Salmon Age, Sex, and Length Catalog for the Kuskokwim Area, 2018

by

Kathryn E. Froning

and

Nicholas J. Smith

Symbols and Abbreviations

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

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations

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

REGIONAL INFORMATION REPORT 3A20-06

SALMON AGE, SEX, AND LENGTH CATALOG FOR THE KUSKOKWIM AREA, 2018

by

Kathryn E. Froning and Nicholas J. Smith

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

Kathryn E. Froning and Nicholas J. Smith
Alaska Department of Fish and Game, Division of Commercial Fisheries,
333 Raspberry Rd, Anchorage, Alaska, 99518, USA

This document should be cited as follows:
Froning, K. E., and N. J. Smith. 2020. Salmon age, sex, and length catalog for the Kuskokwim Area, 2018. Alaska Department of Fish and Game, Regional Information Report 3A20-06, Anchorage.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF TABLES (Continued)

LIST OF TABLES (Continued)

ABSTRACT

Pacific salmon *Oncorhynchus* spp. age, sex, and length (ASL) data have been collected from Kuskokwim Area harvests and escapements since 1961. Since 1995, the salmon age, sex, and length catalog for the Kuskokwim Area has been produced to compile ASL data into historical summaries useful to Kuskokwim Area fishery managers, contributing project leaders, and other interested parties. This report provides (1) an overview of projects that collected ASL information in 2018, and highlights new data added to the Arctic-Yukon-Kuskokwim Database Management System or AYKDBMS, (2) a single source document for project specific data summaries produced in 2018, (3) a historical summary of ASL data for select long-term monitoring projects, and (4) a quick reference guide to the available historical ASL data archived in the AYKDBMS. This report presents details of ASL sampling efforts which occurred during the 2018 season at 10 project locations including subsistence harvest, test fishery harvest, and escapement. Sampling during the 2018 season resulted in 4,871 salmon sampled for age, sex, or length. Chinook *O. tshawytscha* salmon made up 42% of the samples collected, followed by Chum *O. keta* salmon at 29%, sockeye *O. nerka* at 14%, and coho *O. kisutch* at 15%.

Key words: age, sex, length, ASL, Pacific salmon, *Oncorhynchus* spp., Kuskokwim River, Kuskokwim Bay, age class composition, sex composition, length composition, Arctic-Yukon-Kuskokwim Database Management System, AYKDBMS.

INTRODUCTION

Since 1961, age, sex, and length (ASL) data have been collected from Chinook *Oncorhynchus tshawytscha*, chum *O. keta*, sockeye *O. nerka*, and coho *O. kisutch* salmon returning to the Kuskokwim Management Area (Figure 1; Brannian et al. 2005). The Kuskokwim Area ASL sampling program collects data from salmon harvest and escapement monitoring projects operated throughout Kuskokwim River and Kuskokwim Bay. Standardized methods are used to collect ASL data (Eaton 2016) that can be used for a wide range of purposes including management evaluation, trend analysis, and brood table development.

ASL data are available from discontinuous time series of sample collections from commercial, subsistence, and sport harvests, escapement monitoring projects, test fisheries, mark–recapture studies, and other special projects. A variety of organizations including state, federal, tribal, and non-government groups have jointly funded and participated in the collection of Kuskokwim Area salmon ASL data. Primary data are archived in the Arctic-Yukon-Kuskokwim (AYK) Database Management System[1] (AYKDBMS). The AYKDBMS is an online clearinghouse maintained by the Alaska Department of Fish and Game (ADF&G) and provides a public interface for querying and downloading data. Since 1995, summarized data have been published by the ADF&G as part of the salmon ASL catalog for the Kuskokwim Area (Molyneaux and DuBois 1996, 1998, 1999; DuBois and Molyneaux 2000; Molyneaux and Folletti 2005, 2007; Molyneaux et al. 2006, 2008, 2009, 2010; Liller et al. 2013; Brodersen et al. 2013; Liller et al. 2015, 2016; Froning and Liller 2019a, 2019b). Prior to 2014, summarized ASL data was also reported in agency project reports and fisheries management reports. Beginning in 2014, ADF&G project reports only provide information regarding data collection efforts (e.g., Head and Smith 2018), and the salmon ASL catalog for the Kuskokwim Area is the only published source for ASL data summaries.

The 2018 ASL catalog format provides a single source document for all ASL data collected by ADF&G and partner organizations throughout the Kuskokwim Management Area. This document provides a general description of the methods used to collect ASL data (Eaton 2016) and a detailed description of data processing, analysis, and archiving. This document provides standardized data

---

[1]   AYKDBMS [Arctic-Yukon-Kuskokwim Database Management System] Home Page.
     http://sf.adfg.state.ak.us/CommFishR3/WebSite/AYKDBMSWebsite/Default.aspx.

summaries for all projects that operated in 2018 and historical summaries for select long-term projects. This report format complements the AYKDBMS by providing a quick reference guide to the archived data by species, project type (e.g., harvest or escapement), project name, and year.

A total of 9 Kuskokwim Area projects collected ASL data from Chinook, chum, sockeye, and coho salmon in 2018. Commercial harvest occurred from small-scale catcher sellers in 2018; however, no ASL samples were collected from this fishery. For Chinook salmon, the gear types used by subsistence fishermen and the timing of subsistence fishing activities were very different compared to other sources of harvest (e.g., test fisheries). Therefore, dedicated sampling effort occurred for Chinook salmon harvested in the lower Kuskokwim River subsistence fishery where majority of the total subsistence harvest occurs (e.g., Liller et al. 2019). Chinook salmon were sampled from a test fishery that operated in the lower portion of the Kuskokwim River near Bethel. Samples collected from the test fishery were assumed to be reasonably representative of the total run. ASL data were collected for all salmon species monitored at 7 weirs located on select spawning tributaries. A weir was operated on the Kwethluk River by the U.S. Fish and Wildlife Service (USFWS) to index salmon escapement to the lower portion of the Kuskokwim River and ASL data were collected to represent age-sex-size composition of these portions of each species' run. ASL data collected from the Kwethluk River in 2018 were processed and data summaries were published by USFWS. A weir operated on the George river indexed salmon escapement to the middle portion of the Kuskokwim River. Weirs operated on the Salmon and Kogrukluk rivers indexed salmon escapement to the Aniak and Holitna rivers respectively. The Telaquana River weir was used to index escapement of lake-spawning sockeye salmon. The Salmon River (Pitka Fork) and Takotna River weirs provided an index of escapement to the headwaters of the Kuskokwim River drainage.

OBJECTIVES

The goal of this project was to process, compile, and analyze salmon age (scales), sex, and length samples collected in 2018 from Kuskokwim Area subsistence fisheries, escapement, and other projects.

Specific objectives of this report were to:

1. Provide an overview of projects and methods used to collect ASL information in 2018;
2. Provide a single source document for detailed project ASL data summaries produced in 2018;
3. Provide a historical summary of annual ASL composition estimates for select long-term monitoring projects; and
4. Provide a quick reference guide to the available historical ASL data archived in the AYKDBMS.

METHODS

In 2018, ASL samples were collected from 10 projects. Target species differed by project type and location (Table 1). Project types included test fishery, subsistence catch, and escapement. Detailed operational and ASL collection methods were summarized in individual project reports (Table 2). Capture gear, sampling, and measurement methods varied by species and project (Tables 3–6).

SAMPLE SIZE

A minimum sample size was determined for each species to achieve 95% confidence intervals no wider than ±10% (α = 0.05 and d = 0.10; Bromaghin 1993) for all major age-sex combinations (Table 7). Recommended sample sizes were increased by at least 20% to account for scales that could not be aged for a variety of reasons. This minimum sample size was required to estimate the age-sex composition for any location or temporal strata of interest. For less abundant species (e.g., Chinook salmon) collecting the minimum number of samples was often not practical. In the event the sample size was inadequate, a simple summary of the samples collected is provided.

Sampling Strategies

Viewed from a fixed location, such as an escapement project or a fishing district, the ASL composition of an upstream-migrating salmon population often changes over the course of the season. The following are sampling strategies which were implemented to collect representative samples from the various project types.

Escapement Projects

ASL samples, from Kuskokwim Area escapement monitoring projects, were collected using weirs with an integrated trap. Weir designs and specifications varied by location (e.g., Head and Smith 2018; Harper et al. 2018; and Webber and Harper 2018), however, all weirs functioned as a complete barrier to upstream movement for target species. Target species passed upstream of the weir through a designated chute. A trap was integrated into the passage chute at the upstream side of the weir. The trap included an entrance and exit gate that could be manually closed to capture salmon for sampling.

A daily sampling strategy was used for all salmon species sampled at Kuskokwim River escapement monitoring locations. Daily sample goals were determined preseason by distributing the season total sample size proportional to historical run timing. Daily sample schedules were adjusted as needed inseason to account for observed run abundance. Furthermore, staff were given discretion to modify the timing and intensity of daily sampling activities to accommodate other work priorities if the sum of the daily samples for each week of project operations met or exceeded the predetermined schedule.

Commercial Harvest

There was limited commercial opportunity for those registered with the department as catcher/sellers and no large-scale commercial harvest occurred in the Kuskokwim Area in 2018. In prior years, samples were from commercial fish deliveries made to local processing plants in Bethel, Quinhagak, and Platinum Alaska.

Subsistence Harvest

Opportunistic sampling was used to collect samples from the Kuskokwim River Chinook salmon subsistence harvest (e.g., Liller et al. 2019). ADF&G partnered with Orutsaramuit Native Council to recruit and train subsistence fishermen to sample their own harvest and the harvest of others. Samplers were paid for each fish sampled. All interested individuals were encouraged to participate regardless of their fishing practices. Subsistence samplers were encouraged to sample from their entire harvest of Chinook salmon. We assumed that a sufficiently large pool of subsistence fishermen would adequately represent the range of fishing practices implemented in

the subsistence fishery. Therefore, we assumed the resulting samples adequately represent the total subsistence harvest in the lower Kuskokwim River.

In 2018, a total of 26 subsistence samplers participated in the program and sampled 552 Chinook salmon from 28 individual harvesters (Table 8). Majority of samples were collected from residents of Bethel (72%). Remaining samples were collected from McGrath (9%), Tuntutuliak (8%), Akiak (5%), Akiachak (3%), Kwethluk (2%), and Napaskiak (1%). Samples collected from Chinook salmon subsistence harvests were from gillnets ranging between 3 and 8-inch mesh (Table 9). Included in total number of samples were those opportunistically collected by ADF&G at the Bethel boat harbor during 3 subsistence openers. In addition to gillnets, 1 sample in McGrath came from fishwheel harvest.

Test Fisheries

Census sampling was conducted for Chinook salmon harvested in the Bethel and Aniak test fisheries. An attempt was made to collect ASL samples from all Chinook salmon harvested in the Bethel Test Fishery and sex and length only from the Aniak Test Fishery. Samples from Chinook salmon harvested in the Bethel test fishery were taken with 5 3/8 inch and 8-inch drift gillnets. Gillnet mesh size of 6-inch was used at the Aniak Test Fishery.

AGE, SEX AND LENGTH SAMPLING PROCEDURES

To the extent practicable, sampling procedures were standardized across all projects (Eaton 2016; Tables 3–6). Scales were collected from the left side of the fish, approximately 2 rows above the lateral line in an area crossed by a diagonal from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin (INPFC 1963). Because of the high rate of scale regeneration (i.e., lost and regrown) among Chinook and coho salmon, 3 scales were collected from each fish. Only 1 scale per fish was collected from chum salmon. No sockeye scales were collected from Kuskokwim River weir projects (Table 5). The sex of each salmon sampled was verified by visual examination of the gonads (harvest projects) or visual examination of external characteristics (escapement projects). Fish length was measured from the mid eye to tail fork (METF) to the nearest millimeter using a straight edge measuring device.

AGE ESTIMATION

Collected scales were used to estimate age. Scales were mounted on gummed cards and impressions were made in cellulose acetate (Clutter and Whitesel 1956). Scale impressions were magnified using a microfiche reader with a 15 mm, 48 x, F/2.8 lens. Trained scale agers estimated total age by counting the number of annuli in the freshwater and saltwater zones. An annulus was defined as a concentration and interruption in the growth pattern of the ridges (circuli) on the upper surface of the anterior field of the scale (Mosher 1969). Typically, annuli presented as 3 or more tightly spaced and broken circuli that appeared to cross over each other. Freshwater age was estimated for all scales that had less than 10 mm of regeneration around the scale focus. Saltwater age was estimated for all scales that had at least some portion the outer edge of the scale visible. Total age was reported in European notation (Koo 1962); numerals preceding the decimal refer to the number of freshwater annuli and numerals following the decimal refer to the number of marine annuli. Total age from time of egg deposition, or brood year, is the sum of these 2 numbers plus 1 to account for incubation time.

ESTIMATES OF AGE, SEX, AND LENGTH COMPOSITION

Samples were used to estimate the ASL composition of the escapement or harvest, when adequate sample sizes were available and sampling occurred in proportion to abundance. Generally, it was not possible to collect samples in proportion to abundance, due to imperfect knowledge of the abundance and timing of escapement or harvest. Disproportionate sampling was addressed postseason by stratifying the total escapement/harvest by the timing of sample collection (Tables 10–13).

The number of salmon sampled (n) during stratum i with a valid age and sex determination were used to estimate the proportion of the stratum composition by age, sex, and age/sex category. Let c equal any age or sex category of interest. The proportion (p) of the total abundance (N) in stratum i which belonged to each category (c) was estimated as

$$\hat{p}_{c,i} = n_{c,i} / n_i .$$

(1)

The percent of the season total abundance that belonged to each category ($\hat{p}_c$) was estimated from the weighted average across all strata as

$$\hat{p}_c = \frac{1}{N} \sum_i N_i \hat{p}_{c,i} .$$

(2)

The variance ($\hat{V}$) of the season total percentage by category was estimated as

$$\hat{V}(\hat{p}_c) = \frac{1}{N^2} \sum_i N_i^2 \hat{V}(\hat{p}_{c,i}) ,$$

(3)

where

$$\hat{V}(\hat{p}_{c,i}) = \left(\frac{N_i - n_i}{N_i} \right) \left(\frac{\hat{p}_{c,i}(1 - \hat{p}_{c,i})}{n_i - 1} \right).$$

(4)

Confidence intervals (95%) around the percent composition for each category were calculated as

$$1.96 * \sqrt{\hat{V}(\hat{p}_c)} * 100.$$

(5)

The season total abundance by category ($\hat{N}_c$) was estimated as the sum of all stratum estimates $\left(\hat{N}_{c,i} \right)$ as

$$\hat{N}_c = \sum_i \hat{N}_{c,i} ,$$

(6)

where

$$\hat{N}_{c,i} = \hat{p}_{c,i} N_i .$$

(7)

Seasonal mean length by sex and age category was estimated using all salmon samples (n) with a valid age, sex, and length. Let $y_{c,i,j}$ equal the length of the j-th fish in any age/sex category (c), sampled during stratum i. The mean length of fish in any age/sex category ($\bar{y}_{c,i}$) was estimated as

$$\bar{y}_{c,i} = \frac{\sum_j y_{c,i,j}}{n_{c,i}} .$$

(8)

Seasonal mean length by age/sex category was estimated as

$$\bar{y}_c = \frac{1}{N_c} \sum_i N_{c,i} \bar{y}_{c,i} ,$$

(9)

with a variance of

$$\hat{V}(\bar{y}_c) = \frac{1}{N_c^2} \sum_i N_{c,i}^2 \hat{V}(\bar{y}_{c,i}),$$

(10)

where

$$\hat{V}(\bar{y}_{c,i}) = \left(\frac{\sum_j (y_{c,i,j} - \bar{y}_{c,i})^2 \Big/ (n_{c,i} - 1)}{n_{c,i}} \right).$$

(11)

Standardized data summaries were produced for all projects (Table 1). Each summary table consists of 2 parts. The top portion presents the age and sex composition, and the bottom portion presents length summaries for each age and sex class. If sample sizes or timing were not adequate to estimate ASL composition, a summary of the samples collected was presented.

HISTORICAL DATA SUMMARIES

Historical ASL data summaries were produced for select projects as a convenient way to compile foundational data needed for additional analysis, such as development of brood tables. Each summary table presents total abundance, percent by age and sex, and mean length (mm; METF) for each project year. Annual estimates of ASL composition prior to 2010 were obtained from Molyneaux et al. 2010, except for Chinook salmon subsistence harvest compositions which were recalculated in 2011 based on data archived in the AYKDBMS. Abundance information was obtained from multiple sources: commercial harvest data from Lipka and Tiernan (2018) and the Statewide electronic fish ticket database[2] (ADF&G); 2018 subsistence harvest estimates from D. Koster, Research Analyst, ADF&G, Division of Subsistence, Anchorage, personal communication); and escapement data on file with the ADF&G Kuskokwim Research Group. Minor differences in harvest and escapement numbers may exist between annual and historical data summaries due to timing of reporting and use of preliminary versus final estimates.

---

[2] ADF&G (Alaska Department of Fish and Game). Statewide electronic fish ticket database [Internet]. 1985– . Juneau, AK: ADF&G, Division of Commercial Fisheries. (cited September 10, 2012). [URL not publically available as some information is confidential].

ARCHIVING

Raw data forms, scale cards, and acetate impressions were archived in the Alaska Department of Fish and Game, Anchorage Regional Office. ASL data are archived in the AYKDBMS.

USER GENERATED REPORTS

ASL data are publicly accessible through the AYKDBMS. By following the "Search" link on the main database page, users are directed to a series of data filters that allow for focused searches by management area, data type, project type, and method type. An alphabetical list of all projects and associated date ranges that meet the user defined search criteria is available by selecting the "Go to Projects" link. Selection of a specific project yields a general project description and annual year notes that provide context (i.e., metadata) regarding the type, quality, quantity, and utility of the data available. ASL data for a specific project are available by selecting the "ASL" link and selecting from the range of years of available data. A report is generated with all associated data for each fish sampled, including information about data collection (e.g., date of sample, location, method of capture, method of sex determination, etc.); archival references (i.e., scale card number and fish number) and primary biological data such as fresh water age, saltwater age, sex, and length.

RESULTS

A total of 4,871 salmon were sampled for age, sex, or length during the 2018 season. Chinook salmon made up 42% of the samples collected, followed by chum salmon (29%), coho salmon (15%), and sockeye salmon (14%). All projects attempted to collect paired age, sex, and length data from each fish. Although age samples were collected for majority of fish sampled, not all fish could be successfully aged (Table 14–17).

Some scale samples could not be aged for at least 1 of 6 different reasons (Tables 18–20). Overall, the percentage of Chinook, chum, and coho salmon scales that were not successfully aged was 14%, 5%, and 13% respectively. Collection of regenerated scales was the primary reason Chinook ($n = 182$, 66%), chum ($n = 34$, 52%), and coho salmon samples ($n = 77$, 84%) could not be aged. Presentation of age errors was intended as feedback to project leaders but may also be useful when considering sample sizes needed to achieve desired statistical accuracy and precision.

ASL data collected in 2018 were summarized by project for each salmon species sampled (Table 1[3]). Chinook salmon summaries include 1 test fishery operated near Bethel (Table 21), subsistence harvest composition from the lower Kuskokwim River (Tables 22 and 23), and 5 escapement monitoring weirs operated in tributaries throughout the middle and upper Kuskokwim River (Tables 24–28). Chum salmon summaries include 3 escapement monitoring weirs operated in tributaries throughout the middle Kuskokwim River (Tables 29–31). Sockeye salmon summaries include 2 escapement monitoring weirs operated in tributaries throughout the middle Kuskokwim River (Tables 32 and 33). Coho salmon summaries include 2 escapement monitoring weirs operated in tributaries of the middle Kuskokwim River (Tables 34–35).

---

[3] Summaries were not provided for Aniak Test Fishery or Kwethluk River weir.

HISTORICAL DATA SUMMARIES

Historical summaries were produced for select projects. Historical ASL data summaries for Chinook salmon include commercial harvest composition from 1 Kuskokwim River (Table 36) and 2 Kuskokwim Bay (Tables 37 and 38) subdistricts, 1 test fishery near Bethel (Table 39), subsistence harvest composition from the lower Kuskokwim River (Table 40), 2 escapement monitoring weir projects located on tributaries that drain into Kuskokwim Bay (Table 41 and 42), and 5 escapement monitoring weirs operated in tributaries throughout the middle and upper Kuskokwim River (Tables 43–47). Historical ASL summaries for chum salmon include commercial harvest composition from 1 Kuskokwim River (Table 48) and 2 Kuskokwim Bay (Tables 49 and 50) subdistricts, 2 escapement monitoring weir projects located on tributaries that drain into Kuskokwim Bay (Table 51 and 52), and 4 escapement monitoring weirs operated in tributaries throughout the middle Kuskokwim River (Tables 53–56). Historical ASL summaries for sockeye salmon include commercial harvest composition from 1 Kuskokwim River (Table 57) and 2 Kuskokwim Bay (Tables 58 and 59) subdistricts, and 2 escapement monitoring weir projects located on tributaries that drain into Kuskokwim Bay (Table 60 and 61). Historical ASL summaries for coho salmon include commercial harvest composition from 1 Kuskokwim River (Table 62) and 2 Kuskokwim Bay (Tables 63 and 64) subdistricts, and 4 escapement monitoring weirs operated in tributaries throughout the middle Kuskokwim River (Tables 65–68).

KUSKOKWIM AREA ASL DATA IN THE AYKDBMS

The goal of the AYKDBMS is to provide managers, researchers, and the public involved in fisheries in the AYK Region with a system to enter and process new data, as well as to retrieve historical data. The AYKDBMS provides access to Kuskokwim Area project descriptions and biological measurements of salmon age, sex, and length. For each salmon species, we provided a comprehensive list of all Kuskokwim Area projects that have collected salmon ASL data and highlighted the years for which at least some data are available. Tables were developed by querying data directly from the AYKDBMS. Overview tables provide a quick reference for agency staff and members of the public who may be interested in Kuskokwim Area ASL data for independent research but are unfamiliar with the scope of the data available. The AYKDBMS contains Chinook salmon ASL data collected from 28 different projects (Table 69), chum salmon data from 24 projects (Table 70), sockeye salmon data from 27 projects (Table 71), and coho salmon data from 19 projects (Table 72). For each salmon species, ASL data are available from a range of project types including commercial catch, subsistence catch, escapement monitoring, mark–recapture experiments, and test fisheries. The length and continuity of the time series of available data varies considerably within and between project types (Tables 69–72).

DISCUSSION

SOURCES OF BIAS

Users of Kuskokwim Area ASL data are responsible for ensuring that all data used are appropriate for the intended purpose. Since 1961, numerous changes have occurred regarding how fisheries and fisheries monitoring projects have been executed, including how ASL data are collected, processed, and analyzed. Examples of differences between project types or between years at the same project include: (1) changes in harvest regulation including time, area, and gear restrictions; (2) changes in capture methods including weir picket spacing and gillnet dimensions and mesh sizes; (3) differences in length measurement methods including cloth tape, hard rulers, fish cradles,

and calipers; (4) changes in method used to sex fish including using internal or external characteristics; (5) changes in staff responsible for collection and processing ASL samples; and (6) changes in study design including assumptions and sample size requirements. Prospective users are encouraged to review the original reports or other sources to understand the methods used for specific ASL data collections, including any changes in methodology. Previous versions of the Kuskokwim Area ASL catalog also provide some examples of bias and data quality concerns (e.g., Molyneaux et al. 2010).

DATA QUALITY, AYKDBMS

The AYKDBMS was populated with data archived in a variety of formats, including paper data forms, digital scan forms, spreadsheets, and other database programs. Considerable care was taken to reduce transcription errors during the data upload process. However, some of the Kuskokwim Area ASL data in the AYKDBMS has not been reviewed for errors. As such, we acknowledge that some unknown level of data transcription errors, incorrect labeling, and erroneous data may exist in the database. ADF&G stock biologists, who regularly use the database, generally agree that fewer errors exist for data collected after 2000. Earlier data should be used with caution, and if a data quality concern exists, users are encouraged to contact agency staff for assistance.

The AYKDBMS provides project leaders with tools for archiving metadata. To date, the level of metadata available for database users is not sufficient. Kuskokwim Area ADF&G staff provides general project descriptions, methods, and project year notes in the AYKDBMS. However, the AYKDBMS does not currently provide details regarding aging or methods for estimating ASL composition. Users of the database should review annual project reports or consult ADF&G staff for information regarding data collection and limitations.

ACKNOWLEDGEMENTS

REFERENCES CITED

Brannian, L. K., S. Darr, H. A. Krenz, S. StClair, and C. Lawn. 2005. Development of the Arctic-Yukon-Kuskokwim salmon database management system through June 30, 2005. Alaska Department of Fish and Game, Special Publication No. 05-10, Anchorage.

Brodersen, A. B., Z. W. Liller, and C. L. Truesdale. 2013. Salmon age, sex, and length catalog for the Kuskokwim Area, 2012. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 13-07, Anchorage.

Bromaghin, J. F. 1993. Sample size determination for interval estimation of multinomial probabilities. The American Statistician 47(3):203-206.

Clutter, R. and L. Whitesel. 1956. Collection and interpretation of sockeye salmon scales. Bulletin of the International North Pacific Fisheries Commission 9, Westminster, British Columbia, Canada.

REFERENCES CITED (Continued)

DuBois, L., and D. B. Molyneaux. 2000. Salmon age, sex and length catalog for the Kuskokwim area, 1999 progress report. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A00-18, Anchorage.

Eaton, S. M. 2015. Salmon age, sex, and length (ASL) sampling procedures for the Arctic-Yukon-Kuskokwim Region. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A15-04, Anchorage.

Froning, K. E., and Z. W. Liller. 2019a. Salmon age, sex, and length catalog for the Kuskokwim Area, 2015. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A19-04, Anchorage.

Froning, K. E., and Z. W. Liller. 2019b. Salmon age, sex, and length catalog for the Kuskokwim Area, 2016. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A.19-03, Anchorage.

Head J. M.., and N. J. Smith. 2018. Salmon escapement monitoring in the Kuskokwim Area, 2017. Alaska Department of Fish and Game, Fishery Data Series No. 18-11, Anchorage.

INPFC (International North Pacific Fisheries Commission). 1963. Annual report, 1961. International North Pacific Fisheries Commission, 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 Press, Seattle, Washington.

Liller, Z. W., A. B. Brodersen, and J. L. Clark. 2013a. Salmon age, sex, and length catalog for the Kuskokwim Area, 2010 and 2011. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A13-01, Anchorage.

Liller, Z. W., A. B. Brodersen, and C. L. Truesdale. 2015. Salmon age, sex, and length catalog for the Kuskokwim Area, 2013. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A15-07, Anchorage.

Liller, Z. W., A. B. Brodersen, and K. E. Froning. 2016. Salmon age, sex, and length catalog for the Kuskokwim Area, 2014. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A.16-02, Anchorage.

Liller, Z. W., K. E. Froning, N. J. Smith, and J. Esquible. 2019. Age, sex, and length composition of Chinook salmon harvested in the 2016 and 2017 Lower Kuskokwim River subsistence fishery. Alaska Department of Fish and Game, Fishery Data Series No. 19-18, Anchorage.

Lipka, C., A. Tiernan. 2018. 2017 Kuskokwim area management report. Alaska Department of Fish and Game, Fishery Management Report No. 18-22, Anchorage.

Harper, K. C., P. A. Webber, and J. Boersma. 2018. Abundance and run timing of adult Pacific Salmon in the Kwethluk River, Yukon Delta National Wildlife Refuge, Alaska, 2017. Alaska Fisheries Data Series, 2018-6, U.S. Fish and Wildlife Service.

Mosher, K. H. 1969. Identification of Pacific salmon and steelhead trout by scale characteristics. United States Department of the Interior, United States Fish and Wildlife Service, Bureau of Commercial Fisheries, Circular 317, Washington, D.C.

Molyneaux, D. B. and L. DuBois. 1996. Salmon age, sex and length catalog for the Kuskokwim area, 1995 progress report. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A96-31, Anchorage.

Molyneaux, D. B., and L. DuBois. 1998. Salmon age, sex and length catalog for the Kuskokwim area, 1996–1997 progress report. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A98-15, Anchorage.

REFERENCES CITED (Continued)

Molyneaux, D. B., and L. DuBois. 1999. Salmon age, sex and length catalog for the Kuskokwim area, 1998 progress report. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A99-15, Anchorage.

Molyneaux, D. B., and D. Folletti. 2005. Salmon age, sex, and length catalog for the Kuskokwim Area, 2004. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A05-03 Anchorage.

Molyneaux, D. B., and D. L. Folletti. 2007. Salmon age, sex, and length catalog for the Kuskokwim Area, 2006. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A07-09, Anchorage.

Molyneaux, D. B., A. R. Brodersen, and C. A. Shelden. 2009. Salmon age, sex, and length catalog for the Kuskokwim Area, 2008. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A09-06, Anchorage.

Molyneaux, D. B., A. R. Brodersen, and C. A. Shelden. 2010. Salmon age, sex, and length catalog for the Kuskokwim Area, 2009. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A10-05, Anchorage.

Molyneaux, D. B., D. L. Folletti, and A. R. Brodersen. 2008. Salmon age, sex, and length catalog for the Kuskokwim Area, 2007. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A08-05, Anchorage.

Molyneaux, D. B., D. L. Folletti, and C. A. Shelden. 2006. Salmon age, sex, and length catalog for the Kuskokwim Area, 2005. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A06-01, Anchorage.

Webber, P. A, and K. C. Harper. 2018. Abundance and run timing of adult Pacific Salmon in the Tuluksak River, Yukon Delta National Wildlife Refuge, Alaska, 2014. Alaska Fisheries Data Series, 2018-5, U.S. Fish and Wildlife Service.

FIGURE AND TABLES
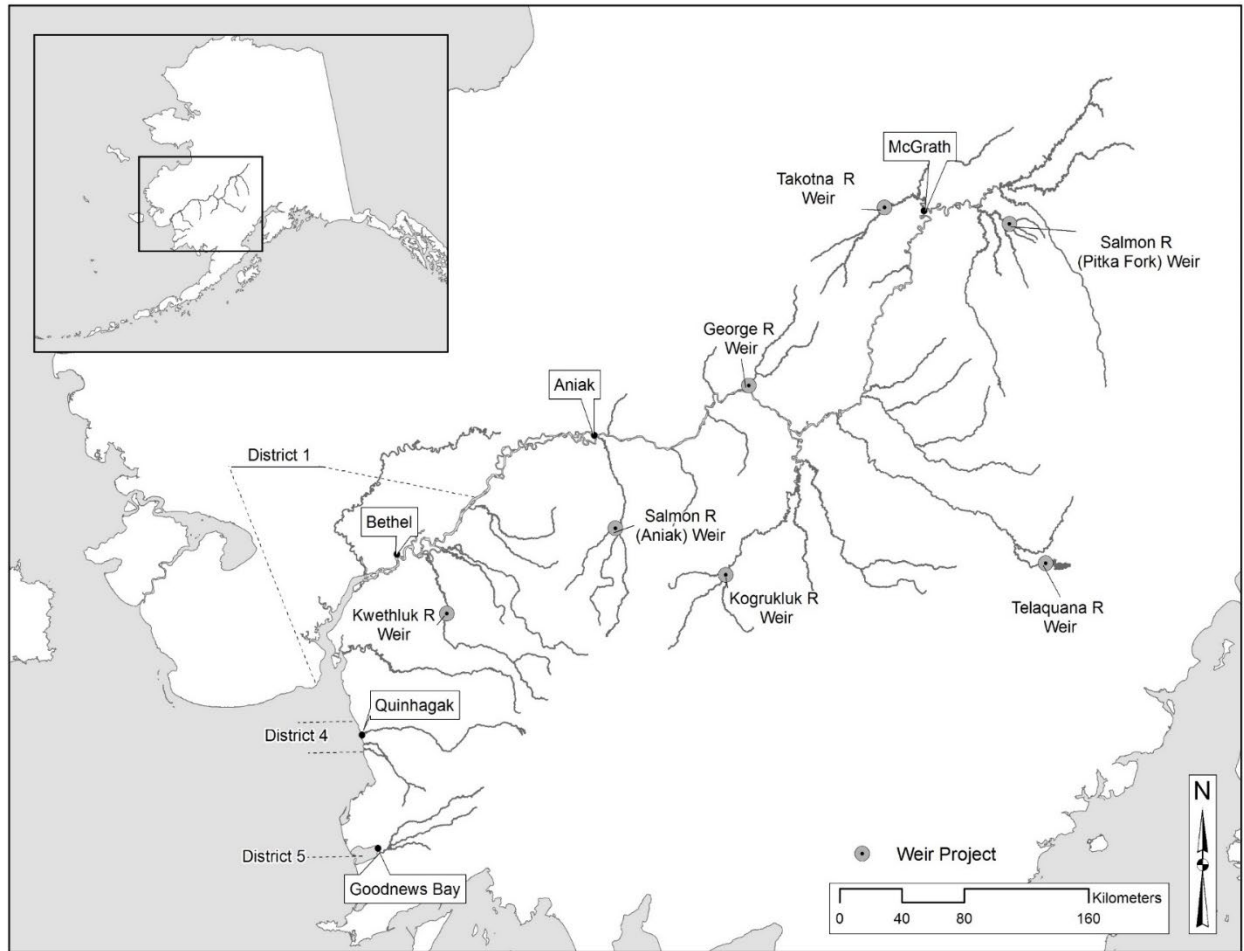
Figure 1.–Project locations where ASL data were collected in 2018.

Table 1.–Projects and salmon species for which ASL data were collected in 2018.

Project type	Location	River (km)	Species			
			Chinook	Sockeye	Chum	Coho
Test fishery	Bethel - Subdistrict W1A (Above Bethel)	111	X			
Test fishery	Aniak[a]	307	X			
Subsistence catch	Lower Kuskokwim River	-[a]	X			
Escapement	Kwethluk River[b]	216	X	X	X	
	Salmon River (Aniak)	404	X		X	
	Salmon River (Pitka Fork)	916	X			
	George River	453	X		X	X
	Kogrukluk River	710	X	X	X	X
	Takotna River	752	X			
	Telaquana River	772		X		

Note: X designates that samples were collected. All escapement projects were weirs. Harvest and test fisheries used gillnets of variable mesh size.

[a] Data were collected by Native Village of Napaimute. Results are not summarized in this report, but data has been added to the Arctic Yukon Kuskokwim Database Management System.

[b] The lower Kuskokwim river consists of all waters between the Kuskokwim Bay and the Village of Tuluksak and approximates District W1.

Table 2.–Reporting status and contact persons for salmon monitoring projects that collected ASL data from the Kuskokwim Area in 2018.

Project type and location	Report status	Contact person
Test Fishery[a]		
Bethel - Subdistrict W1A	No Report	Nicholas Smith, Kuskokwim Area Commercial Fisheries Management Biologist, ADF&G, Anchorage, Alaska
Aniak	No Report	Dan Gillikin, Fisheries Director, Native Village of Napaimute, Aniak, Alaska
Subsistence Catch[a]		
Lower Kuskokwim River	No Report	Nicholas Smith, Kuskokwim Area Commercial Fisheries Management Biologist, ADF&G, Anchorage, Alaska
Escapement		
Kwethluk River	In prep	Aaron Webber, U.S. Fish and Wildlife Service, Kenai National Wildlife Refuge, Soldotna, Alaska
Salmon River (Aniak)	In prep	Bobette Dickerson, Commercial Fisheries Biologist, ADF&G, Anchorage, Alaska
Salmon River (Pitka Fork)	In prep	Bobette Dickerson, Commercial Fisheries Biologist, ADF&G, Anchorage, Alaska
George River	In prep	Bobette Dickerson, Commercial Fisheries Biologist, ADF&G, Anchorage, Alaska
Kogrukluk River	In prep	Bobette Dickerson, Commercial Fisheries Biologist, ADF&G, Anchorage, Alaska
Takotna River	In prep	Bobette Dickerson, Commercial Fisheries Biologist, ADF&G, Anchorage, Alaska
Telaquana River	In prep	Bobette Dickerson, Commercial Fisheries Biologist, ADF&G, Anchorage, Alaska

[a] No annual report has been designated. Methods followed guidelines presented in the salmon ASL catalog for the Kuskokwim Area, 2018.

Table 3.–Summary of Chinook salmon ASL sampling methods by project, 2018.

Project type	Location	Capture gear		Sample design			Length measurement		Sexing		Scales per fish
		Gillnet[a]	Weir	Census[b]	Daily[c]	Opportunistic[d]	Caliper	Straight edge[e]	External[f]	Internal[g]	Three
Test fishery	Bethel - Subdistrict W1A (above Bethel)	X		X				X		X	X
	Aniak	X		X				X		X	
Subsistence catch		X									
	Lower Kuskokwim River					X		X		X	X
Escapement	Salmon River (Aniak)		X		X			X	X		X
	Salmon River (Pitka Fork)		X		X			X	X		X
	George River		X		X			X	X		X
	Takotna River		X		X			X	X		X
	Kogrukluk River		X		X			X	X		X

Note: "X" designates the primary method used.

[a] Includes a range of mesh sizes.

[b] Intent was to sample all harvested fish

[c] Season sampling goal was stratified such that small numbers of samples were collected daily in proportion to historic run timing.

[d] Samples were collected by self-selected subsistence fishermen who sampled opportunistically from their own harvest or the harvest of others.

[e] Includes a variety of straight-edge measuring devices such as fish cradles, meter sticks, and fish measuring boards.

[f] Based on external sexual characteristics such as kype development, roundness of belly, and egg or milt secretion.

[g] Abdominal cavity was cut and visually inspected for gonads.

Table 4.–Summary of chum salmon ASL sampling methods by project, 2018.

Project type	Location	Capture gear (weir)	Sample design (Daily)[a]	Length measurement (Straight edge)[b]	Sexing (External)[c]	Scales per fish (One)
Escapement	Salmon River (Aniak)	X	X	X	X	X
	George River	X	X	X	X	X
	Kogrukluk River	X	X	X	X	X

Note: "X" designates the primary method used.

[a] Season sampling goal was stratified such that small numbers of samples were collected daily in proportion to historic run timing.

[b] Includes a variety of straight-edge measuring devices such as fish cradles, meter sticks, and fish measuring boards.

[c] Based on external sexual characteristics such as kype development, roundness of belly, and egg or milt secretion.

Table 5.–Summary of sockeye salmon ASL sampling methods by project, 2018.

Project type	Location	Capture gear (weir)	Sample design (daily)[a]	Length measurement (straight edge)[b]	Sexing (external)[c]	Scales per fish (no scales)[d]
Escapement	Kogrukluk River	X	X	X	X	
	Telaquana River	X	X	X	X	

Note: "X" designates the primary method used.

[a] Season sampling goal was stratified such that small numbers of samples were collected daily in proportion to historic run timing.

[b] Includes a variety of straight-edge measuring devices such as fish cradles, meter sticks, and fish measuring boards.

[c] Based on external sexual characteristics such as kype development, roundness of belly, and egg or milt secretion.

[d] No scales collected.

Table 6.–Summary of coho salmon ASL sampling methods by project, 2018.

Project type	Location	Capture gear (weir)	Sample design (daily)[a]	Length measurement (straight edge)[b]	Sexing (external)[c]	Scales per fish (three)
Escapement	George River	X	X	X	X	X
	Kogrukluk River	X	X	X	X	X

Note: "X" designates the primary method used.

[a] Season sampling goal was stratified such that small numbers of samples were collected daily in proportion to historic run timing.

[b] Includes a variety of straight-edge measuring devices such as fish cradles, meter sticks, and fish measuring boards.

[c] Based on external sexual characteristics such as kype development, roundness of belly, and egg or milt secretion.

Table 7.–Minimum sample size requirements for estimating salmon ASL composition in 2018.

Species	Number categories[a]	Sample size[b]	Adjusted sample size[c]	Age classes[d]
Chinook	8	190	230	1.1, 1.2, 1.3, 1.4, and other
Sockeye	6	205	230	0.3, 1.2, 1.3, 2.2, 1.4, and 2.3
Chum	4	180	220	0.2, 0.3, 0.4, and other
Coho	3	168	200	1.1, 2.1, and 3.1

[a] Age/sex categories.

[b] From Bromaghin 1993, $\alpha = 0.05$, $d = 0.1$. Does not include correction for small population size.

[c] Increased by approximately 20% to account for unageable scales.

[d] Common age classes that make up at least 1% of historical average. Other category is composed of all minor age classes which in aggregate generally account for <1% of historical average.

Table 8.–Sample collections by community residents used to represent the ASL composition of Chinook salmon harvested in lower Kuskokwim River and McGrath subsistence fishery, 2018.

Location	River km	Number of samplers	Harvests sampled[a]	Sample size[b]	Percent
Tuntutuliak	45	2	3	42	8%
Napaskiak	97	1	1	6	1%
Bethel	106	18	18	400	72%
Kwethluk	132	1	1	9	2%
Akiachak	143	1	1	17	3%
Akiak	161	2	2	26	5%
McGrath	753	1	2	52	9%
Total		26	28	552	100%

[a] Participants were encouraged to sample from as many households as possible.

[b] Sample sizes include Chinook salmon whose age could not be determined.

Table 9.–Percent of samples collected by gillnet mesh size in the lower Kuskokwim River and McGrath Chinook salmon subsistence fishery, 2018.

Mesh size[a]	Tuntutuliak ($n = 42$)	Napaskiak ($n = 6$)	Bethel ($n = 400$)	Kwethluk ($n = 9$)	Akiachak ($n = 17$)	Akiak ($n = 26$)	McGrath ($n = 52$)	Total ($n = 552$)
3.0 inch						0.2%		0.2%
4.0 inch			2.7%					2.7%
4.75 inch							0.2%	0.2%
5.0 inch			0.5%					0.5%
5.25 inch			0.7%					0.7%
5.375 inch			0.9%					0.9%
5.5 inch			0.5%			3.4%		4.0%
5.75 inch	1.4%		9.2%					10.7%
5.875 inch	2.4%		11.2%					13.6%
6.0 inch	3.6%		42.0%	1.6%	3.1%	1.1%	8.3%	59.8%
6.5 inch			1.6%					1.6%
7.5 inch	0.2%							0.2%
7.75 inch			2.0%					2.0%
8.0 inch			0.9%					0.9%
Unknown		1.1%					0.9%	2.0%
Total	7.6%	1.1%	72.2%	1.6%	3.1%	4.7%	9.4%	100.0%

Note: Sample sizes include Chinook salmon whose age could not be determined.

[a] Drift and set gillnets combined.

Table 10.–Postseason stratification used to account for disproportionate sampling of Chinook salmon at ASL monitoring projects in the Kuskokwim Area, 2018.

Project location	Stratum	Sample size	Esc/ harvest	Stratum dates	Sample dates
Bethel test fishery	5.4 in	193	223	6/05–7/23	6/05, 6/07–6/18, 6/20–7/13, 7/15–7/18, 7/23
	8 in	192	216	6/01–7/22	6/01–7/08, 7/10–7/15, 7/22
Subsistence catch	Unknown	6		6/12–7/02	6/12, 6/24, 7/02
	3-5.5 in	42		6/16–7/05	6/12, 6/16, 6/19, 6/24–6/25, 6/29, 7/05
	5.75–5.875 in	86		6/12–7/05	6/12, 6/16, 6/19, 6/22–6/24, 6/29, 7/05
	6 in	238		6/12–7/05	6/12, 6/16, 6/22, 6/24, 6/26–7/03, 7/05
	6.5–8 in	17		6/12–6/30	6/12, 6/16, 6/24, 6/29–6/30
George River	1	145	1,012	6/21–7/10	6/24–6/26, 6/28–6/29, 7/01–7/04, 7/06–7/10
	2	46	1,145	7/11–7/15	7/11, 7/13–7/15
	3	31	1,149	7/16–9/05	7/17–7/18, 7/20–7/23, 7/25, 8/02
Kogrukluk River	1	56	1,858	7/05–7/17	7/07–7/08, 7/13–7/17
	2	38	1,936	7/18–7/22	7/18–7/21
	3	119	1,976	7/23–9/17	7/23–8/01, 8/03, 8/06–8/07
Salmon River (Aniak)	1	73	684	7/02–7/18	7/06–7/07, 7/10–7/18
	2	79	800	7/19–7/26	7/19–7/26
	3	50	793	7/27–8/26	7/27–8/06
Salmon River (Pitka Fork)	1	60	1,676	6/23–7/15	7/06, 7/08, 7/10–7/12, 7/14–7/15
	2	57	1,874	7/16–7/20	7/16–7/20
	3	103	1,767	7/21–8/05	7/21–7/29
Takotna River[a]	1	54	195		7/07, 7/10, 7/12–7/29, 7/31–8/04, 8/07–8/10

Note: Disproportionate sampling was addressed postseason by stratifying the total escapement/harvest by the timing of sample collection. Stratum estimates were weighted by the proportion of the total escapement/harvest and combined to estimate the overall age and sex composition and mean length of the entire escapement/harvest.

[a] Sample size was not sufficient to stratify and apply to escapement. Only a summary of the samples was generated for this project.

Table 11.–Postseason stratification used to account for disproportionate sampling of chum salmon at ASL monitoring projects in the Kuskokwim Area, 2018.

Project location	Stratum	Sample size	Escapement/ harvest	Stratum dates	Sample dates
George River[a]	1	386	48,277		6/29, 7/01–7/03, 7/06–7/07, 7/09–7/7/11, 7/13–7/15, 7/17, 7/20, 7/23, 7/27, 7/30, 8/01–8/02, 8/08
Kogrukluk River	1	152	16,233	6/16–7/16	7/06–7/08, 7/14–7/16
	2	228	15,335	7/17–7/22	7/17–7/19,7/21
	3	200	16,709	7/23–9/20	7/23, 7/25, 7/27, 7/29, 7/31, 8/03, 8/06
Salmon River (Aniak)	1	185	6,193	7/04–7/22	7/06–7/22
	2	110	6,586	7/23–7/29	7/23–7/29
	3	94	6,143	7/30–8/31	7/30–8/10, 8/12

Note: Disproportionate sampling was addressed postseason by stratifying the total escapement/harvest by the timing of sample collection. Stratum estimates were weighted by the proportion of the total escapement/harvest and combined to estimate the overall age and sex composition and mean length of the entire escapement/harvest.

[a] Sample size was not sufficient to stratify and apply to escapement. Only a summary of the samples was generated for this project.

Table 12.–Postseason stratification used to account for disproportionate sampling of sockeye salmon at ASL monitoring projects in the Kuskokwim Area, 2018.

Project location	Stratum	Sample size	Esc/ harvest	Stratum dates	Sample dates
Kogrukluk River[a,b]	1	252	21,768		7/07, 7/13–7/21, 7/23–7/25, 7/27, 7/29, 7/31, 8/03
Telaquana River[b]	1	154	64,879	7/14–7/23	7/19–7/23
	2	106	67,046	7/24–7/29	7/24–7/29
	3	150	65,427	7/30–8/26	7/30–8/13, 8/16

Note: Disproportionate sampling was addressed postseason by stratifying the total escapement/harvest by the timing of sample collection. Stratum estimates were weighted by the proportion of the total escapement/harvest and combined to estimate the overall age and sex composition and mean length of the entire escapement/harvest.

[a] Sample size was not sufficient to stratify and apply to escapement. Only a summary of the samples was generated for this project.

[b] No scales taken.

Table 13.–Postseason stratification used to account for disproportionate sampling of coho salmon at ASL monitoring projects in the Kuskokwim Area, 2018.

Project location	Stratum	Sample size	Esc/ harvest	Stratum dates	Sample dates
George River	1	65	3,253	7/26–8/27	8/13, 8/20–8/24, 8/26
	2	97	2,779	8/28–9/06	8/29–9/03, 9/05–9/06
	3	99	2,967	9/07–9/20	9/07–9/09, 9/12, 9/14, 9/16–9/17
Kogrukluk River	1	188	2,875	7/30–9/01	8/18–8/22, 8/24–8/26, 8/28–9/01
	2	134	2,763	9/02–9/11	9/02–9/03, 9/05–9/11
	3	34	2,536	9/12–9/25	9/12, 9/14–9/16

Note: Disproportionate sampling was addressed postseason by stratifying the total escapement/harvest by the timing of sample collection. Stratum estimates were weighted by the proportion of the total escapement/harvest and combined to estimate the overall age and sex composition and mean length of the entire escapement/harvest.

Table 14.– Summary of Chinook salmon ASL samples collected from Kuskokwim Area projects, 2018.

Project type	Location	Number sampled	Age samples	Number aged	Number sexed	Number lengths
Test Fishing	Bethel - Subdistrict W1A (Above Bethel)	439	437	385	438	439
	Aniak	63	0	0	63	63
Subsistence catch	Lower Kuskokwim River	552	552	428	501	524
Escapement	George River	235	235	222	235	235
	Kogrukluk River	234	234	220	226	226
	Salmon River (Aniak)	232	232	202	232	232
	Salmon River (Pitka Fork)	254	254	220	254	254
	Takotna River	60	60	54	56	56
	Totals	2,069	2,004	1,731	2,005	2,029

Table 15.–Summary of chum salmon ASL samples collected from Kuskokwim Area projects, 2018.

Project type	Location	Number sampled	Age samples	Number aged	Number sexed	Number lengths
Escapement	George River	401	401	386	401	400
	Kogrukluk River	602	601	581	601	601
	Salmon River (Aniak)	423	419	389	423	423
	Totals	1,426	1,421	1,356	1,425	1,424

Table 16.–Summary of sockeye salmon ASL samples collected from Kuskokwim Area projects, 2018.

Project type	Location	Number sampled	Age samples	Number aged	Number sexed	Number lengths
Escapement	Kogrukluk River	252	0	0	252	252
	Telaquana River	410	0	0	410	410
	Totals	662	0	0	662	662

Table 17.–Summary of coho salmon ASL samples collected from Kuskokwim Area projects, 2018.

Project type	Location	Number sampled	Age samples	Number aged	Number sexed	Number lengths
Escapement	George River	313	310	261	312	312
	Kogrukluk River	401	397	357	400	401
	Totals	714	707	618	712	713

Table 18.–Aging errors for Chinook salmon scale samples collected in the Kuskokwim Management Area, 2018.

Project type	Location	Age samples	No. age errors	% Age errors	Resorbed[a]	Illegible[b]	Inverted[c]	Missing[d]	Regenerated[e]	Wrong species[f]
Test fishery	Bethel - Subdistrict W1A (Above Bethel)	437	52	12%		3	8		41	
Subsistence catch	Lower Kuskokwim River	554	126	23%	1	13	22	17	71	2
Escapement	George River	235	13	6%	1	6			6	
	Kogrukluk River	234	14	6%	1	4		1	8	
	Salmon River (Aniak)	232	30	13%	1	7			22	
	Salmon River (Pitka Fork)	254	34	13%	2	2	1		29	
	Takotna River	60	6	10%				1	5	
	Totals	2,006	275	14%	6	35	31	19	182	2

Note: More than one age error may apply to a single scale.

[a] Resorbed scales show deterioration along the outer edge and are missing age information necessary for estimating saltwater age.

[b] Illegible scales have debris or scratches on the gummed card or acetate that obscure the circuli.

[c] Inverted scales are mounted on the gummed card so that their circuli are facing the gummed paper and an impression can not be made.

[d] Missing scales were collected, but fell off of the gummed card before an impression was made.

[e] Regenerated scales have a missing or inadequate age information near the center inhibiting estimation of freshwater age. As a general rule, scales with an area of regeneration >10 mm diameter were not aged. Regenerated scales presented in this table are the sum of age error codes 3 and 9 as reported in the AYKDBMS.

[f] Wrong species are scales collected from another species other then what was labeled on the gummed card.

Table 19.–Aging errors for chum salmon scale samples collected in the Kuskokwim Management Area, 2018.

Project type	Location	Age samples	No. age errors	% Age errors	Resorbed[a]	Illegible[b]	Inverted[c]	Missing[d]	Regenerated[e]
Escapement	George River	401	15	4%	1	3		2	9
	Kogrukluk River	601	20	3%	1	12		6	1
	Salmon River (Aniak)	419	30	7%	2	2	1	1	24
	Totals	1,421	65	5%	4	17	1	9	34

Note: More than one age error may apply to a single scale.

[a] Resorbed scales show deterioration along the outer edge and are missing age information necessary for estimating saltwater age.

[b] Illegible scales have debris or scratches on the gummed card or acetate that obscure the circuli.

[c] Inverted scales are mounted on the gummed card so that their circuli are facing the gummed paper, and an impression can not be made.

[d] Missing scales were collected, but fell off of the gummed card before an impression was made.

[e] Regenerated scales have a missing or inadequate age information near the center inhibiting estimation of freshwater age. As a general rule, scales with an area of regeneration >10 mm diameter were not aged. Regenerated scales presented in this table are the sum of age error codes 3 and 9 as reported in the AYKDBMS.

Table 20.–Aging errors for coho salmon scale samples collected in the Kuskokwim Management Area, 2018.

Project type	Location	Age samples	No. age errors	% Age errors	Illegible[a]	Inverted[b]	Regenerated[c]	Wrong species[d]
Escapement	George River	312	51	16%	4	4	41	2
	Kogrukluk River	398	41	10%	4		36	1
	Totals	710	92	13%	8	4	77	3

Note: More than one age error may apply to a single scale.

[a] Illegible scales have debris or scratches on the gummed card or acetate that obscure the circuli.

[b] Inverted scales are mounted on the gummed card so that their circuli are facing the gummed paper, and an impression can not be made.

[c] Regenerated scales have a missing or inadequate age information near the center inhibiting estimation of freshwater age. As a general rule, scales with an area of regeneration >10 mm diameter were not aged. Regenerated scales presented in this table are the sum of age error codes 3 and 9 as reported in the AYKDBMS.

[d] Wrong species are scales collected from another species other then what was labeled on the gummed card.

Table 21.–Kuskokwim River Chinook salmon from the Bethel - Subdistrict W1A (Above Bethel) Drift Gillnet Test Fishing project age and sex composition and mean length (mm), 2018.

Mesh size	Sample size		2015 (1.1) N	2015 (1.1) %	2014 (1.2) N	2014 (1.2) %	2013 (1.3) N	2013 (1.3) %	2012 (1.4) N	2012 (1.4) %	Total N	Total %
5.375 inch	193	Male	0	0.0	105	54.4	52	26.9	7	3.6	164	85.0
		Female	0	0.0	1	0.5	14	7.3	14	7.3	29	15.0
		Subtotal	0	0.0	106	54.9	66	34.2	21	10.9	193	100.0
		Male Mean Length	–		557		663		737			
		SD	–		47		50		83			
		Range	–		455–665		565–848		643–904			
		n	–		105		52		7			
		Female Mean Length	–		614		718		801			
		SD	–		–		40		52			
		Range	–		614		657–791		706–866			
		n	–		1		14		14			
8 inch	191	Male	1	0.5	14	7.3	72	37.7	24	12.6	111	58.1
		Female	0	0.0	1	0.5	49	25.7	30	15.7	80	41.9
		Subtotal	1	0.5	15	7.9	122	63.4	54	28.3	191	100.0
		Male Mean Length	388		595		713		759			
		SD	–		44		47		52			
		Range	388		519–663		628–860		603–859			
		n	1		14		72		24			
		Female Mean Length	–		615		771		795			
		SD	–		–		38		44			
		Range	–		615		682–845		723–857			
		n	–		1		49		30			
	384	Male	1	0.3	119	31.0	124	32.3	31	8.1	275	71.6
		Female	0	0.0	2	0.5	63	16.4	44	11.5	109	28.4
Total		Total	1	0.3	121	31.5	187	48.7	75	19.5	384	100.0
All data combined		Male Mean Length	388		561		692		754			
No stratification		SD	–		48		54		59			
		Range	388		455–665		565–860		603–904			
		n	1		119		124		31			
		Female Mean Length	–		615		759		797			
		SD	–		1		44		46			
		Range	–		614–615		657–845		706–866			
		n	–		2		63		44			

Table 22.–Age-sex composition and mean length (mm) of Kuskokwim Area Chinook salmon harvested in the lower Kuskokwim River subsistence gillnet fishery, 2018.

Sample dates	Sample size		2015 (1.1) N	2015 (1.1) %	2014 (1.2) N	2014 (1.2) %	2013 (1.3) N	2013 (1.3) %	2012 (1.4) N	2012 (1.4) %	Total N	Total %
6/12, 6/16, 6/19, 6/22–7/03, 7/05	389	Male	5	1.3	177	45.5	90	23.1	25	6.4	297	76.3
		Female	0	0.0	15	3.9	44	11.3	33	8.5	92	23.7
		Total	5	1.3	192	49.4	134	34.4	58	14.9	389	100.0
		Male Mean Length	358		573		685		788			
		SD	20		54		82		56			
		Range	336–383		445–750		234–890		657–900			
		n	5		175		90		25			
		Female Mean Length	–		637		733		805			
		SD	–		69		55		63			
		Range	–		557–820		610–860		685–957			
		n	–		14		43		33			

Note: Samples were collected by subsistence fishermen in the lower Kuskokwim River, who sampled their own harvests or the harvests of others. Known mesh sizes ranged from 3.0 to 8.0 inches. ASL samples were not applied to the total harvest. Statistics shown represent the number, mean length, and percent composition of the samples by age and sex category. Discrepancies in sums or statistics are attributed to rounding errors.

Table 23.–Kuskokwim River Chinook salmon from the Bethel (Village/City) Drift Gillnet Subsistence Catch project age and sex composition and mean length (mm), 2018.

Sample dates (Mesh size)	Sample size		2015 (1.1)		2014 (1.2)		2013 (1.3)		2012 (1.4)		Total	
			N	%	N	%	N	%	N	%	N	%
6/12, 6/16, 6/19, 6/24–6/25, 6/29, 7/05 (3–5.5")	42	Male	3	7.1	17	40.5	9	21.4	2	4.8	31	73.8
		Female	0	0.0	1	2.4	7	16.7	3	7.1	11	26.2
		Subtotal	3	7.1	18	42.9	16	38.1	5	11.9	42	100.0
		Male Mean Length	361		536		695		828			
		SD	23		65		75		40			
		Range	338–383		448–690		610–815		800–856			
		n	3		17		9		2			
		Female Mean Length	–		604		753		802			
		SD	–		–		45		135			
		Range	–		604–604		697–810		724–957			
		n	–		1		7		3			
6/12, 6/16, 6/19, 6/22–6/24, 6/29, 7/05 (5.75–5.875")	86	Male	0	0.0	46	53.5	22	25.6	3	3.5	71	82.6
		Female	0	0.0	1	1.2	7	8.1	7	8.1	15	17.4
		Subtotal	0	0.0	47	54.7	29	33.7	10	11.6	86	100.0
		Male Mean Length	–		571		678		817			
		SD	–		49		60		42			
		Range	–		500–750		570–800		770–850			
		n	–		46		22		3			
		Female Mean Length	–		570		738		831			
		SD	–		–		66		51			
		Range	–		570–570		650–860		750–900			
		n	–		1		7		7			
6/12, 6/16, 6/22, 6/24, 6/26–7/03, 7/05 (6")	238	Male	2	0.8	108	45.4	56	23.5	18	7.6	184	77.3
		Female	0	0.0	9	3.8	25	10.5	20	8.4	54	22.7
		Subtotal	2	0.8	117	49.2	81	34.0	38	16.0	238	100.0
		Male Mean Length	353		578		689		774			
		SD	24		51		91		59			
		Range	336–370		445–724		234–890		657–900			
		n	2		107		56		18			
		Female Mean Length	–		630		725		793			
		SD	–		51		49		59			
		Range	–		557–678		650–820		685–916			
		n	–		9		25		20			
6/12, 6/16, 6/24, 6/29–6/30 (6.5–8")	17	Male	0	0.0	5	29.4	1	5.9	2	11.8	8	47.1
		Female	0	0.0	3	17.6	3	17.6	3	17.6	9	52.9
		Subtotal	0	0.0	8	47.1	4	23.5	5	29.4	17	100.0
		Male Mean Length	–		608		540		826			
		SD	–		48		–		36			
		Range	–		550–660		540–540		800–851			
		n	–		5		1		2			
		Female Mean Length	–		693		779		821			
		SD	–		114		44		32			
		Range	–		600–820		730–816		787–851			
		n	–		3		3		3			

–continued–

27

Table 23.–Page 2 of 2.

Sample dates (Mesh size)	Sample size		Brood year (age)									
			2015 (1.1)		2014 (1.2)		2013 (1.3)		2012 (1.4)		Total	
			N	%	N	%	N	%	N	%	N	%
6/12, 6/24, 7/02 (Unknown Mesh)	6	Male	0	0.0	1	16.7	2	33.3	0	0.0	3	50.0
		Female	0	0.0	1	16.7	2	33.3	0	0.0	3	50.0
		Subtotal	0	0.0	2	33.3	4	66.7	0	0.0	6	100.0
		Male Mean Length	–		–		675		–			
		SD	–		–		21		–			
		Range	–		–		660–690		–			
		n	–		–		2		–			
		Female Mean Length	–		–		610		–			
		SD	–		–		–		–			
		Range	–		–		610–610		–			
		n	–		–		1		–			

Note: Samples were collected by subsistence fishermen who sampled their own harvests or the harvests of others. Known mesh sizes ranged from 3.0 to 8.0 inches. ASL samples were not applied to the total harvest. Statistics shown represent the number, mean length, and percent composition of the samples by age and sex category. Discrepancies in sums or statistics are attributed to rounding errors.

Table 24.–Age-sex composition and mean length (mm) of Kuskokwim Area Chinook salmon sampled at the Salmon River (Aniak) weir, 2018.

Sample dates	Sample size		2015 (1.1)		2014 (1.2)		2013 (1.3)		2012 (1.4)		Total	
			N	%	N	%	N	%	N	%	N	%
7/06–7/07, 7/10–8/06	202	Male	51	2.2	1,034	45.4	692	30.4	20	0.9	1,798	79.0
		Female	0	0.0	9	0.4	340	15.0	129	5.7	479	21.0
		Total	51	2.2	1,044	45.8	1,033	45.4	149	6.6	2,277	100.0
		95% C.I. (± %)		2.2		6.7		6.8		3.0		0.1
		Male Mean Length	339		544		681		788			
		SE	5		7		7		13			
		Range	240–374		400–691		596–798		775–800			
		n	4		89		62		2			
		Female Mean Length	–		557		739		818			
		SE	–		0		9		14			
		Range	–		557		615–837		705–915			
		n	–		1		31		13			

Note: Samples were used to estimate total number and percent of escapement by age and sex category. Samples were used to estimate mean length and summary statistics for each age and sex category. Discrepancies in sums or statistics are attributed to rounding errors.

Table 25.–Age-sex composition and mean length (mm) of Kuskokwim Area Chinook salmon sampled at the George River weir, 2018.

Sample dates	Sample size		2015 (1.1)		2014 (1.2)		2013 (1.3)		2012 (1.4)		Total	
			N	%	N	%	N	%	N	%	N	%
6/24–6/26, 6/28–6/29, 7/01–7/04, 7/06–7/11, 7/13–7/15, 7/17–7/18, 7/20–7/23, 7/25, 8/02	222	Male	70	2.1	1,229	37.2	1,116	33.8	160	4.8	2,575	77.9
		Female	0	0.0	0	0.0	270	8.2	461	14.0	731	22.1
		Total	70	2.1	1,229	37.2	1,386	41.9	621	18.8	3,306	100.0
		95% C.I. (± %)		1.2		7.9		8.0		5.7		0.2
		Male Mean Length	396		532		667		825			
		SE	9		9		14		12			
		Range	330–430		390–690		507–855		680–955			
		n	10		85		68		16			
		Female Mean Length	–		–		729		804			
		SE	–		–		15		11			
		Range	–		–		630–810		690–935			
		n	–		–		12		31			

Note: Samples were used to estimate total number and percent of escapement by age and sex category. Samples were used to estimate mean length and summary statistics for each age and sex category. Discrepancies in sums or statistics are attributed to rounding errors.

Table 26.–Age-sex composition and mean length (mm) of Kuskokwim Area Chinook salmon sampled at Kogrukluk River weir, 2018.

Sample dates	Sample size		2015 (1.1) N	%	2014 (1.2) N	%	2013 (1.3) N	%	2012 (1.4) N	%	2012 (2.3) N	%	Total N	%
7/07–7/08, 7/13–7/21, 7/23–8/01, 8/03, 8/06–8/07	213	Male	282	4.9	2,023	35.1	1,471	25.5	152	2.6	0	0.0	3,928	68.1
		Female	0	0.0	0	0.0	917	15.9	908	15.7	17	0.3	1,842	31.9
		Total	282	4.9	2,023	35.1	2,388	41.4	1,059	18.4	17	0.3	5,770	100.0
		95% C.I. (± %)		2.6		7.1		7.2		6.0		0.5		0.2
		Male Mean Length	383		558		706		804		–			
		SE	6		7		9		59		–			
		Range	344–419		406–681		476–799		634–909		–			
		n	14		74		55		4		–			
		Female Mean Length	–		–		769		827		829			
		SE	–		–		7		9		–			
		Range	–		–		671–841		708–906		829			
		n	–		–		37		28		1			

Note: Samples were used to estimate total number and percent of escapement by age and sex category. Samples were used to estimate mean length and summary statistics for each age and sex category. Discrepancies in sums or statistics are attributed to rounding errors.

Table 27.–Age-sex composition and mean length (mm) of Kuskokwim Area Chinook salmon sampled at the Salmon River (Pitka Fork) weir, 2018.

Sample dates	Sample size		2014 (1.2) N	%	2013 (1.3) N	%	2012 (1.4) N	%	2011 (1.5) N	%	Total N	%
7/06, 7/08, 7/10–7/12, 7/14–7/29	220	Male	710	13.3	1,834	34.5	563	10.6	28	0.5	3,134	58.9
		Female	56	1.1	1,036	19.5	1,091	20.5	0	0.0	2,183	41.1
		Total	766	14.4	2,870	54.0	1,654	31.1	28	0.5	5,317	100.0
		95% C.I. (± %)		4.8		6.7		6.3		1.0		0.2
		Male Mean Length	522		679		773		765			
		SE	10		5		13		–			
		Range	447–639		558–819		676–847		765			
		n	29		76		22		1			
		Female Mean Length	574		678		737		–			
		SE	49		6		7		–			
		Range	525–623		589–788		642–818		–			
		n	2		45		45		–			

Note: Samples were used to estimate total number and percent of escapement by age and sex category. Samples were used to estimate mean length and summary statistics for each age and sex category. Discrepancies in sums or statistics are attributed to rounding errors.

Table 28.–Age-sex composition and mean length (mm) of Kuskokwim Area Chinook salmon sampled at Takotna River weir, 2018.

Sample dates	Sample size		2014 (1.2)		2013 (1.3)		2012 (1.4)		Total	
			N	%	N	%	N	%	N	%
7/07, 7/10, 7/12–7/29, 7/31–8/04, 8/07–8/10	51	Male	14	27.5	14	27.5	0	0.0	28	54.9
		Female	1	2.0	11	21.6	11	21.6	23	45.1
		Total	15	29.4	25	49.0	11	21.6	51	100.0
		Male Mean Length	572		668		–			
		SD	63		44		–			
		Range	490–744		584–745		–			
		n	14		14		–			
		Female Mean Length	565		742		798			
		SD	–		66		55			
		Range	565		644–852		709–905			
		n	1		11		11			

Note: ASL samples were not applied to the total escapement. Statistics shown represent the number, mean length, and percent composition of the samples by age and sex category. Discrepancies in sums or statistics are attributed to rounding errors.

Table 29.–Age-sex composition and mean length (mm) of Kuskokwim Area chum salmon that escaped past the George River weir, 2018.

Sample dates	Sample size		2015 (0.2)		2014 (0.3)		2013 (0.4)		2012 (0.5)		Total	
			N	%	N	%	N	%	N	%	N	%
6/29, 7/01–7/03, 7/06–7/07, 7/09–7/11, 7/13–7/15, 7/17, 7/20, 7/23, 7/27, 7/30, 8/01–8/02, 8/08	386	Male	7	1.8	141	36.5	47	12.2	2	0.5	197	51.0
		Female	8	2.1	151	39.1	28	7.3	2	0.5	189	49.0
		Subtotal	15	3.9	292	75.6	75	19.4	4	1.0	386	100.0
		Male Mean Length	504		555		582		528			
		SD	28		32		35		4			
		Range	455–545		481–650		525–694		525–530			
		n	7		141		47		2			
		Female Mean Length	495		520		527		555			
		SD	40		29		33		35			
		Range	443–565		431–601		448–600		530–580			
		n	8		151		28		2			

Note: ASL samples were not applied to the total escapement. Statistics shown represent the number, mean length, and percent composition of the samples by age and sex category. Discrepancies in sums or statistics are attributed to rounding errors.

Table 30.–Age-sex composition and mean length (mm) of Kuskokwim Area chum salmon sampled at the Kogrukluk River weir, 2018.

Sample dates	Sample size		2015 (0.2)		2014 (0.3)		2013 (0.4)		2012 (0.5)		Total	
			N	%	N	%	N	%	N	%	N	%
7/06–7/08, 7/14–7/19, 7/21, 7/23, 7/25, 7/27, 7/29, 7/31, 8/03, 8/06	580	Male	1,244	2.6	24,173	50.1	7,717	16.0	320	0.7	33,454	69.3
		Female	775	1.6	11,788	24.4	2,260	4.7	0	0.0	14,823	30.7
		Total	2,019	4.2	35,961	74.5	9,977	20.7	320	0.7	48,277	100.0
		95% C.I. (± %)		1.6		3.6		3.3		0.7		0.1
		Male Mean Length	527		560		579		591			
		SE	5		2		4		33			
		Range	499–563		478–638		494–692		530–642			
		n	15		292		87		3			
		Female Mean Length	484		521		531		–			
		SE	4		2		7		–			
		Range	448–550		449–634		465–605		–			
		n	9		147		27		–			

Note: Samples were used to estimate total number and percent of escapement by age and sex category. Samples were used to estimate mean length and summary statistics for each age and sex category. Discrepancies in sums or statistics are attributed to rounding errors.

Table 31.–Age-sex composition and mean length (mm) of Kuskokwim Area chum salmon sampled at the Salmon River (Aniak) weir, 2018.

Sample dates	Sample size		2015 (0.2)		2014 (0.3)		2013 (0.4)		2012 (0.5)		Total	
			N	%	N	%	N	%	N	%	N	%
7/06–8/10, 8/12	389	Male	579	3.1	8,859	46.8	2,094	11.1	100	0.5	11,632	61.5
		Female	289	1.5	6,520	34.5	421	2.2	60	0.3	7,290	38.5
		Total	868	4.6	15,379	81.3	2,515	13.3	160	0.8	18,922	100.0
		95% C.I. (± %)		2.3		3.9		3.3		0.9		0.1
		Male Mean Length	513		555		551		587			
		SE	9		3		5		19			
		Range	480–554		438–695		440–610		550–610			
		n	10		186		48		3			
		Female Mean Length	472		516		519		531			
		SE	5		3		9		–			
		Range	442–493		446–579		487–571		531			
		n	5		125		11		1			

Note: Samples were used to estimate total number and percent of escapement by age and sex category. Samples were used to estimate mean length and summary statistics for each age and sex category. Discrepancies in sums or statistics are attributed to rounding errors.

Table 32.–Age-sex composition and mean length (mm) of Kuskokwim Area sockeye salmon sampled at the Kogrukluk River weir, 2018.

Sample dates	Sample size		Total	
			N	%
7/07, 7/13–7/21, 7/23–7/25, 7/27, 7/29, 7/31, 8/03	252	Male	102	40.5
		Female	150	59.5
		Total	252	100.0
		Male Mean Length	535	
		SD	24	
		Range	433–581	
		n	102	
		Female Mean Length	485	
		SD	24	
		Range	414–549	
		n	150	

Note: Age samples were not collected at this project. Sex and length samples were not applied to the total escapement. Statistics shown represent the number, mean length, and percent composition of the samples by sex category. Discrepancies in sums or statistics are attributed to rounding errors.

Table 33.–Age-sex composition and mean length (mm) of Kuskokwim Area sockeye salmon sampled at the Telaquana River weir, 2018.

Sample dates	Sample size		Total	
			N	%
7/19–8/13, 8/16	410	Male	86,811	44.0
		Female	110,541	56.0
		Total	197,352	100.0
		95% C.I. (± %)		0.0
		Male Mean Length	492	
		SE	4	
		Range	297–612	
		n	185	
		Female Mean Length	497	
		SE	2	
		Range	420–603	
		n	225	

Note: Age samples were not collected at this project. Sex and length samples were applied to the total escapement. Statistics shown represent the number, mean length, and percent composition of the samples by sex category. Discrepancies in sums or statistics are attributed to rounding errors.

Table 34.–Age-sex composition and mean length (mm) of Kuskokwim Area coho salmon sampled at the George River weir, 2018.

Sample dates	Sample size		Brood year (age)						Total	
			2015 (1.1)		2014 (2.1)		2013 (3.1)			
			N	%	N	%	N	%	N	%
8/13, 8/20–8/24, 8/26, 8/29–9/03, 9/05–9/09, 9/12, 9/14, 9/16–9/17	261	Male	522	5.8	4,415	49.1	217	2.4	5,155	57.3
		Female	167	1.9	3,442	38.3	234	2.6	3,844	42.7
		Total	689	7.7	7,858	87.3	452	5.0	8,999	100.0
		95% CI (± %)		3.3		4.1		2.6		0.2
		Male Mean Length	517		538		539			
		SE	8		4		44			
		Range	452–557		391–634		461–646			
		n	15		126		6			
		Female Mean Length	557		549		561			
		SE	10		4		15			
		Range	534–587		426–604		509–612			
		n	5		101		8			

Note: Samples were used to estimate total number and percent of escapement by age and sex category. Samples were used to estimate mean length and summary statistics for each age and sex category. Discrepancies in sums or statistics are attributed to rounding errors.

Table 35.–Age-sex composition and mean length (mm) of Kuskokwim Area coho salmon sampled at the Kogrukluk River weir, 2018.

Sample dates	Sample size		Brood year (age)						Total	
			2015 (1.1)		2014 (2.1)		2013 (3.1)			
			N	%	N	%	N	%	N	%
8/18–8/22, 8/24–8/26, 8/28–9/03, 9/05–9/12, 9/14–9/16	356	Male	380	4.6	3,753	45.9	395	4.8	4,528	55.4
		Female	218	2.7	3,084	37.7	344	4.2	3,646	44.6
		Total	598	7.3	6,837	83.6	739	9.0	8,174	100.0
		95% CI (± %)		3.5		5.0		3.9		0.2
		Male Mean Length	512		509		518			
		SE	9		3		15			
		Range	409–578		377–615		398–581			
		n	15		184		17			
		Female Mean Length	512		514		516			
		SE	7		4		10			
		Range	482–578		391–591		412–550			
		n	9		118		13			

Note: Samples were used to estimate total number and percent of escapement by age and sex category. Samples were used to estimate mean length and summary statistics for each age and sex category. Discrepancies in sums or statistics are attributed to rounding errors.

Table 36.–Estimated age and sex composition, mean length, and total number of Kuskokwim Area Chinook salmon harvested in the W1 commercial gillnet fishery, 1964–2018.

Year	Sample size	Total harvest	(0.2)	(1.1)	(0.3)	(1.2)	(2.1)	(0.4)	(1.3)	(2.2)	(1.4)	(2.3)	(1.5)	(2.4)	(1.6)	(2.5)	Percent females	Mean length (mm)
1964	535	17,149	0.0	0.0	0.0	0.5	0.0		19.6	1.0	58.8	4.3	9.0	6.8	0.0	0.0	52.8	911
1965	322	21,989	0.0	0.0	0.0	0.0	0.0		43.4	0.0	27.5	5.0	12.8	9.4	0.0	1.9	45.1	884
1966	468	25,545	0.0	0.0	0.0	0.2	0.0	0.0	12.4	0.0	85.1	0.0	2.3	0.0	0.0	0.0	50.3	911
1967	654	29,986	0.0	0.0	0.0	0.1	0.0	0.0	8.2	0.0	74.4	0.0	17.3	0.0	0.0	0.0	55.8	880
1968	540	34,278	0.0	0.0	0.0	3.9	0.0	0.0	25.1	0.0	49.2	2.0	19.0	0.8	0.0	0.0	42.6	848
1969[a]	0	43,997																
1970[a]	0	39,290																
1971	791	40,274	0.0	0.0	0.0	2.9	0.1	0.0	23.0	0.0	73.3	0.0	0.7	0.0	0.0	0.0	53.0	865
1972	500	39,454	0.0	0.0	0.0	0.0	0.0	0.0	20.3	0.0	74.7	0.0	5.0	0.0	0.0	0.0	50.4	877
1973	470	32,838	0.0	0.0	0.0	2.3	0.0	0.0	25.7	0.0	65.4	0.0	6.6	0.0	0.0	0.0	55.3	857
1974[b]	42	18,664	0.0	0.0	0.0	38.1	0.0	0.0	45.2	0.0	9.5	0.0	7.1	0.0	0.0	0.0	7.1	645
1975	307	20,816	0.0	0.0	2.2	0.2	0.0	1.7	81.3	0.0	13.5	0.0	1.3	0.0	0.0	0.0	25.6	765
1976[a]	0	30,735																
1977	234	35,830	0.0	0.0	0.0	0.7	0.0	0.0	31.2	0.0	65.3	0.0	2.8	0.0	0.0	0.0	36.3	836
1978	289	45,641	0.0	0.0	0.0	0.2	0.0	0.0	12.8	0.0	82.2	0.0	4.8	0.9	0.0	0.0	58.2	856
1979	302	36,053	0.0	0.0	0.0	23.5	0.0	0.0	42.1	0.0	28.6	0.0	5.7	0.0	0.0	0.0	41.9	248
1980	273	35,881	0.0	0.0	0.0	10.9	0.0	0.0	65.1	0.0	20.7	0.0	3.2	0.0	0.0	0.0	29.0	759
1981	467	47,663	0.0	0.0	0.0	7.7	0.0	0.0	40.5	0.0	48.5	0.0	3.3	0.0	0.0	0.0	39.0	794
1982	715	48,234	0.0	0.3	0.0	10.4	0.0	0.0	23.2	0.0	63.1	0.0	2.8	0.1	0.0	0.0	41.1	791
1983	1,255	33,174	0.0	1.5	0.0	21.1	0.0	0.0	19.5	0.0	52.2	0.0	5.1	0.6	0.0	0.0	36.8	812
1984	664	31,742	0.0	0.7	0.0	12.3	0.1	0.0	39.0	0.4	36.7	1.3	8.1	1.4	0.0	0.0	29.9	783
1985	634	37,847	0.0	0.0	0.0	34.5	0.0	0.0	29.7	0.4	31.8	0.0	3.6	0.0	0.0	0.0	36.2	713
1986	141	19,413	0.0	2.2	0.0	12.5	0.0	0.0	56.5	0.0	24.2	0.0	4.6	0.0	0.0	0.0	32.0	715
1987	549	35,340	0.0	0.0	0.0	47.2	0.0	0.0	15.7	0.0	35.7	0.0	1.5	0.0	0.0	0.0	21.9	632
1988	645	55,769	0.0	0.0	0.0	30.9	0.0	0.0	44.0	0.0	19.1	0.0	6.0	0.0	0.0	0.0	35.5	699
1989	353	43,128	0.0	0.0	0.0	33.1	0.0	0.0	24.8	3.5	29.7	1.4	5.2	2.2	0.0	0.0	28.2	719
1990	408	53,502	0.0	0.0	0.0	41.4	0.0	0.0	37.7	0.0	17.4	0.0	3.5	0.0	0.0	0.0	18.0	691
1991	420	37,778	0.2	0.0	0.0	33.0	0.0	0.0	30.5	1.9	28.4	1.5	2.8	1.3	0.0	0.5	36.0	712
1992	717	46,848	0.0	1.2	0.0	45.7	0.0	0.0	27.7	0.2	24.0	0.0	1.0	0.1	0.0	0.0	22.6	658
1993	102	8,735	0.0	0.0	0.0	61.6	0.0	0.0	21.5	0.0	9.6	4.8	0.5	1.0	0.0	1.0	6.3	621

-continued-

Table 36.–Page 2 of 2.

Year	Sample size	Total harvest	Percent by age class														Percent females	Mean length (mm)
			(0.2)	(1.1)	(0.3)	(1.2)	(2.1)	(0.4)	(1.3)	(2.2)	(1.4)	(2.3)	(1.5)	(2.4)	(1.6)	(2.5)		
1994	208	16,211	0.0	0.5	0.0	17.3	0.0	0.0	50.3	1.9	26.0	1.0	2.0	1.0	0.0	0.0	23.7	708
1995	578	30,846	0.0	0.1	0.0	34.2	0.0	0.0	15.9	0.0	49.0	0.0	0.8	0.0	0.0	0.0	31.2	715
1996	592	6,973	0.0	0.3	0.0	27.7	0.0	0.0	42.6	0.0	19.9	0.1	9.4	0.0	0.1	0.0		686
1997	162	10,441	0.0	0.0	0.0	52.5	0.0	0.0	16.7	0.0	30.2	0.0	0.6	0.0	0.0	0.0	18.5	673
1998	437	17,359	0.0	1.1	0.0	23.8	0.0	0.0	59.0	0.0	13.9	0.0	2.2	0.0	0.0	0.0	22.0	692
1999	190	4,705	0.0	0.5	0.0	29.5	0.0	0.0	23.2	0.0	45.8	0.0	1.1	0.0	0.0	0.0	28.4	704
2000[a]	0	444																
2001[b]	20	90																
2002[a]	0	72																
2003[a]	0	158																
2004	353	2,305	0.0	1.2	0.0	58.2	0.0	0.0	25.4	0.0	14.6	0.0	0.6	0.0	0.0	0.0	11.6	645
2005	488	4,784	0.0	0.0	0.0	36.8	0.0	0.0	48.0	0.2	14.8	0.0	0.2	0.0	0.0	0.0	16.0	667
2006[c]	184	2,777	0.0	1.1	0.0	60.9	0.0	0.0	27.2	0.0	10.3	0.0	0.5	0.0	0.0	0.0	7.1	617
2007[a]	0	179																
2008	455	8,865	0.0	0.0	0.0	40.3	0.0	0.0	46.6	0.3	10.0	1.3	1.5	0.0	0.0	0.0	10.4	627
2009	388	6,664	0.0	0.0	0.0	41.9	0.0	0.0	30.0	0.5	26.3	0.0	1.0	0.2	0.0	0.0	20.1	673
2010	290	2,731	0.0	0.0	0.0	35.6	0.0	0.0	38.7	0.0	24.9	0.0	0.3	0.4	0.0	0.0	29.0	660
2011[b,d]	13	49																
2012[a,d]	0	14																
2013[a,d]	0	1																
2014[a,d]	0	0																
2015[a,d]	0	2																
2016[e]																		
2017[e]																		
2018[e]																		

Note: Harvest totals are Districts W1 and W2 combined. From 1964-1971 mesh size was unrestricted; from 1972 to 1984, both restricted (≤6 inch) and unrestricted mesh sizes were used, since 1985 mesh size has been restricted (≤6 inch). Harvest totals exclude fish kept for personal use.

[a] ASL data were not collected.

[b] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[c] Samples were collected, are archived at ADF&G, but data are not available through the AYKDBMS.

[d] Sale of Chinook salmon was prohibited.

[e] No commercial fishery occurred.

Table 37.–Estimated age and sex composition, mean length, and total number of Kuskokwim Area Chinook salmon harvested in the W4 commercial gillnet fishery, 1969–2018.

Year	Sample size	Total harvest	Percent by age class															Percent females	Mean length (mm)
			(0.1)	(0.2)	(1.1)	(0.3)	(1.2)	(2.1)	(0.4)	(1.3)	(2.2)	(1.4)	(2.3)	(1.5)	(2.4)	(1.6)	(2.5)		
1969	204	16,802	0.0	0.0	1.7	0.0	31.1	0.0	0.0	19.3	0.0	39.8	0.0	6.7	1.3	0.0	0.0	39.1	709
1970	259	18,269	0.0	0.0	0.0	0.0	19.4	0.0	0.0	34.6	0.2	34.5	2.4	7.7	1.1	0.0	0.0	30.1	727
1971[a]	0	4,185																	
1972[a]	0	15,880																	
1973	213	14,993	0.0	0.0	0.0	0.0	6.1	0.0	0.0	11.0	0.0	70.8	0.0	12.1	0.0	0.0	0.0	53.8	848
1974	150	8,704	0.0	0.0	1.4	0.0	30.9	0.0	0.0	13.6	0.0	25.0	0.0	29.1	0.0	0.0	0.0	32.8	771
1975	198	3,928	0.0	0.0	1.1	0.0	33.3	0.0	0.0	44.6	0.0	16.3	0.0	4.7	0.0	0.0	0.0	26.1	679
1976	349	14,110	0.0	0.0	0.0	0.0	49.5	0.0	0.0	32.2	0.0	17.5	0.0	0.7	0.0	0.0	0.0	23.8	656
1977	480	19,090	0.0	0.0	0.0	0.0	2.5	0.0	0.0	39.0	0.0	56.5	0.0	2.0	0.0	0.0	0.0	49.0	818
1978	234	12,335	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	91.9	0.0	4.3	0.0	0.8	0.0	52.4	887
1979[b]	377	11,144																	
1980	495	10,387	0.0	0.0	4.6	0.0	29.6	0.0	0.0	40.8	0.2	20.2	0.8	3.6	0.2	0.0	0.0	43.1	705
1981	612	24,524	0.0	0.0	0.1	0.0	55.1	0.0	0.0	23.6	0.0	19.2	0.0	1.9	0.0	0.0	0.0	57.9	667
1982[b]	715	22,106																	
1983	762	46,385	0.0	0.0	0.3	0.0	26.2	0.0	0.0	7.2	0.0	64.0	0.0	2.3	0.0	0.0	0.0	39.1	779
1984	583	33,663	0.0	0.0	0.0	0.0	12.7	0.0	0.0	55.0	0.0	25.1	0.0	7.2	0.0	0.0	0.0	15.2	719
1985	568	30,401	0.0	0.0	0.0	0.0	19.4	0.0	0.0	23.1	0.0	55.3	0.0	2.2	0.0	0.0	0.0	32.3	778
1986	502	22,835	0.0	0.0	1.6	0.0	5.8	0.0	0.0	45.5	0.0	35.1	0.0	12.1	0.0	0.0	0.0	28.8	771
1987	524	26,022	0.0	0.0	0.5	0.0	27.0	0.0	0.0	17.5	0.0	52.5	0.0	2.5	0.0	0.0	0.0	16.3	738
1988	591	13,893	0.0	0.0	0.0	0.0	24.0	0.0	0.0	33.4	0.0	30.5	0.0	12.1	0.0	0.0	0.0	38.6	749
1989	422	20,820	0.0	0.0	2.2	0.0	20.4	0.0	0.0	18.8	0.0	53.3	0.0	5.3	0.0	0.0	0.0	46.0	780
1990	349	27,644	0.0	0.0	0.0	0.0	21.8	0.0	0.0	34.9	0.0	31.2	0.1	10.7	0.3	0.5	0.1	38.8	743
1991	503	9,480	0.0	0.0	0.1	0.0	18.5	0.0	0.0	25.8	0.0	48.4	0.4	6.6	0.0	0.0	0.1	39.5	768
1992	501	17,197	0.0	0.0	4.9	0.0	31.3	0.0	0.0	35.3	0.0	24.7	0.0	3.7	0.0	0.0	0.0	66.1	N/A
1993	337	15,784	0.0	0.0	0.0	0.0	36.4	0.0	0.0	27.9	0.3	30.9	1.0	3.3	0.2	0.0	0.0	38.5	706
1994	326	8,564	0.0	0.0	1.1	0.0	17.2	0.0	0.0	40.3	0.0	36.6	0.0	4.4	0.3	0.0	0.0	45.1	739
1995	603	38,584	0.0	0.0	0.0	0.0	23.6	0.0	0.0	15.8	0.0	60.0	0.0	0.6	0.0	0.0	0.0	44.4	761
1996[c]	399	14,165																	
1997	573	35,492	0.0	0.0	1.1	0.0	35.2	0.1	0.0	12.0	0.0	51.0	0.0	0.6	0.0	0.0	0.0	35.0	710
1998	724	23,158	0.0	0.0	3.1	0.0	24.1	0.0	0.0	51.3	0.0	19.4	0.0	2.1	0.0	0.0	0.0	20.7	692

-continued-

Table 37.–Page 2 of 2.

Year	Sample size	Total harvest	Percent by age class															Percent females	Mean length (mm)
			(0.1)	(0.2)	(1.1)	(0.3)	(1.2)	(2.1)	(0.4)	(1.3)	(2.2)	(1.4)	(2.3)	(1.5)	(2.4)	(1.6)	(2.5)		
1999	662	18,426	0.0	0.0	0.4	0.0	29.8	0.0	0.0	22.2	0.1	45.6	0.0	1.6	0.2	0.0	0.0	30.2	718
2000	480	21,229	0.0	0.0	0.7	0.0	13.3	0.0	0.0	43.0	0.0	40.5	0.0	2.4	0.0	0.0	0.0	30.4	734
2001	570	12,775	0.0	0.0	0.3	0.0	9.6	0.0	0.0	13.5	0.0	75.3	0.0	1.2	0.0	0.0	0.0		791
2002	436	11,486	0.0	0.0	1.0	0.0	30.8	0.0	0.0	27.6	0.0	36.3	0.0	4.3	0.0	0.0	0.0	23.3	687
2003	547	14,444	0.0	0.0	2.9	0.0	27.6	0.0	0.0	34.3	0.0	32.6	0.0	2.5	0.0	0.0	0.0	23.7	681
2004	208	25,365	0.0	0.0	0.5	0.0	46.6	0.0	0.0	29.4	0.0	21.7	0.0	1.9	0.0	0.0	0.0	14.0	677
2005	866	24,195	0.0	0.0	0.5	0.0	22.1	0.0	0.0	49.4	0.0a	27.3	0.0	0.7	0.0	0.0	0.0	25.8	717
2006	658	19,184	0.0	0.0	0.2	0.0	32.9	0.0	0.0	30.9	0.3	33.4	0.0	2.3	0.0	0.0	0.0	26.9	696
2007	615	19,573	0.0	0.0	0.4	0.0	36.0	0.0	0.0	23.2	0.0	38.0	0.2	1.6	0.6	0.0	0.0	26.9	687
2008	529	13,812	0.0	0.0	0.0	0.0	30.3	0.0	0.0	42.4	0.0	25.7	0.0	1.1	0.5	0.0	0.0	24.0	678
2009	567	13,920	0.0	0.0	1.5	0.0	44.5	0.0	0.0	26.9	0.5	26.0	0.1	0.4	0.1	0.0	0.0	17.6	657
2010	479	14,233	0.0	0.0	2.0	0.0	22.7	0.0	0.0	50.3	0.0	24.5	0.0	0.5	0.0	0.0	0.0	28.4	692
2011	749	15,387	0.0	0.0	1.4	0.0	42.0	0.0	0.0	32.7	0.5	22.1	0.4	0.8	0.2	0.0	0.0	20.1	658
2012	789	6,675	0.0	0.4	0.5	0.1	28.8	0.1	0.0	38.5	0.5	30.5	0.0	0.6	0.0	0.0	0.0	33.6	700
2013	257	2,054	0.8	0.9	0.3	0.0	19.3	0.0	0.0	37.0	0.3	40.5	0.0	1.0	0.0	0.0	0.0	39.9	732
2014[c]	105	2,265																	
2015	302	7,547	0.0	0.0	6.4	0.0	61.5	0.0	0.6	22.1	0.0	8.8	0.2	0.4	0.0	0.0	0.0	17.7	624
2016[d]																			
2017[d]																			
2018[d]																			

Note: From 1969 to 197, mesh size was unrestricted; from 1972 to 1984 both restricted (≤ 6 inch) and unrestricted mesh sizes were used, and since 1985 mesh size has been restricted mesh (≤ 6 inch).

[a] ASL data were not collected.

[b] Samples were not summaries in Molyneaux et al. 2010.

[c] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[d] No commercial fishery occurred.

Table 38.–Estimated age and sex composition, mean length, and total number of Kuskokwim Area Chinook salmon harvest in the W5 commercial gillnet fishery, 1990–2018.

Year	Sample size	Total harvest	Percent by age class												Percent females	Mean length (mm)
			(0.2)	(1.1)	(1.2)	(2.1)	(0.4)	(1.3)	(2.2)	(1.4)	(2.3)	(1.5)	(2.4)	(2.5)		
1990[a]	148	3,303	0.0	0.0	39.2	0.0	0.0	20.3	0.0	36.5	0.7	3.4	0.0	0.0	25.7	
1991	258	912	0.0	0.0	27.9	0.0	0.0	41.5	0.2	24.1	0.0	3.6	2.3	0.4	38.6	N/A
1992	140	3,528	0.0	0.7	29.9	0.0	0.0	35.3	1.1	30.5	0.0	1.5	1.1	0.0	35.2	N/A
1993[a]	152	2,117	0.0	0.0	32.2	0.0	0.0	27.6	0.0	36.2	0.0	3.9	0.0	0.0	60.5	
1994[a]	150	2,570	0.0	0.0	18.7	0.0	0.0	37.3	0.0	41.3	0.0	2.7	0.0	0.0	52.0	
1995[a]	196	2,922	0.0	0.0	44.9	0.0	0.0	13.3	0.0	41.3	0.0	0.5	0.0	0.0	31.6	
1996[b]	0	1,375														
1997	471	2,039	0.0	0.8	46.6	0.0	0.0	12.3	0.0	38.8	0.0	1.4	0.0	0.0	32.1	714
1998	404	3,675	0.0	1.0	16.2	0.0	0.0	57.6	0.0	22.3	0.0	2.4	0.0	0.0	25.8	722
1999[a]	312	1,888	0.0	0.0	26.5	0.0	0.0	13.6	0.0	58.5	0.0	1.4	0.0	0.0	51.7	
2000	376	4,442	0.0	0.0	20.4	0.0	0.0	58.4	0.0	19.5	0.0	1.7	0.0	0.0	51.7	705
2001	262	1,519	0.0	0.4	12.5	0.0	0.0	22.4	0.0	63.1	0.0	1.8	0.0	0.0	60.1	775
2002	164	979	0.0	0.6	38.2	0.0	0.0	31.4	0.0	27.9	0.0	1.7	0.0	0.0	22.0	644
2003[a]	142	1,412	0.0	1.4	23.9	0.0	0.0	31.0	0.0	40.8	0.0	2.8	0.0	0.0		742
2004	129	2,565	0.0	0.0	53.2	0.0	0.0	26.1	0.0	16.3	0.0	4.5	0.0	0.0		655
2005[a]	208	2,035	0.0	0.5	27.9	0.0	0.0	58.7	0.0	13.0	0.0	0.0	0.0	0.0	13.0	683
2006	182	2,892	0.0	0.0	33.0	0.0	0.0	45.1	0.0	20.3	0.0	1.6	0.0	0.0	17.6	674
2007	369	3,112	0.0	0.0	39.8	0.0	0.0	21.9	0.0	35.0	0.6	0.4	2.3	0.0	27.5	696
2008[b]	0	1,281														
2009	515	1,509	0.0	0.2	52.9	0.0	0.0	19.2	0.2	26.1	0.8	0.5	0.0	0.0	21.3	643
2010	621	1,759	0.0	1.6	32.3	0.0	0.0	50.8	0.2	13.7	0.0	0.9	0.0	0.0	23.4	666
2011	540	2,092	0.2	0.2	62.6	0.0	0.0	21.4	0.3	15.1	0.0	0.4	0.0	0.0	12.1	611
2012	664	1,531	0.0	0.0	19.2	0.0	0.0	65.6	0.2	15.1	0.0	0.0	0.0	0.0	28.7	703
2013	106	495	0.0	0.0	25.5	0.0	0.9	37.7	0.0	35.8	0.0	0.0	0.0	0.0	37.7	718
2014[a]	17	205														
2015	198	705	0.0	0.2	71.9	0.0	0.0	23.1	0.0	4.8	0.0	0.0	0.0	0.0	5.5	624
2016[c]																
2017[c]																
2018[c]																

Note: From 1990 to 2012 restricted mesh (≤6 inch) gillnets were used. ASL samples are available discontinuously back to 1973 but summaries have not been produced.

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] ASL data were not collected.

[c] No commercial fishery occurred.

Table 39.–Estimated age and sex composition, mean length, and total number of Chinook salmon harvest in the Bethel Test Fishery, 2001–2018.

Year	Sample size	Total harvest	Percent by age class									Percent females	Mean length (mm)
			(1.1)	(1.2)	(0.4)	(1.3)	(2.2)	(1.4)	(2.3)	(1.5)	(2.4)		
2001	75	86	0.0	30.8	0.0	26.6	0.0	33.2	0.0	6.6	2.7	24.0	723
2002	197	288	0.0	33.4	0.0	33.1	1.6	31.4	0.0	0.5	0.0	14.8	689
2003	311	409	0.3	35.8	0.0	39.9	0.0	20.0	0.0	3.9	0.0	13.9	674
2004	322	691	0.0	38.3	0.0	41.7	0.6	17.7	0.0	1.6	0.0	12.1	684
2005	335	557	0.0	28.7	0.0	43.0	0.0	27.0	0.3	1.1	0.0	24.0	708
2006	244	352	0.0	28.4	0.0	30.2	0.0	37.1	0.0	4.4	0.0	29.6	744
2007	98	305	0.0	34.1	0.0	37.0	0.0	24.5	0.0	4.3	0.0	28.1	720
2008[a]	30	420											
2009[b]	0	470											
2010[b]	0	292											
2011	216	337	0.0	38.8	0.0	30.0	0.0	29.2	0.0	1.9	0.0	29.1	693
2012	228	321	0.0	19.3	0.0	56.6	0.0	22.8	0.4	0.4	0.4	25.0	717
2013	146	201	0.0	28.0	0.0	35.8	0.0	34.3	0.0	1.9	0.0	33.2	723
2014	408	520	0.0	19.3	0.0	50.2	0.2	30.0	0.0	0.2	0.0	29.4	719
2015	430	477	0.0	50.2	0.2	24.9	0.2	23.3	0.2	0.7	0.2	20.7	665
2016	464	524	0.4	26.3	0.0	52.6	0.2	19.4	0.0	0.9	0.2	30.4	707
2017	248	284	0.8	33.9	0.0	41.5	0.4	22.2	0.4	0.4	0.4	25.8	693
2018	384	439	0.3	31.5	0.0	48.7	0.0	19.5	0.0	0.0	0.0	28.4	682

Note: Bethel test fishery uses a 5-3/8 inch and 8.0 inch drift gillnet to index run timing and relative abundance of Chinook salmon.

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] ASL data were not collected.

Table 40.–Estimated age and sex composition, mean length, and total number of Chinook salmon harvest in the lower Kuskokwim River subsistence fishery, 2001–2018.

Year	Number of samplers	Sample size	Total harvest	(0.1)	(0.2)	(1.1)	(1.2)	(2.1)	(1.3)	(2.2)	(1.4)	(2.3)	(1.5)	(2.4)	(1.6)	Percent females	Mean length (mm)
									Percent by age class								
2001	20	1,052	78,174	0.0	0.0	0.1	4.1	0.0	29.4	0.0	62.1	0.0	4.1	0.1	0.0	33.9	780
2002	24	1,489	81,169	0.0	0.0	0.0	7.8	0.0	34.0	0.0	53.3	0.0	4.8	0.0	0.1	41.6	769
2003	32	1,941	67,737	0.0	0.0	0.2	7.1	0.0	43.7	0.0	42.7	0.0	6.3	0.0	0.0	37.8	770
2004	22	2,277	96,788	0.0	0.0	0.1	15.1	0.0	35.8	0.3	45.9	0.0	2.6	0.0	0.0	32.6	758
2005	30	2,826	85,863	0.0	0.0	0.0	5.4	0.0	49.8	0.0	42.7	0.2	1.8	0.1	0.0	37.0	775
2006	20	1,972	90,812	0.0	0.0	0.2	6.3	0.0	35.9	0.1	53.2	0.2	4.0	0.1	0.0	41.6	786
2007	28	2,475	94,898	0.0	0.0	0.0	6.6	0.0	37.5	0.0	52.4	0.3	2.6	0.6	0.0	41.7	782
2008	48	3,397	88,912	0.0	0.0	0.2	8.2	0.0	53.9	0.0	34.2	0.6	2.6	0.2	0.0	34.5	752
2009	55	4,218	79,896	0.0	0.0	0.1	9.9	0.0	34.6	0.1	53.8	0.1	1.3	0.1	0.0	38.4	769
2010	37	2,153	67,286	0.0	0.0	0.2	8.2	0.0	49.1	0.1	39.5	0.0	3.0	0.0	0.0	41.7	769
2011	21	1,482	62,366	0.0	0.0	0.3	13.6	0.0	47.5	0.0	36.5	0.2	1.8	0.0	0.1	33.0	749
2012	9	407	22,544	0.0	0.0	0.0	12.6	0.0	52.4	0.0	32.3	0.3	2.4	0.0	0.0	32.0	739
2013	16	873	47,113	0.0	0.0	0.2	5.8	0.0	29.9	0.0	62.3	0.5	1.2	0.2	0.0	42.2	779
2014	4	131	11,234	1.1	0.0	24.2	33.7	0.0	25.3	1.1	14.7	0.0	0.0	0.0	0.0	29.7	577
2015	9	299	16,124	0.0	0.4	1.6	34.1	0.4	35.7	0.0	26.4	1.2	0.4	0.0	0.0	38.1	677
2016	9	261	30,676	0.0	0.0	0.4	42.3	0.0	48.5	0.4	7.5	0.9	0.0	0.0	0.0	13.1	654
2017	13	231	22,151	0.0	0.0	0.0	35.9	0.0	46.7	0.5	15.9	0.5	0.0	0.5	0.0	28.4	679
2018	26	552	22,624	0.0	0.0	1.2	49.5	0.0	34.8	0.0	14.5	0.0	0.0	0.0	0.0	25.1	656

Note: Samples were collected by subsistence fishermen who sampled their own harvests or the harvests of others. Age and sex percentages and mean length were calculated separately using all fish and may differ from annual summaries that are based on a subset of fish with a complete record of paired ASL data. Mesh sizes used in the subsistence fishery have changed over time.

Table 41.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area Chinook salmon past the Middle Fork Goodnews River weir, 1991–2018.

Year	Sample size	Total escapement	(1.1)	(1.2)	(1.3)	(2.2)	(1.4)	(2.3)	(1.5)	(2.4)	(2.5)	Percent females	Mean length (mm)
							Percent by age class						
1991	279	2,080	0.0	17.3	32.0	0.0	39.1	0.0	11.0	0.3	0.3	44.7	N/A
1992[a]	70	1,445	1.4	7.1	27.1	1.4	58.6	0.0	4.3	0.0	0.0	54.3	
1993[a]	31	2,132	0.0	12.9	22.6	0.0	54.8	0.0	9.7	0.0	0.0	67.7	
1994[a]	208	3,061	0.5	3.8	33.2	0.0	50.0	0.0	10.6	1.9	0.0	46.6	
1995	308	4,678	0.0	17.4	17.5	0.0	64.3	0.0	0.8	0.0	0.0	43.8	798
1996[a]	42		4.6	11.8	42.1	0.0	37.5	0.0	3.9	0.0	0.0	45.4	
1997	121	2,897	0.6	60.3	9.1	0.0	30.0	0.0	0.0	0.0	0.0	25.0	691
1998[a]	8	3,553											
1999[a]	28	3,703											
2000	214	2,670	1.1	11.9	63.9	0.0	22.2	0.0	0.9	0.0	0.0	32.0	738
2001[a]	39	5,351	0.0	12.8	12.8	0.0	71.8	0.0	0.0	2.6	0.0	46.2	
2002	199	3,025	0.0	31.0	23.7	0.0	41.1	0.0	4.2	0.0	0.0	32.2	713
2003	241	2,248	3.2	13.6	44.1	0.0	34.4	0.0	4.7	0.0	0.0	41.6	742
2004[a]	174	4,438	4.0	52.0	23.4	0.6	20.0	0.0	0.0	0.0	0.0	30.3	
2005[a]	155	4,781	1.3	14.7	52.6	0.0	30.8	0.0	0.0	0.6	0.0	36.5	
2006[a]	57	4,572	1.8	33.3	26.3	0.0	36.8	0.0	1.8	0.0	0.0	47.4	
2007	209	3,914	1.2	33.7	27.2	0.0	34.8	0.3	1.2	1.6	0.0	37.2	713
2008	123	2,223	7.8	17.5	42.0	0.0	26.1	0.0	6.5	0.0	0.0	46.6	718
2009[a]	57	1,669	0.0	28.1	14.0	0.0	57.9	0.0	0.0	0.0	0.0	47.4	
2010[a]	76	2,176	13.8	29.2	40.0	0.0	13.8	1.5	1.5	0.0	0.0	32.3	
2011[a]	44	2,045	0.0	31.8	36.4	0.0	31.8	0.0	0.0	0.0	0.0	34.1	
2012[a]	45	524	0.0	8.9	66.7	0.0	24.4	0.0	0.0	0.0	0.0	48.9	
2013	175	1,187	0.5	14.8	22.4	0.0	60.8	0.0	1.0	0.5	0.0	56.7	795
2014[a]	74	750	1.4	13.5	48.6	0.0	33.8	0.0	1.4	1.4	0.0	44.6	
2015[a]	111	1,494	3.6	58.6	15.3	0.0	22.5	0.0	0.0	0.0	0.0	27.9	
2016[a]	89	3,767	5.6	58.4	30.3	0.0	5.6	0.0	0.0	0.0	0.0	16.9	
2017	234	6,881	9.8	20.9	65.0	0.4	3.0	0.9	0.0	0.0	0.0	51.3	666
2018[b]													

Note: N/A designates years when length data were not available or not summarized.

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] Weir did not operate.

Table 42.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area Chinook salmon past the Kanektok River weir, 2002–2018.

Year	Sample size	Total escapement	Percent by age class								Percent females	Mean length (mm)
			(1.1)	(1.2)	(1.3)	(2.2)	(1.4)	(2.3)	(1.5)	(2.4)		
2002	188	5,304	2.3	22.9	25.0	0.0	43.1	0.0	6.6	0.0	37.5	712
2003	174	8,211	2.3	23.6	35.3	0.0	36.7	0.0	2.0	0.0	32.7	704
2004	428	19,569	0.2	58.3	25.2	0.0	15.6	0.0	0.7	0.0	13.6	658
2005[a]	224	14,177										
2006[b]												
2007	431	13,965	0.9	32.9	19.1	0.0	44.2	0.0	2.7	0.2	34.9	706
2008[a]	34											
2009	468	7,065	0.4	26.2	23.2	0.2	49.5	0.0	0.2	0.2	37.3	740
2010	224	6,537	0.9	35.2	44.0	0.4	19.1	0.0	0.5	0.0	23.7	659
2011	159	5,170	0.0	59.2	27.9	0.0	12.9	0.0	0.0	0.0	22.0	617
2012[a]	48	1,561										
2013	153	3,569	0.0	35.2	25.7	0.0	37.8	0.5	0.8	0.0	36.8	689
2014[a]	117	3,594										
2015	311	10,416	9.1	51.5	21.9	0.0	17.3	0.0	0.1	0.0	26.2	651
2016[b]												
2017[b]												
2018[b]												

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] Weir did not operate.

Table 43.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area Chinook salmon past the Salmon River (Aniak) weir, 2006–2018.

Year	Sample size	Total escapement	(1.1)	(1.2)	(0.4)	(1.3)	(2.2)	(1.4)	(2.3)	(1.5)	(2.4)	Percent females	Mean length (mm)
						Percent by age class							
2006	345	7,075	0.4	36.1	0.0	29.6	0.0	30.3	0.0	3.5	0.0	22.9	680
2007	403	6,255	0.2	47.8	0.0	23.9	0.0	25.9	0.8	0.1	1.4	15.0	628
2008	219	2,376	0.0	21.9	0.0	50.7	0.0	23.6	1.3	2.5	0.0	28.5	684
2009	0	1,656											
2010[b]													
2011[b]													
2012[a,c]	48	473	0.0	12.5	0.0	45.8	0.0	37.5	0.0	4.2	0.0	27.1	740
2013[a]	76	625	0.0	46.1	1.3	26.3	1.3	23.7	0.0	1.3	0.0	30.3	673
2014[a]	45	1,757	0.0	13.3	0.0	51.1	2.2	33.3	0.0	0.0	0.0	31.1	683
2015	149	2,404	1.3	55.0	0.0	23.7	0.0	19.5	0.4	0.0	0.0	12.1	619
2016[a]	36	776	0.0	22.2	0.0	50.0	0.0	25.0	0.0	2.8	0.0	50.0	661
2017	206	2,800	0.5	49.0	0.0	39.3	0.0	11.2	0.0	0.0	0.0	19.9	619
2018	202	2,277	2.2	45.8	0.0	45.4	0.0	6.6	0.0	0.0	0.0	21.0	631

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] Weir did not operate.

[c] Weir did not operate for most of the season. Only observed escapement counts are presented.

Table 44.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim River Chinook salmon past the George River weir, 1996–2018.

Year	Sample size	Total escapement	(0.2)	(1.1)	(1.2)	(1.3)	(2.2)	(1.4)	(2.3)	(1.5)	(2.4)	Percent females	Mean length (mm)
			Percent by age class										
1996	191	7,770	0.0	0.0	7.1	23.2	0.4	39.8	0.0	29.4	0.0	44.3	816
1997	269	7,810	0.0	0.0	34.6	11.7	0.0	53.7	0.0	0.0	0.0	37.4	736
1998[a,b]	75	2,505	0.0	0.0	30.7	50.7	0.0	17.6	0.0	0.0	0.0	25.7	671
1999[a,b]	54	2,439	0.0	0.0	9.3	14.8	0.0	75.9	0.0	0.0	0.0	53.7	799
2000[a]	72	2,959	0.0	0.0	9.7	20.8	0.0	68.1	0.0	1.4	0.0	52.8	805
2001[a]	62	3,277	0.0	0.0	12.9	24.2	0.0	53.2	0.0	9.7	0.0	38.7	762
2002	315	2,443	0.0	0.0	12.6	18.3	0.0	60.9	0.0	8.2	0.0	40.6	759
2003[a,b]	23	975											
2004	269	5,488	0.0	0.5	25.9	21.2	0.0	49.6	0.0	2.7	0.0	37.7	763
2005	471	3,845	0.0	0.0	10.6	43.9	0.0	40.7	1.2	3.3	0.3	35.7	756
2006	223	4,355	0.0	0.2	24.9	28.2	0.0	35.8	0.0	10.8	0.0	35.1	736
2007	249	4,011	0.0	0.0	54.0	22.2	0.0	22.0	0.0	1.3	0.5	16.8	623
2008	288	2,563	0.0	0.0	19.8	48.7	0.0	27.3	1.0	3.2	0.0	27.9	699
2009	152	3,663	0.0	0.0	21.1	25.0	0.0	52.0	0.0	1.0	0.9	41.9	762
2010	163	1,498	0.0	1.1	35.8	27.9	0.0	29.9	0.0	5.3	0.0	30.6	647
2011	167	1,547	0.0	1.2	35.2	33.5	0.0	27.7	0.4	1.7	0.4	37.5	686
2012	138	2,201	0.6	0.0	30.2	41.2	0.0	25.6	1.4	1.1	0.0	30.5	695
2013[a]	85	1,292	0.0	0.0	16.5	30.6	0.0	51.8	0.0	1.2	0.0	60.0	643
2014	155	2,993	0.0	0.0	12.9	21.7	0.7	61.4	0.7	2.6	0.0	54.6	705
2015	174	2,282	0.0	1.7	50.2	21.6	0.0	26.5	0.0	0.0	0.0	24.3	643
2016[a]	43	1,663	0.0	0.0	32.6	55.8	0.0	11.6	0.0	0.0	0.0	27.9	658
2017	229	3,685	0.0	0.4	28.8	52.0	0.4	17.9	0.4	0.0	0.0	22.7	639
2018	222	3,306	0.0	2.1	37.2	41.9	0.0	18.8	0.0	0.0	0.0	22.1	635

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] Weir did not operate for most of the season. Only observed escapement counts are presented.

Table 45.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area Chinook salmon past the Tatlawiksuk River weir, 1998–2018.

Year	Sample size	Total escapement	Percent by age class								Percent females	Mean length (mm)
			(1.1)	(1.2)	(1.3)	(2.2)	(1.4)	(2.3)	(1.5)	(2.4)		
1998[a,b]	15	970										
1999[b]	7	1,484										
2000[b]	7	807										
2001[b]	74	1,978	0.0	12.2	39.2	0.0	44.6	0.0	4.1	0.0	39.2	733
2002	279	2,237	0.0	23.2	19.7	0.4	52.9	0.0	3.6	0.0	36.8	716
2003[a,b]	39	601	0.0	7.7	56.4	0.0	28.2	0.0	7.7	0.0	38.5	765
2004	301	2,833	0.0	26.5	40.6	0.0	32.9	0.0	0.0	0.0	32.6	716
2005	384	2,864	0.0	13.4	49.5	0.0	35.6	0.0	1.4	0.0	42.6	729
2006	178	1,700	0.0	21.0	44.1	0.0	30.4	0.0	4.6	0.0	41.4	682
2007	275	2,032	0.4	34.7	43.9	0.0	19.7	0.0	1.0	0.4	27.2	653
2008	93	1,075	0.0	10.3	57.4	0.0	32.3	0.0	0.0	0.0	39.0	709
2009	93	1,071	0.0	31.7	40.1	0.0	27.5	0.0	0.0	0.8	40.0	730
2010	80	546	1.0	29.4	43.2	0.0	23.3	0.0	2.0	1.1	39.4	706
2011	123	992	0.0	45.5	30.2	0.0	21.7	0.0	1.7	0.8	25.5	664
2012	91	1,116	0.0	21.9	61.4	0.0	16.7	0.0	0.0	0.0	42.8	713
2013[b]	66	495	0.0	7.6	37.9	0.0	53.0	0.0	1.5	0.0	53.0	704
2014[b]	94	1,904	0.0	13.8	42.6	0.0	43.6	0.0	0.0	0.0	58.5	750
2015	176	2,104	0.0	38.7	49.5	0.0	11.8	0.0	0.0	0.0	26.7	649
2016[b]	62	2,494	1.6	12.9	72.6	0.0	12.9	0.0	0.0	0.0	48.4	688
2017[b]	130	2,156	0.8	23.1	54.6	0.0	20.8	0.8	0.0	0.0	30.8	681
2018[c]												

[a] Weir did not operate for most of the season. Only observed escapement counts are presented

[b] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[c] Weir did not operate.

Table 46.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area Chinook salmon past the Kogrukluk River weir, 1976–2018.

Year	Sample size	Total escapement	(1.1)	(1.2)	(1.3)	(2.2)	(1.4)	(2.3)	(1.5)	(2.4)	(1.6)	Percent females	Mean length (mm)
							Percent by age class						
1976	347	5,638	0.0	7.6	40.7	0.4	50.8	0.0	0.4	0.0	0.0	44.7	815
1977[a,b]	0	1,385											
1978	516	14,533	0.2	17.0	10.5	0.0	55.9	1.4	3.0	12.1	0.0	46.2	849
1979	383	11,393	0.0	66.2	14.4	0.0	16.3	0.0	3.1	0.0	0.0	13.3	691
1980[a,c]	118	843	0.0	21.2	51.7	0.0	19.5	0.0	7.6	0.0	0.0	29.7	755
1981	797	16,809	0.3	7.4	30.3	0.0	58.2	0.0	3.9	0.0	0.0	44.0	830
1982	392	13,126	0.0	4.1	24.5	0.0	66.3	0.0	5.1	0.0	0.0	51.7	779
1983[a]	448	1,080	0.2	20.0	19.6	0.0	55.9	0.0	4.2	0.0	0.0	30.5	763
1984	1,376	4,922	0.1	22.5	47.5	0.0	26.4	0.0	3.5	0.0	0.1	21.0	701
1985	1,042	4,442	0.0	16.2	35.7	0.0	44.9	0.0	3.2	0.0	0.1	31.5	745
1986[a]	679	2,968	0.4	8.6	50.9	0.0	32.8	0.0	7.2	0.0	0.0	30.4	726
1987[a,c]	117	770	0.0	25.6	24.8	0.0	48.7	0.0	0.9	0.0	0.0	28.2	743
1988	867	8,028	0.0	8.0	52.7	0.0	31.4	0.0	8.0	0.0	0.0	35.3	728
1989[a,c]	217	4,911	0.0	14.7	25.3	0.0	58.1	0.0	1.8	0.0	0.0	34.6	781
1990[d]	367	10,093	2.7	23.7	62.3	0.0	11.2	0.0	0.2	0.0	0.0	22.2	714
1991	315	6,835	0.0	6.4	29.8	0.3	62.4	0.0	1.1	0.0	0.0	49.3	830
1992	349	6,563	0.0	21.3	40.3	0.0	36.5	0.0	1.7	0.0	0.0	32.6	762
1993[c]	313	12,377	0.0	34.5	24.9	0.0	35.5	0.0	4.8	0.3	0.0	29.7	729
2009	245	9,528	0.0	22.2	52.4	0.7	22.9	0.4	1.4	0.0	0.0	28.2	730
2010	298	5,812	0.0	44.0	28.8	0.0	25.6	0.0	1.5	0.0	0.0	26.2	672
2011	268	6,731	0.0	47.2	32.6	0.3	19.5	0.3	0.0	0.0	0.0	20.1	673
2012[a,c]	87	1,156	0.0	5.7	56.3	0.0	36.8	1.1	0.0	0.0	0.0	54.0	765
2013[c]	61	1,819	0.0	26.2	36.1	0.0	37.7	0.0	0.0	0.0	0.0	49.2	636
2014[c]	106	3,732	0.9	17.0	49.1	0.0	31.1	0.9	0.9	0.0	0.0	30.0	709
2015	225	8,081	0.0	58.3	33.9	0.0	7.7	0.0	0.0	0.0	0.0	14.6	632
2016	201	7,056	0.0	24.4	63.7	0.0	11.9	0.0	0.0	0.0	0.0	25.9	694
2017[c]	162	10,004	1.1	37.6	40.7	0.0	20.6	0.0	0.0	0.0	0.0	30.6	695
2018	213	5,770	4.9	35.1	41.4	0.0	18.4	0.0	0.0	0.0	0.0	31.9	656

[a] Weir did not operate for most of the season. Only observed escapement counts are presented.

[b] ASL Samples were not collected.

[c] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[d] All 1990 scales need re-aged due to potential errors.

Table 47.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area Chinook salmon past the Salmon River (Pitka Fork) weir, 1981–1982 and 2015–2018.

Year	Sample size	Total escapement	Percent by age class								Percent females	Mean length (mm)
			(1.1)	(1.2)	(1.3)	(2.2)	(1.4)	(2.3)	(1.5)	(2.4)		
1981	132	1,700	0.0	0.8	9.8	0.0	78.0	0.0	10.6	0.0	47.0	852
1982	142	730	0.0	4.9	16.2	0.0	71.1	0.0	7.7	0.0	51.0	793
2015	195	6,736	0.0	22.1	33.1	0.0	43.3	0.0	1.5	0.0	37.0	722
2016	258	6,326	0.0	9.9	64.7	0.4	24.7	0.3	0.0	0.0	52.8	715
2017	151	8,003	0.0	12.6	47.1	0.0	40.3	0.0	0.0	0.0	50.5	711
2018	220	5,317	0.0	14.4	54.0	0.0	31.1	0.0	0.5	0.0	41.1	680

Note: In 1981 and 1982 the weir was located 200 m upstream from the of the south fork. The weir was re-established in 2015 immediately downriver of the south and north forks.

Table 48.–Estimated age and sex composition, mean length, and total number of Kuskokwim Area chum salmon harvested in the District W1 commercial gillnet fishery, 1972–2018.

Year	Sample size	Total harvest	(0.2)	(0.3)	(0.4)	(0.5)	Percent females	Mean length (mm)
			Percent by age class					
1972	542	78,619	3.1	39.4	57.5	0.0	54.9	585
1973	534	148,746	0.4	60.8	35.8	2.9	46.5	583
1974	163	171,887	1.3	46.8	47.1	4.9	47.7	553
1975	527	184,171	1.0	85.6	13.0	0.4	53.5	575
1976[a]	514	177,864						
1977	679	248,721	9.6	83.0	7.3	0.1	56.6	581
1978	877	248,656	6.0	64.8	29.0	0.2	54.5	579
1979[a]	962	261,874						
1980	507	483,751	0.5	98.1	1.4	0.0	56.8	557
1981	855	418,677	1.8	37.0	61.1	0.1	51.3	580
1982	888	278,306	1.0	67.8	29.7	1.4	53.5	583
1983	1,705	276,698	0.8	47.0	50.8	1.3	52.8	587
1984	1,834	423,718	0.8	89.1	9.7	0.7	60.0	576
1985	1,063	199,563	0.8	36.8	62.0	0.4	54.1	585
1986	1,064	309,048	0.4	76.5	22.6	0.5	53.1	581
1987	1,312	570,708	1.5	52.9	44.8	0.8	57.0	581
1988	2,404	1,384,267	0.8	79.3	19.1	0.8	49.1	577
1989	655	748,338	0.2	36.9	61.8	1.1	52.1	584
1990	558	459,974	0.6	70.6	27.5	1.3	51.8	576
1991	1,630	431,798	2.2	64.9	32.8	0.1	55.6	566
1992	1,677	344,470	0.0	44.5	53.5	2.0	48.9	555
1993	318	43,337	1.4	32.2	60.2	6.2	45.9	554
1994	1,389	271,115	0.7	72.5	24.7	2.0	56.7	546
1995	1,811	605,918	3.6	58.0	37.0	1.4	54.5	557
1996	2,169	200,298	0.3	73.0	24.5	2.2	53.7	565
1997	355	17,026	3.3	52.1	42.2	2.4	47.6	571
1998	1,433	207,809	0.8	87.2	11.8	0.1	57.1	557
1999	268	23,006	0.0	58.0	41.9	0.0	50.7	576
2000	253	11,571	2.4	73.6	23.0	1.0	52.6	566
2001[b]	118	1,273						
2002[b]	93	1,900						
2003[b]	118	2,764						
2004	737	20,150	30.7	42.2	27.1	0.0	47.3	551
2005	779	69,139	0.9	93.1	5.9	0.1	53.4	558
2006[c]	392	44,070	0.4	49.9	49.7	0.0	45.9	571
2007[b]	201	10,763						
2008	865	30,516	0.3	20.7	74.3	4.7	41.9	563
2009	1,199	76,790	2.1	66.6	29.1	2.2	42.6	564
2010	1,265	93,148	2.8	72.6	23.5	1.1	44.7	552
2011	903	118,256	0.3	63.9	35.0	0.8	43.2	553
2012	668	65,171	1.7	73.2	23.3	1.7	56.8	547
2013	196	52,235	0.0	81.6	17.3	1.0	48.0	555
2014	202	19,080	2.5	37.1	57.9	2.5	40.1	556
2015[d]	0	507						

-continued-

49

Table 48.–Page 2 of 2.

Year	Sample size	Total harvest	Percent by age class				Percent females	Mean length (mm)
			(0.2)	(0.3)	(0.4)	(0.5)		
2016[e]								
2017[e]								
2018[e]								

[a] ASL samples were not summarized in Molyneaux et al. 2010.

[b] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[c] Samples were collected, are archived at ADF&G, but data are not available through the AYKDBMS.

[d] ASL data were not collected

[e] No commercial fishery occurred.

Table 49.–Estimated age and sex composition, mean length, and total number of Kuskokwim Area chum salmon harvested in the District W4 commercial gillnet fishery, 1984-2018.

Year	Sample size	Total harvest	Percent by age class					Percent females	Mean length (mm)
			(0.2)	(0.3)	(0.4)	(0.5)	(0.6)		
1984	464	50,422	0.3	75.5	23.6	0.6	0.0	54.1	589
1985	457	20,418	0.0	46.2	53.1	0.7	0.0	53.5	597
1986	398	29,700	0.0	58.6	41.4	0.0	0.0	53.8	584
1987[a]	241	8,557							
1988	593	29,247	1.3	68.0	29.3	1.4	0.0	49.6	583
1989	703	39,395	0.0	49.0	49.7	1.3	0.0	53.4	590
1990	618	47,717	0.8	77.3	21.3	0.6	0.0	55.0	584
1991	656	54,493	1.0	72.5	26.5	0.0	0.0	52.0	565
1992	546	73,383	0.2	35.4	62.9	1.5	0.0	52.3	590
1993	398	40,924	0.9	42.2	47.1	9.8	0.0	51.1	550
1994[a]	547	61,301							
1995	598	81,462	7.6	48.5	43.1	0.8	0.0	64.1	574
1996[a]	615	81,505							
1997	1,221	38,435	1.5	37.5	59.9	1.1	0.0	54.4	582
1998	857	45,095	0.7	89.0	9.6	0.7	0.0	58.5	574
1999	814	38,091	0.2	70.0	29.6	0.2	0.0	57.7	583
2000	1,043	30,553	0.5	54.0	44.9	0.6	0.0	54.3	595
2001	576	17,209	0.4	49.9	49.5	0.2	0.0	59.0	575
2002	449	29,319	4.0	56.9	36.8	2.2	0.0	63.8	574
2003	243	27,868	1.1	88.0	9.7	1.3	0.0	52.1	562
2004	225	25,850	4.2	40.2	55.0	0.6	0.0	44.3	586
2005	958	13,529	0.6	86.0	12.7	0..7	0.0	48.0	561
2006[b]	1,320	39,151	4.6	43.7	51.4	0.4	0.0	50.5	559
2007	1,134	61,228	0.0	79.1	19.2	1.8	0.0	55.6	549
2008	585	57,033	0.8	34.6	60.5	4.2	0.0	47.3	580
2009	1,101	91,158	2.6	69.3	27.1	1.1	0.0	55.4	573
2010	1,174	106,610	1.0	66.8	31.0	1.2	0.0	46.9	566
2011	903	104,959	1.6	61.2	36.3	1.0	0.0	50.2	567
2012	921	61,140	0.6	72.8	24.9	1.7	0.0	54.3	570
2013	667	58,079	0.0	43.0	55.9	0.9	0.2	54.6	568
2014	341	14,563	2.2	29.9	64.8	3.2	0.0	54.4	568
2015	339	16,051	1.5	83.3	15.0	0.2	0.0	43.9	562
2016[c]									
2017[c]									
2018[c]									

Note: Commercial chum salmon fishery was executed using restricted mesh (≤ 6 inch) gillnets.

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] Samples were collected, are archived at ADF&G, but data are not available through the AYKDBMS.

[c] No commercial fishery occurred.

Table 50.–Estimated age and sex composition, mean length, and total number of Kuskokwim Area chum salmon harvested in the District W5 commercial gillnet fishery, 1984-2018.

Year	Sample size	Total harvest	Percent by age class				Percent females	Mean length (mm)
			(0.2)	(0.3)	(0.4)	(0.5)		
1984[a]	459	14,340						
1985[a]	270	4,784						
1986	353	10,356	0.4	69.3	29.4	1.0	48.5	588
1987	430	20,381	0.0	68.2	31.8	0.0	46.7	589
1988	469	33,059	0.3	17.4	80.5	1.7	54.4	606
1989	543	13,622	0.1	45.2	52.5	2.2	39.4	597
1990	359	13,194	0.4	77.6	21.8	0.2	43.9	583
1991	565	15,892	2.0	79.8	18.2	0.0	52.3	571
1992	418	18,520	0.0	14.5	83.5	2.0	59.4	573
1993[a]	191	10,657						
1994[a]	512	28,477						
1995[a]	355	19,832						
1996[a]	190	11,093						
1997	805	11,729	0.6	30.0	69.0	0.4	51.9	585
1998	469	14,155	0.5	85.7	13.3	0.5	48.6	576
1999	455	11,562	0.2	77.0	22.5	0.3	55.0	579
2000	598	7,450	0.0	42.5	57.1	0.4	60.4	601
2001	647	3,412	0.2	56.9	42.9	0.0	61.4	583
2002	234	3,799	0.3	50.3	47.9	15.0	56.1	590
2003	296	5,593	0.0	88.0	9.3	2.7	44.1	564
2004[a]	76	5,965						
2005[a]	105	2,568						
2006[a,b]	193	11,568						
2007[a]	543	7,519						
2008[c]	0	10,340						
2009	1,268	16,985	2.1	40.1	55.6	2.3	37.9	579
2010	752	26,914	1.8	74.5	21.0	2.6	36.2	564
2011	644	13,191	0.2	43.7	55.2	1.0	33.1	567
2012	1,288	24,487	0.3	65.7	30.8	3.2	0.0	570
2013	782	12,651	0.0	38.6	58.7	2.7	40.1	572
2014	330	3,403	0.0	32.3	65.3	2.4	42.5	569
2015	630	4,510	8.1	71.7	18.1	2.1	26.1	565
2016[d]								
2017[d]								
2018[d]								

Note: Commercial chum salmon fishery was executed using restricted mesh (≤ 6 inch) gillnets.

[a] Samples were not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] Samples were collected, are archived at ADF&G, but data are not available through the AYKDBMS.

[c] ASL Samples were not collected.

[d] No commercial fishery occurred.

Table 51.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area chum salmon past the Middle Fork Goodnews River weir, 1991–2018.

Year	Sample size	Total escapement	Percent by age class				Percent females	Mean length (mm)
			(0.2)	(0.3)	(0.4)	(0.5)		
1991	291	27,632	0.0	73.1	26.9	0.0	40.5	566
1992[a]	493	21,096						
1993[a]	236	14,581						
1994[a]	207	35,652						
1995[a]	280	33,559						
1996[a,b]	311	26,719						
1997	526	17,151	0.4	31.5	67.8	0.2	44.4	589
1998	705	26,996	0.3	86.1	13.4	0.2	49.9	578
1999	672	21,818	0.0	65.4	34.3	0.3	49.9	587
2000[a]	418	14,405						
2001	768	26,820	0.7	70.6	28.7	0.1	55.5	587
2002	725	29,905	2.9	37.1	58.6	1.4	55.0	600
2003	556	21,778	0.7	84.5	12.6	2.3	45.6	572
2004	1,220	32,442	4.2	59.3	36.4	0.1	51.8	579
2005	907	26,501	1.5	83.4	15.0	0.1	52.9	571
2006	776	54,689	1.3	69.7	28.6	0.3	23.9	574
2007	865	50,232	0.8	54.1	44.2	0.9	51.4	570
2008	1,241	39,548	0.3	44.9	49.0	5.7	61.5	578
2009[a]	196	19,236						
2010	189	24,789	2.1	74.5	22.7	0.7	59.7	564
2011	447	19,974	0.6	44.2	52.6	2.6	43.0	572
2012[a]	347	9,065						
2013	494	27,682	0.0	32.8	64.5	2.7	44.4	585
2014	284	11,518	0.2	35.8	55.7	8.3	38.8	588
2015	445	11,517	6.8	67.3	25.6	0.3	38.5	564
2016	351	41,661	9.7	75.8	14.5	0.0	53.5	564
2017[a]	592	54,799	1.4	75.7	22.6	0.3	55.1	569
2018[c]								

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] Weir did not operate for most of the season. Only observed escapement counts are presented.

[c] Weir did not operate.

Table 52.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area chum salmon past the Kanektok River weir, 2002–2018.

Year	Sample size	Total escapement	Percent by age class				Percent females	Mean length (mm)
			(0.2)	(0.3)	(0.4)	(0.5)		
2002	738	41,912	2.5	43.1	53.0	1.4	57.5	586
2003	733	40,086	0.8	86.8	10.4	1.9	49.6	566
2004	736	46,008	5.7	49.9	44.2	0.3	48.2	568
2005[a]	894	55,340						
2006[b]								
2007	1,121	131,000	0.1	63.3	34.7	2.0	48.4	566
2008[a,c]	725	53,077						
2009	631	55,846	0.6	68.0	29.4	2.1	35.9	591
2010	663	68,186	1.2	65.1	32.3	1.4	51.5	573
2011	936	53,050	0.2	44.7	53.8	1.3	51.9	570
2012	382	28,726	0.0	56.1	38.1	5.8	47.7	582
2013	573	43,040	0.0	26.0	70.3	3.7	45.1	582
2014[a]	314	18,602						
2015	662	15,048	1.7	75.5	22.2	0.6	47.7	569
2016[b]								
2017[b]								
2018[b]								

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] Weir did not operate.

[c] Weir did not operate for most of the season. Only observed escapement counts are presented.

Table 53.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area chum salmon past the Salmon River (Aniak) weir, 2006–2018.

Year	Sample size	Total escapement	Percent by age class				Percent females	Mean length (mm)
			(0.2)	(0.3)	(0.4)	(0.5)		
2006	846	42,825	1.6	51.9	46.2	0.4	36.8	559
2007	759	25,340	2.1	62.2	33.6	2.1	38.8	554
2008	668	9,459	0.2	24.1	70.0	5.7	30.2	564
2009	0	9,392						
2010[a]								
2011[a]								
2012[b,c]	253	3,134	2.0	51.4	39.1	7.5	36.4	554
2013	653	7,723	0.0	55.0	41.1	3.8	19.0	563
2014[b]	124	2,890	0.8	27.4	67.7	4.0	8.1	566
2015	570	5,657	1.9	57.2	39.8	1.0	27.4	529
2016[b]	93	817	3.2	63.4	33.3	0.0	29.0	533
2017	333	10,173	0.2	58.6	38.4	2.7	31.9	523
2018	389	18,922	4.6	81.3	13.3	0.8	38.5	541

[a] Weir did not operate.

[b] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[c] Weir did not operate for most of the season. Only observed escapement counts are presented.

Table 54.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area chum salmon past the George River weir, 1996–2018.

Year	Sample size	Total escapement	Percent by age class					Percent females	Mean length (mm)
			(0.2)	(0.3)	(0.4)	(0.5)	(0.6)		
1996	765	24,214	1.6	59.9	36.8	1.7	0.0	46.1	582
1997	641	5,906	0.7	51.4	46.3	1.6	0.0	42.8	562
1998[a,b]	322	6,391							
1999[a]	611	8,684							
2000	235	3,507	1.4	46.7	50.4	1.6	0.0	43.5	580
2001	782	11,287	0.0	66.3	33.7	0.0	0.0	53.8	556
2002	955	6,534	6.4	46.3	45.8	1.5	0.0	47.3	571
2003	597	33,648	1.5	88.2	10.0	0.3	0.0	49.7	540
2004	923	15,012	9.2	38.6	52.0	0.2	0.0	47.9	555
2005	985	14,834	5.2	89.8	4.5	0.6	0.0	46.8	539
2006	934	42,318	3.5	50.8	45.5	0.2	0.0	57.5	542
2007[a]	705	61,531							
2008	787	29,396	0.6	17.4	78.8	3.2	0.0	48.4	551
2009	690	7,944	10.6	52.7	30.6	6.1	0.0	50.0	545
2010	1,067	26,275	3.9	87.8	7.5	0.7	0.1	51.6	531
2011	1,023	46,650	0.8	50.0	48.8	0.4	0.0	48.2	547
2012	672	33,310	0.0	58.2	33.8	7.9	0.0	52.4	553
2013	547	37,879	0.6	36.9	61.0	1.4	0.0	55.1	549
2014	370	17,148	0.0	42.1	49.8	7.7	0.4	51.8	546
2015	631	17,551	3.4	66.1	29.7	0.8	0.0	53.5	538
2016	320	20,834	6.9	78.1	15.0	0.0	0.0	52.0	526
2017	408	40,028	2.5	67.3	29.5	0.6	0.0	54.0	537
2018	386	48,277	3.9	75.6	19.4	1.0	0.0	49.0	540

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] Weir did not operate for most of the season. Only observed escapement counts are presented.

Table 55.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area chum salmon past the Tatlawiksuk River weir, 1998-2018.

Year	Sample size	Total escapement	Percent by age class						Percent females	Mean length (mm)
			0.1	(0.2)	(0.3)	(0.4)	(0.5)	(0.6)		
1998[a,b]	330	5,726								
1999	856	9,739	0.0	0.1	72.1	27.5	0.3	0.0	52.6	575
2000	705	7,076	0.0	2.0	57.6	39.9	0.5	0.0	48.2	577
2001	847	23,863	0.0	0.4	65.7	33.5	0.4	0.0	51.0	571
2002	1,346	24,539	0.0	6.7	58.6	33.2	1.5	0.0	50.3	567
2003[a,b]	57	479	0.0							
2004	1,299	21,245	0.0	14.6	42.1	43.1	0.2	0.0	38.7	565
2005	1,075	55,599	0.0	5.2	89.4	5.4	0.0	0.0	58.1	557
2006	935	32,776	0.0	1.8	55.6	42.3	0.3	0.0	42.1	560
2007	920	83,484	0.0	3.3	80.2	15.8	0.6	0.0	52.3	549
2008	799	30,129	0.0	0.5	21.3	76.2	2.0	0.0	52.3	559
2009	829	19,975	0.0	7.8	64.4	23.9	3.8	0.0	51.9	540
2010	1,082	37,737	0.0	8.9	82.7	7.9	0.5	0.0	51.6	551
2011	938	88,202	0.0	0.5	67.9	31.3	0.3	0.0	52.5	554
2012	593	44,569	0.0	0.6	45.7	49.2	4.5	0.0	54.7	560
2013	553	32,249	0.0	0.1	40.1	57.5	2.2	0.2	50.0	558
2014	211	12,455	0.0	0.6	30.6	58.1	10.7	0.0	36.2	568
2015	297	10,379	0.0	2.7	65.3	30.8	0.8	0.4	37.5	534
2016	277	10,564	0.0	7.8	64.7	27.5	0.0	0.0	50.0	538
2017	399	29,876	0.4	1.6	70.2	26.5	1.3	0.0	52.0	548
2018[c]										

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] Weir did not operate for most of the season. Only observed escapement counts are presented.

[c] Weir did not operate.

Table 56.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area chum salmon past the Kogrukluk River weir, 1976–2018.

Year	Sample size	Total escapement	Percent by age class				Percent females	Mean length (mm)
			(0.2)	(0.3)	(0.4)	(0.5)		
2002	999	52,973	0.2	75.7	23.1	1.1	15.1	579
2003	1,014	23,779	1.8	65.9	31.7	0.6	8.9	573
2004	1,033	24,405	9.2	59.4	30.9	0.5	9.2	565
2005	1,198	194,887	4.0	90.5	5.6	0.0	45.1	545
2006	1,275	188,003	1.6	62.2	36.0	0.3	38.2	550
2007	640	52,961	2.9	59.2	34.9	3.0	37.6	555
2008	524	44,744	1.5	53.8	42.0	2.6	34.9	560
2009	806	82,483	2.6	74.8	21.8	0.8	44..8	561
2010	746	69,258	2.8	62.2	34.1	0.8	45.3	553
2011	788	76,823	1.8	64.2	32.7	1.2	42.0	552
2012[a,b]	229	14,297	0.9	71.4	26.0	1.7	23.2	550
2013	661	65,644	0.1	55.3	43.9	0.7	46.8	555
2014	302	30,763	0.2	23.4	70.7	5.6	39.4	562
2015	799	33,201	11.4	70.6	17.6	0.4	40.8	539
2016	555	45,329	2.6	77.3	19.4	0.7	42.8	552
2017[c]	376	94,387	0.0	49.2	49.5	1.3	30.1	554
2018	580	54,211	4.2	74.5	20.7	0.7	30.7	549

[a] Weir did not operate for most of the season. Only observed escapement counts are presented.

[b] Samples were applied to observed escapement.

Table 57.–Estimated age and sex composition, mean length, and total number of Kuskokwim Area sockeye salmon harvested in the District W1 commercial gillnet fishery, 1984-2018.

Year	Sample size	Total harvest	(0.2)	(1.1)	(0.3)	(1.2)	(0.4)	(1.3)	(2.2)	(1.4)	(2.3)	(3.2)	(1.5)	(2.4)	(3.3)	Percent females	Mean length (mm)
								Percent by age class									
1984	296	48,575	0.3	0.3	6.8	9.4	0.3	56.9	6.8	0.6	18.6	0.0	0.0	0.0	0.0	52.6	N/A
1985	893	106,659	0.0	0.0	2.7	5.7	1.1	65.6	10.9	1.1	12.9	0.0	0.0	0.0	0.0	55.9	N/A
1986	535	95,363	0.0	0.0	2.4	4.6	1.3	64.4	11.6	1.3	14.5	0.0	0.0	0.0	0.0	50.3	N/A
1987	567	136,160	0.0	0.0	1.4	6.7	0.4	75.7	1.3	1.3	13.2	0.0	0.0	0.0	0.0	53.0	N/A
1988	453	92,538	0.0	0.0	0.2	1.4	0.0	73.0	1.4	2.2	21.0	0.0	0.0	0.4	0.4	56.5	N/A
1989	175	42,484	0.0	0.0	0.0	3.4	0.0	59.0	10.3	4.5	21.1	0.0	0.0	1.1	0.6	55.5	590
1990	250	84,414	0.0	0.4	0.4	3.6	0.8	77.2	4.8	2.8	10.0	0.0	0.0	0.0	0.0	51.2	576
1991	513	108,946	0.3	0.0	1.6	10.0	0.8	81.1	0.8	2.0	3.5	0.0	0.0	0.0	0.0	49.8	N/A
1992	504	92,174	0.0	0.0	2.4	6.1	0.8	69.2	3.2	6.3	12.0	0.0	0.0	0.0	0.0	51.1	553
1993	186	27,008	0.0	0.0	1.6	22.1	1.1	55.3	9.1	2.2	8.6	0.0	0.0	0.0	0.0	50.0	557
1994	173	49,365	0.0	0.0	0.6	1.8	0.0	72.0	0.6	1.8	22.0	0.0	0.0	1.2	0.0	49.7	571
1995	419	92,500	0.0	0.0[a]	1.8	7.8	0.3	81.8	1.7	2.5	4.0	0.0	0.0	0.0	0.0	58.3	564
1996	520	33,517	0.2	0.3	6.3	3.5	0.0	82.1	1.5	1.5	4.7	0.0	0.0	0.0	0.0	42.9	566
1997	89	21,989	0.0	0.0	0.0	25.8	0.0	50.6	11.2	2.2	10.1	0.0	0.0	0.0	0.0	50.6	566
1998	493	60,906	0.0	0.0	1.4	5.9	0.1	62.6	9.4	1.5	18.7	0.0	0.0	0.4	0.0	49.6	563
1999	189	16,976	0.0	0.0	0.0	4.2	0.0	65.6	5.8	5.3	19.0	0.0	0.0	0.0	0.0	58.7	578
2000	170	4,130	0.0	0.0	2.9	9.4	0.0	60.0	2.4	0.0	25.3	0.0	0.0	0.0	0.0	57.1	574
2001[b]	0	84															
2002[b]	0	84															
2003[b]	0	282															
2004[c]	416	8,532															
2005	551	27,645	0.0	0.0	1.4	8.9	0.0	80.7	0.8	1.2	7.0	0.0	0.0	0.0	0.0	54.3	562
2006[c,d]	179	12,618															572
2007[b]	0	703															
2008	509	15,601	0.0	0.0	2.5	5.2	0.0	84.5	0.1	4.6	3.0	0.0	0.0	0.0	0.0	53.2	550
2009	525	25,673	0.0	0.0	6.9	6.3	0.0	67.4	1.8	12.8	4.8	0.0	0.0	0.0	0.0	52.3	557
2010	1,120	22,428	0.0	0.0	3.8	17.3	1.9	66.3	0.3	8.9	1.3	0.0	0.0	0.0	0.0	52.5	564
2011	682	13,482	0.0	0.0	13.3	2.5	2.6	64.6	0.6	13.1	2.8	0.0	0.1	0.3	0.0	54.7	562
2012	315	2,857	0.0	0.0	4.8	5.7	1.5	72.7	0.8	10.8	3.5	0.0	0.3	0.0	0.0	49.3	552
2013	183	768	0.0	0.0	4.4	7.1	0.0	47.5	1.6	4.4	29.5	0.5	0.0	1.1	3.8	47.0	555

-continued-

58

Table 57.–Page 2 of 2.

| Year | Sample size | Total harvest | Percent by age class | | | | | | | | | | | | | Percent females | Mean length (mm) |
			(0.2)	(1.1)	(0.3)	(1.2)	(0.4)	(1.3)	(2.2)	(1.4)	(2.3)	(3.2)	(1.5)	(2.4)	(3.3)		
2014	52	2,720	0.0	0.0	1.9	32.7	1.9	40.4	3.8	15.4	3.8	0.0	0.0	0.0	0.0	34.6	543
2015[b]	0	130															
2016[e]																	
2017[e]																	
2018[e]																	

Note: Harvest data are from Districts W1 and W2 combined. The commercial sockeye salmon fishery was executed using restricted mesh (≤ 6 inch) gillnets. N/A designates years when length data were not available or not summarized.

[a] Age class was represented in samples but percent composition was <0.05.

[b] ASL data were not collected.

[c] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[d] Samples were collected, are archived at ADF&G, but data are not available through the AYK DB

[e] No commercial fishery occurred.

Table 58.–Estimated age and sex composition, mean length, and total number of Kuskokwim Area sockeye salmon harvested in the District W4 commercial gillnet fishery, 1990–2018.

Year	Sample size	Total harvest	(0.2)	(1.1)	(0.3)	(1.2)	(0.4)	(1.3)	(2.2)	(1.4)	(2.3)	(3.2)	(2.4)	(3.3)	Percent females	Mean length (mm)
			Percent by age class														
1990	573	83,681	0.2	0.1	6.7	49.3	0.3	41.7	0.1	0.3	1.2	0.0	0.0	0.0	44.0	N/A
1991	420	53,657	0.2	0.0	11.0	10.8	0.9	74.2	0.0	2.6	0.2	0.0	0.0	0.0	57.9	N/A
1992[a]	255	60,929														
1993	535	80,878	0.9	0.0	8.0	24.2	3.5	55.3	1.4	4.8	1.9	0.0	0.0	0.0	42.6	N/A
1994	527	72,314	0.0	0.0	10.0	14.0	0.3	68.4	0.2	4.4	2.6	0.0	0.1	0.0	46.2	N/A
1995	620	68,194	0.7	0.0	0.0	37.6	0.0	49.8	6.3	4.3	1.3	0.0	0.0	0.0	46.8	540
1996	509	57,665	0.2	0.0	5.8	16.6	0.0	68.1	2.5	0.6	5.8	0.0	0.0	0.3	57.0	559
1997	952	69,508	0.2	0.0	3.2	17.9	3.4	55.2	1.3	10.4	8.5	0.0	0.0	0.0	51.1	561
1998	757	41,382	0.3	0.0	4.0	23.4	0.4	65.3	2.4	1.2	2.9	0.0	0.2	0.0	53.0	544
1999	539	41,315	0.0	0.0	1.7	46.2	0.3	45.4	1.1	3.6	1.7	0.0	0.0	0.0	43.6	545
2000	880	68,557	0.0	0.0	0.6	22.5	0.1	74.1	0.5	0.2	1.9	0.0	0.0	0.0	54.8	559
2001	713	33,807	0.0	0.0	1.0	2.7	0.0[b]	89.8	0.2	1.8	4.5	0.0	0.0	0.0	44.0	568
2002[b]	307	17,820	2.6	0.0	0.3	49.7	0.3	38.0	3.0	2.1	3.9	0.0	0.0	0.0	46.1	530
2003	365	33,941	0.0	0.0	0.2	26.5	0.0	66.2	2.8	1.8	2.5	0.0	0.0	0.0	45.7	558
2004	217	34,437	0.0	0.0	2.2	30.9	1.1	59.0	0.6	5.6	0.6	0.0	0.0	0.0	47.1	547
2005	937	68,801	0.1	0.0	2.0	28.6	0.0	66.6	0.5	1.0	1.3	0.0	0.0	0.0	45.8	538
2002[b]	807	106,308	0.1	0.0	0.9	22.9	0.2	73.2	0.2	2.0	0.4	0.0	0.0	0.0	33.1	528
2007	1,005	109,343	0.0[c]	0.0	4.4	45.7	0.0	45.8	0.1	2.4	1.6[c]	0.0	0.0	0.0	44.6	524
2008	488	69,743	0.0	0.0	2.5	19.6	0.5	74.1	0.3	2.2	0.8	0.0	0.0	0.0	47.0	542
2009	976	112,153	0.0	0.0	2.4	53.8	0.1	40.5	0.5	1.5	1.2	0.0	0.0	0.0	51.7	540
2010	844	138,362	0.0[c]	0.0	2.8	14.5	1.2	78.7	0.2	2.0	0.6[c]	0.0	0.0	0.0	49.0	549
2011	602	38,543	0.3	0.0	5.3	29.3	1.6	50.1	5.3	4.2	3.5	0.2	0.2	0.0	48.9	541
2012	836	37,688	0.2	0.0	2.3	12.2	0.2	78.3	0.2	1.2	5.1	0.0	0.2	0.0	52.1	540
2013	602	26,393	0.0	0.3	1.7	60.2	0.4	29.8	1.4	2.2	4.0	0.0	0.0	0.0	54.3	520
2014	345	58,879	0.0	0.0	1.7	43.8	0.0	47.8	5.6	0.6	0.2	0.2	0.0	0.0	55.9	522
2015	551	30,269	0.0	0.0	3.6	7.4	0.3	77.6	7.5	1.9	1.8	0.0	0.0	0.0	43.5	545
2016[d]																
2017[d]																
2018[d]																

60

Table 58.–Page 2 of 2.

Note: Commercial sockeye salmon fishery was executed using restricted mesh (≤ 6 inch) gillnets. N/A designates years when length data were not available or not summarized.

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] Samples were collected, are archived at ADF&G, but data are not available through the AYKDBMS.

[c] Age class was represented in samples but percent composition was <0.0.

[d] No commercial fishery occurred.

Table 59.–Estimated age and sex composition, mean length, and total number of Kuskokwim Area sockeye salmon harvested in the District W5 commercial gillnet fishery, 1985–2018.

Year	Sample size	Total harvest	(0.2)	(1.1)	(0.3)	(1.2)	(0.4)	(1.3)	(2.2)	(1.4)	(2.3)	(2.4)	(3.3)	(3.4)	Percent females	Mean length (mm)
							Percent by age class									
1985	485	6,698	0.0	0.0	0.0	25.1	0.0	73.8	1.1	0.0	0.0	0.0	0.0	0.0	46.8	570
1986	548	25,112	0.0	0.0	0.0	7.6	0.0	91.8	0.7	0.0	0.0	0.0	0.0	0.0	43.5	586
1987	545	27,758	0.0	0.0	0.0	7.0	0.0	93.0	0.0	0.0	0.0	0.0	0.0	0.0	51.9	584
1988	738	36,368	0.1	0.0	0.4	3.9	0.4	90.0	0.4	4.5	0.2	0.1	0.0	0.0	43.6	597
1989	577	19,299	0.0	0.0	0.0	8.9	0.3	86.0	0.5	2.9	1.4	0.0	0.0	0.0	48.2	584
1990	458	35,823	0.0	0.0	5.9	11.2	0.5	63.7	8.0	1.5	9.3	0.0	0.0	0.0	33.7	575
1991	564	39,838	0.1	0.0	2.3	3.1	0.9	78.7	4.6	0.9	9.5	0.0	0.0	0.0	45.2	564
1992	573	39,194	4.6	0.6	9.1	23.3	1.4	53.4	0.9	3.5	2.5	0.8	0.0	0.0	42.6	575
1993	489	59,293	0.2	0.0	6.5	26.8	0.7	53.3	2.5	1.6	8.1	0.4	0.0	0.0	54.4	560
1994	485	69,490	0.0	0.0	5.3	1.8	0.2	83.4	0.6	1.8	6.8	0.1	0.0	0.0	53.4	567
1995[a]	369	37,351	0.0	0.0	0.3	7.0	0.3	71.5	7.9	3.5	9.5	0.0	0.0	0.0	42.8	
1996[a]	343	30,717	0.3	0.0	5.5	7.3	0.0	77.8	2.3	0.6	5.8	0.0	0.3	0.0	55.1	
1997	833	31,451	0.4	0.0	2.5	13.8	1.4	56.4	3.2	6.8	14.9	0.6	0.0	0.0	48.6	563
1998	840	27,161	0.0	0.0	3.1	8.9	0.1	72.9	3.9	0.5	10.4	0.1	0.2	0.0	45.7	555
1999	532	22,910	0.0	0.0	1.3	18.5	0.0	68.9	2.2	3.5	5.7	0.0	0.0	0.0	41.3	556
2000	715	37,252	0.0	0.0	1.1	7.5	0.0	82.1	5.1	0.0	4.3	0.0	0.0	0.0	40.2	575
2001	576	25,654	0.0	0.0	0.4	2.2	0.0	90.3	0.0	2.2	5.0	0.0	0.0	0.0	51.0	581
2002	539	6,304	0.0	0.0	2.8	19.4	0.0	51.6	6.5	8.9	10.7	0.3	0.0	0.0	46.4	562
2003	329	29,423	0.0	0.0	0.4	7.2	0.0	71.9	2.6	1.4	16.6	0.0	0.0	0.0	32.5	579
2004	182	20,523	0.0	0.0	0.0	21.1	0.0	62.6	6.8	1.7	7.9	0.0	0.0	0.0	29.8	547
2005[a]	191	23,933	0.0	0.0	0.5	17.3	0.0	70.7	4.7	1.0	5.8	0.0	0.0	0.0	39.8	
2006[a,b]	95	29,857	0.0	0.0	8.4	8.4	0.0	74.7	0.0	3.2	2.3	0.0	0.0	0.0	32.6	
2007	705	43,716	0.0	0.0	4.2	10.0	0.0	71.4	2.0	3.6	8.7	0.0	0.0	0.0	37.7	549
2008[c]	0	27,236														
2009	1,353	32,544	0.1	0.0	3.9	14.0	1.3	64.2	3.4	2.8	10.4	0.0	0.0	0.0	41.9	557
2010	685	41,074	0.0	0.0	2.2	13.2	1.1	79.6	0.8	2.3	0.8	0.0	0.0	0.0	36.9	550
2011	607	24,573	0.3	0.0	3.2	13.3	0.8	74.0	3.7	1.7	2.9	0.0	0.0	0.0	42.3	553
2012	1,217	50,635	0.0	0.0	0.7	7.7	0.3	70.3	5.1	1.6	13.8	0.0	0.4	0.0	46.1	550
2013	735	24,521	0.0	0.0	3.3	3.4	0.2	42.2	1.5	1.9	43.1	0.8	3.3	0.4	45.5	556
2014	338	20,515	0.0	0.3	2.4	41.1	2.1	33.2	9.7	1.5	8.8	0.3	0.6	0.0	36.8	527

-continued-

Table 59.–Page 2 of 2.

Year	Sample size	Total harvest	Percent by age class												Percent females	Mean length (mm)
			(0.2)	(1.1)	(0.3)	(1.2)	(0.4)	(1.3)	(2.2)	(1.4)	(2.3)	(2.4)	(3.3)	(3.4)		
2015	630	25,861	0.0	0.0	5.2	9.3	0.3	75.1	3.6	0.9	5.6	0.0	0.0	0.0	24.9	546
2016[d]																
2017[d]																
2018[d]																

Note: Commercial sockeye salmon fishery was executed using restricted mesh (≤ 6 inch) gillnets.

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] Samples were collected, are archived at ADF&G, but data are not available through the AYKDBMS. Composition, if shown, represents samples collected only.

[c] ASL data were not collected.

[d] No commercial fishery occurred.

Table 60.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area sockeye salmon past the Middle Fork Goodnews River weir, 1991–2018.

Year	Sample size	Total escapement	(0.2)	(1.1)	(0.3)	(1.2)	(0.4)	(1.3)	(2.2)	(1.4)	(2.3)	(3.2)	(2.4)	(3.3)	Percent females	Mean length (mm)
							Percent by age class									
1991[a]	272	41,656	1.1	0.0	2.9	7.1	0.4	83.2	1.1	2.1	2.1	0.0	0.0	0.0	56.4	
1992[a,b]	204	15,133	1.5	0.0	0.0	38.7	0.0	51.5	1.0	5.9	1.5	0.0	0.0	0.0	60.8	
1993[a]	312	24,957	0.6	0.3	5.1	19.2	0.3	67.0	1.0	3.5	2.6	0.0	0.3	0.0	60.9	
1994[a]	160	56,503	0.0	0.0	3.1	1.9	0.0	87.5	1.3	6.3	0.0	0.0	0.0	0.0	49.4	
1995	454	37,776	0.0	0.0	0.2	13.7	0.0	76.8	2.8	2.7	3.8	0.0	0.0	0.0	50.4	543
1996[a,b]	246	38,343	0.0	0.0	3.3	2.0	0.0	89.4	0.0	1.2	4.1	0.0	0.0	0.0	47.6	
1997	733	34,322	0.2	0.0	1.4	20.9	0.7	63.2	2.4	2.5	8.2	0.0	0.4	0.0	54.0	543
1998[a]	542	38,493	0.0	0.0	2.4	19.9	0.0	64.2	5.4	0.9	7.2	0.0	0.0	0.0	55.5	
1999	789	49,321	0.0	0.0	1.2	11.6	0.2	77.9	2.0	1.7	5.1	0.0	0.3	0.0	48.4	548
2000	607	40,828	0.0	0.0	1.3	2.0	0.0	91.2	1.4	1.4	2.7	0.0	0.0	0.0	54.1	560
2001	432	21,194	0.0	0.0	0.9	2.1	0.0	79.2	0.6	9.6	7.7	0.0	0.0	0.0	48.9	572
2002	485	21,329	0.0	0.0	0.5	54.5	0.2	27.6	8.8	2.6	5.4	0.0	0.2	0.1	55.7	520
2003	657	37,933	0.0	0.0	0.6	8.5	0.0	86.6	0.4	1.7	2.3	0.0	0.0	0.0	45.6	575
2004	806	54,035	0.0	0.0	1.4	31.8	0.0	55.8	2.9	5.6	2.5	0.0	0.0	0.0	54.5	540
2005	955	118,969	0.0[c]	0.0	0.1	13.5	0.0	79.0	2.7	1.1	3.6	0.0	0.0	0.0	54.3	543
2006	576	127,245	0.0	0.0	2.4	18.7	0.0	70.4	0.7	3.5	4.3	0.0	0.0	0.0	57.1	533
2007	727	73,768	0.6	0.0	8.1	12.2	0.4	70.0	1.6	3.0	4.2	0.0	0.0	0.0	50.1	550
2008	512	43,879	0.0	0.0	4.3	9.0	0.2	78.7	1.0	3.3	3.4	0.0	0.0	0.0	56.8	540
2009[a]	161	27,494	0.0	0.0	4.3	31.7	0.0	54.7	1.9	2.5	5.0	0.0	0.0	0.0	57.8	540
2010	307	36,574	0.0	0.0	2.0	4.6	0.0	85.8	1.0	2.6	3.9	0.0	0.0	0.0	54.6	539
2011	440	19,643	0.0	0.0	3.0	6.4	0.2	84.1	0.2	3.9	2.0	0.0	0.2	0.0	56.1	550
2012	331	29,531	0.0	0.0	1.5	6.7	0.0	77.2	4.5	2.6	7.0	0.4	0.0	0.0	56.0	539
2013	625	23,545	0.1	0.0	1.8	6.8	0.0	52.5	3.1	6.4	21.4	0.0	2.6	5.3	56.3	549
2014	494	41,473	0.0	0.0	0.1	8.4	0.0	80.6	2.7	4.0	4.0	0.1	0.1	0.0	55.5	552
2015[a]	425	57,809	0.0	0.0	0.9	10.1	0.0	86.4	0.7	1.2	0.7	0.0	0.0	0.0	55.8	532
2016	560	171,114	0.0	0.0	0.6	34.5	0.0	57.5	3.4	1.0	3.0	0.0	0.0	0.0	58.8	529
2017	551	179,897	0.4	0.0	0.7	14.8	0.0	79.7	0.0	1.0	3.0	0.0	0.1	0.1	54.6	529
2018[d]																

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.
[b] Weir did not operate for most of the season. Only observed escapement counts are presented.
[c] Age class was represented in samples but percent composition was <0.05.
[d] Weir did not operate.

Table 61.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area sockeye salmon past the Kanektok River weir, 2002–2018.

Year	Sample size	Total escapement	Percent by age class											Percent females	Mean length (mm)
			(0.2)	(1.1)	(0.3)	(1.2)	(0.4)	(1.3)	(2.2)	(1.4)	(2.3)	(2.4)	(3.3)		
2002	663	60,228	0.0	0.0	0.5	56.2	0.3	34.7	1.1	2.3	4.1	0.5	0.3	57.7	529
2003	403	128,030	0.0	0.0	0.2	26.6	0.0	69.0	0.2	2.0	2.0	0.0	0.0	50.6	551
2004	470	105,135	0.2	0.0	0.2	48.3	0.0	46.5	3.3	1.0	0.5	0.0	0.0	43.5	530
2005[a]	688	268,537													
2006[b]															
2007	793	304,086	0.5	0.0	2.9	45.3	0.0	48.3	0.0	2.2	0.8	0.0	0.0	36.0	542
2008[a,c]	307	68,192												36.8	558
2009	585	305,756	0.0	0.0	1.9	62.1	0.0	34.9	0.4	0.1	0.5	0.0	0.0	51.7	538
2010	819	204,954	0.0	0.0	0.8	8.5	0.4	87.8	0.2	2.2	0.1	0.0	0.0	45.8	563
2011	697	88,177	0.9	0.0	3.9	40.0	0.2	48.0	4.1	1.7	1.1	0.0	0.1	50.8	543
2012	575	115,021	0.0	0.0	1.2	18.3	0.0	75.4	0.5	0.5	4.2	0.0	0.0	52.8	546
2013	601	128,761	0.0	0.0	0.2	71.1	0.0	24.6	1.1	2.4	0.6	0.0	0.0	55.7	519
2014	168	259,406	0.0	0.0	0.0	29.2	0.0	67.3	3.0	0.6	0.0	0.0	0.0	50.0	539
2015	582	106,751	0.0	0.0	0.4	12.4	0.0	72.0	13.3	1.1	0.6	0.0	0.0	52.5	541
2016[b]															
2017[b]															
2018[b]															

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] Weir did not operate.

[c] Weir did not operate for most of the season. Only observed escapement counts are presented.

Table 62.–Estimated age and sex composition, mean length, and total number of Kuskokwim Area coho salmon harvested in the District W1 commercial gillnet fishery, 1984-2018.

Year	Sample size	Total harvest	Percent by age class				Percent females	Mean length (mm)
			(1.1)	(2.1)	(3.1)	(4.1)		
1984	1,333	623,447	4.4	92.5	3.1	0.0	48.2	N/A
1985	1,119	335,551	8.5	86.8	4.7	0.0	45.8	N/A
1986	841	659,708	4.8	92.0	3.2	0.0	46.1	N/A
1987	820	399,380	7.2	76.9	15.9	0.0	53.1	N/A
1988	1,427	525,502	4.4	94.1	1.5	0.0	50.1	N/A
1989	743	477,955	8.9	88.3	2.8	0.0	45.5	N/A
1990	389	409,053	4.8	90	5.2	0.0	43.1	N/A
1991	573	500,824	4.7	87.4	7.9	0.0	33.8	554
1992	804	666,170	13.5	81.6	4.9	0.0	50.3	563
1993	540	610,667	5.8	91.2	3.0	0.0	48.1	549
1994	826	724,721	6.7	83.7	9.6	0.0	39.5	566
1995	565	471,461	12.3	79.3	8.4	0.0	44.7	558
1996	666	936,066	4.3	94.4	1.3	0.0	48.6	570
1997[a]	324	130,631						
1998	1,194	210,481	4.9	93.0	2.1	0.0	49.5	572
1999	151	23,593	4.6	82.1	13.2	0.0	43.7	550
2000	2,616	261,379	3.5	94.4	2.1	0.0	53.2	555
2001	422	193,154	6.7	82.6	10.8	0.0	56.8	573
2002	428	83,463	1.0	93.2	5.8	0.0	51.7	572
2003[b]	0	284,064						
2004	662	435,407	1.1	89.1	9.8	0.0	48.2	550
2005	412	142,319	7.3	83.5	9.2	0.0	50.2	552
2006	411	185,598	14.1	82.2	3.8	0.0	50.7	539
2007	448	141,049	5.0	90.5	4.5	0.0	53.5	548
2008	493	142,862	5.6	78.3	16.0	0.0	50.4	554
2009	669	104,546	5.0	87.4	7.5	0.0	50.0	563
2010	425	58,031	7.7	89.1	3.2	0.0	51.3	549
2011	667	74,108	15.1	79.3	5.5	0.0	48.6	555
2012	702	86,389	15.8	78.8	5.4	0.1	45.7	522
2013	351	114,069	6.1	81.3	12.6	0.0	53.2	560
2014	536	117,588	5.3	86.8	7.6	0.3	58.6	543
2015	349	65,034	10.1	84.5	5.4	0.0	49.0	574
2016[c]								
2017[c]								
2018[c]								

Note: Harvest data are from Districts W1 and W2 combined. The commercial coho salmon fishery was executed using restricted mesh (≤ 6 inch) gillnets. N/A designates years when length data were not available or not summarized.

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] ASL data were not collected.

[c] No commercial fishery occurred.

Table 63.–Estimated age and sex composition, mean length, and total number of Kuskokwim Area coho salmon harvested in the District W4 commercial gillnet fishery, 1990–2018.

Year	Sample size	Total harvest	Percent by age class			Percent females	Mean length (mm)
			(1.1)	(2.1)	(3.1)		
1990	607	26,926	5.8	88.4	5.8	42.4	N/A
1991	535	42,571	13.2	74.5	12.3	50.2	N/A
1992	590	86,404	16.9	79.1	4.0	46.6	N/A
1993	300	55,817	3.6	92.5	3.9	45.3	N/A
1994	429	83,912	6.6	89.7	3.7	52.8	N/A
1995	653	66,203	8.6	84.3	7.2	45.0	N/A
1996	556	118,718	6.0	92.5	1.5	43.1	596
1997[a]	359	32,862					
1998	446	80,183	6.0	93.2	0.9	57.4	601
1999[b]	0	6,184					
2000	285	30,529	1.4	97.0	1.6	49.2	580
2001	415	18,531	7.8	85.2	7.0	39.3	596
2002	460	26,695	1.4	89.1	9.6	50.3	599
2003	153	49,833	7.1	82.9	10.1	32.3	582
2004	186	82,710	4.8	94.3	0.9	46.3	573
2005	666	51,708	15.6	79.3	5.1	43.5	564
2006[c]	377	26,831	13.3	84.8	1.9	48.8	538
2007[a]	224	34,710					
2008	499	94,257	8.6	87.5	3.9	47.9	568
2009[a]	198	48,115					
2010	189	13,690	11.6	85.8	2.6	46.4	566
2011	482	30,457	26.8	69.3	3.9	46.9	569
2012	519	31,214	13.1	83.5	3.5	52.4	547
2013	186	21,126	6.5	88.3	5.2	47.3	582
2014	166	52,317	17.7	77.3	5.1	44.3	553
2015	353	76,285	14.2	83.6	2.3	45.7	591
2016[d]							
2017[d]							
2018[d]							

Note: Commercial coho salmon fishery was executed using restricted mesh (≤ 6 inch) gillnets. N/A designates years when length data were not available or not summarized.

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] ASL data were not collected.

[c] Samples were collected, are archived at ADF&G, but data are not available through the AYKDBMS.

[d] No commercial fishery occurred.

Table 64.–Estimated age and sex composition, mean length, and total number of Kuskokwim Area coho salmon harvested in the District W5 commercial gillnet fishery, 1990–2018.

Year	Sample size	Total harvest	Percent by age class				Percent females	Mean length (mm)
			(1.1)	(2.1)	(3.1)	(4.1)		
1990	250	7,804	5.2	91.6	3.2	0	42.8	N/A
1991	430	13,312	7.5	85.4	7.2	0.0	24.1	N/A
1992	404	19,875	12.0	85..5	2.6	0.0	42.7	N/A
1993	429	20,014	2.9	92.5	4.6	0.0	52.4	N/A
1994	415	47,499	9.0	86.5	4.5	0.0	48.1	N/A
1995	299	17,875	3.1	92.4	4.5	0.0	49.6	N/A
1996	457	43,836	6.3	90.2	3.5	0.0	52.3	622
1997[a]	271	2,983						
1998	315	21,246	9.9	87.7	2.5	0.0	52.5	611
1999	205	2,474	10.3	84.9	4.8	0.0	47.7	592
2000	439	15,531	0.7	97.6	1.8	0.0	52.1	598
2001	414	9,275	4.8	89.6	5.5	0.0	47.4	619
2002[b]	0	3,041						
2003[a]	109	12,658						
2004[c]	163	24,089	12.5	84.2	3.3	0.0	38.9	584
2005[a]	69	11,735						
2006[b]	0	12,436						
2007[b]	0	13,689						
2008[b]	0	22,547						
2009[a]	43	8,406						
2010	600	4,900	10.6	87.3	2.2	0.0	40.7	572
2011	558	15,358	15.4	77.8	6.8	0.0	45.1	573
2012	542	25,515	9.8	85.7	4.6	0.0	44.6	551
2013	345	21,581	3.0	91.5	5.5	0.0	52.3	589
2014	341	52,158	6.0	88.0	5.4	0.6	51.1	575
2015[a]	171	7,030						
2016[d]								
2017[d]								
2018[d]								

Note: Commercial coho salmon fishery was executed using small mesh (≤ 6 inch) gillnets. N/A designates years when length data were not available or not summarized.

[a] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[b] ASL data were not collected.

[c] Samples were collected, are archived at ADF&G, but data are not available through the AYKDBMS.

[d] No commercial fishery occurred.

Table 65.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area coho salmon past the Salmon River (Aniak) weir, 2008–2018.

Year	Sample size	Total escapement	Percent by age class			Percent females	Mean length (mm)
			(1.1)	(2.1)	(3.1)		
2008	467	10,974	1.4	91.5	7.1	48.5	541
2009	652	6,351	2.1	91.4	6.5	47.3	551
2010[a]							
2011[a]							
2012[b]	0	2,209					
2013	267	2,797	8.0	74.5	17.5	25.8	568
2014	251	8,254	0.6	89.6	9.8	34.5	527
2015[b,c]	9	267					
2016[d]	0	560					
2017[e]							
2018[e]							

[a] Weir did not operate.

[b] Weir did not operate for most of the season. Only observed escapement counts are presented.

[c] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[d] Samples were lost.

[e] Weir did not operate during coho run.

Table 66.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area coho salmon past the George River weir, 1997-2018.

Year	Sample size	Total escapement	Percent by age class					Percent females	Mean length (mm)
			(1.1)	(2.1)	(3.1)	(3.2)	(4.1)		
1997	205	9,392	2.2	95.9	1.9	0.0	0.0	42.2	557
1998[a]									
1999	338	8,914	2.7	69.8	27.4	0.0	0.0	40.9	547
2000	365	11,269	1.3	97.6	1.1	0.0	0.0	43.2	548
2001	371	16,724	0.8	65.6	33.6	0.0	0.0	53.3	557
2002[b]	72	6,759							
2003	171	32,873	0.9	88.0	11.0	0.0	0.0	52.7	556
2004	191	12,499	1.3	89.8	8.9	0.0	0.0	36.6	538
2005	463	8,294	1.0	80.2	18.8	0.0	0.0	48.6	539
2006	440	12,705	4.4	88.0	7.7	0.0	0.0	50.5	525
2007[b]	442	28,398							
2008	429	21,931	0.5	63.4	36.2	0.0	0.0	52.3	543
2009	524	12,490	1.6	92.8	5.6	0.0	0.0	44.7	553
2010	559	12,639	2.7	89.6	7.7	0.0	0.0	51.5	545
2011	552	29,120	4.9	90.0	5.0	0.1	0.0	51.2	552
2012	366	14,478	1.9	73.6	24.6	0.0	0.0	48.1	505
2013	275	15,308	5.3	63.0	31.4	0.0	0.2	50.7	562
2014	389	35,771	1.5	85.9	12.6	0.0	0.0	52.1	528
2015	400	35,812	4.4	93.8	1.8	0.0	0.0	45.6	544
2016	42	17,239	4.8	66.7	28.6	0.0	0.0	42.9	505
2017[b]	159	25,384	4.4	88.7	6.9	0.0	0.0	32.1	494
2018	261	8,999	7.7	87.3	5.0	0.0	0.0	42.7	539

[a] Weir was inoperable during coho salmon season.

[b] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

Table 67.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area coho salmon past the Kogrukluk River weir, 1989–2018.

Year	Sample size	Total escapement	Percent by age class (1.1)	(2.1)	(3.1)	Percent females	Mean length (mm)
1989[a,b]	75	1,272					
1990[b]	173	3,446					
1991	377	7,206	1.8	96.0	2.2	42.5	558
1992[a,b]	158	2,715					
1993[a]	157	4,437	2.5	94.3	3.1	40.1	564
1994	463	28,110	1.5	90.1	8.3	47.8	581
1995[a]	364	18,924	4.1	88.5	7.0	39.1	557
1996	639	50,003	3.0	94.9	2.1	37.0	594
1997[c]	0	11,883					
1998	455	22,987	1.6	94.1	4.2	40.9	580
1999	343	10,908	2.5	88.1	9.4	17.0	563
2000	604	33,063	1.0	96.9	2.1	30.5	568
2001	504	19,983	1.5	91.3	7.2	49.1	577
2002	423	14,515	0.0	86.4	13.6	30.9	561
2003	161	74,915	1.6	81.5	16.8	40.2	566
2004	176	26,078	0.6	87.6	11.7	29.8	547
2005	447	25,407	6.0	84.9	9.1	49.7	543
2006	426	16,268	10.6	86.5	2.8	55.0	514
2007	394	26,423	3.5	90.7	5.8	44.6	542
2008	455	29,237	2.9	81.4	15.7	55.1	536
2009	520	22,289	1.5	90.2	8.2	56.5	541
2010	549	14,689	4.7	87.4	7.9	49.1	551
2011	535	21,800	4.5	87.3	8.2	51.1	545
2012[b]	187	13,421					
2013	346	21,207	3.0	86.2	10.8	58.0	548
2014	257	52,975	2.2	84.2	13.7	57.2	506
2015	351	32,493	7.1	92.2	0.7	51.6	538
2016[a,d]	0	2,286					
2017[a,b]	26	790					
2018	356	8,174	7.3	83.6	9.0	44.6	509

[a] Weir did not operate for most of the season. Only observed escapement counts are presented.

[b] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[c] ASL Samples were not collected.

[d] Crew misplaced samples in season.

Table 68.–Estimated age and sex composition, mean length, and total escapement of Kuskokwim Area coho salmon past the Tatlawiksuk River weir, 1999–2018.

Year	Sample size	Total escapement	Percent by age class (1.1)	(2.1)	(3.1)	Percent females	Mean length (mm)
1999	287	3,621	8.0	79.1	12.9	43.3	550
2000[a]	188	5,646	0.0	100.0	0.0	39.9	564
2001[a]	518	5,669	2.2	91.2	6.6	52.1	571
2002	596	11,156	1.2	89.3	9.5	38.7	565
2003[b]							
2004	361	16,446	3.1	94.4	2.5	50.6	544
2005	476	7,076	4.4	89.7	5.9	48.2	557
2006[a,c]	155	2,362					
2007[c]	419	8,500					
2008	485	11,022	3.8	84.3	11.9	52.7	542
2009	508	10,148	6.3	83.9	9.8	47.8	551
2010	517	3,773	5.4	92.9	1.7	53.6	534
2011	359	14,184	5.0	87.5	7.5	56.3	560
2012	323	8,015	7.8	90.4	1.8	49.2	516
2013[c]	170	12,764					
2014	344	19,814	2.8	90.8	6.4	43.3	539
2015	332	17,701	2.5	94.6	2.8	47.3	565
2016	208	11,897	13.8	78.8	7.3	49.6	526
2017[c]	5	1,171					
2018[d]							

[a] Weir did not operate for most of the season. Only observed escapement counts are presented.

[b] Weir did not operate during coho run.

[c] Sampling was not appropriate for estimating ASL composition for the season. Composition, if shown, represents samples collected only.

[d] Weir did not operate.

Table 69.–List of years for which Chinook salmon ASL data was collected from Kuskokwim Management Area projects and archived in the Arctic Yukon Kuskokwim Database Management System.

Project type / name	Years with available ASL data
Commercial Catch	
District 1	1964–1968, 1971–1975, 1977–1999, 2001, 2004, 2005, 2008–2011
District 4	1968–1970, 1973–2005, 2007–2014
District 5	1973, 1974, 1977, 1978, 1980–1995, 1997–2005, 2007, 2009–2014
Subsistence Catch	
Upper Kuskokwim River	1987, 1992, 2001–2003, 2018
Middle Kuskokwim River	1975, 1992, 2001–2003, 2014
Lower Kuskokwim River	1964, 1968, 1970, 1986, 1987, 1991–1995, 2001–2018
Kuskokwim Bay	1975, 2007, 2014
Escapement	
Aniak River	1980–1983, 1985, 1989, 1996, 2007
Eek River	1989
George River	1996–2018
Goodnews River (Middle Fork)	1983–1985, 1987–2017
Kanektok River	1983–1987, 1989, 1997, 2002–2005, 2007–2015
Kipchuk River	1989
Kisaralik River	1986, 2001
Kogrukluk River	1968, 1969, 1971–1973, 1976, 1978–2018
Kwethluk River	1989, 1991, 1992, 2000–2004, 2006–2017
NYAC weir	1988
Salmon River (Aniak)	1989, 2006–2008, 2012, 2014–2018
Salmon River (Pitka Fork)	1981, 1982, 1989, 2015–2018
Takotna River	2000–2013, 2017–2018
Tatlawiksuk River	1998–2017
Tuluksak River	1991–1994, 2001–2017
Mark–Recapture	
Kalskag Fish Wheel	2007
Sport Catch (freshwater)	
Kanektok River	1983, 1985
Sport Catch (marine)	
District 5	1996
Test Fishing	
Kwegooyuk (Village/City)	1967, 1969, 1972–1976, 1978–1980, 1982, 1983
District 1	1981, 1993–1995, 2001–2008, 2011–2018
Aniak	2018

Table 70.–List of years for which chum salmon ASL data was collected from Kuskokwim Management Area projects and archived in the Arctic Yukon Kuskokwim Database Management System.

Project type / name	Years with available ASL data
Commercial Catch	
Aniak River	1992
District 1	1966–1968, 1972–2005, 2007–2014
District 4	1965, 1967–1970, 1973–2005, 2007–2015
District 5	1974, 1978, 1980–2005, 2007, 2009–2015
Subsistence Catch	
Lower Kuskokwim River	1964, 1984–1986, 1993
Upper Kuskokwim River	1987, 1992
Escapement	
Aniak River	1980–1982, 1984, 1985, 1989, 1994–2011
George River	1996–2018
Goodnews River (Middle Fork)	1983–2017
Kanektok River	1983–1987, 1989, 1997, 2002–2005, 2007–2015
Kisaralik River	1986
Kogrukluk River	1971–1973, 1976, 1978–2018
Kwethluk River	1989, 1991, 1992, 1997, 2000–2017
Nikolai (Village/City)	2004
NYAC weir	1988
Salmon River (Aniak)	2006–2008, 2014–2018
Salmon River (Pitka Fork)	1981, 1982
Takotna River	2000–2013
Tatlawiksuk River	1998–2017
Tuluksak River	1991–1994, 2001–2017
Mark–Recapture	
Birch Tree Crossing	2002
Kalskag Fish Wheel	2002
Test Fishing	
Kwegooyuk (Village/City)	1967, 1969, 1971–1975, 1977–1981
District 1	1981, 1993–1995, 2000–2005, 2007, 2008

Table 71.–List of years for which sockeye salmon ASL data was collected from Kuskokwim Management Area projects and archived in the Arctic Yukon Kuskokwim Database Management System.

Project type / name	Years with available ASL data
Commercial Catch	
District 1	1969, 1972, 1975, 1977, 1980–2000, 2004, 2005, 2008–2014
District 4	1964, 1965, 1967–1970, 1974–1978, 1980–1985, 1987–2001, 2003–2005, 2007–2015
District 5	1969, 1974, 1977, 1978, 1980–2005, 2007, 2009–2015
Subsistence Catch	
Upper Kuskokwim River	1987
Middle Kuskokwim River	2014
Kuskokwim Bay	1980
Escapement	
Aniak River	1981, 1983, 1985, 2007
George River	2007
Goodnews River (Middle Fork)	1983, 1985–2017
Goodnews River (North Fork)	1989
Kanektok River	1984, 1985, 1987, 1989, 1997, 2002–2005, 2007–2015
Kisaralik River	1986
Kogrukluk River	1968, 1976, 1978, 1980–1994, 2007, 2009–2018
Kwethluk River	1991, 1992, 2000, 2003, 2004, 2006–2017
Salmon River (Aniak)	2007, 2008, 2013, 2014
Stony River	1989
Takotna River	2007
Tatlawiksuk River	2007
Telaquana River	2010–2018
Tuluksak River	1991–1994, 2002, 2003, 2007–2017
Mark–Recapture	
Birch Tree Crossing	2002
Kalskag Fish Wheel	2002, 2005–2007, 2012
Salmon River (Aniak)	2012
Kogrukluk River	2012
Telaquana River	2012
Test Fishing	
District 1	1981, 1994, 1995, 2001–2005, 2012–2014
Kwegooyuk (Village/City)	1967, 1971–1981

Table 72.–List of years for which coho salmon ASL data was collected from Kuskokwim Management Area projects and archived in the Arctic Yukon Kuskokwim Database Management System.

Project type / name	Years with available ASL data
Commercial Catch	
District 1	1961, 1965–1969, 1971–1978, 1980–2002, 2004–2015
District 4	1967, 1968, 1974–1978, 1980–1998, 2000–2005, 2007–2015
District 5	1974, 1977, 1980–2001, 2003, 2005, 2009–2015
Subsistence Catch	
Lower Kuskokwim River	1989, 1992
Escapement	
Aniak River	1980
George River	1997, 1999–2018
Goodnews River (Middle Fork)	1988, 1991, 1995, 1996, 1998–2001, 2003–2013
Kanektok River	1983, 1997, 2001–2005, 2007–2009
Kisaralik River	1986
Kogrukluk River	1981–1996, 1998–2015, 2018
Kwethluk River	1989, 2000–2004, 2006–2017
Salmon River (Aniak)	2008, 2009, 2013–2015
Takotna River	2000–2013
Tatlawiksuk River	1999–2002, 2004–2017
Tuluksak River	1991–1994, 2001–2017
Mark/Recapture	
Kalskag Fish Wheel	2008, 2009
Test Fishing	
Aniak River	1995
Kwegooyuk (Village/City)	1974, 1975
District 1	1980, 1994, 1995