Fishery Management Report No. 21-04

2019 Bristol Bay Area Annual Management Report

by

Aaron Tiernan

Travis Elison

Tim Sands

Jordan Head

Stacy L. Vega

and

Terri Lemons

October 2021

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

Symbols and Abbreviations

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Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Mathematics, statistics

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

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2019 BRISTOL BAY AREA ANNUAL MANAGEMENT REPORT

Aaron Tiernan, Travis Elison, Jordan Head, and Stacy L. Vega
Alaska Department of Fish and Game, Division of Commercial Fisheries, Anchorage

Tim Sands
Alaska Department of Fish and Game, Division of Commercial Fisheries, Dillingham

and

Terri Lemons
Alaska Department of Fish and Game, Division of Subsistence, Anchorage

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1565

October 2021

The Fishery Management Reports series was established in 1989 by the Division of Sport Fish for the publication of an overview of management activities and goals in a specific geographic area, and became a joint divisional series in 2004 with the Division of Commercial Fisheries. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Fishery Management Reports are available through the Alaska State Library and on the Internet: http://www.adfg.alaska.gov/sf/publications/. This publication has undergone regional peer review.

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Aaron Tiernan, Travis Elison, Jordan Head, and Stacy L. Vega
Alaska Department of Fish and Game, Division of Commercial Fisheries,
333 Raspberry Road, Anchorage, AK, 99518, USA

Tim Sands
Alaska Department of Fish and Game, Division of Commercial Fisheries,
546 Kenny Wren Road, P.O. Box 230, Dillingham, AK 99576, USA

and

Terri Lemons
Alaska Department of Fish and Game, Division of Subsistence,
333 Raspberry Road, Anchorage, AK, 99518, USA

This document should be cited as follows:
Tiernan, A., T. Elison, T. Sands, J. Head, S. L. Vega, and T. Lemons. 2021. 2019 Bristol Bay annual management report. Alaska Department of Fish and Game, Fishery Management Report No. 21-04, Anchorage.

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ABSTRACT

The *2019 Bristol Bay Area Annual Management Report* is the 58th consecutive annual volume reporting on management activities of the Alaska Department of Fish and Game, Division of Commercial Fisheries staff in Bristol Bay. The report emphasizes a descriptive account of the information, decisions, and rationale used to manage the annual Bristol Bay commercial salmon (sockeye *Oncorhynchus nerka*, Chinook *O. tshawytscha*, chum *O. keta*, pink *O. gorbuscha*, and coho salmon *O. kisutch*) and Pacific herring (*Clupea pallasii*) fisheries. The 2019 inshore sockeye salmon run of 56.0 million fish was 46% above the preseason forecast of 38.6 million fish. Sockeye salmon dominated the inshore commercial harvest, totaling 43.0 million of the 44.5 million fish harvested. Sockeye salmon escapement goals were met or exceeded in all systems where spawning requirements have been defined; areawide escapement totaled 21.0 million fish. There was a harvest of 33,200 Chinook, 1,394,000 chum, 6,800 pink, and 83,900 coho salmon. The 2019 Togiak District herring preseason biomass forecast was 217,584 short tons. The purse seine harvest of Togiak herring was 22,542 short tons with an average roe percent of 11.8%. All 2019 salmon harvest data are considered final and are based on fish tickets.

Keywords: Pacific salmon, *Oncorhynchus* spp., sockeye salmon, *Oncorhynchus nerka*, Chinook salmon, *O. tshawytscha*, chum salmon, *O. keta*, coho salmon, *O. kisutch*, pink salmon, *O. gorbuscha*, Pacific herring, *Clupea pallasii*, commercial fisheries, Bristol Bay, Naknek, Kvichak, Egegik, Ugashik, Wood, Nushagak, Igushik, Togiak, annual management report, AMR

INTRODUCTION

MANAGEMENT AREA DESCRIPTION

The Bristol Bay management area includes all coastal and inland waters east of a line from Cape Newenham to Cape Menshikof (Figure 1). The area includes 9 major river systems: Naknek, Kvichak, Alagnak, Egegik, Ugashik, Wood, Nushagak, Igushik, and Togiak. Collectively, these rivers are home to the largest commercial sockeye salmon *Oncorhynchus nerka* fishery in the world. Sockeye salmon are by far the most abundant salmon species that return to Bristol Bay each year; however, Chinook *O. tshawytscha*, chum *O. keta*, coho *O. kisutch*, and, in even years, pink salmon *O. gorbuscha* returns are important to the fishery as well. The Bristol Bay area (baywide) is divided into 5 management districts (Naknek-Kvichak, Egegik, Ugashik, Nushagak, and Togiak) that correspond to major river systems. The management objective for each river is to achieve salmon escapements within established escapement goal ranges while harvesting fish in excess of those ranges, consistent with regulatory management plans.

OVERVIEW OF BRISTOL BAY SALMON FISHERIES

The 5 species of Pacific salmon found in Bristol Bay are the focus of major commercial, subsistence, and sport fisheries. Annual commercial catches for the most recent 20 years (1999–2018) averaged approximately 26.2 million sockeye, 39,900 Chinook, 1.1 million chum, 510,000 (even-years only) pink, and 93,000 coho salmon (Appendices A3–A7). Since 1999, the value of commercial salmon harvest in Bristol Bay has averaged approximately $134.0 million. Sockeye salmon were the most valuable and averaged $133.0 million annually (Appendix A24). Of the total 2019 subsistence salmon harvest of 96,900 fish, 75,400 of those fish were sockeye salmon (Appendices A27–A29). Sport fisheries harvest all species of salmon, but most effort was directed toward Chinook and coho salmon stocks.

Management of the commercial fishery in Bristol Bay is focused on discrete stocks with harvests directed at terminal areas around the mouths of major river systems. Each district is managed to achieve spawning escapement goals based on sustained yield. These goals are achieved by regulating fishing time and area by emergency order (EO) and/or adjusting weekly fishing

schedules. Legal gear for the commercial salmon fishery includes both drift (150 fathoms) and set (50 fathoms) gillnets. Drift gillnet permits are more common; out of 1,862 permits registered in Bristol Bay (Area T), 1,724 were fished in 2019 (Appendix A2). From a total of 965 set gillnet permits registered in Bristol Bay, 893 made at least 1 delivery in 2019 (Appendix A2).

2019 COMMERCIAL SALMON FISHERY

RUN STRENGTH INDICATORS

Fishery managers in Bristol Bay have several early indicators of sockeye salmon run size including the preseason forecast, the South Alaska Peninsula commercial salmon fishery, an offshore test fishery operating from Port Moller, genetic stock identification, age composition information, individual district test fishery programs, early performance of the commercial fishery, inriver test fishery programs, and timely escapement information from counting towers and a sonar project. These pieces of information may not give an accurate assessment of run size on their own, but collectively they allow broadscale examination of inseason data. This includes the relative strengths of year classes, discrepancies from the forecast (relative to expected year class contributions), or differences in run timing that can be important to successful management of the commercial fishery.

Due to State of Alaska budget cuts, many of these run assessment projects have not been funded by the state general fund since the 2015 fishing season. In 2016, the Bristol Bay Fisheries Collaborative was initiated and formed as a grassroots stakeholder group to temporarily provide financial support for Bristol Bay commercial fisheries management. Members that made financial contributions included fishing associations, individual commercial fishery participants, 12 different processing companies, 5 different shipping companies, 6 different boroughs and villages, and Bristol Bay Native Corporation. In 2019, the Bristol Bay Fisheries Collaborative funded or partially funded 7 projects: Port Moller test fishery; Ugashik, Egegik, and Kvichak inriver test fisheries; district catch sampling; extended Nushagak sonar operations into late August to enumerate pink and coho salmon escapement; and aerial surveys of Naknek, Kvichak, and Alagnak drainages. These projects were operated by the Alaska Department of Fish and Game (ADF&G) and the Bristol Bay Science and Research Institute (BBSRI), either individually or collaboratively.

2018 ALASKA BOARD OF FISHERIES

The Alaska Board of Fisheries (BOF) met in Dillingham in November 2018 to review proposals regarding the Bristol Bay Salmon fishery. Actions taken at that meeting resulted in the following regulatory changes for the Bristol Bay fishery:

- A mesh size restriction of 5.5 inches or less was established in the Ugashik and Naknek-Kvichak Districts from June 1 through July 22 to help the conservation of Chinook salmon. The Egegik District already had the same restriction by regulation.
- The late season fishing schedule for Naknek-Kvichak, Egegik, and Ugashik Districts was changed to allow fishing from 9:00 AM Monday to 9:00 AM Sunday, beginning 9:00 AM July 17, or as established by EO.
- The Kvichak Section boundary line (north line) was moved slightly north near Graveyard Point to the newly defined coordinate of lat 58°52.10'N, long 157°00.80'W.

- The Alagnak River Sockeye Salmon Special Harvest Area Management Plan was amended to provide opportunity while conserving Kvichak River sockeye salmon. The BOF actions repealed the connection to the Chinook salmon escapement goal and provided direction to minimize harvest of Chinook salmon.
- Increase minimum distance between set gillnets in the Wood River Special Harvest Area to 250 feet.
- Clarified the definition of districts to include special harvest areas and further clarified gillnet specifications and operations within special harvest areas.

PRESEASON FORECASTS

Total inshore (excluding harvest in other areas) sockeye salmon production for Bristol Bay in 2019 was forecast to be 38.6 million (Table 1) including an inshore harvest forecast of 26.1 million fish. Runs were expected to be large enough to meet spawning escapement goals for all river systems in Bristol Bay.

The forecast for the sockeye salmon run to Bristol Bay in 2019 was the sum of individual predictions for 9 river systems (Kvichak, Alagnak, Naknek, Egegik, Ugashik, Wood, Igushik, Nushagak, and Togiak) and 4 major age classes (age 1.2, 1.3, 2.2, and 2.3, plus age 0.3 and 1.4 for Nushagak; Table 2). Adult escapement and return data from brood years 1972–2015 were used in the analyses.

Forecasts for each age class returning to a river system were derived from models based on the relationship between adult returns of that age class and either total returns or sibling returns from the same brood years. In general, models with statistically significant parameters and/or the best past performance (accuracy and precision) were chosen. Performance was evaluated using mean absolute deviation, mean absolute percent error, and mean percent error between forecasted and observed returns. These performance metrics were calculated and considered for each model across the most recent 3-year and 5-year time frames. In certain cases, competing models were averaged in a hybrid model approach.

The forecast range is the upper and lower values of the 80% confidence interval for the total run forecast. The confidence bounds were calculated from the deviation of actual runs and run forecasts from 2001 through 2018.

SOUTH UNIMAK/SHUMAGIN ISLANDS FISHERY

From 1975 to 2000, the South Unimak and Shumagin Islands commercial fisheries were managed under a guideline harvest level that was based on a percentage of the Bristol Bay inshore sockeye salmon harvest. The original intent was to prevent overharvest of sockeye salmon runs bound for river systems in Bristol Bay. From 1986 to 2000, a chum salmon cap was implemented because of concerns about large chum salmon harvest and a weak Yukon River fall chum salmon run. In 2001, the BOF modified the *South Unimak/Shumagin Islands June Fishery Management Plan* (5 AAC 09.365), replacing the guideline harvest level and chum salmon cap with a June fishing schedule. In 2004, the BOF established a fishing schedule that began at 6:00 AM on June 7 and ended at 10:00 PM on June 29 for all gear types. Fishing periods were 88 hours in duration interspersed by a 32-hour closure (Poetter 2014a). In 2013, the BOF modified the purse seine and drift gillnet fishing schedule to begin the season at 6:00 AM on June 10 and end at 10:00 PM on

June 28, which reduced fishing time by 64 hours (Poetter 2014b). Preliminary 2019 catch information for these fisheries can be found in Appendix A25.

PORT MOLLER TEST FISHERY

From 1967 to 1985, ADF&G operated a test fishery program based near the community of Port Moller, approximately 150–200 miles southwest of the Bristol Bay fishing districts. A large vessel (70–100 ft) fished gillnets at specific stations on a transect line perpendicular to the migration path of sockeye salmon returning to Bristol Bay. Collected data were used to estimate strength, timing, age, and size composition of the run about 6–9 days prior to arrival at the inshore fishing districts. Although forecasting performance of the project was inaccurate, the project was popular with salmon processors because it gave an additional indication of run size, which influenced production capacity and price paid to fishery participants. The project did not operate in 1986, but with funding from processors, the Fisheries Research Institute operated the test fishery from 1987 through 2002. Beginning in 2003, with financial support from ADF&G, industry, and BBSRI, BBSRI has operated the project and performed the bulk of daily inseason analysis (Raborn and Link 2018).

In 2019, the project included operation of a second vessel and extended the sampling transect further offshore to investigate whether the existing transect adequately captured the migratory pathways traveled by the returning sockeye salmon. Between the 2 vessels, for approximately 2 weeks, coverage was almost complete along a line between Port Moller and Cape Newenham; fish were present throughout the transect and distributed farther offshore than previously known. In 2019, there was a particularly strong component from the Egegik River within traditional stations. Without the second vessel, the Egegik run would have been overrepresented and the Naknek-Kvichak and Nushagak Districts would have been underrepresented. By sampling the expanded transect with a second vessel, there was better representation from all stocks entering Bristol Bay (Link et al. 2019). In 2019, the project was operated by personnel from ADF&G, BBSRI, and LGL Alaska Research Associates.

GENETICS

Over the last 18 years, ADF&G has built and tested a genetic baseline capable of identifying stock compositions of mixed-fishery samples from within Bristol Bay. The genetics program has 2 primary objectives: (1) to provide managers with a preliminary estimate of stock compositions of sockeye salmon returning to Bristol Bay through the Port Moller test fishery (PMTF); and (2) to provide researchers with sockeye salmon stock composition estimates, by year, within fishing districts to estimate total runs and develop brood tables.

Genetic sampling was added to the PMTF project starting in 2004. The intent was to use inseason genetic analysis to identify components of the annual sockeye salmon run in time to inform management decisions for individual stocks. ADF&G genetics staff can complete analysis and deliver results in 3–5 days depending on several factors (e.g., timing of airline flights, weather on the fishing grounds). The travel time for fish from Port Moller to Bristol Bay is approximately 6–9 days depending on several factors (e.g., district, water temperature, wind). Therefore, results from genetic sampling are typically available before the fish they represent reach the fishing districts of Bristol Bay (Figure 2).

ECONOMICS AND MARKET PRODUCTION

In 2019, the exvessel value of inshore commercial salmon harvest was an estimated $303.5 million (Table 3), which was 63% above the $192.5 million 10-year (2009–2018) average (Appendix A24). The 2019 average sockeye salmon price was $1.35/pound before incentives and postseason adjustments. Prices paid for the other salmon species ranged from $0.05/pound to $0.55/pound (Table 3).

During the 2019 season, a total of 35 processors/buyers registered to process fish from Bristol Bay. Of those processors, 3 companies canned, 34 froze, 19 exported fresh, 4 cured salmon, and 9 extracted roe. Product was exported by air by 25 companies and exported by sea by 22 companies (Table 4).

RUN AND HARVEST PERFORMANCE BY SPECIES

Sockeye Salmon

The 2019 inshore sockeye salmon run of approximately 56.4 million was 69% above the preseason forecast of 38.7 million (Table 1). The 2019 Alagnak, Ugashik, and Igushik Rivers sockeye salmon runs came in below forecast, and the rest of the river systems came in above forecast. Sockeye salmon dominated the inshore commercial harvest, totaling 43.0 million fish; this is the second largest sockeye salmon harvest recorded in Bristol Bay (Table 5; Appendix A3). Sockeye salmon sustainable escapement goals (SEG) were met or exceeded in all systems where spawning requirements have been defined.

Several benchmarks were set in 2019; it was the 5th largest total run of sockeye salmon to Bristol Bay (56.4 million), 2nd largest sockeye salmon harvest in the history of Bristol Bay (43.0 million), 2nd highest total salmon harvest (44.5 million), 2nd highest exvessel value of all time ($303.5 million), and the 3rd largest total run of sockeye salmon to Egegik District (17.0 million).

The 2019 fishing season exhibited unusually calm and warm conditions throughout much of Alaska. Bristol Bay was not unique; the region saw some of the warmest air temperatures on record during July. This weather event resulted in abnormally high water temperatures in all major river systems within Bristol Bay. ADF&G received reports from those on the fishing grounds of water temperatures reaching upwards of 21°C, which was corroborated by temperatures at tower and test fishery sites. Coinciding with these extremely warm water conditions, ADF&G staff received countless reports from fishery participants and pilots of significant die-offs of salmon in the rivers and fishing districts within Bristol Bay. These high water temperatures persisted for an extended period and were within the known range that can cause heat stress in sockeye salmon (Armstrong et al. 2016; Hinch et al. 2012). The largest number of die-off reports were in the Igushik and Ugashik Rivers where there appeared to be a pronounced thermal barrier that severely restricted fish from migrating upriver, as seen in the low passage rates at the counting towers. When weather conditions shifted and the rivers began to cool, passage rates at the towers increased substantially.

Average sockeye salmon weights in 2019 varied from previous years; sockeye salmon that spent 3 years at sea were closer to historical averages (5.5–6 pounds), whereas fish that spent 2 years at sea were very small and averaged between 4 and 4.5 pounds. The combined average weight of 5.1 pounds was below the long-term average of 5.8 pounds. (Appendix A22).

Chinook Salmon

The 2019 baywide commercial harvest of 33,226 Chinook salmon was below the 1999–2018 average of 39,924 (Appendix A4). The Naknek-Kvichak, Egegik, and Ugashik Districts harvests were above the 1999–2018 averages, and the Togiak District was below average. Harvest in the Nushagak District, the largest producer of Chinook salmon in Bristol Bay, was 21,509 fish, which was below the 1999–2018 average of 34,403 fish (Appendix A4). The Nushagak River Chinook salmon escapement of 46,763 (Table 6) was below the SEG range of 55,000–120,000 and the inriver goal of 95,000.

Chum Salmon

In 2019, the baywide commercial harvest of 1,394,185 chum salmon was above the 1999–2018 average of 1,052,570. Chum salmon harvests were above the 1999–2018 averages in Egegik, Nushagak, and Togiak Districts. Ugashik and Naknek-Kvichak harvests were below their respective 1999–2018 averages (Appendix A5).

Pink Salmon

Bristol Bay has a dominant even-year pink salmon cycle. In 2019, an out-of-cycle year, the baywide pink salmon harvest was 6,830—compared to the 1999–2018 even-year average of 510,266 (Appendix A6).

Coho Salmon

Commercial harvest of coho salmon was 80,997, which was below the 1999–2018 average of 93,339. The largest commercial harvest was in the Nushagak District, where the harvest (33,018) was 49% below the 1999–2018 average of 63,771 (Appendix A7). The Nushagak River sonar project was operational until August 17 and enumerated a coho salmon escapement of 51,852 (Table 6).

SEASON SUMMARY BY DISTRICT

Naknek-Kvichak District

The 2019 inshore run forecast for the Naknek-Kvichak District was 15.5 million sockeye salmon composed of an estimated 7.7 million for escapement and 7.8 million for harvest. The forecast by river system was 6.7 million for the Kvichak River, 3.8 million for the Alagnak River, and 5.0 million for the Naknek River (Table 1). There are sockeye salmon escapement goals for Naknek River (800,000–2.0 million), Kvichak River (2.0–10.0 million), and Alagnak River (≥210,000; which was revised during the 2018 escapement goal review process). The total inshore run to the district for 2019 was 17.6 million sockeye salmon which included a commercial harvest of 11.5 million and a total escapement of 6.1 million (Table 1).

ADF&G does not forecast Chinook, chum, coho, or pink salmon for systems in Naknek-Kvichak District. Commercial harvest of Chinook salmon has remained relatively small because of mesh size restrictions that have been set by EO since the early 1990s. During the 2018 BOF meeting, a regulation was adopted that prohibits gillnets with a mesh size larger than 5.5 inches from June 1 until July 22 in the Naknek-Kvichak and Ugashik Districts. Additionally, the *Naknek-Kvichak District Commercial Set and Drift Gillnet Sockeye Salmon Fisheries Management and Allocation Plan* (5 AAC 06.364(f)) directs ADF&G to open commercial fishing periods for drift gillnets only between the 7-foot flood and 7-foot ebb tide stage for the conservation of Chinook salmon.

Escapement counting towers for Naknek, Kvichak, and Alagnak Rivers were operational during the 2019 season. The Naknek River tower began counting on June 21, the Kvichak River tower began counting on June 22, and the Alagnak River tower began counting on June 25 (Table 7). This was the third season of operations for the Alagnak River tower since 2011. The Naknek River escapement was 2.9 million, the Kvichak River escapement was 2.4 million, and the Alagnak River escapement was 820,000 sockeye salmon. The Naknek River escapement was above the escapement goal range, Kvichak River escapement was within the escapement goal range, and Alagnak River escapement was above the lower bound escapement goal (Appendix A1).

Drift gillnet effort in 2019 was expected to be low in the Naknek-Kvichak District early in the season for several reasons. In 2017 and 2018, the Nushagak District experienced record-breaking sockeye salmon runs. The Naknek-Kvichak District had a 2019 forecast of 15.5 million sockeye salmon, which is near the average run size for the district. The Nushagak and Egegik Districts typically experience earlier run timing than the Naknek-Kvichak District and this pattern had been amplified in the previous 4 seasons when substantial harvests in the district did not occur until July. Because of the anticipated limited harvesting capacity of the fleet, the preseason management strategy was to fish 1 tide per day as the run began building in the district.

Fishing with drift gillnets was restricted to the Naknek Section during the early season schedule, but both sections were open to set gillnets. Fishing periods were from 9:00 AM Monday until 9:00 AM Friday from June 3 to June 21 (Table 8). The first deliveries occurred on June 12 (Table 9), and the early season fishing schedule ended with a small harvest. Following the closure on June 21, subsequent fishing periods were based on inseason indicators of abundance in the Naknek, Kvichak, and Alagnak Rivers.

Sockeye salmon began showing up in substantial numbers at the Naknek River tower late in the morning of June 23 (Table 7). That afternoon, the first fishing period was announced to start at 5:30 AM on June 24 for 9 hours with set gillnets fishing in the whole district and drift gillnets restricted to the Naknek Section. Sockeye salmon escapement on June 23 was 50,200, and the cumulative tower count was 55,962. At this passage rate, this early in the run, the escapement was projected to exceed the upper bound of the escapement goal. On the morning of June 24, it was announced that the fishing period for set gillnets would be extended and the drift fleet would have a 7.5-hour fishing period in the whole district on the following tide. Harvest on June 24 was about 114,000 fish from 198 drift gillnet deliveries and 283 set gillnet deliveries (Table 9).

The drift fleet fished each high tide in the whole district on June 25 and June 26 with fishing periods ranging from 7.5 to 9 hours in duration. Beginning on June 27, drift gillnet fishing periods were timed to fish through the holdover tide, cover 2 high tides, and were approximately 19 hours in duration. Fishing with set gillnets was extended each day for approximately 24.5 hours. Fishing periods followed this pattern; the drift fleet fished the whole district through July 2, apart from June 29 when Kvichak Section was closed to both gear groups (Table 8). Daily sockeye salmon harvest ranged from 67,517 on June 25 to 281,259 on June 30, and cumulative harvest through July 2 was almost 1.6 million fish (Table 9). There were 297 vessels registered to fish in the district by July 2 and the allocation was 9.6% Kvichak set, 15.4% Naknek set, and 74.9% drift. The allocation specified in regulation is 8% Kvichak set, 8% Naknek set, and 84% drift. Through July 2, Naknek River cumulative escapement was 555,474 sockeye salmon and projected to fall near the midpoint of the upper half of the escapement goal range. The Kvichak River cumulative escapement was only 28,782 sockeye salmon and projected to be below the lower bound of the escapement goal based on the recent late run timing curve (2015–2018). The Alagnak River

cumulative escapement was only 11,616 sockeye salmon and was projecting to be below the lower bound of the escapement goal.

Through July 2, fishing opportunity had been provided to the drift fleet in the Kvichak Section to harvest more Naknek River fish to improve the harvest allocation for the drift fleet. The presence of Kvichak River fish was determined to be low based on escapement into the Kvichak River and the very low proportion (range of 0.1–3.0%) of Kvichak River fish in stock composition estimates from the PMTF through June 26 (Figure 2). The June 27–28 stock composition estimates showed 5.8% Kvichak River fish in the samples. These fish were expected to arrive in the district by July 5 based on an 8-day travel time. Allowing the drift fleet to fish in the Kvichak Section did not appear to improve harvest of Naknek River fish. In some years, Naknek River fish will travel up the Kvichak Section before migrating across the Naknek Section to enter the river. However, this season, most Naknek River fish were entering the district and continuing into the river in shallow water along the South Naknek Beach. This likely inhibited the fleets' ability to harvest these fish.

On July 3 and 4, the drift fleet fished an 18-hour period each day in the Naknek Section and the setnet fleet fished continuously in the whole district. Beginning on July 4, the fishing period following the morning tide was announced at 9:00 AM; that period would be either be extended or another period would be announced while the original period was ongoing. This resulted in the drift fleet fishing 18- to 19-hour periods from July 6 to July 9. The setnet fleet fished continuously in the whole district until noon on July 6. Kvichak Section setnet was closed the evening tide of July 6 and the morning tide of July 7. This was followed by a 20.5-hour period and then a closure from the afternoon of July 8 until the afternoon of July 9 to increase Kvichak and Alagnak River escapements. Meanwhile, fishing continued in the Naknek Section with drift and set gillnets. From July 3 through July 9, harvest ranged from approximately 390,000 on July 3 to 870,000 on July 6 for a total 4.6 million fish harvested in this time period. During the same time frame, district registration ranged from 346 vessels on July 3 to 440 vessels on July 9 (Table 10).

By the morning of July 7, Kvichak River tower cumulative escapement was 71,550 fish, and 4 days behind the lower bound of the late run timing curve (2015–2019). An aerial survey was flown on July 8 and an estimated 100,000 fish were in the Kvichak River. A large pulse of fish was also observed moving up the Alagnak River. Kvichak River escapement on July 9 was 245,106, bringing the cumulative count to 351,378; the inriver estimate based on the inriver test fishery was 250,000 (Table 11). The Kvichak River was still 3 days behind the lower bound of the escapement goal curve; however, the run was beginning to materialize, and management was based on historically late run timing. The assumption of historically late run timing was supported by stock composition estimates at PMTF. The fish that passed the counting tower were detected at the PMTF on July 1–2 and had a stock composition estimate of 15% Kvichak River stock. The Kvichak River stock composition increased to 20.6% on July 4–6 and increased again to 22.3% on July 7–8 (Figure 2).

From July 10 to July 12, the set gillnet fleet fished continuously in the whole district and the drift gillnet fleet fished each high tide from 7-foot flood to the 7-foot ebb in the Naknek Section. Daily harvest ranged from approximately 603,000 to 779,000 sockeye salmon and cumulative harvest was up to almost 8.3 million (Table 9). The harvest allocation through July 12 was 8% Kvichak set, 14% Naknek set, and 79% drift. There were 609 vessels registered to fish in the district (Table 10).

Through July 12, the Naknek River cumulative sockeye salmon escapement was 1,881,390 and projecting to exceed the upper end of the escapement goal. Alagnak River cumulative escapement was 217,242 and above the lower bound escapement goal of 210,000 (Table 7). The Kvichak River cumulative escapement was 895,602 sockeye salmon and 250,000 fish were estimated inriver (Table 11). The abundance of Kvichak River fish was expected to increase based on the PMTF, so a 7.5-hour fishing period was announced for the drift fleet in the Naknek-Kvichak District on July 13. An aerial survey was flown the same day and estimated 240,000 fish in the Kvichak River; however, the abundance in the lower river was less than anticipated.

The Naknek River escapement goal was exceeded on July 13, but 900,000 more fish were needed to reach the Kvichak River escapement goal. From July 14 through the evening tide on July 16, the drift fleet fished each high tide in the Naknek Section and the setnet fleet fished continuously in the whole district. Daily escapement on the Kvichak River had dropped to 74,154 on July 15 and down to 24,534 on July 16 for a cumulative total of 1,325,724 (Table 7). The district was closed to fishing during the morning tide on July 17.

The district registration and the allocation periods ended at 9:00 AM July 17. The harvest by gear type through the allocation period was 9% Kvichak set, 14% Naknek set, and 77% drift (Appendix A9). On July 16, there were 742 vessels registered to fish in the district. The lack of drift vessels throughout the season was the main reason for the drift fleet only harvesting 77% when the allocation specified in regulation is 84%. Throughout the season the drift fleet always started fishing near the 7-foot flood stage, fished up to 20-hour periods, and fished more often in the Kvichak Section than they had in the past given the Kvichak River run size.

ADF&G flew an aerial survey of the Kvichak River on July 17 and estimated 300,000 fish in the river. Cumulative escapement through 2:00 PM July 17 was 1,354,000, so approximately 300,000 more fish were still needed to meet the escapement goal. At 3:00 PM on July 17, it was announced that the Naknek-Kvichak District would close at 8:00 PM on July 17, and the Naknek River Special Harvest Area (NRSHA) would open at 2:00 AM on July 18 to drift gillnet gear followed by another drift gillnet period in the NRSHA beginning at 2:00 PM July 18. The fleets were notified that after these 2 periods fishing would reopen in the Naknek-Kvichak District. Due to the short notice of the NRSHA opening coupled with escapements exceeding their respective escapement goals in Egegik and Wood Rivers, and the late date of the season, dual drift vessels could continue fishing with 200 fathoms of gear in the Egegik and Nushagak Districts. However, this was outside of ADF&G's authority. This action led to a proposal being submitted to and adopted by the BOF following the season allowing dual drift operations to continue fishing 200 fathoms of gillnet in the Nushagak and sometimes Ugashik Districts when the NRSHA is open.

Harvest from the 2 drift gillnet fishing periods in the NRSHA on July 18 was 110,768 sockeye salmon (Table 9). Cumulative escapement at the Kvichak tower through 2:00 PM, July 18 was about 1,550,000 sockeye salmon and the inriver estimate based on an aerial survey was 450,000. With assessment indicating that the Kvichak River escapement goal would be met, the fishery moved back into the Naknek-Kvichak District beginning at 2:30 AM on July 19. From July 19 to July 21, the setnet fleet fished continuously in the whole district, and the drift fleet alternated fishing periods from the Naknek-Kvichak District to the Naknek Section. The drift fleet and setnet fleet fished continuously from 4:30 PM on July 21, until the fall schedule began by EO at 9:00 AM on August 5. The BOF adopted a new fall fishing schedule during the December 2018 Bristol Bay

meeting to facilitate commercial fishery participants and processors operating late in the season. The new fall fishing schedule was from 9:00 AM Monday until 9:00 AM Sunday (Table 8).

The Naknek River tower operated through July 23 with a final sockeye salmon escapement estimate of 2,911,470. The Alagnak River tower operated through July 24 with a final escapement estimate of 820,458. The Kvichak River tower operated through July 25 with a final escapement estimate of 2,371,242 (Table 7). Estimates were made for missed passage at the Kvichak tower July 9–10. Fish were observed crossing the river between the towers on July 10. A third counting tower was set up July 11; however, this was ineffective and there was uncertainty as to how many fish were crossing the river. Therefore, the left bank counting tower was moved upstream near the sampling shed on July 12 to address concerns of missed passage.

The sockeye salmon total harvest of 11,527,837 was 28% above the 1999–2018 average harvest of 8,329,291. The Chinook salmon total harvest of 2,743 was above the 1999–2018 average of 1,662 (Appendix A4). Chum salmon harvest totaled 134,517, which was below the 1999–2018 average of 208,297 (Appendix A5). There was a commercial harvest of 530 pink salmon and 1,418 coho salmon (Appendices A6 and A7).

Egegik District

The 2019 Egegik District harvest of 14.7 million sockeye salmon was approximately double the forecasted harvest of 7.0 million (Table 1) and was the largest harvest in the last 20 years (Appendix A14). The sockeye salmon escapement of 2.3 million exceeded the Egegik River SEG range (800,000–2.0 million; Appendix A1). The inshore total of approximately 17.0 million to the Egegik District was 95% above the forecast of 8.7 million and was largest out of the last 20 years (Table 1; Appendix A14).

The district opened to commercial salmon fishing for a set schedule of 3 days per week at 9:00 AM on Monday, June 3. Fishing was permitted from 9:00 AM Monday to 9:00 AM Wednesday and 9:00 AM Thursday to 9:00 AM Friday through June 14 (Table 8). The first deliveries were recorded June 3 (Table 12). Harvest was small and remained so through the end of the schedule. Through June 14, the total harvest was just over 14,000 fish. After June 14, the district went to active management and additional fishing time was based on inseason indicators of abundance.

Daily inriver test fishing, which provides an index of sockeye salmon passage into the lower Egegik River, began on June 17 at established sites just upstream of Wolverine Creek (Table 13). Initial catches from the test fishery indicated small numbers of fish moving into the Egegik River.

The fishery opened for 3 periods the following week on June 17, 19, and 21. Harvest increased over each period, bringing the cumulative harvest to 217,500 sockeye salmon. The increasing harvests over the week indicated a larger volume of fish was beginning to show up in the district (Table 12). Cumulative sockeye salmon escapement through June 21 was approximately 27,000 (Table 13). Both drift and set gillnet gear were permitted to fish on June 23 for 7 hours. Harvest from this period was 144,000 sockeye salmon, indicating an increasing number of fish entering the district (Table 12).

On June 24, the drift fleet was permitted to fish for 5 hours, but the set gillnet fleet did not fish in an effort to balance allocation between gear groups and to increase escapement while not leaving the district completely unguarded in case a strong push materialized. Harvest from this period was 217,500 sockeye salmon. Inriver test fishery indices peaked on June 24—the highest daily index

of the season. Corresponding escapements at the escapement tower resulted in daily counts of 86,280 on June 25 and 102,432 on June 26. These data showed a travel time of just over 1 day from the district to the tower for this group of fish (Table 13). Through June 26, cumulative escapement increased to 279,204, which is higher than typically enumerated by that date.

Because of increased escapement and test fishery indices, extended fishing periods were allowed for both gear groups from June 27 to June 29, resulting in a harvest of approximately 1.2 million sockeye salmon. Daily escapement counts at the tower decreased over those days, but cumulative escapement remained higher than expected. Through June 29, cumulative catch was 2.1 million and cumulative escapement was 417,690 (Tables 12 and 13).

Between June 30 and July 4, set gillnet gear was allowed for 8 hours each day, and drift gillnet periods varied from 9 hours to 6.5 hours per day. During that time frame, test fish indices and escapement counts continued to indicate that escapement goal would be achieved. Combined commercial harvest for the 5 days was 2 million sockeye salmon. Escapement was 250,200 during that time period, bringing the cumulative total escapement to 667,890.

At this pace, escapement was projecting to fall in the upper half of the escapement goal range by season's end. Additionally, inriver test fish indices were continuing to show that a sufficient number of sockeye salmon were moving through the fishing district and upriver. On July 5, a 12-hour drift net and an 8-hour set net opportunity was allowed. Harvest from this period was 852,914 sockeye salmon, which was the largest daily catch for the season. The same opportunity was permitted on July 6 with a resulting harvest of 776,601, bringing the cumulative harvest to 5.8 million (Table 12). Cumulative escapement through July 6 was 794,166, just below the lower bound of the escapement goal range (Table 13).

PMTF genetic stock composition estimates from July 4 to July 6 indicated a continued high abundance of Egegik River bound fish entering the bay. Combining that genetic data with increasing escapement and high harvest levels, it was apparent that the sockeye salmon run was above forecast. From July 7 to July 9, commercial fishing was provided on each tide for both gear groups—approximately 9.5 hours per day for the drift fleet and more than 8 hours per day for the set net fleet. Harvest over those 3 days was 2.3 million sockeye salmon. Escapement counts at the tower totaled 331,794, bringing the cumulative count to 1.1 million. The lower bound of the escapement goal range was exceeded on July 7.

Additional fishing opportunities were provided for both gear groups from July 10 to July 16. Drift gillnets were allowed to fish an average of 13 hours per day and set gillnets averaged 15 hours per day. Cumulative harvest from those 7 days was 4.4 million fish (Table 12). Inriver test fishery indices increased sharply from July 10 through the final day of operation on July 12 (Table 13). Some of the highest daily test fishery indices of the season were recorded during the final days of operation, which indicated a strong push of fish had escaped the fishing district (Table 13). The ensuing escapements from those indices proved to be the highest counts of the season and exceeded 200,000 fish daily on July 11 and 12 (Table 13). The midpoint (1.4 million) of the SEG range was surpassed on July 11, and the 48-hour transfer waiting period into the Egegik District was waived the following day per regulations. Daily counts started to trend downward after July 12, but sockeye salmon were still migrating upriver. The upper end of the escapement goal range (2 million) was exceeded on July 16 when cumulative count reached 2.03 million sockeye salmon (Table 13).

With the upper end of escapement goal range exceeded and harvest levels beginning to decrease, on July 17, commercial fishing within the Egegik District was liberalized to 24 hours per day until July 29. By July 18, Naknek and Egegik Rivers had both exceeded their respective escapement goals, whereas Kvichak and Ugashik Rivers (historically later run timing) were below desired escapement levels. Accordingly, fishing in the Naknek-Kvichak District was confined to the NRSHA to conserve Kvichak River sockeye salmon stocks. Therefore, by regulation, fishing opportunity in the Egegik District was confined to the Egegik River Special Harvest Area from 2:00 AM until 8:30 PM on July 18. Due to the short notice of reducing fishing to the Egegik River Special Harvest Area coupled with escapements exceeding their respective escapement goals in Egegik, Naknek, and Wood Rivers, and the late date of the season, dual drift vessels could continue fishing with 200 fathoms of gear in the Egegik and Nushagak Districts. On July 18, at 8:30 PM, the district was reopened to continuous fishing until 9:00 PM Monday, July 29, when the fall schedule took effect.

The 2019 Egegik sockeye salmon run was above forecast and exhibited one of the later run timings on record; the midpoint of the run was July 10, which was 6 days later than the 20-year average (1999–2018) of July 4. By the end of the allocation period (July 17) the cumulative catch was 13.1 million, but another 1.6 million fish were caught before the last buyer ended operations for the year. This catch was not included in the allocation calculations because the allocation period is June 1 to July 17 by regulation. Harvest of all species in 2019 was 14.9 million fish (Table 12). The sockeye salmon escapement goal range was exceeded with a cumulative escapement count of 2,340,210 (Table 13).

The 2019 Egegik sockeye salmon run was composed of mostly age-.2 and age-.3 fish (Table 14) from 2014 (1.4 million) and 2015 (2.2 million) escapements (Table 13; Appendix A10). Age-2.2 fish were underforecast for the season. Age-1.2 fish were overforecast and made up approximately 75% of the 2019 run.

During the period from June 16 to July 17 in 2019, a total of 296 hours were fished by the drift gillnet group (approx. 65 hours more than 2018) and 304.25 hours were fished by the set gillnet gear group (53.75 hours more than in 2018). Of the 672 available fishing hours, 44% were fished by the drift gillnet group and 45% were fished by the set gillnet group (Table 12). By the end of the allocation period on July 17, harvest allocations were 81% drift and 19% set gillnet (Appendix A9). Regulation specifies 86% drift and 14% set.

Commercial harvest of other salmon species in the Egegik District was 178,058 fish, or about 1% of the total (Table 12). The reported Chinook salmon harvest was 3,344, which was above the 20-year average (1999–2018) of 672 (Appendix A4). The district chum salmon harvest of 156,260 was above the 20-year average (1999–2018) of 72,000 (Appendix A5). Reported pink salmon harvest was 212 (Appendix A6). The coho salmon harvest of 18,233 was above the 20-year average (1999–2018) of 13,000 (Appendix A7).

In summary, the 2019 harvest of 14.7 million sockeye salmon in the Egegik District ranked 1st out of the last 20 years and is the 3rd highest on record. It was well above the 20-year average (1999–2018) of approximately 6.7 million fish and was 95% above the preseason forecast (Table 1; Appendix A14). The 2019 fishery harvested 86% of the run into the district—the 20-year average (1999–2018) is 82% (Appendix A14). The midpoint of the run was July 10, which was 6 days later than the 20-year average (1999–2018). Peak harvest occurred on July 5 (852,000 fish) and July 8 (825,000 fish; Table 12). Peak escapement occurred on July 11

(203,424 fish) and July 12 (215,760 fish; Table 13). Peak effort occurred on July 16, when 617 drift gillnet permits were registered in the district, including 162 dual permits (Table 10). There were 13 processors registered to purchase fish in the Egegik District in 2019 (Table 4).

Ugashik District

The 2019 inshore sockeye salmon run to the Ugashik District of 2.6 million ranks 16th out of the last 20 years and was below forecast (Table 1; Appendix A15). The midpoint of the run was July 22, which was 11 days later than the 20-year average (1999–2018) of July 11. The commercial catch of approximately 1.0 million was below the 20-year average (1999–2018) and was the second lowest harvest during the same period (Table 15; Appendix A3). The number of sockeye salmon enumerated at the Ugashik River tower was 1,547,748 (Table 16) and exceeded the SEG range (500,000–1.4 million).

The Ugashik District was opened to a fishing schedule of 4 days per week (9:00 AM Monday to 9:00 AM Friday) beginning 9:00 AM Monday, June 3, by EO (Table 8). The first landings occurred on June 5 (Table 15). Because the preseason forecast for the Kvichak River allowed all fishing districts to start the season in their full areas, the schedule of 4 days per week was continued until 9:00 AM Friday, June 14. After that point, ADF&G switched to an active management strategy (Table 8). Commercial fishing participants were advised that additional fishing time would depend on inseason indicators of abundance.

Within the Ugashik District, there was a permitted and Commercial Fisheries Entry Commission approved commercial fishing skills camp held for local area youth. The goal of this camp is to introduce participants to the skills and knowledge needed to be a crew member on a commercial set net site, with the hope of building a strong local workforce for the future. On June 17, a fishing opportunity was provided to the set net fleet for 12 hours. This allowed camp participants to partake in a commercial fishery opening prior to the completion of camp on June 18. Harvest from this period was 133 sockeye and 39 Chinook salmon (Table 15).

Available information suggested a low volume of fish, which kept the district closed until June 23 when an 8-hour period was permitted for both gear groups to provide insight on abundance within the district. Harvest of sockeye salmon was only 4,000 fish; the combined drift and set gillnet fleets made 44 deliveries (Table 15), which was extremely low.

The Ugashik District inriver test fishery, which occurs about 3 miles upstream of Ugashik Village, provides a daily index of sockeye salmon passage into the lower part of the Ugashik River. Inriver test fishing started on June 25 and suggested that fish were passing into the river in low numbers (Table 16).

A 12-hour period for both drift and set gillnets was permitted on June 26. Harvest was 14,208 sockeye salmon and indicated that there was still little movement of fish into the Ugashik River. Information from the inriver test fishery confirmed that passage into the river was slow which led to the fishing district remaining closed on June 27 (Tables 15 and 16).

On June 27, inriver indices increased slightly, which resulted in a 12-hour opportunity for both drift and set gillnets on June 28 (Table 16). The drift fleet was small; only 28 drift vessels were registered to fish in the district (Table 10), but the set gillnet fleet was mostly operational. The relatively small number of drift vessels reduced the possibility of intercepting nonlocal stocks, which allowed for this opportunity. Harvest from the period was 27,000 sockeye salmon (Table 15).

The escapement tower project, operating about 24 miles upstream of Ugashik Village, began operations on June 27 with a partial day passage count of 126 sockeye salmon (Table 16). Tower count data corroborated inriver test fishery data that entry of fish into the river was low and that there were few fish in the river below the escapement project.

Because the drift gillnet fleet size remained small (Table 10), an additional 12-hour opportunity was provided for drift and set gillnet fleets on June 30. Harvest doubled from the previous fishing period, with 52,000 sockeye salmon caught (Table 15). Through June 30, cumulative escapement was 6,054 fish, which was tracking below the lower bound of the escapement goal (Table 16). Cumulative harvest was 78,000 by June 30.

Small inriver test fishery indices remained consistent through July 1 (Table 16). Although the drift fleet remained small, another fishing period was provided on July 2 with a reduction in time. Both gear groups fished 8 hours and harvested a combined total of 25,600 fish on July 2. Cumulative escapement was 11,900 sockeye salmon at the Ugashik River tower (Table 16). The district remained closed over the next 2 days to allow for increased escapements.

Indices from the inriver test fishery improved slightly on July 3 and July 4, indicating a small increase in numbers of fish migrating upriver. Drift gillnet fleet size remained small through this time and fishing opportunity was warranted to gauge run entry and strength. A 5-hour drift and 8-hour set gillnet period was provided on July 5, which resulted in a harvest of approximately 65,000 fish, indicating that entry of fish into the district had increased compared to the previous period. Escapement counts through July 5 totaled just 26,490 fish (Table 16) and were tracking below desired levels; therefore, the district remained closed July 6–7 to allow for escapement (Table 15).

Reports of large numbers of fish moving into the district were received by ADF&G beginning the evening of July 6. Inriver test fish indices increased on July 5, but the increase was not sustained into the following day. Registered drift boat numbers were still on the low end; only 50 boats were registered in the fishing district. A commercial period was provided on July 8 to gauge run strength. The drift fleet fished for 5.5 hours and the set net fleet fished for 8 hours. Harvest from this period was 148,599 fish (Table 15), the highest daily catch to date. This brought cumulative harvest to 337,000 fish. Escapement continued to track below escapement needs, with a cumulative count of 44,268 fish through July 8.

Beginning July 9, inriver test fish indices began to increase, but not to levels that would suggest a surge in escapement. Daily counts at the tower site increased slightly over the following days (July 10–12); however, escapement was not enough to warrant additional fishing opportunity in the near term. As previously stated, the month of July was exceptionally warm and calm. As the weather persisted into the middle of the month, ADF&G received an increasing number of reports of extremely warm water conditions (upwards of 21°C) in addition to reports of dead salmon along shorelines and floating in the district. These reports also contained positive signs that fish were beginning to build in large numbers in the district. ADF&G staff conducted multiple aerial district surveys to confirm these reports. By July 15, the district had been closed for 7 days and inseason run assessment projects indicated a decreasing number of fish moving inriver (Tables 15 and 16), although numbers of fish present in the district appeared to be increasing. The warm water conditions were likely causing fish to mill within the fishing district instead of moving upriver. These conditions lasted until approximately July 16 when the weather patterns changed and

brought westerly winds and some rain to the area. Water temperatures began to cool, signaling imminent fish movement.

By July 17, escapement was still projected to be below the lower bound of the escapement goal range; cumulative escapement was 140,604 fish (Table 16). Thus, the district remained in active management past July 17, and additional fishing time would continue to be determined by inseason run assessment in an effort to achieve the escapement goal. Daily inriver test fish indices increased on July 17 and July 18, with some of the highest indices recorded at the project, suggesting a large push of fish had moved inriver. An evening announcement on July 18 provided a 12-hour fishing period for both gear groups on July 19. Harvest from this period was 154,000 sockeye salmon (Table 15).

Inriver test fishery indices continued increasing on July 19, with a daily test fish index of 11,141. This is the highest known test fish index recorded for this project. This suggested an even larger number of fish had escaped the district. On July 20, another 12-hour fishing period was provided to both gear groups. Harvest was 133,000 sockeye salmon during that period, bringing the cumulative total to 624,000 for the season. Approximately 40% of the total season harvest occurred during the last 2 fishing periods. Large inriver test fish indices continued until project completion on July 21. Fishing opportunity was liberalized on July 21 with an 18-hour fishing period, and then fishing was extended until August 1, at which point the fall schedule took effect.

Subsequent escapements from those large test fish indices were equally large. Starting July 20, daily escapement counts increased over the next few days (Table 16). The lower bound of the escapement goal range was surpassed on July 21 and the upper bound was exceeded on July 24. The peak daily count of 409,644 fish occurred on July 23 (Table 16). Between July 20 and July 24, 1.2 million sockeye salmon passed the counting tower at Ugashik Lake. This condensed passage could be attributed to the fish milling in the district until suitable conditions allowed them all to move upriver in a short amount of time. When counting tower operations ended on July 28, a total of 1,547,748 sockeye salmon had been enumerated.

Fishing continued through the rest of July and an additional 412,000 sockeye salmon were harvested. By regulation, the allocation period runs from June 1 to July 17 but approximately 70% of the harvest occurred after July 17 and was not included in the allocation calculation. The last deliveries were recorded on August 4 and cumulative catch through that date was 1,037,030 fish (Table 15). By the end of the allocation period (July 17), set gillnetters caught approximately 34% of the sockeye salmon harvest and drift gillnetters caught 66%. The allocation specified in regulation is 10% set gillnet and 90% drift gillnet (Appendix A9). Between June 23 and July 17, set gillnet permit holders were provided a total of 68 hours of fishing time (88 hours less than in 2018), and drift gillnet permit holders were provided a total of 62.5 hours of fishing time (67.5 hours less than in 2018; Table 15).

The reported harvest of 2,062 Chinook salmon was above the 20-year average (1999–2018) of 953 (Appendix A4). Chinook and chum salmon escapements are assessed via aerial surveys in the Dog Salmon and King Salmon Rivers (major tributaries of the Ugashik River), the biggest producers of these species in the district. In 2019, no escapement surveys were flown in the Ugashik River drainages because of budget constraints. The chum salmon harvest of 20,249 fish was below the 20-year average (1999–2018) of 70,973 (Appendix A5). Reported pink salmon harvest was 183 and incidental to directed sockeye salmon fishing (Appendix A6). There was no directed commercial effort for coho salmon in 2019; reported harvest was 550 fish (Appendix A7).

Pacific walrus returned to the same beach they used during the 2016 and 2017 season, which is located about 0.5 miles north of the district boundary. Like past seasons when this occurred, EO authority was used to move the district boundary 1 mile south from the location defined in regulation to provide an additional buffer space for the animals (Table 8). Although this did not eliminate interactions between the drift gillnet fleet and walrus, the buffer zone seemed to work as intended.

In summary, the 2019 Ugashik District sockeye salmon fishery harvested approximately 40% of the sockeye salmon run to the district, compared to the 20-year (1999–2018) average harvest rate of 72% (Appendix A15). Days of peak catch occurred on July 8 (148,599) and July 19 (154,327; Table 15). The midpoint of the run was July 22; the 20-year (1999–2018) average is July 11. Days of peak escapement past the counting tower were July 22 (295,230) and July 23 (409,644; Table 16). There were 10 processors registered to purchase fish in the Ugashik District this season (Table 4).

Nushagak District

The 2019 Nushagak District total inshore sockeye salmon run was 17.8 million, 71% above the preseason forecast of 10.0 million (Table 1). Commercial sockeye salmon harvest in Nushagak District reached 14.8 million, 86% above the preseason projected harvest of 8.0 million and 97% above the 1999–2018 average harvest of 7.5 million (Table 1; Appendices A3 and A16). Sockeye salmon escapement in the district's 3 major river systems was 2,073,276 for Wood River, 256,074 for Igushik River, and 709,349 for Nushagak River (Tables 6 and 17). Wood River's sockeye salmon escapement exceeded the upper end of the escapement goal range (Appendix A1). Nushagak and Igushik River sockeye salmon escapements were within their established escapement goal ranges.

In 2019, there was no forecast for Nushagak District Chinook salmon. The preseason plan for Chinook salmon management was to have directed openings if escapement warranted such openings. This decision was based on the lower-than-average Chinook salmon runs in recent years and the lack of a reliable forecast for the 2019 season (Appendix A19). There were no directed Chinook salmon openings in the Nushagak District in 2019, although there were 21,509 Chinook incidentally harvested in the commercial salmon fishery (Table 18). This harvest is 63% of the 1999–2018 average harvest of 34,403 for the Nushagak District (Appendices A4 and A19). Chinook salmon escapement into Nushagak River was 46,763, which was below the lower end of the escapement goal range of 55,000.

The sonar escapement enumeration project at Portage Creek was fully operational on June 6 (Table 6). ADF&G began the season very conservatively regarding directed Chinook salmon openings. This was partly based on the 2014 experience of a strong early Chinook salmon run followed by a very poor second half. Additionally, because of the strong baywide sockeye salmon forecast, ADF&G expected to begin directed sockeye salmon openings earlier than usual. Earlier sockeye salmon openings would increase the incidental harvest of Chinook salmon. Nushagak Chinook salmon escapement was tracking close to the inriver goal (95,000) curve early in the season and went below the inriver goal on June 18. The cumulative escapement through June 17 was 12,498 (Table 6). Projections were for a total escapement of approximately 98,000, which is above the inriver goal of 95,000. Escapement slowed after June 17 and the projection dropped to 83,000 fish on June 18. The preseason plan, outlined in the outlook (Appendix C1), indicated commercial fishing for sockeye salmon would begin in the Nushagak District when Wood River

escapement reached 30,000 if Nushagak Chinook salmon escapement was projecting above 95,000 fish. Management emphasis would also switch from Chinook salmon to sockeye salmon at this point. Because the Nushagak Chinook salmon escapement was projecting below 95,000 on June 19 (when Wood River sockeye salmon escapement exceeded 30,000 total), commercial fishing remained closed. Wood River sockeye salmon escapement increased on June 20, with a daily total of 62,000, bringing the cumulative escapement to over 110,000. At this point, ADF&G switched from Chinook salmon management to sockeye salmon management and commercial fishing began.

Sockeye salmon enumeration on the Wood River began June 17. Fish passage was above average from the start, with over 4,000 counted on June 17 (Table 17). On June 18, the daily count was 10,552 past Wood River tower—above average but not approaching the 100,000 fish needed to trigger a shift to sockeye salmon management. ADF&G staff flew an aerial survey of the Wood River on the evening of June 19 and observed significant numbers of sockeye salmon inriver. Reports from subsistence fishing also indicated strong catches of sockeye salmon even though most subsistence users were fishing large mesh nets. Staff returned from the survey flight and announced at 8:00 PM on June 19 (giving 24-hour notice) the earliest possible drift gillnet opening of 8:00 PM, June 20. The set gillnet fleet was advised their earliest possible opening in the Nushagak Section would be 3:30 PM, June 20. Staff hoped to delay these openings to allow for more Chinook salmon escapement, but needed to have the option to respond with commercial fishing if sockeye salmon escapement was stronger than expected.

The June 19 sockeye salmon escapement past Wood River tower was 32,988, for a cumulative total of 48,252. The midnight to 6:00 AM escapement count on June 20 was 31,176, indicating the fish observed during the aerial survey the previous evening were migrating upriver. With the possibility of more than 100,000 sockeye salmon escaping into the Wood River on June 20, staff switched to sockeye salmon management and opened the commercial fishery. A 9:00 AM announcement on June 20 specified set gillnet fishing time in the Nushagak Section starting at 3:30 PM, and a 6:00 PM announcement opened drift gillnet fishing from 11:00 PM, June 20, until 3:00 AM, June 21, and from 6:30 AM until noon also on June 21. The drift fishery remained closed for the evening tide on June 21, but after that, drift gillnet fishing time was provided on every tide for the rest of the season (Table 18). Drift gillnet fishing continued with 2 openings per day in the whole district until 2:00 PM, July 8. Due to poor escapement in the Igushik River, when drift gillnet fishing reopened at 7:30 PM, it was limited to the Nushagak Section only.

With another exceptional run shaping up in the Nushagak District, fleet size was far above average. District registration peaked on June 24 with 861 permits and 654 vessels registered to fish in the Nushagak District (Table 10). The fleet was able to harvest large numbers of fish but never reached 1 million sockeye salmon harvest in a day (Table 18), a mark that had been reached the previous 2 seasons. There were no known issues with processing capacity despite the large harvests during the season.

The summer of 2019 was unusually hot, sunny, and calm. This combination resulted in water temperatures that were much higher than average. The Igushik River is particularly susceptible to solar heating because of the low slope, high turbidity, and long winding path through unshaded tundra. The high temperatures appeared to result in a thermal block developing in the river. We believe this because migration of salmon into the lake dramatically slowed for what is usually the peak of the migration and then increased later as temperatures moderated. ADF&G staff felt confident that the run was strong and that once the thermal barrier diminished, escapement would

surge up the river and the escapement goal would be achieved. By July 7, cumulative sockeye salmon escapement was 41,502 (Table 17); it should have been at least 60,000 to meet the lower end of the escapement goal range. With this poor escapement, staff closed the Igushik Section of the district to commercial fishing with drift gillnets. Daily escapements past the Igushik tower continued to drop, and on July 10, ADF&G announced that continuous set gillnet fishing in the Igushik Section would close at 7:30 AM, July 11. Set gillnet fishing was opened for 7.5 to 10 hours daily until July 17 when it was closed (Table 18). Through July 17, cumulative sockeye salmon escapement past the Igushik tower was 49,746, which is well below the lower end of the escapement goal range (150,000). However, the weather had begun to cool and daily escapement counts were increasing. Escapement increased with 7 days of counts over 20,000, and the lower end of the escapement goal range was achieved on July 23. On July 27, counting operations concluded at the Igushik River tower with a cumulative escapement of 256,074. The partial daily count on July 27 was over 11,000. Significant escapement likely occurred after tower operations ended. Commercial fishing with both set and drift gillnets was reopened on July 22. By that point in the season, the main buyer for Igushik had ceased operations and effort diminished.

New records for run size in the Nushagak District and escapement in the Wood River were set in 2017 and 2018. This trend ended in 2019 (the 3rd largest run in the history of the Nushagak District, and the 2nd largest harvest on record). This could be because the run was not dominated by smaller age-.2 fish as it had been in 2017 and 2018, or because of warm waters keeping fish milling in the commercial district longer, or fishery participants becoming more efficient at targeting fish in the district. Whatever the reason, escapement was much more controlled in 2019 than the previous 2 years. Because escapement numbers were more normal, ADF&G did not open the Wood River Special Harvest Area to continuous fishing when it was opened on July 6. The Wood River Special Harvest Area was opened to set gillnet fishing only, starting at 4:00 PM, July 6. Openings were scheduled around the high tide to provide some harvest opportunity and to allow some passage for Muklung River Chinook salmon. The Wood River sockeye salmon escapement for 2019 was 2,073,276, which exceeds the upper end of the escapement goal range of 1.8 million. Nushagak River sockeye salmon escapement was steady and strong for the whole season. The daily counts peaked on July 1 with a count of 71,161. The total count was 709,349 (Table 6).

Commercial fishing with set gillnets in the Igushik Section of the Nushagak District began on June 10 (Tables 18 and 19) with 8-hour openings daily. The Igushik set gillnet harvest was average for the first week of fishing. When fishing began on the Nushagak side of the district on June 20, the Igushik set gillnet openings mirrored the Nushagak Section gillnet openings. All set gillnet fishing in the Nushagak District was opened continuously beginning June 24. The Igushik set gillnet harvest was steady for the entire season. Igushik harvest is not reported separately here, but it was above average for 2019.

As the sockeye salmon run ended, fishing effort dropped steadily, and processing effort also diminished. With decreased fishing effort and reduced processing capacity, ADF&G transitioned from sockeye salmon management to coho salmon management. In 2019, the sonar project was operational on the Nushagak River until August 17. This meant that sonar counts were available for management of the coho salmon fishery. The counts, however, were low all season with a final cumulative count of 51,852 (Table 6). Based on the management plan, ADF&G closed commercial fishing in the Nushagak Section of the district for both set and drift gillnets on July 31 at 9:00 AM. Coho salmon escapement was never projected to be at a level that would allow commercial fishing

and the Nushagak Section remained closed for the remainder of the 2019 season. It is unclear whether the coho salmon escapement was delayed by warm water temperatures and a calm August or if the run was just small. Fishing remained open continuously in the Igushik Section for both drift and set gillnets, but effort was minimal. The coho salmon run was smaller than expected in 2019 and harvest was mostly incidental in the sockeye salmon fishery.

The total Nushagak District coho salmon harvest was 33,018, 52% of the 20-year (1999–2018) average of 63,771 (Tables 5 and 18; Appendix A7). Because it was an odd year, there was no significant pink salmon run or harvest in 2019. The final chum salmon harvest was 855,428 (Tables 5 and 18; Appendix A5). The final sockeye salmon harvest was 14,755,905 (Tables 5 and 18; Appendix A3).

Togiak District

The 2019 inshore run sockeye salmon forecast for the Togiak River was 1.1 million, composed of a projected 230,000 escapement and 870,000 harvest (Table 1). Smaller sockeye salmon runs to other drainages in the district occur, primarily to the Kulukak River. These are not included in the preseason forecast; however, they contribute approximately 50,000 sockeye salmon to the district harvest each year. The SEG for the Togiak River is 120,000–270,000 sockeye salmon. The total inshore run to the district in 2019 was 1.4 million sockeye salmon, making it the second largest on record behind the 2018 run (Table 1; Appendix A18). The commercial harvest of 1.0 million fish is the highest on record, and the first time that harvest in the Togiak District exceeded 1.0 million (Table 20; Appendices A3 and A18).

The escapement counting tower on the Togiak River began operations on July 4. Escapement counts remained low until July 16, when counts increased to near record levels and remained high throughout the remainder of the season (Table 17). Tower operations ended on August 8 with a daily count of 2,730—after which only a small proportion of fish were thought to be missed. Escapement into Togiak Lake was 351,846 sockeye salmon, exceeding the escapement goal range of 120,000–270,000 (Table 17; Appendix A1).

The Togiak District is managed differently than other districts in Bristol Bay. This district uses a fixed fishing schedule of 60 hours per week in Kulukak Section, 4 days per week in Togiak River Section (except for a peak fishing schedule of 5.5 days per week from July 1 to July 15), and 5 days per week in Osviak, Matogak, and Cape Peirce Sections. The Togiak River Section schedule was adjusted by EO, as needed, to achieve escapement objectives in 2019. Above average fishing in the Togiak River section resulted in less effort in other sections of the Togiak District in 2019, all of which remained open for regularly scheduled fishing periods for the entire season. In addition, transferring into Togiak District prior to July 27 was prohibited by regulation if the permit had been registered in any of the 4 other Bristol Bay districts. Conversely, permit holders that have fished in Togiak District are prohibited from fishing in any other Bristol Bay district until July 27.

ADF&G does not forecast Chinook salmon for systems in the Togiak District. However, based on recent harvests, the Chinook salmon run was again anticipated to be below average. As a result, ADF&G managed the early portion of the season conservatively and monitored effort and Chinook salmon harvest closely through June. Effort remained low throughout much of June and ADF&G took no management actions to restrict fishing time, but when effort increased the week of June 24, the Togiak River Section was subsequently reduced by 24 hours (Table 19). Total Chinook salmon commercial harvest for the Togiak District was 3,568 fish, well below the 20-year (1999–2018) average of 5,654 fish (Table 20; Appendix A20).

The start of July marked the beginning of the extended weekly fishing schedule in the Togiak River section, and a shift towards sockeye salmon management in the Togiak District. Catches over the course of the first week of July averaged over 20,000 fish per day (Table 20). However, because escapement levels at the tower were below average, ADF&G did not provide any additional fishing time. Sockeye salmon catches continued to increase during the second week of July, but tower counts remained below average. It can take up to 10 days for sockeye salmon to reach the tower after making it through the fishing district, so to ensure fish were making it through the fishery, ADF&G staff flew an aerial survey on July 11. The survey indicated numerous fish were in the Togiak River between the fishing district and the counting tower and as a result, ADF&G added 36 hours to the weekly fishing schedule in the Togiak Section in an effort to control escapement.

During the week of July 15, escapement counts at the tower increased to near record, which confirmed the aerial survey assessment of the previous week (Table 17). On July 18, escapement was projected to be between the midpoint and upper bound of the escapement goal range, and the weekly schedule was again extended for the maximum 48 hours. By July 25, daily escapements on the Togiak River continued to increase and total escapement was projected to be above the upper bound escapement goal range. The fishing schedule was extended for the maximum allowable time of 48 hours each week until August 12, when fishing effort and sockeye salmon catches declined and coho salmon catches began to pick up. Because there was interest in coho salmon fishing after sockeye salmon harvest dropped off, fishing continued according to the regular weekly schedule until the last processor stopped buying fish on August 30.

Commercial harvest of nonsockeye salmon species in the Togiak District was 262,952 fish in 2019, or about 21% of the total (Table 20). The commercial Chinook salmon harvest of 3,568 represented only 62% of the 20-year average (1999–2018), and the chum salmon harvest of 227,731 was 145% of the 20-year average (1999–2018; Appendices A4 and A5). Pink salmon harvest was 3,875, representing 6% of the 20-year average (1999–2018), but this low number was expected as pink salmon are primarily even-year returners in the Togiak District (Appendix A6). Coho salmon harvest was 27,778, which was over twice the 20-year average (1999–2018) of 12,916 (Appendix A7).

In 2019, approximately 74% of the sockeye salmon return to the Togiak District were harvested, compared to the 20-year average harvest rate of 71% (Appendix A18). Peak catch occurred on July 20 with a harvest of 66,612 fish (Table 20). Peak escapement occurred on July 25 when 29,748 sockeye salmon passed the counting tower (Table 17). Peak effort occurred on July 31 when 115 permits delivered fish. There were 3 processors registered to purchase fish in the Togiak District in 2019 (Table 4).

2019 BRISTOL BAY HERRING FISHERY

The Bristol Bay area includes all waters south of a line extending west from Cape Newenham, east of the International Date Line in the Bering Sea, and north of a line extending west from Cape Menshikof. The Bristol Bay area is divided into 3 herring fishing districts: the Bay District, including all waters east of the longitude of Cape Constantine; the Togiak District, including all waters between the longitude of Cape Newenham and the longitude of Cape Constantine; and the General District, including all waters west of the longitude of Cape Newenham. Togiak District spans approximately 192 kilometers (Figure 3). Togiak village lies at the center of the district, 108 kilometers west of Dillingham.

Pacific herring (*Clupea pallasii*) have been documented throughout Bristol Bay, but a large concentration returns to the Togiak area each spring to spawn and is the focus of herring sac roe and spawn-on-kelp fisheries. In the Togiak District, herring are commercially harvested for sac roe using gillnets and purse seines, whereas herring spawn on rockweed kelp (*Fucus* spp.) is harvested by hand.

The herring sac roe fishery began in the Togiak District in 1967, followed by the first fishery for spawn on kelp in 1968. Effort and harvest levels remained low for the first 10 years of the fishery. Increased interest, favorable market conditions, and additional incentives provided by the Fishery Conservation and Management Act of 1976 (later becoming the Magnusson-Stevens Act) resulted in a rapid expansion of the Togiak herring fishery in 1977.

The Togiak herring fishery is the largest in Alaska. From 1999 to 2018, sac roe harvests averaged 21,961 tons, worth an average of $2.8 million annually (Appendices B2 and B5). Given the volatile nature of the herring sac roe market, historic harvests and value are of limited utility when contemplating future harvest or value. In 2019, sac roe harvests brought $1.7 million to permit holders, below the most recent 10-year average of $2.4 million (Appendix B5). This value represents the grounds price and does not necessarily include postseason adjustments. No spawn-on-kelp fishery has occurred since 2003.

STOCK ASSESSMENT

Since 1978, ADF&G has conducted aerial surveys throughout the herring spawning migration to estimate abundance, timing, and distribution of Pacific herring in the Togiak District. Surveys are conducted after there is a reasonable expectation that herring might be present in the Togiak area. Surveys occur several times a week after threshold biomass has been documented. Surveys are performed as weather, pilot availability, and funding allow.

Fundamental aerial survey techniques used in Togiak have remained largely unchanged since 1978 and are described in Lebida and Whitmore (1985). Herring school surface area is estimated through a handheld tube with a measured grid and a known focal length from a known altitude. Standard conversion factors of 1.52 tons (water depths of 16 ft or less), 2.58 tons (water depths 16–26 ft), and 2.83 tons (water depths greater than 26 ft) per 538 ft^2 of surface area are applied to herring school surface areas to estimate the total biomass observed during each flight. Over the last 10 years, ADF&G has transitioned to aerial survey data collection methods that use Geographic Information Systems (GIS), allowing real-time data entry and analysis. The new GIS-based program, among other improvements, allows observers to use the survey aircraft to estimate length and width dimensions of very large herring schools, providing a more objective and reliable estimate.

Herring ages 2–20 have been observed in the Togiak District, but herring are generally considered to begin recruiting into the fishery at age 4 and to be fully recruited at age 9. Herring abundance is related to year class survival and is strongly driven by large recruitment events that occur approximately every 8–10 years.

SAC ROE HERRING FISHERY OVERVIEW

Fishing and Industry Participation

Unlike most herring fisheries in Alaska, the Togiak sac roe fishery is not a limited entry fishery. Gillnets, purse seines, and hand purse seines are legal gear. Because fishing effort is not limited,

effort levels can vary substantially from year to year. Herring market conditions are one of the leading factors influencing effort each year, but other factors also influence fleet size. Because most herring permit holders in Togiak participate in other fisheries, like Bristol Bay salmon, the health of the salmon market and markets for other fish indirectly affect effort in the herring fishery. Herring prices paid to permit holders the prior year and run timing also affect effort. For over a decade, processors have utilized cooperative fleets for the purse seine fishery. Under limited markets, processors choose the makeup of their fishing fleets to maximize their efficiency, thereby influencing the number of participants.

Fishing effort in the sac roe fishery increased through the late 1980s, decreased early in the 1990s, increased again to a peak in 1996, and has generally declined since that time (Appendix B1). Since 1994, gillnet effort increased from 146 vessels to a peak of 461 in 1996, followed by a general decline to an all-time low of 1 in 2018 (Appendix B1). Purse seine participation fluctuated between 100 and 300 vessels from 1994 to 1998, before declining to an all-time low of 16 vessels in 2012 (Appendix B1). The 2019 participation of 19 purse seine vessels was down from 20 in 2018. In 2019, gillnet participation increased from 1 vessel in 2018 to 3 in 2019 (Appendix B1).

Industry participation in the fishery peaked between 1979 and 1982, when 33 processors participated in the herring fishery. From 1994 through 1997, between 16 and 22 companies have purchased herring from Togiak. Since 1998, industry participation has steadily declined to a low of 4 companies in 2012 and 2015 to present (Appendix B1). In 2019, processor participation involved 4 companies (Table 21). Processing capacity on the grounds has also declined from a high of 4,850 tons per day in 1996 to a low of 1,420 tons per day in 2007. Capacity was 2,100 tons per day in 2019 (Appendix B1).

2019 SEASON SUMMARY

Togiak District aerial surveys began April 7, 2019. ADF&G staff observed fish in the district for the first time on April 16, although fish were previously reported on the grounds April 13. Survey ratings were above average for most of the season and significantly better than the previous 3 seasons (Appendix B4). Fish behavior, however, was atypical—herring stayed offshore and deep instead of moving into the shallows of Togiak and Kulukak Bays. In general, ADF&G staff were able to get good biomass estimates from aerial surveys; the peak estimate was on April 26 (Table 22).

COMMERCIAL FISHERY

Togiak District herring fisheries are managed in accordance with the *Bristol Bay Herring Management Plan* (5 AAC 27.865), which specifies a maximum allowable exploitation rate of 20% and allocates the harvestable surplus among all the fisheries harvesting the Togiak herring stock. The 2019 preseason biomass forecast was 217,548 tons (Appendix B4) with an exploitation rate of 14% (30,457 tons) due to 3 consecutive years of poor aerial surveys and the associated uncertainty. The projected harvest guideline for each fishery was as follows: 1,500 tons of herring equivalent or 350,000 pounds of product for the spawn-on-kelp fishery; 2,027 tons for the Dutch Harbor food and bait fishery; and the remaining 26,930 tons for the sac roe fishery. The management plan further specifies that ADF&G will manage the sac roe fishery so that 80% of the harvest is taken by purse seine (21,544 tons in 2019) and 20% of the harvest is taken by gillnet (5,386 tons in 2019). This 80/20 split reflects a change made by the BOF in 2018; the previous allocation was 70% of the harvest for purse seine and 30% of the harvest for gillnet. Additionally,

there is a provision to allow 50% of the unharvested spawn-on-kelp and gillnet quotas to be reallocated. This allowed for a potential purse seine quota of 24,800 tons in 2019 (Appendix B6).

The *Bristol Bay Herring Management Plan* and other regulations direct ADF&G to conduct an orderly, manageable fishery, strive for the highest level of product value, and minimize waste. For at least the past decade, the seine fleet has been composed of processor-organized cooperatives. During the 2019 season, management staff allowed long duration purse seine openings across a large area of the district and let processors limit harvest for their individual fleets based on processing capacity.

ADF&G staff took a poll of processing companies prior to the 2019 season to assess processing capacity and to inquire about additional concerns or issues. The poll indicated that 4 companies intended to participate in the 2019 Togiak herring fishery (Table 21). One company indicated they planned to buy both gillnet and purse seine fish and 3 companies planned to buy only purse seine fish. The processing capacity for 2019 was estimated to be 2,375 tons per day.

Purse Seine

The Togiak purse seine fishery opened until further notice at 5:00 PM on April 16 (Table 23) and harvested 1,310 tons on the first day of fishing. Weather conditions were better than in previous years and fishing was able to proceed at a fast pace. Roe recovery started at 11.4% on April 16, peaked at 12.2% (on April 22), and ended with an overall average of 11.8% at the end of the season. Fish size decreased over the course of the season starting at 421 grams on April 16 and dropping to 301 grams on April 26, the last day of fishing. The average fish size for the season was 348 grams, higher than the preseason forecast of 318 grams. April 22 was the only day this season when inclement weather significantly reduced purse seine fishing effort. Harvest on that day was 350 tons. Harvest was generally steady all season, though it fluctuated with capacity. Harvest peaked on April 23 at 4,430 tons. On April 24, ADF&G announced the reallocation of both the spawn-on-kelp and gillnet quota, bringing the purse seine quota up to 24,800 tons. Fishing continued at a strong pace and by the morning of April 26, management staff felt there was sufficient capacity and opportunity to harvest the quota by 1:00 PM that day. ADF&G announced at 9:00 AM on April 26 that the fishery would close at 1:00 PM that afternoon and that all sets needed to be completely pumped by 5:00 PM that evening. Reported harvest on April 26 was 750 tons, bringing the cumulative harvest to 23,060 tons. With 1,660 tons of documented deadloss, this brought the total purse seine harvest to 24,720 tons. This represented 99.7% of the quota and there was no need to reopen the fishery. Purse seine participation was 19 vessels, down from 20 in 2018. The 23,060-ton harvest is a record for the purse seine fishery, exceeding the previous record of 22,853 tons set in 1994.

Gillnet

The Togiak herring gillnet fishery opened until further notice at 8:00 AM April 18. The gillnet opening was later than the purse seine opening due to the lack of gillnetters present on April 16. The first gillnet harvest was reported on April 23; all harvest information is confidential due to only 1 processor and 3 gillnetters participating in the fishery. The last gillnet harvest was reported on May 3. Although fish were present in the open gillnet area, they remained offshore and in deeper water than usual, making them difficult for the gillnet fleet to find and fish effectively. Weather also hampered fishing from April 28 until May 2.

Spawn-on-Kelp

No companies registered to buy herring spawn-on-kelp in 2019; therefore, there were no openings and no commercial harvest.

AGE COMPOSITION

A total of 4,150 herring were sampled over the course of the fishery from the commercial harvest to (1) determine age composition of the harvest, (2) estimate the age composition of the biomass, (3) determine the size at age of herring in this year's spawning biomass, and (4) provide data for next year's forecast. Scale data showed 64% of the herring in the 2019 harvest were age 7 or younger, 20% were age 8 or age 9, and 16% were age 10 or older. Mean weight of herring was 406 grams in the gillnet harvest, and 326 grams in the purse seine harvest. The 2019 spawning biomass was younger than is typical; 24.2% of the biomass was age 5 and younger. Between 2009 and 2018, the median age of the Togiak herring biomass was between age 7 and age 8. The 2019 spawning biomass was 51.7% age-6 through age-8 herring, and 24.0% age-9 and older herring (Appendix B3). This biomass is considered healthy and stable.

EXPLOITATION

The 2019 Togiak herring fisheries were managed for a maximum exploitation rate of 14% of the preseason biomass estimate. Purse seine harvest, including deadloss, was 23,542 tons, the average roe content was 11.8%, and the average reported weight was 348 grams. Gillnet harvest is confidential. The Dutch Harbor food and bait fishery harvested 1,805 tons. The 2019 exploitation rate is 11.7% based on the preseason biomass estimate of 217,548 tons (Appendix B2).

ACKNOWLEDGEMENTS

In 2019, ADF&G Bristol Bay commercial fishery management activities were funded by a combination of State of Alaska general funds and stakeholder support via the Bristol Bay Fisheries Collaborative (BBFC; www.bbsri.org/bbfc). We would like to thank the organizers of the BBFC (Michael Link and Jeff Regnart) and financial contributors Bristol Bay Science and Research Institute, Bristol Bay Regional Seafood Development Association, Bristol Bay Native Corporation, Bristol Bay Borough, Lake and Peninsula Borough, City of Egegik, Ugashik Traditional Village Council, Levelock Village Council, Curyung Tribal Council, Kvichak Setnetters Association, individual set- and driftnet commercial fishery participants, Alaska Marine Lines, American President Lines, Alaska General Seafoods, Big Creek Fisheries, Copper River Seafoods, E&E Seafoods, Ekuk Fisheries, Icicle Seafoods, Leader Creek Fisheries, North Pacific Seafoods, Ocean Beauty Seafoods, Peter Pan Seafoods, Silver Bay Seafoods, Trident Seafoods, Delta Western Petroleum, and Air Cargo. Without the financial support of BBFC, ADF&G's ability to manage the 2019 Bristol Bay salmon run would have been greatly reduced and resulted in significant forgone harvest in 2019 and in future years. The authors gratefully acknowledge the ADF&G Divisions of Commercial Fisheries and Subsistence staff of the Dillingham, King Salmon, and Anchorage offices for their contributions to this report.

ADF&G would also like to thank the BBFC for committing to fund Togiak herring fishery monitoring activities in 2019. Although BBFC funding was not used, their commitment allowed ADF&G to continue a monitoring program essential to the understanding of Togiak herring.

ADF&G would like to thank the processors for allowing us to collect herring samples from their 2019 commercial harvest. The biological data collected in our herring sampling program allows ADF&G to produce biomass estimates, which are the basis of sustainable management.

Below is a list of ADF&G employees and outside contributors that the authors would like to thank for their services during salmon and herring fishery operations in the 2019 season.

Division of Commercial Fisheries

Permanent Employees

Dillingham: Tim Sands, Nushagak and Togiak Biologist; Phil Carpenter, Facilities and Equipment Maintenance; and Karen Brito, Program Technician.

King Salmon: April Burnett, Program Technician.

Anchorage: Travis Elison, Naknek-Kvichak Biologist; Paul Salomone and Aaron Tiernan, Egegik and Ugashik Biologists; Jordan Head, Assistant Nushagak and Togiak Biologist; Greg Buck, Area Research Biologist; Stacy Vega, Research Biologist; Art Nelson, Information Officer; Tami Matheny, Program Technician; Shannon Royse, Publication Specialist; Jack Erickson, Regional Research Coordinator; and Aaron Poetter, Regional Management Coordinator.

Port Moller: Erin Baker, Reid Johnson, and Bob Murphy.

Seasonal Employees

WEST SIDE: Mariel Terry, Field Camp Coordinator; Cody Miller, Office Staff; Wood River tower: Anthony Reynolds, Betty Kostenborder, and Ray Nichols; Igushik River Tower: Justin Dye, Jesse Noden, and Walter Reynolds; Togiak River Tower: Kristine Post, Gillean Middelstadt, and Timothy Kennedy; Nushagak Sonar: Konrad Middelstadt, Tyler Henegan, Cole Deal, Eve Jakabosky, Corina Torgeson, and Tyler Henegan.

EAST SIDE: Mary Emery, Seafood Industry Coordinator/Office Manager; Rob Regnart, Field Camp Coordinator; Sam Decker, Inriver Test Fishery Project Leader; Cathy Tilly, Scale Reader; Diana Merlino, Scale Reader; Elise Donaghy, District Test Fishery Observer; Naknek River tower: Jacob Newbold, Hannah Shuman, and E. Lotsey; Kvichak River test fishery: Emory Cole and Neccia Porter; Egegik River test fishery: Sihaya Meijer and Kris Loeppky; Ugashik River test fishery: Morgan MacConnell and Wenona Stafford; Kvichak River tower: Dustin Capik, Meaghan Faneuf, and Anthony Vrolyk; Ugashik River tower: Kevin Sailors, Courtney Owen, and Oguzhan Bal; Egegik River tower: Parker Stone, Travis Brase, and Donald Graydanus. Alagnak River Tower: Tyler Flowers, Steve Kershner, and Walter Olazabal; Catch samplers: Daniel Scarbrough, Helen Wonhola, Marcus Chavez, and Joanna Andrew.

Gene Conservation Laboratory

Tyler Dann, Project Geneticist; Heather Hoyt, Laboratory Supervisor; Paul Kuriscak, Erica Chenoweth, Zac Grauvogel, Mariel Terry, and Zach Pechacek, Genotypers; Andy Barclay, Nick Ellickson, and Marie Filteau, Sample Coordinators and DNA Extractors; Eric Lardizabal, Analyst Programmer; Judy Berger, Field Coordinator and Tissue Archivist; and Chris Habicht, Program Leader.

Non-ADF&G contributors

Port Moller test fishery: Michael Link, manager; and Dr. Scott Raborn, analyst. ADF&G vessel crew, R/V *Pandalus*: Ted Jewel (skipper), Dave Knight, and Charlie Schollenbergh; BBSRI vessel technicians: John Hill and Dirk Middleton. Shore support: Trevor Milich and Gary Johnson, Peter Pan Seafoods.

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TABLES AND FIGURES

Table 1.–Comparison of inshore sockeye salmon forecast versus actual run, escapement goals versus actual escapements, and projected versus actual commercial catch, by river system and district, in thousands of fish, Bristol Bay, 2019.

	Inshore run			Escapement		Inshore catch		
District and river system[a]	Forecast[b]	Actual	Percent deviation[c]	Range	Actual	Projected harvest[b]	Actual	Percent deviation[c]
NAKNEK-KVICHAK DISTRICT								
Kvichak River	6,690	7,499	12	2,000–10,000	2,371	2,690	5,127	91
Alagnak River	3,820	1,777	-53	210 minimum	820	1,540	949	-38
Naknek River	5,010	8,362	67	800–2,000	2,911	3,610	5,451	51
Total	15,520	17,638	14	3,010–12,320	6,102	7,840	11,527	47
EGEGIK DISTRICT	8,740	17,023	95	800–2,000	2,340	7,040	14,683	109
UGASHIK DISTRICT	3,330	2,584	-22	500–1,400	1,547	2,380	1,037	-56
NUSHAGAK DISTRICT								
Wood River	4,450	12,197	174	700–1,800	2,073	3,470	10,123	42
Igushik River	1,520	1,342	-12	150–400	256	1,250	1,086	-26
Nushagak-Mulchatna	4,020	4,255	6	370–900	709	3,260	3,546	28
Total	9,990	17,794	78	1,220–3,100	3,038	7,980	14,755	85
TOGIAK DISTRICT	1,100	1,370	25	120–270	352	870	1,018	17
TOTAL BRISTOL BAY[d]	38,680	56,409	46	5,650–19,090	13,379	26,110	43,020	65

[a] The Bristol Bay inshore forecast does not include several minor river systems, including the Snake River drainage in Nushagak District, and the Kulukak, Osviak, Matogak, and Slug River systems in Togiak District. Catches, escapements, and total runs for these smaller systems are not included in this table so that forecast efficacy may be gauged. Totals may not equal column sums due to rounding.

[b] Does not include South Peninsula projected harvest.

[c] Percent deviation = [(Actual – Forecast) / Forecast] × 100.

[d] Total may not equal sum of all districts due to rounding.

Table 2.–Forecast of sockeye salmon returns by age class, river system and district, in thousands of fish, Bristol Bay, 2019.

	Age-.2			Age-.3			
District and river system	1.2 (2015)	2.2 (2014)	Total	1.3 (2014)	2.3 (2013)	Total	Total
NAKNEK-KVICHAK DISTRICT							
Kvichak River	2,950	1,080	4,030	2,870	50	2,920	6,950
Alagnak River	1,880	190	2,070	1,880	20	1,900	3,970
Naknek River	2,180	580	2,760	2,000	450	2,450	5,210
Total	7,010	1,850	8,860	6,750	520	7,270	16,130
EGEGIK DISTRICT	2,510	3,040	5,550	1,810	1,720	3,530	9,080
UGASHIK DISTRICT	1,310	330	1,640	1,720	100	1,820	3,460
NUSHAGAK DISTRICT							
Wood River	2,410	230	2,640	1,940	40	1,980	12,310
Igushik River	620	10	630	940	10	950	2,130
Nushagak River[a]	1,120	20	1,140	2,950	20	2,970	4,110
Total	4,140	260	4,400	5,830	70	5,900	21,790
TOGIAK DISTRICT[b]	180	10	190	950	10	960	1,150
TOTAL BRISTOL BAY[c,d]							
Number	15,160	5,490	20,650	17,050	2,420	19,470	40,180
Percent	38%	14%	51%	42%	6%	48%	100%

[a] Nushagak River forecast total includes minor contributions from age-0.3 and age-1.4 fish.

[b] Several smaller river systems not forecast. These systems contribute approximately 50,000 sockeye salmon to Togiak District harvest each year.

[c] Sockeye salmon of several minor age classes are expected to contribute an additional 1–2% to the total return.

[d] Total may not equal some of all districts due to rounding.

Table 3.–Mean round weight, price per pound, and total exvessel value of the commercial salmon catch by species, Bristol Bay, 2019.

Species	Total catch (lb)	Mean weight (lb)	Mean price ($/lb)	Exvessel value ($)
Sockeye	222,876,515	5.2	1.35	300,883,295
Chinook	385,691	11.6	0.50	192,846
Chum	8,632,648	6.2	0.25	2,158,162
Pink	22,121	3.2	0.05	1,106
Coho	485,927	6.0	0.55	267,260
Total	232,402,902			303,502,669

Table 4.–Commercial salmon processors and buyers operating in Bristol Bay, 2019.

	Name of operator/buyer	Base of operations	District[a]	Type[b]	Export
1	Alaska's Best Seafood, LLC.	Dillingham, AK	N	EF, F, RE	AIR, SEA
2	Alaska General Seafoods	Kenmore, WA	K, E, N	C, EF, F, RE	AIR, SEA
3	Anthony Wood	King Salmon, AK	K	EF, F	AIR, SEA
4	Big Creek Fisheries	Everett, WA	E, U	EF, F	AIR, SEA
5	Cape Greig	Seattle, WA	U	F	SEA
6	Coffee Point Seafoods	Seattle, WA	E	EF, F, RE	AIR, SEA
7	Copper River Seafoods	Anchorage, AK	E, K, N, U	EF, F, RE	AIR, SEA
8	Diamond O Fish House	Wasilla, AK	K	F	AIR
9	Ekuk Fisheries LLC.	Seattle, WA	N	F	SEA
10	Kevin Cossart	Bonners Ferry, ID	K	EF	AIR
11	Kristene Stanford	Wasilla, AK	N	EF	AIR
12	Friedman Family Fisheries	Baltimore, MD	N	F	SEA
13	I Choose Wild	Palm Springs, CA	K		AIR
14	Icicle Seafoods	Seattle, WA	E, K, N, U	C, EF, F, RE	AIR, SEA
15	JoJo's Wild Alaska Salmon LLC.	Chugiak, AK	N	F, EF, RE	AIR
16	Just Wild Salmon	College Place, WA	N	F	SEA
17	Leader Creek Fisheries	Seattle, WA	E, K, N, U	F, RE, S	SEA
18	Nakeen Homepack	King Salmon, AK	K	F	SEA
19	North Pacific Seafoods (Togiak Fisheries)	Seattle, WA	T	F	SEA
20	North Pacific Seafoods (Red Salmon Cannery)	Seattle, WA	E, K, N	F, EF	SEA
21	North Pacific Seafoods (Pederson Point)	Seattle, WA	K	F	SEA
22	Ocean Beauty Seafoods	Seattle, WA	E, K, N, U	EF, F, RE	AIR, SEA
23	Peter Pan Seafoods	Seattle, WA	E, K, N, T, U	EF, F, RE, S	AIR, SEA
24	Salmon Slayer/Matt Beck	Gunnison, CO	N	EF, S	AIR
25	Small Boat Salmon	Anchorage, AK	N	EF	AIR
26	Silver Bay Seafoods	Sitka, AK	E, K, N, T, U	F	AIR, SEA
27	Sunrise Salmon	Fergus Falls, MN	K	F	AIR
28	Terpening Fishing LLC	Homer, AK	U	F	AIR
29	Trident Seafoods	Seattle, WA	E, K, N, U	C, F, EF	AIR, SEA
30	Tulchina Fisheries	Naknek, AK	K	EF, F	AIR
31	Two If By Seafoods	Issaquah, WA	K	F	AIR
32	F/V King Louie Victor Popa	Fallbrook, CA	E	F	SEA
33	Wild Alaska Salmon and Seafood	King Salmon, AK	N	EF, F	AIR, SEA
34	Wild Premium Salmon	Raymond, WA	E	EF, F	AIR
35	Willbros Salmo Co.	Ruidoso, NM	K	F	AIR

[a] E = Egegik, K = Naknek-Kvichak, N = Nushagak, T = Togiak, U = Ugashik.

[b] Type of processing: C = canned, EF = export fresh, F = frozen, RE = roe extraction, S = cured.

Table 5.–Commercial salmon catch by district, river, and species, in number of fish, Bristol Bay, 2019.

District and river system		Sockeye	Chinook	Chum	Pink	Coho	Total
NAKNEK-KVICHAK DISTRICT							
Kvichak River		5,127,785					5,127,785
Alagnak River		949,010					949,010
Naknek River		5,451,043					5,451,043
	Total	11,527,837	2,743	134,517	530	1,418	11,667,045
EGEGIK DISTRICT		14,683,614	3,344	156,260	221	21,139	14,864,578
UGASHIK DISTRICT		1,037,030	2,062	20,249	183	550	1,060,074
NUSHAGAK DISTRICT							
Wood River		10,123,569					10,123,569
Igushik River		1,086,029					1,086,029
Nushagak River		3,546,307					3,546,307
	Total	14,755,905	21,509	855,428	2,021	33,018	15,667,881
TOGIAK DISTRICT		1,018,644	3,568	227,731	3,875	27,778	1,281,596
TOTAL BRISTOL BAY	Total	43,023,030	33,226	1,394,185	6,830	83,903	44,541,174

Note: Species other than sockeye salmon are not apportioned to individual rivers.

Table 6.–Daily and cumulative escapement estimates by salmon species, Nushagak River sonar project, Bristol Bay, 2019.

	Sockeye		Chinook		Chum		Coho	
Date	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative
6/6	270	270	208	208	26	26	0	0
6/7	543	813	388	596	41	67	0	0
6/8	323	1,136	108	704	7	74	0	0
6/9	490	1,626	213	917	17	91	0	0
6/10	794	2,420	291	1,208	109	200	0	0
6/11	746	3,166	252	1,460	82	282	0	0
6/12	805	3,971	227	1,687	84	366	0	0
6/13	1,138	5,109	1,279	2,966	366	732	0	0
6/14	1,689	6,798	1,362	4,328	596	1,328	0	0
6/15	2,978	9,776	2,919	7,247	1,447	2,775	0	0
6/16	4,463	14,239	4,175	11,422	7,898	10,673	0	0
6/17	6,460	20,699	1,076	12,498	3,475	14,148	0	0
6/18	5,366	26,065	317	12,815	1,565	15,713	0	0
6/19	10,034	36,099	878	13,693	4,186	19,899	0	0
6/20	31,703	67,802	4,713	18,406	10,343	30,242	0	0
6/21	35,002	102,804	3,881	22,287	22,293	52,535	0	0
6/22	13,673	116,477	2,001	24,288	7,570	60,105	0	0
6/23	16,353	132,830	1,950	26,238	13,480	73,585	0	0
6/24	13,278	146,108	2,066	28,304	11,503	85,088	0	0
6/25	23,219	169,327	1,623	29,927	26,188	111,276	0	0
6/26	16,591	185,918	1,094	31,021	12,717	123,993	0	0
6/27	10,516	196,434	397	31,418	9,529	133,522	0	0
6/28	16,150	212,584	1,209	32,627	3,185	136,707	0	0
6/29	30,566	243,150	856	33,483	14,418	151,125	0	0
6/30	65,393	308,543	1,787	35,270	32,510	183,635	0	0
7/1	71,161	379,704	1,075	36,345	16,246	199,881	0	0
7/2	25,380	405,084	792	37,137	28,593	228,474	0	0
7/3	23,523	428,607	46	37,183	20,371	248,845	0	0
7/4	21,509	450,116	362	37,545	19,721	268,566	0	0
7/5	11,539	461,655	778	38,323	14,230	282,796	0	0
7/6	12,517	474,172	339	38,662	16,268	299,064	0	0
7/7	9,333	483,505	1,087	39,749	15,177	314,241	0	0
7/8	21,318	504,823	91	39,840	10,385	324,626	0	0
7/9	20,376	525,199	22	39,862	13,364	337,990	0	0
7/10	28,900	554,099	74	39,936	21,972	359,962	0	0
7/11	23,547	577,646	749	40,685	12,328	372,290	0	0
7/12	19,555	597,201	0	40,685	16,981	389,271	0	0
7/13	17,210	614,411	47	40,732	8,405	397,676	0	0
7/14	16,064	630,475	0	40,732	11,476	409,152	0	0
7/15	6,236	636,711	772	41,504	20,760	429,912	0	0

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Table 6.–Page 2 of 2.

	Sockeye		Chinook		Chum		Coho	
Date	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative
7/16	3,410	640,121	0	41,504	20,835	450,747	0	0
7/17	12,772	652,893	1,526	43,030	19,990	470,737	116	116
7/18	11,359	664,252	325	43,355	18,622	489,359	0	116
7/19	7,191	671,443	269	43,624	10,342	499,701	0	116
7/20	4,076	675,519	0	43,624	14,638	514,339	0	116
7/21	3,749	679,268	0	43,624	19,277	533,616	530	646
7/22	8,890	688,158	0	43,624	15,105	548,721	551	1,197
7/23	5,520	693,678	0	43,624	10,603	559,324	221	1,418
7/24	2,002	695,680	140	43,764	5,301	564,625	1,095	2,513
7/25	88	695,768	231	43,995	10,076	574,701	288	2,801
7/26	253	696,021	195	44,190	9,646	584,347	243	3,044
7/27	612	696,633	101	44,291	7,402	591,749	543	3,587
7/28	379	697,012	37	44,328	5,134	596,883	476	4,063
7/29	176	697,188	42	44,370	3,689	600,572	521	4,584
7/30	182	697,370	64	44,434	3,799	604,371	125	4,709
7/31	176	697,546	0	44,434	2,917	607,288	153	4,862
8/1	187	697,733	0	44,434	2,048	609,336	220	5,082
8/2	444	698,177	0	44,434	2,959	612,295	575	5,657
8/3	510	698,687	0	44,434	7,948	620,243	2,204	7,861
8/4	544	699,231	810	45,244	6,101	626,344	3,474	11,335
8/5	346	699,577	531	45,775	4,036	630,380	2,354	13,689
8/6	400	699,977	396	46,171	4,481	634,861	2,493	16,182
8/7	406	700,383	592	46,763	3,858	638,719	5,128	21,310
8/8	2,072	702,455	0	46,763	1,225	639,944	3,359	24,669
8/9	1,506	703,961	0	46,763	1,129	641,073	1,307	25,976
8/10	830	704,791	0	46,763	748	641,821	792	26,768
8/11	658	705,449	0	46,763	875	642,696	754	27,522
8/12	670	706,119	0	46,763	1,060	643,756	1,016	28,538
8/13	558	706,677	0	46,763	603	644,359	585	29,123
8/14	1,274	707,951	0	46,763	2,324	646,683	1,910	31,033
8/15	750	708,701	0	46,763	2,615	649,298	11,471	42,504
8/16	370	709,071	0	46,763	1,141	650,439	5,689	48,193
8/17	278	709,349	0	46,763	725	651,164	3,659	51,852

Table 7.–Daily sockeye salmon escapement tower counts by river system, east side Bristol Bay, 2019.

	Kvichak River		Naknek River		Alagnak River		Egegik River		Ugashik River	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/17							78	78		
6/18							4,020	4,098		
6/19							11,148	15,246		
6/20							4,746	19,992		
6/21			804	804			7,044	27,036		
6/22	126	126	4,944	5,748			23,286	50,322		
6/23	108	234	50,214	55,962			10,662	60,984		
6/24	66	300	36,456	92,418			29,508	90,492		
6/25	1,092	1,392	48,732	141,150	780	780	86,280	176,772		
6/26	5,544	6,936	17,094	158,244	840	1,914	102,432	279,204		
6/27	3,144	10,080	52,860	211,104	546	2,166	83,754	362,958	126	126
6/28	1,062	11,142	41,136	252,240	756	2,922	22,302	385,260	930	1,056
6/29	354	11,496	46,080	298,320	816	3,738	32,430	417,690	2,898	3,954
6/30	576	12,072	115,746	414,066	1,290	5,028	52,428	470,118	2,100	6,054
7/1	6,924	18,996	83,964	498,030	3,054	8,082	37,902	508,020	1,890	7,944
7/2	9,786	28,782	57,444	555,474	3,534	11,616	40,326	548,346	3,984	11,928
7/3	5,142	33,924	58,584	614,058	3,528	15,144	76,314	624,660	5,472	17,400
7/4	8,172	42,096	104,436	718,494	2,340	17,484	43,230	667,890	4,170	21,570
7/5	6,048	48,144	68,274	786,768	3,204	20,688	66,060	733,950	4,920	26,490
7/6	12,348	60,492	83,514	870,282	3,804	24,492	60,216	794,166	7,116	33,606
7/7	11,058	71,550	140,076	1,010,358	6,168	30,660	121,824	915,990	6,018	39,624
7/8	34,722	106,272	148,242	1,158,600	20,466	51,126	108,810	1,024,800	4,644	44,268
7/9	245,106	351,378	118,428	1,277,028	31,296	82,422	101,160	1,125,960	9,432	53,700
7/10	245,670	597,048	138,282	1,415,310	33,762	116,184	78,768	1,204,728	12,576	66,276
7/11	146,640	743,688	285,180	1,700,490	38,262	154,446	203,424	1,408,152	15,708	81,984
7/12	151,914	895,602	180,900	1,881,390	62,796	217,242	215,760	1,623,912	10,482	92,466
7/13	190,254	1,085,856	110,058	1,991,448	81,294	298,536	172,344	1,796,256	7,914	100,380
7/14	141,180	1,227,036	121,530	2,112,978	44,376	342,912	82,134	1,878,390	7,908	108,288
7/15	74,154	1,301,190	112,080	2,225,058	31,158	374,070	77,802	1,956,192	4,740	113,028
7/16	24,534	1,325,724	119,652	2,344,710	24,132	398,202	78,498	2,034,690	6,726	119,754
7/17	94,164	1,419,888	170,106	2,514,816	68,874	467,076	81,546	2,116,236	20,850	140,604
7/18	194,976	1,614,864	118,884	2,633,700	84,084	551,160	61,236	2,177,472	36,042	176,646
7/19	226,020	1,840,884	123,546	2,757,246	94,656	645,816	60,840	2,238,312	47,100	223,746
7/20	219,762	2,060,646	78,714	2,835,960	89,346	735,162	40,464	2,278,776	126,450	350,196
7/21	188,196	2,248,842	37,560	2,873,520	37,122	772,284	20,490	2,299,266	239,862	590,058
7/22	78,252	2,327,094	19,884	2,893,404	25,254	797,538	19,020	2,318,286	295,230	885,288
7/23	24,144	2,351,238	18,066	2,911,470	12,552	810,090	21,924	2,340,210	409,644	1,294,932
7/24	9,144	2,360,382			10,368	820,458			138,192	1,433,124
7/25	10,860	2,371,242							61,572	1,494,696
7/26									29,226	1,523,922
7/27									15,384	1,539,306
7/28									8,442	1,547,748

Note: Blank cells represent days with no data.

Table 8.–Commercial and subsistence fishing emergency orders, by period, district and statistical area, Bristol Bay eastside, 2019.

Number	Start date	Start time		End date	End time	Effective time
Naknek/Kvichak District						
Driftnet						
AKN.16	24-Jun	6:30 PM	to	25-Jun	2:00 AM	7.5 hours
AKN.16	25-Jun	6:00 AM	to	25-Jun	3:00 PM	9.0 hours
AKN.19	25-Jun	7:30 PM	to	26-Jun	3:00 AM	7.5 hours
AKN.19	26-Jun	6:30 AM	to	26-Jun	3:30 PM	9.0 hours
AKN.22	26-Jun	8:00 PM	to	27-Jun	3:30 PM	19.5 hours
AKN.24	27-Jun	9:00 PM	to	28-Jun	4:00 PM	19.0 hours
AKN.29	29-Jun	10:30 PM	to	30-Jun	5:00 PM	18.5 hours
AKN.32	30-Jun	11:00 PM	to	1-Jul	5:30 PM	18.5 hours
AKN.34	2-Jul	12:00 AM	to	2-Jul	6:00 PM	18.0 hours
AKN.62	13-Jul	9:30 AM	to	13-Jul	5:00 PM	7.5 hours
AKN.72	19-Jul	3:00 AM	to	19-Jul	11:30 AM	8.5 hours
AKN.74	20-Jul	4:00 PM	to	20-Jul	10:30 PM	6.5 hours
AKN.76	21-Jul	4:30 PM	to	5-Aug	9:00 AM	350.5 hours[a]
Setnet						
AKN.01	1-Jun	9:00 AM	to	21-Jun	9:00 AM	
AKN.15	24-Jun	5:30 AM	to	24-Jun	2:30 PM	9.0 hours
AKN.16	24-Jun	6:30 PM	to	25-Jun	2:00 AM	7.5 hours
AKN.16	25-Jun	6:00 AM	to	25-Jun	3:00 PM	9.0 hours
AKN.18	24-Jun	2:30 PM	to	25-Jun	3:00 PM	24.5 hours[b]
AKN.19	25-Jun	3:00 PM	to	26-Jun	3:30 PM	24.5 hours[b]
AKN.22	26-Jun	3:30 PM	to	27-Jun	3:30 PM	24.0 hours[b]
AKN.24	27-Jun	3:30 PM	to	28-Jun	4:00 PM	24.5 hours[b]
AKN.32	30-Jun	5:00 PM	to	1-Jul	5:30 PM	24.5 hours[b]
AKN.34	1-Jul	5:30 PM	to	2-Jul	6:00 PM	24.5 hours[b]
AKN.37	2-Jul	6:00 PM	to	3-Jul	7:00 PM	25.0 hours[b]
AKN.39	3-Jul	7:00 PM	to	4-Jul	8:00 PM	25.0 hours[b]
AKN.40	4-Jul	8:00 PM	to	5-Jul	11:30 AM	15.5 hours[b]
AKN.44	5-Jul	11:30 AM	to	6-Jul	12:00 PM	24.5 hours[b]
AKN.56	10-Jul	2:30 PM	to	11-Jul	3:30 PM	25.0 hours[b]
AKN.58	11-Jul	3:30 PM	to	12-Jul	4:00 PM	24.5 hours[b]
AKN.60	12-Jul	4:00 PM	to	13-Jul	5:00 PM	25.0 hours[b]
AKN.62	13-Jul	5:00 PM	to	14-Jul	5:30 PM	24.5 hours[b]
AKN.64	14-Jul	5:30 PM	to	15-Jul	6:00 PM	24.5 hours[b]
AKN.66	15-Jul	6:00 PM	to	16-Jul	7:00 PM	25.0 hours[b]
AKN.68	17-Jul	12:30 PM	to	17-Jul	8:00 PM	6.5 hours
AKN.72	19-Jul	2:30 AM	to	19-Jul	9:30 PM	19.0 hours
AKN.74	19-Jul	9:30 PM	to	20-Jul	10:30 PM	25.0 hours[b]
AKN.76	20-Jul	10:30 PM	to	5-Aug	9:00 AM	370.5 hours[a]

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Table 8.–Page 2 of 6.

Number	Start date	Start time		End date	End time	Effective time
	Naknek Section					
Driftnet						
AKN.01	1-Jun	9:00 AM	to	21-Jun	9:00 AM	288.0 hours[c]
AKN.15	24-Jun	5:30 AM	to	24-Jun	2:30 PM	9.0 hours
AKN.27	28-Jun	9:30 PM	to	29-Jun	4:30 PM	19.0 hours
AKN.37	3-Jul	1:00 AM	to	3-Jul	7:00 PM	18.0 hours
AKN.39	4-Jul	2:00 AM	to	4-Jul	8:00 PM	18.0 hours
AKN.40	5-Jul	2:30 AM	to	5-Jul	11:30 AM	9.0 hours
AKN.44	5-Jul	2:30 PM	to	5-Jul	9:00 PM	6.5 hours
AKN.44	6-Jul	3:30 AM	to	6-Jul	12:00 PM	8.5 hours
AKN.46	6-Jul	12:00 PM	to	6-Jul	10:30 PM	10.5 hours[b]
AKN.46	7-Jul	4:00 AM	to	6-Jul	1:00 PM	9.0 hours
AKN.48	7-Jul	1:00 PM	to	8-Jul	12:00 AM	11 hours[b]
AKN.48	8-Jul	5:00 AM	to	8-Jul	1:00 PM	8.0 hours
AKN.52	8-Jul	1:00 PM	to	9-Jul	1:00 AM	12.0 hours[b]
AKN.52	9-Jul	5:30 AM	to	9-Jul	2:00 PM	8.5 hours
AKN.54	9-Jul	2:00 PM	to	10-Jul	2:30 AM	12.5 hours[b]
AKN.54	10-Jul	6:30 AM	to	10-Jul	2:30 PM	8.0 hours
AKN.56	10-Jul	8:00 PM	to	11-Jul	4:00 AM	8.0 hours
AKN.56	11-Jul	8:00 AM	to	11-Jul	3:30 PM	7.5 hours
AKN.58	11-Jul	9:00 PM	to	12-Jul	5:00 AM	8.0 hours
AKN.58	12-Jul	9:00 AM	to	12-Jul	4:00 PM	7.0 hours
AKN.60	12-Jul	10:00 PM	to	13-Jul	6:30 AM	8.5 hours
AKN.60	13-Jul	9:30 AM	to	13-Jul	5:00 PM	7.5 hours
AKN.62	13-Jul	11:00 PM	to	14-Jul	7:30 AM	8.5 hours
AKN.64	14-Jul	10:30 AM	to	14-Jul	5:30 PM	7.0 hours
AKN.64	14-Jul	11:30 PM	to	15-Jul	8:30 AM	9.0 hours
AKN.66	15-Jul	12:00 PM	to	15-Jul	6:00 PM	6.0 hours
AKN.66	16-Jul	1:00 AM	to	16-Jul	9:30 PM	8.5 hours
AKN.68	16-Jul	12:30 PM	to	16-Jul	7:00 PM	6.5 hours
AKN.68	17-Jul	1:30 PM	to	17-Jul	8:00 PM	6.5 hours
AKN.72	19-Jul	3:30 PM	to	19-Jul	9:30 PM	6.0 hours
AKN.74	20-Jul	3:30 AM	to	20-Jul	12:00 PM	8.5 hours
AKN.76	21-Jul	4:00 AM	to	21-Jul	1:00 PM	9.0 hours
Setnet						
AKN.27	28-Jun	4:00 PM	to	29-Jun	4:30 PM	24.5 hours[b]
AKN.29	29-Jun	4:30 PM	to	30-Jun	5:00 PM	24.5 hours[b]
AKN.46	6-Jul	12:00 PM	to	7-Jul	1:00 PM	25.0 hours[b]
AKN.48	7-Jul	1:00 PM	to	8-Jul	1:00 PM	24.0 hours[b]
AKN.52	8-Jul	1:00 PM	to	9-Jul	2:00 PM	25.0 hours[b]
AKN.54	9-Jul	2:00 PM	to	10-Jul	2:30 PM	24.5 hours[b]

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Table 8.–Page 3 of 6.

Number	Start date	Start time		End date	End time	Effective time
Kvichak Section						
Setnet						
AKN.29	29-Jun	10:30 PM	to	30-Jun	5:00 PM	18.5 hours
AKN.48	7-Jul	4:30 PM	to	8-Jul	1:00 PM	20.5 hours
AKN.54	9-Jul	6:30 PM	to	10-Jul	2:30 PM	20.0 hours
Naknek River Special Harvest Area						
Drift Net						
AKN.70	18-Jul	2:00 AM	to	18-Jul	11:00 AM	9.0 hours
AKN.70	18-Jul	2:00 PM	to	18-Jul	8:30 PM	6.5 hours[d]
Egegik District						
Driftnet						
AKN.02	3-Jun	9:00 AM	to	14-Jun	9:00 AM	144.0 hours[e]
AKN.03	1-Jun	12:01 AM	to	14-Jun	11:59 PM	336.0 hours[f]
AKN.07	17-Jun	11:00 AM	to	17-Jun	7:00 PM	8.0 hours
AKN.09	18-Jun	12:01 AM	to	18-Jun	11:59 PM	24.0 hours[f]
AKN.10	19-Jun	12:45 PM	to	19-Jun	5:45 PM	5.0 hours
AKN.11	20-Jun	12:01 AM	to	20-Jun	12:00 PM	12.0 hours[f]
AKN.12	21-Jun	3:00 PM	to	21-Jun	11:00 PM	8.0 hours
AKN.13	23-Jun	4:15 AM	to	23-Jun	12:15 PM	7.0 hours
AKN.17	24-Jun	6:00 PM	to	24-Jun	11:00 PM	5.0 hours
AKN.17	25-Jun	5:00 AM	to	24-Jun	1:00 PM	8.0 hours
AKN.20	26-Jun	5:30 AM	to	26-Jun	1:30 PM	8.0 hours
AKN.23	27-Jun	6:15 AM	to	27-Jun	2:15 PM	8.0 hours
AKN.25	27-Jun	7:30 PM	to	28-Jun	3:30 AM	8.0 hours
AKN.25	28-Jun	7:00 AM	to	28-Jun	3:00 PM	8.0 hours
AKN.28	28-Jun	9:15 PM	to	29-Jun	4:15 AM	7.0 hours
AKN.28	29-Jun	8:00 AM	to	29-Jun	4:00 PM	8.0 hours
AKN.30	29-Jun	8:45 PM	to	29-Jun	11:45 PM	3.0 hours
AKN.30	30-Jun	9:15 AM	to	30-Jun	4:45 PM	7.0 hours
AKN.33	30-Jun	10:00 PM	to	30-Jun	11:59 PM	2.0 hours
AKN.33	1-Jul	10:15 AM	to	1-Jul	5:45 PM	7.5 hours
AKN.35	2-Jul	11:00 AM	to	2-Jul	6:30 PM	7.5 hours
AKN.38	3-Jul	12:00 PM	to	3-Jul	7:30 PM	7.5 hours
AKN.40	4-Jul	12:45 PM	to	4-Jul	7:15 PM	6.5 hours
AKN.42	5-Jul	1:15 AM	to	5-Jul	7:15 AM	6.0 hours
AKN.42	5-Jul	1:30 PM	to	5-Jul	7:30 PM	6.0 hours
AKN.45	6-Jul	2:00 AM	to	6-Jul	8:00 AM	6.0 hours
AKN.45	6-Jul	2:30 PM	to	6-Jul	8:30 PM	6.0 hours
AKN.47	7-Jul	3:00 AM	to	7-Jul	8:00 AM	5.0 hours
AKN.47	7-Jul	3:30 PM	to	7-Jul	8:15 PM	4.75 hours
AKN.49	8-Jul	4:00 AM	to	8-Jul	9:00 AM	5.0 hours
AKN.49	8-Jul	4:45 PM	to	8-Jul	9:15 PM	4.5 hours

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Table 8.–Page 4 of 6.

Number	Start date	Start time		End date	End time	Effective time
Egegik District						
Driftnet						
AKN.53	9-Jul	4:45 AM	to	9-Jul	9:45 AM	5.0 hours
AKN.53	9-Jul	5:45 PM	to	9-Jul	10:30 PM	4.75 hours
AKN.55	10-Jul	5:30 AM	to	10-Jul	10:30 AM	5.0 hours
AKN.55	10-Jul	6:45 PM	to	10-Jul	11:45 PM	5.0 hours
AKN.57	11-Jul	6:15 AM	to	11-Jul	12:15 PM	6.0 hours
AKN.57	11-Jul	7:30 PM	to	12-Jul	1:30 AM	6.0 hours
AKN.59	12-Jul	7:15 AM	to	12-Jul	1:15 PM	6.0 hours
AKN.59	12-Jul	8:30 PM	to	13-Jul	2:30 AM	6.0 hours
AKN.61	13-Jul	8:15 AM	to	13-Jul	4:15 PM	8.0 hours
AKN.61	13-Jul	9:15 PM	to	14-Jul	5:15 AM	8.0 hours
AKN.63	14-Jul	8:45 AM	to	14-Jul	4:45 PM	8.0 hours
AKN.63	14-Jul	10:15 PM	to	15-Jul	6:15 AM	8.0 hours
AKN.65	15-Jul	9:45 AM	to	15-Jul	5:45 PM	8.0 hours
AKN.65	15-Jul	11:00 PM	to	16-Jul	7:00 AM	8.0 hours
AKN.67	16-Jul	11:00 AM	to	16-Jul	7:00 PM	8.0 hours
AKN.67	16-Jul	11:45 PM	to	29-Jul	9:00 AM	297.25 hours
AKN.67	29-Jul	9:00 AM	to	Fall Schedule		
Setnet						
AKN.02	3-Jun	9:00 AM	to	14-Jun	9:00 AM	144.0 hours[e]
AKN.03	1-Jun	12:01 AM	to	14-Jun	11:59 PM	336.0 hours[f]
AKN.07	17-Jun	11:00 AM	to	17-Jun	4:00 PM	5.0 hours
AKN.09	18-Jun	12:01 AM	to	18-Jun	11:59 PM	24.0 hours[f]
AKN.10	19-Jun	12:45 PM	to	19-Jun	8:45 PM	8.0 hours
AKN.11	20-Jun	12:01 AM	to	20-Jun	12:00 PM	12.0 hours[f]
AKN.12	21-Jun	3:00 PM	to	21-Jun	11:00 PM	8.0 hours
AKN.13	23-Jun	4:15 AM	to	23-Jun	12:15 PM	7.0 hours
AKN.17	25-Jun	5:00 AM	to	25-Jun	1:00 PM	8.0 hours
AKN.20	26-Jun	5:30 AM	to	26-Jun	1:30 PM	8.0 hours
AKN.23	27-Jun	6:15 AM	to	27-Jun	2:15 PM	8.0 hours
AKN.25	27-Jun	7:30 PM	to	28-Jun	3:30 AM	8.0 hours
AKN.25	28-Jun	7:00 AM	to	28-Jun	3:00 PM	8.0 hours
AKN.28	28-Jun	8:15 PM	to	29-Jun	4:15 AM	8.0 hours
AKN.28	29-Jun	8:00 AM	to	29-Jun	4:00 PM	8.0 hours
AKN.30	30-Jun	8:45 AM	to	30-Jun	4:45 PM	8.0 hours
AKN.33	1-Jul	9:45 AM	to	1-Jul	5:45 PM	8.0 hours
AKN.35	2-Jul	10:30 AM	to	2-Jul	6:30 PM	8.0 hours
AKN.38	3-Jul	11:30 AM	to	3-Jul	7:30 PM	8.0 hours
AKN.40	4-Jul	12:15 PM	to	4-Jul	8:15 PM	8.0 hours
AKN.42	5-Jul	1:30 PM	to	5-Jul	9:30 PM	8.0 hours
AKN.45	6-Jul	2:30 PM	to	6-Jul	10:30 PM	8.0 hours
AKN.47	7-Jul	3:30 PM	to	7-Jul	11:30 PM	8.0 hours

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Table 8.–Page 5 of 6.

Number	Start date	Start time		End date	End time	Effective time
Egegik District						
Setnet						
AKN.49	8-Jul	4:45 PM	to	9-Jul	12:45 AM	8.0 hours
AKN.51	8-Jul	4:00 AM	to	8-Jul	12:00 PM	8.0 hours
AKN.53	9-Jul	4:45 AM	to	9-Jul	12:45 PM	8.0 hours
AKN.55	10-Jul	6:45 PM	to	11-Jul	2:45 AM	8.0 hours
AKN.57	11-Jul	6:15 AM	to	11-Jul	2:15 PM	8.0 hours
AKN.57	11-Jul	7:30 PM	to	12-Jul	3:30 AM	8.0 hours
AKN.59	12-Jul	7:15 AM	to	12-Jul	3:15 PM	8.0 hours
AKN.59	12-Jul	8:30 PM	to	13-Jul	4:30 AM	8.0 hours
AKN.61	13-Jul	8:15 AM	to	13-Jul	4:15 PM	8.0 hours
AKN.61	13-Jul	9:15 PM	to	14-Jul	5:15 AM	8.0 hours
AKN.63	14-Jul	8:45 AM	to	14-Jul	4:45 PM	8.0 hours
AKN.63	14-Jul	10:15 PM	to	15-Jul	6:15 AM	8.0 hours
AKN.65	15-Jul	9:45 AM	to	15-Jul	5:45 PM	8.0 hours
AKN.65	15-Jul	11:00 PM	to	16-Jul	7:00 AM	8.0 hours
AKN.67	15-Jul	11:00 PM	to	16-Jul	7:00 PM	20.0 hours[b]
AKN.67	16-Jul	11:45 PM	to	29-Jul	9:00 AM	297.25 hours
AKN.67	29-Jul	9:00 AM	to	Fall Schedule		
Egegik River Special Harvest Area						
AKN.71	18-Jul	2:00 AM	to	18-Jul	8:30 PM	18.5 hours[d]
Ugashik District						
Driftnet						
AKN.04	3-Jun	9:00 AM	to	14-Jun	9:00 AM	[c]
AKN.05	1-Jun	12:01 AM	to	21-Jun	11:59 PM	[f]
AKN.06	1-Jun	12:01 AM	to	30-Sep	11:59 PM	[g]
AKN.14	23-Jun	3:30 PM	to	23-Jun	11:30 PM	8.0 hours
AKN.21	26-Jun	4:00 AM	to	26-Jun	4:00 PM	12.0 hours
AKN.26	28-Jun	5:30 AM	to	28-Jun	5:30 PM	12.0 hours
AKN.31	30-Jun	7:15 AM	to	30-Jun	7:15 AM	12.0 hours
AKN.36	2-Jul	9:00 AM	to	2-Jul	5:00 PM	8.0 hours
AKN.43	5-Jul	11:30 AM	to	5-Jul	4:30 PM	5.0 hours
AKN.50	8-Jul	2:15 PM	to	8-Jul	7:45 PM	5.5 hours
AKN.69	17-Jul	9:00 AM	to	1-Aug	9:00 AM	[h]
AKN.73	19-Jul	11:45 AM	to	19-Jul	11:45 PM	12.0 hours
AKN.75	20-Jul	12:30 PM	to	21-Jul	12:30 AM	12.0 hours
AKN.77	21-Jul	1:00 PM	to	22-Jul	7:00 AM	18.0 hours
AKN.78	22-Jul	2:00 PM	to	1-Aug	9:00 AM	235.0 hours[a]

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Table 8.–Page 6 of 6.

Number	Start Date	Start Time		End Date	End Time	Effective time
Ugashik District (cont.)						
Setnet						
AKN.04	3-Jun	9:00 AM	to	14-Jun	9:00 AM	[h]
AKN.05	1-Jun	12:01 AM	to	21-Jun	11:59 PM	[f]
AKN.06	1-Jun	12:01 AM	to	30-Sep	11:59 PM	[g]
AKN.08	17-Jun	9:30 AM	to	17-Jun	9:30 PM	12.0 hours
AKN.14	23-Jun	3:30 PM	to	23-Jun	11:30 PM	8.0 hours
AKN.21	26-Jun	4:00 AM	to	26-Jun	4:00 PM	12.0 hours
AKN.26	28-Jun	5:30 AM	to	28-Jun	5:30 PM	12.0 hours
AKN.31	30-Jun	7:15 AM	to	30-Jun	7:15 AM	12.0 hours
AKN.36	2-Jul	9:00 AM	to	2-Jul	5:00 PM	8.0 hours
AKN.43	5-Jul	11:30 AM	to	5-Jul	7:30 PM	8.0 hours
AKN.50	8-Jul	2:15 PM	to	8-Jul	10:15 PM	8.0 hours
AKN.69	17-Jul	9:00 AM	to	1-Aug	9:00 AM	[h]
AKN.73	19-Jul	11:45 AM	to	19-Jul	11:45 PM	12.0 hours
AKN.75	20-Jul	12:30 PM	to	21-Jul	12:30 AM	12.0 hours
AKN.77	21-Jul	1:00 PM	to	22-Jul	7:00 AM	18.0 hours
AKN.78	22-Jul	2:00 PM	to	1-Aug	9:00 AM	235.0 hours[a]

[a] Start of the fall schedule.

[b] Fishing period extension.

[c] Weekly schedule: 9:00 AM Monday until 9:00 AM Friday.

[d] Waives the 48-hour transfer notification period when fishing is open in the NRSHA.

[e] Weekly schedule: 9:00 AM Monday to 9:00 AM Wednesday, and 9:00 AM Thursday to 9:00 AM Friday.

[f] Subsistence.

[g] Moves north line of Ugashik District.

[h] Closure.

Table 9.–Commercial salmon catch by date and species, in numbers of fish, Naknek-Kvichak District, Bristol Bay, 2019.

	Hours fished		Deliveries							
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/12[a,b]	24	24		2						
6/13[a,b]	24	24		4						
6/14[a,b]	9	9		2						
6/15										
6/16										
6/17[a,b]	15	15	8	11						
6/18[a,b]	24	24	10	14						
6/19[a,b]	24	24	4	24						
6/20[a,b]	24	24	3	21						
6/21[a,b]	9	9	1	4						
6/22										
6/23										
6/24[c]	14.5	18.5	198	283	113,988	66	674	0	0	114,728
6/25	15.5	24	238	195	67,517	22	578	0	0	68,117
6/26	16	24	312	291	105,324	103	1,033	0	0	106,460
6/27	18.5	24	327	242	90,415	105	817	0	0	91,337
6/28	18.5	24	373	219	127,358	78	1,247	0	0	128,683
6/29[a,d]	18	24	463	273	278,067	103	2,513	0	0	280,683
6/30	18	24	355	347	281,259	114	1,469	0	0	282,842
7/1	17.5	24	325	363	244,736	122	4,424	1	1	249,284
7/2	18	24	350	401	276,144	113	1,750	2	0	278,009
7/3[a]	18	24	415	415	391,745	116	1,854	0	0	393,715
7/4[a]	18	24	437	485	393,311	110	1,778	0	0	395,199
7/5[a]	15.5	24	586	464	564,893	103	2,921	0	0	567,917
7/6[a,e]	19	24	622	441	870,483	57	4,271	0	0	874,811
7/7[a,e]	20	24	543	428	790,019	81	2,425	50	0	792,575
7/8[a,e]	19	24	537	423	768,509	63	3,016	12	4	771,604
7/9[a,e]	19.5	24	689	398	867,330	69	5,900	14	0	873,313
7/10[a]	14.5	24	647	441	656,545	97	4,329	0	0	660,971
7/11[a]	14.5	24	766	590	778,865	88	7,784	0	0	786,737
7/12[a]	14	24	888	538	602,591	89	5,040	0	0	607,720
7/13[c]	15	24	873	476	573,367	93	7,084	1	0	580,545
7/14[a]	15	24	825	350	411,459	89	4,998	0	0	416,546
7/15[a]	14.5	24	672	543	520,272	104	5,992	0	0	526,368
7/16[a]	15	19	848	456	416,151	94	5,059	0	0	421,304
7/17[a]	6.5	7.5	554	276	291,473	37	3,316	2	0	294,828
7/18[e]	15.5		501		110,768	33	2,577	0	45	113,423
7/19[c]	14.5	19	932	399	382,531	88	10,798	0	98	393,515
7/20[c]	15	22.5	612	300	183,392	89	7,477	1	66	191,025

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Table 9.–Page 2 of 2.

	Hours fished		Deliveries							
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
7/21[c]	16.5	24	388	265	105,690	46	6,617	44	80	112,477
7/22	24	24	299	216	89,028	44	5,378	22	173	94,645
7/23	24	24	169	171	59,532	25	3,665	31	15	63,268
7/24	24	24	157	131	43,220	26	3,959	58	32	47,295
7/25	24	24	84	90	21,477	29	1,626	17	17	23,166
7/26	24	24	44	67						
7/27	24	24	28	58						
7/28	24	24	10	59						
7/29	24	24	15	36						
7/30	24	24	13	23						
7/31	24	24	9	21						
8/1	24	24	6	13						
8/2	24	24	5	6						
8/3	24	24	2	5						
8/4	24	24	3	9						
8/5	24	24	2	5						
8/6	24	24	1	7						
8/7	24	24	2	5						
8/8	24	24	2	5						
8/9	9	9	4	2						
8/10				2						
8/11				2						
8/12	15	15	1	2						
8/13	24	24		4						
8/14	24	24								
8/15	24	24								
8/16	9	9								
8/17										
8/18										
8/19	15	15								
8/20	24	24	1							
Total	1183	1344	16,159	11,323	11,527,837	2,743	134,517	530	1,418	11,667,045

Note: Unless otherwise noted, blank cells represent days with no data.

[a] Drift gillnet gear was open in the Naknek Section only.

[b] Less than 4 permit holders or companies operated, harvest confidential.

[c] Drift gillnet gear was open in the Naknek Section only during 1 of 2 periods.

[d] Set gillnet gear was open in the Naknek Section only.

[e] Fishing was open in the Naknek River Special Harvest Area.

Table 10.–Daily district registration of drift gillnet permit holders and dual vessel registration, by district, Bristol Bay, 2019.

	Naknek-Kvichak		Egegik		Ugashik		Nushagak		Togiak[a]	
Date	Total	Dual	Total	Dual	Total	Dual	Total	Dual	Total	Total
6/1			1	0						
6/2	1		6	1			3			10
6/3	1		6	1			3			10
6/4	2	2	6	1			11	2		19
6/5	2	2	8	1			12	2	3	25
6/6	3	2	8	1	2	0	13	2	4	30
6/7	3	2	12	2	2	0	13	2	4	34
6/8	3	2	13	2	2	0	14	2	4	36
6/9	3	2	15	3	3	0	14	2	4	39
6/10	3	2	15	3	4	0	14	2	4	40
6/11	3	2	21	5	5	0	22	2	5	56
6/12	3	2	40	9	5	0	25	2	5	78
6/13	4	3	49	11	5	0	35	3	5	98
6/14	7	5	70	15	5	0	43	5	5	130
6/15	8	9	82	16	7	1	60	9	5	162
6/16	8	9	85	17	7	1	61	9	5	166
6/17	10	10	123	26	7	1	65	10	6	211
6/18	19	17	177	40	11	1	101	17	7	315
6/19	21	23	198	46	11	1	124	23	9	363
6/20	24	34	210	44	12	1	183	34	13	442
6/21	30	156	228	46	12	1	632	156	14	916
6/22	31	187	340	75	13	1	758	187	14	1,156
6/23	32	200	377	85	16	2	819	200	17	1,261
6/24	120	207	359	77	17	2	861	207	20	1,377
6/25	194	203	368	79	20	4	849	203	24	1,455
6/26	234	210	385	85	26	5	856	210	25	1,526
6/27	322	205	394	88	26	5	840	205	28	1,610
6/28	328	200	408	89	28	5	829	200	32	1,625
6/29	327	200	428	94	36	6	833	200	32	1,656
6/30	334	201	450	103	41	7	834	201	33	1,692
7/01	337	200	449	102	45	8	834	200	34	1,699
7/02	342	200	450	103	45	8	832	200	36	1,705
7/03	346	203	452	103	49	10	840	203	37	1,724
7/04	354	201	453	104	46	9	827	201	38	1,718
7/05	361	198	452	104	47	10	814	198	39	1,713
7/06	377	190	456	105	50	11	792	190	39	1,714
7/07	387	184	460	107	54	12	763	184	39	1,703
7/08	406	179	452	104	55	12	740	179	39	1,692
7/09	440	164	450	103	55	12	699	164	40	1,684
7/10	462	126	441	102	62	14	592	126	42	1,599
7/11	501	100	430	102	69	17	522	100	42	1,564
7/12	609	92	427	102	77	18	481	92	42	1,636
7/13	639	81	467	119	89	22	414	81	42	1,651
7/14	656	72	456	119	89	22	358	72	42	1,601
7/15	691	51	563	150	81	22	284	51	42	1,661
7/16	742	41	617	162	65	15	250	41	44	1,718
Average[b]	312	140	387	90	41	9	603	140	30	1,373

Note: Total permit sum includes dual boat registrations.

[a] Dual boat registration in not permitted by regulation in Togiak District.

[b] Seasonal averages calculated for June 16–July 16.

Table 11.–Comparison of daily sockeye escapement estimates by tower count and river test fish enumeration methods, Kvichak River, Bristol Bay 2019.

	Tower count		River test fishing				
				Index points			
Date	Daily	Cum.	Fish per index point[a]	Daily	Cum.	Est. cumulative escapement	Estimated river fish[b]
6/22	126	126	185	3	3		
6/23	108	234	185	132	135	25,000	25,000
6/24	66	300	185	45	180	65,000	40,000
6/25	1,092	1,392	185	41	221	105,000	40,000
6/26	5,544	6,936	185	31	252	120,000	15,000
6/27	3,144	10,080	217	23	275	125,000	5,000
6/28	1,062	11,142	93	54	329	130,000	5,000
6/29	354	11,496	70	71	400	135,000	5,000
6/30	576	12,072	46	217	617	145,000	10,000
7/1	6,924	18,996	682	22	639	160,000	15,000
7/2	9,786	28,782	233	43	682	170,000	10,000
7/3	5,142	33,924	233	43	725	180,000	10,000
7/4	8,172	42,096	206	97	822	200,000	20,000
7/5	6,048	48,144	316	95	917	230,000	30,000
7/6	12,348	60,492	236	127	1,044	260,000	30,000
7/7	11,058	71,550	155	194	1,238	290,000	30,000
7/8	34,722	106,272	369	542	1,780	490,000	200,000
7/9	245,106	351,378	407	614	2,394	740,000	250,000
7/10	245,670	597,048	432	463	2,857	940,000	200,000
7/11	146,640	743,688	379	792	3,649	1,240,000	300,000
7/12	151,914	895,602	499	501	4,150	1,490,000	250,000
7/13	190,254	1,085,856	433	462	4,612	1,690,000	200,000
7/14	141,180	1,227,036	296	675	5,287	1,890,000	200,000
7/15	74,154	1,301,190	233	645	5,932	2,040,000	150,000
7/16	24,534	1,325,724	282	709	6,641	2,240,000	200,000
7/17	94,164	1,419,888	210	1,907	8,548	2,640,000	400,000
7/18	194,976	1,614,864	336	1,190	9,738	3,040,000	400,000
7/19	226,020	1,840,884	328	915	10,653	3,340,000	300,000
7/20	219,762	2,060,646					
7/21	188,196	2,248,842					
7/22	78,252	2,327,094					
7/23	24,144	2,351,238					
7/24	9,144	2,360,382					
7/25	10,860	2,371,242					

Note: Blank cells represent no data.

[a] The fish per index (FPI) used to estimate the daily Estimated river fish (ERF) prior to using lag time relationships was calculated using a 4 year mean of median FPIs with a stronger 2-ocean component and similar inshore total run as that projected for 2015. This method was used until June 26 when FPIs were based on lag time relationships.

[b] Estimated river fish (ERF) was based on the inriver test fish cumulative escapement estimate less the cumulative tower count. On occasion, staff adjusted the ERF based on catchability, etc.

Table 12.–Commercial salmon catch by species, in numbers of fish, Egegik District, Bristol Bay 2019.

	Hours fished		Deliveries							
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/1										
6/2										
6/3[a]	15	15		2						
6/4[a]	24	24		1						
6/5	9	9								
6/6[a]	15	15		3						
6/7	9	9								
6/8										
6/9										
6/10	15	15	10	26	3,539	106	19	0	0	3,664
6/11	24	24	6	35	2,074	30	17	0	0	2,121
6/12[a]	9	9	1							
6/13	15	15	26	57	7,555	132	41	0	0	7,728
6/14[a]	9	9	1	9						
6/15										
6/16										
6/17	8	5	106	179	45,593	333	320	0	0	46,246
6/18										
6/19	5	8	160	145	68,895	236	487	0	0	69,618
6/20										
6/21	8	8	255	203	88,786	247	1,475	0	0	90,508
6/22[a]				3						
6/23	7	7	270	185	144,167	156	2,068	0	0	146,391
6/24	5	0	292	9	217,515	43	971	0	0	218,529
6/25	8	8	263	251	143,001	123	946	0	0	144,070
6/26	8	8	301	260	213,488	151	1,540	0	0	215,179
6/27	12.5	12.5	568	471	382,063	250	1,971	0	0	384,284
6/28	14.25	15.25	527	423	408,154	221	2,930	0	0	411,305
6/29	15.25	12.25	693	279	410,500	108	3,145	0	0	413,753
6/30	9	8	504	313	303,581	143	2,193	0	0	305,917
7/1	7.5	8	380	246	428,530	121	3,740	0	0	432,391
7/2	7.5	8	312	329	339,743	78	2,162	0	0	341,983
7/3	7.5	8	376	304	507,957	102	2,728	0	0	510,787
7/4	6.5	8	355	333	493,082	90	2,527	0	0	495,699
7/5	12	8	664	366	852,914	78	5,606	0	0	858,598
7/6	12	8	637	328	776,601	49	3,608	0	0	780,258
7/7	9.75	8.00	598	358	741,715	55	4,439	9	0	746,218
7/8	9.5	15.25	669	563	825,825	50	4,910	16	0	830,801
7/9	9.75	8.75	643	449	742,863	40	6,742	22	0	749,667
7/10	10	13.25	572	205	665,590	25	6,663	0	0	672,278
7/11	10.50	15.25	626	487	761,799	41	8,049	0	1	769,890
7/12	11	15	641	455	760,592	31	8,507	0	0	769,130

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Table 12.–Page 2 of 2.

	Hours fished		Deliveries							
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
7/13	13.25	15.25	533	343	578,286	20	7,388	0	0	585,694
7/14	15	15	706	305	667,268	19	8,947	0	0	676,234
7/15	15.25	15.25	537	344	360,030	28	4,831	0	1	364,890
7/16	15.25	19.25	724	319	620,749	45	8,194	0	0	628,988
7/17	24	24	498	232	497,523	41	9,900	2	0	507,466
7/18	24	24	441	260	324,024	29	4,785	0	0	328,838
7/19	24	24	536	233	404,755	32	7,118	0	0	411,905
7/20	24	24	284	210	187,525	23	4,106	0	0	191,654
7/21	24	24	281	162	168,425	9	5,129	40	36	173,639
7/22	24	24	268	153	143,197	10	4,090	4	40	147,341
7/23	24	24	172	131	86,393	10	2,508	9	8	88,928
7/24	24	24	168	103	75,818	10	1,800	7	6	77,641
7/25	24	24	97	75	39,575	3	1,014	9	8	40,609
7/26	24	24	94	68	48,259	7	1,446	29	58	49,799
7/27	24	24	51	58	38,018	3	1,536	45	75	39,677
7/28	24	24	8	4	5,112	0	19	1	2	5,134
7/29	24	24	28	6	21,841	0	228	0	31	22,100
7/30	24	24	55	9	26,283	1	605	3	522	27,414
7/31	24	24	23	3	7,366	1	392	0	287	8,046
8/1	24	24	28	6	14,124	1	313	0	484	14,922
8/2	9	9	55	8	13,462	3	776	8	994	15,243
8/3										
8/4										
8/5	15	15	16	1	5,533	0	576	4	818	6,931
8/6	24	24	14	3	4,842	0	398	6	567	5,813
8/7	24	24	9	2	1,648	2	810	0	874	3,334
8/8	24	24	10	2	2,590	0	542	0	1,163	4,295
8/9	9	9	13	2	2,963	0	832	0	2,413	6,208
8/10										
8/11										
8/12[a]	15	15		2						
8/13[a]	24	24		3						
8/14[a]	24	24		3						
8/15[a]	24	24		3						
8/16	9	9								
8/17										
8/18										
8/19[a]	15	15		2						
8/20[a]	24	24		3						
8/21[a]	24	24		2						
8/22[a]	24	24		3						
8/23	9	9								
8/24										
8/25										
8/26[a]	15	15		1						
8/27[a]	24	24		1						
8/28[a]	24	24		1						
8/29[a]	24	24		1						
Totals	1,184	1,192	16,105	10,338	14,683,614	3,344	156,260	221	18,233	14,861,672

Note: Unless otherwise noted, blank cells represent days with no data. Due to rounding, totals may not equal column sums.

[a] Fewer than 4 permits; data are confidential.

Table 13.–Comparison of daily sockeye escapement estimates by tower count and river test fish enumeration methods, Egegik River, Bristol Bay 2019.

	Tower count		River test fishing				
			Fish per	Index points		Est. cumulative	Estimated
Date	Daily	Cum.	index point[a]	Daily	Cum.	escapement	river fish[b]
6/17	78	78	90				
6/18	4,020	4,098	90	297	297		
6/19	11,148	15,246	90	275	572		
6/20	4,746	19,992	90	146	718		
6/21	7,044	27,036	53	563	1,281	30,000	30,000
6/22	23,286	50,322	38	130	1,411	35,000	5,000
6/23	10,662	60,984	43	300	1,711	48,000	13,000
6/24	29,508	90,492	27	2,984	4,695	128,000	80,000
6/25	86,280	176,772	47	636	5,331	158,000	30,000
6/26	102,432	279,204	102	488	5,819	208,000	50,000
6/27	83,754	362,958	50	401	6,220	228,000	20,000
6/28	22,302	385,260	152	198	6,418	258,000	30,000
6/29	32,430	417,690	61	489	6,907	288,000	30,000
6/30	52,428	470,118	218	229	7,136	338,000	50,000
7/1	37,902	508,020	66	677	7,813	383,000	45,000
7/2	40,326	548,346	55	991	8,804	438,000	55,000
7/3	76,314	624,660	97	568	9,372	493,000	55,000
7/4	43,230	667,890	77	776	10,148	553,000	60,000
7/5	66,060	733,950	117	428	10,576	603,000	50,000
7/6	60,216	794,166	104	579	11,155	663,000	60,000
7/7	121,824	915,990	213	375	11,530	743,000	80,000
7/8	108,810	1,024,800	164	487	12,017	823,000	80,000
7/9	101,160	1,125,960	147	648	12,665	918,000	95,000
7/10	78,768	1,204,728	93	1,395	14,060	1,048,000	130,000
7/11	203,424	1,408,152	111	1,350	15,410	1,198,000	150,000
7/12	215,760	1,623,912	100	1,805	17,215	1,378,000	180,000
7/13	172,344	1,796,256					
7/14	82,134	1,878,390					
7/15	77,802	1,956,192					
7/16	78,498	2,034,690					
7/17	81,546	2,116,236					
7/18	61,236	2,177,472					
7/19	60,840	2,238,312					
7/20	40,464	2,278,776					
7/21	20,490	2,299,266					
7/22	19,020	2,318,286					
7/23	21,924	2,340,210					

Note: Blank cells represent no data.

[a] The fish per index (FPI) used to estimate the daily estimated river fish prior (ERF) to using lag time relationships was calculated using a 4 year mean of median FPIs. This method was used until June 21 when FPIs were based on lag time relationships.

[b] ERF was based on the inriver test fish cumulative escapement estimate less the cumulative tower count. On occasion, staff adjusted the ERF based on catchability, etc.

Table 14.–Inshore run of sockeye salmon by age class, river system, and district, in thousands of fish, Bristol Bay, 2019.

District and river system[a]		Age 1.2	Age 2.2	Age .2	Age 1.3	Age 2.3	Age .3	Age 1.4	Total[b]
NAKNEK-KVICHAK DISTRICT									
Kvichak River									
	Number	5,494	65	5,559	1,896	29	1,924	12	7,499
	Percent	73.3	0.9	74.1	25.3	0.4	25.7	0.2	100.0
Alagnak River									
	Number	1,182	23	1,206	558	9	566	0	1,777
	Percent	66.5	1.3	67.8	31.4	0.5	31.9	0.0	99.7
Naknek River									
	Number	5,078	219	5,297	2,920	139	3,059	4	8,362
	Percent	60.7	2.6	63.3	34.9	1.7	36.6	0.0	100.0
Total	Number	11,755	307	12,062	5,374	176	5,550	16	17,638
	Percent	66.7	1.7	68.4	30.5	1.0	31.5	0.1	99.9
EGEGIK DISTRICT									
	Number	12,721	1,402	14,123	2,236	551	2,787	0	17,023
	Percent	74.7	8.2	83.0	13.1	3.2	16.4	0.0	99.3
UGASHIK DISTRICT									
	Number	1,366	36	1,402	1,119	19	1,138	1	2,584
	Percent	52.9	1.4	54.2	43.3	0.7	44.0	0.1	98.3
NUSHAGAK DISTRICT									
Wood River									
	Number	7,972	336	8,308	3,746	51	3,797	0	12,197
	Percent	65.4	2.8	68.1	30.7	0.4	31.1	0.0	99.2
Igushik River									
	Number	230	5	235	1,102	3	1,105	1	1,342
	Percent	17.1	0.4	18	82.1	0.2	82	0.1	99.9
Nushagak River									
	Number	499	65	564	3,587	59	3,646	38	4,255
	Percent	11.7	1.5	13	84.3	1.4	86	0.9	99.8
Total	Number	8,701	406	9,107	8,435	113	8,548	39	17,794
	Percent	48.9	2.3	51.2	47.4	0.6	48.0	0.2	99.4
TOGIAK DISTRICT[c]									
	Number	307	5	312	1,052	3	1,055	2	1,370
	Percent	22.4	0.4	23	76.8	0.2	77.0	0.1	99.9
TOTAL BRISTOL BAY[d]									
	Number	34,850	2,155	37,006	18,216	863	19,079	59	56,409
	Percent	61.3	3.6	64.9	33.1	1.5	34.5	0.1	99.5

[a] The inshore run data does not include the South Peninsula catch of Bristol Bay sockeye or immature high seas bycatch.

[b] Totals do not include minor age classes; therefore, totals are greater than the sum of age classes listed.

[c] Does not include rivers other than Togiak River.

[d] Totals may not equal column sums due to rounding.

Table 15.–Commercial catch by date and species, in numbers of fish, Ugashik District, Bristol Bay, 2019.

	Hours fished		Deliveries							
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/1										
6/2										
6/3	15	15								
6/4	24	24								
6/5[a]	24	24		1						
6/6[a]	24	24		1						
6/7	9	9								
6/8										
6/9										
6/10[a]	15	15		1						
6/11[a]	24	24		1						
6/12[a]	24	24	1	1						
6/13[a]	24	24	1	1						
6/14	9	9								
6/15										
6/16										
6/17	0	12		4	133	39	0	0	0	172
6/18										
6/19										
6/20										
6/21										
6/22										
6/23	8	8	11	33	4,080	199	9	0	0	4,288
6/24										
6/25										
6/26	12	12	19	47	14,208	288	67	0	0	14,563
6/27										
6/28	12	12	27	70	27,312	383	51	0	0	27,746
6/29										
6/30	12	12	49	63	52,037	440	1,343	0	0	53,820
7/1										
7/2	8	8	37	60	25,630	300	193	0	0	26,123
7/3										
7/4										
7/5	5	8	39	77	64,575	201	302	0	0	65,078
7/6										
7/7										
7/8	5.5	8	44	121	148,599	84	728	3	0	149,414
7/9										
7/10										
7/11										
7/12										
7/13										
7/14										
7/15										
7/16										
7/17										

-continued-

Table 15.–Page 2 of 2.

	Hours fished		Deliveries							
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
7/18										
7/19	12	12	70	119	154,327	8	2,651	0	0	156,986
7/20	11.5	11.5	72	100	133,489	7	2,674	22	58	136,250
7/21	11.5	11.5	105	103	116,402	11	2,957	18	78	119,466
7/22	17	17	394	101	150,829	13	2,796	41	37	153,716
7/23	24	24	88	78	38,519	8	1,863	7	11	40,408
7/24	24	24	103	62	37,325	13	1,226	35	55	38,654
7/25	24	24	63	50	19,957	5	405	0	20	20,387
7/26	24	24	23	34	11,743	4	1,036	0	0	12,783
7/27	24	24	8	26	6,910	4	104	0	0	7,018
7/28	24	24	13	21	9,627	7	413	11	17	10,075
7/29	24	24	6	15	6,849	2	63	0	0	6,914
7/30	24	24	6	21	5,459	3	85	0	0	5,547
7/31	9	9	5	18	2,565	0	203	2	25	2,795
8/1	24	24	3	16	2,786	2	606	18	99	3,511
8/2	24	24	3	17	2,711	4	382	22	98	3,217
8/3	24	24	1	10	855	0	81	4	49	989
8/4[a]	24	24		2						
8/5										
8/6										
Totals	498.5	516	1,191	1,274	1,037,030	2,062	20,249	183	550	1,060,074

Note: Unless otherwise noted, blank cells represent days with no data. Due to rounding, totals may not equal column sums.

[a] Fewer than 4 permits; data are confidential.

Table 16.–Comparison of daily sockeye escapement estimates by tower count and river test fish enumeration methods, Ugashik River, Bristol Bay 2019.

	Tower count		River test fishing				
			Fish per	Index points		Est. cumulative	Estimated
Date	Daily	Cum.	index point[a]	Daily	Cum.	escapement	river fish[b]
6/23							
6/24							
6/25				40	40	5,000	5,000
6/26			88	37	77	10,000	5,000
6/27	126	126	68	74	151	15,000	5,000
6/28	930	1,056	42	119	270	20,000	5,000
6/29	2,898	3,954	42	119	389	25,000	5,000
6/30	2,100	6,054	42	119	508	30,000	5,000
7/1	1,890	7,944	42	119	627	35,000	5,000
7/2	3,984	11,928	31	160	787	40,000	5,000
7/3	5,472	17,400	19	268	1,055	45,000	5,000
7/4	4,170	21,570	29	171	1,226	50,000	5,000
7/5	4,920	26,490	23	217	1,443	55,000	5,000
7/6	7,116	33,606	59	127	1,570	62,500	7,500
7/7	6,018	39,624	39	190	1,760	70,000	7,500
7/8	4,644	44,268	43	164	1,924	77,000	7,000
7/9	9,432	53,700	53	226	2,150	89,000	12,000
7/10	12,576	66,276	57	351	2,501	109,000	20,000
7/11	15,708	81,984	58	604	3,105	144,000	35,000
7/12	10,482	92,466	24	841	3,946	164,000	20,000
7/13	7,914	100,380	24	844	4,790	184,000	20,000
7/14	7,908	108,288	31	653	5,443	204,000	20,000
7/15	4,740	113,028	48	419	5,862	224,000	20,000
7/16	6,726	119,754	139	576	6,438	304,000	80,000
7/17	20,850	140,604	0	1,783	8,221	304,000	NA
7/18	36,042	176,646	65	3,830	12,051	554,000	250,000
7/19	47,100	223,746	30	11,141	23,192	884,000	330,000
7/20	126,450	350,196	58	5,694	28,886	1,214,000	330,000
7/21	239,862	590,058	72	4,578	33,464	1,544,000	330,000
7/22	295,230	885,288					
7/23	409,644	1,294,932					
7/24	138,192	1,433,124					
7/25	61,572	1,494,696					
7/26	29,226	1,523,922					
7/27	15,384	1,539,306					
7/28	8,442	1,547,748					

Note: Blank cells represent no data.

[a] The fish per index (FPI) used to estimate the daily estimated river fish (ERF) prior to using lag time relationships was calculated using a 4 year mean of median FPIs. This method was used until July 2 when FPIs were based on lag time relationships.

[b] ERF was based on the inriver test fish cumulative escapement estimate less the cumulative tower count. On occasion, staff adjusted the ERF based on catchability, etc.

Table 17.–Daily sockeye salmon escapement tower counts by river system, Bristol Bay westside, 2019.

	Wood River		Igushik River		Togiak River	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/17	4,712	4,712				
6/18	10,552	15,264				
6/19	32,988	48,252				
6/20	62,196	110,448				
6/21	91,452	201,900				
6/22	21,666	223,566				
6/23	43,152	266,718		0		
6/24	49,902	316,620	390	390		
6/25	73,566	390,186	3,264	3,654		
6/26	40,572	430,758	3,240	6,894		
6/27	37,944	468,702	3,258	10,152		
6/28	38,898	507,600	2,220	12,372		
6/29	71,124	578,724	3,618	15,990		
6/30	129,180	707,904	4,026	20,016		
7/1	147,510	855,414	2,898	22,914		
7/2	82,230	937,644	3,612	26,526		
7/3	78,390	1,016,034	4,008	30,534		
7/4	51,204	1,067,238	3,312	33,846	888	888
7/5	47,280	1,114,518	3,066	36,912	2,364	3,252
7/6	68,490	1,183,008	2,796	39,708	1,650	4,902
7/7	59,802	1,242,810	1,794	41,502	1,530	6,432
7/8	55,788	1,298,598	714	42,216	2,568	9,000
7/9	80,106	1,378,704	378	42,594	3,558	12,558
7/10	91,458	1,470,162	558	43,152	7,290	19,848
7/11	67,140	1,537,302	384	43,536	3,954	23,802
7/12	77,334	1,614,636	714	44,250	2,874	26,676
7/13	65,238	1,679,874	372	44,622	3,576	30,252
7/14	79,524	1,759,398	318	44,940	4,338	34,590
7/15	63,570	1,822,968	276	45,216	6,042	40,632
7/16	58,848	1,881,816	1,182	46,398	23,982	64,614
7/17	88,884	1,970,700	3,348	49,746	15,264	79,878
7/18	37,758	2,008,458	5,028	54,774	11,172	91,050
7/19	28,794	2,037,252	10,812	65,586	8,568	99,618
7/20	19,182	2,056,434	22,350	87,936	9,162	108,780
7/21	16,842	2,073,276	27,774	115,710	10,218	118,998
7/22			29,670	145,380	10,026	129,024
7/23			26,766	172,146	12,636	141,660
7/24			25,380	197,526	29,136	170,796
7/25			24,918	222,444	29,748	200,544
7/26			21,996	244,440	27,276	227,820
7/27			11,634	256,074	12,888	240,708

-continued-

Table 17.–Page 2 of 2.

	Wood River		Igushik River		Togiak River	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.
7/28					13,944	254,652
7/29					12,762	267,414
7/30					13,956	281,370
7/31					15,906	297,276
8/1					17,910	315,186
8/2					12,876	328,062
8/3					4,800	332,862
8/4					4,926	337,788
8/5					3,618	341,406
8/6					3,912	345,318
8/7					3,798	349,116
8/8					2,730	351,846

Note: Blank cells represent days when projects were not operational.

Table 18.–Commercial salmon catch by date and species, in numbers of fish, Nushagak District, Bristol Bay, 2019.

	Hours fished (drift/set)		Deliveries							
Date	Nushagak	Igushik	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/10[a]	0/0	0/8		1						
6/11[a]	0/0	0/8		4						
6/12[a]	0/0	0/8		6						
6/13[a]	0/0	0/8		5						
6/14[a]	0/0	0/8		5						
6/15[a]	0/0	0/8		6						
6/16[a]	0/0	0/8		12						
6/17[a]	0/0	0/8		14						
6/18[a]	0/0	0/8		20						
6/19[a]	0/0	0/8		34						
6/20	1/8.5	1/8.5	152	246	102,615	1,079	6,628	0	1	110,323
6/21	8.5/19.5	8.5/19.5	388	326	194,723	1,916	26,040	0	0	222,679
6/22	10.5/19.5	10.5/19.5	941	359	439,883	3,016	40,678	0	0	483,577
6/23	10/13	10/13	902	412	477,178	2,620	34,088	0	1	513,887
6/24	10/24[b]	10/24[b]	1,041	426	436,671	1,833	28,636	0	1	467,141
6/25	11.5/24	11.5/24	903	426	305,347	1,041	17,331	0	5	323,724
6/26	12/24	12/24	1,091	413	376,787	1,184	18,195	0	0	396,166
6/27	13/24	13/24	1,029	389	431,330	1,110	25,671	0	0	458,111
6/28	10/24	10/24	777	484	512,405	1,145	24,958	1	0	538,509
6/29	12/24	12/24	1,056	541	725,348	922	36,894	5	0	763,169
6/30	15.5/24	15.5/24	854	541	754,083	665	48,913	2	1	803,664
7/1	17/24	17/24	1,005	489	727,838	576	50,654	10	0	779,078
7/2	16/24	16/24	1,166	557	900,883	469	43,914	5	0	945,271
7/3	18.5/24	18.5/24	1,007	360	684,296	275	25,206	6	0	709,783
7/4	16.5/24	16.5/24	1,123	508	954,570	302	30,434	26	0	985,332
7/5	18/24	18/24	1,003	456	642,648	386	26,217	12	0	669,263
7/6	14.5/24	14.5/24	941	460	783,540	281	29,019	18	1	812,859
7/7	16/24	16/24	826	532	805,013	404	31,048	26	0	836,491
7/8	13/24	8.5/24	1,121	611	900,942	263	34,164	61	1	935,431
7/9	11/24	0/24	879	567	664,086	201	29,197	9	0	693,493
7/10	11/24	0/24	780	582	551,553	199	28,093	45	2	579,892
7/11	11.5/24	0/7.5	580	454	488,129	195	22,060	54	3	510,441
7/12	15.5/24	0/10	437	583	437,519	156	21,238	102	2	459,017
7/13	16/24	0/10	291	401	285,044	152	17,948	29	64	303,237
7/14	16/24	0/8.5	338	464	231,441	143	18,870	111	155	250,720
7/15	16/24	0/8.5	229	358	146,379	125	13,160	156	434	160,254
7/16	17.5/24	0/8	279	498	278,783	195	24,199	177	799	304,153
7/17	24[b]/24	0/0	196	300	160,320	127	15,596	86	459	176,588
7/18	24/24	0/0	243	267	123,118	119	21,790	149	725	145,901
7/19	24/24	0/0	171	200	69,647	99	18,484	126	915	89,271
7/20	24/24	0/0	98	151	47,223	76	10,886	136	1,859	60,180
7/21	24/24	0/0	31	144	22,336	31	4,394	85	1,219	28,065
7/22	24/24	6.5/6.5	42	136	19,564	45	4,916	80	1,091	25,696
7/23	24/24	24/24[b]	26	117	14,423	23	3,696	71	1,694	19,907

-continued-

Table 18.–Page 2 of 2.

	Hours fished (drift/set)		Deliveries							
Date	Nushagak	Igushik	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
7/24	24/24	24/24	25	117	14,163	22	3,092	91	3,222	20,590
7/25	24/24	24/24	39	98	9,641	21	3,167	76	7,623	20,528
7/26	24/24	24/24	73	68	7,805	15	5,834	89	4,021	17,764
7/27	24/24	24/24	21	63	3,890	9	2,325	14	1,815	8,053
7/28	24/24	24/24	23	61	3,802	13	2,245	27	1,253	7,340
7/29	24/24	24/24	18	64	2,200	13	2,543	54	1,149	5,959
7/30	24/24	24/24	8	71	2,584	6	1,917	26	1,216	5,749
7/31	9/9	24/24	6	44	2,804	0	777	20	866	4,467
8/1[a]	0/0	24/24		10	882					
8/2[a]	0/0	24/24		7	430					
8/3[a]	0/0	24/24		3	479					
8/4[a]	0/0	24/24		1	29					
8/5[a]	0/0	24/24		3	228					
8/6[a]	0/0	24/24		3	284					
8/8[a]	0/0	24/24		3	205					
8/11[a]	0/0	24/24		3	504					
8/13[a]	0/0	24/24		3	543					
8/18[a]	0/0	24/24		2	186					
8/21[a]	0/0	24/24		2	160					
8/22[a]	0/0	24/24		2	161					
8/25[a]	0/0	24/24		1	80					
8/27[a]	0/0	24/24		1	32					
8/30[a]	0/0	24/24		1	28					
Total	679/933.5	797.5/1159.5	22,159	14,496	14,746,785	21,509	855,428	2,021	33,018	15,667,881

[a] Less than 4 permit holders or companies operated, harvest confidential.

[b] Fishing extended until further notice.

Table 19.–Commercial fishing emergency orders, by district and statistical area, Bristol Bay westside, 2019.

Number[a]	Start date	Start time		End date	End time	Effective time
Nushagak District						
Nushagak Section						
Drift Net						
DLG.8	20-Jun	3:30 PM	to			[b]
DLG.10	20-Jun	11:00 PM	to	21-Jun	3:00 AM	4.0 hours
DLG.10	21-Jun	6:30 AM	to	21-Jun	12:00 PM	5.5 hours
DLG.11	22-Jun	7:00 AM	to	22-Jun	12:30 PM	5.5 hours
DLG.14	22-Jun	6:30 PM	to	22-Jun	11:30 PM	5.0 hours
DLG.14	23-Jun	7:30 AM	to	23-Jun	1:00 PM	5.5 hours
DLG.15	23-Jun	7:30 PM	to	24-Jun	1:30 AM	6.0 hours
DLG.15	24-Jun	8:00 AM	to	24-Jun	1:00 PM	5.0 hours
DLG.16	24-Jun	8:30 PM	to	25-Jun	3:30 AM	7.0 hours
DLG.16	25-Jun	8:30 AM	to	25-Jun	1:30 PM	5.0 hours
DLG.17	25-Jun	9:00 PM	to	26-Jun	3:00 AM	6.0 hours
DLG.17	26-Jun	9:00 AM	to	26-Jun	3:00 PM	6.0 hours
DLG.18	26-Jun	9:00 PM	to	27-Jun	5:00 AM	8.0 hours
DLG.18	27-Jun	10:00 AM	to	27-Jun	5:00 PM	7.0 hours
DLG.19	27-Jun	11:00 PM	to	28-Jun	3:00 AM	4.0 hours
DLG.19	28-Jun	10:30 AM	to	28-Jun	3:30 PM	5.0 hours
DLG.20	28-Jun	3:30 PM	to	28-Jun	5:00 PM	1.5 hours[c]
DLG.21	29-Jun	12:00 AM	to	29-Jun	6:00 AM	6.0 hours
DLG.21	29-Jun	11:30 AM	to	29-Jun	5:30 PM	6.0 hours
DLG.22	30-Jun	12:00 AM	to	30-Jun	7:00 AM	7.0 hours
DLG.22	30-Jun	11:30 AM	to	30-Jun	6:00 PM	6.5 hours
DLG.23	30-Jun	6:00 PM	to	30-Jun	8:00 PM	2.0 hours[c]
DLG.23	1-Jul	12:00 AM	to	1-Jul	9:00 AM	9.0 hours
DLG.23	1-Jul	12:00 PM	to	1-Jul	8:00 PM	8.0 hours
DLG.24	2-Jul	1:00 AM	to	2-Jul	9:00 AM	8.0 hours
DLG.24	2-Jul	1:30 PM	to	2-Jul	9:30 PM	8.0 hours
DLG.25	3-Jul	1:30 AM	to	3-Jul	11:00 AM	9.5 hours
DLG.25	3-Jul	1:30 PM	to	3-Jul	10:30 PM	9.0 hours
DLG.26	4-Jul	2:30 AM	to	4-Jul	11:30 AM	9.0 hours
DLG.26	4-Jul	3:30 PM	to	4-Jul	11:00 PM	7.5 hours
DLG.27	5-Jul	3:30 AM	to	5-Jul	12:30 PM	9.0 hours
DLG.28	5-Jul	4:30 PM	to	5-Jul	11:30 PM	7.0 hours[c]
DLG.28	6-Jul	5:00 AM	to	6-Jul	1:00 PM	8.0 hours
DLG.30	6-Jul	5:30 PM	to	7-Jul	1:30 AM	8.0 hours
DLG.30	7-Jul	6:00 AM	to	7-Jul	2:00 PM	8.0 hours
DLG.31	7-Jul	5:30 PM	to	8-Jul	2:00 AM	8.5 hours
DLG.31	8-Jul	7:30 AM	to	8-Jul	2:00 PM	6.5 hours
DLG.32	8-Jul	7:30 PM	to	9-Jul	1:00 AM	5.5 hours
DLG.32	9-Jul	8:00 AM	to	9-Jul	2:00 PM	6.0 hours[c]
DLG.33	9-Jul	8:00 PM	to	10-Jul	2:00 AM	6.0 hours
DLG.33	10-Jul	8:00 AM	to	10-Jul	2:30 PM	6.5 hours
DLG.34	10-Jul	9:30 PM	to	11-Jul	3:00 AM	5.5 hours
DLG.34	11-Jul	9:00 AM	to	11-Jul	3:30 PM	6.5 hours
DLG.35	11-Jul	10:00 PM	to	12-Jul	6:00 AM	8.0 hours

-continued-

Table 19.–Page 2 of 4.

Number[a]	Start date	Start time		End date	End time	Effective time
Nushagak District (cont.)						
Nushagak Section (cont.)						
Drift net (cont.)						
DLG.35	12-Jul	10:00 AM	to	12-Jul	6:30 PM	8.5 hours
DLG.37	12-Jul	11:00 PM	to	13-Jul	7:00 AM	8.0 hours
DLG.37	13-Jul	10:00 AM	to	13-Jul	7:00 PM	9.0 hours
DLG.38	14-Jul	12:30 AM	to	14-Jul	8:00 AM	7.5 hours
DLG.38	14-Jul	11:30 AM	to	14-Jul	8:00 PM	8.5 hours
DLG.39	15-Jul	1:30 AM	to	15-Jul	9:00 AM	7.5 hours
DLG.39	15-Jul	12:30 PM	to	15-Jul	9:00 PM	8.5 hours
DLG.40	16-Jul	2:30 AM	to	16-Jul	10:00 AM	7.5 hours
DLG.40	16-Jul	2:00 PM	to			[d]
DLG.51			to	31-Jul	9:00 AM	335.0 hours
Nushagak District						
Nushagak Section						
Set Net						
DLG.8	20-Jun	3:30 PM	to			[b]
DLG.9	20-Jun	3:30 PM	to	21-Jun	12:00 PM	20.5 hours[c]
DLG.11	21-Jun	4:30 PM	to	22-Jun	12:30 PM	20.0 hours
DLG.14	22-Jun	5:00 PM	to	23-Jun	1:00 PM	20.0 hours
DLG.15	23-Jun	12:00 PM	to			[d]
DLG.51			to	31-Jul	9:00 AM	908.0 hours
Nushagak District						
Igushik Section						
Drift Net						
DLG.8	20-Jun	3:30 PM	to			[b]
DLG.10	20-Jun	11:00 PM	to	21-Jun	3:00 AM	4.0 hours
DLG.10	21-Jun	6:30 AM	to	21-Jun	12:00 PM	5.5 hours
DLG.11	22-Jun	7:00 AM	to	22-Jun	12:30 PM	5.5 hours
DLG.14	22-Jun	6:30 PM	to	22-Jun	11:30 PM	5.0 hours
DLG.14	23-Jun	7:30 AM	to	23-Jun	1:00 PM	5.5 hours
DLG.15	23-Jun	7:30 PM	to	24-Jun	1:30 AM	6.0 hours
DLG.15	24-Jun	8:00 AM	to	24-Jun	1:00 PM	5.0 hours
DLG.16	24-Jun	8:30 PM	to	25-Jun	3:30 AM	7.0 hours
DLG.16	25-Jun	8:30 AM	to	25-Jun	1:30 PM	5.0 hours
DLG.17	25-Jun	9:00 PM	to	26-Jun	3:00 AM	6.0 hours
DLG.17	26-Jun	9:00 AM	to	26-Jun	3:00 PM	6.0 hours
DLG.18	26-Jun	9:00 PM	to	27-Jun	5:00 AM	8.0 hours
DLG.18	27-Jun	10:00 AM	to	27-Jun	5:00 PM	7.0 hours
DLG.19	27-Jun	11:00 PM	to	28-Jun	3:00 AM	4.0 hours
DLG.19	28-Jun	10:30 AM	to	28-Jun	3:30 PM	5.0 hours
DLG.20	28-Jun	3:30 PM	to	28-Jun	5:00 PM	1.5 hours
DLG.21	29-Jun	12:00 AM	to	29-Jun	6:00 AM	6.0 hours
DLG.21	29-Jun	11:30 AM	to	29-Jun	5:30 PM	6.0 hours
DLG.22	30-Jun	12:00 AM	to	30-Jun	7:00 AM	7.0 hours
DLG.22	30-Jun	11:30 AM	to	30-Jun	6:00 PM	6.5 hours
DLG.23	30-Jun	6:00 PM	to	30-Jun	8:00 PM	2.0 hours

-continued-

Table 19.–Page 3 of 4.

Number[a]	Start date	Start time		End date	End time	Effective time
Nushagak District (cont.)						
Igushik Section (cont.)						
Drift net (cont.)						
DLG.23	1-Jul	12:00 AM	to	1-Jul	9:00 AM	9.0 hours
DLG.23	1-Jul	12:00 PM	to	1-Jul	8:00 PM	8.0 hours
DLG.24	2-Jul	1:00 AM	to	2-Jul	9:00 AM	8.0 hours
DLG.24	2-Jul	1:30 PM	to	2-Jul	9:30 PM	8.0 hours
DLG.25	3-Jul	1:30 AM	to	3-Jul	11:00 AM	9.5 hours
DLG.25	3-Jul	1:30 PM	to	3-Jul	10:30 PM	9.0 hours
DLG.26	4-Jul	2:30 AM	to	4-Jul	11:30 AM	9.0 hours
DLG.26	4-Jul	3:30 PM	to	4-Jul	11:00 PM	7.5 hours
DLG.27	5-Jul	3:30 AM	to	5-Jul	12:30 PM	9.0 hours
DLG.28	5-Jul	4:30 PM	to	5-Jul	11:30 PM	7.0 hours
DLG.28	6-Jul	5:00 AM	to	6-Jul	1:00 PM	8.0 hours
DLG.30	6-Jul	5:30 PM	to	7-Jul	1:30 AM	8.0 hours
DLG.30	7-Jul	6:00 AM	to	7-Jul	2:00 PM	8.0 hours
DLG.31	7-Jul	5:30 PM	to	8-Jul	2:00 AM	8.5 hours
DLG.31	8-Jul	7:30 AM	to	8-Jul	2:00 PM	6.5 hours
DLG.49	22-Jul	5:30 PM	to			[d]
Nushagak District						
Igushik Section						
Set Net						
DLG.3	10-Jun	6:30 AM	to	10-Jun	2:30 PM	8.0 hours
DLG.3	11-Jun	7:00 AM	to	11-Jun	3:00 PM	8.0 hours
DLG.3	12-Jun	8:00 AM	to	12-Jun	4:00 PM	8.0 hours
DLG.4	13-Jun	9:00 AM	to	13-Jun	5:00 PM	8.0 hours
DLG.4	14-Jun	10:00 AM	to	14-Jun	6:00 PM	8.0 hours
DLG.4	15-Jun	11:00 AM	to	15-Jun	7:00 PM	8.0 hours
DLG.5	16-Jun	12:00 PM	to	16-Jun	8:00 PM	8.0 hours
DLG.5	17-Jun	1:00 PM	to	17-Jun	9:00 PM	8.0 hours
DLG.5	18-Jun	1:30 PM	to	18-Jun	9:30 PM	8.0 hours
DLG.6	19-Jun	2:30 PM	to	19-Jun	10:30 PM	8.0 hours
DLG.6	20-Jun	3:30 PM	to	20-Jun	11:30 PM	8.0 hours
DLG.8	20-Jun	3:30 PM	to			[b]
DLG.9	20-Jun	11:30 PM	to	21-Jun	12:00 PM	12.5 hours[c]
DLG.11	21-Jun	4:30 PM	to	22-Jun	12:30 PM	20.0 hours
DLG.14	22-Jun	5:00 PM	to	23-Jun	1:00 PM	20.0 hours
DLG.15	23-Jun	12:00 PM	to			[d]
DLG.34			to	11-Jul	7:30 AM	426.5 hours
DLG.35	12-Jul	9:00 AM	to	12-Jul	7:00 PM	10.0 hours
DLG.37	13-Jul	10:00 AM	to	13-Jul	8:00 PM	10.0 hours
DLG.38	14-Jul	11:30 AM	to	14-Jul	8:00 PM	8.5 hours
DLG.39	15-Jul	11:30 AM	to	15-Jul	8:00 PM	7.5 hours
DLG.40	16-Jul	12:30 PM	to	16-Jul	8:30 PM	8.0 hours
DLG.49	22-Jul	5:30 PM	to			[d]

-continued-

Table 19.–Page 4 of 4.

Number[a]	Start date	Start time		End date	End time	Effective time
Togiak District						
Togiak River Section						
Drift and Set Net						
DLG.12	27-Jun	9:00 AM	to	28-Jun	9:00 AM	24.0 hours[e]
DLG.36	13-Jan	9:00 PM	to	15-Jul	9:00 AM	35.5 hours[f]
DLG.44	19-Jul	9:00 AM	to	21-Jul	9:00 AM	48.0 hours[f]
DLG.50	26-Jul	9:00 AM	to	28-Jul	9:00 AM	48.0 hours[f]
DLG.53	2-Aug	9:00 AM	to	4-Aug	9:00 AM	48.0 hours[f]
DLG.54	9-Aug	9:00 AM	to	11-Aug	9:00 AM	48.0 hours[f]
Wood River Special Harvest Area						
Set Net						
DLG.30	6-Jul	4:00 PM	to	7-Jul	9:30 AM	17.0 hours
DLG.31	8-Jul	5:00 AM	to	8-Jul	10:30 AM	5.5 hours
DLG.32	9-Jul	6:00 AM	to	9-Jul	11:30 AM	5.5 hours
DLG.33	10-Jul	6:30 AM	to	10-Jul	1:00 PM	6.5 hours
DLG.34	10-Jul	8:00 PM	to	11-Jul	1:00 AM	5.0 hours
DLG.34	11-Jul	7:30 AM	to	11-Jul	1:30 PM	6.0 hours
DLG.35	11-Jul	9:00 PM	to	12-Jul	2:30 AM	5.5 hours
DLG.35	12-Jul	8:30 AM	to	12-Jul	2:00 PM	5.5 hours
DLG.37	12-Jul	10:00 PM	to	13-Jul	3:30 AM	5.5 hours
DLG.37	13-Jul	10:00 AM	to	13-Jul	3:00 PM	5.0 hours
DLG.38	13-Jul	11:00 PM	to	14-Jul	4:00 AM	5.0 hours
DLG.38	14-Jul	11:30 AM	to	14-Jul	3:00 PM	3.5 hours
DLG.39	14-Jul	11:30 PM	to	15-Jul	5:00 AM	5.5 hours
DLG.39	15-Jul	11:30 AM	to	15-Jul	4:00 PM	4.5 hours
DLG.40	16-Jul	12:30 PM	to	16-Jul	5:00 PM	4.5 hours
DLG.41	17-Jul	1:30 PM	to	17-Jul	6:00 PM	4.5 hours
DLG.42	18-Jul	2:30 AM	to	18-Jul	7:00 AM	4.5 hours
DLG.42	18-Jul	2:00 PM	to	18-Jul	6:30 PM	4.5 hours
DLG.45	19-Jul	3:00 PM	to	19-Jul	10:00 PM	7.0 hours
DLG.46	20-Jul	4:00 PM	to	20-Jul	11:00 PM	7.0 hours

[a] Prefix code on emergency orders indicate where announcement originated (DLG = for Dillingham field office).

[b] Restricts mesh size.

[c] Extends current fishing period.

[d] Commercial fishing open until further notice.

[e] Reduces the weekly fishing schedule in Togiak River Section.

[f] Extends the weekly fishing schedule in Togiak River Section.

Table 20.–Commercial salmon catch by date and species, in numbers of fish, Togiak District, Bristol Bay, 2019.

	Deliveries							
Date[a]	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/17		4	66	3	1	0	0	70
6/18	4	7	240	20	39	1	0	300
6/19	2	9	373	33	42	0	0	448
6/20		7	223	22	9	0	0	254
6/21	1	4	175	33	61	0	0	269
6/22[b]		1						
6/24	15	47	5,373	139	285	10	0	5,807
6/25	16	73	6,741	175	666	21	0	7,603
6/26	10	57	5,876	154	917	48	0	6,995
6/27	6	24	1,837	87	382	4	0	2,310
6/28	5	4	1,480	25	804	21	0	2,330
6/29[b]	2	2						
7/1	28	72	10,289	197	1,915	48	0	12,449
7/2	52	129	23,236	311	5,299	96	0	28,942
7/3	53	120	25,149	251	4,560	106	0	30,066
7/4	48	113	19,890	273	3,203	66	0	23,432
7/5	55	127	22,253	171	4,104	145	0	26,673
7/6	50	105	23,345	137	3,675	186	0	27,343
7/7	2	7	2,317	3	199	0	0	2,519
7/8	44	134	29,264	180	5,737	296	0	35,477
7/9	79	161	36,855	207	10,268	627	0	47,957
7/10	71	163	32,619	183	9,969	335	0	43,106
7/11	12	82	10,811	62	4,487	64	0	15,424
7/12	11	84	17,495	76	3,231	58	0	20,860
7/13	3	2	1,111	0	130	2	0	1,243
7/14	51	118	29,491	66	5,897	70	0	35,524
7/15	69	143	31,879	82	8,861	127	1	40,950
7/16	75	152	38,234	80	9,528	118	0	47,960
7/17	73	144	35,164	90	9,378	142	0	44,774
7/18	38	152	33,487	41	6,018	59	0	39,605
7/19	42	140	40,680	65	8,069	77	0	48,891
7/20	52	135	56,758	48	9,754	52	0	66,612
7/21	8	39	14,675	4	1,939	3	0	16,621
7/22	52	177	51,392	22	9,986	52	0	61,452
7/23	90	160	45,558	39	11,585	56	1	57,239
7/24	49	154	29,739	35	7,788	275	0	37,837
7/25	18	100	16,321	19	3,959	40	1	20,340
7/26	57	147	41,429	28	8,161	58	4	49,680
7/27	60	141	35,600	11	10,016	68	3	45,698
7/28	16	39	11,113	14	2,453	14	1	13,595
7/29	50	123	38,745	23	5,106	35	4	43,913
7/30	71	129	34,660	17	7,631	84	12	42,404
7/31	72	137	28,731	36	8,532	43	44	37,386
8/1	45	144	25,145	19	7,569	73	45	32,851

-continued-

Table 20.–Page 2 of 2.

Date[a]	Deliveries		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set						
8/2	37	74	14,650	14	5,128	24	63	19,879
8/3	14	43	9,286	4	2,375	18	168	11,851
8/4	1	8	1,605	0	298	0	6	1,909
8/5	29	47	7,704	7	2,769	19	249	10,748
8/6	36	85	8,613	13	3,097	59	340	12,122
8/7	38	61	11,043	7	2,978	32	565	14,625
8/8	16	57	5,847	7	1,064	24	239	7,181
8/9	18	37	7,107	4	1,611	12	736	9,470
8/10	9	40	6,244	9	1,035	25	705	8,018
8/11	4	15	2,541	1	394	3	227	3,166
8/12	3	27	1,758	3	364	16	776	2,917
8/13	21	50	7,066	4	1,224	11	3,191	11,496
8/14	4	48	3,450	4	572	19	767	4,812
8/15	22	43	5,691	2	800	3	2,077	8,573
8/16	4	19	1,374	1	218	1	292	1,886
8/17	4		263	0	109	0	484	856
8/19		20	849	0	149	2	645	1,645
8/20	17	28	1,749	0	212	8	3,083	5,052
8/21	13	32	1,810	1	308	2	3,760	5,881
8/22	10	26	1,157	2	211	3	2,284	3,657
8/23	1	12	505	0	54	0	872	1,431
8/24[b]	1		36					
8/26	1	9	119	0	33	7	763	922
8/27	8	17	773	1	81	1	2,600	3,456
8/28	6	16	461	0	46	0	1,475	1,982
8/29	3	11	507	0	37	0	837	1,381
8/30	2	3	165	0	7	0	294	466
Total	1,879	4,840	1,018,644	3,568	227,731	3,875	27,778	1,281,596

[a] See Table 19 for inseason adjustments to the regular weekly fishing schedule.

[b] Information confidential, less than 3 permit holders involved in fishery

Table 21.–Commercial herring sac roe and spawn-on-kelp buyers in Togiak District, 2019.

			Product purchased		
			Sac Roe		
	Operator/Buyer[a]	Base of operation	Gillnet	Purse seine	Spawn-on-kelp
1	Icicle Seafoods	P/V *Gordon Jensen*	X	X	
2	North Pacific Seafoods	S/P Pedersen Pt., Red Salmon		X	
3	Silver Bay Seafoods	S/P Naknek		X	
4	Trident Seafoods	S/P Naknek		X	

Note: P/V = processing vessel; S/P = shore processor.

Table 22.–Daily observed estimates in tons of herring, by index area, Togiak District, 2019.

				Estimated biomass by index area[a]													
Date	Start time	Survey rating[b]	Miles of spawn	NUS	KUK	MET	NVK	UGL	TOG	TNG	MTG	OSK	PYR	CPN	HAG	WAL	Daily total
13-Apr	10:30	2.5	0.0	0	0	0	0	0	0	0	NS	NS	NS	NS	0	NS	0
16-Apr	10:15	2.4	4.9	3,932	3,994	12,215	2,090	2,231	2,359	0	0	0	NS	NS	0	7,011	33,832
18-Apr	15:15	2.8	6.7	0	0	9,588	80	14,541	915	1,795	308	1,920	NS	NS	295	19	29,461
19-Apr	19:15	3.6	6.7	2,272	7,415	16,467	2,450	4,064	2,448	3,130	486	865	NS	NS	4,317	423	44,337
20-Apr	10:15	2.0	7.5	959	4,770	31,977	9,030	12,138	0	140	4,715	4,765	NS	NS	20,108	0	88,602
23-Apr	16:00	2.1	6.6	44,647	26,237	18,170	40,230	13,530	1,022	3,905	NS	NS	NS	NS	2,735	204	150,680
26-Apr	10:30	1.3	37.1	5,147	14,691	21,771	16,087	3,282	32,940	27,662	461	4,793	694	31	25,174	3,239	155,972
3-May	10:15	4.5	1.4	0	0	0	157	0	NS	NS	NS	NS	NS	NS	NS	NS	157
Total linear miles of spawn			70.9										Peak biomass estimate				155,972

Note: NS = no survey.

[a] Index areas: NUS = Nushagak Peninsula; KUK = Kulukak; MET = Metervik; NVK = Nunavachak; UGL = Ungalikthluk/Togiak; TOG = Togiak; TNG = Tongue Pt.; MTG = Matogak; OSK = Osviak; PYR = Pyrite Point; CPN = Cape Newenham HAG = Hagemeister; WAL = Walrus Islands.

[b] Average survey rating for all sections surveyed: 1 = Excellent, 2 = Good, 3 = Fair, 4 = Poor, 5 = Unsatisfactory.

Table 23.–Emergency order (EO) commercial fishing periods for herring sac roe and spawn-on-kelp, Togiak District, 2019.

EO No.	Area[a]		Date and time			
Herring sac roe gillnet						
DLG-02	Egg Island Section		4/18	8:00 AM	to	end of season
DLG-05	159°30.00'W to and including Egg Island Section and west to 162°10.50'W	Area change	4/26	2:00 PM		
Herring sac roe purse seine						
DLG-01	Anchor Pt. to Right Hand Pt., Togiak Reef to Cape Newenham		4/16	5:00 PM	to	end of season
DLG-03	Reallocate unharvested gillnet allocation	Quota change	4/24	10:00 AM		
DLG-04	Season ends		4/26	1:00 PM		
Herring spawn on kelp[b]						

[a] Area descriptions are approximate. Precise boundaries are described in EOs.

[b] There was no market for spawn on kelp, therefore, a fishery did not occur.

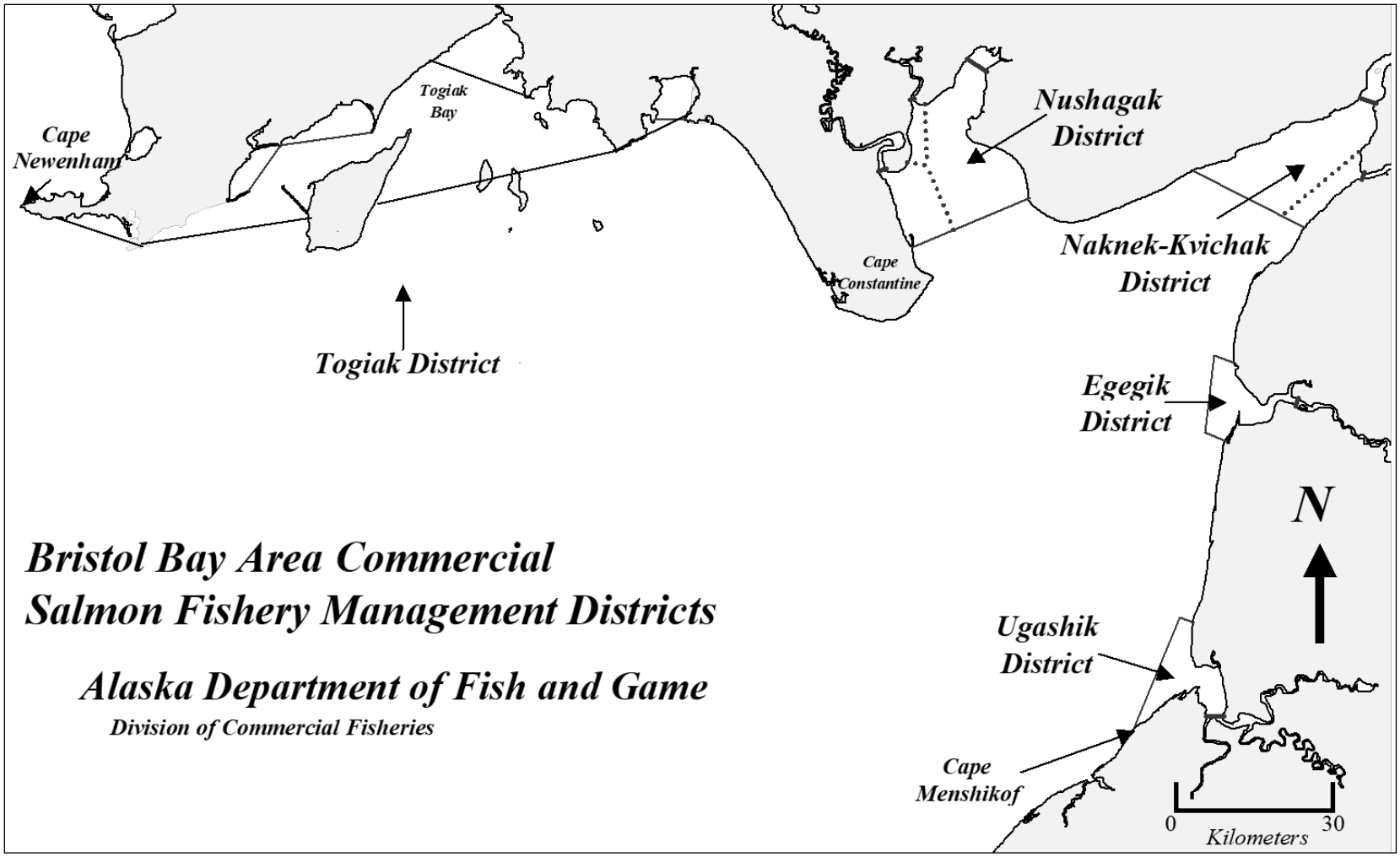

Figure 1.–Bristol Bay area commercial fisheries salmon management districts.

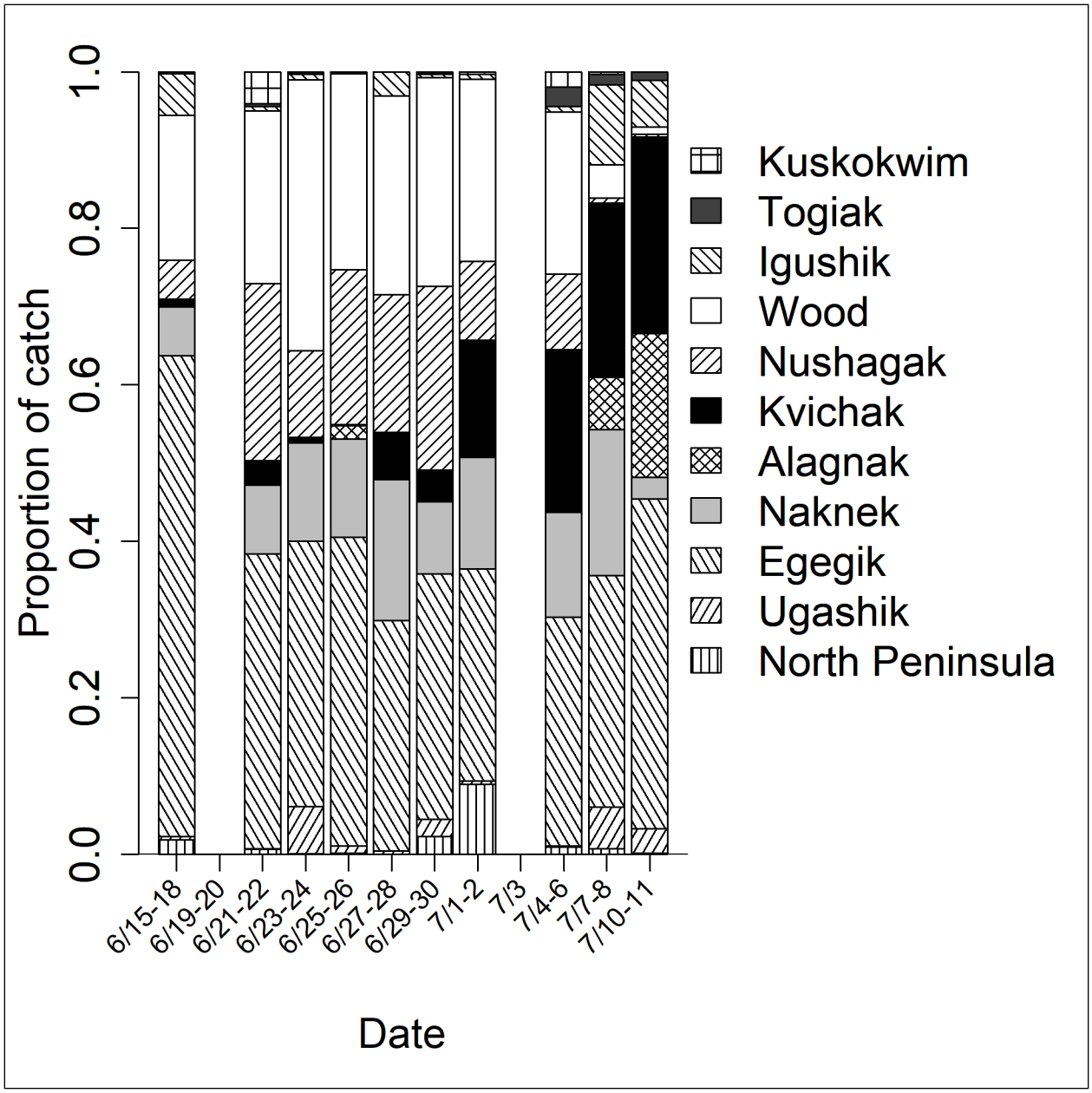

Figure 2.–Stock composition estimates for sockeye salmon sampled from the Port Moller test fishery, 2019.

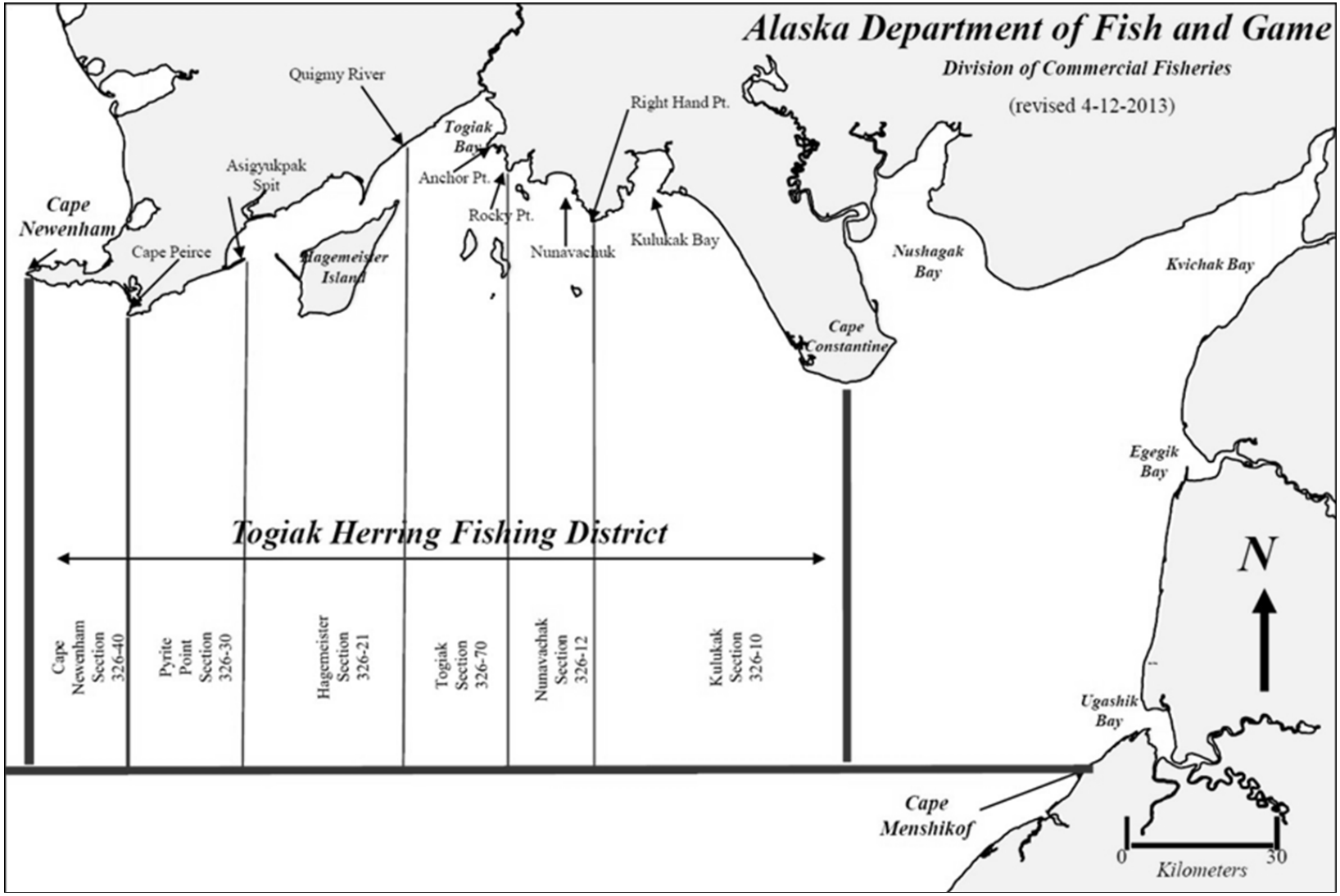

Figure 3.–Togiak Herring District, Bristol Bay.

APPENDIX A: SALMON

Appendix A1.–Escapement goal ranges and actual counts of sockeye salmon by river system, in thousands of fish, Bristol Bay, 1999–2019.

	Kvichak River			Naknek River[a]		
	Range			Range		
Year	Lower	Upper	Actual	Lower	Upper	Actual
1999	6,000	10,000	6,197	800	1,400	1,625
2000	6,000	10,000	1,828	800	1,400	1,375
2001	2,000	10,000	1,095	800	2,000	1,830
2002	2,000	10,000	704	800	2,000	1,264
2003	2,000	10,000	1,687	800	2,000	1,831
2004	2,000	10,000	5,500	800	2,000	1,939
2005	2,000	10,000	2,320	800	2,000	2,745
2006	2,000	10,000	3,068	800	2,000	1,953
2007	2,000	10,000	2,810	800	2,000	2,945
2008	2,000	10,000	2,758	800	1,400	2,473
2009	2,000	10,000	2,266	800	1,400	1,170
2010	2,000	10,000	4,207	800	1,400	1,464
2011	2,000	10,000	2,264	800	1,400	1,177
2012	2,000	10,000	4,164	800	1,400	900
2013	2,000	10,000	2,089	800	1,400	938
2014	2,000	10,000	4,459	800	1,400	1,474
2015	2,000	10,000	7,342	800	2,000	1,921
2016	2,000	10,000	4,463	800	2,000	1,692
2017	2,000	10,000	3,163	800	2,000	1,900
2018	2,000	10,000	4,399	800	2,000	2,221
2019	2,000	10,000	2,371	800	2,000	2,911
20-year avg.			3,289			1,691
1999–2008 avg.			2,751			1,871
2009–2018 avg.			3,882			1,615

	Egegik River			Ugashik River		
	Range			Range		
Year	Lower	Upper	Actual	Lower	Upper	Actual
1999	800	1,400	1,728	500	1,200	1,652
2000	800	1,400	1,032	500	1,200	620
2001	800	1,400	969	500	1,200	834
2002	800	1,400	1,036	500	1,200	892
2003	800	1,400	1,152	500	1,200	759
2004	800	1,400	1,290	500	1,200	776
2005	800	1,400	1,622	500	1,200	779
2006	800	1,400	1,465	500	1,200	978
2007	800	1,400	1,433	500	1,200	2,599
2008	800	1,400	1,260	500	1,200	569
2009	800	1,400	1,146	500	1,200	1,346
2010	800	1,400	927	500	1,200	805
2011	800	1,400	961	500	1,200	1,030
2012	800	1,400	1,234	500	1,200	671
2013	800	1,400	1,114	500	1,200	898
2014	800	1,400	1,382	500	1,200	640
2015	800	2,000	2,161	500	1,400	1,565
2016	800	2,000	1,837	500	1,400	1,635
2017	800	2,000	2,601	500	1,400	1,186
2018	800	2,000	1,608	500	1,400	1,168
2019	800	2,000	2,340	500	1,400	1,547
20-year avg.			1,288			1,011
1999–2008 avg.			1,284			1,078
2009–2018 avg.			1,462			1,035

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	Wood River			Igushik River		
	Range			Range		
Year	Lower	Upper	Actual	Lower	Upper	Actual
1999	700	1,200	1,512	150	250	446
2000	700	1,200	1,300	150	250	413
2001	700	1,500	1,459	150	300	410
2002	700	1,500	1,284	150	300	123
2003	700	1,500	1,460	150	300	194
2004	700	1,500	1,543	150	300	110
2005	700	1,500	1,497	150	300	366
2006	700	1,500	4,008	150	300	305
2007	700	1,500	1,528	150	300	415
2008	700	1,500	1,725	150	300	1,055
2009	700	1,500	1,319	150	300	514
2010	700	1,500	1,804	150	300	518
2011	700	1,500	1,098	150	300	421
2012	700	1,500	764	150	300	193
2013	700	1,500	1,183	150	300	387
2014	700	1,500	2,765	150	300	341
2015	700	1,800	1,941	150	400	651
2016	700	1,800	1,310	150	400	469
2017	700	1,800	4,274	150	400	579
2018	700	1,800	7,507	150	400	771
2019	700	1,800	2,073	150	400	256
20-year avg.			2,049			424
1999–2008 avg.			1,734			368
2009–2018 avg.			2,397			484

	Nushagak River			Togiak River		
	Range			Range		
Year	Lower[b]	Upper	Actual[c]	Lower	Upper	Actual
1999	235	760	345	100	200	156
2000	235	760	446	100	200	312
2001	340	760	897	100	200	297
2002	235	760	349	100	200	162
2003	340	760	642	100	200	232
2004	340	760	544	100	200	129
2005	340	760	1,107	100	200	149
2006	340	760	541	100	200	312
2007	340	760	518	120	270	270
2008	340	760	493	120	270	206
2009	340	760	484	120	270	314
2010	340	760	469	120	270	188
2011	340	760	428	120	270	191
2012	340	760	432	120	270	203
2013	370	840	895	120	270	128
2014	370	840	618	120	270	152
2015	370	900	797	120	270	219
2016	370	900	1,226	120	270	200
2017	370	900	2,852	120	270	195
2018	370	900	1,247	120	270	512
2019	370	900	1,459	120	270	351
20-year avg.			605			203
1999–2008 avg.			590			217
2009–2018 avg.			869			200

[a] An optimal escapement goal of up to 2.0 million sockeye set by the BOF in 2001, when fishing in the Naknek River SHA.

[b] The optimum escapement goal of 235,000 sockeye set by the BOF in 1999.

[c] Nushagak River sonar escapement estimates prior to 2006 were adjusted due to a change in sonar technology (Buck et al 2012).

Appendix A2.–Salmon entry permit registration by gear and residency, Bristol Bay, 1999–2019.

	Drift net[a]						Set net[a]						Total
Year	Resident	Non-resident	Drift total	Permits fished	% Fished	Interim use	Resident	Non-resident	Set total	Permits fished	% Fished	Interim use	Drift and set[b]
1999	937	961	1,898	1,847	95%	52	748	266	1,014	925	91%	6	2,912
2000	945	945	1,890	1,823	95%	38	735	277	1,012	921	90%	6	2,902
2001	958	925	1,883	1,566	82%	24	729	281	1,010	834	82%	2	2,893
2002	945	933	1,878	1,183	62%	16	717	289	1,006	680	67%	2	2,884
2003	923	944	1,867	1,389	74%	7	713	288	1,001	714	71%	1	2,868
2004	912	948	1,860	1,426	77%	3	703	286	989	797	81%	1	2,849
2005	895	967	1,862	1,526	82%	3	688	300	988	829	84%	1	2,850
2006	893	966	1,859	1,567	84%	1	683	302	985	844	86%	0	2,844
2007	881	981	1,862	1,621	87%	1	672	311	983	836	85%	0	2,845
2008	887	976	1,863	1,636	88%	0	678	302	980	850	87%	0	2,843
2009	864	999	1,863	1,642	88%	0	674	307	981	855	87%	0	2,844
2010	866	997	1,863	1,731	93%	0	672	311	983	861	88%	0	2,846
2011	1,005	857	1,862	1,747	94%	0	660	321	981	878	90%	0	2,843
2012	849	1,013	1,862	1,740	93%	0	654	325	979	883	90%	0	2,841
2013	862	1,000	1,862	1,709	92%	0	646	332	978	854	87%	0	2,840
2014	848	1,015	1,863	1,751	94%	0	636	341	977	881	90%	0	2,840
2015	834	1,030	1,864	1,744	94%	0	639	336	975	885	91%	0	2,839
2016	826	1,038	1,864	1,732	93%	0	637	336	973	858	88%	0	2,837
2017	842	1,021	1,863	1,710	92%	0	635	337	972	881	91%	0	2,835
2018	838	1,025	1,863	1,749	94%	0	634	336	970	879	91%	0	2,833
2019	840	1,022	1,862	1,724	86%	0	632	333	965	893	93%	0	2,827
20-year avg.	891	977	1,868	1,642	88%	7	678	309	987	847	86%	1	2,854
1999–2008 avg.	921	954	1,875	1,586	84%	18	711	287	998	830	83%	2	2,873
2009–2018 avg.	863	1,000	1,863	1,726	93%	0	649	328	977	872	89%	0	2,840

[a] Allowable permit gear: 150 fathoms for drift and 50 for set.

[b] Includes interim use permits.

Appendix A3.–Sockeye salmon commercial catch by district, in numbers of fish, Bristol Bay, 1999–2019.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1999	9,452,972	7,388,080	2,256,007	6,175,419	385,411	25,657,889
2000	4,727,061	7,029,397	1,538,790	6,367,208	794,996	20,457,452
2001	5,280,538	2,872,662	480,509	4,734,800	810,096	14,178,605
2002	1,418,938	4,610,374	1,573,234	2,839,424	233,743	10,675,713
2003	3,348,504	2,291,502	1,748,934	6,665,965	706,008	14,760,913
2004[a]	4,715,070	10,209,227	3,139,229	6,104,048	437,234	26,261,802
2005	6,728,469	8,015,950	2,216,635	7,096,031	465,094	24,522,179
2006	7,151,741	7,408,983	2,429,637	10,876,552	626,442	28,493,355
2007	9,022,511	6,495,908	5,026,615	8,404,111	816,581	29,765,726
2008	10,381,844	7,403,885	2,334,022	6,903,157	651,315	27,674,223
2009	8,514,944	11,527,462	2,555,263	7,730,168	559,442	30,887,279
2010	10,858,209	5,070,816	4,031,832	8,424,030	667,850	29,052,737
2011	9,016,321	4,810,362	2,643,495	4,886,552	744,626	22,101,356
2012	10,152,917	5,062,390	2,418,653	2,663,014	622,909	20,919,883
2013	4,853,030	4,779,133	2,168,216	3,163,805	467,329	15,431,513
2014[b]	13,791,290	6,928,621	1,511,416	6,448,463	443,287	29,127,035
2015	16,531,193	8,749,567	5,473,800	5,592,816	371,903	36,719,279
2016	13,466,245	8,739,699	6,630,231	8,109,797	645,797	37,591,769
2017	8,256,304	11,980,502	5,705,712	12,322,519	516,488	38,781,525
2018	8,917,710	5,149,621	2,771,945	24,230,150	867,770	41,937,196
2019	11,527,837	14,683,614	1,037,030	14,755,905	1,018,644	43,023,030
20-year avg.	8,329,291	6,826,207	2,932,709	7,486,901	591,716	26,249,871
1999–2008 avg.	6,222,765	6,372,597	2,274,361	6,616,672	592,692	22,244,786
2009–2018 avg.	10,435,816	7,279,817	3,591,056	8,357,131	590,740	30,254,957

[a] Total includes General District harvest of 1,656,994 fish.

[b] Includes 3,958 fish that were not assigned to a district.

Appendix A4.–Chinook salmon commercial catch by district, in numbers of fish, Bristol Bay, 1999–2019.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1999	1,439	740	1,640	11,178	11,932	26,929
2000	1,077	1,067	893	12,120	7,862	23,019
2001	995	967	1,021	11,746	1,021	15,750
2002	1,002	284	623	40,039	2,801	44,749
2003	611	135	478	43,485	3,231	47,940
2004[a]	1,496	1,632	891	96,759	9,310	114,280
2005	1,458	486	1,818	62,764	10,759	77,285
2006	2,333	915	2,608	84,881	16,225	106,962
2007	1,520	528	1,473	51,831	7,769	63,121
2008	1,344	416	1,191	18,968	3,087	25,006
2009	1,026	308	948	24,693	4,602	31,577
2010	1,060	223	460	26,056	5,553	33,352
2011	1,962	567	372	26,927	6,731	36,559
2012	2,306	282	212	11,952	4,829	19,581
2013	1,360	144	52	10,213	2,718	14,487
2014	1,648	461	83	11,862	1,841	15,895
2015	2,926	753	226	50,675	2,663	57,243
2016	2,797	1,144	1,435	23,783	3,831	32,990
2017	2,477	866	1,219	32,194	4,643	41,399
2018	2,398	1,520	1,407	35,938	3,457	44,720
2019	2,743	3,344	2,062	21,509	3,568	33,226
20-year avg.	1,662	672	953	34,403	5,743	39,924
1999–2008 avg.	1,328	717	1,264	43,377	7,400	47,862
2009–2018 avg.	1,996	627	641	25,429	4,087	32,780

[a] Total includes General District harvest of 4,624 fish.

Appendix A5.–Chum salmon commercial catch by district, in numbers of fish, Bristol Bay, 1999–2019.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1999	259,922	74,890	68,004	170,806	111,677	685,299
2000	68,218	38,777	36,349	114,456	140,175	397,975
2001	16,526	33,579	43,404	526,739	211,701	831,949
2002	19,189	23,516	35,792	276,787	112,987	468,271
2003	34,481	37,116	52,908	740,372	68,154	933,031
2004	29,972	75,061	49,358	458,916	94,025	732,481
2005	204,777	62,029	39,513	966,069	124,695	1,397,083
2006	457,855	153,777	168,428	1,240,235	223,364	2,243,659
2007	383,927	157,991	242,025	953,292	202,486	1,939,721
2008	237,260	92,901	135,292	492,341	301,967	1,259,761
2009	255,520	118,212	64,974	745,161	141,375	1,325,242
2010	337,911	57,324	62,987	424,234	118,767	1,001,223
2011	218,710	39,246	34,287	296,909	113,234	702,386
2012	133,959	35,375	31,352	272,163	206,614	679,463
2013	272,754	36,792	32,624	586,117	209,946	1,138,233
2014[a]	87,188	33,173	19,677	242,261	100,195	482,531
2015	350,169	69,057	69,967	502,820	103,773	1,095,786
2016	237,035	74,641	72,534	397,761	187,508	969,479
2017	249,696	147,330	88,126	804,878	204,518	1,494,548
2018	310,872	75,524	71,854	1,020,227	158,329	1,636,806
2019	134,517	156,260	20,249	855,428	227,731	1,394,185
20-year avg.	208,297	71,816	70,973	561,627	156,775	1,070,746
1999–2008 avg.	171,213	74,964	87,107	594,001	159,123	1,088,923
2009–2018 avg.	245,381	68,667	54,838	529,253	154,426	1,052,570

[a] Includes 37 fish that were not assigned to a district.

Appendix A6.–Pink salmon commercial catch by district, in numbers of fish, Bristol Bay, 1999–2019.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1999	11	0	3	52	2	68
2000	19,659	32	4	38,309	695	58,699
2001	23	0	0	308	97	428
2002	10	1	1	204	311	527
2003	24	0	0	188	32	244
2004[a]	7,749	0	187	26,150	18,293	52,380
2005	32	0	1	554	2,108	2,695
2006	25,149	700	0	39,011	80,748	145,608
2007	9	9	2	384	533	937
2008	20,682	1,033	16	138,284	125,409	285,424
2009	23	0	1	320	544	888
2010	8,237	1,655	0	1,289,970	39,734	1,339,596
2011	13	0	5	257	352	627
2012	3,535	285	0	877,466	28,055	909,341
2013	467	0	0	208	187	862
2014	7,473	4,835	227	1,166,997	118,682	1,298,214
2015	112	0	2	807	1,219	2,140
2016	12,058	343	1,498	537,525	217,190	768,614
2017	174	214	143	7,230	26,797	34,558
2018	30,507	2,742	971	142,287	67,747	244,254
2019	530	221	183	2,021	3,875	6,830
20-year avg.	13,506	1,163	290	425,620	69,686	510,266
1999–2008 avg.	14,650	353	42	48,392	45,091	108,528
2009–2018 avg.	12,362	1,972	539	802,849	94,282	912,004

Note: Averages include even numbered years only.

[a] Total includes General District harvest of 1.

Appendix A7.–Coho salmon commercial catch by district, in numbers of fish, Bristol Bay, 1999–2019.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1999	303	11,464	2,289	2,836	2,653	19,545
2000	952	13,166	1,269	112,852	2,758	130,997
2001	3	12,603	976	3,218	284	17,084
2002	0	7,099	464	93	754	8,410
2003	42	40,577	994	583	1,047	43,243
2004	2,142	2,324	4,744	47,706	15,463	72,379
2005	3,314	20,611	8,162	42,456	8	74,551
2006	5,163	26,788	3,087	44,385	449	79,872
2007	2,180	18,111	1,954	29,578	157	51,980
2008	7,059	29,682	2,220	76,932	1,159	117,052
2009	732	10,594	2,602	35,171	9,209	58,308
2010	901	9,984	407	72,909	24,065	108,266
2011	633	440	84	4,712	7,605	13,474
2012	431	2,493	0	97,382	15,977	116,283
2013	467	812	479	124,182	11,420	137,360
2014	646	11,473	435	242,604	32,134	287,292
2015	1,253	730	2,533	6,614	26,080	37,210
2016	1,110	546	171	79,538	9,346	90,711
2017	4,754	14,274	7	167,347	54,503	240,885
2018	11,549	21,139	1,633	84,320	43,243	161,884
2019	1,418	18,233	550	33,018	27,778	80,997
20-year avg.	2,182	12,746	1,726	63,771	12,916	93,339
1999–2008 avg.	2,116	18,243	2,616	36,064	2,473	61,511
2009–2018 avg.	2,248	7,249	835	91,478	23,358	125,167

Appendix A8.–Total salmon commercial catch by district, in numbers of fish, Bristol Bay, 1999–2019.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1999	9,715,807	7,475,451	2,328,047	6,360,934	511,689	26,391,928
2000	4,818,024	7,082,486	1,577,446	6,645,252	946,486	21,069,694
2001	5,299,384	2,919,874	526,114	5,277,729	1,032,116	15,055,217
2002	1,439,831	4,641,902	1,610,548	3,157,042	350,596	11,199,919
2003	3,385,814	2,369,459	1,804,199	7,452,178	778,472	15,790,122
2004[a]	4,758,330	10,288,807	3,194,507	6,734,064	574,325	27,233,322
2005	6,940,395	8,099,368	2,266,400	8,168,138	602,660	26,076,961
2006	7,641,821	7,591,163	2,603,760	12,285,064	947,228	31,069,036
2007	9,414,797	6,674,941	5,272,187	9,440,219	1,027,528	31,829,672
2008	10,651,517	7,528,622	2,472,742	7,629,892	1,082,937	29,365,710
2009	8,774,759	11,658,846	2,623,819	8,774,759	714,804	32,546,987
2010	11,208,947	5,144,104	4,095,854	10,222,381	866,201	31,537,487
2011	9,240,963	4,853,480	2,678,405	5,216,149	872,551	22,403,764
2012	10,293,536	5,101,370	2,450,220	3,918,549	878,294	22,641,969
2013	5,127,632	4,816,881	2,201,371	3,884,525	691,600	16,722,009
2014[b]	13,888,262	6,978,563	1,531,838	8,112,236	696,139	31,211,033
2015	16,885,517	8,819,956	5,546,460	6,152,464	505,638	37,910,035
2016	13,719,245	8,816,373	6,705,869	9,148,404	1,063,672	39,453,563
2017	8,513,405	12,143,186	5,795,207	13,334,168	806,949	40,592,915
2018	9,273,036	5,250,546	2,847,810	25,512,922	1,140,546	44,024,860
2019	11,667,045	14,861,672	1,060,074	15,667,881	1,281,596	44,538,268
20-year avg.	8,549,551	6,912,769	3,006,640	8,371,353	804,522	27,706,310
1999–2008 avg.	6,406,572	6,467,207	2,365,595	7,315,051	785,404	23,508,158
2009–2018 avg.	10,692,530	7,358,331	3,647,685	9,427,656	823,639	31,904,462

[a] Total includes General District harvest.

[b] Includes 3,995 fish that were not assigned to a district.

Appendix A9.–Commercial sockeye salmon catch, in percent, by gear type and district, Bristol Bay, 1999–2019.

	Naknek-Kvichak									Nushagak								
		Setnet Sec.		NRSHA[a]		Egegik		Ugashik			Setnet Sec.		WRSHA[b]		Togiak		Total	
Year	Drift	Nak.	Kvi.	Drift	Set	Drift	Set	Drift	Set	Drift	Nush.	Igushik	Drift	Set	Drift	Set	Drift	Set
1999	85	8	7			85	15	89	11	70	24	6	78	22	53	47	82	18
2000	84	11	5			84	16	87	13	77	17	6	68	32	57	43	80	20
2001	82	16	2	74[c]	26[c]	86	14	80	20	77	18	5			66	34	80	20
2002				64[c]	36[c]	85	15	88	12	77	22	1	67	33	62	38	79	21
2003	91	9	0	65[c]	35[c]	81	19	89	11	83	15	2			63	37	79	21
2004	79	11	10	88[c]	12[c]	86	14	88	12	84	15	1			55	45	79	21
2005				81[c]	19[c]	82	18	87	13	84	14	2			56	44	66	34
2006	86	8	5	81[c]	19[c]	84	16	88	12	87	11	2			53	47	85	15
2007	82	12	6	80[c]	12[c]	84	16	92	8	80	17	3			59	41	81	19
2008	81	12	7			85	15	92	8	79	16	5			60	40	82	18
2009	80	12	9			85	15	87	13	76	20	4			60	40	82	18
2010	81	10	9			84	16	90	10	78	17	6	71	29	61	39	82	18
2011	84	10	7			83	17	87	13	76	16	7			60	40	81	19
2012	85	7	8			83	17	90	10	67	27	6	45	55	67	33	73	27
2013	84	9	7			85	15	90	10	78	17	5			65	35	84	16
2014	83	9	8			89	11	82	18	73	16	7			58	42	82	18
2015	84	8	8			81	19	91	9	69	22	9			50	50	81	19
2016	83	8	9			82	18	91	9	67	22	11			56	44	81	19
2017	70	17	13			87	13	92	8	76	18	4			56	44	80	20
2018	71	17	12	84	16	80	20	78	22	82	13	2	0	3	51	49	81	19
2019	77	14	9			81	19	66	34	78	18	3		2	49	51	79	21
1999–2008 avg.	84	11	6	76	23	84	16	88	12	79	18	3	72	28	57	43	80	20
2009–2018 avg.	81	11	9	NA	NA	84	16	88	12	74	19	6	39	29	58	42	81	19
Allocation[d]	84	8	8	84	16	86	14	90	10	74	20	6	NA	NA	NA	NA	NA	NA

Note: Blank cells represent no data; NA = not available.

[a] Naknek River Special Harvest Area (NRSHA), Naknek-Kvichak District; allocation plan enacted in December 2003.

[b] Wood River Special Harvest Area (WRSHA), Nushagak District.

[c] NRSHA prior to allocation plan; fishing periods were alternated between gear types.

[d] The Alaska Board of Fisheries enacted an allocation plan in 1998; reviewed in December 2003.

Appendix A10.–Sockeye salmon escapement by district, in numbers of fish, Bristol Bay, 1999–2019.

Year	Naknek-Kvichak [a]	Egegik [b]	Ugashik [c]	Nushagak [d]	Togiak [e]	Total
1999	8,303,878	1,727,772	1,662,042	2,302,934 [f]	231,196	14,227,822
2000	3,654,568	1,032,138	638,420	2,159,628 [f]	390,080	7,874,834
2001	3,194,708	968,872	866,368	2,765,440 [f]	338,616 [g]	8,134,004
2002	2,303,463	1,036,092	905,584	1,755,993 [f]	199,507	6,200,639
2003	5,627,974 [h]	1,152,120	790,202	2,295,963 [f]	261,851 [g]	10,128,110
2004	12,836,100 [h]	1,290,144	815,104	2,196,864 [f]	154,681 [g]	17,292,893
2005	9,283,980 [h]	1,621,734	799,612	2,968,962 [f]	155,778 [g]	14,830,066
2006	6,795,420 [h]	1,465,158	1,003,158	4,861,780 [f]	312,126 [i]	14,437,642
2007	8,221,926 [h]	1,432,500	2,599,186	2,461,579 [f]	269,646 [i]	14,984,837
2008	7,411,104 [h]	1,259,568	596,332	3,271,926 [f]	205,680 [i]	12,744,610
2009	4,406,424 [h]	1,146,276	1,364,338	2,317,569 [f]	313,946 [i]	9,548,553
2010	6,859,068 [h]	927,054	830,886	2,791,080 [f]	188,298 [i]	11,596,386
2011	4,325,220 [h]	961,200	1,029,853	1,947,577	190,970 [i]	8,454,820
2012	5,926,503	1,233,900	695,018	1,389,975	203,148 [i]	9,448,544
2013	4,122,686	1,113,630	898,110	2,465,791	128,118 [i]	8,728,335
2014	6,133,492	1,382,466	640,158	3,723,697	151,934 [i]	12,031,747
2015	15,033,216	2,160,792	1,564,638	3,389,330	218,700 [i]	22,366,676
2016	7,930,458	1,837,260	1,635,270	2,459,450	200,046 [i]	14,062,484
2017	7,105,200 [h]	2,600,982	1,186,446	7,705,277	195,330 [i]	18,793,235
2018	8,201,286 [h]	1,608,354	1,167,792	9,525,486	511,770 [i]	21,014,688
2019	6,103,170 [h]	2,340,210	1,547,748	3,038,781	351,846 [i]	13,381,755
20-year avg.	6,883,834	1,397,901	1,084,426	3,237,815	241,071	12,845,046
1999–2008 avg.	6,763,312	1,298,610	1,067,601	2,704,107	251,916	12,085,546
2009–2018 avg.	7,004,355	1,497,191	1,101,251	3,771,523	230,226	13,604,547

[a] Includes counts from Kvichak tower, Alagnak aerial survey, and Naknek tower.

[b] Includes Egegik River. May include King Salmon River and Shosky Creek.

[c] Includes Ugashik River. Also includes Mother Goose River and Dog Salmon River system 1991–2004.

[d] Includes Igushik, Nushagak-Mulchatna, Nuyakuk, Snake, and Wood Rivers. Nushagak River sonar escapement estimates prior to 2006 were adjusted after the 2012 season to account for a transition in sonar technology that occurred in 2006 (Buck et al. 2012).

[e] Includes Togiak River, Lake tributaries, Kulukak system and other miscellaneous river systems, except where noted.

[f] Snake River not surveyed.

[g] Only partial and/or late survey of Togiak streams.

[h] Alagnak tower count.

[i] Togiak River tower count.

Appendix A11.–Inshore total run of sockeye salmon by district, in numbers of fish, Bristol Bay, 1999–2019.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak[a]	Togiak	Total
1999	17,756,850	9,115,852	3,918,049	8,478,353	616,607	39,885,711
2000	8,381,629	8,061,535	2,177,210	8,526,836	1,185,076	28,332,286
2001	8,475,246	3,841,534	1,346,877	7,500,240	1,148,712	22,312,609
2002	3,722,401	5,646,466	2,478,818	4,595,417	433,250	16,876,352
2003	8,976,478	3,443,622	2,539,136	8,961,928	967,859	24,889,023
2004	17,551,170	11,499,371	3,954,333	8,300,912	591,915	41,897,701
2005	16,012,449	9,637,684	3,016,247	10,064,993	620,872	39,352,245
2006	13,947,161	8,874,141	3,432,795	15,738,332	938,568	42,930,997
2007	17,244,437	7,928,408	7,625,801	10,865,690	1,086,227	44,750,563
2008	17,792,948	8,663,453	2,930,354	10,175,083	856,995	40,418,833
2009	12,921,368	12,673,738	3,919,601	10,047,737	873,388	40,435,832
2010	17,717,277	5,997,870	4,862,718	11,215,110	856,148	40,649,123
2011	13,341,541	5,771,562	3,673,348	6,834,129	935,596	30,556,176
2012	16,079,420	6,296,290	3,113,671	4,052,989	826,057	30,368,427
2013	9,148,587	5,950,083	3,070,893	5,648,098	621,670	24,439,331
2014	19,924,521	8,310,816	2,147,598	10,171,331	595,192	41,149,458
2015	31,565,141	10,631,593	7,038,933	8,983,050	590,604	58,809,321
2016	21,396,703	10,576,959	8,265,501	10,569,247	845,843	51,654,253
2017	15,361,504	14,581,484	6,892,158	20,027,749	711,818	57,574,713
2018	17,118,996	6,757,975	3,939,737	33,755,636	1,379,540	62,951,884
2019	17,638,837	17,023,824	2,584,778	17,794,604	1,370,490	56,412,533
20-year avg.	15,221,791	8,213,022	4,017,189	10,725,643	834,097	39,011,742
1999–2008 avg.	12,986,077	7,671,207	3,341,962	9,320,778	844,608	34,164,632
2009–2018 avg.	17,457,506	8,754,837	4,692,416	12,130,508	823,586	43,858,852

[a] Reflects a 2012 adjustment of Nushagak River sonar escapement estimates prior to 2006 to account for a transition in sonar technology that occurred in 2006 (Buck et al. 2012).

Appendix A12.–Inshore commercial catch and escapement of sockeye salmon in the Naknek-Kvichak District in numbers of fish, Bristol Bay, 1999–2019.

		Escapement				
Year	Catch	Kvichak[a]	Alagnak	Naknek[a]	Total	Total run
1999	9,454,109	6,196,914	481,600[b]	1,625,364	8,303,878	17,756,850
2000	4,728,095	1,827,780	451,300[b]	1,375,488	3,654,568	8,381,629
2001	5,281,837	1,095,348	267,000[b]	1,830,360	3,192,708	8,473,246
2002	1,419,630	703,884	335,661[b]	1,263,918	2,303,463	3,722,401
2003	3,350,656	1,686,804	3,676,146[a]	1,831,170	7,194,120	10,542,573
2004	4,716,715	5,500,134	5,396,592[a]	1,939,374	12,836,100	17,551,170
2005	6,730,812	2,320,422	4,219,026[a]	2,744,622	9,284,070	15,990,456
2006	7,151,741	3,068,226	1,773,966[a]	1,953,228	6,795,420	13,949,170
2007	9,027,161	2,810,208	2,466,414[a]	2,945,304	8,221,926	17,244,437
2008	10,385,172	2,757,912	2,180,502[a]	2,472,690	7,411,104	17,792,948
2009	8,517,450	2,266,140	970,818[a]	1,169,466	4,406,424	12,925,769
2010	10,861,016	4,207,410	1,187,730[a]	1,463,928	6,859,068	17,720,084
2011	9,019,372	2,264,352	883,794[a]	1,177,074	4,325,220	13,344,592
2012	10,152,917	4,164,444	861,747[b]	900,312	5,926,503	16,079,420
2013	4,853,030	2,088,576	1,095,950[b]	938,160	4,122,686	8,975,716
2014	13,791,053	4,458,540	200,500[b]	1,474,428	6,133,468	19,924,521
2015	16,531,193	7,349,712	5,770,650[b]	1,920,954	15,041,316	31,572,509
2016	13,466,245	4,462,728	1,775,820[b]	1,691,910	7,930,458	21,396,703
2017	8,256,304	3,163,404	2,047,894[a]	1,899,426	7,110,724	15,367,028
2018	8,917,710	4,398,708	1,581,426[a]	2,221,152	8,201,286	17,118,996
2019	11,527,837	2,371,242	820,458[a]	2,911,470	6,103,170	17,631,007
20-year avg.	8,330,611	3,339,582	1,881,227	1,741,916	6,962,726	15,291,511
1999–2008 avg.	6,224,593	2,796,763	2,124,821	1,998,152	6,919,736	13,140,488
2009–2018 avg.	10,436,629	3,882,401	1,637,633	1,485,681	7,005,715	17,442,534

[a] Tower counts.

[b] Aerial surveys estimates expanded by a factor of 2.55 (Clark 2005).

Appendix A13.–Inshore sockeye salmon total run by river system Naknek-Kvichak District, in thousands of fish, Bristol Bay, 1999–2019.

	Kvichak		Alagnak		Naknek		
Year	Number	%	Number	%	Number	%	Total run[a]
1999	12,963	73	1,065	6[b]	3,729	21	17,757
2000	2,850	34	754	9[b]	4,778	57	8,382
2001	1,440	17	424	5[b]	6,609	78	8,473
2002	707	19	335	9[b]	2,680	72	3,722
2003	2,003	19	2,530	24[c]	6,010	57	10,543
2004	7,371	42	6,494	37[c]	3,686	21	17,551
2005	2,878	18	5,277	33[c]	7,835	49	15,990
2006	5,859	42	2,790	20[c]	5,301	38	13,949
2007	4,311	25	4,311	25[c]	8,794	51	17,244
2008	5,694	32	5,872	33[c]	6,228	35	17,793
2009	5,558	43	2,714	21[c]	4,653	36	12,926
2010	9,392	53	2,658	15[c]	5,670	32	17,720
2011	7,073	53	2,002	15[c]	4,270	32	13,345
2012	10,372	65	2,417	15[b]	3,216	20	16,079
2013	4,587	51	2,377	26[b]	2,249	25	8,976
2014	5,579	28	797	4[b]	13,350	67	19,925
2015	15,470	49	11,682	37[b]	4,420	14	31,572
2016	11,615	54	4,857	23[b]	4,925	23	21,397
2017	6,524	42	4,125	27[c]	4,718	31	15,367
2018	7,393	43	2,851	17[c]	6,876	40	17,119
2019	7,499	43	1,769	10[c]	8,363	47	17,631
20-year avg.	6,482	40	3,317	20	5,500	40	15,292
1999–2008 avg.	4,608	32	2,985	20	5,565	48	13,140
2009–2018 avg.	8,356	48	3,648	20	5,435	32	17,443

[a] Due to rounding of river system total runs, district total run may not equal the sum of the rows.

[b] Escapement from aerial survey estimate.

[c] Escapement from tower count.

Appendix A14.–Inshore commercial catch and escapement of sockeye salmon in the Egegik District, by river system, in numbers of fish, Bristol Bay, 1999–2019.

		Escapement			
Year	Catch	Egegik[a]	Shosky Creek[b]	King Salmon River[b]	Total run
1999	7,383,750	1,727,772		625	9,112,147
2000	6,996,138	1,032,138			8,028,276
2001	2,836,555	968,862	10		3,805,427
2002	4,525,293	1,036,092			5,561,385
2003	2,253,721	1,152,030		90	3,405,841
2004	9,881,907	1,290,144			11,172,051
2005	8,015,950	1,621,584	0		9,637,534
2006	7,388,027	1,465,128	0		8,853,155
2007	6,474,027	1,432,500	0	1,500	7,908,027
2008	7,379,871	1,259,568	0	250	8,639,689
2009	11,527,282	1,146,276	0	4	12,673,562
2010	5,059,029	926,904		150	5,986,083
2011	4,806,939	961,200			5,768,139
2012	5,057,490	1,233,900		300	6,291,690
2013	4,779,133	1,113,630	[c]	[c]	5,892,763
2014	6,928,655	1,382,466	[c]	[c]	8,311,121
2015	8,325,956	2,160,792	[c]	[c]	10,486,748
2016	8,739,699	1,837,260	[c]	[c]	10,576,959
2017	11,980,502	2,600,982	[c]	[c]	14,581,484
2018	5,149,621	1,608,354	[c]	[c]	6,757,975
2019	14,683,614	2,340,210	[c]	[c]	17,023,824
20-year avg.	6,618,728	1,384,213	2	371	8,065,338
1999–2008 avg.	6,058,089	1,281,518	2	503	7,339,837
2009–2018 avg.	7,235,431	1,497,176	0	176	8,291,862

Note: Blank cells represent no data.

[a] Tower count.

[b] Aerial survey.

[c] No survey conducted.

Appendix A15.–Inshore commercial catch and escapement of sockeye salmon in the Ugashik District, by river system, in numbers of fish, Bristol Bay, 1999–2019.

Year	Catch	Escapement			Total run
		Ugashik River[a]	King Salmon River[b]	Dog Salmon River[b]	
1999	2,255,131	1,651,572	6,350	4,120	3,917,173
2000	1,517,236	620,040	12,900	5,480	2,155,656
2001	474,759	833,628	22,940	9,800	1,341,127
2002	1,570,418	892,104	11,460	2,020	2,476,002
2003	1,731,657	758,532	27,620	4,000	2,521,809
2004	3,077,745	776,364	22,850	15,890	3,892,849
2005	2,216,906	779,172	[c]	20,440	3,016,518
2006	2,428,334	978,718	[c]	24,440	3,431,492
2007	4,996,077	2,523,686	5,420[c]	70,020	7,595,203
2008	2,319,790	588,632	[c]	7,700	2,916,122
2009	2,555,268	1,346,630	[c]	17,920	3,919,818
2010	4,031,625	805,686	[c]	25,200	4,862,511
2011	2,641,882	1,003,753	[c]	26,100	3,671,735
2012	2,415,580	670,578	8	24,432	3,110,598
2013	2,168,216	898,110	[c]	[c]	3,066,326
2014	1,507,440	640,158	[c]	[c]	2,147,598
2015	5,473,800	1,564,638	[c]	[c]	7,038,438
2016	6,630,231	1,635,270	[c]	[c]	8,265,501
2017	5,705,712	1,186,446	[c]	[c]	6,892,158
2018	2,771,945	1,167,792	[c]	[c]	3,939,737
2019	1,037,030	1,547,748	[c]	[c]	2,584,778
20-year avg.	2,821,731	1,052,211	15,219	17,632	3,894,015
1999–2008 avg.	2,118,624	1,026,632	17,121	15,530	3,173,238
2009–2018 avg.	3,590,170	1,091,906	8	23,413	4,691,442

[a] Tower counts plus fish observed during postseason surveys.

[b] Aerial surveys.

[c] Not surveyed.

Appendix A16.–Inshore commercial catch and escapement of sockeye salmon in the Nushagak District by river system, in numbers of fish, Bristol Bay, 1999–2019.

		Escapement				
Year	Catch	Wood[a]	Igushik[a]	Nushagak[b]	Total	Total run
1999	6,176,051	1,512,426	445,536	344,972[c]	2,302,934	8,478,985
2000	6,367,502	1,300,026	413,316	446,286[c]	2,159,628	8,527,130
2001	4,735,718	1,458,732	409,596	897,112[c]	2,765,440	7,501,158
2002	2,839,918	1,283,682	123,156	349,155[c]	1,755,993	4,595,911
2003	6,667,538	1,459,782	194,088	642,093[c]	2,295,963	8,963,501
2004	6,104,492	1,543,342	109,650	543,872[c]	2,196,864	8,301,356
2005	7,096,296	1,496,550	365,709	1,106,703[c]	2,968,962	10,065,258
2006	10,876,552	4,008,102	305,268	548,410	4,861,780	15,738,332
2007	8,404,532	1,528,086	415,452	518,041	2,461,579	10,866,111
2008	6,903,367	1,724,676	1,054,704	492,546	3,271,926	10,175,293
2009	7,731,518	1,319,232	514,188	484,149	2,317,569	10,049,087
2010	8,424,702	1,804,344	518,040	468,696	2,818,215	11,242,917
2011	4,887,305	1,098,006	421,380	428,191	1,968,744	6,856,049
2012	2,663,014	764,202	193,770	432,438	1,392,410	4,055,424
2013	3,163,805	1,183,348	387,744	894,172	2,466,552	5,630,357
2014	6,447,650	2,764,614	340,590	618,477	3,723,681	10,171,331
2015	5,593,702	1,941,474	651,172	796,648	3,389,294	8,982,996
2016	8,886,077	1,309,707	469,230	680,513	2,459,450	11,345,527
2017	12,322,519	4,274,224	578,700	2,852,306	7,705,230	20,027,749
2018	24,230,150	7,507,254	770,772	1,247,460	9,525,486	33,755,636
2019	14,755,905	2,073,276	256,074	709,349	3,038,699	17,794,604
20-year avg.	7,526,120	2,064,090	434,103	739,612	3,240,385	10,766,505
1999–2008 avg.	6,617,197	1,731,540	383,648	588,919	2,704,107	9,321,304
2009–2018 avg.	8,435,044	2,396,641	484,559	890,305	3,776,663	12,211,707

[a] Tower count.

[b] Total escapements determined for the entire drainage using Nushagak River sonar (at Portage Creek) estimate.

[c] Nushagak River sonar escapement estimates prior to 2006 were adjusted after the 2012 season to account for a transition in sonar technology that occurred in 2006 (Buck et al. 2012).

Appendix A17.–Inshore sockeye salmon total run by river system, in thousands of fish, Nushagak District, 1999–2019.

	Wood		Igushik		Nushagak				
Year	Total run	%	Total run	%	Sonar[a]	Catch total	Total run	%	Total run[b]
1999	5,930	70	1,563	18	345	640	985	12	8,478
2000	5,278	62	1,748	21	446	1,054	1,500	18	8,526
2001	3,987	53	1,315	18	897	1,301	2,198	29	7,500
2002	3,715	81	207	5	349	325	674	15	4,596
2003	5,647	63	1,018	11	642	1,655	2,297	26	8,962
2004	5,375	65	564	7	544	1,801	2,345	28	8,284
2005	4,771	47	1,878	19	1,107	2,346	3,453	34	10,102
2006	11,064	70	1,435	9	548	2,690	3,238	21	15,737
2007	6,523	60	1,762	16	518	2,062	2,580	24	10,865
2008	5,236	56	2,394	26	493	1,152	1,645	18	9,275
2009	7,195	72	926	9	484	1,443	1,927	19	10,048
2010	7,698	66	1,365	12	469	2,153	2,622	22	11,712
2011	4,328	63	1,036	15	428	1,042	1,470	21	6,855
2012	2,449	60	703	17	432	469	901	22	4,055
2013	3,174	46	745	11	891	2,090	2,981	43	6,900
2014	7,521	74	992	10	618	1,040	1,658	16	10,171
2015	5,070	56	1,657	18	797	1,458	2,255	25	8,982
2016	5,487	52	1,964	19	681	2,438	3,119	30	10,570
2017	11,010	55	1,318	7	2,852	4,848	7,700	38	20,028
2018	22,426	66	1,905	6	1,248	8,177	9,425	28	33,756
2019	12,197	69	1,342	8	709	3,547	4,256	24	17,795
20-year avg.	6,694	62	1,325	14	739	2,009	2,749	24	10,770
1999–2008 avg.	5,753	63	1,388	15	589	1,503	2,092	22	9,233
2009–2018 avg.	7,636	61	1,261	12	890	2,516	3,406	27	12,308

[a] Nushagak River sonar escapement estimates prior to 2006 were adjusted after the 2012 season to account for a transition in sonar technology that occurred in 2006 (Buck et al 2012).

[b] Due to rounding, district total runs may not equal the sum of the rows. District total run is the sum of Wood, Igushik, Nushagak, and Snake River total run numbers.

Appendix A18.–Inshore commercial catch and escapement of sockeye salmon in the Togiak District by river system, in numbers of fish, Bristol Bay, 1999–2019.

	Catch				Escapement		
					Togiak		
Year	Togiak	Kulukak	Os/Mat[a]	Total	Lake[b]	Total[c]	Total run
1999	346,750	38,662	0	385,412	155,898	231,196	616,608
2000	727,384	67,612	0	794,996	311,970	390,080	1,185,076
2002	214,240	19,032	471	233,743	162,402	199,507	433,250
2001	798,427	10,052	1,618	810,097	296,676	338,616	1,148,713
2003	650,066	55,081	861	706,008	232,302	261,851	967,859
2004	356,747	79,392	1,095	437,234	129,462	154,681	591,915
2005	411,042	54,052	0	465,094	149,178	159,491	624,585
2006	574,629	51,813	0	626,442	312,126	312,126	938,568
2007	758,736	57,845	0	816,581	269,646	269,646	1,086,227
2008	626,792	24,523	0	651,315	205,680	205,680	856,995
2009	516,955	42,504	0	559,459	313,946	313,946	873,388
2010	535,489	132,392	4	667,885	190,970	190,970	858,855
2011	625,423	118,664	547	744,634	188,298	188,298	932,932
2012	586,160	34,731	1,929	622,820	203,148	203,148	825,968
2013	425,407	34,692	7,230	467,329	128,118	128,118	595,447
2014	371,933	59,088	12,237	443,258	151,934	151,934	595,192
2015	313,200	45,331	13,372	371,903	218,700	218,700	590,603
2016	522,187	101,554	22,056	645,797	200,046	200,046	845,843
2017	458,951	44,389	13,148	516,488	195,330	195,330	711,818
2018	829,305	37,645	820	867,770	511,770	511,770	1,379,540
2019	918,577	94,826	5,241	1,018,644	351,846	351,846	1,370,490
20-year avg.	532,491	55,453	3,769	591,713	226,380	241,257	832,969
1999–2008 avg.	546,481	45,806	405	592,692	222,534	252,287	844,980
2009–2018 avg.	518,501	65,099	7,134	590,734	230,226	230,226	820,959

[a] Catches in the Osviak and Matogak Sections were combined.

[b] Tower count.

[c] May include aerial survey counts when available.

Appendix A19.–Chinook salmon harvest, escapement, and total runs in the Nushagak District, in numbers of fish, Bristol Bay, 1999–2019.

	Harvests by fishery				Inriver	Spawning	
Year	Commercial	Sport	Subsistence	Total	abundance[a]	escapement[b]	Total run
1999	11,178	4,237	10,057	25,472	129,686	122,059	147,531
2000	12,120	6,017	9,470	27,607	117,288	108,588	136,195
2001	11,746	5,899	11,760	29,405	191,988	182,632	212,037
2002	40,039	3,693	11,281	55,013	181,307	173,956	228,969
2003	43,485	5,590	18,686	67,761	166,507	155,085	222,846
2004	96,759	6,813	15,610	119,182	242,183	231,224	350,406
2005	62,764	8,565	12,529	83,858	234,123	223,034	306,892
2006	84,881	7,473	9,971	102,325	124,683	116,088	218,413
2007	51,831	9,669	13,330	74,830	60,464	48,644	123,474
2008	18,968	6,700	12,960	38,628	96,641	87,673	126,301
2009	24,693	6,354	12,737	43,784	81,480	72,100	115,884
2010	26,056	3,907	9,150	39,113	36,625[c]	30,443	69,556
2011	26,927	4,844	12,461	44,232	59,728[c]	51,068	95,300
2012	11,952	5,931	10,350	28,233	107,786[c]	101,049	129,282
2013	10,213	6,685	11,602	28,500	113,709	104,746	133,246
2014	11,862	6,260	16,049	34,171	70,482	62,701	96,872
2015	50,675	7,234	12,117	70,026	98,019	89,286	159,312
2016	23,783	8,411	16,576	48,770	125,368	118,077	166,847
2017	32,194	5,671	11,060	48,925	56,961	52,298	101,223
2018	35,938	8,397	12,206	56,541	97,239	91,089	147,630
2019	21,509	7,195[d]	13,602[d]	42,305	46,763	36,120	78,425
20-year avg.	34,403	6,418	12,498	53,319	119,613	111,092	164,411
1999–2008 avg.	43,377	6,466	12,565	62,408	154,487	144,898	207,307
2009–2018 avg.	25,429	6,369	12,431	44,230	84,740	77,286	121,515

[a] Inriver abundance estimated by sonar below the village of Portage Creek. Estimates prior to 2006 were adjusted after the 2012 season to account for a transition in sonar technology that occurred in 2006 (Buck et al. 2012).

[b] Spawning escapement estimated from the following: 1999 from comprehensive aerial surveys; 1992–1996 and 1998–2008 from inriver abundance estimated by sonar minus inriver harvests.

[c] Revised passage estimates are 60,185 (2010), 108,278 (2011), and 174,085 (2012).

[d] Data not available at the time of publication. Five-year average used.

Appendix A20.–Chinook salmon harvest, escapement, and total runs in the Togiak River drainage, in numbers of fish, Togiak District, Bristol Bay, 1999–2019.

	Harvests by fishery				Spawning	Total
Year	Commercial	Sport[a]	Subsistence	Total	escapement[b]	run
1999	10,830	644	1,244	12,718	9,520	22,238
2000	7,258	470	1,116	8,844	11,813	20,657
2001	9,518	1,006	1,612	12,136	13,110	25,246
2002	2,682	76	703	3,461	9,515	12,976
2003	3,078	706	1,208	4,992	3,050[c]	[d]
2004	7,673	1,388	1,094	10,155	12,324	22,479
2005	10,125	1,734	1,528	13,387	10,200	23,587
2006	15,078	1,064	1,630	17,772	[e]	[d]
2007	7,142	1,501	1,234	9,877	0[c]	[d]
2008	2,891	592	1,337	4,820	2,140[c]	[d]
2009	4,429	606	827	5,862	[e]	[d]
2010	5,160	591	1,162	6,913	10,096[f]	17,009
2011	5,780	871	966	7,617	2,140	9,757
2012	4,357	859	933	6,149	1,503	7,652
2013	2,458	900	691	4,049	[e]	[d]
2014	1,477	2,166	607	4,250	3,994	8,244
2015	2,448	983	876	4,307	2,922	7,229
2016	3,831	787	1,140	5,758	[e]	[d]
2017	3,413	978	949	5,340	[e]	[d]
2018	3,457	641	481	4,579	[e]	[d]
2019	3,568	1,111[g]	811[g]	5,490	[e]	[d]
20-year avg.	5,654	928	1,067	7,649	6,595	16,098
1999–2008 avg.	7,628	918	1,271	9,816	7,964	21,197
2009–2018 avg.	3,681	938	863	5,482	4,131	9,978

[a] Sport fish harvest estimate only includes the Togiak River Section.

[b] Spawning escapement estimated from comprehensive aerial surveys.

[c] Partial survey.

[d] Total run size cannot be determined in the absence of complete escapement data.

[e] No survey conducted.

[f] U.S. Fish and Wildlife Service radio telemetry-derived escapement estimate.

[g] Data not available at the time of publication. Five-year average used.

Appendix A21.–Inshore commercial catch and escapement of chum salmon in the Nushagak and Togiak Districts, in numbers of fish, 1999–2019.

	Nushagak District			Togiak District		
Year	Catch	Escapement[a]	Total run	Catch	Escapement[b]	Total run
1999	170,806	307,586	478,392	111,677	116,183	227,860
2000	114,456	179,394	293,850	140,175	80,860[c]	[d]
2001	526,739	716,850	1,243,589	211,701	252,610	464,311
2002	276,787	533,095	809,882	112,987	154,360	267,347
2003	740,372	374,992	1,115,364	68,154	39,090[c]	[d]
2004	458,916	360,265	819,181	94,025	103,810	197,835
2005	966,069	519,618	1,485,687	124,695	108,346	233,041
2006	1,240,235	661,003	1,901,238	223,364	26,900	[d]
2007	953,292	161,483	1,114,775	202,486	[e]	[d]
2008	492,341	326,300	818,641	301,967	279,580[c]	[d]
2009	745,161	438,481	1,183,642	141,375	[e]	[d]
2010	424,234	273,914	698,148	118,767	[e]	[d]
2011	296,909	248,278	545,187	113,234	[e]	[d]
2012	272,163	364,499	636,662	206,614	[e]	[d]
2013	340,881	623,326	628,134	208,786	[e]	[d]
2014	242,261	552,797	795,058	100,195	[e]	[d]
2015	502,981	288,929	791,910	103,773	[e]	[d]
2016	397,761	419,810	817,571	187,508	[e]	[d]
2017	804,878	415,488	1,220,366	204,518	[e]	[d]
2018	1,020,227	811,283	1,831,510	158,329	[e]	[d]
2019	855,428	651,164	1,506,592	227,731	[e]	[d]
20-year avg.	549,373	428,870	961,439	156,717	129,082	69,520
1999–2008 avg.	594,001	414,059	1,008,060	159,123	129,082	139,039
2009–2018 avg.	504,746	443,681	914,819	154,310		

Note: Blank cells represent no data.

[a] Escapement based on estimates from the Nushagak River sonar project at Portage Creek. Estimates prior to 2006 were adjusted after the 2012 season to account for a transition in sonar technology that occurred in 2006 (Buck et al. 2012).

[b] Escapement estimates based on aerial surveys. Estimate includes Togiak, Kulukak, Matogak, Osviak, Slug, Quigmy, Negukthlik, and Ungalikthluk Rivers except where noted.

[c] Partial survey count.

[d] Total run size cannot be determined in the absence of complete escapement data.

[e] Chum salmon spawning escapement survey did not occur.

Appendix A22.–Average round weight (lb) of the commercial salmon catch by species, Bristol Bay, 1999–2019.

Year	Sockeye	Chinook	Chum	Pink	Coho
1999	5.3	14.3	6.7	3.2	6.4
2000	6.1	15.7	6.9	3.7	7.6
2001	6.7	17.4	8.2	2.8	7.1
2002	6.1	18.2	7.1	3.8	6.8
2003	6.3	16.0	6.5	4.0	6.9
2004	5.8	15.4	6.6	4.1	6.8
2005	6.3	16.6	7.1	3.5	6.3
2006	5.7	17.0	7.7	3.7	6.4
2007	5.8	13.5	6.1	3.5	6.4
2008	5.8	15.5	6.5	3.6	6.5
2009	5.9	15.2	6.3	3.3	6.5
2010	5.5	14.7	6.4	3.2	8.9
2011	6.2	13.0	7.0	3.2	6.8
2012	5.7	13.9	6.7	3.1	5.4
2013	6.0	15.3	6.4	3.9	6.0
2014	5.6	15.4	6.1	3.7	6.4
2015	5.2	15.1	6.1	3.7	6.7
2016	5.4	12.6	6.0	4.0	5.8
2017	5.5	11.2	6.4	3.9	6.3
2018	5.1	10.5	6.3	3.6	6.5
2019	5.2	11.6	6.2	3.2	6.0
20-year avg.	5.8	15.2	6.7	3.6	6.7
1999–2008 avg.	6.0	16.1	6.9	3.6	6.9
2009–2018 avg.	5.6	13.7	6.4	3.6	6.5

Appendix A23.–Average price paid in dollars per pound for salmon, by species, Bristol Bay, 1999–2019.

Year	Sockeye	Chinook	Chum	Pink	Coho
1999	0.84	0.53	0.10	0.09	0.72
2000	0.67	0.46	0.09	0.08	0.41
2001	0.42	0.31	0.11	0.09	0.33
2002	0.49	0.33	0.09	0.06	0.32
2003	0.51	0.32	0.08	0.07	0.27
2004	0.51	0.37	0.09	0.09	0.31
2005	0.62	0.58	0.11	0.02	0.29
2006	0.66	0.71	0.12	0.03	0.38
2007	0.67	0.64	0.13	0.03	0.41
2008	0.75	0.83	0.17	0.17	0.55
2009	0.80	0.89	0.17	0.07	0.56
2010	1.07	1.18	0.28	0.36	0.66
2011	1.17	1.04	0.37	0.29	0.74
2012	1.18	1.31	0.34	0.39	0.55
2013	1.61	1.48	0.30	0.14	0.79
2014	1.35	1.32	0.41	0.24	0.84
2015	0.64	0.56	0.30	0.06	0.39
2016	0.96	0.84	0.30	0.18	0.58
2017	1.30	0.94	0.29	0.15	0.70
2018	1.60	1.02	0.37	0.27	0.68
2019[a]	1.35	0.50	0.25	0.05	0.55
20-year avg.	0.91	0.78	0.21	0.14	0.52
1999–2008 avg.	0.67	0.52	0.11	0.07	0.41
2009–2018 avg.	1.17	1.06	0.31	0.22	0.65

Source: OCEANAK ADF&G Commercial Operators Annual Report (COAR) Buy Subject Area. ADF&G is not responsible for errors or deficiencies in reproduction, subsequent analysis, or interpretation.

Note: The exvessel value includes any postseason adjustments or bonuses paid after the fish was purchased. Prices represent a weighted average price per pound by species and area. Prices may reflect a mixture of gear types and delivery conditions.

[a] Price does not include postseason adjustments or bonuses.

Appendix A24.–Estimated exvessel value of the commercial salmon catch by species, in thousands of dollars, Bristol Bay, 1999–2019.

Year	Sockeye	Chinook	Chum	Pink[a]	Coho	Total[b]
1999	104,354	186	331		398	105,269
2000	78,214	152	228	16	687	79,297
2001	38,211	135	712		43	39,101
2002	31,962	277	287	0	18	32,544
2003	46,897	236	423		238	47,794
2004	76,175	634	423	171	150	77,553
2005	96,044	720	946		168	97,878
2006	110,372	1,240	1,441	19	191	113,263
2007	119,196	542	1,583		120	121,441
2008	118,028	297	1,344	171	401	120,241
2009	142,457	387	1,347		177	144,368
2010	176,784	495	1,743	1,567	470	181,059
2011	154,851	455	1,542		62	137,726
2012	139,675	338	1,475	860	345	142,693
2013	148,681	366	2,049		654	151,750
2014	217,311	311	1,214	1,209	1,990	222,035
2015	123,547	347	1,758		92	125,744
2016	192,349	361	1,688	547	312	195,257
2017	271,549	431	2,594		1,071	275,645
2018	344,253	477	2,891	238	720	348,579
2019[c]	300,883	193	2,158	1	267	303,502
20-year avg.	133,211	458	1,251	437	430	134,665
1999–2008 avg.	80,544	513	724	64	286	82,101
2009–2018 avg.	191,146	397	1,830	884	589	192,486

Source: OCEANAK ADF&G Commercial Operators Annual Report (COAR) Buy Subject Area. ADF&G is not responsible for errors or deficiencies in reproduction, subsequent analysis, or interpretation.

Note: The exvessel value includes any postseason adjustments or bonuses paid after the fish was purchased. Prices represent a weighted average price per pound by species and area. Prices may reflect a mixture of gear types and delivery conditions.

Note: Blank cells represent no data.

[a] Averages include even-years only.

[b] Total may vary from actual sum due to rounding.

[c] Exvessel value does not include post-season adjustments or bonuses. Derived from price per pound times commercial catch.

Appendix A25.–South Unimak and Shumigan Island preseason sockeye salmon quota, actual sockeye and chum salmon harvest in thousands of fish, Alaska Peninsula, 1999–2019.

	South Unimak			Shumigan Island			Total		
	Sockeye			Sockeye			Sockeye		
Year	Actual	Quota[a]	Chum	Actual	Quota[a]	Chum	Actual	Quota[a]	Chum
1999	1,106	1,024	187	269	226	58	1,375	1,250	245
2000	892	1,650	169	359	363	70	1,251	2,013	239
2001	271		185	130		149	401		334
2002	356		201	235		178	591		379
2003	336		121	117		161	453		282
2004	532		131	816		357	1,348		488
2005	437		144	567		282	1,004		426
2006	491		96	441		204	932		300
2007	738		153	852		144	1,023		297
2008	1,064		285	650		126	1,714		411
2009	594		201	573		496	1,167		697
2010	488		100	331		171	819		271
2011	937		231	422		192	1,359		423
2012	900		212	628		181	1,528		393
2013	1,049		189	508		208	1,557		397
2014	413		208	252		181	665		389
2015	618		42	497		136	1,115		178
2016	877		149	416		122	1,293		271
2017	1,071		179	883		461	1,954		640
2018	415		234	407		303	822		537
2019	388		273	246		332	634		605
20-yr avg.	707		169	463		196	1,142		365
1999–2008 avg.	654		170	432		162	1,035		331
2009–2018 avg.	736		175	492		245	1,228		420

Note: Blank cells represent no data.

[a] Sockeye quota management system used from 1992–2000. The system was based on 8.3% of the Bristol Bay projected inshore harvest and traditional harvest patterns.

Appendix A26.–Subsistence salmon harvest by species, in numbers of fish, by district and location fished, Bristol Bay, 2019.

Area and river system	No. of permits issued[a]	Estimated salmon harvest[b]					
		Chinook	Sockeye	Coho	Chum	Pink	Total
Naknek-Kvichak District	431	573	42,902	548	296	92	44,411
Naknek River Subdistrict	270	553	21,335	540	280	81	22,789
Kvichak River/Iliamna Lake Subdistrict	162	20	21,566	8	17	11	21,621
Igiugig	2	10	83	0	2	10	105
Iliamna Lake-General	29	0	3,310	0	0	0	3,310
Kijik	1	0	0	0	0	0	0
King Salmon Creek	1	0	180	0	0	0	180
Kokhanok	16	10	3,526	8	11	1	3,555
Kvichak River	30	0	3,247	0	0	0	3,247
Lake Clark	36	0	3,282	0	0	0	3,282
Levelock	4	0	38	0	3	0	40
Newhalen River	25	0	4,384	0	0	0	4,384
Pedro Bay	17	0	1,616	0	0	0	1,616
Pile Bay	1	0	214	0	1	0	215
Six Mile Lake	12	0	1,687	0	0	0	1,687
Egegik District	18	39	730	122	6	2	899
Ugashik District	17	65	879	57	7	2	1,010
Nushagak District	623	10,185	29,123	5,474	2,948	258	47,988
Igushik/Snake River	22	42	1,655	49	36	14	1,796
Nushagak Bay Commercial	62	1,045	3,004	1,015	351	18	5,432
Nushagak Bay Noncommercial	366	3,827	14,304	2,624	1,304	175	22,233
Nushagak River	108	3,946	3,244	759	817	4	8,771
Site Unknown	4	11	66	16	24	0	117
Wood River	117	1,314	6,851	1,011	416	47	9,639
Togiak District	28	599	1,779	98	143	26	2,645
Total	1,106	11,461	75,413	6,298	3,402	379	96,953

Source: Alaska Subsistence Fisheries Database (ASFDB). 1999– . Alaska Department of Fish and Game, Division of Subsistence, Anchorage, AK (database not publicly available).

Note: Harvests are extrapolated for all permits issued, based on those returned and area fished as recorded on the permit. Due to rounding, the sum of columns and rows may not equal the estimated total. Of 1,106 permits issued for the management area, 806 were returned (72.9%).

[a] Sum of sites may exceed district totals, and sum of districts may exceed area total, because permittees may use more than 1 site.

[b] Preliminary data as of April 20, 2020.

Appendix A27.–Subsistence salmon harvest by district and species, Bristol Bay, 1999–2019.

Year	Permits issued	Sockeye	Chinook	Chum	Pink	Coho	Total
NAKNEK KVICHAK DISTRICT							
1999	528	85,315	1,567	725	210	856	88,674
2000	562	61,817	894	560	845	937	65,053
2001	506	57,250	869	667	383	740	59,909
2002	471	52,805	837	909	1,137	943	56,632
2003	489	61,443	1,221	259	198	812	63,934
2004	481	71,110	1,075	469	1,080	566	74,300
2005	462	69,211	1,047	546	275	1,224	72,302
2006	468	69,097	881	341	757	720	71,796
2007	480	69,837	672	405	262	1,104	72,280
2008	481	69,823	719	404	801	1,437	73,184
2009	461	67,970	392	167	36	669	69,235
2010	437	62,309	422	233	835	645	64,445
2011	484	67,164	550	215	56	690	68,675
2012	483	72,708	785	127	474	485	74,579
2013	460	62,143	502	403	88	399	63,535
2014	473	65,810	562	272	386	573	67,603
2015	486	69,720	678	263	126	796	71,583
2016	422	53,502	938	254	349	609	55,653
2017	441	50,574	723	283	129	1,116	52,825
2018	452	48,775	943	174	183	1,155	51,230
2019[a]	431	42,902	573	296	92	548	44,411
20-year avg.	476	64,419	814	384	430	824	66,871
1999–2008 avg.	493	66,771	978	529	595	934	69,806
2009–2018 avg.	460	62,068	650	239	266	714	63,936
EGEGIK DISTRICT							
1999	42	2,434	106	35	2	806	3,384
2000	31	842	16	11	0	262	1,131
2001	57	2,493	111	105	16	928	3,653
2002	53	1,892	65	34	12	356	2,359
2003	62	3,240	84	32	10	297	3,663
2004	46	2,618	169	410	91	1,423	4,711
2005	45	2,267	81	231	2	526	3,106
2006	41	1,641	94	34	7	641	2,418
2007	28	980	165	72	26	334	1,577
2008	37	1,502	91	35	4	295	1,928
2009	26	778	31	6	5	133	953
2010	37	1,657	93	59	8	275	2,091
2011	37	1,772	91	23	2	377	2,265
2012	38	1,172	37	19	7	190	1,425
2013	44	2,108	45	17	5	205	2,380
2014	36	972	150	4	2	237	1,366
2015	32	1,253	150	38	13	353	1,806
2016	26	366	27	3	0	167	563
2017	23	1,243	129	13	6	430	1,821
2018	22	540	48	16	9	548	1,161
2019[a]	18	730	39	6	2	122	899
20-year avg.	38	1,589	89	60	11	439	2,188
1999–2008 avg.	44	1,991	98	100	17	587	2,793
2009–2018 avg.	32	1,186	80	20	6	291	1,583

-continued-

Year	Permits issued	Sockeye	Chinook	Chum	Pink	Coho	Total
UGASHIK DISTRICT							
1999	25	1,365	35	5	0	271	1,675
2000	31	1,927	51	34	1	467	2,481
2001	24	1,197	61	8	2	357	1,624
2002	23	1,294	51	14	2	460	1,821
2003	23	1,113	31	30	0	392	1,567
2004	21	804	64	9	4	234	1,116
2005	22	818	27	18	2	249	1,114
2006	25	962	41	6	16	339	1,364
2007	17	1,056	43	88	79	281	1,546
2008	14	1,660	47	17	9	222	1,955
2009	15	1,061	33	4	41	131	1,270
2010	18	896	21	4	0	135	1,056
2011	15	531	15	3	2	136	687
2012	20	997	31	25	0	228	1,281
2013	14	537	19	10	0	106	672
2014	20	566	50	1	0	224	842
2015	20	935	53	8	0	217	1,214
2016	19	1,100	106	20	9	199	1,432
2017	15	444	18	5	2	113	581
2018	18	1,479	81	13	18	293	1,883
2019[a]	17	879	65	7	2	57	1,010
20-year avg.	20	1,037	44	16	9	253	1,359
1999–2008 avg.	23	1,220	45	23	12	327	1,626
2009–2018 avg.	17	855	43	9	7	178	1,092
NUSHAGAK DISTRICT							
1999	548	29,387	10,057	2,409	124	3,993	45,969
2000	541	24,451	9,470	3,463	1,662	5,983	45,029
2001	554	26,939	11,760	3,011	378	5,993	48,080
2002	520	22,777	11,281	5,096	1,179	4,565	44,897
2003	527	25,491	18,686	5,064	403	5,432	55,076
2004	511	17,491	15,610	3,869	1,944	4,240	43,154
2005	502	23,916	12,529	5,006	793	5,596	47,841
2006	461	20,773	9,971	4,448	1,591	3,590	40,373
2007	496	25,127	13,330	3,006	430	3,050	44,944
2008	571	26,828	12,960	4,552	1,923	5,133	51,395
2009	530	26,922	12,737	4,510	355	6,777	51,300
2010	528	22,326	9,150	3,660	1,672	2,983	39,791
2011	525	28,006	12,461	3,055	230	5,746	49,498
2012	517	20,587	10,350	3,072	1,309	2,642	37,960
2013	584	30,283	11,602	4,368	206	7,717	54,176
2014	581	27,073	16,049	5,731	2,110	7,463	58,425
2015	591	25,240	12,117	2,953	295	5,644	46,248
2016	649	27,425	16,576	4,602	4,409	4,792	57,803
2017	562	31,206	11,060	3,965	254	5,732	52,218
2018	589	25,547	12,206	3,635	840	4,735	46,963
2019[a]	623	29,123	10,185	2,948	258	5,474	47,988
20-year avg.	544	25,390	12,498	3,974	1,105	5,090	48,057
1999–2008 avg.	523	24,318	12,565	3,992	1,043	4,757	46,676
2009–2018 avg.	566	26,461	12,431	3,955	1,168	5,423	49,438

-continued-

Year	Permits issued	Sockeye	Chinook	Chum	Pink	Coho	Total
TOGIAK DISTRICT							
1999	76	3,780	1,244	479	84	217	5,804
2000	54	3,013	1,116	569	90	342	5,130
2001	92	2,576	1,612	367	61	388	6,590
2002	36	2,890	703	605	10	241	3,878
2003	92	2,357	1,208	483	451	883	7,428
2004	46	2,221	1,094	383	108	204	3,584
2005	45	2,299	1,528	301	26	295	4,448
2006	61	2,728	1,630	492	355	408	5,613
2007	48	2,548	1,234	420	19	110	4,332
2008	91	3,770	1,337	701	114	541	6,463
2009	40	2,220	827	365	5	272	3,689
2010	64	3,256	1,162	735	113	514	5,779
2011	68	3,462	966	497	42	545	5,512
2012	53	5,265	933	764	84	293	7,339
2013	64	3,695	691	375	33	208	5,002
2014	59	4,586	607	669	190	486	6,539
2015	48	2,387	876	312	23	650	4,249
2016	70	3,772	1,140	376	198	521	6,007
2017	69	5,436	949	556	107	900	7,948
2018	34	2,326	481	192	85	181	3,264
2019[a]	28	1,779	599	143	26	98	2,645
20-year avg.	61	3,229	1,067	482	110	410	5,430
1999–2008 avg.	64	2,818	1,271	480	132	363	5,327
2009–2018 avg.	57	3,641	863	484	88	457	5,533
TOTAL BRISTOL BAY AREA							
1999	1,219	122,281	13,009	3,653	420	6,143	145,506
2000	1,219	92,050	11,547	4,637	2,599	7,991	118,824
2001	1,226	92,041	14,412	4,158	839	8,406	119,856
2002	1,093	81,088	12,936	6,658	2,341	6,565	109,587
2003	1,182	95,690	21,231	5,868	1,062	7,816	131,667
2004	1,100	93,819	18,012	5,141	3,225	6,667	126,865
2005	1,076	98,511	15,212	6,102	1,098	7,889	128,811
2006	1,050	95,201	12,617	5,321	2,726	5,697	121,564
2007	1,062	107,778	15,484	3,972	796	4,870	132,901
2008	1,178	103,583	15,153	5,710	2,851	7,627	134,924
2009	1,063	98,951	14,020	5,052	442	7,982	126,447
2010	1,082	90,444	10,852	4,692	2,627	4,623	113,238
2011	1,129	100,935	14,083	3,793	332	7,494	126,637
2012	1,107	100,728	12,136	4,007	1,874	3,837	122,582
2013	1,162	98,765	12,858	5,173	333	8,635	125,764
2014	1,158	99,008	17,417	6,677	2,689	8,984	134,775
2015	1,169	99,535	13,874	3,573	458	7,659	125,100
2016	1,180	86,165	18,787	5,255	4,964	6,287	121,458
2017	1,103	88,903	12,880	4,821	498	8,291	115,393
2018	1,105	78,666	13,758	4,030	1,135	6,913	104,502
2019[a]	1,106	75,413	11,461	3,402	379	6,298	96,953
20-year avg.	1,133	96,207	14,514	4,915	1,665	7,019	124,320
1999–2008 avg.	1,141	98,204	14,961	5,122	1,796	6,967	127,050
2009–2018 avg.	1,126	94,210	14,067	4,707	1,535	7,070	121,590

Note: The sum of columns and rows may not equal the estimated total due to rounding. Harvests extrapolated over areas based on permits returned.

[a] Preliminary data as of April 20, 2020.

Appendix A28.–Subsistence harvest of sockeye salmon by community, Kvichak River drainage, Bristol Bay, 1999–2019.

Year	Levelock	Igiugig	Pedro Bay	Kokhanok	Iliamna Newhalen[a]	Nondalton	Port Alsworth	Other[b]	Total
1999	1,276	1,608	5,005	10,725	14,129	17,864	4,282	2,834	57,723
2000	1,467	1,981	1,815	7,175	6,679	11,953	3,200	2,720	36,990
2001	908	779	2,118	9,447	8,132	7,566	1,958	1,901	32,808
2002	625	2,138	2,687	9,847	9,417	5,508	1,201	1,578	33,001
2003	737	1,081	2,135	9,771	13,824	8,016	1,370	1,591	38,495
2004	1,000	1,026	4,803	11,869	21,652	8,789	2,455	1,631	53,225
2005	914	1,017	4,162	16,801	12,010	8,824	2,457	2,078	48,263
2006	0	1,252	4,319	19,028	11,487	8,885	2,418	2,461	49,850
2007	102	1,803	5,487	15,105	11,453	7,902	3,211	2,410	47,473
2008	30	1,558	4,884	14,755	13,569	8,916	3,307	2,544	49,563
2009	759	1,457	7,802	15,759	9,871	5,709	3,155	2,260	46,772
2010	940	2,901	5,609	13,973	8,815	3,185	3,250	2,015	40,688
2011	933	1,931	3,898	9,895	15,433	7,947	4,026	1,163	45,226
2012	750	2,608	4,028	16,530	12,933	9,247	4,420	1,855	52,370
2013	984	345	3,971	13,392	7,632	10,550	3,377	2,305	42,556
2014	1,170	513	3,999	6,440	11,388	9,004	4,296	4,206	41,016
2015	398	1,153	2,519	8,098	9,691	8,722	6,588	2,207	39,377
2016	1,265	297	2,036	7,087	9,900	2,320	4,090	3,241	30,236
2017	168	700	1,678	5,430	6,403	6,548	3,623	3,282	27,832
2018	401	410	1,228	4,558	8,567	4,228	3,753	2,618	25,764
2019[c]	38	412	1,321	4,708	6,872	1,367	3,905	2,943	21,566
20-year avg.	741	1,328	3,709	11,284	11,149	8,084	3,322	2,345	41,961
1999–2008 avg.	706	1,424	3,741	12,452	12,235	9,422	2,586	2,175	44,739
2009–2018 avg.	777	1,232	3,677	10,116	10,063	6,746	4,058	2,515	39,184

Note: Harvests are extrapolated over areas for all permits issued, based on those returned. Harvest estimates based on community of residence and include fish caught only in the Kvichak District.

[a] Includes Chekok.

[b] Subsistence harvests by non-Kvichak River watershed residents.

[c] Preliminary data as of April 20, 2020.

Appendix A29.–Subsistence salmon harvests by community, Nushagak District, Bristol Bay, 1999–2019.

Year	Dillingham[a]	Manokotak	Aleknagik	Ekwok	New Stuyahok	Koliganek	Other[b]	Total
1999	26,502	3,413	1,532	1,805	4,556	2,772	5,389	45,969
2000	27,931	3,173	1,111	3,946	3,715	2,792	2,362	45,029
2001	26,435	3,700	2,129	2,218	7,294	2,209	4,096	48,080
2002	25,004	3,254	1,517	2,735	6,043	3,098	3,247	44,897
2003	26,955	4,214	2,044	2,291	10,817	5,721	3,034	55,076
2004	23,308	2,052	2,206	1,891	6,714	3,619	3,364	43,154
2005	21,898	1,576	1,795	1,388	9,673	8,422	3,088	47,841
2006	22,184	1,655	2,048	1,499	6,160	3,886	2,941	40,373
2007	25,237	2,442	1,382	1,267	8,284	3,054	3,278	44,944
2008	27,446	5,429	3,309	1,902	5,690	4,423	3,196	51,395
2009	30,184	2,068	2,646	2,345	6,855	3,700	3,502	51,300
2010	22,903	2,665	1,570	1,380	5,608	2,406	3,259	39,791
2011	26,850	1,433	3,016	1,805	7,980	3,539	4,875	49,498
2012	22,037	1,212	2,457	1,253	5,062	2,834	3,105	37,960
2013	26,302	1,375	2,368	2,448	11,104	7,290	3,290	54,176
2014	31,838	1,658	3,560	2,700	7,613	4,654	6,403	58,425
2015	26,049	2,946	2,186	1,618	2,860	2,085	8,504	46,248
2016	37,493	2,486	2,349	1,418	5,716	2,510	5,830	57,803
2017	30,194	2,320	2,767	1,622	5,785	2,286	7,243	52,217
2018	25,867	722	2,351	965	5,213	2,807	9,037	46,963
2019[c]	27,241	1,788	1,257	571	3,963	2,752	10,416	47,988
20-year avg.	26,631	2,490	2,217	1,925	6,637	3,705	4,452	48,057
1999–2008 avg.	25,290	3,091	1,907	2,094	6,895	4,000	3,400	46,676
2009–2018 avg.	27,972	1,889	2,527	1,755	6,379	3,411	5,505	49,438

Note: Harvests are extrapolated over areas for all permits issued based on those returned. Harvest estimates are based on community of residence and include fish caught only in the Nushagak District.

[a] Includes Portage Creek, Clarks Point, and Ekuk.

[b] Subsistence harvests by nonwatershed residents.

[c] A 5-year average was used as current data was not available at the time of publishing.

APPENDIX B: HERRING

Appendix B1.–Sac roe herring industry participation, fishing effort and harvest, Togiak District, 1999–2019.

Year	No. of buyers	Daily processing capacity[a]	Gillnet					Purse Seine				Total harvest[c]
			Fishery dates	Effort[b]	Duration (hours)	Harvest[c]	Roe %	Effort[b]	Duration (hours)	Harvest[c]	Roe %	
1999	12	2,400	5/18–5/26	171	28	4,858	11.5	96	4.7	14,368	9.2	19,226
2000	12	2,100	5/6–5/14	227	67	5,464	10.6	90	15.8	14,957	10.1	20,421
2001	11	2,255	5/6–5/13	96	84	6,491	10.6	64	26.0	15,879	9.2	22,370
2002	8	1,920	5/3–5/13	82	102	5,216	10.9	37	57.5	11,833	9.3	17,049
2003	7	1,920	4/25–5/7	75	142	6,505	10.9	35	110.2	15,158	8.9	21,663
2004	6	2,150	4/29–5/9	54	162	4,980	10.4	31	78.0	13,888	9.5	18,868
2005	8	2,330	4/30–5/8	56	149	5,841	11.2	33	83.0	15,071	9.6	20,912
2006	7	2,060	5/12–5/21	49	144	7,132	10.8	28	113.0	16,821	9.2	23,953
2007	5	1,420	5/10–5/25	25	366	4,012	11.2	21	244.0	13,120	10.0	17,132
2008	7	1,950	5/16–5/31	27	312	4,832	11.4	28	292.0	15,691	8.4	20,523
2009	6	2,015	5/16–5/31	32	314	4,140	10.2	21	266.0	12,967	10.3	17,107
2010	6	2,690	5/11–5/27	35	338	7,540	10.1	26	266.0	18,816	9.7	26,356
2011	5	2,413	5/8–5/31	25	318	5,907	12.1	22	268.0	16,970	9.6	22,877
2012	4	1,970	5/14–6/1	18	534	4,027	12.1	16	328.0	12,994	9.4	17,021
2013	6	2,675	5/11–5/28	37	408	8,244	10.9	26	224.0	19,366	9.0	27,610
2014	6	3,065	4/27–5/13	24	412	6,016	11.9	17	412.0	19,544	9.7	25,560
2015	4	1,880	4/27–5/11	6	328	1,156	11.1	16	328.0	20,240	11.3	21,396
2016	4	2,530	4/17–5/2	3	366	80	12.2	17	306.0	14,799	12.3	14,879
2017	4	1,950	4/28–5/12	15	342	1,342	12.0	19	195.0	15,787	11.4	17,129
2018	4	1,950	4/22–5/14	1	378	[d]		20	254.0	15,856	10.0	15,856
2019	4	2,100	4/16–5/03	3	376	[d]	12.2	19	234.0	22,542	11.8	22,542
20-year avg.	7	2,182		53	265	4,936	11	33	194	15,706	10	20,395
1999–2008 avg.	8	2,051		86	156	5,533	11	46	102	14,679	9	20,212
2009–2018 avg.	5	2,314		20	374	4,272	11	20	285	16,734	10	20,579

Note: Blank cells represent no data.

[a] Number of tons per day based on companies registered.

[b] Total vessels fished.

[c] Harvest in tons and includes deadloss and test fish harvest.

[d] Harvest is confidential due to participation level.

Appendix B2.–Exploitation of Togiak herring stock, 1999–2019.

Year	Biomass estimate[a] (short tons)	Dutch Harbor food/bait	Sac roe				Total harvest	Exploitation rate
			Gillnet[b]	Purse seine[c]	Waste[d]	Total[e]		
1999	124,946	2,398	4,879	14,368	198	19,247	23,250	18.6%
2000	130,904	2,014	5,464	14,857	100	20,321	22,335	17.1%
2001	119,818	1,439	6,491	15,660	219	22,151	23,590	19.7%
2002	120,196	2,846	5,216	11,793	40	17,009	20,115	16.7%
2003	126,213	1,487	6,505	14,778	380	21,283	22,825	18.1%
2004	143,124	1,258	4,980	13,785	103	18,765	20,023	14.0%
2005	108,585	1,154	5,841	14,287	784	20,128	21,282	19.6%
2006	129,976	953	7,132	16,321	500	23,453	24,406	18.8%
2007	134,566	1,214	4,012	12,800	320	16,812	18,026	13.4%
2008	136,495	1,536	4,832	15,691		20,523	22,059	16.2%
2009	121,800	1,941	4,140	12,967		17,107	19,048	15.6%
2010	146,775	1,938	7,540	18,816		26,356	28,294	19.3%
2011	140,860	1,795	5,907	16,970		22,877	24,672	17.5%
2012	123,745	1,807	4,027	12,994		17,021	18,828	15.2%
2013	169,020	1,764	8,243	19,366	1,593	27,609	29,373	17.4%
2014	157,448	1,645	6,016	19,544	54	25,560	27,205	17.3%
2015	163,480	1,972	1,156	20,240	500	21,396	23,368	14.3%
2016	162,244	208	80	14,799		14,879	15,087	9.3%
2017	130,852	1,270	1,342	15,787	466	17,129	18,399	14.1%
2018	136,756	1,188	[f]	15,856		15,856	17,044	12.5%
2019	217,548	1,805	[f]	22,542	1,000	23,542	25,347	11.7%
20-year avg.	136,390	1,591	4,717	15,584	404	20,274	21,961	16.2%
1999–2008 avg.	127,764	1,545	5,608	14,441	306	20,049	21,629	17.1%
2009–2018 avg.	145,298	1,553	3,898	16,734	653	20,579	22,132	15.2%

Note: Blank cells represent no data.

[a] Preseason forecast unless peak biomass inseason estimate exceeded preseason forecast.

[b] Includes bait harvest.

[c] Includes test fish harvest.

[d] Aerial survey estimated waste.

[e] Does not include waste.

[f] Data is confidential because there was only 1 buyer.

Appendix B3.–Age composition by weight of total inshore herring run, Togiak District, 1999–2019.

Year	Age composition (%) ≤4	5	6	7	8	≥9	Spawning biomass[a] (short tons)
1999	[b]	1.0	13.0	9.0	12.0	65.0	157,028
2000	[b]	1.0	2.0	17.0	16.0	63.0	93,214
2001	5.0	21.0	5.0	4.0	27.0	39.0	115,155
2002	1.0	25.0	28.0	4.0	5.0	36.0	61,377
2003	[b]	3.0	37.0	25.0	4.0	31.0	47,074
2004	[b]	[b]	3.8	43.7	24.6	27.5	53,625
2005	[b]	[b]	0.8	11.0	41.4	46.4	163,737
2006	1.8	5.4	2.8	5.4	25.9	58.7	179,580
2007	0.7	7.3	15.5	5.5	9.4	61.7	143,827
2008	6.2	9.0	14.6	15.5	8.1	46.5	136,839
2009	9.4	14.7	14.5	14.9	12.2	34.0	142,154
2010	1.4	16.1	18.1	13.2	13.2	38.3	146,913
2011	[b]	4.0	25.3	21.7	15.7	33.3	62,333
2012	0.5	6.6	16.9	35.8	17.6	22.7	167,738
2013	0.1	2	9.6	24.7	28.8	34.8	169,020
2014	0.7	4.3	9.6	23.5	27.6	34.3	203,267
2015	1.0	4.0	12.8	11.4	24.7	46.1	228,807
2016[c]	–	–	–	–	–	–	136,993
2017	3.4	1.6	5.4	13.0	19.0	56.7	90,269
2018	10.3	15.3	7.5	12.7	16.8	37.4	16,001
2019	1.8	22.4	25.3	14.1	12.3	24.0	177,980

[a] Includes commercial catch, escapement, and documented waste. Age contribution of the commercial purse seine harvest (by weight) was used to represent the total run. Dataset reviewed, fall 2017 (G. B. Buck, ADF&G Division of Commercial Fisheries, Togiak Pacific herring project, 2017, unpublished data).

[b] Contribution of age class is less than 0.5%.

[c] Not available. No sampling of the commercial harvest occurred.

Appendix B4.–Aerial survey estimates of herring biomass (in tons) and spawn deposition (in miles), Togiak District, 1999–2019.

Year	Preseason forecast[a]	Biomass estimate[b]	Spawn estimate
1999	90,000	157,028	56
2000	130,904	93,214	46
2001	119,818	115,155	57
2002	120,196	61,377	32
2003	126,213	47,074	95
2004	143,124	53,625	36
2005	96,029	163,737	28
2006	129,976	179,580	18
2007	134,566	143,827	19
2008	134,516	136,839	49
2009	121,800	142,154	15
2010	146,775	146,913	8
2011	140,860	62,333	36
2012	123,745	167,738	31
2013	169,094	169,020	47
2014	157,448	203,267	92
2015	163,480	228,807	63
2016	164,247	136,993	43
2017	130,852	90,269	[c]
2018	136,756	16,001	[c]
2019	217,548	177,980	71
1999–2018 avg.	124,263	151,541	34
2009–2018 avg.	145,506	79,983	55

[a] Forecasts based on age structured analysis.

[b] Dataset reviewed, fall 2017 (G. B. Buck, ADF&G Division of Commercial Fisheries, Togiak Pacific herring project, 2017, unpublished data).

[c] Not collected.

Appendix B5.–Exvessel value of the commercial herring and spawn-on-kelp harvest, in thousands of dollars, Togiak District, 1999–2018.

Year	Herring sac roe	Total
1999	5,511	6,526
2000	3,718	4,000
2001	3,283	3,090
2002	2,264	1,900
2003	2,664	2,914
2004	2,077	2,659
2005	3,308	3,308
2006	3,168	3,168
2007	2,254	2,254
2008	2,748	2,748
2009	2,803	2,803
2010	3,481	3,481
2011	2,555	2,555
2012	3,698	3,698
2013	4,204	4,204
2014	1,394	1,394
2015	1,031	1,031
2016	1,521	1,521
2017	1,907	1,907
2018	1,629	1,629
2019	1,706	1,706
20-year avg.	2,761	2,840
1999–2008 avg.	3,100	3,257
2009–2018 avg.	2,422	2,422

Note: Exvessel value (value paid to the commercial fishery participants) is derived by multiplying price/ton by the commercial harvest. These estimates do not include any postseason adjustments to fishery participants from processors and should therefore be treated as minimum estimates.

Appendix B6.–Guideline and actual harvests of sac roe herring (tons) and spawn on kelp (lb), Togiak District, 1999–2019.

	Gillnet sac roe			Purse seine sac roe		
Year	Guideline[a]	Actual	% Difference[b]	Guideline[a]	Actual[c]	% Difference[b]
1999	6,914	4,858	–30	20,741	14,368	–31
2000	5,738	5,464	–5	17,215	14,957	–13
2001	6,268	6,491	4	14,624	15,879	9
2002	6,288	5,216	–17	14,673	11,833	–19
2003	6,624	6,505	–2	15,457	15,158	–2
2004	7,568	4,980	–34	17,658	13,888	–21
2005	5,667	5,841	3	13,224	15,071	14
2006	7,059	7,132	1	16,471	16,821	2
2007	7,090	4,012	–43	16,544	13,120	–21
2008	6,864	4,832	–30	16,017	15,602	–3
2009	6,378	4,167	–35	14,882	12,404	–17
2010	7,772	7,540	–3	18,134	18,816	4
2011	7,442	5,907	–21	17,364	16,970	–2
2012	6,487	4,027	–38	15,135	12,994	–14
2013	9,017	8,244	–9	21,040	19,366	–9
2014	8,367	6,468	–23	19,523	19,544	0
2015	8,704	1,220	–86	20,309	20,374	0
2016	8,635	80	–99	20,148	14,799	–27
2017	6,883	1,342	–81	16,060	15,787	–2
2018	7,212	[d]		16,829	15,856	–6
2019	5,386	[d]		24,800	23,542	–5
20-year avg.	7,149	4,965	–29	17,102	15,680	–8
1999–2008 avg.	6,608	5,533	–15	16,262	14,670	–9
2009–2018 avg.	7,690	4,333	–44	17,942	16,691	–7

[a] Harvest guideline derived from preseason forecast or inseason biomass estimate when larger.

[b] (Actual – guideline) / guideline × 100.

[c] Includes deadloss and test fish harvest.

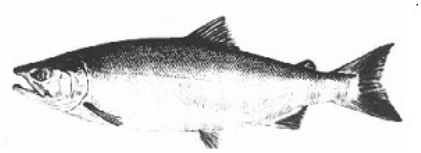
[d] Confidential due to participation levels.

APPENDIX C: 2019 BRISTOL BAY SALMON OUTLOOK

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES
NEWS RELEASE

Douglas Vincent-Lang, Commissioner

Sam Rabung, Director



Travis Elison, Naknek-Kvichak Manager
Paul Salomone, Egegik and Ugashik Manager
Tim Sands, Nushagak and Togiak Manager
Date Issued: April 9, 2019
Time: 11:00 AM

King Salmon Office P.O. Box 37
King Salmon, AK 99613
Phone: 246-3341 Fax: 246-3309
Dillingham Office P.O. Box 230
Dillingham, AK 99576
Phone: 842-5227 Fax: 842-5937

BRISTOL BAY

2019 OUTLOOK FOR COMMERCIAL

SALMON FISHING

INTRODUCTION

This document provides general information to fishermen, processors, and the public concerning the upcoming Bristol Bay salmon season. Included is the general framework for management of each of the five major districts and the 2019 salmon forecast.

During the season, Bristol Bay salmon fishing announcements are broadcast on marine VHF Channel 07A. Current fishing announcements are aired on local radio stations – KAKN and KDLG. As conditions in the fishery change, for the most current information, fishermen should stand by at regular announcement times: 9:00 AM, 12:00 noon, 3:00 PM, 6:00 PM, and 8:00 PM, unless otherwise stated. Information is also available via telephone; for east-side fisheries (Naknek-Kvichak, Egegik, and Ugashik), dial 246-INFO (4636), for west-side fisheries (Nushagak and Togiak) dial 842-5226. Fishermen are asked to note that regular office hours at the Dillingham ADF&G office will be 8:00 AM to 5:00 PM Monday thru Friday. In addition to the regular office hours, from June 15 to July 14 the Dillingham office will be open on weekends from 8:00 AM until 12:00 noon. In King Salmon the office hours are as follows: June 1 to June 14 and after July 17: 8:00 AM to 12:00 PM, and 1:00 PM to 4:30 PM, closed for lunch and weekends. From June 15 to July 17: 8:00 AM to 5:00 PM seven days per week.

Regarding district registration cards: set gillnet permit holders are only required to fill out and return set gillnet registration cards if they fish in the Nushagak District. Drift gillnet permit

-continued-

holders must fill out and return district registration cards prior to commercial fishing in any district in Bristol Bay. District registration cards will be available at the Anchorage, King Salmon, and Dillingham offices beginning May 1. In addition, PDF files of district registration cards are posted on the ADF&G Bristol Bay homepage and can be printed, completed, mailed to the address on the printout, or submitted to Anchorage, King Salmon, or Dillingham office personnel. District registration for drift gillnet permit holders can also be accomplished online at:
http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareabristolbay.salmon#management
Fishery updates, announcements, catch and escapement information, and Port Moller Test Fishery genetic stock composition estimates will be available at:
http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareabristolbay.salmon

The Port Moller Test Fishery daily catch updates and interpretations of the data will be posted at the following web site once the project becomes operational on June 10:
https://www.bbsri.org/port-moller-test-fishery
Fishermen and processors should be aware of the reporting requirements in 5 AAC 06.377(b) that state:
"Each commercial fisherman shall report, on an ADF&G fish ticket, at the time of landing, the number of king and coho salmon taken but not sold."

Alaska Wildlife Troopers – Summer 2019 Outlook – Bristol Bay

Enforcement Priorities:

- Continued strong focus on fishing district lines and open/closed fishing periods in all districts using all available assets.
- Routine boarding of drift gillnet and processor vessels to verify licensing and permitting regulations are met. Fishermen and processors are reminded that at the time of delivery of fish, a fish ticket must be generated and must include the signature of a company representative and the full name and signature of the CFEC permit holder (BOTH permit holders if dual operation). The permit holder must be present at the time of delivery in order to sign the fish ticket. Crew members cannot sign fish tickets for permit holders.
- Continued enforcement of state boating safety laws in cooperation with the U.S. Coast Guard.
- Continued enforcement and educational outreach regarding potential conflicts between resource users and marine mammals in cooperation with National Marine Fisheries Service.
- Increased checks for compliance with legal gear length and depths as well as continued focus on basic vessel and gear ID such as boat, buoy, and cork markings.
- AWT has noted an increase in violations for grounding and failure to report lost gillnets. Fisherman are reminded to review gillnet specifications and operations regulations and be aware that fishing a drift gillnet when the net, or vessel to which it is attached, is grounded is prohibited by regulation and the loss of a gillnet, or portion of the gillnet, is required to be reported to a local department office in Dillingham or King Salmon within 15 hours.

-continued-

Captain of the Port, Western Alaska Navigation Safety Advisory

In January 2018 and 2019, the US Coast Guard participated in industry-led navigation safety workshops composed of Bristol Bay commercial fishermen and tug/barge industry members who developed safety measures and reminders on the International Navigation Rules. This navigation advisory addresses the requirements for operating a vessel upon the navigable waters of Bristol Bay. Additionally, it outlines specific navigational safety concerns and risk mitigation measures for vessels operating in the Naknek River. Please refer to the attached Navigation Safety Advisory for details.

SALMON OUTLOOK

BAYWIDE

The 2019 Bristol Bay sockeye salmon run is forecasted to be approximately 40.2 million fish. Based on the forecast and using the mid-points of the lower or upper portion of escapement goal ranges, depending on forecasted run size, 26.1 million fish are potentially available for commercial inshore harvest (Table 1). The department manages fisheries based on inseason information regarding abundance. The inseason management approach uses a suite of tools to provide information on abundance in each district as each run develops and that information is used by the department to determine fishing opportunity.

The commercial salmon season in Bristol Bay opens June 1 by regulation. Fishing in eastside districts and Togiak will be allowed using a weekly schedule that will vary by district. The schedules are in place to balance fishing opportunity with escapement in the early part of the season, particularly for king salmon. As each run develops and sockeye salmon run characteristics become defined within individual districts, fishing time will be adjusted accordingly. In the Nushagak District, management will focus on king salmon in the early part of the season, and switch to sockeye salmon management as abundance dictates.

2019 Regulatory Changes

The Alaska Board of Fisheries (board) met in Dillingham in November 2018 to review proposals regarding the Bristol Bay Salmon fishery. Action taken at that meeting resulted in the following regulatory changes for the Bristol Bay fishery:

- A mesh size restriction of 5.5 inches or less has been established in the Ugashik and Naknek-Kvichak districts from June 1 through July 22, to help in the conservation of king salmon. Fishermen are reminded that the Egegik District has the same restriction by regulation.
- The late-season fishing schedule for Naknek-Kvichak, Egegik, and Ugashik districts was changed to allow fishing from 9:00 AM Monday to 9:00 AM Sunday, beginning 9:00 AM July 17, or as established by emergency order.
- The Kvichak Section boundary line (north line) was moved slightly north near Graveyard Point to the newly defined coordinate of 58° 52.10' N lat., 157° 00.80' W. long.
- The Alagnak River Sockeye Salmon Special Harvest Area Management Plan was amended to provide opportunity while conserving Kvichak River sockeye salmon, repealed the condition that was tied to the king salmon escapement goal, and provided direction to minimize harvest of king salmon.

-continued-

- Increase minimum distance between set gillnets in the Wood River Special Harvest Area to 250 feet.
- Clarified the definition of districts to include special harvest areas and further clarified gillnet specifications and operations within special harvest areas.

NAKNEK-KVICHAK DISTRICT

An inshore run of approximately 15.5 million sockeye salmon is expected for the Naknek-Kvichak District in 2019. Based on the forecast, the projected harvest in the Naknek-Kvichak District is approximately 7.8 million sockeye salmon: 2.7 million from the Kvichak River, 1.5 million from the Alagnak River, and 3.6 million from the Naknek River (Table 1). Sockeye salmon returning to the Naknek-Kvichak District are predicted to be 43% age-1.2, 42% age-1.3, 11% age-2.2, and 3% age-2.3 fish.

The Naknek River escapement goal range is 800,000 to 2.0 million sockeye salmon. The Kvichak River escapement goal range is 2.0 million to 10.0 million sockeye salmon. The Alagnak River escapement goal was changed to a minimum of 210,000 sockeye salmon. Escapements will be managed within the lower or upper portions of the escapement goals proportional to the run size based on the preseason forecast and inseason assessment of run size.

Fishing in the Naknek-Kvichak District will be open four days per week from 9:00 AM Monday to 9:00 AM Friday, beginning 9:00 AM Monday, June 3 and ending 9:00 AM Friday, June 21. Drift gillnets will be restricted to fishing in the Naknek Section only, while set gillnets will be allowed to fish in the entire Naknek-Kvichak District. From June 21 until July 17 fishing periods will be based on sockeye salmon escapements, abundance in the district, and gear group harvest percentages. District test fishing for inseason management may be conducted periodically depending on run characteristics. As in previous years, some openings could occur on short notice.

EGEGIK DISTRICT

A forecasted inshore run of approximately 8.7 million sockeye salmon is expected for the Egegik River in 2019. The escapement goal range is 800,000 to 2.0 million sockeye salmon. Based on the forecast, the expected surplus potentially available for harvest is 7.0 million fish (Table 1). Approximately 34% of the run is expected to be age-2.2 fish, followed by age-1.2 (28%), age-1.3 (20%), and age 2.3 (19%).

In 2019, separate gear openings and extensions will be used to adjust harvest in an attempt to achieve allocation percentages. Fishermen are reminded that regulations direct the department to avoid "to the extent practicable," continuous fishing with set gillnet gear in the Egegik District, therefore Egegik set gillnet fishermen should expect breaks in fishing.

Based on the Kvichak River sockeye salmon forecast, fishing will begin in the full Egegik District. The season will start with a three day per week schedule that will be in effect through June 14. The primary reason for the three day per week schedule is to provide for king salmon escapement. Commercial fishing will be allowed in the Egegik District from 9:00 AM Monday, until 9:00 AM Wednesday and from 9:00 AM Thursday until 9:00 AM Friday. This schedule will begin at 9:00 AM Monday, June 3 and run through 9:00 AM Friday, June 14 for drift and set gillnet gear. After June 14, additional fishing time for both gear groups will be scheduled according to sockeye salmon run strength. As in previous years, some openings could occur on short notice.

-continued-

Periods will be adjusted to allocate harvest between drift and set gillnet gear groups.

In addition, subsistence fishing will be permitted in the waters of the Egegik commercial district from 12:01 AM Saturday, June 1 until 11:59 PM Sunday, June 16. The department will consider additional directed subsistence openings but will wait until inseason to announce the timing of those openings.

UGASHIK DISTRICT

The forecasted Ugashik River sockeye salmon inshore run in 2019 is 3.3 million fish. The escapement goal range is 500,000 to 1.4 million sockeye salmon. Based on the forecast, 2.4 million fish are potentially available for harvest. Approximately 50% of the run is expected to be age-1.3, 38% age-1.2, 10% age-2.2, and 3% age-2.3 fish.

The Ugashik District allocation plan specifies 10% for set gillnet and 90% for the drift gillnet group. As in previous years, separate gear openings and adjusting length of commercial periods will be used to address allocation between gear groups in 2019.

Beginning 9.00 AM Monday, June 3, commercial fishing in the Ugashik District will be allowed on a 9:00 AM Monday to 9:00 AM Friday schedule through 9:00 AM Friday, June 14. With an expected run to the Kvichak River that exceeds the minimum escapement goal stipulated in regulation, fishing will begin in the full Ugashik District. Additional fishing time after June 14 will depend on fishery performance and run strength indicators. Permit holders should note that the regulation restricting opportunity to no more than 48 hours between June 16 and June 23 will not be in effect in 2019.

In addition, subsistence fishing will be permitted in the waters of the Ugashik commercial district from 12:01 AM Saturday, June 1 until 11:59 PM Sunday, June 16.

WALRUS

It is unknown at this time whether walrus will return to the Cape Greig area. If they do, then the department will use the adjusted line from 2016. If they do not, the district boundaries will revert to those in regulation at 5 AAC 06.200(d). The first announcement of the 2019 season will clarify which boundary will be in place for the summer.

At the March 2013 meeting, the board made changes to when Area T permit holders may fish in the inner portion of the Cinder River Section (river and lagoon) and the Inner Port Heiden Section. The board adopted proposals that would allow Area T permit holders to fish within the inner portion of the Cinder River Section and Inner Port Heiden Section during all months when open by regulation. For further information contact ADF&G in Port Moller at 907-375-2716. Area T permit holders who fish the Cinder River and Port Heiden sections and deliver their catch in the Ugashik District are reminded to report the section of catch on the appropriate fish tickets and note that transporting fish from the sections mentioned above to deliver in the Ugashik District is not permitted during July.

NUSHAGAK DISTRICT

Nushagak River king salmon are managed according to the *Nushagak-Mulchatna King Salmon Management Plan* (5 AAC 06.361). This plan directs the commercial fishery to be managed for an inriver goal of 95,000 king salmon. The department will closely monitor king salmon escapement to evaluate the potential for any directed king salmon openings in 2019.

The Nushagak District sockeye salmon inshore run forecast is approximately 10.0 million fish;

-continued-

2.0 million for escapement and 8.0 million potentially available for harvest in the Nushagak District commercial salmon fishery (Table 1). The total inshore run by river system is: Wood River 4.5 million (escapement goal range 700,000 to 1.8 million), Igushik River 1.5 million (escapement goal range 150,000 to 400,000), and Nushagak River 4.0 million (escapement goal range of 370,000 to 900,000). Approximately 40% of the forecasted run is expected to be age-1.2 sockeye salmon, < 3% age-2.2, 56% age-1.3, and < 1% age-2.3 fish.

The strategy for 2019 is to start directed sockeye salmon openings around June 20 once we have 30,000 sockeye salmon escapement past the Wood River tower. This is contingent upon the Nushagak River king salmon escapement projecting to be at least 95,000. If Nushagak River king salmon escapement is projecting below 95,000 fish, directed sockeye salmon openings will wait until 100,000 sockeye salmon are projected to pass Wood River tower.

Openings will be scheduled based on sockeye salmon escapement levels in the Nushagak and Wood rivers. Mesh size will be limited to 5.5 inches or smaller unless king salmon escapement is above expectations. If the Nushagak River sockeye salmon escapement decreases relative to expected escapements, the department may first warn and then impose the 4.75-inch mesh restriction in the Nushagak District. Based on changes made by the board in December 2015, the department would also open the Wood River Special Harvest Area (WRSHA) at this time. Subsequently, if Nushagak River sockeye salmon escapement falls below the expected 370,000 fish curve, then the department may limit fishing to only the WRSHA to protect Nushagak River sockeye salmon. Commercial openings in the district may follow as allowed by escapement levels in the Nushagak River.

Igushik River sockeye salmon will be managed independently of the Nushagak-Wood River sockeye salmon stocks. Set gillnet fishing will begin in the Igushik Section when there is a market available. Initial openings will be 8-hours per day and additional time will be added if large harvests or escapement information indicate more time is warranted. Drift gillnet openings in the Igushik Section will be added as needed to control sockeye salmon escapement. Igushik River sockeye salmon returns can be quite variable relative to forecasted run strength. Management will incorporate a readiness to respond with increasing early set gillnet openings, and an attempt to maintain the 6% sockeye salmon harvest allocation to the Igushik Section set gillnet group by only adding drift gillnet openings as needed.

The department will switch to coho salmon management around July 23, when sockeye salmon harvest decreases. Sonar counts will be used to make management decisions regarding coho salmon fishing opportunity.

District test fishing for inseason management may be conducted periodically depending on run characteristics. Permit holders interested in test fishing in the Nushagak District should contact Tim Sands in Dillingham at (907) 842-5227.

TOGIAK DISTRICT

The 2019 inshore run of Togiak River sockeye salmon is forecast to be approximately 1.1 million fish. Based on the forecast, approximately 870,000 sockeye salmon will potentially be available for commercial harvest. The escapement goal range is 120,000 to 270,000 sockeye salmon. Approximately 16% of the run is expected to be age 1.2, < 1% of the run is expected to be age 2.2, 83% is expected to be age 1.3 and < 1% is expected to be age 2.3.

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Unlike other fishing districts in Bristol Bay that require emergency orders to announce fishing periods, Togiak District follows a regular weekly schedule that allows fishing in: Togiak Bay Section four days per week, fishing in Kulukak Section two and a half days per week, and fishing in Matogak, Osviak, and Cape Peirce Sections five days per week. Following the *Registration and Reregistration* regulations, permit holders are restricted from fishing in the Togiak District until 9:00 AM July 27 if they have fished in any other district in Bristol Bay, and conversely, restricts permit holders from fishing in any other district until 9:00 AM July 27 if they have fished in the Togiak District. A 2015 board action now requires vessel transfers to be restricted in Togiak District similarly to the restriction of permit transfers. Other recent regulation changes prevent drift gillnet fishing effort near the Togiak River mouth through July 15 and restricts mesh size to 5.5 inches or smaller between June 15 and July 15 for the conservation of king salmon.

King salmon run strength in the Togiak River has been considered below average for several years. The department is anticipating another poor king salmon run, and permit holders can expect emergency orders to reduce the weekly fishing schedule in the last two weeks of June.

Harvest of coho and pink salmon will be dependent on market presence. If a market for coho salmon is present, the department will continue to follow the regular weekly schedule unless it is determined that more conservative action is needed.

Acknowledgements

The department would like to thank the Bristol Bay Fisheries Collaborative (BBFC) for funding assistance in 2018. The BBFC began in 2016 and is an agreement between ADF&G and the Bristol Bay Science and Research Institute to work together with stakeholders to restore a world-class fishery management system and raise funds to support and maintain it. This agreement is supported by ADF&G, BBSRI, drift and set net fishermen, processors, municipalities, villages, support industries and other stakeholders. A list of organizations that committed financial support to the BBFC in 2018, as well as additional information about this agreement can be found at https://www.bbsri.org/bbfc.

-continued-

Table 1.–Forecast of total run, escapement, and harvest of major age classes of sockeye salmon returning to Bristol Bay river systems in 2019.

	Millions of sockeye salmon								
DISTRICT	Forecasted production by age class					Forecasted		South	
River	1.2	2.2	1.3	2.3	Total	Escapement	Harvest	Peninsula[a]	BB Inshore
NAKNEK-KVICHAK									
Kvichak	2.95	1.08	2.87	0.05	6.95	4.00	2.69	0.26	6.69
Alagnak	1.88	0.19	1.88	0.02	3.97	2.28	1.54	0.15	3.82
Naknek	2.18	0.58	2.00	0.45	5.21	1.40	3.61	0.19	5.01
Total	7.01	1.84	6.74	0.53	16.12	7.68	7.84	0.60	15.53
EGEGIK	2.51	3.04	1.81	1.72	9.07	1.70	7.04	0.34	8.74
UGASHIK	1.31	0.33	1.72	0.10	3.46	0.95	2.38	0.13	3.33
NUSHAGAK									
Wood	2.41	0.23	1.94	0.04	4.62	0.98	3.47	0.17	4.45
Igushik	0.62	0.01	0.94	0.01	1.58	0.28	1.25	0.06	1.52
Nushagak	1.12	0.02	2.95	0.02	4.18[b]	0.77	3.26	0.15	4.02
Total	4.14	0.26	5.83	0.07	10.38	2.02	7.97	0.38	9.99
TOGIAK	0.18	0.01	0.95	0.01	1.15	0.23	0.87[c]	0.04	1.10
BRISTOL BAY	15.16	5.49	17.05	2.42	40.18	12.58	26.11	1.49	38.70
	38%	14%	42%	6%	100%				

Note: This table is a summary. Slight differences may appear due to rounding.

[a] Projected harvest is based on the current 5 year running average exploitation rate of 3.7%.

[b] Nushagak River forecast total includes age-0.3 and age-1.4 fish.

[c] Forecasts for Kulukak, Kanik, Osviak, and Matogak river systems are not included. These systems contribute approximately 50,000 sockeye salmon to Togiak District harvest each year.

-continued-

U.S. Department of Homeland Security
United States Coast Guard

Commander
United States Coast Guard
Sector Anchorage

PO Box 5800
JBER, AK 99505
Staff Symbol: s
Phone: 907-428-4200
Fax: 907-428-4128

16670
March 1, 2018

CAPTAIN OF THE PORT, WESTERN ALASKA
NAVIGATION SAFETY ADVISORY

1. **PURPOSE:** This navigation advisory addresses the requirements for operating a vessel upon the navigable waters of Bristol Bay. Additionally, it outlines specific navigational safety concerns and risk mitigation measures for vessels operating in the Naknek River.
2. **DISCUSSION:** In January 2018 the Coast Guard participated in an industry-led navigation safety workshop composed of Bristol Bay commercial fishermen and tug/barge industry members who developed the following safety measures and reminders on the International Navigation Rules:
   a. **Responsibilities Between Vessels**:
      i. All vessels shall adhere to Rule 18 of the International Navigation Rules, which outlines the navigational responsibilities between vessels underway.
      ii. Any vessel less than 20 meters, or 65 feet, shall not impede the passage of a vessel which can safely navigate only within a narrow channel or fairway, per Rule 9 of the International Navigation Rules.
      iii. Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision, per Rule 5 of the International Navigation Rules.
   b. **Anchoring:**
      i. Fishing vessels shall anchor away from the deep draft navigable channel in the Naknek River, as illustrated by the Naknek River Chartlet in Enclosure (1).
      ii. Per Rule 9 of the International Navigation Rules, anchoring within the narrow channel impedes safe navigation, increases the risk of collision, and is a violation of federal regulation.
   c. **Tug/Barge Pre-Arrival Notifications:**
      i. Tug/barge operators should provide a pre-arrival notice to vessels in the Naknek River by all available means per the Pre-Arrival Communication Flowchart in Enclosure (2), and publish transit windows based on a minimum 17 foot Nushagak tide.
      ii. All vessel operators and crew should register to receive tug/barge pre-arrival notices via text message by texting “AML” to 74121.

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d. **Navigation Lights:**

i. Vessels shall display proper navigation lights at all times whether underway, anchored, or engaged in fishing, and use appropriate sound signals as required by the International Navigation Rules.

ii. Vessels shall not use any unauthorized lights, such as sodium or LED lights, that impair the visibility of other mariners or interfere with the keeping of a proper lookout per Rule 20 of the International Navigation Rules.

iii. Fishing vessels shall pay particular attention to Rule 26 and Annex II of the International Navigation Rules, which prescribe the proper lights and shapes that shall be displayed for vessels fishing in close proximity to one another.

e. **Communication**:

i. Tug/barge operators shall make "sécurité" calls on local working VHF frequencies, and alert fishing vessels as necessary when transiting.

ii. All vessels shall monitor VHF channels 13/16 as required by the International Navigation Rules and relay information to fishing vessels as necessary.

iii. Tug/barge operators shall use appropriate sound signals when departing a berth and while underway as required by the International Navigation Rules.

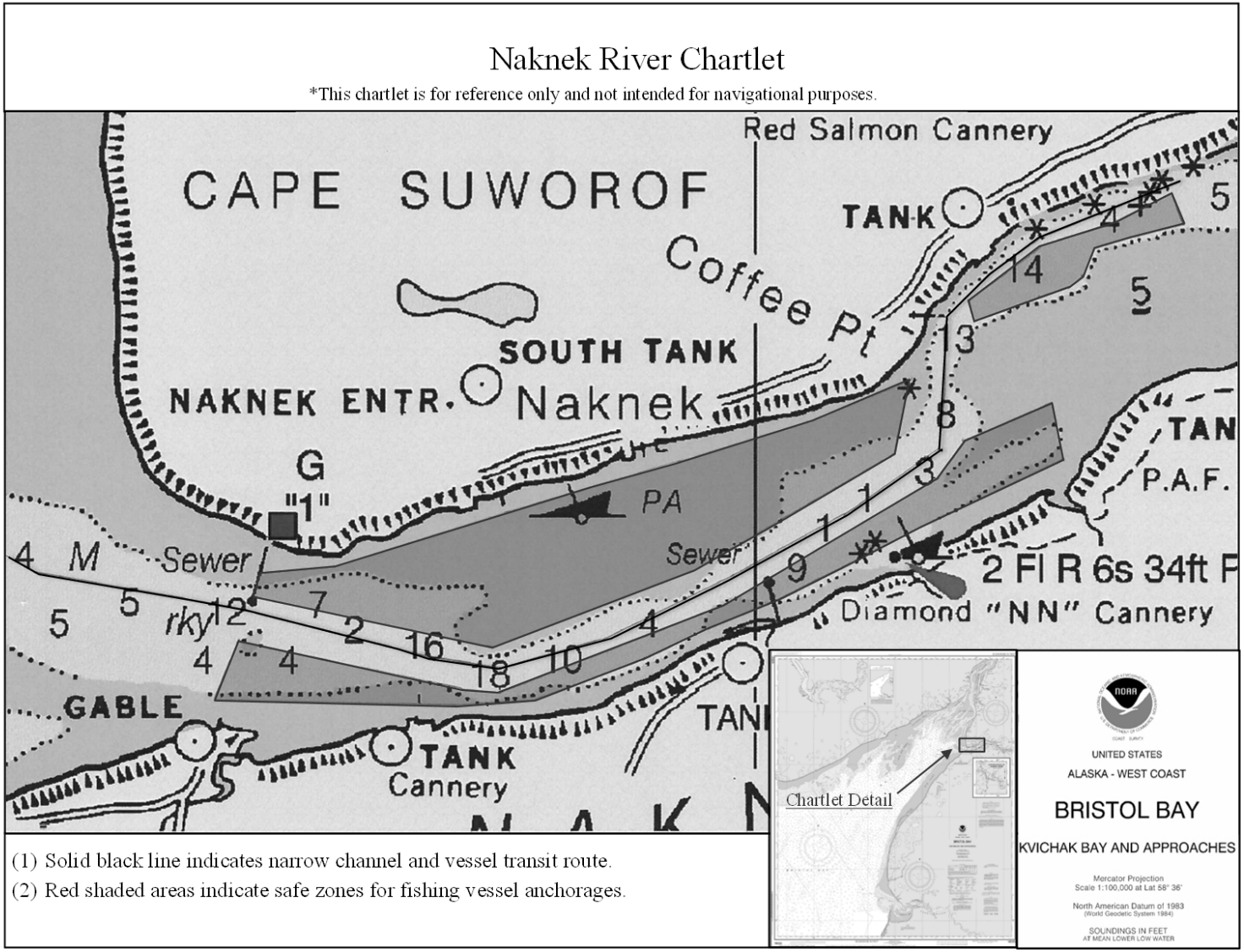
f. **Violation of the International Navigation Rules:**

i. In addition to the specific rules referenced in this advisory, vessels must comply with all International Navigation Rules appropriate to their operations.

ii. Any vessel found in violation of these or any of the International Navigation Rules is subject to enforcement action by the Coast Guard and can result in civil penalties and monetary fines.

S. C. MACKENZIE
Captain, U.S. Coast Guard
Captain of the Port, Western Alaska

-continued-


Naknek River Chartlet
*This chartlet is for reference only and not intended for navigational purposes.
Red Salmon Cannery
CAPE SUWOROF
Coffee Pt
TANK
SOUTH TANK
NAKNEK ENTR.
Naknek
G
"1"
PA
Sewer
Sewer
4 M
5
rky
12
7
2
16
18
10
4
4
9
1
1
3
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14
5
4
5
3
TAN
P.A.F.
2 Fl R 6s 34ft F
Diamond "NN" Cannery
GABLE
TANK
Cannery
TAN
(1) Solid black line indicates narrow channel and vessel transit route.
(2) Red shaded areas indicate safe zones for fishing vessel anchorages.
Chartlet Detail
UNITED STATES
ALASKA - WEST COAST
BRISTOL BAY
KVICHAK BAY AND APPROACHES
Mercator Projection
Scale 1:100,000 at Lat 58° 36'
North American Datum of 1983
(World Geodetic System 1984)
SOUNDINGS IN FEET
AT MEAN LOWER LOW WATER

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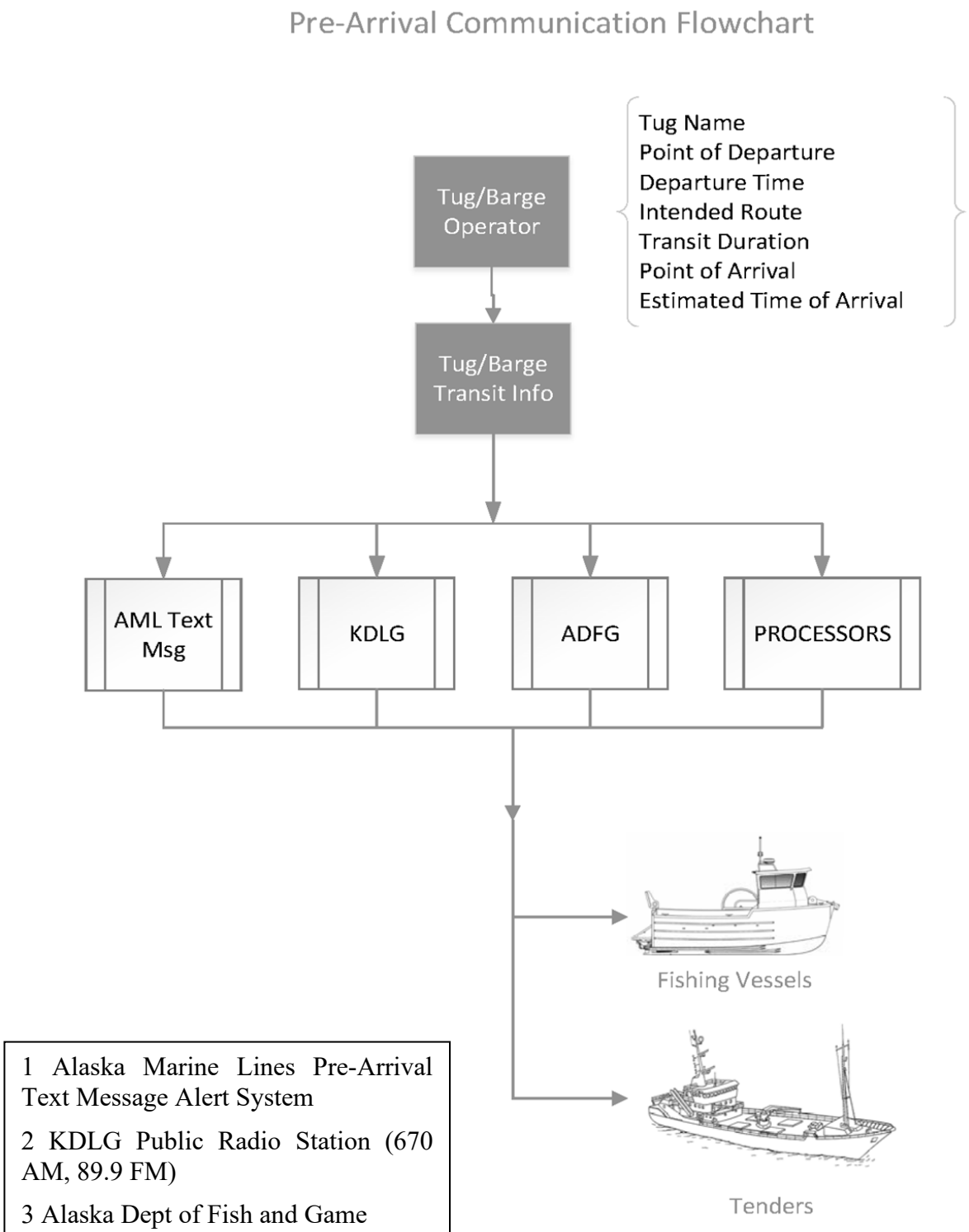
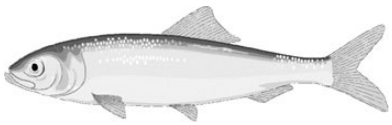

Pre-Arrival Communication Flowchart
Tug Name
Point of Departure
Departure Time
Intended Route
Transit Duration
Point of Arrival
Estimated Time of Arrival
Tug/Barge Operator
Tug/Barge Transit Info
AML Text Msg
KDLG
ADFG
PROCESSORS
Fishing Vessels
Tenders
1 Alaska Marine Lines Pre-Arrival Text Message Alert System
2 KDLG Public Radio Station (670 AM, 89.9 FM)
3 Alaska Dept of Fish and Game

APPENDIX D: 2019 TOGIAK OUTLOOK

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES
NEWS RELEASE

Douglas Vincent-Lang, Commissioner
Sam Rabung, Director



Contact:
Tim Sands, Area Management Biologist
Mariel Terry, Fisheries Biologist
Phone: (907) 842-5227
Fax: (907) 842-5937

Dillingham Area Office
546 Kenny Wren Road
Dillingham, AK, 99576
Date Issued: March 20, 2019
Time: 3:00 PM

2019 TOGIAK HERRING OUTLOOK

The 2019 Togiak District herring biomass is forecast to be 217,548 tons, a 63% increase over the 2018 biomass forecast. This forecast is based on an age-structured analysis (ASA) model that has been used for all Togiak herring forecasts produced since 1993. Herring ages 4–6 are expected to comprise 50% of the projected biomass, ages 7–10 are expected to make up 32% and the remaining 18% are expected to be age 11+ fish.

The commercial fishery and spawn timing of Togiak herring are related to several factors including water temperatures at the spawning grounds in Togiak District and sea surface temperatures in the southeastern Bering Sea. The department uses a sea surface temperature model (SST) based on temperatures near Unalaska to predict the Togiak herring run timing. Additionally, the department tracks ice coverage of the Bering Sea throughout February and March to help inform predictions in run timing as we consider this a useful index for predicting the maturity of herring bound for the Togiak District to spawn. Based on our SST model, the 2019 fishery could commence as early as the third week of April; however, it is important to consider that sea surface temperatures are approximately 1° C warmer than historical averages for this time of year and about 0.3° C warmer than last year. The region of the Bering Sea that we use to predict run timing based on ice coverage is currently ice free. As these conditions are far from normal, it is necessary to note that we have reduced confidence in our ability to accurately forecast timing this year.

The Bristol Bay Herring Management Plan (**5 AAC 27.865**) sets a maximum exploitation rate of 20% for the Togiak District stock. However, based on three years of poor aerial surveys and one year of missing age composition data, the department has applied a conservative exploitation rate of 14% for 2019. The biomass forecast for 2019 is 217,548 tons. Applying the 14% exploitation rate to that biomass yields a quota of 30,457 tons of herring that will be available for harvest in 2019. Harvest allocation, in accordance with the management plan will be

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Fishery	Harvest Allocation
Spawn-on-Kelp	1,500 tons
Dutch Harbor Food and Bait	2,027 tons
Togiak Sac Roe	26,930 tons
Purse Seine (80%)	21,544 tons
Gillnet (20%)	5,386 tons

Participants are reminded that the Board of Fisheries met in December 2018 and changed the allocation plan for the Togiak sac roe herring fishery. The changes, reflected above, now allocate 80% of the Togiak sac roe quota to the purse seine fishery and 20% to the gillnet fishery. The allocation was 70% and 30 % previously. Additionally, up to 50% of any unharvested gillnet quota may also be reallocated to the purse seine fishery in season. The department expects to make all quota available for harvest in 2019 according to these new regulations. With the spawn on kelp roll over also included, up to 24,837 tons of herring will potentially be available for harvest by the purse seine fleet in 2019.

SAC ROE FISHERY

The management strategy for the Togiak herring fishery is designed to provide for maximum sustained yield. In 2019, sac roe fisheries will again be managed to maximize product quality through long openings which allow permit holders to make smaller sets and harvest the highest quality fish. Long openings also allow processors to have flexible control of harvest volume so that holding time between harvest and processing is optimal. Based on a preseason poll, processing capacity is expected to be approximately 2,375 tons per day. The preseason poll also indicates that four processors will participate in the Togiak sac roe herring fishery with a fleet size of three gillnet and 19 purse seine vessels. For the last decade, the department has opened the herring fishery as soon as the threshold biomass of 35,000 tons has been documented and will use this strategy again in 2019. This strategy allows individual companies to maximize their processing capacity and decide what quality fish is suitable for their individual market.

Purse Seine

For at least the last decade, the seine fishery has operated as individual processor-controlled fleets. Indications are that this will be the case again in 2019, and therefore, fishing time and area will be liberal allowing for the harvest of market quality herring. This approach should result in fresher, higher quality roe, thereby maximizing product quality and value. The department will not be coordinating any test fishing efforts however, the department will work with processors that want to make test sets to monitor roe quality prior to the threshold biomass being documented. Based on a preseason poll, there are 19 purse seine vessels expected to participate in the 2019 Togiak sac roe herring fishery.

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Gillnet

Management of the gillnet fishery will be similar to past years. Ample fishing time and area will be allowed in an effort to take as much gillnet herring as possible. In 2019, the department will primarily focus the gillnet fleet in the area east of Right Hand Point. The department will consider opening areas west of Right Hand Point to the gillnet fleet if weather conditions are unfavorable in the eastern section. As in past years, the plan is to open the gillnet area to fishing when threshold biomass is documented. Processors and fishermen may organize test fishing to monitor product quality once the area is open to determine when to begin fishing for production. Until it is determined that commercial quality fish are present, participants should test cautiously with a small portion of gear to reduce waste. Based on a preseason poll, there are three gillnet vessels expected to participate in the 2019 Togiak sac roe herring fishery.

ADF&G OPERATIONS 2019

Beginning in mid-April, current fishery information will be available by calling the telephone recorder in Dillingham at (907) 842-5226. Recordings will be updated regularly throughout the season as information becomes available. The department will conduct aerial surveys of the Togiak District beginning in mid-April, depending on weather conditions. The department will monitor marine VHF channel 7 from Dillingham and be available at the phone number listed at the top of this document. Fishing announcements and regular fishery updates will be communicated directly to each processor, published on the web, and distributed by fax and email. The harvest will be sampled from Naknek shore plants. The department will seek to coordinate directly with plant managers as the season progresses to meet our sampling needs.

Visit http://www.adfg.alaska.gov/index.cfm?adfg=cfnews.main to subscribe to herring fax and/or email updates and announcements. Harvest and fishery opening information will also be available at the Commercial Fisheries website at:

http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareabristolbay.herring_announcements