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2018 Bristol Bay Area Annual Management Report

by

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

Symbols and Abbreviations

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

Weights and measures (metric)

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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2018 BRISTOL BAY AREA ANNUAL MANAGEMENT REPORT

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ABSTRACT

The *2018 Bristol Bay Area Annual Management Report* is the 57th 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 *O. kisutch*) and Pacific herring (*Clupea pallasii*) fisheries. The 2018 inshore sockeye salmon run of 63.0 million fish is the largest on record and 26% above the preseason forecast of 49.8 million fish. Sockeye salmon dominated the inshore commercial harvest, totaling 41.9 million of the 44.0 million fish commercial salmon harvest. Sockeye salmon escapement goals were met or exceeded in all systems where spawning requirements have been defined with a baywide escapement of 21.0 million fish. There was a harvest of 45,000 Chinook, 1,637,000 chum, 244,000 pink, and 162,000 coho salmon. The 2018 Togiak District herring preseason biomass forecast was 136,756 short tons. The purse seine harvest in Togiak was 15,856 short tons and an average roe percent of 11.4%. All 2018 salmon harvest data are considered final and are based on fish tickets.

Key words: 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, but 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 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-year span (1998–2017) averaged approximately 24.7 million sockeye, 45,000 Chinook, 1,000,000 chum, 488,000 (even-years only) pink, and 92,000 coho salmon (Appendices A3–A7). Since 1998, the value of the commercial salmon harvest in Bristol Bay has averaged approximately $124.0 million. Sockeye salmon was the most valuable and averaged $122.5 million annually (Appendix A24). Subsistence catches were composed primarily of sockeye salmon and averaged approximately 126,000 fish (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 and harvests are directed at terminal areas around the mouths of major river systems. Each stock is managed to achieve a spawning escapement goal based on sustained yield. Escapement 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. However, the Alaska Board of Fisheries (BOF) passed a regulation in 2003 that allows 2 drift permit holders to concurrently fish from the same vessel and jointly operate up to 200 fathoms of drift gillnet gear. Drift gillnet permits are the most numerous and 1,863 are in Bristol Bay (Area T) of which, 1,749 were registered to fish in 2018. There are a total of 972 set gillnet permits in Bristol Bay and 879 made at least 1 delivery in 2018 (Appendix A2).

2018 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, 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. Individually, these pieces of information may not give a correct assessment of run size, but collectively, they allow broad scale examination of inseason data such as 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 were not funded by the state general fund in the 2016, 2017, and 2018 fishing seasons. In 2016, the Bristol Bay Fisheries Collaborative (BBFC) was initiated and formed as a grass-roots stakeholder group to temporarily provide financial support for Bristol Bay commercial fisheries management. Members that made financial contributions included fishermen's associations, individual fishermen, 12 different processing companies, 5 different shipping companies, 6 different boroughs and villages, and Bristol Bay Native Corporation. In 2018, BBFC 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.

PRESEASON FORECASTS

Total inshore (excluding harvest in other areas) sockeye salmon production for Bristol Bay in 2018 was forecast to be 49.8 million (Table 1). The Bristol Bay sockeye salmon inshore harvest was predicted to reach 37.6 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 2018 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 1972–2014 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 2017.

SOUTH UNIMAK/SHUMAGIN ISLANDS FISHERY

From 1975 to 2000, the South Unimak and Shumagin Islands commercial fisheries were managed under a guideline harvest level (GHL), which 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) to eliminate the GHL and chum salmon cap and instead established 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 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 2018 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 Bristol Bay fishing districts. A large vessel (70–100′) 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 its arrival to 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 fishermen. The project did not operate in 1986, but with funding from processors, the Fisheries Research Institute (FRI) 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 2018 project operations were modified by adding another vessel and extending the sampling transect further offshore to investigate whether the existing transect adequately captured the migratory pathways traveled by the returning run. 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. Unfortunately, this particular year was the largest Bristol Bay run on record with particularly strong components from the Nushagak and Wood rivers; those stocks are generally distributed

on the western portions (offshore) of the traditional transect. As such, it was difficult to put the 2018 distribution into context. The discovery of fish offshore of the traditional transect may partially explain why inseason projections have been unreliable. However, it is uncertain how the 2018 distribution of salmon along the Port Moller transect represents the annual migratory pathway of returning Bristol Bay sockeye salmon in years of more typical abundance. In 2018 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 fish returning to Bristol Bay through the Port Moller test fishery; and 2) to provide researchers with stock composition estimates, by year, within fishing districts to estimate total runs and develop brood tables.

Genetic sampling was added to the Port Moller test fishery project starting in 2004. The intent was to use inseason genetic analysis to identify components of the annual run in time to inform management decisions for individual stocks. ADF&G genetics staff can complete analysis and deliver results in 3 to 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 to 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 2018, the exvessel value of inshore commercial salmon harvest was an estimated $277.0 million (Table 3), which was 64% above the $169.4 million 10-year (2008–2017) average (Appendix A24). The 2018 average sockeye salmon price was $1.26/pound before incentives and postseason adjustments.

During the 2018 season, a total of 51 processors/buyers registered to process fish from Bristol Bay (Table 4). Of those processors, 3 companies canned, 40 froze, 25 exported fresh, 0 cured salmon, and 15 extracted roe. Product was exported by air by 38 companies and exported by sea by 31 companies.

RUN AND HARVEST PERFORMANCE BY SPECIES

Sockeye Salmon

The 2018 inshore sockeye salmon run of approximately 63.0 million fish was the largest ever recorded in Bristol Bay and 26% above the preseason forecast of 49.8 million (Table 1). All districts except Egegik had run sizes that were above forecast. Sockeye salmon dominated the inshore commercial harvest, totaling 41.9 million fish, which was the second largest sockeye salmon harvest recorded in Bristol Bay (Table 5 and 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 2018;it was the largest total run to Bristol Bay (63.0 million), second largest sockeye salmon harvest in the history of Bristol Bay (41.9 million), the largest single district single season harvest of 24.2 million sockeye salmon occurred in the Nushagak District. The third largest run to a single district of 33.8 million salmon, also the Nushagak District, the largest escapement to the Wood River, largest Togiak run, and contrasted by near historic late run timing in all eastside districts.

Market price rose again in 2018 and finished the season with a base price of $1.26/pound, which was up from $1.02/pound in 2017. Average fish weights were a mixed bag in 2018; 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 approximately 5.1 pounds was below the long-term average (Appendix A22).

Chinook Salmon

The 2018 baywide commercial harvest of 44,720 Chinook salmon nearly matched the 1998–2017 average of 44,681 fish (Appendix A4). The Naknek-Kvichak, Egegik, and Ugashik District harvests were above the 1998–2017 averages and the Togiak District was below average. Harvest in the Nushagak District, the largest producer of Chinook salmon in Bristol Bay, was 35,938, which was below the 1998–2017 average of 38,461 fish (Appendix A4). The Nushagak River Chinook salmon escapement was 97,239 which was within the sustainable escapement goal (SEG) range of 55,000–120,000, and was above the inriver goal of 95,000 (Table 6).

Chum Salmon

In 2018, the commercial harvest of 1,636,806 chum salmon was 62% above the 1998–2017 average of 1,008,690 fish. Chum salmon harvests in all districts were above the 1998–2017 averages (Appendix A5).

Pink Salmon

Bristol Bay has a dominant even-year pink salmon cycle. In 2018, an on-cycle year, the baywide pink salmon harvest was 244,254 pink salmon compared to the 1998–2017 even-year average of 488,383 fish (Appendix A6).

Coho Salmon

Commercial harvest of coho salmon was 161,884 fish, which was 77% above the 1998–2017 average of 91,537. The largest commercial harvest was in the Nushagak District, where the 84,320 fish harvest was 39% higher than the 1998–2017 average of 60,690 coho salmon (Appendix A7). The Nushagak River sonar project was operational until August 17 and enumerated a coho salmon escapement of 111,455 fish (Table 6).

SEASON SUMMARY BY DISTRICT

Naknek-Kvichak District

The 2018 inshore run forecast for the Naknek-Kvichak District was 16.2 million sockeye salmon composed of a projected 7.2 million for escapement and 9.0 million for harvest. The forecast by river system was 8.1 million for the Kvichak River, 4.3 million for the Alagnak River, and 3.8 million for the Naknek River (Table 1). The SEG for Naknek River is a range of 800,000–2.0 million. The SEG for the Kvichak River is a range of 2.0–10.0 million. The Alagnak River has a lower bound SEG of 320,000. The total inshore run to the district for 2018 was 17.1 million

sockeye salmon, which included a commercial harvest of 8.9 million and a total escapement of 8.2 million. All escapement goals were met or exceeded in 2018 (Table 1).

ADF&G does not forecast Chinook, chum, coho, or pink salmon for systems in the Naknek-Kvichak District. Commercial harvest of Chinook salmon has remained relatively small because of mesh size restrictions that have been in effect since the early 1990s. Mesh restrictions are set by EO and prohibit gillnets using a mesh size larger than 5.5 inches until July 20. 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 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 2018 season. The Naknek River tower crew began counting on June 20, the Kvichak River tower began counting on June 21, and the Alagnak River tower began counting on June 29 (Table 7). This was the second season of operations for the Alagnak River tower since 2011. The Naknek River escapement was 2.2 million, the Kvichak River escapement was 4.4 million, and the Alagnak River escapement was 1.6 million 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).

Fishing with drift gillnets was restricted to the Naknek Section during the early season schedule, but both sections were open to the set gillnets. Fishing periods were from 9:00 AM Monday until 9:00 AM Friday, beginning 9:00 AM Monday, June 4 and ending 9:00 AM Friday, June 22 (Table 8). The first deliveries occurred on June 18 (Table 9) and the early season fishing schedule ended with a total harvest of 507 sockeye salmon. This was a notably small harvest for this period of time. Following the closure on June 22, subsequent fishing periods were based on inseason indicators of abundance in the Naknek, Kvichak, and Alagnak rivers.

Drift gillnet effort was expected to be low in the Naknek-Kvichak District early in the season for several reasons. In 2017, the Nushagak District experienced a record breaking sockeye salmon run of 20.0 million fish and the forecast for 2018 was 21.2 million sockeye salmon (Table 1). The Naknek-Kvichak District had a forecast of 16.1 million, which was 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 3 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.

Sockeye salmon passage started to increase at the Naknek River tower on June 23 (Table 7). The first fishing period after the early season schedule was on June 26 for 7.5 hours using set gillnets that fished in the whole district and drift gillnets were restricted to the Naknek Section. Harvest was about 25,000 sockeye salmon from 83 drift gillnet deliveries and 137 set gillnet deliveries (Table 9). Similar fishing periods were provided daily through June 29 and daily harvests ranged between 11,000 and 39,000 sockeye salmon. Daily escapement continued to increase until June 29 when the daily count was 42,312 and the cumulative was 132,270 (Table 7). On June 29, set gillnets were extended 24.5 hours in order to fish through June 30. Harvest dropped to 11,000 on June 29 and to 14,000 on June 30, whereas Naknek River escapement dropped to 8,982 on June

30 and 2,880 on July 1. Meanwhile, cumulative Kvichak River escapement was only 3,492 fish. These escapements put both river systems well behind the expected escapement goal curves. On July 2, Naknek River escapement surged to a daily count of 270,900, which put the Naknek River on track to meet the lower end of the escapement goal. Fishing continued during 1 tide per day from July 1 to July 5 and only 215 drift permits were registered by July 5 (Table 10).

By the morning of July 5, the Naknek River cumulative escapement had exceeded 500,000 and was on track to meet the midpoint of the escapement goal range. Meanwhile, the Kvichak River cumulative escapement was less than 100,000 and tracking below the lower end of the escapement goal curve in even the late run scenarios. It was announced that fishing would open to both gear groups, in the Naknek Section only, on the July 5 evening tide. This was the first step taken to direct harvest to Naknek River fish, while minimizing harvest of Kvichak River fish. Fishing continued each tide, in the Naknek Section only, until July 7.

On the afternoon of July 5, fishermen were notified that if escapements did not improve in the Kvichak River, the district would close and the Naknek River Special Harvest Area (NRSHA) could open as soon as 8:00 PM on July 7. Fishing in the NRSHA also required fishing in the Egegik District to move into the Egegik River Special Harvest Area (ERSHA) and dual drift permit operations were not allowed to use the additional 50 fathoms of gear in any district. When fishing in the NRSHA, the Naknek-Kvichak allocation plan does not apply. Fishing periods in the NRSHA are separate gear group openings with a seasonal ratio of 3 drift gillnet periods to 1 set gillnet fishing period.

Naknek River escapement exceeded 800,000 fish (the lower bound of the escapement goal) on July 6 (Table 7). Kvichak River cumulative escapement through July 6 was 262,000, which was 4 days behind the lower bound of the escapement goal curve. The Kvichak River inriver estimate was 500,000 fish. If the estimate was accurate then the escapement would be 2 days behind the lower bound escapement goal curve by July 9. However, in 2018, recent inriver estimates had been biased high (Table 11). From June 30 to July 3 at the Port Moller Test Fishery (PMTF) 2 of the largest indices of the season were observed (Raborn and Link 2018). Kvichak River had a relatively low representation in the genetic stock composition estimates up until samples collected June 30–July 1 and July 2–3, which represented 10% and 17%, respectively (Figure 2). These fish were expected to arrive in the district beginning July 8, based on a 9 day travel time.

The first fishing period in the NRSHA opened to drift gillnet gear at 8:00 PM on July 7. The following 2 tides were also opened to drift gillnet gear. Harvest on July 8 was 201,000 sockeye salmon (Table 9). Naknek River escapement was only 25,260 but the Kvichak River daily escapement improved to 190,836. The NRSHA opened to set gillnet gear for 2 periods starting at 8:00 AM on July 9 and 139,000 sockeye salmon were harvested. Drifters fished 3 high tides from the morning of July 10 to the afternoon of July 11 and harvested 306,000 and 461,000 sockeye salmon on these 2 days. Daily escapements on the Naknek River increased to 146,136 and 119,268 on the same 2 days. Meanwhile, the Alagnak River escapement was 59,364 on July 10 for a cumulative of 320,220; which was above the lower bound of the escapement goal.

With the date approaching mid-July and Kvichak River escapement so far behind the minimum escapement goal curve, the management strategy was to ensure that there would be 2 million fish escapement to the Kvichak River by combining the tower escapement number with the inriver estimate before fishing would be moved back into the main district. District test fishing was used to give an earlier indication of when this might happen. District test fishing began on July 9 in

the Kvichak Section and indices ranged between 35 and 275 fish per 100 fathom hours. On July 10 indices ranged between 21 and 475 and several indices were above 400. On July 11, district test fishery indices continued to be high, range 86–934, and the majority of indices were above 200 (data on file with Bristol Bay Management Group, Division of Commercial Fisheries, ADF&G, Anchorage). This appeared to be the fish detected by PMTF on June 30–July 3. On the afternoon of July 12, Kvichak River cumulative escapement was 1,198,000 and 600,000 were estimated inriver based on an aerial survey. The daily escapement on July 12 was 277,026 and the 6:00 AM count on July 13 was 159,342, for a cumulative of 1,514,208. The inriver estimate based on the test fishery was 500,000; which meant the escapement needed to meet the goal had probably already passed the district.

At 9:00 AM on July 13, it was announced that the NRSHA would close at 7:00 PM July 13 and the Naknek-Kvichak District would open to set gillnet gear at 1:00 AM July 14 for a 19-hour period while the Naknek Section would open to drift gillnet gear for 2 tides starting at 1:00 AM July 14. By the morning of July 14 the Kvichak River cumulative escapement was 1,960,000 and 500,000 were estimated inriver. As a result, the Naknek-Kvichak District was opened to drift gillnet gear for 3 periods beginning at 1:00 PM July 14 and the set gillnet fishing period was extended for 25 hours. Harvest on July 14 was 834,748 sockeye salmon, which was the largest daily harvest of the season (Table 9). Kvichak River escapement on July 14 was 557,010 for a cumulative of 2,377,254 fish which was within the escapement goal range.

On the morning of July 15 the last 3 EO fishing periods were announced, which resulted in continuous fishing from 4:00 AM Tuesday, July 17 until 9:00 AM Friday, August 3. The fall schedule of 9:00 AM Monday to 9:00 AM Friday took effect on August 3. Large daily harvests of sockeye salmon continued through July 21 and the daily harvest was 447,484 (Table 9). Harvest and effort tapered off until August 2 and the daily harvest was 21,707 sockeye salmon. Limited fishing effort continued until August 22; however harvest from these days was confidential.

The total inshore run to the district in 2018 was 17.1 million sockeye salmon and commercial harvest was 8.9 million. The inshore harvest and total run for the district were nearly identical to the preseason forecast. The Naknek River total run was well above forecast and the Alagnak and Kvichak rivers were below forecast (Table 1). The escapements were 2,221,152 on the Naknek River, 4,398,708 on the Kvichak River, and 1,581,426 on the Alagnak River (Table 7).

The total harvest of 8.9 million sockeye salmon was 11% above the 1998–2017 average of 8.0 million (Appendix A3). The total inshore run of 17.1 million sockeye salmon was 16% above the 1998–2017 average of 14.8 million (Appendix A13). The midpoint of the sockeye salmon run into the district was July 15, which was 10 days later than the historical average and the latest on record. This was the fourth season in a row with notably late run timing (data on file with Bristol Bay Management Group, Division of Commercial Fisheries, ADF&G, Anchorage).

Cumulative harvest through July 16 was 4,884,794 sockeye salmon (Table 9). The final allocation was 71% drift gillnet, 17% Naknek set gillnet, and 12% Kvichak set gillnet (Appendix A9). Regulation specifies 84% drift gillnet, 8% Naknek set gillnet, and 8% Kvichak set gillnet for the allocation period of June 1 to July 17. At the end of the allocation period there were 397 permits including 134 dual permit operations registered to fish in the district (Table 10). Of the 8.9 million sockeye salmon harvested during the season only 3.3 million were harvested in the district during the allocation period. The low numbers of drift gillnet vessels, use of the NRSHA, and late run timing made achieving the catch allocation impracticable.

The Chinook salmon total harvest of 2,398 fish was above the 1998–2017 average of 1,678 fish (Appendix A4). The chum salmon harvest totaled 310,872 fish, which was above the 1998–2017 average of 196,868 fish (Appendix A5). There was a commercial harvest of 30,507 pink salmon and 11,549 coho salmon (Appendices A6 and A7).

Egegik District

The 2018 Egegik District harvest of 5.2 million sockeye salmon was 31% below the forecasted harvest of 7.5 million (Table 1) and ranked 12 out of the last 20 years (Appendix A14). The sockeye salmon escapement of 1.6 million fish was within the (SEG) range of 800,000–2.0 million. (Appendix A1). The inshore total of approximately 6.8 million fish to the Egegik District, ranked the 2018 run 12th out of the last 20 years and was 24% below the forecast of 8.9 million fish (Table 1; Appendix A14).

The district opened to commercial salmon fishing for a set schedule of 3 days per week at 9:00 AM Monday June 4. Fishing was permitted from 9:00 AM Monday to 9:00 AM Wednesday and 9:00 AM Thursday to 9:00 AM Friday until June 15 (Table 8). After that date, the district went to active management and additional fishing time was based on inseason indicators of abundance. The first deliveries were recorded June 4 (Table 12). Harvest was small and remained so through the end of the schedule. Through June 15, the total harvest was just over 3,400 fish. Because indications of volume were low, the district remained closed the weekend of June 16–17.

Daily inriver test fishing, which provided estimates 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.

Because indications from the inriver test fishery and the escapement project showed low numbers, 5-hour drift and 8-hour set gillnet periods were permitted on June 18, 20, and 22. Volume remained low and by June 22 cumulative catch was 31,000 (Table 12) and cumulative escapement was 9,024 (Table 13), both comparatively low numbers for this date. Because volume was low, the fishery remained closed to allow additional escapement over the weekend of June 23–24 (Table 12).

Inriver test fishery indices increased June 22–23, which resulted in escapements of 17,622 on June 23 and 59,634 on June 24 and demonstrated a travel time of just over 1 day for this particular group of fish (Table 13). Through June 24, cumulative escapement increased to 86,280 and began to track at a desirable pace.

As a result of increased escapement, an 8-hour period was permitted for both gear groups on June 25, which resulted in a harvest of 99,000 fish. Escapement continued to increase on June 25 and the tower count was 72,444 sockeye salmon for the day. Through June 25, cumulative catch was 130,000 fish and cumulative escapement was 158,724 sockeye salmon (Tables 12 and 13).

On June 26, inriver indices dropped off, however, because escapement was pacing well, 8-hour periods were permitted for both gear groups on June 26–27. Combined commercial harvest for the 2 days was 160,000 fish. Escapement was 72,108 sockeye salmon over the same time period, and when combined with test fishery information, indicated that the pace of escapement was slowing (Tables 12 and 13).

Because of indications of a slowdown in the escapement, fishing time for the drift fleet was reduced to 4 hours daily on June 28–29, whereas the set gillnet fleet was permitted to fish 8 hours daily. On June 29, inriver test fishery indices increased again, which lead to daily single tide 8-hour periods for both gear groups between June 29 and July 2. Through July 2, cumulative harvest was just shy of 1 million fish. Cumulative escapement was 392,442 which was almost halfway to the minimum escapement (Tables 12 and 13).

Up until this point in the season, the run had not materialized as expected, and there was a lack of age-2.2 fish in any of the scale samples collected from the fishery. The age-2.2 fish were a significant component of the preseason forecast and the lack of that age class suggested that the district run size would fall short of expectations (Table 1; Appendix C1).

Because of the slow pace of the run and the lack of age-2.2 fish through July 2, ADF&G became more conservative and switched from the more productive tide (the evening in this case) to the morning tide. This approach generally provides some fishing opportunity while allowing fish to pass into escapement. In 2018, this was accomplished by fishing the evening tide on July 2, but not allowing fishing on July 3, and then permitting 4 hours of drift and 8 hours of set gillnet fishing the morning of July 4. This allowed fish to move upriver during a 2 tide break on July 3. On July 4, the inriver test fishery detected an increase in passage and escapement at the tower increased to 168,582 sockeye salmon on July 5. These fish probably entered the river during the closure on July 3, which demonstrated a travel time of about 2 days from the district to the tower. Commercial catch on July 4 was 161,000 and July 5 was 168,000 fish, which brought the cumulative catch to 1.3 million (Table 12). Cumulative escapement was 703,224 sockeye salmon through July 5 (Table 13).

Escapement had caught up to expected run timing curves and was within reach of the lower bound of the escapement goal range, therefore fishing for the drift gillnet fleet was increased to allow fishing 2 tides on July 6; a 4-hour period on the morning tide and a 4-hour period on the evening tide. Considering the set gillnet fleet was ahead in the allocation they were permitted, a single 8-hour period was scheduled on the morning tide in an attempt to balance the catch percentage between gear groups. Escapement on July 6 was 130,824 fish, which brought the cumulative to 834,048 and surpassed the lower end of the escapement goal range.

At this point it was apparent that even though escapement was being achieved, the run was showing as either very late or very weak on the eastside of the Bristol Bay. Naknek and Egegik rivers were tracking nicely towards their escapement goals, whereas Kvichak and Ugashik, both have historically later run timing, and were lagging behind desired escapement levels. Accordingly, fishing in the Naknek-Kvichak District was confined to the NRSHA to conserve Kvichak River sockeye salmon stocks beginning at 8:00 PM July 7. By regulation fishing in the Egegik District was confined to the ERSHA whenever the NRSHA was used. Egegik escapement was already within the escapement goal range, and the ERSHA was in use, therefore commercial fishing time was increased. When in use, the reduced area of the ERSHA provides little time to react to a strong push of fish and as result a more aggressive approach was adopted to guard against a large escapement event. Fleet size was a consideration and because the Nushagak District was experiencing strong catches, much of the drift gillnet fleet was located there. On July 7, there were 308 vessels registered to fish in Egegik. That dropped to 292 vessels on July 8 (Table 10).

The drift fleet was permitted to fish a 5-hour period on the morning tide of July 7, then the ERSHA was opened and the set gillnet fleet was permitted to fish an 8-hour period on the evening tide along with another 5-hour period for the drift fleet. Harvest on July 6 was 225,000 fish and on July 7 was 122,000, which brought the cumulative harvest to 1.7 million fish (Table 12). Escapement on July 7 was 155,694, which brought the cumulative escapement to 989,742 sockeye salmon (Table 13).

Fishing was restricted to the ERSHA from July 7 until July 13, and during this time both fleets were permitted to fish 2 tides a day. Harvest averaged 213,000 fish per day and escapement averaged 61,000 sockeye salmon per day. Through July 13, cumulative harvest was 3.1 million fish and cumulative escapement was 1,257,868 sockeye salmon (Tables 12 and 13).

Fishing was again permitted in the full Egegik District beginning on the morning of July 14. The set gillnet group was permitted to fish 1 tide per day and the drift group was permitted to fish 1 long period that encompassed both ebbs because fish were pushing on the ebb and ADF&G wanted to slow the pace of escapement. On July 15 the district was opened to continuous fishing until 9:00 AM Monday July 30 when the fall schedule took effect.

The 2018 Egegik sockeye salmon run was below forecast and exhibited one of the latest run timings on record; the midpoint was July 11 compared to the 20-year average (1998–2017) of July 3. By the end of the allocation period, July 17, the cumulative catch was 4.3 million salmon, but another 946,000 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 was June 1 to July 17 by regulation. Harvest of all species in 2018 was 5.3 million fish. Cumulative escapement was 1,608,354 sockeye salmon and was within the escapement goal range when the escapement project ended on July 22 (Tables 12 and 13).

The 2018 Egegik sockeye salmon run was composed of mostly ocean age-2 and age-3 fish (Table 14), which came from the 2013 and 2014 escapement of 1.1 million and 1.4 million sockeye salmon, respectively (Table 13; Appendix A10). As previously noted, due to unknown causes, age-2.2 fish were well under forecast for the season. During the period from June 16 to July 17 in 2018, a total of 231.5 hours were fished by the drift gillnet group (124.5 hours less than 2017) and 250.5 hours were fished by the set gillnet gear group (126 hours less than in 2017), which equated to 31% and 33%, respectively, of the 753 available hours (Table 12). By the end of the allocation period on July 17, harvest allocations were 80% drift and 20% set gillnet (Appendix A9). The disparity can be partly explained by the reduced numbers of drift gillnet vessels for portions of the season, and by use of the ERSHA. Regulation specifies 86% drift and 14% set.

Commercial harvest of other salmon species in the Egegik District was 100,925 fish, or about 2% of the total (Table 8). The reported Chinook salmon harvest was 1,520 fish, which was 139% above the 20-year average (1998–2017) of 636 fish (Appendix A4). The district chum salmon harvest of 75,524 fish was 13% above the 20-year average (1998–2017) of 70,000 fish (Appendix A5). Reported pink salmon harvest was 2,742 (Appendix A6). The coho salmon harvest of 21,139 fish was 63% higher than the 20-year average (1998–2017) of 13,000 fish (Appendix A7).

In summary, the 2018 harvest of 5.1 million sockeye salmon in the Egegik District ranked 12 out of the last 20 years, was 15% below the 20-year average (1998–2017) of approximately 6.7 million fish, and was 32% below the preseason forecast (Table 1; Appendix A14). The fishery

harvested 76% of the run into the district compared to the 20-year average (1998–2017) of 82% (Appendix A14). The midpoint of the run was July 11, which was 8 days later than the 20-year average (1998–2017). Peak harvest occurred on July 12 and July 16 with 363,000 and 360,000 sockeye salmon harvested, respectively (Table 12). Peak escapement occurred on July 5 and July 7 when 168,582 and 155,694 sockeye salmon were counted respectively (Table 14). Peak effort occurred on July 3, when 378 drift gillnet permits were registered in the district, including 144 dual permits (Table 10). There were 17 processors registered to purchase fish in the Egegik District in 2018 (Table 4).

Ugashik District

The 2018 inshore sockeye salmon run to the Ugashik District of 3.9 million ranks seventh in the last 20 years and was 42% above forecast (Table 1; Appendix A15). The midpoint of the run was July 17, which was 6 days later than the 20-year average (1998–2017) of July 11. The commercial catch of approximately 2.8 million sockeye salmon was slightly under the 20-year average (1998–2017) and ranked sixth for the same period (Table 15; Appendix A3). Sockeye salmon escapement to the Ugashik River totaled 1,167,792 and was within the SEG range of 500,000–1.4 million fish (Table 16).

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 4 by EO (Table 7). Initial landings occurred on June 11 (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 15, when fishery management switched to a tide-by-tide basis (Table 8). Fishermen were advised that additional fishing time would depend on inseason indicators of abundance.

Available information suggested a low volume of fish, which kept the district closed until June 23 when a 12-hour period was permitted for both gear groups to provide insight about abundance within the district. Harvest was only 3,500 fish; the combined drift and set gillnet fleets made 44 deliveries (Table 15), which was extremely low.

Initial information from the Ugashik District inriver test fishery became available on June 24 (Table 16) and suggested that fish were passing into the river in low volume. Inriver test fishing, which occurs about 3 miles upstream of Ugashik Village, provided a daily estimate of sockeye salmon passage into the lower part of the Ugashik River.

Because of low catches from June 23, another 12-hour period for just the set gillnet fleet was permitted on June 25. Harvest was 2,300 fish and indicated that there was little movement into the Ugashik River. Information from the inriver test fishery confirmed that passage into the river was slow (Tables 15 and 16) which lead to the district remaining closed on June 26.

On June 26 inriver indices increased slightly, which in turn resulted in a 12-hour opportunity for both gear groups on June 27(Table 16). The drift fleet was small and only 25 drift vessels were registered to fish in the district (Table 10), but the set gillnet fleet was mostly operational. Because of the small number of drift gillnet vessels in the district, the possibility of intercepting non-local stocks was reduced and it was permissible to allow the fleet some opportunity. Harvest from the period was 12,000 fish (Table 15).

The escapement tower project, operating about 24 miles upstream of Ugashik Village, started counting on June 27 and ended with an estimated partial day passage of 462 sockeye salmon

(Table 16). That count represented fish that had been inriver for a couple of days, however, the inriver test fishery data showed that entry of fish into the river was low and there were few fish in the river below the escapement project.

Drift gillnet fleet size remained small (Table 10) and additional 12-hour opportunities were permitted for drift and set gillnet fleets on June 28 and June 29; harvests showed a modest increase with 16,000 and 45,000 fish caught respectively (Table 15). Escapement counts remained flat and through June 29 and cumulative escapement was 2,580 sockeye salmon after 2.5 days of tower operation (Table 16). Cumulative harvest was 78,000 fish.

Drift gillnet fleet size began to increase on June 30 (Table 10), but inriver test fishery indices (Table 16) remained flat. Because the fleet was still relatively small, fishing was allowed to continue with a reduction in time. On June 30, a 6-hour drift and 11-hour set gillnet period produced a combined harvest of 58,000 fish.

Inriver test fishery indices remained steady, but low, which indicated some passage into the Ugashik River. Drift gillnet fleet size also remained small although was increasing on a daily basis. An 8-hour drift and 11-hour set gillnet period was permitted on July 1, which resulted in a harvest of 45,000 fish; another 11-hour period was permitted for both gear groups on July 2 and 46,000 fish were harvested. Inriver test fishery indices increased on July 2, but escapement counts through July 2 totaled just 11,340 and were beginning to fall behind desired levels, therefore the district remained closed on July 3 to allow escapement (Tables 15 and 16).

Inriver indices increased again on July 3 and a 9-hour period was permitted for both gear groups on July 4, which resulted in a combined harvest of 126,000 fish, the largest harvest to date. However, this was with almost twice the number of drift gillnet vessels present than during the July 2 period. Escapement on July 3 was 9,762 sockeye salmon and an additional 16,740 on July 4. Although this was an increase over previous days, it was still lower than desired which resulted in the district remaining closed on July 5. The July 4 escapement probably represented fish the inriver fishery detected on July 2, which suggested a travel time of a little over 2 days from the location of the test fishery to the tower (Table 16). It also indicated that there was not much escapement between the test fishery site and the counting tower. Meanwhile, drift effort had increased to 99 registered vessels (Table 10). The increase in harvesting potential and the lack of fish inriver caused ADF&G to be more conservative with drift gillnet opportunity.

A 4-hour drift and 12-hour set gillnet period were permitted on July 6, followed by a 4-hour drift only period on July 7, which resulted in 36,000 and 11,000 fish harvests, respectively. Escapement increased to 25,134 sockeye salmon on July 5, but then decreased to 17,556 and 15,426 on July 6 and July 7. Through July 7, cumulative harvest was 401,000 and cumulative escapement was 95,985 which was falling behind escapement curves. The Ugashik District was closed on July 8 to provide escapement.

Inriver indices showed slight improvement on July 8, slightly better on July 9, and decreased on July 10. However, this was not enough of an increase to justify commercial fishing opportunity (Table 16). On July 11, ADF&G received reports of increased abundance in the Ugashik District from multiple sources. The reports were considered reliable, but because of the lag in escapement ADF&G wanted to see some passage into the Ugashik River before committing to any commercial fishing time.

The inriver test fishery began to see increased fish passage on the evening of July 12 (Table 16). As a result, a 10-hour drift and 9-hour set gillnet period was permitted on the morning of July 13. Harvest from this period was 186,000 fish, bringing the cumulative harvest to 585,000. Cumulative escapement had improved to 220,398 sockeye salmon (Tables 15 and 16). Although escapements had improved, fishing opportunity was reduced in the face of either a very late or very small run. Fishing time was reduced to 6 hours for the drift fleet and another 9-hour period for the setnet fleet on July 14. Harvest from this period dropped to 96,000 fish, but inriver indices remained strong. Escapement on July 12 was 24,258 sockeye salmon, and on July 13 increased to 110,502, and another 116,010 on July 14 as the fish detected by the inriver test fishery on July 12 began passing the tower, thus confirming a roughly 2.5 day travel time from the inriver test fishery (Tables 15 and 16). Through July 14, cumulative harvest was 682,000 fish and cumulative escapement had increased to 471,168 sockeye salmon. The lower end of the escapement goal range of 500,000 was surpassed on July 15 with a daily count of 165,282 sockeye salmon that brought the cumulative escapement to 636,450 (Table 16)

Escapement had surpassed the lower end of the escapement goal range and fishing opportunity was liberalized to 12 hours for both gear groups on July 15 and July 16. On July 17, fishing was extended until July 31, when the fall schedule took effect. Through July 17 cumulative harvest was 1.3 million fish. Cumulative escapement was 878,532 sockeye salmon (Tables 15 and 16).

Harvest and escapement continued through the rest of July and an additional 1.5 million fish were harvested, which was an average of 106,000 fish per day between July 17 and July 31. Two of the largest daily harvests occurred on July 16 and July 18 with 262,000 and 250,000 fish harvested, respectively. By regulation the allocation period runs from June 1 to July 17 but approximately half the run occurred after July 17 and was not included in the allocation calculation. The last deliveries were recorded on August 6 and cumulative catch through that date was 2,847,810 fish (Table 15).

Escapement on July 18 was 125,772, but began to taper off after that date demonstrating that the fleet was impacting passage into the Ugashik River. Through July 26, cumulative escapement was 1,167,792 sockeye salmon and within the escapement goal range when the project ended for the season (Table 16).

By the end of the allocation period (July 17), set gillnet fishermen caught approximately 22% of the sockeye salmon harvest and drift gillnet fishermen caught 78%; the allocation specified in regulation was 10% set gillnet and 90% drift gillnet (Appendix A9). However, by including the entire season, the allocation changes to 15% set gillnet and 85% drift, so the overall allocation was not as lopsided as it appeared. Between June 23 and July 17, set gillnet permit holders were permitted to fish a total of 156 hours, which was 51.5 hours less fishing time than in 2017, and drift gillnet permit holders were permitted to fish a total of 130 hours, which was 63 hours less than in 2017 (Table 15). However, it is important to note that the July 17 date represents roughly 50% of the run in 2018 and it is uncertain how well these metrics represent the season.

The reported harvest of 1,407 Chinook salmon was 56% above the 20-year average (1998–2017) of 900 (Appendix A4). Chinook and chum escapement was assessed by aerial surveys in the Dog Salmon and King Salmon rivers, major tributaries of the Ugashik River and the biggest producers of these species in the district. In 2018, no escapement surveys were flown in the Ugashik River drainages because of budget constraints. The chum salmon harvest of 71,854 fish was 6% above the 20-year average (1998–2017) of 68,000 (Appendix A5). Reported pink

salmon harvest was 971 and incidental to directed sockeye salmon fishing (Appendix A6). There was little directed commercial effort for coho salmon in 2018; reported harvest was 1,633 fish (Appendix A7).

Unlike 2016 and 2017, Pacific walrus did not return to the beach used during the previous 2 years. The Ugashik District boundaries reverted back to those in regulation and no adjustment was made to the north line in 2018. It appears the animals relocated to beach areas further south in the Meshik and Nelson Lagoon areas.

In summary, the 2018 Ugashik District fishery harvested approximately 71% of the sockeye salmon run to the district, compared to the 20-year average (1998–2017) harvest rate of 70% (Appendix A15). Days of peak catch occurred on July 16 and July 18 when 262,000 and 250,000 fish were harvested, respectively (Table 15). The midpoint of the run was July 17 compared to the 20-year average (1998–2017) average of July 11. Days of peak escapement were, July 15 and July 16 when 165,282 and 133,140 sockeye salmon, respectively, passed the counting tower (Table 16). Peak effort occurred on July 17 when 144 drift gillnet permits, including 76 with dual permits, registered to fish in the district (Table 10). There were 12 processors registered to purchase fish in the Ugashik District this season (Table 4).

Nushagak District

The 2018 Nushagak District total inshore sockeye salmon run was 33.8 million fish, which was 59% above the preseason forecast of 21.2 million fish (Table 1). Commercial sockeye salmon harvest in Nushagak District was 24.2 million fish, which was 31% above the preseason projected harvest of 18.5 million fish and 274% above the 1998–2017 average harvest of 6.5 million sockeye salmon (Table 1; Appendices A3 and A16). Escapement in the district's 3 major river systems was as follows: 7,507,254 for Wood River, 770,772 for Igushik River, and 1,247,460 sockeye salmon for Nushagak River (Tables 6 and 17). Wood, Igushik and Nushagak river sockeye salmon escapements exceeded the upper ends of their escapement goal ranges (Appendix A1). Wood River sockeye salmon escapement set a record for total escapement, Igushik River escapement was the fourth largest ever recorded, and Nushagak River sockeye salmon escapement was the third largest on record. Chinook salmon escapement into Nushagak River was 97,239, 2% above the 95,000 inriver goal (Table 6). Incidental commercial harvest was 35,938 Chinook salmon in Nushagak District (Table 18).

In 2018, there was no forecast for Nushagak District Chinook salmon. The preseason plan for Chinook salmon management was to have directed openings if and when 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 2018 season (Appendix A19). There were no directed Chinook salmon openings in the Nushagak District in 2018. The harvest of 35,938 Chinook salmon was 93% of the 1998–2017 average harvest of 38,461 fish for the Nushagak District (Appendices A4 and A19).

The sonar escapement enumeration project at Portage Creek was fully operational on June 7 (Table 6). ADF&G began the season with the idea of being very conservative in regards to directed Chinook salmon openings. This was partly based on the 2014 experience of a strong early showing and then a very poor second half of the season. In addition, because of the strong baywide sockeye salmon forecast, ADF&G expected to begin directed sockeye salmon openings earlier than normal. Earlier than normal sockeye salmon openings would probably increase the incidental harvest of Chinook salmon. Nushagak River Chinook salmon escapement was at or

above expectations early in the season. The cumulative escapement through June 18 was 18,159 (Table 6), which projected out to a total escapement of approximately 117,000, which was above the inriver goal of 95,000. The preseason plan, outlined in the preseason outlook, indicated commercial fishing for sockeye salmon would begin in the Nushagak District when Wood River escapement reached 30,000 if Nushagak Chinook escapement was projecting above 95,000. Management emphasis would also switch from Chinook salmon to sockeye salmon at this point.

Sockeye salmon enumeration on the Wood River began June 18. Fish passage was above average from the start, and over 28,000 sockeye salmon were counted on the first day (Table 17). Following the preseason plan, commercial fishing using set gillnets was announced to begin on the evening of June 19 and drift gillnet fishing began early in the morning of June 20. Once fishing did begin, it continued on a daily basis, gradually ramping up to a schedule of 8 or 9 hours on and 3 or 4 hours off for the drift gillnet fleet. The set gillnet fleet had short closures once a day until June 24, when fishing was extended and never closed again.

Despite an early start to fishing and above average fishing time, the Wood River sockeye salmon escapement exceeded the 1.1 million sockeye salmon threshold to open the Wood River Special Harvest Area (WRSHA), which was opened to set gillnet fishing on June 30. The WRSHA remained open until July 25 and was only open to set gillnets. This was done in accordance with the WRSHA management plan. That plan stipulates the gear type that is behind relative to the allocation plan in the commercial fishing district is allowed the additional fishing opportunity in the WRSHA.

With an exceptional run shaping up in the Nushagak District and not many fish showing early in the eastside districts, there was a large fleet present in the Nushagak District. District registration peaked on June 27 and 1,053 permits and 786 vessels registered (Table 10) to fish in the Nushagak District. The fleet was also able to harvest large numbers of fish and exceeded 1 million sockeye salmon harvest on 6 separate days (Table 18). There were no known issues with processing capacity despite the large harvests during the season. Fishing continued with 2 periods a day for most of the season. The transfer period into the Nushagak District was waived by regulation on July 12 when all 3 river systems exceeded the midpoint of their respective escapement goal ranges.

The Nushagak sockeye salmon escapement had lagged for 1 or 2 days in late June, but then surged and exceed the upper end of the escapement goal range finishing at 1,247,460 (Table 6). Escapement on the Wood River also exceeded the upper end of the escapement goal range finishing at 7,507,254 (Table 17) and establishing a new record. The largest single day escapement record was also set on July 2 and 1,130,802 sockeye salmon were counted at the tower site, which was double the previous record. This despite the Wood River Special Harvest Area (WRSHA) opening to set gillnet gear on June 30 at 6:00 PM.

Commercial fishing using set gillnets in the Igushik Section of the Nushagak District began on June 11 (Tables 18 and 19) with 8-hour periods 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 19, the Igushik set gillnet periods mirrored the Nushagak Section set gillnet periods. 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 was not reported separately because of confidentiality, but it was above average for 2018. Escapement into the Igushik River

was also steady and strong, finishing with a final escapement of 770,772, which exceeded the upper end of the escapement goal range (Table 17; Appendix A16).

Fishing and processing effort started decreasing around July 20. On July 25 the tender F/V *Pacific Knight* sank in Nushagak Bay near the mouth of Queen Slough. The vessel began leaking fuel on July 26 and the Nushagak District was closed to commercial fishing. The Igushik Section was reopened briefly but closed again as wind drove fuel all the way across Nushagak Bay. Commercial fishing opened again on July 31 at 4:00 PM after vents were secured on the vessel and fuel was no longer observed leaking.

With decreased fishing effort and reduced processing capacity, the transition from sockeye salmon management to pink and coho salmon management was relatively seamless. Fishing remained open continuously for the rest of the season, except for the closure related to the *Pacific Knight*. Pink and coho salmon harvest was less than expected. Part of this was due to low effort because many fishermen were still fishing on the east side, where late run timing meant sockeye salmon were still being caught there. The pink and coho salmon runs were smaller than expected in 2018 and this also contributed to the smaller harvest. The total Nushagak District coho salmon harvest was 84,320, which was 39% more than the 20-year average of 60,000 (Tables 5 and 18; Appendix A7). Because 2018 was an even year, it was a year with a significant pink salmon run. Harvest was 142,287, which was the lowest harvest since interest in pink salmon reemerged in 2008 and only 35% of the even year harvest since 1998. The Nushagak River sonar project was operational through August 17 and enumerated pink and coho salmon escapement in 2018 (Table 6). Final coho salmon passage estimated through August 17 was 111,455 fish and within the inriver escapement goal range of 70,000–130,000. Pink salmon escapement was 628,069, which was well above the 165,000 minimum. The final chum salmon harvest was 1,020,227 (Tables 5 and 18; Appendix A5). The final sockeye salmon harvest was 24,230,150 (Tables 5 and 18 and Appendix A3).

Togiak District

The 2018 inshore sockeye salmon run of 1.4 million fish was the largest run to Togiak District since record keeping began and exceeded the preseason forecast of 840,000 by 62% (Table 1; Appendix A18). The harvest for the Togiak District was 867,770 sockeye salmon, the largest on record (Table 20; Appendices A3 and A18). Escapement into Togiak Lake was 511,770 sockeye salmon, exceeding the escapement goal range of 120,000–270,000 fish (Table 17; Appendix A1).

The Togiak District was 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. This schedule was adjusted by emergency order, as necessary, to achieve escapement objectives. In addition, transferring into Togiak District prior to July 27 was prohibited by regulation if the permit has been registered in any of the other 4 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.

The 2018 Togiak River inshore run forecast was 840,000 sockeye salmon, of which 78% were projected to be 3-ocean fish and 22% were projected to be 2-ocean fish (Tables 1 and 2). Achieving the escapement goal range of 120,000–270,000 sockeye salmon for Togiak Lake would leave approximately 610,000 fish available for harvest in Togiak River Section (Table 1). Smaller sockeye salmon runs to other drainages in the district (primarily the Kulukak River)

occur, but these are not included in the preseason forecast because age composition and escapement data are not complete. A contribution of 50,000 sockeye salmon to the district harvest was projected from drainages other than Togiak River.

Based on recent year harvests, the Chinook salmon run was again anticipated to be below average. In 2018, the weekly fishing schedule in Togiak River Section was reduced by 48 hours in both the third and fourth weeks of June for Chinook salmon conservation (Table 19). Fishing proceeded according to the extended weekly schedule for the first 2 weeks of July because sockeye salmon escapement past the tower was average until it increased significantly on July 14 and stayed at record levels until counting operations ceased on August 7. The 511,770 sockeye salmon escapement was the highest count since enumeration began in 1960 (Appendix A10). The final daily count on August 7 was over 21,000 sockeye salmon and there was probably significant escapement that was not counted (Table 17). The increase in escapement beginning on July 14 prompted managers to extend commercial fishing in the Togiak River Section for the maximum allowable extension of 48 hours each week from July 18 until August 19 when sockeye salmon management ended and pink and coho salmon management began (Table 19).

Good fishing in the Togiak River Section resulted in less effort in the western sections (Cape Peirce, Osviak, and Matogak) of the Togiak District which remained open for regularly scheduled periods for the entire season. The Kulukak Section was open for the weekly schedule for the entire season. Although the *Togiak District Salmon Management Plan* provides for a directed Chinook salmon fishery if run strength is adequate, effort largely focuses on sockeye salmon. In an effort to reduce the targeting of Togiak River Chinook salmon, a regulation was passed in December 2012 which moved the drift gillnet boundary away from the Togiak River mouth from June 1 through July 15. Total Chinook salmon harvest for Togiak District was 3,457 fish, of which 3,139 were caught in the Togiak River Section (Table 20; Appendix A20).

Commercial fishing for sockeye salmon opened by regulation on Monday, June 4, but the first deliveries of the season did not occur until June 18 (Table 20). Fishing continued through the week and during the next 2 weeks at expected, low early season participation levels, resulting in cumulative harvests of 388 Chinook salmon and 2,653 sockeye salmon at the close of fishing on June 30 (Table 20). Beginning Monday, July 2 management shifted from Chinook salmon to active sockeye salmon management and the peak season weekly fishing schedule began. This year, that resulted in the fishery closing on Wednesday, June 27, in the Togiak River Section and reopening at 9:00 AM Monday, July 2 for the peak schedule. The western sections remained open until June 30, for their regular weekly schedule (Table 19).

There was some interest in pink and coho salmon fishing after the sockeye salmon harvest dropped off. Fishing continued until the last processor stopped buying on September 7. The 2018 commercial Chinook salmon harvest of 3,457 fish represented only 55% of the 20-year average (1998–2017), and the chum salmon harvest of 158,329 fish was 104% of the 20-year average (1998–2017) (Appendices A4 and A5). The pink salmon harvest was 67,747 fish, representing 106% of the 20-year average (1998–2017) (Appendix A6). Harvest for coho salmon totaled 43,243, which was over 3 times the 20-year average (1998–2017) of 13,688 (Appendix A7).

2018 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 the major 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 1998 to 2017, sac roe harvests averaged 20,600 tons, worth an average of $2.9 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 2018, sac roe harvests brought $2.1 million to permit holders, below the 10-year average of $2.5 million (Appendix B5). This value represents the grounds price and doesn't 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 was 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 between 16 ft and 26 ft), and 2.83 tons (water depths greater than 26 ft) per 538 ft^2 of surface area is 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 age-2 through age-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. The very large numbers of age-4 herring,

apparent in the 2018 spawning biomass suggest that we are experiencing a very successful recruitment event. The 2018 spawning biomass was younger than is typical and 26% of the biomass was age-5 and younger. Age-6 through age-8 herring made up 37% and 37% of the spawning biomass was age-9 and older (Appendix B3). This biomass was considered healthy and stable.

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 in a given year, but other factors also influence fleet size. Because the majority of 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 has 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 a general decline to an all-time low in 2012 of 16 vessels (Appendix B1). The 2018 participation of 20 purse seine vessels was up from 19 in 2017. Gillnet participation dropped from 15 vessels in 2017 to 1 in 2018 (Appendix B1).

Industry participation in the fishery peaked between 1979 and 1982, when 33 processors participated in the herring fishery. From 1994 through 1997, 16 to 22 companies have purchased herring in Togiak. Since 1998, industry participation has steadily declined to a low of 4 companies in 2012 and, from 2015 through 2018 (Appendix B1). In 2018, 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 in 2007 of 1,420 tons per day. Capacity was 1,950 tons per day in 2018 (Appendix B1).

2018 SEASON SUMMARY

Biomass Estimation

Togiak District aerial surveys began April 13, 2018. ADF&G staff observed fish in the district for the first time on April 21 (Table 22). Fish had previously been reported on the grounds on April 19. Poor weather conditions persisted throughout the herring season and made aerial surveys difficult. Although some herring were observed, staff were unable to complete a survey that documented peak biomass. Some spawn was documented on surveys before and during the commercial fishery. The best survey conditions occurred on May 16, after commercial fishing was closed, and although conditions were still poor, staff documented the most herring spawn of the 2018 season.

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 2018 preseason biomass forecast was 136,756 tons. 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, 1,810 tons for the Dutch Harbor food and bait fishery, and the remaining 24,042 tons for the sac roe fishery. The management plan further specifies that ADF&G will manage the sac roe fishery so that 70% of the harvest is taken by purse seine (16,829 tons in 2018) and 30% of the harvest is taken by gillnet (7,212 tons in 2018) (Appendix B2).

The *Bristol Bay Herring Management Plan* and other regulations direct ADF&G to conduct an orderly, manageable fishery and strive for the highest level of product quality with a minimum of waste. In recent years, the seine fleet has been comprised of processor-organized cooperatives. During the 2018 season, ADF&G management staff allowed long duration 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 polled processing companies prior to the 2018 season to assess processing capacity and to inquire about additional concerns or issues. The poll indicated that 4 companies intended to participate in the 2018 Togiak herring fishery. 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 2018 was estimated to be 1,950 tons per day. Please note that harvest amounts referenced in the text below reflect inseason information that was used to make management decisions and may differ from the numbers reported in the tables that represent final fish ticket information.

Purse Seine

The Togiak herring purse seine fishery opened at 6:00 AM on April 22 until further notice (Table 23). The harvest was 1,334 tons from April 22 through April 25. Poor weather, turbid water, and cold-water temperatures combined to make fishing conditions poor and the availability of commercial quality fish low. A break in the weather late on April 25 allowed conditions to improve and 3,838 tons of herring were harvested on April 26. The weather continued to complicate fishing efforts on and off for the remainder of the season. Fishing was good on April 28 and 2,703 tons were harvested, but the April 29 harvest was poor again and only 730 tons were taken. The harvest through April 29 was 9,300 tons. Harvest on April 30 was 1,630 tons and then 3,790 tons on May 1. At this point managers polled processors and determined that there was enough capacity available to harvest the remaining quota on May 2. Weather was also cooperating with fair conditions. Based on this, managers announced that the purse seine fishery would close at 8:00 PM May 2. This would allow for the available capacity to be filled and was expected to allow for the remaining quota to be harvested. Allowing the fishery to stay open longer would allow additional capacity to become available and risk exceeding the quota. The harvest on May 2 was 1,770 tons, bringing the cumulative harvest to 16,490 tons of the 16,829 ton quota. This represented 98% of the quota and there was no need to reopen the fishery. Purse seine participation was documented at 20 vessels, up from 19 in 2017.

Gillnet

The Togiak herring gillnet fishery opened at 6:00 AM April 22 until further notice. The first gillnet harvest was reported April 26; all harvest information is confidential due to only 1 processor and 1 fisherman participating in the fishery. The last gillnet harvest was reported on May 16. Weather was a significant factor throughout the fishery with many days unfishable due to wind and water conditions.

Spawn on Kelp

No companies registered to buy herring spawn-on-kelp in 2018, therefore there were no openings and no commercial harvest.

EXVESSEL VALUE

The projected exvessel value of the 2018 Togiak herring fishery was approximately $2.1 million. This was based on an advance price estimate of $100 per ton and does not include any postseason adjustments.

AGE COMPOSITION

Over the course of the fishery ADF&G sampled 7,600 herring from the commercial harvest in order to: 1) determine the 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. Preliminary data suggests that 44% of the herring in this year's harvest were age-7 or younger, 31% were age-8 or age-9, and 25% were age-10 or older. The mean weight of herring in the gillnet harvest was 381g and the purse seine harvest was 316g.

EXPLOITATION

The 2018 Togiak herring fisheries were managed for a maximum exploitation rate of 20% of the preseason biomass estimate. The purse seine harvest was 15,856 tons the average roe content was 11.4% and the average reported weight was 327 grams. Gillnet harvest remains confidential. The Dutch Harbor food and bait fishery harvested 1,188 short tons. The total harvest for 2018 would be estimated at 17,044 short tons without the gillnet harvest. Based on the preseason biomass estimate of 136,756 tons, the 2018 exploitation rate would be approximately 12.5%. Please note the numbers here represent final fish ticket information.

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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, 2018.

	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	8,120	7,393	-9	2,000-10,000	4,399	4,120	2,994	-27
Alagnak River	4,280	2,851	-33	320 minimum	1,581	2,170	1,260	-41
Naknek River	3,750	6,876	83	800-2,000	2,221	2,650	4,655	76
Total	16,160	17,120	6	3,120-12,320	8,202	8,950	8,918	0
Egegik District	8,850	6,758	-24	800-2,000	1,608	7,450	5,150	-31
Ugashik District	2,780	3,940	42	500-1,400	1,168	2,060	2,772	35
Nushagak District								
Wood River	11,950	22,279	86	700-1,800	7,507	10,420	14,771	42
Igushik River	2,060	2,025	-2	150-400	771	1,730	1,255	-26
Nushagak-Mulchatna	7,140	9,452	32	370-900	1,247	6,380	8,204	28
Total	21,160	33,756	59	1,220-3,100	9,525	18,530	24,230	31
Togiak District	840	1,380	64	120-270	512	610	868	42
Total Bristol Bay [d]	49,790	62,952	26	5,760-19,090	21,014	37,600	41,937	12

[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 because of rounding.

[b] Does not include South Peninsula projected harvest.

[c] Percent deviation = (Actual - Forecast) / Forecast.

[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, 2018.

District and	2-Ocean			3-Ocean			
River System	1.2 (2013)	2.2 (2012)	Total	1.3 (2012)	2.3 (2011)	Total	Total
Naknek-Kvichak District							
Kvichak River	4,300	1,050	5,350	2,610	400	3,010	8,360
Alagnak River	1,670	10	1,680	2,720	10	2,730	4,410
Naknek River	1,510	530	2,040	1,250	580	1,830	3,870
Total	7,480	1,590	9,070	6,580	990	7,570	16,640
Egegik District	1,190	3,670	4,860	1,480	2,770	4,250	9,110
Ugashik District	420	620	1,040	1,540	290	1,830	2,870
Nushagak District							
Wood River	8,000	130	8,130	4,130	40	4,170	12,310
Igushik River	590	10	600	1,500	20	1,520	2,130
Nushagak River [a]	560	0	560	6,640	10	6,650	7,210
Total	9,160	140	9,300	12,280	70	12,340	21,790
Togiak District [b]	180	10	190	660	10	670	860
Total Bristol Bay [c,d]							
Number	18,430	6,030	24,460	22,550	4,130	26,660	51, 28
Percent	36%	12%	48%	44%	8%	52%	100%

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

[b] Kulukak, Kanik, Osviak, and Matogak River systems are 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, Bristol Bay, 2018.

Species	Total catch (lb)	Mean weight (lb)	Mean price ($/lb)	Exvessel value ($)
Sockeye	215,788,340	5.1	1.26	271,893,308
Chinook	469,715	10.5	0.80	375,772
Chum	10,325,430	6.3	0.36	3,717,155
Pink	871,926	3.6	0.20	174,385
Coho	1,052,920	6.5	0.80	842,336
Total	228,508,331			277,002,956

Table 4.–Commercial salmon processors and buyers operating in Bristol Bay, 2018.

	Name of operator/buyer	Base of operations	District[a]	Method[b]	Export
1	Alaska's Best Seafood, LLC.	Dillingham, AK	N	EF, F, RE	AIR, SEA
2	Alaska Fisherman Seafoods	Naknek, AK	K, E, U, N	F	AIR, SEA
3	Alaska General Seafoods	Kenmore, WA	K,E,N	C,EF,F,RE	AIR,SEA
4	Alaska Wild Products	Delta Junction, AK	K	EF	AIR
5	Anthony Wood	King Salmon, AK	K	EF, F	AIR, SEA
6	Big Creek Fisheries	Everett, WA	E, U	EF, F, RE	AIR,SEA
7	Bristol Bay Wild Salmon	Dillingham, AK	N	EF, RE	AIR
8	Cape Greig	Seattle, WA	E,U	F	SEA
9	Coffee Point Seafoods	Seattle, WA	E	EF,F,RE	AIR,SEA
10	Copper River Seafoods	Anchorage, AK	E,K,N,U,	F, EF, RE	AIR, SEA
11	Copper River Seafoods (Togiak)	Anchorage, AK	T	F, EF, RE	AIR, SEA
12	David M. Wright	Prospect KY	K	F	SEA
13	Diamond O Fish House	Wasilla, AK	K	F	AIR
14	Ekuk Fisheries LLC.	Seattle, WA	N	F, RE	SEA
15	Ekuk Wild Salmon and Halibut Co.	Dillingham, AK	N	EF, F, RE	AIR, SEA
16	FAVCO	Anchorage, AK	N	EF	AIR
17	Friedman Family Fisheries	Baltimore, MD	N	F	SEA
18	F/V King Louie Victor Popa	Fallbrook, CA	E	F	SEA
19	Galen Eggleston	Anchorage, AK	N	EF	AIR
20	Got Salmon	Bonners Ferry, ID	K	F	AIR
21	Icicle Seafoods	Seattle, WA	E,K,N,U	C,EF,F,RE	AIR,SEA
22	Joel Reynolds	College Place, WA	N	F	SEA
23	JoJo's Wild Alaska Salmon	Chugiak, AK	N	F, EF, RE	AIR
24	Kristene Stanford	Wasilla, AK	N	EF	AIR
25	Kyle Belleque	Dillingham, AK	N	EF	AIR
26	Leader Creek Fisheries	Seattle, WA	E,K,N,U	F,RE	SEA
27	Madison's Salmon Co.	King Salmon, AK	K	F	AIR
28	Matt Crimp	Anchorage, AK	N	EF	AIR
29	Matthew Walter	Palm Springs, CA	K	F	AIR
30	Matt's Fresh Fish	Friday Harbor, WA	K, E	F	SEA
31	Nakeen Homepack	Polson, MT	K	F	SEA, AIR
32	Naknek Kvichak Wild Salmon	Igiugig, AK	K	F	AIR
33	North Pacific Seafoods (Togiak Fisheries)	Seattle, WA	T	F	SEA
34	North Pacific Seafoods (Red Salmon Cannery)	Seattle, WA	E,K,N,U	F, EF	SEA
35	North Pacific Seafoods (Pederson Point)	Seattle, WA	K	F	SEA
36	Ocean Beauty Seafoods	Seattle, WA	E,K,N,U	EF,F, RE	AIR,SEA
37	Peter Pan Seafoods	Seattle, WA	E,K,N,T,U	EF,F,RE,S	AIR,SEA
38	Roger Pietron	Cushing, MN	U	EF, F	AIR, SEA
39	Salmon Slayer/Matt Beck	Gunnison, CO	N	EF	AIR
40	Small Boat (James Crimp)	Anchorage, AK	N	EF	AIR
41	Silver Bay Seafoods	Sitka, AK	E,K,N,T,U	F, RE	SEA
42	Sunrise Salmon	Fergus Falls, MN	K	F	AIR, SEA
43	Terpening Fishing LLC	Homer, AK	U	F	AIR
44	Three Tough Mothers	Naknek, AK	K	F	AIR
45	Trident Seafoods	Seattle, WA	E,K,N,U	C,F	SEA
46	Tulchina Fisheries	Naknek, AK	K	EF, F	AIR
47	Two If By Seafoods	St. John, WA	K	F	AIR, SEA
48	Willbros Salmon Co.	Ruidoso, NM	K	F	AIR
49	Wild Alaska Salmon and Seafood	King Salmon, AK	K	EF, F	AIR,SEA
50	Wild Legacy Seafoods	Homer, AK	K, E, U, N	F	SEA, AIR
51	Wild Premium Salmon	Raymond, WA	E	EF	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 and species, in number of fish, Bristol Bay, 2018.

District and river system		Sockeye	Chinook	Chum	Pink	Coho	Total
Naknek-Kvichak District							
Kvichak River		2,994,127					2,994,127
Alagnak River		1,269,153					1,269,153
Naknek River		4,654,430					4,654,430
	Total	8,917,710	2,398	310,872	30,507	11,549	9,273,036
Egegik District		5,149,621	1,520	75,524	2,742	21,139	5,250,546
Ugashik District		2,771,945	1,407	71,854	971	1,633	2,847,810
Nushagak District							
Wood River		14,771,466					14,771,466
Igushik River		1,254,566					1,254,566
Nushagak River		8,204,118					8,204,118
	Total	24,230,150	35,938	1,020,227	142,287	84,320	25,512,922
Togiak District		867,770	3,457	158,329	67,747	43,243	1,140,546
Total Bristol Bay	Total	41,937,196	44,720	1,636,806	244,254	161,884	44,024,860

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

Table 6.–Final daily and cumulative escapement estimates by species, Nushagak River sonar project, Bristol Bay, 2018.

	Sockeye		Chinook		Chum		Coho		Pink	
Date	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative
6/7	47	47	35	35	316	316	0	0	0	0
6/8	85	132	53	88	592	908	0	0	0	0
6/9	450	582	29	117	314	1,222	0	0	0	0
6/10	424	1,006	47	164	441	1,663	0	0	0	0
6/11	368	1,374	17	181	149	1,812	0	0	0	0
6/12	452	1,826	131	312	203	2,015	0	0	0	0
6/13	1,304	3,130	335	647	719	2,734	0	0	0	0
6/14	1,977	5,107	2,759	3,406	7,516	10,250	0	0	0	0
6/15	3,942	9,049	4,266	7,672	13,914	24,164	0	0	0	0
6/16	1,651	10,700	2,256	9,928	7,913	32,077	0	0	0	0
6/17	6,117	16,817	4,419	14,347	26,149	58,226	0	0	0	0
6/18	5,819	22,636	3,812	18,159	6,486	64,712	0	0	0	0
6/19	11,431	34,067	7,509	25,668	35,338	100,050	0	0	0	0
6/20	11,885	45,952	6,630	32,298	27,270	127,320	0	0	0	0
6/21	18,526	64,478	4,707	37,005	31,254	158,574	0	0	0	0
6/22	11,744	76,222	3,157	40,162	23,009	181,583	0	0	0	0
6/23	6,623	82,845	3,017	43,179	18,998	200,581	0	0	0	0
6/24	3,523	86,368	1,874	45,053	14,931	215,512	0	0	0	0
6/25	13,385	99,753	2,490	47,543	16,663	232,175	0	0	0	0
6/26	15,873	115,626	5,665	53,208	35,114	267,289	0	0	0	0
6/27	14,510	130,136	4,185	57,393	40,131	307,420	0	0	0	0
6/28	18,735	148,871	2,977	60,370	17,182	324,602	0	0	0	0
6/29	16,635	165,506	1,691	62,061	8,824	333,426	0	0	0	0
6/30	18,452	183,958	979	63,040	18,440	351,866	0	0	0	0
7/1	8,550	192,508	677	63,717	28,670	380,536	0	0	0	0
7/2	70,392	262,900	5,179	68,896	41,357	421,893	0	0	0	0
7/3	120,591	383,491	2,266	71,162	43,860	465,753	0	0	0	0
7/4	32,055	415,546	2,579	73,741	26,753	492,506	0	0	0	0
7/5	52,002	467,548	1,357	75,098	8,410	500,916	0	0	0	0
7/6	51,053	518,601	1,772	76,870	19,541	520,457	0	0	0	0
7/7	40,487	559,088	1,043	77,913	23,564	544,021	0	0	0	0
7/8	46,617	605,705	982	78,895	9,077	553,098	0	0	0	0
7/9	45,298	651,003	1,104	79,999	16,816	569,914	0	0	0	0
7/10	47,202	698,205	2,144	82,143	14,379	584,293	0	0	0	0
7/11	37,307	735,512	2,002	84,145	17,898	602,191	0	0	0	0
7/12	69,006	804,518	689	84,834	22,044	624,235	0	0	0	0
7/13	71,921	876,439	1,141	85,975	30,292	654,527	0	0	0	0
7/14	45,206	921,645	1,073	87,048	15,005	669,532	0	0	0	0
7/15	47,573	969,218	154	87,202	16,804	686,336	0	0	0	0

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Table 6.–Page 2 of 2.

	Sockeye		Chinook		Chum		Coho		Pink	
Date	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative
7/16	22,747	991,965	0	87,202	13,230	699,566	79	79	0	0
7/17	18,720	1,010,685	909	88,111	9,235	708,801	0	79	0	0
7/18	19,855	1,030,540	665	88,776	7,536	716,337	0	79	0	0
7/19	19,023	1,049,563	433	89,209	9,098	725,435	0	79	0	0
7/20	13,036	1,062,599	369	89,578	10,193	735,628	0	79	0	0
7/21	11,569	1,074,168	488	90,066	5,769	741,397	0	79	1,085	1,085
7/22	27,396	1,101,564	530	90,596	15,336	756,733	0	79	2,685	3,770
7/23	15,445	1,117,009	1,239	91,835	8,175	764,908	1,169	1,248	0	3,770
7/24	13,535	1,130,544	381	92,216	4,959	769,867	0	1,248	0	3,770
7/25	3,361	1,133,905	444	92,660	4,326	774,193	0	1,248	14,675	18,445
7/26	5,849	1,139,754	685	93,345	2,416	776,609	613	1,861	19,275	37,720
7/27	14,442	1,154,196	74	93,419	2,824	779,433	554	2,415	13,867	51,587
7/28	10,505	1,164,701	134	93,553	4,390	783,823	3,386	5,801	40,241	91,828
7/29	18,517	1,183,218	273	93,826	2,486	786,309	6,118	11,919	36,356	128,184
7/30	12,101	1,195,319	608	94,434	4,033	790,342	9,095	21,014	67,151	195,335
7/31	11,424	1,206,743	1,173	95,607	3,555	793,897	5,753	26,767	44,821	240,156
8/1	13,842	1,220,585	150	95,757	4,850	798,747	2,922	29,689	45,459	285,615
8/2	7,025	1,227,610	230	95,987	3,327	802,074	2,657	32,346	29,296	314,911
8/3	5,251	1,232,861	435	96,422	522	802,596	2,056	34,402	19,780	334,691
8/4	1,937	1,234,798	166	96,588	1,341	803,937	1,096	35,498	33,297	367,988
8/5	1,550	1,236,348	0	96,588	1,063	805,000	1,052	36,550	49,735	417,723
8/6	1,522	1,237,870	0	96,588	2,305	807,305	7,072	43,622	73,311	491,034
8/7	3,402	1,241,272	0	96,588	1,840	809,145	18,579	62,201	43,160	534,194
8/8	768	1,242,040	0	96,588	487	809,632	7,348	69,549	13,916	548,110
8/9	2,498	1,244,538	244	96,832	223	809,855	3,658	73,207	8,519	556,629
8/10	10	1,244,548	97	96,929	11	809,866	689	73,896	8,492	565,121
8/11	783	1,245,331	92	97,021	29	809,895	968	74,864	6,504	571,625
8/12	802	1,246,133	130	97,151	478	810,373	2,948	77,812	6,062	577,687
8/13	341	1,246,474	0	97,151	234	810,607	12,505	90,317	21,987	599,674
8/14	364	1,246,838	0	97,151	378	810,985	15,805	106,122	8,817	608,491
8/15	295	1,247,133	56	97,207	298	811,283	3,330	109,452	6,622	615,113
8/16	200	1,247,333	19	97,226	0	811,283	1,232	110,684	7,886	622,999
8/17	127	1,247,460	13	97,239	0	811,283	771	111,455	5,070	628,069

Table 7.–Daily sockeye salmon escapement tower counts by river system, east side Bristol Bay, 2018.

	Kvichak River		Naknek River		Alagnak River		Egegik River		Ugashik River	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/12										
6/13										
6/14										
6/15										
6/16										
6/17							2,280	2,280		
6/18							246	2,526		
6/19							1,596	4,122		
6/20			42	42			1,782	5,904		
6/21	0	0	24	66			384	6,288		
6/22	6	6	270	336			2,736	9,024		
6/23	36	42	1,992	2,328			17,622	26,646		
6/24	24	66	3,618	5,946			59,634	86,280		
6/25	24	90	10,728	16,674			72,444	158,724		
6/26	0	90	17,196	33,870			39,246	197,970		
6/27	0	90	20,406	54,276			32,862	230,832	462	462
6/28	162	252	35,682	89,958			6,330	237,162	756	1,218
6/29	1,218	1,470	42,312	132,270	456	456	12,876	250,038	1,362	2,580
6/30	738	2,208	8,982	141,252	192	648	71,646	321,684	486	3,066
7/1	1,284	3,492	2,880	144,132	780	1,428	38,178	359,862	5,286	8,352
7/2	1,944	5,436	270,900	415,032	1,506	2,934	32,580	392,442	2,988	11,340
7/3	13,848	19,284	75,030	490,062	10,092	13,026	45,444	437,886	9,762	21,102
7/4	73,500	92,784	15,738	505,800	51,816	64,842	96,756	534,642	16,740	37,842
7/5	75,330	168,114	256,926	762,726	10,890	75,732	168,582	703,224	25,134	62,976
7/6	93,846	261,960	106,752	869,478	25,086	100,818	130,824	834,048	17,556	80,532
7/7	160,428	422,388	50,556	920,034	91,980	192,798	155,694	989,742	15,426	95,958
7/8	190,836	613,224	25,260	945,294	43,236	236,034	16,410	1,006,152	12,258	108,216
7/9	137,424	750,648	97,080	1,042,374	24,822	260,856	7,824	1,013,976	14,898	123,114
7/10	123,498	874,146	146,136	1,188,510	59,364	320,220	22,290	1,036,266	44,580	167,694
7/11	203,694	1,077,840	119,268	1,307,778	58,236	378,456	52,656	1,088,922	52,704	220,398
7/12	277,026	1,354,866	218,988	1,526,766	105,498	483,954	57,264	1,146,186	24,258	244,656
7/13	465,378	1,820,244	55,482	1,582,248	184,182	668,136	111,690	1,257,876	110,502	355,158
7/14	557,010	2,377,254	151,842	1,734,090	194,610	862,746	121,974	1,379,850	116,010	471,168
7/15	471,114	2,848,368	194,448	1,928,538	121,236	983,982	83,208	1,463,058	165,282	636,450
7/16	332,442	3,180,810	89,100	2,017,638	106,692	1,090,674	38,556	1,501,614	133,140	769,590
7/17	325,656	3,506,466	88,338	2,105,976	118,626	1,209,300	21,066	1,522,680	108,942	878,532
7/18	251,586	3,758,052	47,982	2,153,958	67,746	1,277,046	14,490	1,537,170	125,772	1,004,304
7/19	285,522	4,043,574	20,592	2,174,550	103,386	1,380,432	17,094	1,554,264	82,158	1,086,462
7/20	158,796	4,202,370	34,146	2,208,696	39,942	1,420,374	11,862	1,566,126	25,170	1,111,632
7/21	80,448	4,282,818	12,456	2,221,152	39,960	1,460,334	19,422	1,585,548	15,414	1,127,046
7/22	43,854	4,326,672			38,202	1,498,536	22,806	1,608,354	8,628	1,135,674
7/23	31,428	4,358,100			55,080	1,553,616			9,150	1,144,824
7/24	31,122	4,389,222			19,980	1,573,596			5,274	1,150,098
7/25	9,486	4,398,708			7,830	1,581,426			9,042	1,159,140
7/26									8,652	1,167,792

Table 8.–Commercial fishing emergency orders by period, district, and statistical area, Bristol Bay east side, 2018.

Number	Start date	Start time		End date	End time	Effective time	
Naknek/Kvichak District							
Driftnet							
AKN.65	14 Jul	1:00 PM	to	14 Jul	8:00 PM	7.0 hours	
AKN.65	15 Jul	2:00 AM	to	15 Jul	11:00 AM	9.0 hours	
AKN.65	15 Jul	2:00 PM	to	15 Jul	11:00 PM	7.0 hours	
AKN.70	16 Jul	3:00 AM	to	16 Jul	11:00 AM	8.5 hours	
AKN.70	16 Jul	3:00 PM	to	16 Jul	10:30 AM	7.5 hours	
AKN.70	17 Jul	4:00 AM	to	30 Jul	9:00 AM	7.5 hours	[a] fall schedule
Setnet							
AKN.01	4 Jun	9:00 AM	to	22 Jun	9:00 AM		[b,c]
AKN.15	26 Jun	11:00 AM	to	26 Jun	6:30:PM	7.5 hours	
AKN.19	27 Jun	11:30 AM	to	27 Jun	7:00:PM	7.5 hours	
AKN.22	28 Jun	12:30 PM	to	28 Jun	8:00 PM	7.5 hours	
AKN.25	29 Jun	1:30 PM	to	29 Jun	8:30 PM	7.0 hours	
AKN.28	29 Jun	8:30 PM	to	30 Jun	9:00 PM	24.5 hours	[a]
AKN.31	1 Jul	3:00 PM	to	1 Jul	10:00 PM	7.0 hours	
AKN.34	2 Jul	4:00 PM	to	2 Jul	11:00 PM	7.0 hours	
AKN.35	2 Jul	11:00 PM	to	3 Jul	1:30 PM	14.5 hours	[a]
AKN.36	4 Jul	4:30 AM	to	4 Jul	2:00 PM	9.5 hours	
AKN.38	5 Jul	5:00 AM	to	5 Jul	2:00 PM	9.0 hours	
AKN.41	5 Jul	6:30 PM	to	6 Jul	2:00 AM	7.5 hours	
AKN.44	6 Jul	2:00 AM	to	6 Jul	2:30 PM	12.5 hours	[a]
AKN.45	6 Jul	2:30 PM	to	7 Jul	3:00 PM	24.5 hours	[a]
AKN.62	14 Jul	1:00 AM	to	14 Jul	8:00 PM	19.0 hours	
AKN.65	14 Jul	8:00 PM	to	15 Jul	9:00 PM	25.0 hours	[a]
AKN.70	15 Jul	9:00 AM	to	30 Jul	9:00 AM	7.5 hours	[a] fall schedule
Naknek Section							
Driftnet							
AKN.01	4 Jun	9:00 AM	to	22 Jun	9:00 AM		[b,c]
AKN.15	26 Jun	11:00 AM	to	26 Jun	6:30 PM	7.5 hours	
AKN.19	27 Jun	11:30 AM	to	27 Jun	7:00:PM	7.5 hours	
AKN.22	28 Jun	12:30 PM	to	28 Jun	8:00 PM	7.5 hours	
AKN.25	29 Jun	1:30 PM	to	29 Jun	8:30 PM	7.0 hours	
AKN.28	30 Jun	2:00 AM	to	30 Jun	11:30 AM	9.5 hours	
AKN.28	30 Jun	2:30 PM	to	30 Jun	9:00 PM	6.5 hours	
AKN.31	1 Jul	3:00 PM	to	1 Jul	10:00 PM	7.0 hours	
AKN.34	2 Jul	4:00 PM	to	2 Jul	11:00 PM	7.0 hours	
AKN.35	3 Jul	4:00 AM	to	3 Jul	1:30 PM	9.5 hours	
AKN.36	4 Jul	4:30 AM	to	4 Jul	2:00 PM	9.5 hours	
AKN.38	5 Jul	5:00 AM	to	5 Jul	2:00 PM	9.0 hours	
AKN.41	5 Jul	6:30 PM	to	6 Jul	2:00 AM	7.5 hours	
AKN.44	6 Jul	6:00 AM	to	6 Jul	2:30 PM	8.5 hours	
AKN.45	6 Jul	7:00 PM	to	7 Jul	3:00 AM	8.0 hours	
AKN.45	7 Jul	6:30 AM	to	7 Jul	3:00 PM	8.5 hours	
AKN.62	14 Jul	1:00 AM	to	14 Jul	10:00 AM	9.0 hours	
AKN.62	14 Jul	1:00 PM	to	14 Jul	8:00 PM	7.0 hours	

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Table 8.–Page 2 of 5.

Number	Start date	Start time		End date	End time	Effective time	
Naknek River Special Harvest Area							
Driftnet							
AKN.51	8 Jul	9:00 PM	to	9 Jul	5:30 AM	8.5 hours	d
AKN.54	10 Jul	8:30 AM	to	10 Jul	4:30 PM	8.0 hours	d
AKN.56	10 Jul	10:30 PM	to	11 Jul	7:30 AM	9.0 hours	d
AKN.56	11 Jul	9:30 AM	to	11 Jul	5:00 PM	7.5 hours	d
AKN.58	12 Jul	10:30 AM	to	12 Jul	6:00 PM	7.5 hours	d
AKN.60	13 Jul	12:30 AM	to	13 Jul	9:30 AM	9.0 hours	d
AKN.60	13 Jul	11:30 AM	to	13 Jul	7:00 PM	7.5 hours	d
Setnet							
AKN.51	9 Jul	8:00 AM	to	9 Jul	3:30 PM	7.5 hours	d
AKN.54	9 Jul	9:30 PM	to	10 Jul	6:30 AM	7.5 hours	d
AKN.58	11 Jul	11:30 PM	to	12 Jul	8:30 AM	9.0 hours	d
Egegik District							
Driftnet							
AKN.02	4 Jun	9:00 AM	to	15 Jun	9:00 AM		e
AKN.06	18 Jun	3:15 PM	to	18 Jun	8:15 PM	5.0 hours	
AKN.08	20 Jun	5:30 AM	to	20 Jun	10:30 AM	5.0 hours	
AKN.10	22 Jun	6:30 AM	to	22 Jun	11:30 AM	5.0 hours	
AKN.13	25 Jun	8:45 AM	to	25 Jun	12:45 PM	4.0 hours	
AKN.16	25 Jun	12:45 AM	to	25 Jun	4:45 PM	4.0 hours	a
AKN.16	26 Jun	9:45 AM	to	26 Jun	5:45 PM	8.0 hours	
AKN.17	27 Jun	10:45 AM	to	27 Jun	6:45 PM	8.0 hours	
AKN.20	28 Jun	11:30 AM	to	28 Jun	3:30 PM	4.0 hours	
AKN.23	29 Jun	12:30 PM	to	26 Jun	4:30 PM	4.0 hours	
AKN.26	30 Jun	1:30 PM	to	30 Jun	5:30 PM	4.0 hours	
AKN.29	30 Jun	5:30 PM	to	30 Jun	9:30 AM	4.0 hours	a
AKN.32	2 Jul	2:30 PM	to	2 Jul	10:30 PM	8.0 hours	
AKN.37	4 Jul	4:00 AM	to	4 Jul	8:00 AM	4.0 hours	
AKN.39	5 Jul	5:30 AM	to	5 Jul	9:30 PM	4.0 hours	
AKN.42	6 Jul	5:00 AM	to	6 Jul	9:00 AM	4.0 hours	
AKN.46	6 Jul	5:00 PM	to	6 Jul	9:00 PM	4.0 hours	
AKN.46	7 Jul	5:30 AM	to	7 Jul	10:30 AM	4.0 hours	
AKN.49	7 Jul	8:00 PM	to	8 Jul	1:00 AM	5.0 hours	f
AKN.49	8 Jul	6:00 AM	to	8 Jul	2:00 PM	8.0 hours	f
AKN.52	8 Jul	7:45 PM	to	9 Jul	3:45 AM	8.0 hours	f
AKN.52	9 Jul	7:00 AM	to	9 Jul	3:00 PM	8.0 hours	f
AKN.53	9 Jul	8:30 PM	to	10 Jul	4:30 AM	8.0 hours	f
AKN.53	10 Jul	8:00 AM	to	10 Jul	4:00 PM	8.0 hours	f
AKN.55	10 Jul	9:30 PM	to	11 Jul	5:30 AM	8.0 hours	f
AKN.55	11 Jul	8:45 AM	to	11 Jul	4:45 PM	8.0 hours	f
AKN.55	11 Jul	8:45 AM	to	11 Jul	4:45 PM	8.0 hours	f
AKN.57	11 Jul	4:45 PM	to	11 Jul	9:45 PM	5.0 hours	a,f

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Table 8.–Page 3 of 5.

Number	Start date	Start time		End date	End time	Effective time	
Naknek River Special Harvest Area							
Driftnet							
AKN.51	8 Jul	9:00 PM	to	9 Jul	5:30 AM	8.5 hours	d
AKN.54	10 Jul	8:30 AM	to	10 Jul	4:30 PM	8.0 hours	d
AKN.56	10 Jul	10:30 PM	to	11 Jul	7:30 AM	9.0 hours	d
AKN.56	11 Jul	9:30 AM	to	11 Jul	5:00 PM	7.5 hours	d
AKN.58	12 Jul	10:30 AM	to	12 Jul	6:00 PM	7.5 hours	d
AKN.60	13 Jul	12:30 AM	to	13 Jul	9:30 AM	9.0 hours	d
AKN.60	13 Jul	11:30 AM	to	13 Jul	7:00 PM	7.5 hours	d
Setnet							
AKN.51	9 Jul	8:00 AM	to	9 Jul	3:30 PM	7.5 hours	d
AKN.54	9 Jul	9:30 PM	to	10 Jul	6:30 AM	7.5 hours	d
AKN.58	11 Jul	11:30 PM	to	12 Jul	8:30 AM	9.0 hours	d
Egegik District							
Driftnet							
AKN.02	4 Jun	9:00 AM	to	15 Jun	9:00 AM		e
AKN.06	18 Jun	3:15 PM	to	18 Jun	8:15 PM	5.0 hours	
AKN.08	20 Jun	5:30 AM	to	20 Jun	10:30 AM	5.0 hours	
AKN.10	22 Jun	6:30 AM	to	22 Jun	11:30 AM	5.0 hours	
AKN.13	25 Jun	8:45 AM	to	25 Jun	12:45 PM	4.0 hours	
AKN.16	25 Jun	12:45 AM	to	25 Jun	4:45 PM	4.0 hours	a
AKN.16	26 Jun	9:45 AM	to	26 Jun	5:45 PM	8.0 hours	
AKN.17	27 Jun	10:45 AM	to	27 Jun	6:45 PM	8.0 hours	
AKN.20	28 Jun	11:30 AM	to	28 Jun	3:30 PM	4.0 hours	
AKN.23	29 Jun	12:30 PM	to	26 Jun	4:30 PM	4.0 hours	
AKN.26	30 Jun	1:30 PM	to	30 Jun	5:30 PM	4.0 hours	
AKN.29	30 Jun	5:30 PM	to	30 Jun	9:30 AM	4.0 hours	a
AKN.32	2 Jul	2:30 PM	to	2 Jul	10:30 PM	8.0 hours	
AKN.37	4 Jul	4:00 AM	to	4 Jul	8:00 AM	4.0 hours	
AKN.39	5 Jul	5:30 AM	to	5 Jul	9:30 PM	4.0 hours	
AKN.42	6 Jul	5:00 AM	to	6 Jul	9:00 AM	4.0 hours	
AKN.46	6 Jul	5:00 PM	to	6 Jul	9:00 PM	4.0 hours	
AKN.46	7 Jul	5:30 AM	to	7 Jul	10:30 AM	4.0 hours	
AKN.49	7 Jul	8:00 PM	to	8 Jul	1:00 AM	5.0 hours	f
AKN.49	8 Jul	6:00 AM	to	8 Jul	2:00 PM	8.0 hours	f
AKN.52	8 Jul	7:45 PM	to	9 Jul	3:45 AM	8.0 hours	f
AKN.52	9 Jul	7:00 AM	to	9 Jul	3:00 PM	8.0 hours	f
AKN.53	9 Jul	8:30 PM	to	10 Jul	4:30 AM	8.0 hours	f
AKN.53	10 Jul	8:00 AM	to	10 Jul	4:00 PM	8.0 hours	f
AKN.55	10 Jul	9:30 PM	to	11 Jul	5:30 AM	8.0 hours	f
AKN.55	11 Jul	8:45 AM	to	11 Jul	4:45 PM	8.0 hours	f
AKN.55	11 Jul	8:45 AM	to	11 Jul	4:45 PM	8.0 hours	f
AKN.57	11 Jul	4:45 PM	to	11 Jul	9:45 PM	5.0 hours	s,f
AKN.57	12 Jul	7:00 AM	to	12 Jul	5:00 PM	10.0 hours	f

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Number	Start date	Start time		End date	End time	Effective time	
AKN.59	13 Jul	6:00 AM	to	13 Jul	4:00 PM	10.0 hours	[g]
AKN.63	14 Jul	5:00 AM	to	14 Jul	8:00 AM	3.0 hours	
AKN.63	14 Jul	12:00 PM	to	14 Jul	8:00 PM	8.0 hours	
AKN.66	15 Jul	1:00 AM	to	15 Jul	9:00 AM	8.0 hours	
AKN.66	15 Jul	1:00 PM	to	15 Jul	9:00 PM	8.0 hours	
AKN.68	15 Jul	9:00 PM	to	30 Jul	9:00 AM	276.0 hours	[a,g] fall schedule
Setnet							
AKN.02	4 Jun	9:00 AM	to	15 Jun	9:00 AM		[e]
AKN.06	18 Jun	3:15 PM	to	18 Jun	11:15 PM	8.0 hours	
AKN.08	20 Jun	5:00 AM	to	20 Jun	1:00 PM	8.0 hours	
AKN.10	22 Jun	6:30 AM	to	22 Jun	2:30 PM	8.0 hours	
AKN.13	25 Jun	8:45 AM	to	25 Jun	4:45 PM	8.0 hours	
AKN.16	26 Jun	9:45 AM	to	26 Jun	5:45 PM	8.0 hours	
AKN.17	27 Jun	10:45 AM	to	27 Jun	6:45 PM	8.0 hours	
AKN.20	28 Jun	11:30 AM	to	28 Jun	7:30 PM	8.0 hours	
AKN.23	29 Jun	12:30 PM	to	26 Jun	8:30 PM	8.0 hours	
AKN.26	30 Jun	1:15 PM	to	30 Jun	9:15 PM	8.0 hours	
AKN.29	1 Jul	2:00 PM	to	1 Jul	10:00 PM	8.0 hours	
AKN.32	2 Jul	2:30 PM	to	2 Jul	10:30 PM	8.0 hours	
AKN.37	4 Jul	3:15 AM	to	4 Jul	11:15 AM	8.0 hours	
AKN.39	5 Jul	4:15 AM	to	5 Jul	12:15 PM	8.0 hours	
AKN.42	6 Jul	4:45 AM	to	6 Jul	12:45 PM	8.0 hours	
AKN.46	7 Jul	5:30 AM	to	7 Jul	1:30 PM	8.0 hours	
AKN.49	7 Jul	6:30 PM	to	8 Jul	2:30 AM	8.0 hours	[f]
AKN.49	8 Jul	6:00 AM	to	8 Jul	2:00 PM	8.0 hours	[f]
AKN.52	8 Jul	7:45 PM	to	10 Jul	3:45 AM	8.0 hours	[f]
AKN.52	9 Jul	7:00 AM	to	9 Jul	3:00 AM	8.0 hours	[f]
AKN.53	9 Jul	8:30 PM	to	10 Jul	4:30 AM	8.0 hours	[f]
AKN.53	10 Jul	8:00 AM	to	10 Jul	4:00 PM	8.0 hours	[f]
AKN.55	11 Jul	8:45 AM	to	11 Jul	4:45 PM	8.0 hours	[f]
AKN.57	12 Jul	9:45 AM	to	12 Jul	5:00 PM	8.0 hours	[f]
AKN.59	13 Jul	11:00 AM	to	13 Jul	7:00 PM	8.0 hours	[f]
AKN.63	14 Jul	12:00 PM	to	14 Jul	8:00 PM	8.0 hours	
AKN.66	15 Jul	1:00 AM	to	15 Jul	9:00 AM	8.0 hours	
AKN.66	15 Jul	1:00 PM	to	15 Jul	9:00 PM	8.0 hours	
AKN.68	15 Jul	9:00 PM	to	30 Jul	9:00 AM	276.0 hours	[a,g] fall schedule

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Table 8.–Page 5 of 5.

Number	Start date	Start time		End date	End time	Effective time	
Ugashik District							
Driftnet							
AKN.04	4 Jun	9:00 AM	to	15 Jun	9:00 AM		[b,c]
AKN.12	23 Jun	6:30 AM	to	23 Jun	6:30 PM	12.0 hours	
AKN.18	27 Jun	9:15 AM	to	27 Jun	9:15 PM	12.0 hours	
AKN.21	28 Jun	10:00 AM	to	28 Jun	10:00 PM	12.0 hours	
AKN.24	29 Jun	11:00 AM	to	29 Jun	11:00 PM	12.0 hours	
AKN.27	30 Jun	1:00 PM	to	30 Jun	7:00 PM	6.0 hours	
AKN.30	1 Jul	2:00 PM	to	1 Jul	10:00 PM	8.0 hours	
AKN.33	2 Jul	1:00 PM	to	3 Jul	1:00 AM	12.0 hours	
AKN.40	4 Jul	2:30 PM	to	4 Jul	11:30 PM	9.0 hours	
AKN.43	6 Jul	6:00 AM	to	6 Jul	10:00 AM	4.0 hours	
AKN.47	7 Jul	5:30 AM	to	7 Jul	9:30 PM	4.0 hours	
AKN.61	13 Jul	10:00 AM	to	13 Jul	4:00 PM	6.0 hours	
AKN.64	13 Jul	4:00 PM	to	13 Jul	8:00 PM	4.0 hours	[a]
AKN.64	14 Jul	11:00 AM	to	14 Jul	5:00 PM	6.0 hours	
AKN.67	15 Jul	11:00 AM	to	15 Jul	11:00 PM	12.0 hours	
AKN.69	16 Jul	12:00 PM	to	16 Jul	11:59 PM	12.0 hours	
AKN.71	16 Jul	11:59 PM	to	31 Jul	11:59 PM	365.0 hours	[a]
Setnet							
AKN.04	4 Jun	9:00 AM	to	15 Jun	9:00 AM		[b,c]
AKN.12	23 Jun	6:30 AM	to	23 Jun	6:30 PM	12.0 hours	
AKN.14	25 Jun	7:30 AM	to	25 Jun	7:30 PM	12.0 hours	
AKN.18	27 Jun	9:15 AM	to	27 Jun	9:15 PM	12.0 hours	
AKN.21	28 Jun	10:00 AM	to	28 Jun	10:00 PM	12.0 hours	
AKN.24	29 Jun	11:00 AM	to	29 Jun	11:00 PM	12.0 hours	
AKN.27	30 Jun	12:00 PM	to	30 Jun	11:00 PM	11.0 hours	
AKN.30	1 Jul	1:00 PM	to	1 Jul	11:59 PM	11.0 hours	
AKN.33	2 Jul	1:00 PM	to	3 Jul	1:00 AM	12.0 hours	
AKN.40	4 Jul	2:30 PM	to	4 Jul	11:30 PM	9.0 hours	
AKN.43	6 Jul	2:45 AM	to	6 Jul	2:45 PM	12.0 hours	
AKN.61	13 Jul	9:00 AM	to	13 Jul	6:00 PM	9.0 hours	
AKN.64	14 Jul	10:00 AM	to	14 Jul	7:00 PM	9.0 hours	
AKN.67	15 Jul	11:00 AM	to	15 Jul	11:00 PM	12.0 hours	
AKN.71	16 Jul	11:59 PM	to	31 Jul	11:59 PM	365.0 hours	[a]

[a] Extends current fishing period.

[b] Weekly schedule: 9:00 AM Monday to 9:00 AM Friday.

[c] Gillnet mesh size restricted to 5.5 inches or less.

[d] Naknek River Special Harvest Area.

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

[f] Egegik River Special Harvest Area.

[g] Midpoint of escapement goal reached, transfer waiting period waived.

Table 9.–Commercial salmon catch by date and species, in numbers of fish, Naknek-Kvichak District, Bristol Bay, 2018.

		Hours fished		Deliveries							
Date		Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/18	a	15	15	3	6	63	5	1	0	0	69
6/19	a	24	24	1	8	177	7	0	0	0	184
6/20	a	24	24		5	34	10	2	0	0	46
6/21	a	24	24	3	9	217	9	0	0	0	226
6/22	ab	9	9		1						
6/23											
6/24											
6/25											
6/26	a	7.5	7.5	83	137	25,262	90	592	0	0	25,944
6/27	a	7.5	7.5	65	157	24,007	56	537	0	0	24,600
6/28	a	7.5	7.5	83	229	39,239	101	1,233	0	0	40,573
6/29	a	7	10.5	56	187	11,141	94	368	0	0	11,603
6/30	a	16	21	76	253	14,079	100	254	0	0	14,433
7/1	a	7	7	141	332	254,829	176	1,195	0	0	256,200
7/2	a	7	8	125	315	69,192	108	545	0	0	69,845
7/3	a	9.5	13.5	85	162	12,546	33	177	0	0	12,756
7/4	a	9.5	9.5	173	226	145,440	79	1,636	0	0	147,155
7/5	a	14.5	14.5	410	491	344,339	95	2,383	0	0	346,817
7/6	c	14.5	24	422	220	209,954	52	2,675	0	0	212,681
7/7	c	15.5	15	354	145	69,932	35	839	0	0	70,806
7/8	d	15.5	0	430	27	201,209	61	1,178	0	0	202,448
7/9	d	5.5	10	52	497	138,897	52	1,490	0	0	140,439
7/10	d	9.5	6.5	397	70	305,649	80	2,176	0	0	307,905
7/11	d	16.5	0.5	460	85	461,279	60	1,844	0	0	463,183
7/12	d	7.5	8.5	269	259	199,238	50	1,682	0	0	200,970
7/13	d	16.5	0	532	1	246,632	42	2,289	0	0	248,963
7/14	e	16	23	539	660	834,748	115	6,591	0	0	841,454
7/15		16	24	534	444	451,817	69	5,289	0	0	457,175
7/16		16	24	621	393	824,863	58	8,926	0	3	833,850
7/17		20	24	702	365	545,206	74	10,873	0	0	556,153
7/18		24	24	731	345	477,054	73	13,458	0	2	490,587
7/19		24	24	907	281	631,725	48	20,317	2	22	652,114
7/20		24	24	652	235	322,536	69	12,531	0	26	335,162
7/21		24	24	646	193	447,484	54	24,485	52	272	472,347
7/22		24	24	494	148	227,339	47	17,110	2	397	244,895
7/23		24	24	366	123	158,405	54	13,871	151	59	172,540
7/24		24	24	266	136	241,792	57	23,279	107	83	265,318
7/25		24	24	315	156	265,269	44	23,368	264	126	289,071
7/26		24	24	352	168	266,170	55	25,452	485	822	292,984

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Table 9.–Page 2 of 2.

Date		Hours fished		Deliveries		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set	Drift	Set						
7/27		24	24	288	135	144,633	40	26,434	578	1,166	172,851
7/28		24	24	203	133	94,389	30	18,517	1,046	380	114,362
7/29		24	24	102	94	63,867	33	10,233	1,619	305	76,057
7/30		24	24	76	88	43,814	15	10,336	3,021	652	57,838
7/31		24	24	81	84	37,618	10	8,231	3,766	1,190	50,815
8/1		24	24	58	89	25,841	12	3,552	5,572	577	35,554
8/2		24	24	41	67	21,707	28	2,198	4,944	643	29,520
8/3	[b]	9	9	7	20						
8/4											
8/5											
8/6	[b]	15	15	17	7						
8/7	[b]	24	24	10	41						
8/8	[b]	24	24	10	33						
8/9	[b]	24	24	11	39						
8/10	[b]	9	9	5	16						
8/11											
8/12											
8/13	[b]	15	15		4						
8/14	[b]	24	24		1						
8/15	[b]	24	24	1	3						
8/16	[b]	24	24	1	1						
8/17	[b]	9	9		1						
8/18											
8/19											
8/20		15	15								
8/21		24	24								
8/22	[b]	24	24	1							
Total		1,006	1,010	12,257	8,325	8,917,710	2,398	310,872	30,507	11,549	9,273,036

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

[a] Fishery was restricted to the Naknek Section only for drift gillnet gear.

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

[c] Drift and set gillnet gear was open in the Naknek Section only.

[d] Fishing was open in Naknek River Special Harvest Area with separate gear group opening.

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

Table 10.–Daily district registration of drift gillnet permit holders by district, Bristol Bay, 2018.

	Naknek-Kvichak		Egegik		Ugashik		Nushagak		Togiak[a]	
Date	Total	Dual	Total	Dual	Total	Dual	Total	Dual	Total	Total
6/1										
6/2	1	0	7	0			7	2	1	16
6/3	1	0	7	0			7	2	1	16
6/4	1	0	7	0			7	2	1	16
6/5	1	0	8	0			7	2	2	18
6/6	2	0	8	0			8	2	6	24
6/7	2	0	10	0			10	2	7	29
6/8	4	2	11	0			11	2	7	33
6/9	2	0	18	4			16	4	7	43
6/10	4	2	22	6			16	4	7	49
6/11	4	2	26	8	1	0	16	4	7	54
6/12	8	2	53	20	11	8	27	4	9	108
6/13	8	2	61	24	11	8	33	6	9	122
6/14	7	0	92	28	10	6	37	6	11	157
6/15	13	2	105	32	7	4	48	8	11	184
6/16	12	0	108	32	6	2	70	18	11	207
6/17	11	0	112	36	6	2	76	20	11	216
6/18	17	0	123	44	6	2	99	30	11	256
6/19	23	0	183	80	4	0	152	56	13	375
6/20	22	0	194	82	4	0	436	216	13	669
6/21	32	4	209	88	6	0	648	342	13	908
6/22	39	6	245	102	6	0	817	442	14	1,121
6/23	40	6	255	98	20	8	881	460	19	1,215
6/24	43	8	261	100	23	8	960	510	20	1,307
6/25	44	8	286	100	21	8	994	524	22	1,367
6/26	83	14	328	122	21	8	1,034	538	27	1,493
6/27	104	24	336	122	25	10	1,053	548	27	1,545
6/28	117	28	331	118	31	12	1,052	542	27	1,558
6/29	133	30	337	118	38	18	1,032	532	27	1,567
6/30	144	32	359	134	54	22	1,022	524	28	1,607
7/01	152	30	378	140	63	26	1,020	520	28	1,641
7/02	170	36	371	136	70	30	1,003	514	28	1,642
7/03	180	38	378	144	79	36	967	492	32	1,636
7/04	191	38	371	142	99	42	928	482	34	1,623
7/05	215	48	318	114	118	54	913	470	36	1,600
7/06	254	58	313	112	128	58	894	464	36	1,625
7/07	304	88	308	112	131	60	905	476	36	1,684
7/08	310	86	292	106	132	62	908	476	37	1,679
7/09	314	86	279	102	127	58	915	476	37	1,672
7/10	318	86	252	84	122	58	943	490	38	1,673
7/11	326	90	257	88	122	60	950	490	38	1,693
7/12	326	90	260	90	121	60	977	504	38	1,722
7/13	324	88	260	90	122	60	953	488	38	1,697
7/14	330	92	257	90	121	60	883	434	38	1,629
7/15	345	100	259	94	130	66	718	354	38	1,490
7/16	397	134	314	134	144	76	679	326	39	1,573
Average[b]	172	43	275	102	68	31	803	412	28	1,345

Note: Total permit sum includes dual boat registrations.

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

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

Table 11.–Comparison of daily sockeye salmon escapement estimates by tower count, aerial survey estimate, and river test fishing enumeration methods, Kvichak River, Bristol Bay, 2018.

	Tower count		River test fishing				
			Fish per	Index points		Estimated cumulative	Estimated
Date	Daily	Cum.	index pt.[a]	Daily	Cum.	escapement	river fish[b]
6/17	0	0	0				
6/18	0	0	0				
6/19	0	0	0				
6/20	0	0	0				
6/21	0	0	0				
6/22	6	6	0				
6/23	36	42	0				
6/24	24	66	0				
6/25	24	90	91	8	8	728	0
6/26	0	90	91	3	11	1,001	0
6/27	0	90	91	0	11	1,001	0
6/28	162	252	91	0	11	1,001	0
6/29	1,218	1,470	91	56	67	6,097	0
6/30	738	2,208	91	11	78	7,098	0
7/1	1,284	3,492	81	22	100	8,100	0
7/2	1,944	5,436	246	851	951	233,946	100,000
7/3	13,848	19,284	98	615	1,566	153,468	200,000
7/4	73,500	92,784	177	88	1,654	292,758	75,000
7/5	75,330	168,114	167	1,329	2,983	498,161	150,000
7/6	93,846	261,960	199	1,900	4,883	971,717	500,000
7/7	160,428	422,388	166	824	5,707	947,362	300,000
7/8	190,836	613,224	154	273	5,980	920,920	200,000
7/9	137,424	750,648	153	1,573	7,553	1,155,609	300,000
7/10	123,498	874,146	180	1,474	9,027	1,624,860	250,000
7/11	203,694	1,077,840	179	3,022	12,049	2,156,771	450,000
7/12	277,026	1,354,866	202	2,225	14,274	2,883,348	600,000
7/13	465,378	1,820,244	197	1,773	16,047	3,161,259	500,000
7/14	557,010	2,377,254	200	1,525	17,572	3,514,400	600,000
7/15	471,114	2,848,368	198	1,806	19,378	3,836,844	750,000
7/16	332,442	3,180,810	219	858	20,236	4,431,684	600,000
7/17	325,656	3,506,466					
7/18	251,586	3,758,052					
7/19	285,522	4,043,574					
7/20	158,796	4,202,370					
7/21	80,448	4,282,818					
7/22	43,854	4,326,672					
7/23	31,428	4,358,100					
7/24	31,122	4,389,222					
7/25	41,082	4,430,304					

[a] The FPI used to estimate the daily estimated river fish (ERF) prior to using lag time relationships was calculated using the 5-year average of median FPIs. This method was used through July 2 when FPIs were based on lag time relationships.

[b] Estimated river fish (ERF) was based on the river test fishery cumulative escapement estimate less the cumulative tower count. On occasion, ADF&G staff adjusted the ERF based on catchability and other factors.

Table 12.–Commercial salmon catch by date and species, in numbers of fish, Egegik District, Bristol Bay, 2018.

	Hours fished		Deliveries							
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/1										
6/2										
6/3										
6/4[a]	15	15		2						
6/5	24	24								
6/6	9	9								
6/7	15	15								
6/8	9	9								
6/9										
6/10										
6/11	15	15	10	20	369	3	34	0	0	406
6/12	24	24	10	21	601	12	26	0	0	639
6/13	9	9	7	2	287	3	26	0	0	316
6/14	15	15	28	32	1,744	38	194	0	0	1,976
6/15[a]	9	9	2	2						
6/16										
6/17										
6/18	5	8	61	90	3,565	20	325	0	0	3,910
6/19										
6/20	5	8	97	61	6,354	40	1,169	0	0	7,563
6/21										
6/22	5	8	155	154	15,052	63	835	0	0	15,950
6/23										
6/24										
6/25	8	8	243	253	96,952	200	2,233	0	0	99,385
6/26	8	8	170	123	58,963	52	1,067	0	0	60,082
6/27	8	8	281	146	100,954	71	2,007	0	0	103,032
6/28	4	8	223	184	39,558	80	975	0	0	40,613
6/29	4	8	269	196	68,010	54	1,183	0	0	69,247
6/30	8	8	299	239	205,779	116	3,403	0	0	209,298
7/1	8	8	298	182	150,642	83	1,592	0	0	152,317
7/2	8	8	306	247	231,753	65	2,290	0	0	234,108
7/3										
7/4	4	8	291	264	160,361	51	1,291	0	0	161,703
7/5	4	8	272	176	166,474	58	1,632	0	0	168,164
7/6	8	8	502	202	222,152	55	2,504	0	0	224,711

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Table 12.–Page 2 of 2.

	Hours fished		Deliveries							
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
7/7	9	13.50	386	333	120,179	56	1,410	0	0	121,645
7/8	13.25	14.75	300	261	69,762	41	742	0	0	70,545
7/9	14.75	14.75	405	356	214,407	52	1,789	0	0	216,248
7/10	15	15	331	363	260,816	57	1,172	0	0	262,045
7/11	18.50	13.50	288	259	298,252	34	2,329	0	0	300,615
7/12	10	8	234	327	363,438	19	2,896	0	0	366,353
7/13	10	8	200	208	169,527	7	1,186	0	0	170,720
7/14	11	8	337	258	325,470	14	2,805	0	0	328,289
7/15	19	19	359	416	283,363	20	2,797	0	0	286,180
7/16	24	24	312	255	360,241	7	4,609	2	0	364,859
7/17	24	24	278	298	259,891	14	3,218	0	0	263,123
7/18	24	24	231	212	132,418	8	2,370	0	0	134,796
7/19	24	24	123	255	99,645	6	1,442	0	0	101,093
7/20	24	24	119	200	115,547	4	3,099	0	0	118,650
7/21	24	24	99	219	112,248	6	3,972	0	0	116,226
7/22	24	24	99	159	77,906	2	2,251	0	0	80,159
7/23	24	24	80	151	36,218	11	1,677	76	88	38,070
7/24	24	24	62	100	48,105	5	1,615	86	153	49,964
7/25	24	24	39	96	52,036	8	1,458	303	148	53,953
7/26	24	24	41	104	58,144	47	2,440	129	545	61,305
7/27	24	24	41	70	45,085	7	1,420	125	615	47,252
7/28	24	24	42	67	36,632	8	1,224	192	672	38,728
7/29	24	24	13	46	12,622	5	386	70	555	13,638
7/30	24	24	33	36	21,950	2	809	113	785	23,659
7/31	24	24	20	43	9,320	3	915	256	645	11,139
8/1	24	24	12	36	9,093	1	544	407	730	10,775
8/2	24	24	14	30	10,060	4	591	709	1,247	12,611
8/3[a]	9	9		1						
8/4										
8/5										
8/6	15	15	5	1	2,961	1	329	81	1,707	5,079
8/7	24	24	7	3	3,047	2	245	39	1,535	4,868
8/8	24	24	12	3	4,342	0	546	68	2,722	7,678
8/9	24	24	10	1	4,356	0	270	38	1,935	6,599
8/10[a]	9	9	3	1						
8/11										
8/12										
8/13[a]	15	15	1							
8/14[a]	24	24	2	1						
8/15[a]	24	24	1	1						
8/16[a]	24	24	1	1						
8/17	9	9								
8/18										
8/19										
8/20[a]	15	15	2	2						
8/21[a]	24	24	1	1						
8/22[a]	24	24	1	1						
8/23[a]	24	24	2	2						
8/24	9	9								
Totals	1,081	1,100	8,070	7,773	5,149,621	1,520	75,524	2,742	21,139	5,250,546

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; records are confidential.

Table 13.–Comparison of daily sockeye salmon escapement estimates by tower count and river test fishing enumeration methods, Egegik River, Bristol Bay, 2018.

	Tower count		River test fishing				
			Fish per	Index points		Estimated cumulative	Estimated
Date	Daily	Cum.	index pt.[a]	Daily	Cum.	escapement	river fish[b]
6/12							
6/13							
6/14							
6/15							
6/16							
6/17	2,280	2,280	56				
6/18	246	2,526	56	6	6	336	
6/19	1,596	4,122	56	74	81	4,536	
6/20	1,782	5,904	56	20	100	5,600	
6/21	384	6,288	56	25	125	7,000	1,500
6/22	2,736	9,024	56	71	196	10,976	2,000
6/23	17,622	26,646	56	128	323	18,088	40,000
6/24	59,634	86,280	56	490	814	45,584	65,000
6/25	72,444	158,724	243	174	988	240,084	60,000
6/26	39,246	197,970	234	470	1,458	341,172	60,000
6/27	32,862	230,832	163	296	1,754	285,902	40,000
6/28	6,330	237,162	143	269	2,023	289,289	25,000
6/29	12,876	250,038	159	1,156	3,179	505,461	50,000
6/30	71,646	321,684	113	889	4,068	459,684	50,000
7/1	38,178	359,862	96	336	4,404	422,784	25,000
7/2	32,580	392,442	99	190	4,594	454,806	25,000
7/3	45,444	437,886	116	174	4,768	553,088	20,000
7/4	96,756	534,642	147	547	5,315	781,305	80,000
7/5	168,582	703,224	157	1,087	6,402	1,005,114	120,000
7/6	130,824	834,048	155	607	7,009	1,086,395	120,000
7/7	155,694	989,742	144	223	7,232	1,041,408	30,000
7/8	16,410	1,006,152	140	135	7,368	1,031,520	18,000
7/9	7,824	1,013,976	141	135	7,502	1,057,782	10,000
7/10	22,290	1,036,266	145	429	7,931	1,149,995	50,000
7/11	52,656	1,088,922	137	304	8,235	1,128,195	55,000
7/12	57,264	1,146,186					
7/13	111,690	1,257,876					
7/14	121,974	1,379,850					
7/15	83,208	1,463,058					
7/16	38,556	1,501,614					
7/17	21,066	1,522,680					
7/18	14,490	1,537,170					
7/19	17,094	1,554,264					
7/20	11,862	1,566,126					
7/21	19,422	1,585,548					
7/22	22,806	1,608,354					
7/23							
7/24							
7/25							

[a] The FPI used to estimate the daily ERF prior to using lag time relationships was calculated using the 2013–2017 mean of the median FPI. This method was used Until June 24 when the FPI were based on lag time relationships.

[b] Estimated river fish (ERF) was based on the river test fishery cumulative escapement estimate less the cumulative tower count. On occasion, ADF&G staff adjusted the ERF based on catchability and other factors.

Table 14.–Inshore run of sockeye salmon by age class, river system, and district, in thousands of fish, Bristol Bay, 2018.

District and river system [a]		1.2	2.2	2-Ocean	1.3	2.3	3-Ocean	1.4	Total [b]
Naknek-Kvichak District									
Kvichak River									
	Number	4,428	41	4,469	2,780	132	2,912	2	7,393
	Percent	59.9	0.5	60	37.6	1.8	39	0.0	99.8
Alagnak River									
	Number	1,587	3	1,590	1,232	15	1,247	11	2,851
	Percent	55.7	0.1	56	43.2	0.5	44	0.4	99.9
Naknek River									
	Number	2,937	229	3,166	3,278	374	3,652	14	6,876
	Percent	42.7	3.3	46	47.7	5.4	53	0.2	99.3
Total	Number	8,952	273	9,225	7,290	521	7,811	27	17,119
	Percent	52.3	1.6	53.9	42.6	3.0	45.6	0.2	99.7
Egegik District									
	Number	1,643	315	1,958	1,962	881	2,843	3	5,150
	Percent	31.9	6.1	38	38.1	17.1	55	0.1	93.2
Ugashik District									
	Number	1,466	37	1,503	1,195	64	1,258	3	2,772
	Percent	52.9	1.3	54	43.1	2.3	45	0.1	99.5
Nushagak District									
Wood River									
	Number	19,980	57	20,037	2,338	10	2,348	0	22,382
	Percent	89.3	0.3	90	10.4	0.3	11	0.0	100.0
Igushik River									
	Number	728	1	729	1,169	0	1,169	4	1,901
	Percent	38.3	0.0	38	61.5	0.0	62	0.2	100.0
Nushagak River									
	Number	1,109	14	1,123	8,174	96	8,270	70	9,472
	Percent	11.7	0.1	12	86.3	1.0	87	0.7	99.8
Total	Number	21,817	72	21,889	11,681	106	11,787	74	33,756
	Percent	64.6	0.2	64.8	34.6	0.3	34.9	0.2	100.0
Togiak District [c]									
	Number	335	3	338	516	7	523	5	868
	Percent	38.6	0.4	39	59.5	0.8	60.3	0.6	99.8
Total Bristol Bay [d]									
	Number	34,213	700	34,913	22,644	1,578	24,223	112	59,665
	Percent	57.3	1.2	58.5	38.0	2.6	40.6	0.2	99.3

[a] Does not include the South Peninsula catch of Bristol Bay sockeye salmon or immature high seas bycatch.

[b] Totals do not include minor age classes, and 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 because of rounding.

Table 15.–Commercial salmon catch by date and species, in numbers of fish, Ugashik District, Bristol Bay, 2018.

	Hours fished		Deliveries							
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/1										
6/2										
6/3										
6/4	15	15								
6/5	24	24								
6/6	24	24								
6/7	24	24								
6/8	9	9								
6/9										
6/10										
6/11[a]	15	15								
6/12[a]	24	24	4							
6/13[a]	24	24								
6/14[a]	24	24								
6/15	9	9								
6/16										
6/17										
6/18										
6/19										
6/20										
6/21										
6/22										
6/23	12	12	14	30	3,199	103	210	0	0	3,512
6/24										
6/25		12		36	2,242	53	0	0	0	2,295
6/26										
6/27	12	12	14	39	11,037	91	785	0	0	11,913
6/28	12	12	28	36	14,363	189	1,087	0	0	15,639
6/29	12	12	42	39	43,383	214	1,081	0	0	44,678
6/30	6	11	46	58	56,978	93	821	0	0	57,892
7/1	8	11	54	72	44,387	82	408	0	0	44,877
7/2	11	11	59	55	45,342	95	896	0	0	46,333
7/3										
7/4	9	9	130	169	124,033	150	2,028	0	0	126,211
7/5										
7/6	4	12	97	84	35,260	64	345	0	0	35,669
7/7	4		90		10,731	22	202	0	0	10,955
7/8										
7/9										
7/10										
7/11										
7/12										
7/13	10	9	97	93	183,355	25	2,402	0	0	185,782

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Table 15.–Page 2 of 2.

	Hours fished		Deliveries							
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
7/14	6	9	88	98	95,645	15	637	0	0	96,297
7/15	12	12	113	114	210,332	34	2,281	0	0	212,647
7/16	12	12	168	91	258,967	22	2,797	0	0	261,786
7/17	24	24	133	88	186,812	18	2,357	0	0	189,187
7/18	24	24	209	99	246,922	9	3,219	0	0	250,150
7/19	24	24	151	65	232,204	6	3,448	0	0	235,658
7/20	24	24	169	65	159,056	6	7,949	0	0	167,011
7/21	24	24	155	52	141,517	10	3,618	0	552	145,697
7/22	24	24	126	44	125,275	11	4,516	0	0	129,802
7/23	24	24	136	35	109,895	3	4,848	3	22	114,771
7/24	24	24	170	26	127,007	13	5,890	73	223	133,206
7/25	24	24	151	20	92,919	23	3,952	62	43	96,999
7/26	24	24	107	15	55,289	12	3,221	42	219	58,783
7/27	24	24	57	16	36,241	6	2534	15	77	38,873
7/28	24	24	45	28	47,048	4	2,990	34	88	50,164
7/29	24	24	38	12	29,661	0	3,466	53	59	33,239
7/30	24	24	34	10	24,387	3	1,858	36	140	26,424
7/31	24	24	20	5	11,491	1	1,641	23	95	13,251
8/1										
8/2[a]	15	15	1	2						
8/3[a]	24	24	1							
8/4[a]	24	24	2	1						
8/5[a]	24	24	1							
8/6	9	9								
Totals	658	684	2,754	1,600	2,771,945	1,407	71,854	971	1,633	2,847,810

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; records are confidential.

Table 16.–Comparison of daily sockeye salmon escapement estimates by tower count and river test fishing enumeration methods, Ugashik River, Bristol Bay, 2018.

	Tower count		River test fishing				
			Fish per	Index points		Estimated cumulative	Estimated
Date	Daily	Cum.	index pt.[a]	Daily	Cum.	escapement	river fish[b]
6/17							
6/18							
6/19							
6/20							
6/21							
6/22							
6/23							
6/24			88	38	38	3,344	
6/25			88	37	75	6,600	
6/26			88	52	127	11,176	10,000
6/27	462	462	88	55	182	16,016	10,000
6/28	756	1,218	88	74	256	22,528	10,000
6/29	1,362	2,580	88	42	298	26,224	10,000
6/30	486	3,066	89	27	325	28,925	20,000
7/1	5,286	8,352	89	78	403	35,867	10,000
7/2	2,988	11,340	64	188	591	37,824	50,000
7/3	9,762	21,102	101	791	1,382	139,582	50,000
7/4	16,740	37,842	168	251	1,633	274,344	70,000
7/5	25,134	62,976	59	115	1,749	103,191	100,000
7/6	17,556	80,532	60	143	1,892	113,520	20,000
7/7	15,426	95,958	63	224	2,116	133,308	30,000
7/8	12,258	108,216	66	702	2,818	185,988	50,000
7/9	14,898	123,114	80	826	3,644	291,520	85,000
7/10	44,580	167,694	79	670	4,315	340,885	87,000
7/11	52,704	220,398	98	766	5,080	497,840	80,000
7/12	24,258	244,656	83	2,306	7,386	613,038	180,000
7/13	110,502	355,158	102	3,170	10,556	1,076,712	250,000
7/14	116,010	471,168	79	2,412	12,968	1,024,472	150,000
7/15	165,282	636,450	66	1,326	14,293	943,338	200,000
7/16	133,140	769,590	76	1,088	15,381	1,168,956	200,000
7/17	108,942	878,532	76	756	16,138	1,226,488	75,000
7/18	125,772	1,004,304					
7/19	82,158	1,086,462					
7/20	25,170	1,111,632					
7/21	15,414	1,127,046					
7/22	8,628	1,135,674					
7/23	9,150	1,144,824					
7/24	5,274	1,150,098					
7/25	9,042	1,159,140					
7/26	8,652	1,167,792					

Note: Blank cells represent days when no data were collected.

[a] The FPI used to estimate the daily ERF prior to using lag time relationships was calculated using the 2012–2016 mean of the median FPI. This method was used until June 22 when the FPI were based on lag time relationships.

[b] Estimated river fish (ERF) was based on the river test fishery cumulative escapement estimate less the cumulative tower count. On occasion, ADF&G staff adjusted the ERF based on catchability and other factors.

Table 17.–Daily sockeye salmon escapement tower counts by river system, Bristol Bay west side, 2018.

	Wood River		Igushik River		Togiak River	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/18	28,188	28,188				
6/19	21,672	49,860				
6/20	24,492	74,352				
6/21	35,334	109,686				
6/22	25,578	135,264				
6/23	21,288	156,552	2,022	2,022		
6/24	15,420	171,972	2,910	4,932		
6/25	108,168	280,140	1,734	6,666		
6/26	152,382	432,522	1,014	7,680		
6/27	230,508	663,030	1,902	9,582		
6/28	311,850	974,880	2,640	12,222		
6/29	146,880	1,121,760	14,370	26,592		
6/30	75,660	1,197,420	25,524	52,116		
7/1	110,370	1,307,790	24,522	76,638		
7/2	1,130,802	2,438,592	22,404	99,042		
7/3	636,474	3,075,066	21,426	120,468		
7/4	247,932	3,322,998	22,086	142,554	414	414
7/5	455,232	3,778,230	18,438	160,992	402	816
7/6	394,200	4,172,430	18,486	179,478	1,812	2,628
7/7	342,450	4,514,880	16,344	195,822	6,666	9,294
7/8	272,550	4,787,430	17,634	213,456	6,624	15,918
7/9	243,684	5,031,114	19,212	232,668	5,142	21,060
7/10	236,562	5,267,676	30,054	262,722	4,824	25,884
7/11	284,040	5,551,716	22,242	284,964	2,424	28,308
7/12	580,548	6,132,264	27,138	312,102	4,092	32,400
7/13	324,540	6,456,804	31,266	343,368	4,386	36,786
7/14	235,632	6,692,436	33,558	376,926	10,866	47,652
7/15	209,094	6,901,530	42,246	419,172	10,740	58,392
7/16	119,994	7,021,524	53,772	472,944	12,336	70,728
7/17	140,592	7,162,116	40,836	513,780	21,936	92,664
7/18	113,616	7,275,732	41,070	554,850	22,986	115,650
7/19	73,674	7,349,406	36,156	591,006	21,444	137,094
7/20	62,436	7,411,842	22,644	613,650	19,866	156,960
7/21	95,412	7,507,254	25,932	639,582	15,360	172,320
7/22			29,658	669,240	16,782	189,102

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	Wood River		Igushik River		Togiak River	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.
7/23			25,092	694,332	15,132	204,234
7/24			35,358	729,690	15,726	219,960
7/25			41,082	770,772	19,572	239,532
7/26					22,206	261,738
7/27					15,870	277,608
7/28					14,988	292,596
7/29					15,402	307,998
7/30					18,168	326,166
7/31					22,302	348,468
8/1					33,534	382,002
8/2					31,122	413,124
8/3					16,740	429,864
8/4					19,434	449,298
8/5					20,472	469,770
8/6					20,034	489,804
8/7					21,966	511,770

Note: Blank cells represent days when escapement projects were not in operation.

Table 18.–Commercial salmon catch by date and species, in numbers of fish, Nushagak District, Bristol Bay, 2018.

Date	Hours fished (drift/set) Nushagak	Igushik	Deliveries Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/11 [a]	0/0	0/8		5						
6/12 [a]	0/0	0/8		8						
6/13 [a]	0/0	0/8		5						
6/14 [a]	0/0	0/8		10						
6/15 [a]	0/0	0/8		3						
6/16 [a]	0/0	0/8		9						
6/17 [a]	0/0	0/8		17						
6/18 [a]	0/0	0/7		19						
6/19	0/6	0/15		160	21,425	332	1,995	1	0	23,753
6/20	5/18.25	5/18.25	306	204	91,497	2,315	45,257	0	0	139,069
6/21	5/18	5/18	442	263	68,419	2,767	34,903	4	0	106,093
6/22	4.5/17.5	4.5/17.5	515	218	55,175	2,542	26,812	21	0	84,550
6/23	5/17.75	5/17.75	617	234	526,232	2,621	45,725	3	0	574,581
6/24	8.5/17	8.5/17	963	473	574,531	5,869	51,601	20	0	632,021
6/25	16/24	16/24	1,341	486	891,733	4,054	72,941	11	0	968,739
6/26	24/24	24/24[b]	814	285	827,573	1,949	59,881	0	0	889,403
6/27	22.5/24	22.5/24[b]	931	456	592,527	1,643	52,248	0	0	646,418
6/28	16.5/24	16.5/24[b]	1,050	458	288,916	1,201	13,203	0	0	303,320
6/29	15/24	15/24[b]	1,220	393	570,451	1,303	25,793	3	0	597,550
6/30	16/24	16/24[b]	1,236	399	1,637,306	1,185	49,922	0	0	1,688,413
7/1	16.5/24	16.5/24[b]	1,289	702	1,464,607	1,405	51,450	1	0	1,517,463
7/2	16.5/24	16.5/24[b]	1,382	584	1,175,650	1,007	35,943	7	0	1,212,607
7/3	16.5./24	16.5./24[b]	1,216	539	851,120	887	30,063	14	0	882,084
7/4	17.5/24	17.5/24[b]	1,094	529	856,971	760	35,554	8	0	893,293
7/5	17.5/24	17.5/24[b]	1,167	539	943,611	727	41,710	0	0	986,048
7/6	18/24	18/24[b]	1,022	512	962,650	592	33,045	735	3	997,025
7/7	17.5/24	17.5/24[b]	914	405	820,219	356	35,441	7	0	856,023
7/8	21.5/24	21.5/24[b]	832	469	1,093,402	274	30,746	5	3	1,124,430
7/9	21/24	21/24[b]	869	471	952,455	263	25,346	2	0	978,066
7/10	18/24	18/24[b]	1,193	584	1,467,641	237	27,080	5	0	1,494,963
7/11	18/24	18/24[b]	1,278	572	1,426,243	142	29,099	28	1	1,455,513
7/12	21/24	21/24[b]	838	549	948,516	84	17,422	38	2	966,062
7/13	19/24	19/24[b]	845	441	907,777	100	18,364	77	7	926,325
7/14	19/24	19/24[b]	826	431	592,001	81	12,085	82	9	604,258
7/15	19/24	19/24[b]	665	450	457,893	130	8,991	94	99	467,207
7/16	20.5/24	20.5/24[b]	650	392	672,334	110	18,545	144	249	691,382
7/17	24/24	24/24[b]	458	537	547,044	89	14,837	222	180	562,372
7/18	24/24	24/24[b]	464	391	395,476	76	12,683	201	162	408,598
7/19	24/24	24/24[b]	331	346	389,469	72	12,822	1,003	526	403,892
7/20	24/24	24/24[b]	309	368	376,544	90	12,359	1,779	1,515	392,287
7/21	24/24	24/24[b]	189	155	168,610	47	9,078	951	1,918	180,604
7/22	24/24	24/24[b]	199	217	163,923	45	8,201	2,328	3,372	177,869
7/23	24/24	24/24[b]	112	232	113,563	50	5,031	3,083	2,372	124,099
7/24	24/24	24/24[ab]	114	203	92,361	26	4,621	4,726	2,983	104,717

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Date	Hours fished (drift/set)		Deliveries		Sockeye	Chinook	Chum	Pink	Coho	Total
	Nushagak	Igushik	Drift	Set						
7/25	24/24	24/24[b]	91	225	85,105	28	2,811	5,298	2,768	96,010
7/26	13/13	13/13[c]	74	112	47,271	44	3,087	3,809	3,522	57,733
7/27	0/0[c]	11/11[b]	4	33	8,387	3	333	112	143	8,978
7/28	0/0	24/24	4	30	6,878	0	90	60	90	7,118
7/29	0/0	18/18[c]	5	5	2,671	1	89	37	43	2,841
7/31	8/8[b]	8/8[b]	34	59	9,311	4	306	10,115	2,460	22,196
8/1	24/24[d]	24/24[d]	51	78	13,222	5	580	13,806	2,283	29,896
8/2	24/24	24/24	19	96	12,213	11	322	18,205	1,521	32,272
8/3	24/24	24/24	39	101	14,700	11	692	28,541	2,381	46,325
8/4	24/24	24/24	22	83	11,289	6	448	14,631	4,291	30,665
8/5	24/24	24/24	19	81	7,753	13	118	8,261	7,229	23,374
8/6	24/24	24/24	25	56	6,448	2	204	6,454	9,167	22,275
8/7	9/9	24/24	15	10	1,934	0	20	1,278	2,045	5,277
8/8	15/15	24/24	12	35	3,699	2	29	4,471	937	9,138
8/9	24/24	24/24	12	45	3,553	2	20	6,023	819	10,417
8/10	24/24	24/24	7	48	1,630	6	20	2,726	5,464	9,846
8/11	24/24	24/24	6	42	1,549	2	6	1,340	11,524	14,421
8/12	24/24	24/24	6	7	116	0	0	190	3,056	3,362
8/15	24/24	24/24	4	8	276	0	0	111	124	511
8/16	24/24	24/24	2	12	368	0	0	184	94	646
8/17	24/24	24/24	1	8	216	0	0	102	260	578
8/18	24/24	24/24		19	297	2	0	214	1,597	2,110
8/19	24/24	24/24	2	23	191	0	0	275	2,784	3,250
8/20	24/24	24/24		19	198	0	0	160	1,381	1,739
8/21	24/24	24/24	1	23	172	0	0	119	887	1,178
8/22	24/24	24/24	1	20	172	1	0	101	2,703	2,977
8/23	24/24	24/24		17	70	0	1	32	656	759
8/24	24/24	24/24		7	29	0	0	29	546	604
9/11[a]	24/24	24/24								
9/12[a]	24/24	24/24								
Total	2112 / 2299.5	2189 / 2448.5	28,147	16,028	24,230,150	35,938	1,020,227	142,287	84,320	25,512,922

[a] Less than 4 permits involved in fishery; records are confidential.

[b] Fishing extended until further notice.

[c] Fishing closed due to oil spill.

[d] Fishing opened until closed by regulation.

Table 19.–Commercial fishing emergency orders, by district and statistical area, Bristol Bay west side, 2018.

Number[a]	Start date	Start time		End date	End time	Effective time
Nushagak District						
Nushagak Section						
Driftnet						
DLG.8	20 Jun	8:00	to	20 Jun	1:00	5.0 hours
DLG.10	21 Jun	9:00	to	21 Jun	2:00	5.0 hours
DLG.11	22 Jun	10:00	to	22 Jun	2:30	4.5 hours
DLG.12	23 Jun	10:30	to	23 Jun	3:30	5.0 hours
DLG.13	24 Jun	11:30	to	24 Jun	4:00	4.5 hours
DLG.14	24 Jun	12:00	to	24 Jun	4:00	4.0 hours
DLG.15	25 Jun	1:00	to	25 Jun	5:00	4.0 hours
DLG.15	25 Jun	12:00	to	25 Jun	8:30	8.5 hours
DLG.18	25 Jun	8:30	to	26 Jun	9:30	25.0 hours
DLG.19	26 Jun	9:30	to	27 Jun	10:30	25.0 hours
DLG.20	28 Jun	2:30	to	28 Jun	11:00	8.5 hours
DLG.20	28 Jun	3:00	to	28 Jun	11:00	8.0 hours
DLG.21	29 Jun	4:30	to	29 Jun	11:30	7.0 hours
DLG.21	29 Jun	3:30	to	29 Jun	11:30	8.0 hours
DLG.22	30 Jun	5:30	to	30 Jun	12:30	7.0 hours
DLG.22	30 Jun	4:00	to	1 Jul	12:30	8.5 hours
DLG.25	30 Jun	3:00	to	1 Jul	12:30	9.5 hours
DLG.25	1 Jul	5:00	to	1 Jul	1:30	8.5 hours
DLG.26	1 Jul	4:30	to	2 Jul	1:00	8.5 hours
DLG.26	2 Jul	5:00	to	2 Jul	2:00	9.0 hours
DLG.27	2 Jul	5:30	to	3 Jul	1:30	8.0 hours
DLG.27	3 Jul	5:30	to	3 Jul	3:00	9.5 hours
DLG.28	3 Jul	6:30	to	4 Jul	2:30	8.0 hours
DLG.28	4 Jul	6:30	to	4 Jul	4:00	9.5 hours
DLG.29	4 Jul	6:30	to	5 Jul	3:00	8.5 hours
DLG.29	5 Jul	6:30	to	5 Jul	4:00	9.5 hours
DLG.30	5 Jul	7:00	to	6 Jul	4:00	9.0 hours
DLG.30	6 Jul	7:00	to	6 Jul	4:30	9.5 hours
DLG.31	6 Jul	7:30	to	7 Jul	4:30	9.0 hours
DLG.31	7 Jul	7:30	to	7 Jul	5:30	10.0 hours
DLG.32	7 Jul	9:00	to	8 Jul	5:30	8.5 hours
DLG.32	8 Jul	8:00	to	8 Jul	6:00	10.0 hours
DLG.33	8 Jul	6:00	to	9 Jul	6:30	24.5 hours
DLG.34	9 Jul	9:30	to	10 Jul	7:30	10.0 hours
DLG.34	10 Jul	10:30	to	10 Jul	7:30	9.0 hours
DLG.35	10 Jul	10:30	to	11 Jul	8:30	10.0 hours
DLG.35	11 Jul	11:30	to	11 Jul	8:30	9.0 hours
DLG.36	11 Jul	11:30	to	12 Jul	9:30	10.0 hours
DLG.36	12 Jul	12:30	to	13 Jul	10:30	22.0 hours
DLG.37	13 Jul	1:30	to	13 Jul	10:00	8.5 hours
DLG.38	14 Jul	1:00	to	14 Jul	11:00	10.0 hours
DLG.38	14 Jul	2:00	to	14 Jul	11:00	9.0 hours

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Number[a]	Start date	Start time		End date	End time	Effective time	
DLG.39	15 Jul	2:00	to	15 Jul	12:00	10.0 hours	
DLG.40	15 Jul	3:00	to	16 Jul	3:30	12.5 hours	
DLG.40	16 Jul	3:30	to	16 Jul	1:00	9.5 hours	b
DLG.40	16 Jul	4:30	to				
DLG.45			to	26 Jul	1:00	236.5 hours	b
DLG.48	31 Jul	4:00	to				
DLG.50			to	7 Aug	9:00	161.0 hours	
DLG.50	8 Aug	9:00	to	9 Aug	9:00	24.0 hours	c
DLG.51	9 Aug	9:00	to	14 Aug	10:00	121.0 hours	c
DLG.53	14 Aug	10:00	to	16 Aug	11:30	49.5 hours	c
DLG.54	16 Aug	11:30	to	30 Sep	11:59	1092.5	
Nushagak District							
Nushagak Section							
Setnet							d
DLG.8	19 Jun	6:00	to	20 Jun	1:00	19.0 hours	
DLG.10	20 Jun	6:45	to	21 Jun	2:00	19.25 hours	
DLG.11	21 Jun	8:00	to	22 Jun	2:30	18.5 hours	
DLG.12	22 Jun	9:00	to	23 Jun	3:30	18.5 hours	
DLG.13	23 Jun	9:45	to	24 Jun	4:00	18.25 hours	
DLG.15	24 Jun	11:00	to	26 Jun	1:00	26.0 hours	c
DLG.18	26 Jun	1:00	to	27 Jun	2:00	25.0 hours	c
DLG.19	27 Jun	2:00	to	28 Jun	3:00	25.0 hours	c
DLG.20	28 Jun	3:00	to	29 Jun	4:00	25.0 hours	c
DLG.21	29 Jun	4:00	to	30 Jun	5:00	25.0 hours	c
DLG.22	30 Jun	5:00	to	1 Jul	6:00	25.0 hours	
DLG.25	1 Jul	6:00	to	2 Jul	7:00	25.0 hours	c
DLG.26	2 Jul	7:00	to	3 Jul	8:00	25.0 hours	c
DLG.27	3 Jul	8:00	to	4 Jul	9:00	25.0 hours	b
DLG.28	4 Jul	9:00	to				e
DLG.37	13 Jul	3:00	to				
DLG.45				26 Jul	1:00	532	b
DLG.48	31 Jul	4:00	to				
DLG.50				7 Aug	9:00	161.0 hours	
DLG.50	8 Aug	9:00	to	9 Aug	9:00	24.0 hours	c
DLG.51	9 Aug	9:00	to	14 Aug	10:00	121.0 hours	c
DLG.53	14 Aug	10:00	to	16 Aug	11:30	49.5 hours	c
DLG.54	16 Aug	11:30	to	30 Sep	11:59	1092.5	

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Table 19.–Page 3 of 5.

Number[a]	Start date	Start time		End date	End time	Effective time	
Nushagak District							
Igushik Section							
Driftnet							[d]
DLG.8	20 Jun	8:00	to	20 Jun	1:00	5.0 hours	
DLG.10	21 Jun	9:00	to	21 Jun	2:00	5.0 hours	
DLG.11	22 Jun	10:00	to	22 Jun	2:30	4.5 hours	
DLG.12	23 Jun	10:30	to	23 Jun	3:30	5.0 hours	
DLG.13	24 Jun	11:30	to	24 Jun	4:00	4.5 hours	
DLG.14	24 Jun	12:00	to	24 Jun	4:00	4.0 hours	
DLG.15	25 Jun	1:00	to	25 Jun	5:00	4.0 hours	
DLG.15	25 Jun	12:00	to	25 Jun	8:30	8.5 hours	[c]
DLG.18	25 Jun	8:30	to	26 Jun	9:30	25.0 hours	[c]
DLG.19	26 Jun	9:30	to	27 Jun	10:30	25.0 hours	
DLG.20	28 Jun	2:30	to	28 Jun	11:00	8.5 hours	
DLG.20	28 Jun	3:00	to	28 Jun	11:00	8.0 hours	
DLG.21	29 Jun	4:30	to	29 Jun	11:30	7.0 hours	
DLG.21	29 Jun	3:30	to	29 Jun	11:30	8.0 hours	
DLG.22	30 Jun	5:30	to	30 Jun	12:30	7.0 hours	
DLG.22	30 Jun	4:00	to	1 Jul	12:30	8.5 hours	[f]
DLG.25	30 Jun	3:00	to	1 Jul	12:30	9.5 hours	
DLG.25	1 Jul	5:00	to	1 Jul	1:30	8.5 hours	
DLG.26	1 Jul	4:30	to	2 Jul	1:00	8.5 hours	
DLG.26	2 Jul	5:00	to	2 Jul	2:00	9.0 hours	
DLG.27	2 Jul	5:30	to	3 Jul	1:30	8.0 hours	
DLG.27	3 Jul	5:30	to	3 Jul	3:00	9.5 hours	
DLG.28	3 Jul	6:30	to	4 Jul	2:30	8.0 hours	
DLG.28	4 Jul	6:30	to	4 Jul	4:00	9.5 hours	
DLG.29	4 Jul	6:30	to	5 Jul	3:00	8.5 hours	
DLG.29	5 Jul	6:30	to	5 Jul	4:00	9.5 hours	
DLG.30	5 Jul	7:00	to	6 Jul	4:00	9.0 hours	
DLG.30	6 Jul	7:00	to	6 Jul	4:30	9.5 hours	
DLG.31	6 Jul	7:30	to	7 Jul	4:30	9.0 hours	
DLG.31	7 Jul	7:30	to	7 Jul	5:30	10.0 hours	
DLG.32	7 Jul	9:00	to	8 Jul	5:30	8.5 hours	
DLG.32	8 Jul	8:00	to	8 Jul	6:00	10.0 hours	[c]
DLG.33	8 Jul	6:00	to	9 Jul	6:30	24.5 hours	
DLG.34	9 Jul	9:30	to	10 Jul	7:30	10.0 hours	
DLG.34	10 Jul	10:30	to	10 Jul	7:30	9.0 hours	
DLG.35	10 Jul	10:30	to	11 Jul	8:30	10.0 hours	
DLG.35	11 Jul	11:30	to	11 Jul	8:30	9.0 hours	
DLG.36	11 Jul	11:30	to	12 Jul	9:30	10.0 hours	
DLG.36	12 Jul	12:30	to	13 Jul	10:30	22.0 hours	[e]
DLG.37	13 Jul	1:30	to	13 Jul	10:00	8.5 hours	
DLG.38	14 Jul	1:00	to	14 Jul	11:00	10.0 hours	
DLG.38	14 Jul	2:00	to	14 Jul	11:00	9.0 hours	

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Table 19.–Page 4 of 5.

Number[a]	Start date	Start time		End date	End time	Effective time	
DLG.39	15Jul	2:00	to	15 Jul	12:00	10.0 hours	
DLG.40	15 Jul	3:00	to	16 Jul	3:30	12.5 hours	b
DLG.40	16 Jul	3:30	to	16 Jul	1:00	9.5 hours	
DLG.40	16 Jul	4:30	to				b,g
DLG.45				26 Jul	1:00	236.5 hours	
DLG.46	27 Jul	1:00	to				b
DLG.47			to	29 Jul	6:00	53.0 hours	
DLG.48	31 Jul	4:00	to				
DLG.54			to	30 Sep	11:59	1472 hours	
Nushagak District							
Igushik Section							
Setnet							
DLG.3	11 Jun	10:30	to	11 Jun	6:30	8.0 hours	
DLG.3	12 Jun	11:00	to	12 Jun	7:00	8.0 hours	
DLG.3	13 Jun	12:00	to	13 Jun	8:00	8.0 hours	
DLG.4	14 Jun	1:00	to	14 Jun	9:00	8.0 hours	
DLG.4	15 Jun	2:00	to	15 Jun	10:00	8.0 hours	
DLG.4	16 Jun	3:00	to	16 Jun	11:00	8.0 hours	
DLG.5	17 Jun	4:00	to	18 Jun	12:00	8.0 hours	
DLG.5	18 Jun	5:00	to	19 Jun	1:00	8.0 hours	d
DLG.5	19 Jun	5:00	to	19 Jun	1:00	8.0 hours	
DLG.8	19 Jun	6:00	to	20 Jun	1:00	19.0 hours	
DLG.10	20 Jun	6:45	to	21 Jun	2:00	19.25 hours	
DLG.11	21 Jun	8:00	to	22 Jun	2:30	18.5 hours	
DLG.12	22 Jun	9:00	to	23 Jun	3:30	18.5 hours	
DLG.13	23 Jun	9:45	to	24 Jun	4:00	18.25 hours	c
DLG.15	24 Jun	11:00	to	26 Jun	1:00	26.0 hours	c
DLG.18	26 Jun	1:00	to	27 Jun	2:00	25.0 hours	c
DLG.19	27 Jun	2:00	to	28 Jun	3:00	25.0 hours	c
DLG.20	28 Jun	3:00	to	29 Jun	4:00	25.0 hours	c
DLG.21	29 Jun	4:00	to	30 Jun	5:00	25.0 hours	
DLG.22	30 Jun	5:00	to	1 Jul	6:00	25.0 hours	
DLG.25	1 Jul	6:00	to	2 Jul	7:00	25.0 hours	c
DLG.26	2 Jul	7:00	to	3 Jul	8:00	25.0 hours	c,b
DLG.27	3 Jul	8:00	to	4 Jul	9:00	25.0 hours	e
DLG.28	4 Jul	9:00					
DLG.37	13 Jul	3:00					b, g
DLG.45				26 Jul	1:00	532.0 hours	
DLG.46	27 Jul	1:00	to				b
DLG.47				29 Jul	6:00	53.0 hours	
DLG.48	31 Jul	4:00	to				
DLG.54				30 Sep	11:59	1472.0 hours	

-continued-

Table 19.–Page 5 of 5.

Number[a]	Start date	Start time		End date	End time	Effective time	
Togiak District							
Togiak River Section							[h]
Drift and Setnet							[h]
DLG.6	20 Jun	9:00	to	22 Jun	9:00	48.0 hours	[i]
DLG.16	27 Jun	9:00	to	29 Jun	9:00	48.0 hours	[i]
DLG.41	20 Jul	9:00	to	22 Jul	9:00	48.0 hours	[i]
DLG.44	27 Jul	9:00	to	29 Jul	9:00	48.0 hours	[i]
DLG.49	3 Aug	9:00	to	5 Aug	9:00	48.0 hours	[i]
DLG.52	10 Aug	9:00	to	12 Aug	9:00	48.0 hours	
DLG.55	17 Aug	9:00	to	19 Aug	9:00	48.0 hours	
WRSHA							
Setnet							
DLG.24	30 Jun	6:00	to	1 Jul	7:00	25.0 hours	[c]
DLG.26	2 Jul	7:00	to	3 Jul	8:00	25.0 hours	[c]
DLG.27	3 Jul	8:00	to	4 Jul	9:00	25.0 hours	[c,b]
DLG.28	4 Jul	9:00	to			25.0 hours	[e]
DLG.37	13 Jul	3:00					
DLG.42				25 Jul	5:00	512.0 hours	

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

[b] Commercial fishing open until further notice.

[c] Extends current fishing period.

[d] Restricts mesh size.

[e] Transfer waiting period waived.

[f] Closes the weekly fishing schedule in the Matogak, Osviak and Slug Sections.

[g] Removes mesh size restriction.

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

[i] 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, 2018.

Date [a]	Deliveries		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set						
6/18	1	9	66	6	98	0	0	170
6/19	4	21	252	60	472	0	0	784
6/20	1	9	75	20	287	0	0	382
6/22[b]								
6/25	9	22	646	106	778	0	1	1,531
6/26	9	19	413	129	1,249	1	0	1,792
6/27	3	15	750	38	361	0	0	1,149
6/28	4	2	129	11	1,362	1	0	1,503
6/29	1	5	320	18	986	2	0	1,326
6/30[b]								
7/2	32	69	8,561	235	3,856	8	0	12,660
7/3	48	99	11,396	239	6,045	35	0	17,715
7/4	43	105	9,778	247	6,140	31	0	16,196
7/5	48	89	5,833	289	8,047	21	0	14,190
7/6	31	79	8,298	203	5,993	39	0	14,533
7/7	12	41	5,019	67	2,341	7	0	7,434
7/9	32	63	8,607	126	2,346	23	1	11,103
7/10	52	96	15,611	189	4,958	23	0	20,781
7/11	35	107	16,326	128	3,942	28	0	20,424
7/12	58	117	27,672	211	6,479	30	0	34,392
7/13	20	82	16,830	64	2,235	21	0	19,150
7/14	20	92	19,502	85	3,883	29	0	23,499
7/15[b]								
7/16	45	122	23,286	99	10,098	76	0	33,559
7/17	73	174	36,245	138	14,731	123	2	51,239
7/18	73	148	33,075	111	13,407	151	0	46,744
7/19	74	144	33,080	113	8,136	212	1	41,542
7/20	58	111	23,971	79	9,444	185	1	33,680
7/21	41	107	29,105	39	4,245	151	0	33,540
7/22	6	23	5,300	4	369	31	0	5,704
7/23	30	82	17,052	27	3,412	327	6	20,824
7/24	69	121	32,763	60	6,585	983	6	40,397
7/25	59	109	30,408	52	6,210	1,998	4	38,672
7/26	56	111	29,349	36	3,428	1,506	6	34,325
7/27	37	93	28,896	46	1,809	1,962	13	32,726
7/28	32	61	23,479	20	1,565	2,197	7	27,268
7/29	6	16	5,852	5	132	334	1	6,324
7/30	31	79	22,149	11	1,320	2,777	16	26,273
7/31	43	124	41,303	23	2,241	7,576	57	51,200

-continued-

Table 20.–Page 2 of 2.

Date [a]	Deliveries		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set						
8/1	46	133	35,578	21	1,655	5,799	82	43,135
8/2	45	139	43,112	21	1,525	8,105	226	52,989
8/3	42	130	37,983	17	1,620	8,886	245	48,751
8/4	37	107	33,664	10	1,072	6,157	370	41,273
8/5	12	28	9,734	6	195	1,586	88	11,609
8/6	21	60	14,555	4	530	2,693	657	18,439
8/7	46	101	26,760	7	725	4,656	1,137	33,285
8/8	33	110	26,414	4	602	3,614	1,211	31,845
8/9	29	78	20,134	3	418	2,160	1,732	24,447
8/10	25	65	16,041	6	324	1,621	1,972	19,964
8/11	4	38	5,054	1	111	422	831	6,419
8/13[b]								
8/14	4	26	2,234	3	30	127	564	2,958
8/15	7	66	8,152	2	107	395	1,699	10,355
8/16	10	42	5,260	5	109	258	1,659	7,291
8/17	4	29	2,792	0	86	200	1,509	4,587
8/18		5	612	0	8	11	269	900
8/19	1	2	293	0	0	0	187	480
8/20	5	17	588	0	14	7	1,787	2,396
8/21	6	32	1,636	0	28	48	2,446	4,158
8/22	6	30	1,286	4	23	52	3,143	4,508
8/23	5	32	1,180	3	34	21	4,481	5,719
8/24	1	9	294	1	7	1	994	1,297
8/27	3	15	534	1	12	6	2,023	2,576
8/28	2	21	527	0	3	4	1,948	2,482
8/29	4	29	511	0	13	19	3,507	4,050
8/30	1	16	273	1	1	4	1,817	2,096
8/31		5	219	0	0	3	765	987
9/3		6	61	0	0	0	535	596
9/4	2	16	165	0	5	0	2,203	2,373
9/5		8	96	0	1	0	927	1,024
9/6	2	11	191	0	1	0	1,977	2,169
9/7[b]								
Total	1,599	4,177	867,770	3,457	158,329	67,747	43,243	1,140,546

[a] There were inseason adjustments to the regular weekly fishing schedule.

[b] Fewer than 4 permit holders involved in fishery; records are confidential.

Table 21.–Commercial herring sac roe and spawn-on-kelp buyers in Togiak District, 2018.

			Product purchased		
			Sac roe		
	Operator/buyer[a]	Base of operation	Gillnet	Purse seine	Spawn-on-kelp
1	Icicle Seafoods	P/Vs 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	

[a] Operators that registered in the Togiak District.

Table 22.–Daily observed estimates of spawn (in miles) and herring (in short tons) by index area, in the Togiak District, 2018.

				Estimated biomass by index area [a]													
Date	Start time	Survey rating [b]	Miles of spawn	NUS	KUK	MET	NUK	UGL	TOG	TNG	MTG	OSK	PYT	CPN	HAG	WAL	Daily total
16 Apr	1300	3.5		0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 Apr	1100	3.5		0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 Apr	1300	1.0		0	0	0	13	3	0	0	0	0	0	0	0	0	16
23 Apr	1100	3.6	2.6	0	0	0	20	6	0	0	0	0	0	0	48	0	74
26 Apr	1300	1.0	2.0	0	0	0	381	0	0	0	0	224	0	0	13	0	618
1 May	1500	1.0	0.0	0	0	0	242	0	0	0	0	0	0	0	0	0	242
2 May	1000	3.9	3.3	0	1,143	486	37	1,321	317	0	20	51	0	0	0	0	3,375
16 May	1000	3.1	10.0	0	1,399	281	0	277	0	0	0	0	0	0	0	0	1,957
Total linear miles of spawn			17.9											Peak biomass estimate			6,282

Note: Blank cells represent no biomass observed.

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

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

[c] Includes 466 short tons of deadloss from Nunavachak.

Table 23.–Emergency order commercial fishing periods for herring sac roe and spawn-on-kelp in the Togiak District, 2018.

EO #	Area [a]		Date and time		
Herring sac roe gillnet					
DLG-02	Egg Island Section		4/22 6:00 AM	to	end of season
DLG-04	Egg Island Section and west to 58° 50.50'N	Area change	4/23 6:00 AM		
DLG-07	159°30.00'W to and including Egg Island Section and west to 162° 10.50'W	Area change	5/3 10:00 AM		
Herring sac roe purse seine					
DLG-01	Anchor Pt. to Right Hand Pt., Togiak Reef to Cape Newenham		4/22 6:00 AM	to	end of season
DLG-03	Mud Bay to Anchor Pt.; Togiak Reef to Cape Newenham	Area change	4/23 11:59 AM		
DLG-05	New area open middle of Kulukak eastward	Area change	4/27 6:00 AM		
DLG-06	Season ends	Closure	5/6 8:00 AM		
Herring spawn on kelp [b]					

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

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

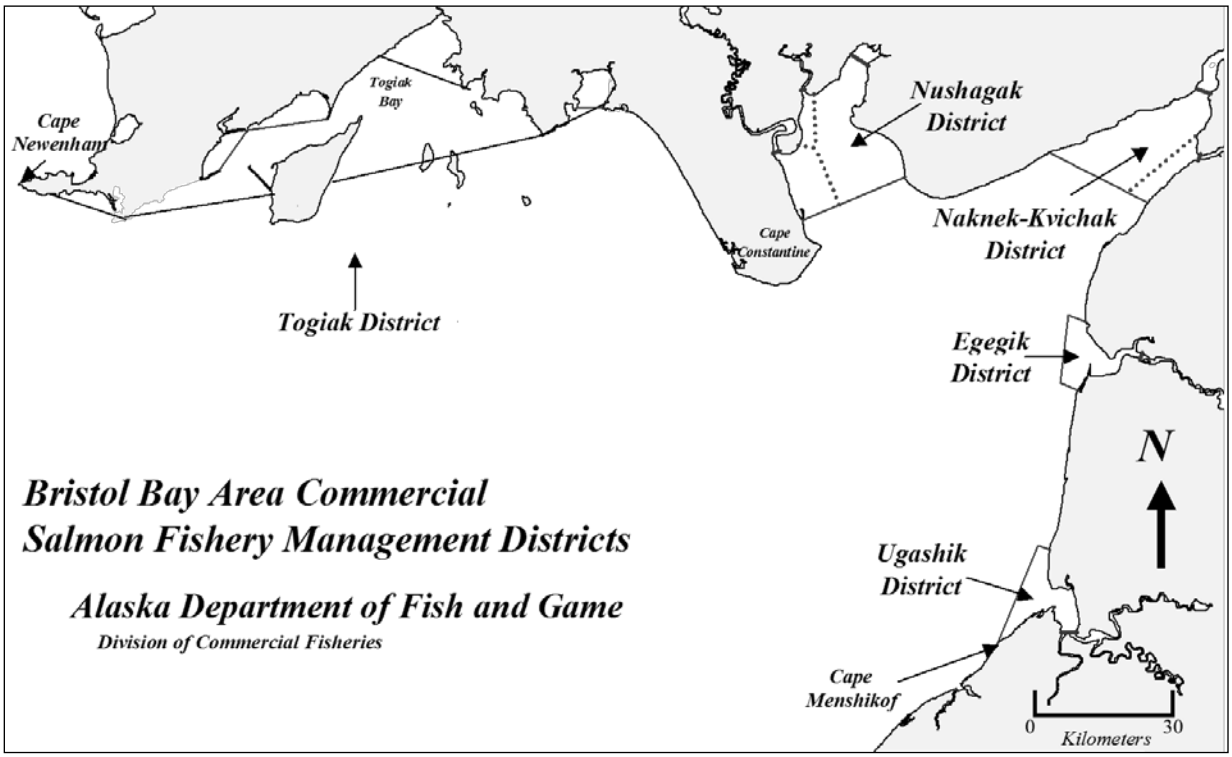

Figure 1.–Bristol Bay area commercial fisheries salmon management districts.

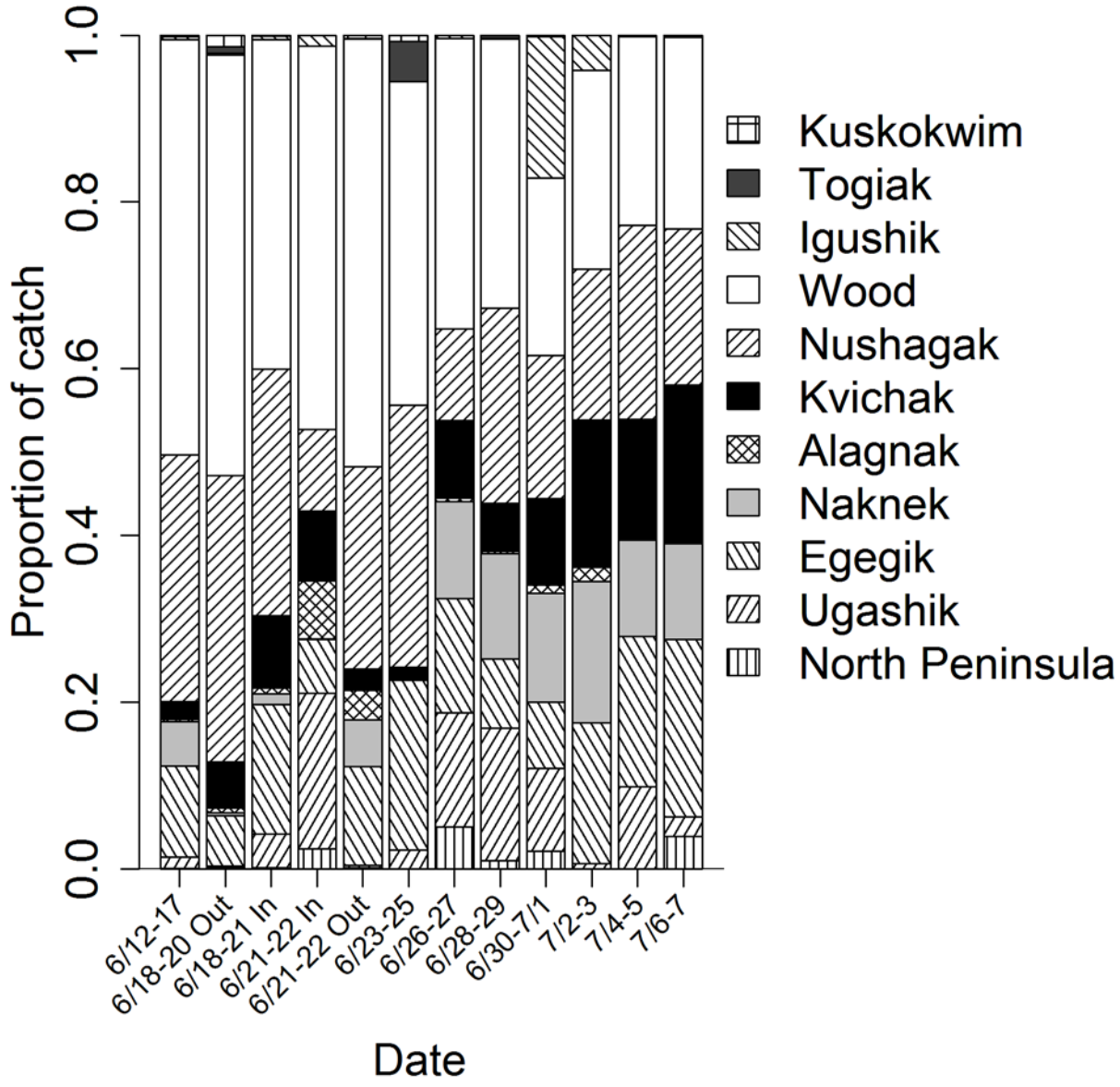

Figure 2.–Stock composition estimates for sockeye salmon sampled from the Port Moller test fishery, 2018.

Note: Mean stock composition estimates for the 11 reporting groups of the Bristol Bay baseline are depicted as stacked bar graphs for each of the 12 temporal periods analyzed in 2018. (Port Moller test fishery data available from ADF&G Gene Conservation Lab, Anchorage)

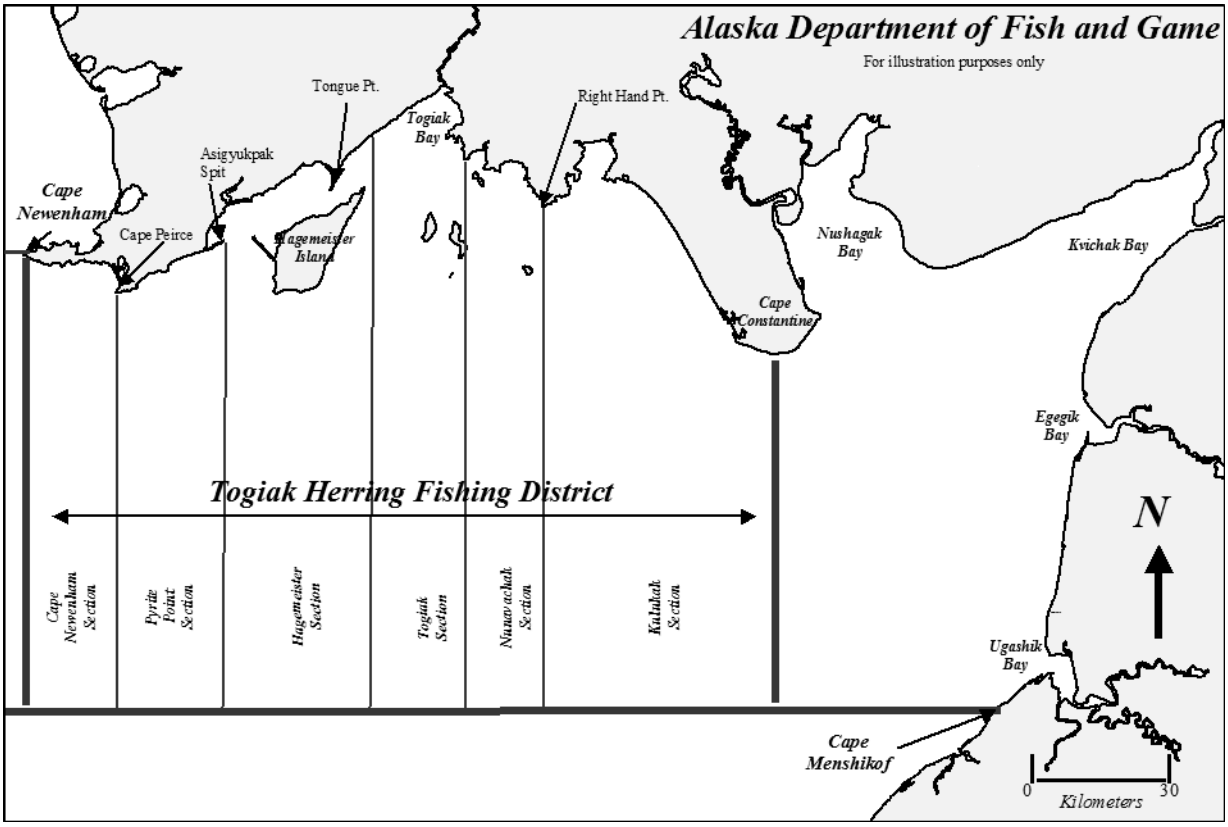

Figure 3.–Togiak Herring District, Bristol Bay.

APPENDIX A: SALMON

Appendix A1.–Escapement goal ranges and actual counts of sockeye salmon by river system, in thousands of fish, Bristol Bay, 1998–2018.

	Kvichak River			Naknek River [a]		
	Range			Range		
Year	Lower	Upper	Actual	Lower	Upper	Actual
1998	2,000	10,000	2,296	800	1,400	1,202
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	2,800	10,000	4,459	800	1,400	1,474
2015	2,000	10,000	7,342	800	1,400	1,921
2016	2,800	10,000	4,463	800	2,000	1,692
2017	2,800	10,000	3,163	800	2,000	1,900
20-Year Avg.	2,520	10,000	3,234	800	1,670	1,691
1998-07 Avg.	2,800	10,000	2,751	800	1,820	1,871
2008-17 Avg.	2,160	10,000	3,682	800	1,520	1,615
2018	2,000	10,000	4,399	800	2,000	2,221

	Egegik River			Ugashik River		
	Range			Range		
Year	Lower	Upper	Actual	Lower	Upper	Actual
1998	800	1,400	1,111	500	1,200	891
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
20-Year Avg.	800	1,460	1,288	500	1,220	1,011
1998-07 Avg.	800	1,400	1,284	500	1,200	1,078
2008-17 Avg.	800	1,580	1,462	500	1,260	1,035
2018	800	2,000	1,608	500	1,400	1,168

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	Wood River			Igushik River		
	Range			Range		
Year	Lower	Upper	Actual	Lower	Upper	Actual
1998	700	1,200	1,756	150	250	216
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
20-Year Avg.	700	1,500	1,777	150	308	406
1998-07 Avg.	700	1,410	1,735	150	285	300
2008-17 Avg.	700	1,560	1,544	150	300	452
2018	700	1,800	7,507	150	400	771

	Nushagak River			Togiak River		
	Range			Range		
Year	Lower [b]	Upper	Actual [c]	Lower	Upper	Actual
1998	340	760	508	100	200	154
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
20-Year Avg.	330	782	605	110	235	203
1998-07 Avg.	309	760	590	102	207	217
2008-17 Avg.	355	818	869	120	270	200
2018	370	900	1,247	120	270	512

[a] In 2001 the Alaska Board of Fisheries (BOF) set an OEG up to 2.0 million sockeye salmon in the Naknek River SHA.

[b] In 1999 the BOF set an OEG of 235,000 sockeye salmon.

[c] Nushagak River sonar (at Portage Creek) escapement estimates prior to 2006 were adjusted because sonar technology changed in 2006 (Buck et al. 2012).

Appendix A2.–Salmon entry permit registration by gear and residency, Bristol Bay, 1998–2018.

	Driftnet [a]						Setnet [a]						Total
Year	Resident	Non-resident	Drift total	Permits fished[b]	% Fished	Interim use	Resident	Non-resident	Set total	Permits fished[c]	% fished	Interim use	drift and set [d]
1998	954	945	1,899	1,858	95%	55	756	259	1,015	901	88%	6	2,914
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	1005	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
20-Year Avg.	896	973	1,869	1,647	88%	10	684	305	989	848	86%	1	2,858
1998-07 Avg.	924	952	1,876	1,581	83%	20	714	286	1,000	828	83%	3	2,876
2008-17 Avg.	868	995	1,863	1,714	92%	0	653	325	978	869	89%	0	2,841
2018	838	1,025	1,863	1,749	94%	0	634	336	972	879	91%	0	2,833

[a] Allowable gear per license/permit is measured in fathoms, 150 for drift and 50 for setnet.

[b] Based on the number of permits registered to fish.

[c] The number of permits that made at least on delivery.

[d] Includes interim use permits.

Appendix A3.–Sockeye salmon commercial catch by district, in numbers of fish, Bristol Bay, 1998–2018.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1998	2,595,439	3,528,845	730,274	2,990,597	190,427	10,035,582
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	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	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
20-Year Avg.	8,013,177	6,745,168	2,830,625	6,424,924	557,849	24,654,791
1998-07 Avg.	5,444,124	5,985,093	2,113,986	6,225,416	546,603	20,480,922
2008-17 Avg.	10,582,230	7,505,244	3,547,264	6,624,432	569,095	28,828,660
2018	8,917,710	5,149,621	2,771,945	24,230,150	867,770	41,937,196

[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, 1998–2018

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1998	2,722	795	347	117,820	14,132	135,816
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	1,496	1,632	891	96,759	9,310	114,280[a]
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	49,945	2,663	56,513
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
20-Year Avg.	1,678	636	900	38,461	6,277	44,681
1998-07 Avg.	1,465	755	1,179	53,262	8,504	60,175
2008-17 Avg.	1,891	516	620	23,659	4,050	30,736
2018	2,398	1,520	1,407	35,938	3,457	44,720

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

Appendix A5.–Chum salmon commercial catch by district, in numbers of fish, Bristol Bay, 1998–2018.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1998	82,281	29,405	8,088	208,551	67,345	395,670
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	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
20-year Avg.	196,868	69,510	67,784	521,043	152,225	1,008,690
1998-07 Avg.	155,715	68,614	74,387	565,622	135,661	1,002,514
2008-17 Avg.	238,020	70,405	61,182	476,465	168,790	1,014,865
2018	310,872	75,524	71,854	1,020,227	158,329	1,636,806

Appendix A6.–Pink salmon commercial catch by district, in numbers of fish, Bristol Bay, 1998–2018.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1998	11,317	674	247	6,787	6,406	25,431
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	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
20-Year Avg.	11,587	956	218	412,070	63,552	488,383
1998-07 Avg.	12,777	281	88	22,092	21,291	56,529
2008-17 Avg.	10,397	1,630	348	802,048	105,814	920,238
2018	30,507	2,742	971	142,287	67,747	244,254

Note: Averages include even-numbered years only.

Appendix A7.–Coho salmon commercial catch by district, in numbers of fish, Bristol Bay, 1998–2018.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1998	1,587	29,856	13,007	22,703	58,688	125,841
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
20-Year Avg.	1,684	13,181	2,294	60,690	13,688	91,537
1998-07 Avg.	1,569	18,260	3,695	30,641	8,226	62,390
2008-17 Avg.	1,799	8,103	894	90,739	19,150	120,684
2018	11,549	21,139	1,633	84,320	43,243	161,884

Appendix A8.–Total salmon commercial catch by district, in numbers of fish, Bristol Bay, 1998–2018.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1998	2,694,447	3,589,915	751,988	3,347,789	337,001	10,721,140
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	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	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
20-Year Avg.	8,220,622	6,829,737	2,901,849	7,263,097	764,344	26,041,124
1998-07 Avg.	5,610,865	6,073,337	2,193,520	6,886,841	710,810	21,643,701
2008-17 Avg.	10,830,378	7,586,138	3,610,179	7,639,353	817,879	30,438,547
2018	9,273,036	5,250,546	2,847,810	25,512,922	1,140,546	44,024,860

Appendix A9.–Commercial sockeye salmon catch, in percent, by gear type and district, Bristol Bay, 1998–2018.

	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
1998	84	8	8			86	14	85	15	72	24	4	76	24		43	57	86	14
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	12	86	14	88	12	84	15	1				55	45	79	21
2005				81	19	82	18	87	13	84	14	2				56	44	66	34
2006	86	8	5	81	19	84	16	88	12	87	11	2				53	47	85	15
2007	82	12	6	80	12	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
1998-07 Avg.	84	10	5	76	23	84	16	87	13	79	18	3	72	28		57	43	80	20
2008-17 Avg.	82	10	9	NA	NA	84	16	89	11	74	19	6	58	42		59	41	81	19
2018	71	17	12	84	16	80	20	78	22	82	13	2	0	3		51	49	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 indicate no data.

[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 allocation plan in 1998; reviewed in December 2003. Historical data prior to 1998 is based on postseason numbers. Inseason numbers are presented for 1998 to present because they were used to make management decisions regarding allocation.

Appendix A10.–Sockeye salmon escapement by district, in numbers of fish, Bristol Bay, 1998–2018.

Year	Naknek-Kvichak [a]	Egegik [b]	Ugashik [c]	Nushagak [d]	Togiak [e]	Total
1998	3,750,246	1,110,932	924,853	2,490,324	214,626	8,490,981
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]	9,102,876
2002	2,303,463	1,036,092	905,584	1,755,993[f]	199,507	6,200,639
2003	5,627,974[b]	1,152,120	790,202	2,295,963[f]	261,851 [g]	10,128,110
2004	12,836,100[b]	1,290,144	815,104	2,196,864[f]	154,681 [g]	17,292,893
2005	9,283,980[b]	1,621,734	799,612	2,968,962 [f]	155,778 [g]	14,830,066
2006	6,795,420[b]	1,465,158	1,003,158	4,861,780 [f]	312,126	14,437,642
2007	8,221,926[b]	1,432,500	2,599,186	2,461,579 [f]	269,646[i]	14,984,837
2008	7,411,104[b]	1,259,568	596,332	3,271,926 [f]	205,680 [i]	12,744,610
2009	4,406,424[b]	1,146,276	1,364,338	2,317,569 [f]	313,946 [i]	9,548,553
2010	6,859,068[b]	927,054	830,886	2,791,080 [f]	188,298 [i]	11,596,386
2011	4,325,220[b]	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
20-Year Avg.	6,661,282	1,373,030	1,072,279	2,886,057	226,214	12,267,305
1998-07 Avg.	6,397,226	1,283,746	1,100,453	2,625,947	252,811	11,757,070
2008-17 Avg.	6,925,337	1,462,313	1,044,105	3,146,167	199,617	12,777,539
2018	8,201.286	1,608,354	1,167,792	9,525,486	511,770	21,014,688

[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 systems in 1991–2004.

[d] Includes Wood, Igushik, Nuyakuk, Nushagak-Mulchatna, and Snake 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 aerial survey of Togiak River, Lake tributaries, Kulukak system, other miscellaneous river systems, and Togiak River tower count except where noted.

[f] Snake River not surveyed.

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

[h] Includes Alagnak tower count.

[i] Togiak River tower count.

Appendix A11.–Inshore total run of sockeye salmon by district, in numbers of fish, Bristol Bay, 1998–2018.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak [a]	Togiak	Total
1998	6,345,685	4,639,777	1,655,127	5,480,921	405,053	18,526,563
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
20-Year Avg.	14,683,126	8,107,112	3,902,958	9,311,907	785,373	36,790,476
1998-07 Avg.	11,841,351	7,268,839	3,214,439	8,851,362	799,414	31,975,405
2008-17 Avg.	17,524,901	8,945,385	4,591,478	9,772,452	771,331	41,605,547
2018	17,118,996	6,757,975	3,939,737	33,755,636	1,379,540	62,951,884

[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 by river system, in numbers of fish, Bristol Bay, 1998–2018.

		Escapement				
Year	Catch	Kvichak [a]	Alagnak		Naknek [a]	Total	Total Run
1998	2,596,490	2,296,074	252,200	[b]	1,202,172	3,750,446	6,345,885
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
20-Year Avg.	8,014,550	3,234,451	1,814,766		1,690,967	6,740,184	14,752,855
1998-07 Avg.	5,445,725	2,750,579	1,931,991		1,871,100	6,553,670	11,995,782
2008-17 Avg.	10,583,375	3,718,322	1,697,541		1,510,835	6,926,697	17,509,929
2018	8,917,710	4,398,708	1,581,426	[a]	2,221,152	8,201,286	17,118,996

[a] Tower count.

[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, 1998–2018.

	Kvichak		Alagnak			Naknek		
Year	Number	%	Number	%		Number	%	Total Run [a]
1998	3,427	54	381	6	[b]	2,538	40	6,346
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
20-Year Avg.	6,284	41	3,193	19		5,283	40	14,753
1998-07 Avg.	4,381	34	2,436	17		5,196	48	11,996
2008-17 Avg.	8,186	47	3,950	22		5,370	31	17,510
2018	7,393	43	2,851	17	[c]	6,876	40	17,119

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

[b] Total run is based on aerial survey estimate.

[c] Total run is based on 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, 1998–2018.

		Escapement			
Year	Catch	Egegik [a]	Shosky Cr. [b]	King Salmon River [b]	Total run
1998	3,503,745	1,110,882		50	4,614,677
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
20-Year Avg.	6,692,183	1,373,006	2	371	8,065,338
1998-07Avg.	6,058,089	1,281,518	2	503	7,339,837
2008-17 Avg.	6,956,006	1,335,777	0	176	8,291,862
2018	5,149,621	1,608,354	[c]	[c]	6,757,975

Note: Blank cells represent no survey conducted.

[a] Tower count.

[b] Aerial survey index count.

[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, 1998–2018.

		Escapement			
Year	Catch	Ugashik [a] River	King Salmon [b] River	Dog Salmon [b] River	Total run
1998	716,814	890,508	27,425	6,920	1,641,667
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	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
20-Year Avg.	2,821,731	1,052,211	15,219	17,632	3,894,015
1998-07 Avg.	2,098,508	1,070,432	17,121	16,313	3,198,950
2008-17 Avg.	3,676,875	1,169,417	2,714	28,562	4,862,364
2018	2,771,045	1,167,792	[c]	[c]	3,938,837

[a] Tower count plus aerial survey index count.

[b] Aerial survey index count.

[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, 1998–2018.

		Escapement				
Year	Catch	Wood[a]	Igushik[a]	Nushagak[b]	Total	Total run
1998	2,991,841	1,755,768	215,904	507,532[c]	2,490,324	5,482,165
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
20-year Avg.	6,464,205	1,776,516	406,360	702,616	2,888,627	9,352,832
1998-07 Avg.	6,226,044	1,734,650	299,768	590,418	2,625,947	8,851,991
2008-17 Avg.	6,702,366	1,818,383	512,952	814,814	3,151,307	9,853,673
2018	24,230,150	7,507,254	770,772	1,247,460	9,525,486	33,755,636

Note: Blank cells represent no data.

[a] Tower count.

[b] Escapement estimates 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 and percent of total district run, Nushagak District, Bristol Bay, 1998–2018.

	Wood		Igushik		Nushagak				
Year	Total run	%	Total run	%	Sonar [a]	Catch total	Total run	%	Total run [b]
1998	3,901	71	571	10	508	490	998	18	5,481
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
20-Year Avg.	5,768	62	1,258	14	702	1,625	2,327	24	9,356
1998-07 Avg.	5,619	64	1,206	13	590	1,436	2,027	22	8,853
2008-17 Avg.	5,917	60	1,310	14	815	1,813	2,628	26	9,860
2018	22,426	66	1,905	6	1,248	8,177	9,425	28	33,756

[a] Nushagak River sonar escapement estimates prior to 2006 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, and Nushagak 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, 1998–2018.

	Catch				Escapement		
Year	Togiak	Kulukak	Os/Mat [a]	Total	Togiak Lake [b]	Total	Total run
1998	112,994	75,279	1,375	189,648	153,576	214,626	404,274
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
20-Year Avg.	496,676	57,334	3,797	557,807	208,470	226,400	784,206
1998-07 Avg.	495,102	50,882	542	546,526	217,324	253,182	799,708
2008-17 Avg.	498,250	63,787	7,052	569,089	199,617	199,617	768,704
2018	829,305	37,645	820	867,770	511,770	511,770	1,379,540

Note: Blank cells represent no data.

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

[b] Tower count.

Appendix A19.–Chinook salmon harvest, escapement and total runs in the Nushagak District, in numbers of fish, Bristol Bay, 1998–2018.

	Harvests by fishery				Inriver	Spawning	Total
Year	Commercial	Sport	Subsistence	Total	abundance[a]	escapement[b]	run
1998	117,820	5,827	12,258	135,905	244,461	235,003	370,908
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
20-Year Avg.	38,497	6,289	12,501	57,287	126,975	118,288	175,575
1998-07 Avg.	53,262	6,378	12,495	72,136	169,269	159,631	231,767
2008-17 Avg.	23,732	6,200	12,506	42,438	84,680	76,944	119,382
2018	35,938	6,852[d]	13,481[d]	56,271	97,239	86,990	143,261

[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: 1997 - from comprehensive aerial surveys; 1993–1996, 1998–2013, from inriver abundance estimated by sonar minus inriver harvests.

[c] Inseason management count. Revised passage estimates for 2010, 2011, and 2012 are 60,185, 108,278, and 174,085, respectively.

[d] 5-year average used.

Appendix A20.–Chinook salmon harvest, escapement and total runs in the Togiak River drainage, in numbers of fish, Bristol Bay, 1998–2018.

	Harvests by fishery				Spawning	Total
Year	Commercial	Sport [a]	Subsistence	Total	escapement [b]	run
1998	12,867	763	782	14,412	9,856	24,268
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]
20-Year Avg.	6,125	934	1,082	8,141	6,812	16,779
1998-07 Avg.	8,625	935	1,215	10,775	8,821	21,636
2008-17 Avg.	3,624	933	949	5,507	3,799	9,978
2018	3,457	1,163[g]	853[g] [g]	5,472	[e]	

[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 due to poor weather/pilot availability.

[f] USFWS radiotelemetry-derived escapement estimate.

[g] 5-year average used.

Appendix A21.–Inshore commercial catch and escapement of chum salmon in the Nushagak and Togiak Districts, in numbers of fish, 1998–2018

	Nushagak District			Togiak District		
Year	Catch	Escapement [a]	Total run	Catch	Escapement [b]	Total run
1998	208,551	379,818	588,369	67,345	102,455	169,800
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 [c]	[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]
20-Year Avg.	508,790	407,296	899,282	152,167	126,419	78,010
1998-07 Avg.	565,622	419,410	985,033	135,661	109,402	156,019
2008-17 Avg.	451,957	395,182	813,532	168,674	279,580	0
2018	1,020,227	811,283	1,831,510	158,329	[e]	[d]

[a] Escapement based on estimates from the Nushagak River sonar project at Portage Creek. Estimates prior to 2006 ere 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.

[c] Partial survey count.

[d] Total run cannot be determined; escapement information incomplete or unavailable.

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

Appendix A22.–Average round weight (in pounds) of the commercial salmon catch by species, Bristol Bay, 1998–2018

Year	Sockeye	Chinook	Chum	Pink	Coho
1998	5.7	17.7	6.4	3.3	8.4
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
20-Year Avg.	5.8	15.2	6.7	3.6	6.7
1998-07 Avg.	6.0	16.2	6.9	3.6	6.9
2008-17 Avg.	5.7	14.2	6.4	3.6	6.5
2018	5.1	10.5	6.3	3.6	6.5

Appendix A23.–Average price paid (in dollars/pound) for salmon, by species, Bristol Bay, 1998–2018.

Year	Sockeye	Chinook	Chum	Pink	Coho
1998	1.22	0.62	0.10	0.08	0.48
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
20-Year Avg.	0.87	0.76	0.20	0.13	0.51
1998-07 Avg.	0.66	0.49	0.10	0.06	0.39
2008-17 Avg.	1.08	1.04	0.29	0.21	0.64
2018 [a]	1.26	0.80	0.36	0.20	0.80

Source: OCEANAK ADF&G Commercial Operators Annual Report (COAR) By 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, 1998–2018.

Year	Sockeye	Chinook	Chum	Pink [a]	Coho	Total [b]
1998	66,530	1,226	242	7	727	68,732
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	268,526	431	2,594		1,071	272,622
20 Year Avg.	122,508	457	1,169	457	416	123,818
1998-07 Avg.	76,796	535	662	43	274	78,287
2008-17 Avg.	168,221	379	1,675	871	557	169,350
2018[c]	271,893	376	3,717	174	842	277,002

Source: OCEANAK ADF&G Commercial Operators Annual Report (COAR) By 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] Includes even-numbered years only.

[b] Total may vary from actual sum because of rounding.

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

Appendix A25.–South Unimak and Shumigan Island preseason sockeye allocation and actual sockeye and chum salmon harvest in thousands of fish, Alaska Peninsula, 1998–2018.

	South Unimak			Shumigan Island			Total		
	Sockeye			Sockeye			Sockeye		
Year	Actual	Quota [a]	Chum	Actual	Quota [a]	Chum	Actual	Quota [a]	Chum
1998	975	1,529	195	314	336	50	1,289	1,865	245
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
20-yr Avg.	707	1,401	169	463	308	196	1,142	1,709	365
1998-07 Avg.	613	1,401	158	410	308	165	967	1,709	324
2008-17 Avg.	801		180	516		227	1,317		407
2018	415		234	407		303	822		537

Note: Blank cells represent no data.

[a] Sockeye salmon quota management system used from 1992 to 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, 2018.

Area and river system	Number of permits issued[a]	Estimated salmon harvest					
		Chinook	Sockeye	Coho	Chum	Pink	Total
Naknek-Kvichak District	441	723	50,574	1,116	283	129	52,825
Naknek River Subdistrict	277	708	21,815	1,100	280	126	24,029
Kvichak River/Iliamna Lake Subdistrict:	158	10	27,832	16	3	2	27,863
Igiugig	4	2	540	5	1	0	548
Iliamna Community	34	0	5,367	0	0	0	5,367
Iliamna Lake-General	2	0	100	0	0	0	100
Kokhanok	18	7	4,433	11	3	1	4,455
Kvichak River	15	0	1,599	0	0	0	1,599
Lake Clark	50	0	4,199	0	0	0	4,199
Levelock	1	1	83	0	0	0	84
Newhalen River	28	0	8,933	0	0	0	8,933
Pedro Bay	8	0	928	0	0	0	928
Pile Bay	1	0	225	0	0	0	225
Six Mile Lake	6	0	1,426	0	0	0	1,426
Naknek or Kvichak (Site Unknown)	9	5	927	1	0	1	933
Egegik District	23	129	1,243	430	13	6	1,821
Ugashik District	15	18	444	113	5	2	581
Nushagak District	562	11,060	31,206	5,732	3,965	254	52,218
Igushik/Snake River	29	215	2,007	147	13	23	2,406
Nushagak Bay Commercial	52	880	1,557	688	247	32	3,403
Nushagak Bay Noncommercial	220	3,231	11,556	2,467	1,879	117	19,250
Nushagak River	125	4,046	6,748	1,525	1,281	26	13,626
Site Unknown	13	390	729	93	32	21	1,265
Wood River	165	2,298	8,609	812	512	36	12,267
Togiak District	69	949	5,436	900	556	107	7,948
Total	1,103	12,880	88,903	8,291	4,821	498	115,393

Source: ADF&G Division of Subsistence.

Note: Harvests are extrapolated for all permits issued, based on those returned and on the area fished as recorded on the permit. Because of rounding, the sum of columns and rows may not equal the estimated total. Of 1,158 permits issued for the management area, 1,031 were returned (89.0%).

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

Appendix A27.–Subsistence salmon harvest by district and species, Bristol Bay, 1998–2018.

Year	Permits issued	Sockeye	Chinook	Chum	Pink	Coho	Total
Naknek-Kvichak District							
1998	567	83,095	2,433	784	1,063	1,592	88,967
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
20-Year Avg.	482	66,135	888	414	474	846	68,758
1998-07 Avg.	501	68,098	1,150	567	621	949	71,385
2008-17 Avg.	463	64,172	627	262	328	742	66,132
2018 [a]	456	60,350	681	295	216	699	62,240
Egegik District							
1998	36	1,795	44	33	52	389	2,314
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
20-Year Avg.	39	1,651	89	61	14	431	2,246
1998-07 Avg.	44	2,020	93	100	22	596	2,832
2008-17 Avg.	34	1,282	84	22	5	266	1,660
2018 [a]	32	1,188	100	15	5	278	1,587

-continued-

Year	Permits issued	Sockeye	Chinook	Chum	Pink	Coho	Total
Ugashik District							
1998	27	1,241	59	75	82	485	1,942
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
20-Year Avg.	20	1,025	43	19	13	262	1,362
1998-07 Avg.	24	1,178	46	29	19	353	1,625
2008-17 Avg.	17	873	39	10	6	171	1,099
2018 [a]	18	716	49	9	2	172	948
Nushagak District							
1998	562	25,217	12,258	2,487	1,076	5,316	46,355
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
20-Year Avg.	543	25,373	12,501	3,916	1,117	5,119	48,027
1998-07 Avg.	522	24,157	12,495	3,786	958	4,776	46,172
2008-17 Avg.	564	26,590	12,506	4,047	1,276	5,463	49,881
2018 [a]	593	28,245	13,481	4,324	1,455	6,270	53,774

-continued-

Year	Permits issued	Sockeye	Chinook	Chum	Pink	Coho	Total
Togiak District							
1998	42	2,211	782	412	76	310	3,791
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
20-Year Avg.	61	3,224	1,082	493	109	416	5,456
1998-07 Avg.	59	2,662	1,215	451	128	340	5,060
2008-17 Avg.	63	3,785	949	535	91	493	5,853
2018 [a]	62	3,975	853	458	110	553	5,949
Total Bristol Bay Area							
1998	1,234	113,560	15,576	3,792	2,349	8,093	143,368
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
20-Year Avg.	1,140	97,952	14,605	4,903	1,726	7,078	126,263
1998-07 Avg.	1,146	99,202	15,004	4,930	1,746	7,014	127,895
2008-17 Avg.	1,133	96,702	14,206	4,875	1,707	7,142	124,632
2018 [a]	1,154	94,475	15,163	5,100	1,788	7,971	124,498

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

[a] 5-year average was used because current year data were not available at the time of publication.

Appendix A28.–Subsistence harvest of sockeye salmon by community, in numbers of fish, Kvichak River drainage, Bristol Bay, 1998–2018.

Year	Levelock	Igiugig	Pedro Bay	Kokhanok	Iliamna-Newhalen [a]	Nondalton	Port Alsworth	Other [b]	Total
1998	2,454	1,659	3,511	10,418	16,165	13,136	2,678	3,635	53,656
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
20-Year Avg.	844	1,390	3,823	11,577	11,529	8,530	3,268	2,396	43,356
1998-07 Avg.	948	1,434	3,604	12,019	12,495	9,844	2,523	2,284	45,148
2008-17 Avg.	740	1,346	4,042	11,136	10,564	7,215	4,013	2,508	41,564
2018[c]	797	602	2,841	8,089	9,003	7,429	4,395	3,048	36,203

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 Naknek-Kvichak District.

[a] Includes Chekok.

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

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

Appendix A29.–Subsistence salmon harvest by community, Nushagak District, Bristol Bay, 1998–2018.

Year	Dillingham[a]	Manokotak	Aleknagik	Ekwok	New Stuyahok	Koliganek	Other [b]	Total
1998	24,072	4,069	1,112	3,555	5,419	3,166	4,958	46,351
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
20-Year Avg.	26,541	2,657	2,155	2,054	6,647	3,723	4,248	48,026
1998-07 Avg.	24,953	2,955	1,688	2,260	6,868	3,874	3,576	46,171
2008-17 Avg.	28,130	2,359	2,623	1,849	6,427	3,573	4,921	49,881
2018 [c]	30,375	2,157	2,646	1,961	6,616	3,765	6,254	53,774

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 non-watershed residents.

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

APPENDIX B: HERRING

Appendix B1.–Sac roe herring industry participation, fishing effort, and harvest, Togiak District, 1998–2018.

			Gillnet					Purse seine				
Year	Number of buyers	Daily processing capacity [a]	Fishery dates	Effort [b]	Duration (hours)	Harvest [c]	Roe %	Effort [b]	Duration (hours)	Harvest [c]	Roe %	Total harvest [c]
1998	15	2,475	4/29-5/10	152	46.0	5,952	12.5	123	16.5	16,824	9.6	22,776
1999	12	2,400	5/18-5/26	171	28.0	4,858	11.5	96	4.7	14,368	9.2	19,226
2000	12	2,100	5/6-5/14	227	67.0	5,464	10.6	90	15.8	14,957	10.1	20,421
2001	11	2,255	5/6-5/13	96	84.0	6,491	10.6	64	26.0	15,879	9.2	22,370
2002	8	1,920	5/3-5/13	82	102.0	5,216	10.9	37	57.5	11,833	9.3	17,049
2003	7	1,920	4/25-5/7	75	142.0	6,505	10.9	35	110.2	15,158	8.9	21,663
2004	6	2,150	4/29-5/9	54	162.0	4,980	10.4	31	78.0	13,888	9.5	18,868
2005	8	2,330	4/30-5/8	56	149.0	5,841	11.2	33	83.0	15,071	9.6	20,912
2006	7	2,060	5/12-5/21	49	143.9	7,132	10.8	28	113.0	16,821	9.2	23,953
2007	5	1,420	5/10-5/25	25	366.0	4,012	11.2	21	244.0	13,120	10.0	17,132
2008	7	1,950	5/16-5/31	27	312.0	4,832	11.4	28	292.0	15,691	8.4	20,523
2009	6	2,015	5/16-5/31	32	314.0	4,140	10.2	21	266.0	12,967	10.3	17,107
2010	6	2,690	5/11-5/27	35	338.0	7,540	10.1	26	266.0	18,816	9.7	26,356
2011	5	2,413	5/8-5/31	25	318.0	5,907	12.1	22	268.0	16,970	9.6	22,877
2012	4	1,970	5/14-6/1	18	534.0	4,027	12.1	16	328.0	12,994	9.4	17,021
2013	6	2,675	5/11-5/28	37	408.0	8,244	10.9	26	224.0	19,366	9.0	27,610
2014	6	3,065	4/27-5/13	24	412.0	6,016	11.9	17	412.0	19,544	9.7	25,560
2015	4	1,880	4/27-5/11	6	328.0	1,156	11.1	16	328.0	20,240	11.3	21,396
2016	4	2,530	4/17-5/2	3	366.0	80	12.2	17	306.0	14,799	12.3	14,879
2017	4	1,950	4/28-5/12	15	342.0	1,342	12.0	19	195.0	15,787	11.4	17,129
20-year Avg.	7	2,208		60	248	4,987	11	38	182	15,755	10	20,741
1998-07 Avg.	8	2,062		93	138	5,611	11	48	81	14,566	9	20,177
2008-17 Avg.	5	2,314		22	367	4,328	11	21	289	16,717	10	21,046
2018	4	1,950	4/22-5/14	1	378.0	[d]	[d]	20	254.0	15,856	11.4	15,856

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

[b] Total vessels fished.

[c] Harvest total includes dead loss and test fishery harvest.

Appendix B2.–Exploitation of Togiak herring stock, 1998–2018.

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]		
1998	121,000	1,994	5,952	16,424	400	22,376	24,370	20.1%
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%
20-year Avg.	135,602	1,632	4,988	15,612	404	20,600	22,328	16.6%
1998-07 Avg.	125,933	1,676	5,647	14,507	304	20,154	22,022	17.6%
2008-17 Avg.	145,272	1,588	4,328	16,717	653	21,046	22,633	15.6%
2018	136,756	1,188	[f]	15,856		15,856	17,044	12.5%

Note: Blank cells represent no data. SOK = spawn-on-kelp.

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

[b] Includes bait harvest.

[c] Includes test fishery harvest.

[d] Aerial survey estimated waste.

[e] Does not include waste.

[f] Data are confidential because there was only 1 participant.

Appendix B3.–Age composition, by weight, of total inshore herring run, Togiak District, 1998–2018.

	Age composition (%)						Spawning biomass [a]
Year	≤4	5	6	7	8	≥9	(short tons)
1995	1	4	7	24	30	35	23,550
1996	[b]	3	5	7	21	64	94,051
1997	7	5	12	11	10	55	144,887
1998	[b]	4	5	10	11	70	9,872
1999	[b]	1	13	9	12	65	157,028
2000	[b]	1	2	17	16	63	93,214
2001	5	21	5	4	27	39	115,155
2002	1	25	28	4	5	36	61,377
2003	[b]	3	37	25	4	31	47,074
2004	[b]	[b]	3.8	43.7	24.6	27.5	53,625
2005	[b]	[b]	0.8	11	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	14.6	15.5	8.1	46.5	136,839
2009	9.4	14.7	14.5	14.9	12.2	34	142,154
2010	1.4	16.1	18.1	13.2	13.2	38.3	146,913
2011	[b]	4	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

[a] Includes commercial catch, escapement, and documented waste.

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

[c] Not available; no sampling of the commercial harvest.

Appendix B4.–Preseason forecast (in short tons), aerial survey estimates of herring biomass (in short tons), and spawn deposition (in miles), Togiak District, 1998–2018.

Year	Preseason forecast [a]	Biomass estimate[b]	Spawn estimate
1998	121,000	9,872	33
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]
1998-2017 Avg.	123,679	151,541	34
2008-2017 Avg.	145,282	79,983	55

[a] Forecasts based on Age Structured Analysis.

[b] Data set was reviewed in fall 2017.

[c] Peak biomass estimate was not available during the commercial fishery and the harvest guideline was based on the preseason forecast.

Appendix B5.–Exvessel value of the commercial herring and spawn-on-kelp harvest, in thousands of dollars, Togiak District, 1998–2018.

Year	Herring sac roe	Total
1998	5,352	3,986
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
20-year Avg.	2,947	2,957
1998-07 Avg.	3,360	3,381
2008-17 Avg.	2,534	2,534
2018	2,110	2,110

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

[a] Fishery not conducted.

Appendix B6.–Guideline and actual harvests of sac roe herring (short tons) and spawn-on-kelp (pounds), Togiak District, 1998–2018.

	Gillnet sac roe			Purse seine sac roe		
Year	Guideline[a]	Actual	% Difference[b]	Guideline[a]	Actual[c]	% Difference[b]
1998	5,280	5,952	13	15,840	16,824	6
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	15,691	-2
2009	6,378	4,140	-35	14,882	12,967	-13
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	6,016	-28	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
20-year Avg.	7,052	4,990	-27	17,053	15,761	-6
1998-07 Avg.	6,450	5,645	-11	16,245	14,792	-4
2008-17 Avg.	7,655	4,335	-43	17,861	16,731	-8
2018	6,883	[d]		16,060	15,856	-1

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

[b] Actual minus guideline divided by guideline multiplied by 100.

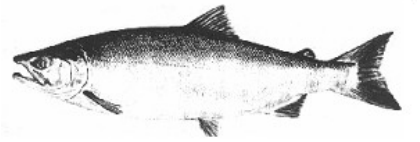
[c] Includes deadloss and test fishery harvest.

[d] Harvest is confidential.

APPENDIX C: 2018 BRISTOL BAY SALMON OUTLOOK

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

Sam Cotten, Commissioner
Scott Kelley, Director



Travis Elison, Naknek-Kvichak Manager
Paul Salomone, Egegik and Ugashik Manager
Tim Sands, Nushagak and Togiak Manager
Date Issued: April 12, 2018
Time: 11:30 a.m.

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BRISTOL BAY
2018 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 5 major districts and the 2018 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 a.m., 12:00 noon, 3:00 p.m., 6:00 p.m., and 8:00 p.m., 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 office hours at the Dillingham ADF&G office will be 8:00 a.m. to 5:00 p.m. Monday thru Friday from June 1–June 15, and again beginning Monday July 16. From June 16 to July 15 weekday office hours will be the same as above, but weekend office hours will be from 8:00 a.m. until 12:00 noon. In King Salmon the office hours are as follows: June 1 to June 15 and after July 17: 8:00 a.m. to 12:00 p.m., and 1:00 p.m. to 4:30 p.m., closed for lunch and weekends. From June 16 to July 17: 8:00 a.m. to 5:00 p.m. 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 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

-continued-

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 Chinook and coho salmon taken but not sold."

Alaska Wildlife Troopers – Summer 2018 Outlook – Bristol Bay

Enforcement Priorities:

- A continued strong focus on fishing district lines and open period enforcement, particularly in the Naknek-Kvichak and Egegik districts using all available assets to include aircraft, rotorcraft, large and small enforcement vessels, and undercover fishing vessels.
- 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.
- Increased enforcement of state boating safety laws in cooperation with the US Coast Guard.
- Increased Alaska Wildlife Troopers (AWT) presence in the Ugashik and Togiak Districts.
- Added enforcement and educational outreach regarding potential conflicts between resource users and marine mammals in cooperation with National Marine Fisheries Service.
- Compliance checks for basic vessel and gear ID such as boat, buoy, and corkline markings.

Captain of the Port, Western Alaska Navigation Safety Advisory

In January 2018 the US Coast Guard participated in an industry-led navigation safety workshop 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.

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SALMON OUTLOOK

BAYWIDE

The 2018 Bristol Bay sockeye salmon run is forecasted to be approximately 51.3 million fish. Based on the forecast and using the midpoints of the lower or upper portion of escapement goal ranges, depending on forecasted run size, 37.6 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 Chinook 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 of the Chinook salmon fishery will govern fishing time in the early part of the season, followed by directed sockeye salmon management as abundance dictates.

NAKNEK-KVICHAK DISTRICT

A run of approximately 16.6 million sockeye salmon is expected for the Naknek-Kvichak District in 2018. Based on the forecast, the projected harvest in the Naknek-Kvichak District is approximately 9 million sockeye salmon: 4.1 million from the Kvichak River, 2.2 million from the Alagnak River, and 2.7 million from the Naknek River (Table 1). Sockeye salmon returning to the Naknek-Kvichak District are predicted to be 45% age-1.2, 40% age-1.3, 10% age-2.2, and 6% age-2.3 fish.

The Naknek River escapement goal range is 800,000–2.0 million sockeye salmon. The Kvichak River escapement goal range is 2.0 million–10.0 million 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 a.m. Mondays to 9:00 a.m. Fridays, beginning 9:00 a.m. Monday, June 4 and ending 9:00 a.m. Friday, June 22. Drift gillnet gear will be restricted to fishing in the Naknek Section only, while set gillnet gear will be allowed to fish in the entire Naknek-Kvichak District. From June 22 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.

A mesh size restriction of 5.5 inches or less will be in effect beginning 9:00 a.m. Monday, June 4 until 9:00 a.m. Friday, July 20, for the conservation of Chinook salmon.

EGEGIK DISTRICT

A forecasted run of approximately 9.1 million sockeye salmon is expected for the Egegik River in 2018. The escapement goal range is 800,000–2.0 million sockeye salmon. Based on the forecast, the

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expected surplus potentially available for harvest is 7.4 million fish. Approximately 40 % of the run is expected to be age-2.2 fish, followed by 30% age-2.3, 16% age-1.3, and age 13% 1.2.

In 2018, separate gear openings and extensions will be used to adjust harvest in an attempt to achieve allocation percentages. Fishermen are reminded that regulation directs 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 15. The primary reason for the three day per week schedule is to provide for Chinook salmon escapement. By emergency order (E.O.), commercial fishing will be allowed in the Egegik District from 9:00 a.m. Monday, until 9:00 a.m. Wednesday and from 9:00 a.m. Thursday until 9:00 a.m. Friday. This schedule will begin at 9:00 a.m. Monday June 4 and run through 9:00 a.m. Friday, June 15 for drift and set gillnet gear. After June 15, 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. 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 a.m. Friday June 1 until 11:59 p.m. Friday, June 15. 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 run in 2018 is approximately 2.9 million fish. The escapement goal range is 500,000–1.4 million sockeye salmon. Based on the forecast, 2.0 million fish are potentially available for harvest. Approximately 54% of the run is expected to be age-1.3 fish, 22% age-2.2, 10% age-2.3, and 15% age-1.2 fish.

The Ugashik District allocation plan specifies 10% 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 2018. A mesh size restriction of 5.5 inches or less will be in effect beginning 12:01 a.m. Friday June 1 until 11:59 p.m. Sunday July 22, to help in the conservation of Chinook salmon.

Beginning 9:00 a.m. Monday June 4, commercial fishing in the Ugashik District will be allowed on a 9:00 a.m. Monday to 9:00 a.m. Friday schedule through 9:00 a.m. Friday June 15. 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 15 will depend on fishery performance and run strength indicators.

WALRUS

It is unknown at this time whether walrus will return to the Cape Greig area. If they do return, the department will use the adjusted line that was in place in 2016 and 2017. If they do not return, the district boundaries will revert to those in regulation 5 AAC 06.200(d). The first announcement of the 2018 season will clarify which boundary will be in place for the summer.

At the March 2013, Alaska Board of Fisheries (BOF) 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)

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and Inner Port Heiden sections. The BOF 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 Chinook 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 Chinook salmon. The department will closely monitor Chinook salmon escapement to evaluate the potential for any directed Chinook salmon openings in 2018.

The Nushagak District sockeye salmon forecast is approximately 21.8 million fish; 2.6 million for escapement and 18.5 million potentially available for harvest in the Nushagak District commercial salmon fishery (Table 1). The total run by river system is Wood River 12.3 million (escapement goal range 700,000–1.8 million), Igushik River 2.1 million (escapement goal range 150,000–400,000), and Nushagak River 7.4 million (escapement goal range of 370,000–900,000). Approximately 42% of the forecasted run is expected to be age-1.2 sockeye salmon, <1% age-2.2, 56% age-1.3, and < 1% age-2.3 fish.

Management strategies for 2018 include: 1) directed Chinook salmon openings only if warranted by escapement, 2) sockeye salmon openings in the Nushagak Section contingent upon Nushagak Chinook escapement or 100,000 sockeye salmon escapement in Wood River if Nushagak Chinook salmon escapement is below expected level. 3) Igushik Section sockeye salmon openings are likely to begin in the second week of June and will likely be set gillnet only until escapement or strong harvests dictate otherwise, and 4) begin fishing in the regular district around June 20 with short openings. 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 Chinook 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 Alaska Board of Fisheries 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. With the large forecast this year the department will try to provide early season opportunity in the Nushagak District. Contingent upon sockeye and Chinook salmon escapement, the department plans to begin fishing once Wood River sockeye salmon escapement exceeds 30,000 fish.

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

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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 allocated 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 pink and 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 2018 run of Togiak River sockeye salmon is forecast is approximately 860,000 fish. Based on the forecast, approximately 610,000 sockeye salmon will potentially be available for commercial harvest. The escapement goal range is 120,000– 270,000 sockeye salmon. Approximately 21% of the run is expected to be age 1.2, 1% of the run is expected to be age 2.2, 77% is expected to be age 1.3 and 1% is expected to be age 2.3. 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 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 *Togiak District Salmon Management Plan*, permit holders are restricted from fishing in the Togiak District until 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 July 27 if they have fished in the Togiak District. A 2015 BOF 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 restrict mesh size to 5.5 inches or smaller between June 15 and July 15 for the conservation of Chinook salmon.

Chinook salmon run strength in the Togiak River has been considered below average for several years. Anticipating another poor Chinook salmon run, permit holders can expect emergency orders to reduce the weekly fishing schedule in the last two weeks of June and a mesh size restriction through all of July.

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

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Table 1.-Forecast of total run, escapement and harvest of sockeye salmon returning to Bristol Bay River systems in 2018.

Millions of Sockeye Salmon							
	Total Run Forecast by Age Class						
DISTRICT River	1.2	2.2	1.3	2.3	Total	Escapement	Inshore Harvest [a]
NAKNEK-KVICHAK							
Kvichak	4.30	1.05	2.61	0.40	8.36	4.00	4.12
Alagnak	1.67	0.01	2.72	0.01	4.41	2.11[b]	2.17
Naknek	1.51	0.53	1.25	0.58	3.87	1.10	2.65
Total	7.48	1.59	6.58	0.99	16.64	7.21	8.95
EGEGIK	1.19	3.67	1.48	2.77	9.12	1.40	7.45
UGASHIK	0.42	0.62	1.54	0.29	2.87	0.73	2.06
NUSHAGAK							
Wood	8.00	0.13	4.13	0.04	12.31	1.53	10.42
Igushik	0.59	0.01	1.50	0.02	2.13	0.34	1.73
Nushagak	0.56	0.00	6.64	0.01	7.36	0.77	6.38
Total	9.16	0.14	12.28	0.07	21.79	2.63	18.53
TOGIAK	0.18	0.01	0.66	0.01	0.86	0.23	0.61
BRISTOL BAY	18.43	6.03	22.55	4.13	51.28	12.20	37.59

[a] The projected harvest accounts for the inshore run of Bristol Bay sockeye salmon, excluding harvest in the South Peninsula commercial salmon fisheries. The South Peninsula harvest has averaged 2.9% of the total Bristol Bay sockeye production during the last five years and is forecasted to be 1.49 million in 2018.

[b] The escapement to the Alagnak was estimated based on exploiting the Alagnak stock at the same level as the Kvichak River stock.

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U.S. Department of Homeland Security
United States Coast Guard
Commander
United States Coast Guard
Sector Anchorage

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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.
   d. **Navigation Lights:**

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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

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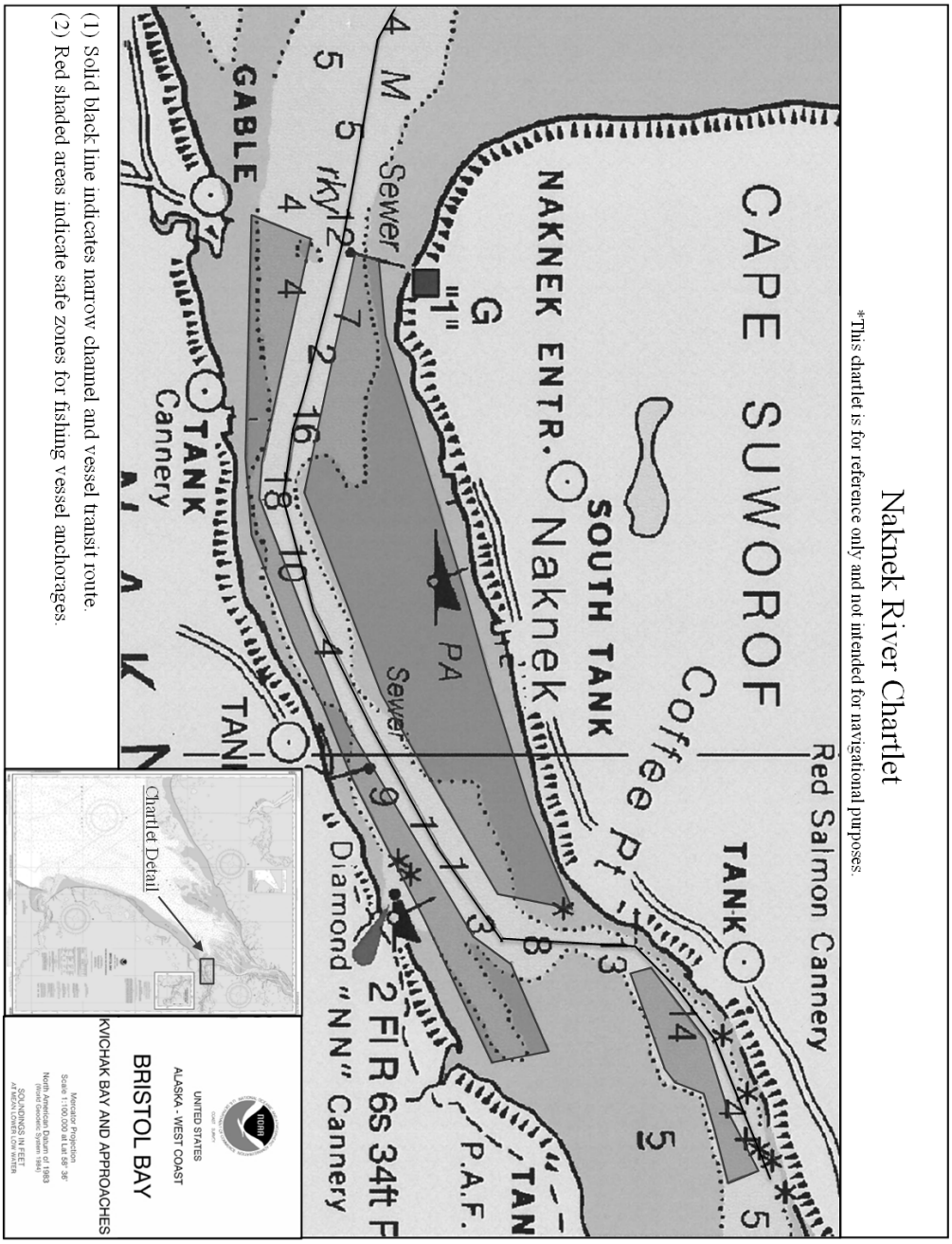

(1) Solid black line indicates narrow channel and vessel transit route.
(2) Red shaded areas indicate safe zones for fishing vessel anchorages.

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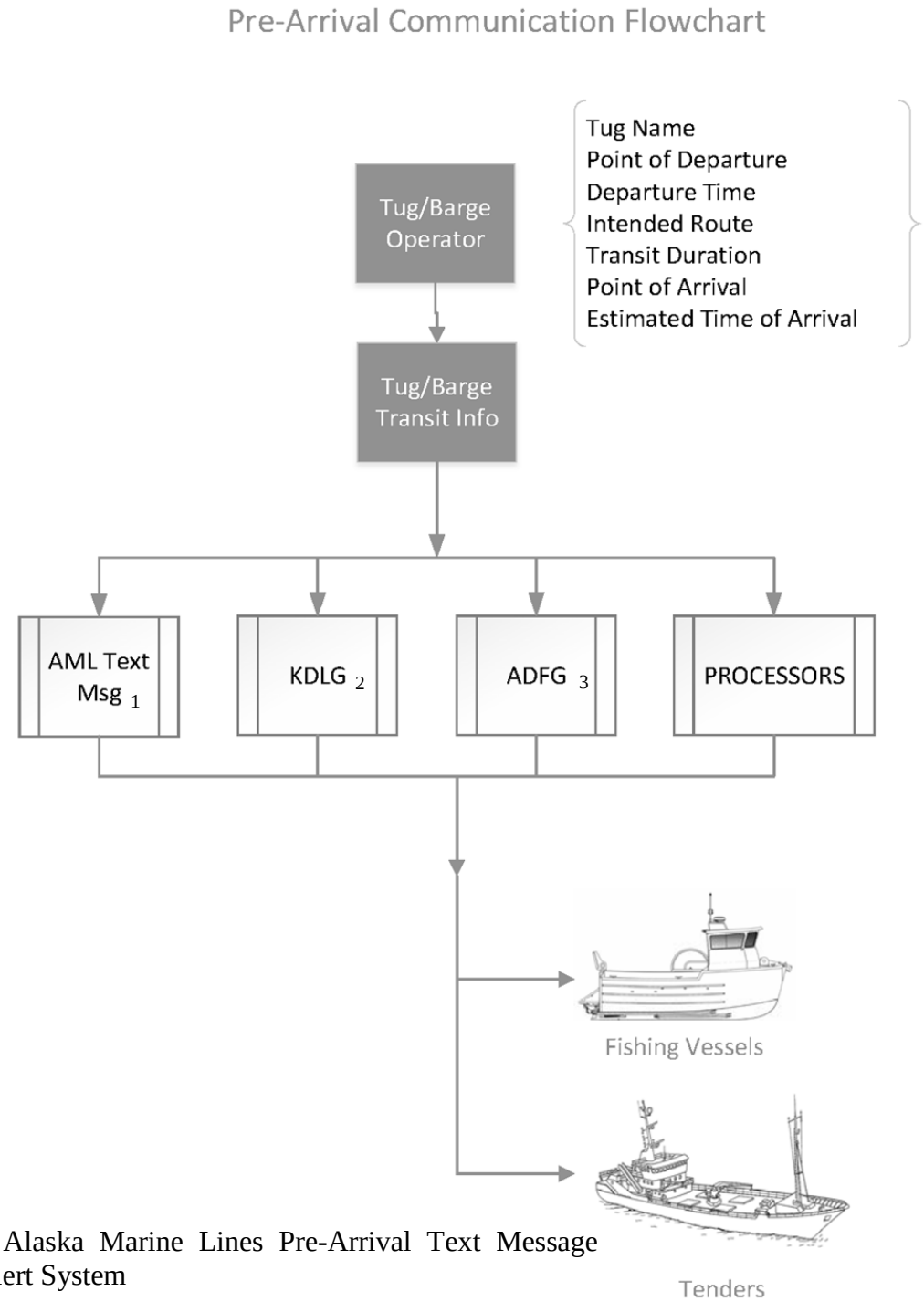

1 Alaska Marine Lines Pre-Arrival Text Message Alert System

2 KDLG Public Radio Station (670 AM, 89.9 FM)

3 Alaska Dept of Fish and Game

APPENDIX D: 2018 TOGIAK HERRING OUTLOOK

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

Sam Cotten, Commissioner
Scott Kelley, Director

Contact:
Tim Sands, Area Management Biologist
Phone: (907) 842-5227
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Dillingham Area Office
546 Kenny Wren Road
Dillingham, AK, 99576
Date Issued: March 20, 2018

2018 TOGIAK HERRING OUTLOOK

The 2018 Togiak District herring biomass is forecast to be 136,756 tons, very similar to the recent 10-year average spawning biomass. This forecast is based on an age-structured analysis (ASA) model that has been used since 1993, except for 2017. Herring ages 4–6 are expected to comprise 15% of the projected biomass, ages 7–10 are expected to make up 51% while the remaining 34% will be age 11+ fish.

The commercial fishery and spawn timing is largely related to water temperatures experienced by herring on the spawning grounds. Additional factors related to timing include sea surface temperature and sea ice trends across the southeastern Bering Sea in the weeks prior to spawning. We track the average sea surface temperature and Bering Sea ice coverage in February and March, as we consider these variables a useful index of timing for maturing herring ultimately bound for spawning grounds in and around the Togiak District. Currently sea surface temperatures are much higher than we would expect at this time of year and the region of the Bering Sea that we believe has predictive power is ice free. Currently these conditions are so far from normal, we have little confidence in our ability to accurately forecast timing this year. Ice and sea surface temperature conditions are most similar to 2016. The department uses a sea surface temperature model (SST) based on temperatures near Unalaska to predict Togiak herring run timing. Based on this model the fishery could commence as early as the third week of April.

The Bristol Bay Herring Management Plan (**5 AAC 27.865**) sets a maximum 20% exploitation rate for the Togiak District stock. Based on the forecast of 136,756 tons, 27,351 tons of herring will be available for harvest in 2018. 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	1,810 tons
Togiak Sac Roe	24,042 tons
Purse Seine (70%)	16,829 tons
Gillnet (30%)	7,212 tons

SAC ROE FISHERY

The management strategy for the Togiak herring fishery is designed to provide for maximum sustained yield. In 2018, 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 2,200 tons per day. The preseason poll also indicates that 4 processors will participate in the Togiak sac roe herring fishery with a fleet size of 3 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 2018. This strategy allows individual companies to maximize their processing capacity and decide what quality fish is suitable for their individual market.

The department has secured funding for the 2018 herring season sufficient to fly aerial surveys and process herring for age, sex, and length samples. This will allow staff to resume the use of the ASA model for forecasting herring biomass.

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 2018 and therefore, fishing time and area will be very liberal. This should allow purse seine vessels to locate high quality herring and fill their company's daily needs. 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. As always, 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 2018 Togiak sac roe herring fishery.

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. At the December 2015 Alaska Board of Fisheries meeting the board removed language from the Togiak herring management plan that tied purse seine and gillnet harvest together for the first 50% of the quota. With that language removed each gear type will be able to fish freely until their respective quotas are harvested. In 2018, 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

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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 3 gillnet vessels expected to participate in the 2018 Togiak sac roe herring fishery.

ADF&G OPERATIONS 2018

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 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