

Regional Operational Plan CF.4K.2015.07

**Chignik River Sockeye Salmon Escapement and
Genetic Stock Identification Sampling Operational
Plan, 2015**

by

Charles W. Russell

April 2015

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)		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				

REGIONAL OPERATIONAL PLAN CF.4K.2015.07

**CHIGNIK RIVER SOCKEYE SALMON ESCAPEMENT AND GENETIC
STOCK IDENTIFICATION SAMPLING OPERATIONAL PLAN, 2015**

by

Charles W. Russell,

Alaska Department of Fish and Game, Division of Commercial Fisheries, Kodiak

Alaska Department of Fish and Game
Division of Commercial Fisheries

April 2015

The Regional Information Report Series was established in 1987 and was redefined in 2006 to meet the Division of Commercial Fisheries regional need for publishing and archiving information such as project operational plans, area management plans, budgetary information, staff comments and opinions to 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/>.

Charles W. Russell
Alaska Department of Fish and Game, Division of Commercial Fisheries
351 Research Court, Kodiak, AK 99615, USA

This document should be cited as:

Russell, C. W. 2015. Chignik River sockeye salmon escapement and genetic stock identification sampling operational plan, 2015. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Operational Plan CF.4K.2015.07, Kodiak.

The Alaska Department of Fish and Game (ADF&G) administers all programs and activities free from discrimination based on race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act (ADA) of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972.

If you believe you have been discriminated against in any program, activity, or facility please write:

ADF&G ADA Coordinator, P.O. Box 115526, Juneau, AK 99811-5526

U.S. Fish and Wildlife Service, 4401 N. Fairfax Drive, MS 2042, Arlington, VA 22203

Office of Equal Opportunity, U.S. Department of the Interior, 1849 C Street NW MS 5230, Washington DC 20240

The department's ADA Coordinator can be reached via phone at the following numbers:

(VOICE) 907-465-6077, (Statewide Telecommunication Device for the Deaf) 1-800-478-3648, (Juneau TDD) 907-465-3646, or (FAX) 907-465-6078

For information on alternative formats and questions on this publication, please contact:

ADF&G Division of Sport Fish, Research and Technical Services, 333 Raspberry Road, Anchorage AK 99518 (907) 267-2375.

SIGNATURE PAGE

Project Title: Chignik River Sockeye Salmon Escapement and Genetic Stock Identification Sampling Operational Plan, 2015

Project Leader(s): Dawn Wilburn, Fishery Biologist III
Mary Beth Loewen, Fishery Biologist II

Division, Region and Area: Division of Commercial Fisheries, Region IV, Kodiak

Project Nomenclature:

Period Covered: June 1, 2015–September 1, 2016

Field Dates: June 1–September 1

Plan Type: Category II

Approval

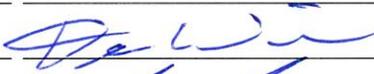
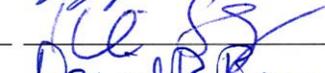
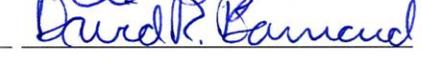
Title	Name	Signature	Date
Project Leader	Dawn Wilburn		4/7/2015
Project Leader	Mary Beth E. Loewen		4.7.2015
Section Supervisor	Jeff Wadle		4/7/15
Regional Editor	Kevin Schaberg		4/7/15
Biometrician	Dave Barnard		7 Apr 2015

TABLE OF CONTENTS

	Page
LIST OF FIGURES	iii
LIST OF APPENDICES	iii
PURPOSE.....	1
INTRODUCTION	1
GOAL	2
OBJECTIVES.....	2
SUPERVISION	2
PROCEDURES	2
Sockeye Salmon	2
Escapement Sampling.....	2
Genetic Sampling.....	3
Black Lake Sampling.....	4
Sample Processing	4
REFERENCES CITED	5
FIGURES	7
APPENDIX A. GENETIC SAMPLING PROCEDURES	11
APPENDIX B. CHIGNIK SAMPLING FORM	15
APPENDIX C. CHINOOK SALMON SAMPLING PROCEDURES.....	17
SAMPLING PROCEDURES	18
Weir Trap Sampling	18
Sport Harvest Sampling	18
Sample Processing and Recording.....	18

LIST OF FIGURES

Figure	Page
1. Map of the Alaska Peninsula illustrating the relative locations of the Chignik, Kodiak, and Alaska Peninsula Management Areas.	8
2. Map of the Chignik Management Area illustrating commercial salmon fishing district boundaries and statistical areas.....	9

LIST OF APPENDICES

A1. Procedure for collecting genetic tissue.....	12
A2. Proposed sampling dates at Chignik River weir, 2015.....	14
B1. The Chignik Inseason Genetic Stock Identification Sampling Form.	16
C1. Age, sex and length sampling procedures for Chinook Salmon.	18

PURPOSE

The Alaska Department of Fish and Game samples sockeye salmon *Oncorhynchus nerka* at the Chignik River weir for age, sex, and length determination to provide information for preseason run forecasts, escapement goal evaluation, and run reconstruction. Every week throughout the season, 240 sockeye salmon are sampled. Sockeye salmon scales are collected using established protocols common to the Westward Region. In order to achieve escapement goals for the Black Lake and Chignik Lake sockeye salmon stocks simultaneously, while maximizing surpluses available to subsistence and commercial harvesters, inseason estimates of the proportion of each stock in the daily escapement into the Chignik River are required. Genetic stock identification can be used to identify the proportion of Black Lake early-run and Chignik Lake late-run fish as they pass the Chignik River Weir. During 2015, fin clips will be taken from sockeye salmon caught in the Chignik River weir trap and preserved in ethanol. Samples will be expedited to the Gene Conservation Laboratory in Anchorage for inseason analysis.

Key words: Chignik Management Area, escapement, sockeye salmon, scale samples, ASL, 2015 management, genetic stock identification, sampling, Black Lake, Chignik Lake

INTRODUCTION

The Chignik Management Area (CMA; Area L) includes all coastal waters and inland drainages on the south side of the Alaska Peninsula between Kilokak Rocks and Kupreanof Point (Figure 1). The CMA is bordered by the Alaska Peninsula Management Area (Area M) to the west and the Kodiak Management Area (Area K) to the east. The CMA is divided into five districts: the Eastern, Central, Chignik Bay, Western, and Perryville districts (Figure 2). These districts are further broken down into sections and statistical reporting areas (Figure 2). The Chignik River system is the largest sockeye salmon *Oncorhynchus nerka* producer within the CMA. The Chignik River weir and Alaska Department of Fish & Game (ADF&G) field office facility is located three miles upriver from the Chignik Lagoon.

There are primarily two runs of sockeye salmon that spawn in the Chignik River watershed. The majority of the early run enters the Chignik watershed in June and July and ascends to Black Lake and its tributaries (Narver 1966). The late run enters the Chignik watershed between mid-June and September and spawns primarily along the beaches and tributaries of Chignik Lake. There is substantial temporal overlap of the two runs each year during late June and early July, and the actual proportion of each run within the overlap is undefined. In order to protect harvest levels and ensure future run productivity, inseason management of each stock is required to accurately meet each run's escapement goal.

To achieve escapement goals for the Black Lake and Chignik Lake stocks simultaneously, as well as maximize surpluses available to subsistence and commercial harvesters, inseason estimates of the proportion of each stock in the daily escapement to the Chignik River are required. Prior to 1980, time-of-entry relationships based on tagging studies and age groups were employed to divide the catch and escapement between the two runs. From 1980 to 2003, with the exception of 1982, stocks were separated using scale pattern analysis (Witteveen and Botz 2004). Beginning in 2004, an estimate of the total escapement of the Black Lake early-run sockeye salmon was based on weir counts through July 4. After July 4, the fish that passed upstream through the weir were assumed to be Chignik Lake late-run sockeye salmon (Witteveen *unpublished memorandum*)¹. Beginning in 2010, Genetic Stock Identification (GSI) was used to separate the early- and late-run stocks, but not until 2013 were results quantified inseason. In

¹ Witteveen, M. J. Unpublished memorandum. Chignik River inseason run apportionment. Alaska Department of Fish and Game, Kodiak memorandum addressed to Denby S. Lloyd, dated May 28, 2004.

comparison to the current management early/late switch date of July 4, logistic run timing during the overlap period suggests that utilizing inseason genetic information would result in more biologically sound escapement-based management (Anderson et al. 2013).

Annually, ADF&G samples sockeye salmon from the Chignik River escapement for biological characteristics (age, sex, and length; ASL). These samples provide the foundation for preseason run forecasts, escapement goal evaluation, and accurate assignment of the run to stock of origin (run reconstruction). In 2015, in addition to ASL, GSI will be collected during the overlap period to estimate the stock proportions of early and late-run sockeye salmon passing the weir and will be determined inseason to assist management of the fishery (Appendices A and B). Therefore, it is important that all data are collected following established protocols.

GOAL

The goal of this project is to collect ASL composition data and GSI samples from sockeye salmon escapement at the Chignik River weir that will be used to assist with commercial fishery management and mixed-stock analysis.

OBJECTIVES

1. Collect a random sample of 240 sockeye salmon per statistical week for ASL data at the Chignik weir.
2. Collect tissue samples for GSI from 190 individual sockeye salmon passing the Chignik River weir once every four days during the overlap time period between the early and late run. The sampling period will occur approximately from June 27 through July 17 totaling 6 strata.
3. Collect a random sample of 1,200 sockeye salmon from the outlet of Black Lake for ASL data.
4. During sockeye salmon sampling, opportunistically sample any Chinook salmon caught in the trap for ASL data (Appendix C).

SUPERVISION

The Assistant Area Management Biologist for the CMA and will oversee inseason sampling at the Chignik River weir and serve as the lead project biologist. The project biologist will schedule and monitor Chignik weir and Black Lake sampling, ensure data quality, quantity and timeliness, determine the age of all sockeye salmon scales, and provide feedback to the sampling crew as well as research staff regarding project progression and quality. A logbook will be maintained by the project biologist tracking weekly samples. Mary Beth Loewen is a finfish research biologist in the Westward Region and will oversee project progress inseason and along with the Chignik Area Management Biologist, Dawn Wilburn, analyze stock composition estimates both in and post season.

PROCEDURES

SOCKEYE SALMON

Escapement Sampling

A fish trap incorporated into the Chignik River weir will be used to capture fish for ASL sampling. Sockeye salmon will be randomly sampled from the trap for ASL data using methods

described in Wattum (*in prep*). When possible, all scales will be collected from the preferred area of each fish following procedures outlined by the International North Pacific Fisheries Commission (INPFC) (INPFC 1963). It is essential that samples be representative of the escapement and unbiased by not pre-selecting fish based upon size, sex, condition or any other factor.

During 2015, the sampling weeks start on Sunday and end the following Saturday. When possible, 80 sockeye salmon will be sampled for ASL data per sampling event on alternating days (e.g., Sunday, Tuesday, Thursday), totaling 240 ASL samples per statistical week (Thompson 1987). Sampling weeks and corresponding calendar dates are listed in Wattum (*in prep*). These data will be clearly marked as “Chignik weir escapement samples” (location code 071; Wattum *in prep*).

If escapement numbers decline and there is concern that the minimum sample size will not be achieved, adjustments in sampling efforts will be implemented so that the weekly goal of 240 samples is met. The camera gates installed in the Chignik River weir may be closed during the operation of the fish trap to increase the number of fish captured in the weir’s fish trap. When the trap catch at the Chignik River weir is not adequate to fulfill ASL sampling needs, additional samples may be collected from the Chignik Lagoon commercial harvest (statistical area 271-10). These data will be clearly marked as Chignik commercial catch samples (location code 072; Wattum *in prep*). At the start of each season, the project leader will train new technicians and review training for returning technicians in ASL and tissue sample collection from sockeye salmon at the Chignik River weir.

In addition to sampling sockeye salmon, any Chinook salmon captured in the trap will also be sampled for ASL data. The weir crew will also sample Chinook salmon for ASL data from the sport fish and subsistence harvests as time allows. See Appendix C for detailed instructions in Chinook ASL data sampling.

Genetic Sampling

On days when GSI tissue collection is scheduled to occur (Appendix A2), paired non-lethal tissue samples and ASL samples will be collected from 190 fish by the crew. An axillary process will be clipped from each sockeye salmon and placed in ethanol in an individually labeled cryovial (Appendix A1). When possible, all scales will be collected from the preferred area of each fish following procedures outlined by the International North Pacific Fisheries Commission (INPFC 1963). All scales will be aged by either the Chignik Area Management Biologist or the Assistant Area Management Biologist at the Chignik River weir facility, following designation criteria established by Mosher (1968).

All samples will be recorded on the *Chignik Inseason GSI Sampling Form* (Appendix B1). Samplers must be careful to track the fish number on the scale card and the scale card number and make sure they are aligned with the proper cryovial number for fin clip samples. In 2015, samples will be shipped via PenPak or Lake Clark Air to the ADF&G Gene Conservation Laboratory in Anchorage on the day of collection or as soon as possible if weather constraints prevent shipment on the sampling day.

If escapement numbers decline and there is concern that the minimum sample size will not be achieved, adjustments in sampling efforts should be implemented so that the daily goal of 190 is met. The camera gates installed in the Chignik River weir may be closed during the operation of the fish trap to increase the number of fish captured in the weir’s fish trap.

Black Lake Sampling

Adult sockeye salmon will be sampled, beginning June 20, at the outlet of Black Lake. These samples provide a representation of the ASL composition of the early run. Sampling effort and coordination will be led by the project biologist with support from Chignik management staff. If possible, 1,200 sockeye salmon will be sampled over several days with a goal of at least 400 fish each sampling day. The fish will be collected using a beach seine, and held in an instream live box prior to sampling. The adipose fin will be clipped on all sampled fish to prevent repeat sampling. Fish will be sampled using methods outlined in Wattum (*in prep*). These samples will be clearly marked as “Black Lake escapement samples” (location code 070; Wattum *in prep*).

SAMPLE PROCESSING

Scales will be mounted on scale “gum” cards and impressions made on acetate/diacetate cards using a heat press. The Assistant Chignik Area Management Biologist will assign sockeye salmon ages by examining scale impressions for annual growth increments using a microfiche reader fitted with a 48X lens following designation criteria established by Mosher (1968). All data will be recorded on a browser based data entry program as outlined in Wattum (*in prep*). All sockeye salmon scales, scale cards, and digital files will be delivered to finfish research biologist Michelle Wattum in Kodiak for analysis and archiving. Data collected as part of this project will be reported in ADF&G reports in the fall of 2015.

REFERENCES CITED

- Anderson, T. J., C. W. Russell, and M. B. Foster. 2013. Chignik Management Area salmon management report, 2013. Alaska Department of Fish and Game, Fishery Management Report No. 13-43, Anchorage.
- Clutter, R. and L. Whitesel. 1956. Collection and interpretation of sockeye salmon scales. International Pacific Salmon Fisheries Commission, Bulletin 9, New Westminster, British Columbia, Canada.
- INPFC (International North Pacific Fisheries Commission). 1963. Annual report 1961, Vancouver, British Columbia.
- Koo, T. S. Y. 1962. Age designation in salmon. Pages 37-48 in T.S.Y. Koo, editor. Studies of Alaska red salmon. University of Washington Publications in Fisheries, New Series, Volume I, Seattle.
- Wattum, M. L. *In Prep.* Kodiak Management Area salmon catch and escapement sampling operational plan, 2015. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Operational Plan, Kodiak.
- Mosher, K. H. 1968. Photographic atlas of sockeye salmon scales. Bureau of the U.S. Fish and Wildlife Service. Fishery Bulletin 67(2):243-280.
- Narver, D. W. 1966. Pelagial ecology and carrying capacity of sockeye salmon in the Chignik Lakes, Alaska. University of Washington, Seattle.
- Thompson, S. K. 1987. Sample size for estimating multinomial proportions. *The American Statistician* 41 (1):42-46.
- Witteveen, M. J. and J. C. Botz. 2004. Chignik Lakes scale pattern analysis, run apportionment, and sockeye salmon catch sampling results, 2003. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Informational Report 4K04-30, Kodiak.

FIGURES

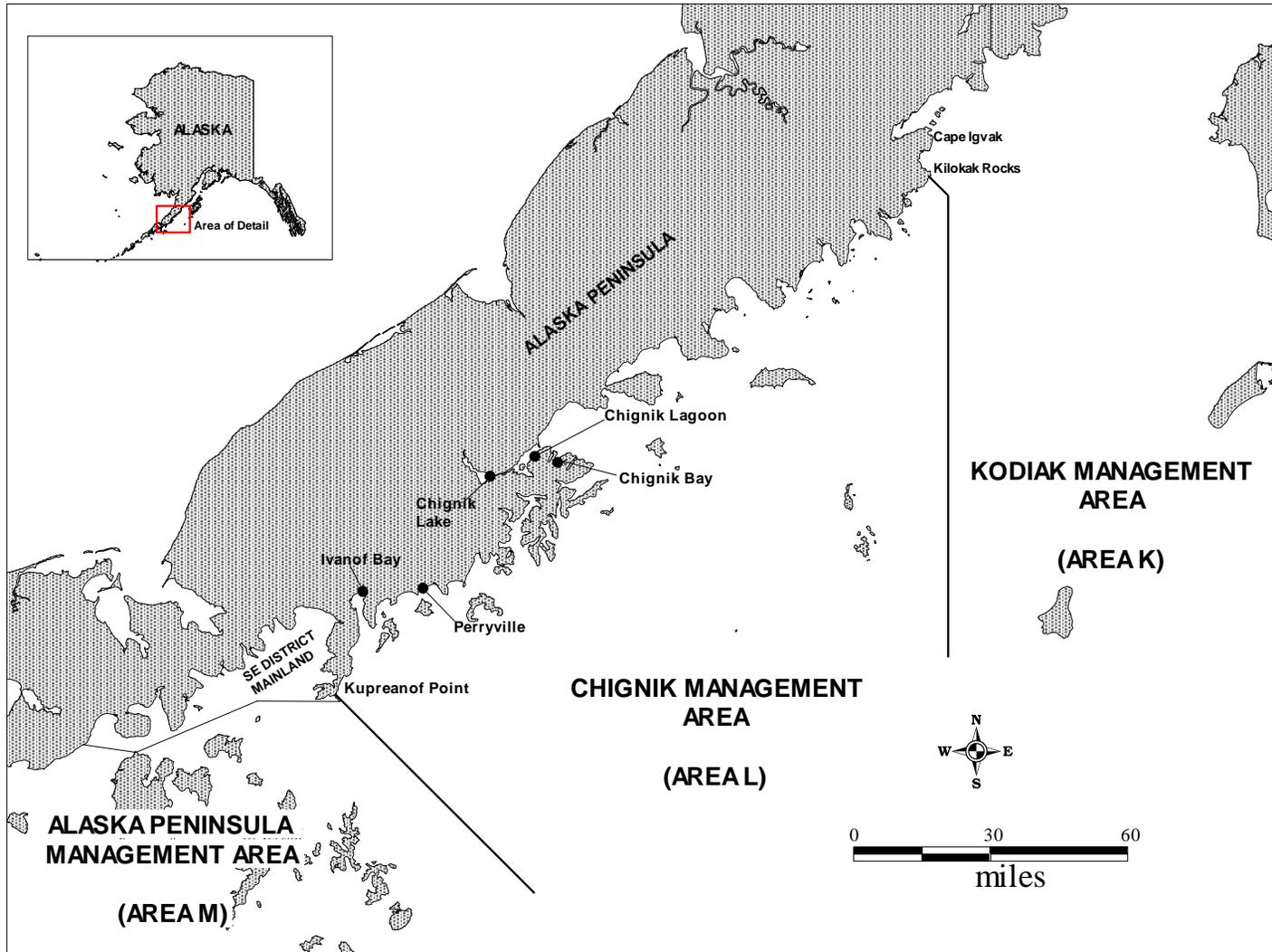


Figure 1.—Map of the Alaska Peninsula illustrating the relative locations of the Chignik, Kodiak, and Alaska Peninsula Management Areas.

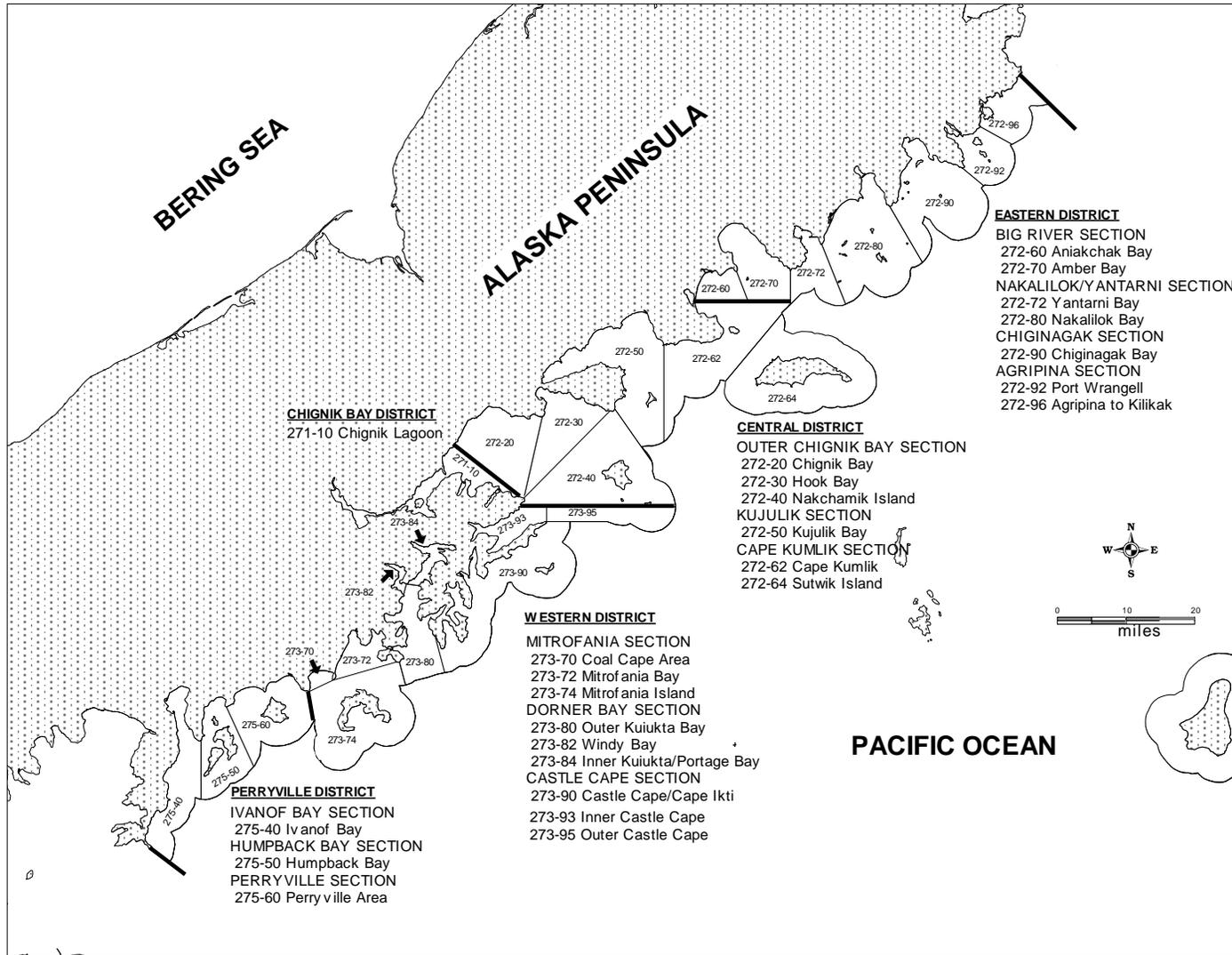


Figure 2.—Map of the Chignik Management Area illustrating commercial salmon fishing district boundaries and statistical areas.

APPENDIX A. GENETIC SAMPLING PROCEDURES

Non-lethal Sampling Finfish Tissue for DNA Analysis

ADF&G Gene Conservation Lab, Anchorage

I. General Information

We use axillary process samples from individual fish to determine the genetic characteristics and profile of a particular run or stock of fish. This is a non-lethal method of collecting tissue samples from adult fish for genetic analysis. The most important thing to remember in collecting samples is that only quality tissue samples give quality results. If sampling from carcasses: tissues need to be as “fresh” and as cold as possible and recently moribund; do not sample from fungal fins.

Sample preservative: Ethanol (ETOH) preserves tissues for later DNA extraction without having to store frozen tissues. Avoid extended contact with skin.

II. Sample procedure:

1. Tissue type: Axillary process; clip one axillary process from each fish.
2. Prior to sampling, fill the tubes half way with ETOH from the squirt bottle. Fill only the tubes that you will use for a particular sampling period.
3. To avoid any excess water or fish slime in the vial, wipe the axillary process dry prior to sampling. Using the dog toe nail clipper or scissors, clip off axillary process (1/2 -1” max) to fit into the cryovial.
4. Place axillary process into ETOH. The ethanol/tissue ratio should be slightly less than 3:1 to thoroughly soak the tissue in the buffer.
5. Top off tubes with ETOH and screw cap on securely. Invert tube twice to mix ETOH and tissue. After each sample, wipe the dog toe nail clippers or scissor blade so not to cross contaminate samples.
6. Data to record: Record each vial number to paired data information.

Discard remaining ethanol from the 500ml bottle before returning samples. Tissue samples must remain in 2ml ethanol after sampling. HAZ-MAT paperwork will be required for return shipment. Store vials containing tissues at cool or room temperature, away from heat in the white sample boxes provided. In the field: keep samples out of direct sun, rain and store capped vials in a dry, cool location. Freezing not required.

III. Supplies included with sampling kit:

1. Clippers – used for cutting the axillary process.
2. Cryovial – a small (2.0ml) plastic vial, pre-labeled.
3. Caps – to prevent evaporation of ETOH.
4. Cryovial box – neon box for holding cryovials while sampling.
5. Ethanol (ETOH) - in bulk Nalgene bottle.
6. Squirt bottle – to fill or “top off” each cryovial with ETOH. Squirt bottle not for ethanol storage.
7. Printout of sampling instructions.
8. Laminated “return address” label.

-continued-

Shipping: HAZMAT paperwork is required for return shipment of these samples and is included in the kit.

Return shipping code: Use sampling date

Ship samples to:

ADF&G – Genetics
333 Raspberry Road
Anchorage, Alaska 99518

Lab staff: 907-267-2247
Judy Berger: 907-267-2175
Chris Habicht: 907-267-2169



What to do with the samples after they are done and refreshed:

1. If you are doing paired sampling, label all the vials at the beginning of the season, you may not have time to do it later.
 2. Double check the sample information with the log book to ensure accuracy.
 3. Make sure all the bottles have internal labels and external port and series numbers (e.g. Chignik 20=CG20).
 4. Put into air approved boxes that sampling supplies arrived in.
 5. Place an unopened bag of vermiculite on top of sample bottles so that the bottles are held in place but not buried in vermiculite.
-

Appendix A2.–Proposed sampling dates at Chignik River weir, 2015.

June 2015						
S	M	TU	W	TH	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

July 2015						
S	M	TU	W	TH	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Note: Sampling dates are represented in bold and can be adjusted inseason by management staff based on the first returns of the early-run; i.e., if the run appears earlier than usual, sampling may occur earlier in June, with intensive sampling occurring in late June. Conversely, late run timing will necessarily shift the greatest intensity of sampling later into the summer, perhaps with sampling occurring into August.

APPENDIX B. CHIGNIK SAMPLING FORM

**APPENDIX C. CHINOOK SALMON SAMPLING
PROCEDURES**

Chinook salmon bound for the Chignik River drainage are harvested in sport and subsistence fisheries, as well as incidentally in the Chignik Lagoon commercial salmon fishery. Age, sex, and length (ASL) composition data of Chignik River Chinook salmon passing above the weir and sport fishery harvest have been collected under the direction of the Alaska Dept of Fish and Game since 2012 to provide data for evaluating the long-term evaluation of the Chignik River drainage Chinook salmon stock.

SAMPLING PROCEDURES

The standard procedures for collecting and recording salmon ASL data are outlined in Wattum (*in prep*).

Weir Trap Sampling

All Chinook salmon that enter a trap incorporated into the Chignik River weir will be sampled for ASL data. Length will be measured from mid-eye to fork-of-tail to the nearest millimeter (mm). Sex will be identified based on external morphology and sexual characteristics. (Appendix C2). Four scales per fish will be taken from the preferred area of the body, at a point on a diagonal line from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin, two rows above the lateral line. When possible, all scales will be collected from the preferred area of each fish following procedures outlined by the International North Pacific Fisheries Commission (INPFC 1963). Scales will be mounted on scale “gum” cards in positions #1, #11, #21, #31 for the first fish, positions #2, #12, #22, #32 for the second fish and continuing across the card for each additional fish (Appendix C3). All sex and length data will be recorded on a browser based data entry program as outlined in Wattum (*In prep*). After data has been collected, the adipose fin will be removed so that fish are not resampled.

Sport Harvest Sampling

The majority of the inriver Chinook salmon harvest comes from guided sport fishing upstream of the Chignik River weir. Currently, the two operating sport-fishing guide services are based downriver of the Chignik River weir in the Villages of Chignik Bay and Chignik Lagoon (Figure 2). This allows Chignik weir staff to sample harvested Chinook salmon when guide boats return home after fishing above the weir. Sport harvested Chinook salmon will be inspected and, if the adipose fin is intact, the fish will be sampled in the same manner as weir trap sampling. All samples taken from harvested Chinook salmon will be clearly labeled as having been taken from a harvested fish.

Sample Processing and Recording

Scale “gum” card impressions will be made on acetate/diacetate cards using a heat press (Clutter and Whitesel 1956). The Chignik Assistant Area Management Biologist will assign ages by examining scale impressions for annual growth increments using a microfiche reader fitted with a 48X lens following designation criteria established by Mosher (1968). Ages will be recorded using European notation (Koo 1962) where a decimal separates the number of winters spent in fresh water (after emergence) from the number of winters spent in salt water. All age data will be entered directly via a virtual private network (VPN) to the ADF&G Kodiak Intranet Database using a programmable keyboard (X-keys®).

-continued-

All Chinook salmon scale “gum” cards, acetate/diacetate cards, and digital files will be delivered to the finfish research biologist in Kodiak for analysis and archiving.

Length sampling procedures and sex identification of Chinook salmon.



Adult salmon length is measured from mid-eye to tail fork because the shape of the salmon’s snout changes as it approaches sexual maturity. The procedure for measuring by this method is as follows.

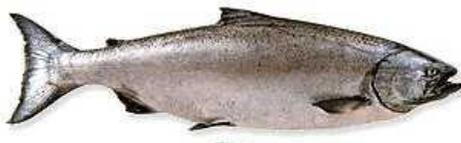
1. Place the salmon flat on its right side (on the measuring board) with its head to your left and the dorsal fin away from you.
2. Slide the fish in place so that the middle of the eye is in line with the edge of the meter stick and hold the head in place with your left hand.
3. Flatten and spread the tail against the board with your right hand.
4. Read and record the mid-eye to tail fork length to the nearest millimeter.

Sexual characteristics on maturing Chinook salmon can be difficult to determine:

A) Male: Large Head, *concave forehead*, large adipose fin, no vent protrusion.

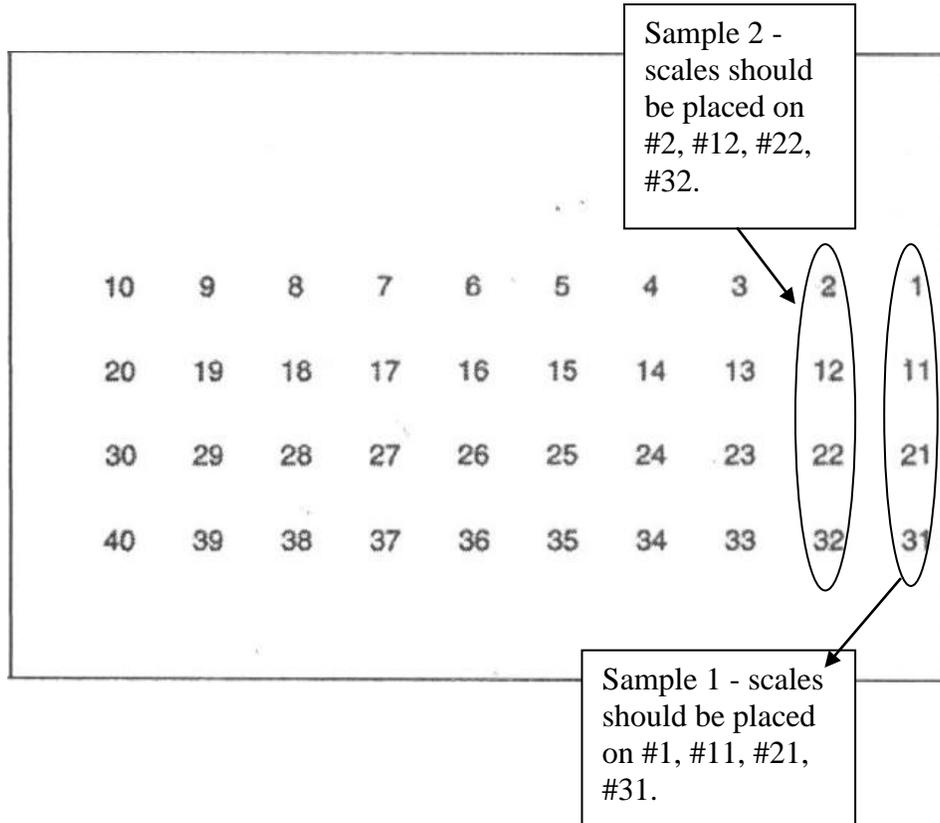


B) Female: Smaller head, *convex forehead*, smaller adipose fin, slight vent protrusion.



-continued-

Chinook salmon scale placement on gum card



Continue this process for fish samples 3-10.