4	350,000	- 400,000 <sup>a</sup>	September 9	14,000	- 16,000
			September 11	18,000	- 20,000
July 6	5,000	- 10,000	September 13	22,000	- 23,000
July 8	15,000	- 20,000	September 15	25,000	- 25,000
July 10	30,000	- 40,000			
July 12	45,000	- 60,000	<b>Objectives through July</b>		
July 14	56,000	- 75,000	<b>4: 350,000 - 400,000</b>		
July 16	67,000	- 95,000			
July 19	86,000	- 115,000	<b>July 5 through Sept. 15</b>		
July 21	101,000	- 135,000	<b>Objectives: 250,000 - 300,000</b>		
July 23	120,000	- 160,000			
July 26	135,000	- 180,000			
July 29	146,000	- 195,000			
July 31	150,000	- 200,000			

<sup>a</sup> Through 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.



**Figure 1.**-Map of the Alaska Peninsula illustrating the relative locations of the Chignik, Kodiak, and Alaska Peninsula Management areas.

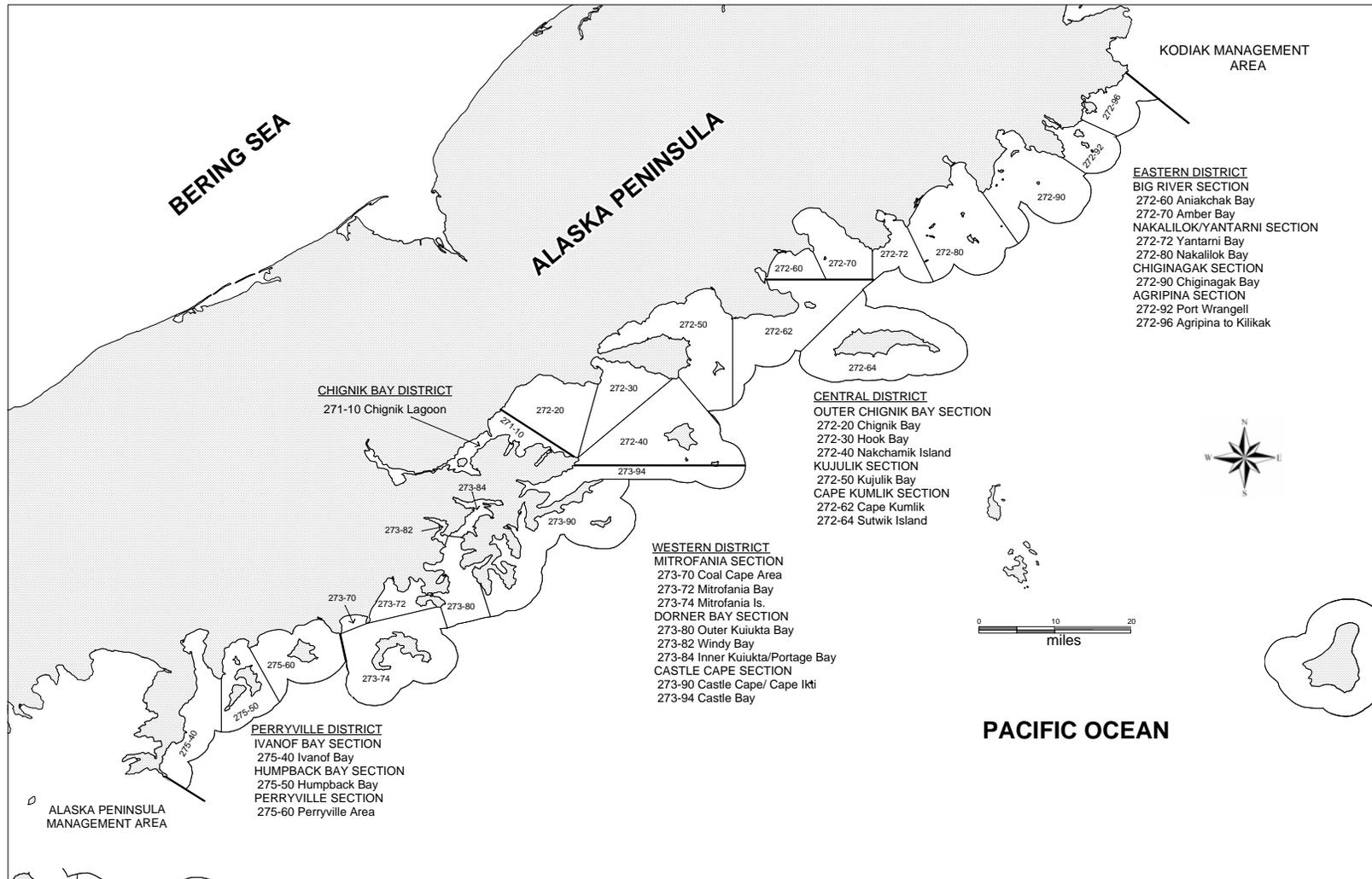
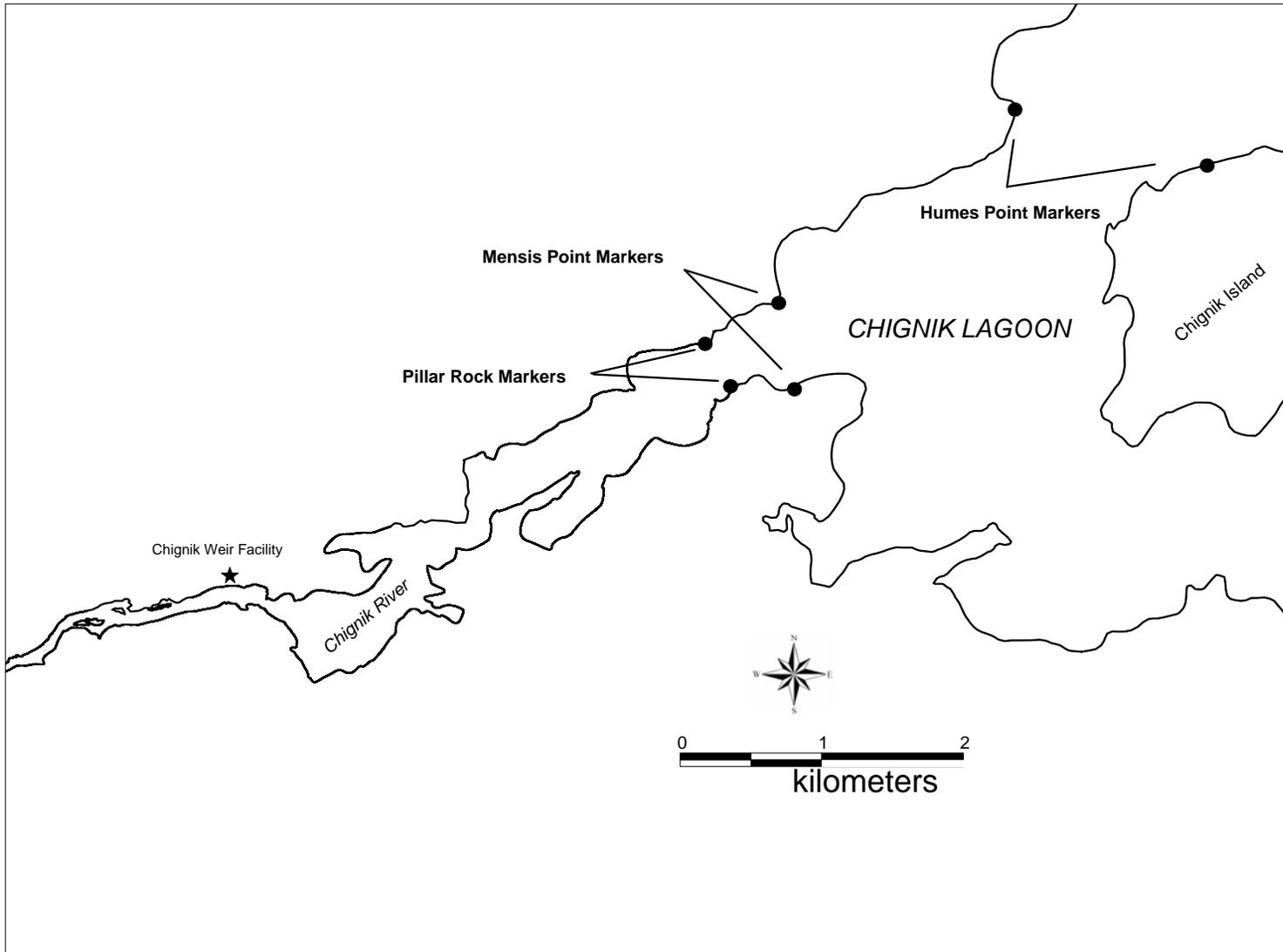
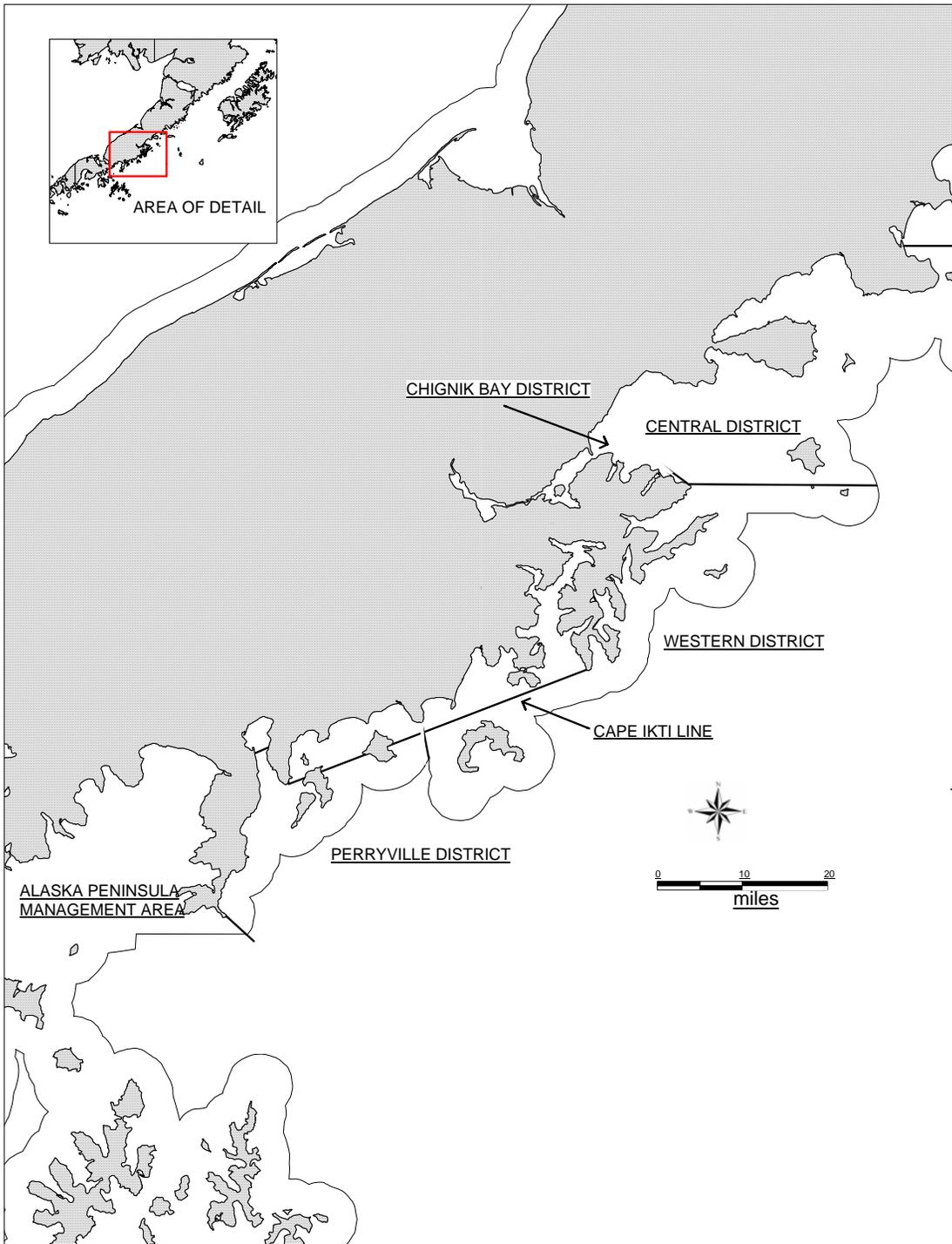


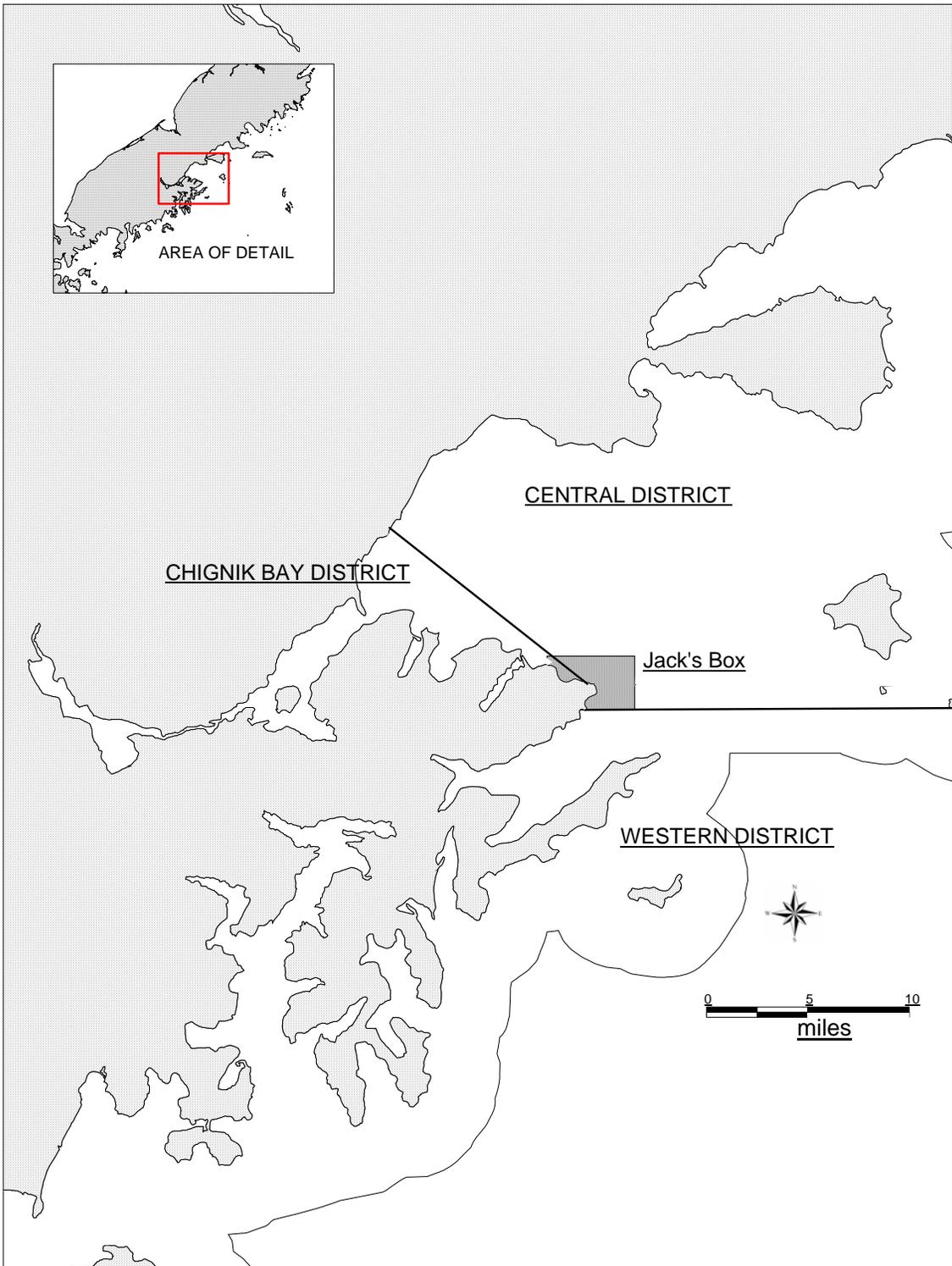
Figure 2.-Map of the Chignik Management Area illustrating district boundaries and statistical areas.



**Figure 3.-**Map of upper Chignik Lagoon showing the location of the Pillar Rock, Mensis Point, and Humes Point marker locations.



**Figure 4.-**Map depicting the “Cape Itki Line” in the Western and Perryville districts.



**Figure 5.-**Map depicting “Jack’s Box” in the Chignik Bay, Central, and Western districts.



## **APPENDIX A. 2006 CHIGNIK SOCKEYE SALMON FORECAST**

**Appendix A1.-2006 Chignik sockeye salmon forecast.**

Preliminary Forecast of the 2006 Run		Forecast Estimate (thousands)	Forecast Range (thousands)
<b>Total Production:</b>			
<b>Early Run (Black Lake)</b>	Total Run Estimate	1,210	506–1,905
	Escapement Goal	350	350–400
	Harvest Estimate <sup>a</sup>	855	
<b>Late Run (Chignik Lake)</b>	Total Run Estimate	282	74–490
	Escapement Objective <sup>b</sup>	250	250–300
	Harvest Estimate <sup>c</sup>	32	
<b>Total Chignik System</b>	Total Run Estimate	1,490	579–2,390
	Escapement Objective <sup>b</sup>	600	600–700
	Harvest Estimate <sup>a</sup>	887	

<sup>a</sup> These figures include harvests of Chignik-bound sockeye salmon from the Southeastern District Mainland and the Cape Igvak fisheries; approximately 703 thousand sockeye salmon are projected to be harvested in the Chignik Management Area.

<sup>b</sup> The Chignik Lake late-run escapement goal is 200,000 to 250,000 sockeye salmon, resulting in an escapement goal for the entire run of 550,000 to 650,000. However, managers try to achieve an additional escapement objective of 50,000 sockeye salmon in August and September.

<sup>c</sup> No harvest of Chignik Lake late-run sockeye salmon was predicted to occur as the total run estimate does not allow for the achievement of the late-run escapement goals.

**Forecast Methods**

The forecasts for the 2006 early and late Chignik sockeye salmon runs were based on available data from 1980 to the present. Simple linear regressions were modeled using sibling, outmigration year, escapement age class, temperature data, and year class return relationships. Each regression model was assessed with standard regression diagnostic procedures. Regression models were only used in cases where the slope of the regression was significantly different from zero ( $P < 0.25$ ). The variance of each estimate was calculated from the error structure of the regression. Prediction intervals were estimated at a coverage probability of 80 percent. Median estimators were used to estimate production of age classes where regression relationships were not significant.

The predicted 2006 early-run ocean age three (3-ocean) sockeye salmon returns were estimated based on the abundance of prior ocean age two (2-ocean) sockeye salmon ( $P = 2.2 \times 10^{-5}$ ). Eighty-percent prediction intervals were calculated using the variance of the regression model. Following non-significant regression results, the early-run ocean age one (1-ocean; ages 1.1 and 2.1), 2-ocean (ages 0.2, 1.2, 2.2, and 3.2), and ocean age four (4-ocean; ages 1.4 and 2.4) age class components were predicted by calculating the median returns. Prediction intervals for each median were calculated using the 10<sup>th</sup> and 90<sup>th</sup> percentiles of the returns.

Ocean age class relationships and temperature indices were analyzed for the late run forecast. Two-ocean sockeye salmon were predicted from prior year 1-ocean returns using simple linear regression, ( $P = 2.1 \times 10^{-4}$ ). Three-ocean sockeye salmon were predicted by regressing the ratio between 3- and 2-ocean fish (same outmigration year) on a temperature index ( $P = 0.003$ ). The temperature index was constructed using the average summer temperatures (May through September) from the corresponding outmigration year. Temperature data were obtained from the King Salmon Airport climate database. Four-ocean sockeye salmon were predicted from prior year 3-ocean returns using simple linear regression, ( $P = 3.7 \times 10^{-3}$ ). Estimates of variance were calculated from each regression. Ocean age one sockeye salmon were predicted by calculating the median return and prediction intervals were calculated using the 10<sup>th</sup> and 90<sup>th</sup> percentiles of the returns. The variances associated with individual regression estimates by age class were summed to calculate 80 percent prediction intervals.

The total early- and late-run forecasts were calculated by summing individual and pooled age class estimates. When the median returns by age class were used, the 10<sup>th</sup> and 90<sup>th</sup> percentiles of the data were used to describe the range of the data. The variances associated with individual estimates were summed to estimate 80 percent prediction

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intervals, which were then added to the percentile estimates to calculate the forecast ranges. Regression and median estimates were summed to estimate the total Chignik watershed sockeye salmon run for 2006; 80 percent prediction intervals for the total run were calculated by combining the regression and median prediction intervals.

### **Forecast Discussion**

The 2006 sockeye salmon run to the Chignik River is expected to be approximately 1.49 million fish. The early run is expected to be approximately 1.21 million fish. The late run is expected to be approximately 282 thousand fish. The 2006 sockeye salmon run to Chignik is expected to be approximately 963 thousand fish less than the recent 10-year average run (2.45 million) and 714 thousand fish less than the 2005 run (2.20 million).

The projected harvest estimate for the early run of 855 thousand fish is based on achievement of the lower end of the early-run escapement goal range of 350 thousand fish. The projected harvest estimate for the late run of 32 thousand is based on achievement of the lower end of the late-run management objective range through September 15 (250,000 sockeye salmon). Harvest estimates for the both runs include Chignik-bound sockeye salmon harvested in the Cape Igvak Section of the Kodiak Management Area and the Southeastern District Mainland of the Alaska Peninsula Management Area.

Approximately 82 percent of the 2006 early run was estimated using ocean age class relationships. Using sibling relationships, the 2005 early run was overestimated by approximately 26 percent. Approximately 98 percent of the 2006 late run was estimated using simple linear regression relationships incorporating temperature indices. Climate indices were initially used in 2004 to forecast the 2005 Chignik late-run using ocean age class ratio simple regression models, which underestimated the late run by approximately 11 percent. Prior to 2004, median estimators have typically been used due to poor sibling relationships.

Available smolt data were analyzed and a significant multiple linear regression relationship was found using the total number of outmigrating smolt and a temperature index to predict the subsequent 3-ocean returns (about 82.6 percent of the run). This estimate was then expanded proportionally to account for other ocean ages not calculated by the simple regressions. The temperature index was constructed using the average temperatures during April through November from the corresponding outmigration year. Temperature data were obtained from the King Salmon Airport climate database. In 2005, returns were predicted using a different multiple regression approach which underestimated the total run by about 41 percent. The smolt-based forecast of the 2006 Chignik total sockeye salmon run is 954 thousand sockeye salmon, which is significantly less (533 thousand) than that predicted from ocean-age and sibling relationships and median estimates (1.49 million).

The disparity between the smolt forecast and the ocean age class forecast suggests the actual run may fall in the lower half of the forecast range. Given this ancillary information, our confidence in this forecast is fair.

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Mark Witteveen, Finfish Research Biologist, Kodiak



**APPENDIX B. 2006 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.

**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.

**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 a commercial salmon fishing period or the 12 hours following 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. 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.
2. Commercial fishermen may always remove salmon from their commercial catch for personal use. Mark the number of salmon taken by species for personal use on your fish ticket.
3. All subsistence caught salmon must be clearly marked by removing the fish's adipose fin upon capture.
4. This permit can be withdrawn at any time.