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**Overview of the Bristol Bay Commercial Salmon  
Fishery 2016-2018, a Report to the Alaska Board of  
Fisheries**

by

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## 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.

<b>Weights and measures (metric)</b>		<b>General</b>		<b>Mathematics, statistics</b>	
centimeter	cm	Alaska Administrative Code	AAC	<i>all standard mathematical signs, symbols and abbreviations</i>	
deciliter	dL	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	alternate hypothesis	$H_A$
gram	g	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	$e$
hectare	ha	at	@	catch per unit effort	CPUE
kilogram	kg	compass directions:		coefficient of variation	CV
kilometer	km	east	E	common test statistics	(F, t, $\chi^2$ , etc.)
liter	L	north	N	confidence interval	CI
meter	m	south	S	correlation coefficient	
milliliter	mL	west	W	(multiple)	R
millimeter	mm	copyright	©	correlation coefficient (simple)	r
		corporate suffixes:		covariance	cov
<b>Weights and measures (English)</b>		Company	Co.	degree (angular)	$^\circ$
cubic feet per second	ft <sup>3</sup> /s	Corporation	Corp.	degrees of freedom	df
foot	ft	Incorporated	Inc.	expected value	$E$
gallon	gal	Limited	Ltd.	greater than	>
inch	in	District of Columbia	D.C.	greater than or equal to	≥
mile	mi	et alii (and others)	et al.	harvest per unit effort	HPUE
nautical mile	nmi	et cetera (and so forth)	etc.	less than	<
ounce	oz	exempli gratia	e.g.	less than or equal to	≤
pound	lb	(for example)		logarithm (natural)	ln
quart	qt	Federal Information Code	FIC	logarithm (base 10)	log
yard	yd	id est (that is)	i.e.	logarithm (specify base)	log <sub>2</sub> , etc.
		latitude or longitude	lat or long	minute (angular)	'
<b>Time and temperature</b>		monetary symbols (U.S.)	\$, ¢	not significant	NS
day	d	months (tables and figures): first three letters	Jan, ..., Dec	null hypothesis	$H_0$
degrees Celsius	°C	registered trademark	®	percent	%
degrees Fahrenheit	°F	trademark	™	probability	P
degrees kelvin	K	United States (adjective)	U.S.	probability of a type I error (rejection of the null hypothesis when true)	$\alpha$
hour	h	United States of America (noun)	USA	probability of a type II error (acceptance of the null hypothesis when false)	$\beta$
minute	min	U.S.C.	United States Code	second (angular)	"
second	s	U.S. state	use two-letter abbreviations (e.g., AK, WA)	standard deviation	SD
<b>Physics and chemistry</b>				standard error	SE
all atomic symbols				variance	
alternating current	AC			population sample	Var
ampere	A			sample	var
calorie	cal				
direct current	DC				
hertz	Hz				
horsepower	hp				
hydrogen ion activity (negative log of)	pH				
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

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The Special Publication series was established by the Division of Sport Fish in 1991 for the publication of techniques and procedures manuals, informational pamphlets, special subject reports to decision-making bodies, symposia and workshop proceedings, application software documentation, in-house lectures, and became a joint divisional series in 2004 with the Division of Commercial Fisheries. Special Publications are intended for fishery and other technical professionals. Special Publications are available through the Alaska State Library, Alaska Resources Library and Information Services (ARLIS) and on the Internet <http://www.adfg.alaska.gov/sf/publications/>. This publication has undergone editorial and peer review.

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## ABSTRACT

The Bristol Bay Area collectively supports the largest wild sockeye salmon (*Oncorhynchus nerka*) fishery in the world. From 2016 to 2018 Bristol Bay sockeye salmon runs, prices and exvessel values progressively increased. The 2016–2018 average sockeye salmon harvest was 39.2 million fish, while the average price and exvessel values were \$1.17 per pound and \$245.5 million dollars respectively. Over the same three-year span harvests of king (Chinook) salmon (*Oncorhynchus tshawytscha*), coho salmon (*Oncorhynchus kisutch*), chum salmon (*Oncorhynchus keta*) have averaged 40,000, 157,000 and 1.4 million fish respectively. Pink salmon (*Oncorhynchus gorbusha*) abundance is strongest in even numbered years and harvests have averaged 494,000 fish. Sockeye salmon escapements over the same time period have averaged 18.0 million fish with all established goals met or exceeded. More detailed information regarding particular years are published in the *Bristol Bay area annual management report* series, and can be found on the Bristol Bay home page:

<http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareabristolbay.salmon#management>.

Keywords: Bristol Bay, sockeye salmon, *Oncorhynchus nerka*, king salmon, *O. tshawytscha*, chum salmon, *O. keta*, pink salmon, *O. gorbusha*, coho salmon, *O. kisutch*

## INTRODUCTION

The Bristol Bay Area is divided into five commercial salmon fishing districts: Togiak and Nushagak, collectively known as the west side districts; and Naknek–Kvichak, Egegik, and Ugashik, referenced as the east-side districts. Togiak District is divided into five sections to focus harvest on Togiak River stocks and those from several separate smaller river systems. The Nushagak District is divided into the Nushagak and Igushik sections with a special harvest area (SHA) in the Wood River. The primary river systems in the Nushagak District are the Nushagak, Wood, and Igushik. Naknek–Kvichak District is divided into the Naknek and Kvichak sections with SHAs in the Naknek and Alagnak rivers. The Naknek, Kvichak, and Alagnak river systems are the primary salmon producers in the Naknek–Kvichak District. Egegik District is supported by the Egegik and King Salmon rivers and includes a SHA. Ugashik District includes a SHA and is supported by the Ugashik, King Salmon, and Dog Salmon rivers. Districts and sections are confined to terminal areas near river mouths in order to minimize interception of salmon destined for other rivers (Figure 1). Special harvest areas are designed to further minimize the interception of salmon stocks or to provide focused harvest on fish surplus to escapement needs.

The management objective for all commercial salmon districts in Bristol Bay is to achieve escapement within specific ranges (goals) while providing opportunities to harvest fish surplus to escapement needs. The Bristol Bay salmon season begins on June 1 by regulation with commercial fishing periods opened by emergency order (EO) in all districts, except the Togiak District, which has a regular weekly fishing schedule. Late in the season, Naknek–Kvichak, Egegik, and Ugashik districts have regulatory fishing schedules that begin on July 17; typically, after the bulk of the sockeye salmon run. There are allocation plans in place for all districts, except for the Togiak District. Allocation plans provide the department with guidelines for distribution of sockeye salmon harvest between the drift and set gillnet fleets from June 1 to July 17.

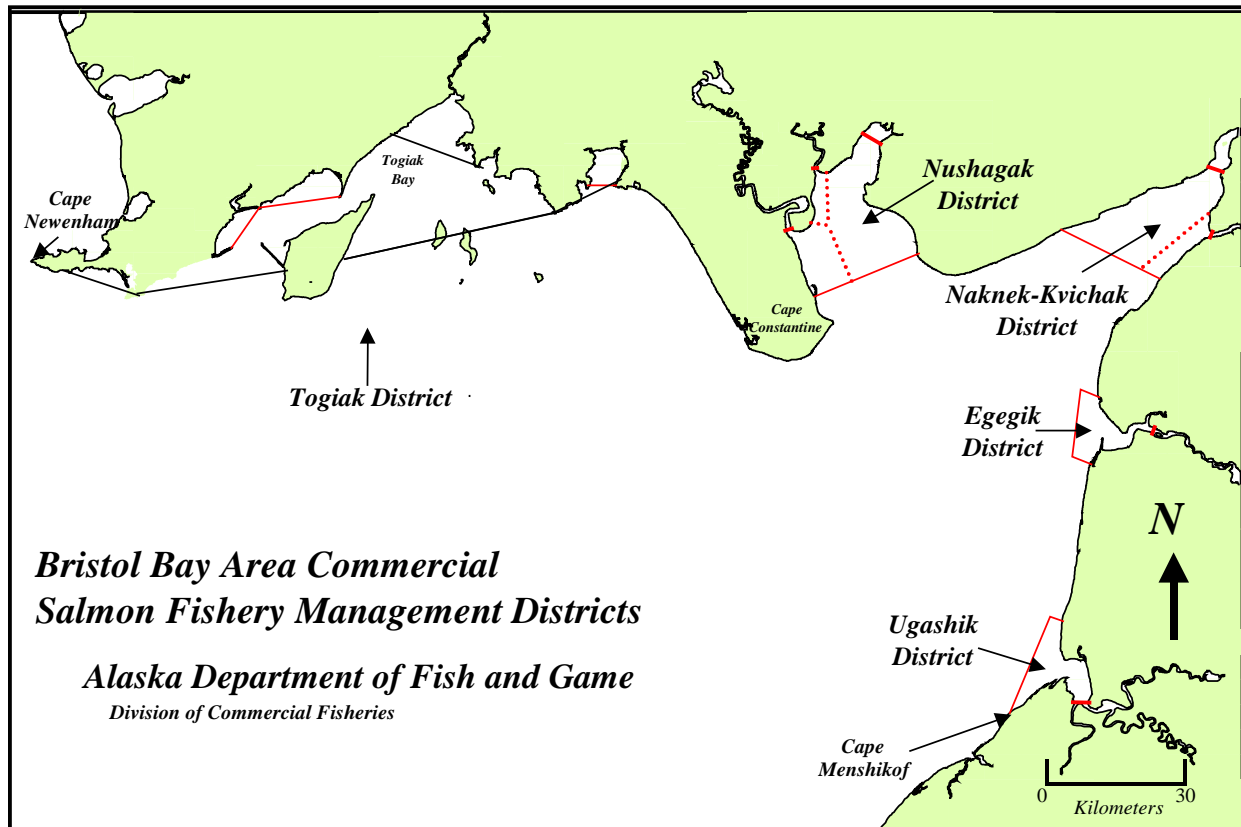


Figure 1.—Estimated exvessel value of the commercial salmon catch by species, in thousands of dollars, Bristol Bay Area, 1998–2018.

Between June 1 and July 17 drift gillnet permit holders must register with the department before fishing in any district. Set gillnet permit holders are required to register before fishing anytime between June 1 and July 17 in the Nushagak District. Permit holders may transfer, after initial registration; however, they must notify the department and wait 48 hours before they may begin fishing again. Drift gillnet permit holders may create a dual permit partnership, which allows them to operate an additional 50 fathoms of gillnet gear. On average, 360 drift gillnet vessels (representing 720 permits) operated as dual permit vessels in Bristol Bay over the past three years (Table 1, Appendix A1).

Subsistence salmon harvests during the most recent 10 years (2008–2017) have averaged approximately 124,000 salmon, of which 96,000 have been sockeye salmon (Halas and Neufeld 2018). Sport fisheries primarily target king and coho salmon, but pink, chum, and sockeye salmon are also harvested (Dye and Borden *In prep*).

## **SOCKEYE SALMON OVERVIEW 2016–2018**

The three-year period from 2016 to 2018 can be characterized as a period of large and late runs. Records were set for largest inshore run to Bristol Bay and individually in Nushagak, Togiak, and Ugashik districts. Inshore run is defined as commercial catch and escapement for a given year within a specific district or Bristol Bay (Area T). Fish weights were lower than historical averages and run timings were historically late, particularly on the east side of Bristol Bay. Exvessel values were among the largest ever recorded.



Bristol Bay sockeye salmon runs steadily increased each year from 2016 to 2018 and produced three above-average harvests (Table 1). The inshore run in 2016 was 52 million and ranks fourth out of the last 20 years (1998–2017; Appendix A2); 2017 produced a run of 58 million and ranks second in the last 20 years (Appendix A4); and the preliminary 2018 run estimate is 62 million (Appendix A6) and is the largest on record. Recent above-average runs have resulted in sockeye salmon harvests and exvessel values that are above the long-term average (Table 1). Sockeye salmon harvests in 2016 were above average in all districts resulting in a Bristol Bay harvest of 37.6 million (Appendices A2 and A11). In 2017, sockeye salmon harvests were above or near average in all districts, except Togiak, and accounted for 38.8 million harvest (Appendices A4 and A11). In 2018, harvests were above average in Nushagak and Togiak, near average in Naknek-Kvichak and Ugashik, and below average in Egegik. The 2018 total Bristol Bay harvest of 41.3 million sockeye salmon is the second largest on record (Appendices A6 and A11).

Total exvessel value of sockeye salmon in 2016–2018 was above the recent 20-year (1998–2017) average in all three years (Appendix A13 and A14). In 2016, after postseason adjustments, sockeye salmon were worth an average price of \$0.96/lb with an exvessel value of \$192 million. In 2017, after postseason adjustments, sockeye salmon were worth an average price of \$1.30/lb with an exvessel value of approximately \$269 million. In 2018, prior to postseason adjustments, sockeye salmon were worth an average price of \$1.26/lb with a preliminary exvessel value of \$275 million (Table 1), the largest exvessel value on record.

Run timing was generally late in all three years. A strong early component in the Nushagak District combined with later run timing in the east side districts made the sockeye salmon run in 2016 prolonged and among one of the latest overall run timings on record. In 2017, the Nushagak District sockeye salmon run was strong early in the season, whereas the east side was compressed with slightly late run timing. Due to a series of large bay-wide catches beginning on July 2, fishermen were put on catch limits for up to 13 days, reducing harvest and increasing escapement. Run timing in 2018 was distinct between the west side and east side districts; the west side was very large and slightly late, whereas the east side districts had the latest run timing on record. Because of the difference in run timing between districts, the processing sector was able to keep pace and a very large harvest was achieved without fishermen being placed on catch limits.

Allocations between gear groups have been, to the extent practicable, achieved within a few percentage points in recent years (Appendices A8, A9, and A10). Sockeye salmon escapements met or exceeded respective sustainable escapement goals for all river systems in all years (Appendix A12). Currently, there are no stocks of concern in Bristol Bay.

Table 1.–Fishery participation, sockeye salmon harvest, price, and value, 2016-2018.

Year	\$/lb	Sockeye Catch (Millions)	Value (Millions)	Drift Gillnet Permits	Dual Drift Gillnet Vessels <sup>a</sup>	Set Gillnet Permits
2016	0.96	37.6	\$192.4	1,714	353	858
2017	1.30	38.8	\$268.5	1,728	357	883
2018 <sup>b</sup>	1.26	41.3	\$275.5	1,733	372	869
2016-18 Avg.	1.17	39.2	\$245.5	1,725	360	873
20-year Avg.	0.87	24.5	\$122.5	1,651	N.A.	850
10-year Avg.	1.08	28.8	\$168.2	1,724	N.A.	871

<sup>a</sup> Dual permit tracking did not begin until 2010.

<sup>b</sup> Preliminary data.

## FISHERIES BY DISTRICT 2016–2018

### NAKNEK-KVICHAK DISTRICT

#### 2016

The total inshore run to the Naknek–Kvichak District in 2016 was 21.4 million sockeye salmon (Appendix A2) and similar to the preseason forecast of 23.2 million. The harvest of 13.5 million sockeye salmon was 82% above the 1996–2015 average of 7.4 million (Appendix A11). All sockeye salmon escapement goals were met with escapements of 1.7 million on the Naknek River, 4.5 million on the Kvichak River, and 1.8 million on the Alagnak River (Appendix A2).

- The sockeye salmon harvest percentages were 9% Naknek set gillnet, 9% Kvichak set gillnet, and 82% drift gillnet (Appendix A9).
- There was an average of 429 permits registered during the allocation period, which is similar to most years (Appendix A3).
- The midpoint of the sockeye salmon run into the district was July 12, which was seven days later than the historical average.

#### 2017

The total inshore run to the Naknek-Kvichak District in 2017 was 15.4 million sockeye salmon (Appendix A4) and on forecast. The harvest of 8.3 million sockeye salmon was 8% above the 1997–2016 average of 7.6 million (Appendix A11). All sockeye salmon escapement goals were met with escapements of 1.9 million on the Naknek River, 3.2 million on the Kvichak River, and 2.0 million on the Alagnak River (Appendix A4).

- This was the first year of Alagnak River Tower operations since 2011.
- The sockeye salmon harvest distribution was 70% drift gillnet, 16% Naknek set gillnet, and 14% Kvichak set gillnet. (Appendix A9).
- There was an average of 316 drift gillnet permits registered during the allocation period, which is low compared to most years (Appendix A5).
- Fishermen were placed on limits from July 4–11.
- The midpoint of the sockeye salmon run into the district was July 10, which was five days later than the historical average.

## **2018**

The total inshore run to the Naknek-Kvichak District in 2018 was 16.8 million sockeye salmon (Appendix A6) and on forecast. The harvest of 8.6 million sockeye salmon was 8% above the 1998–2017 average of 8.0 million (Appendix A11). All sockeye salmon escapement goals were met or exceeded with escapements of 2.2 million on the Naknek River, 4.4 million on the Kvichak River, and 1.6 million on the Alagnak River (Appendix A6).

- The sockeye salmon harvest percentages were 71% drift gillnet, 17% Naknek set gillnet, and 12% Kvichak set gillnet (Appendix A9).
- There was an average of 181 drift gillnet permits registered during the allocation period, which is very low compared to most years. (Appendix A7).
- 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 year in a row with historically late run timing.
- The fishery was moved into the Naknek River Special Harvest Area from July 7–13 to conserve Kvichak River sockeye salmon.

## **EGEGIK DISTRICT**

### **2016**

The 2016 Egegik inshore run of 10.6 million sockeye salmon (Appendix A2) was above the preseason forecast of 7.1 million. The harvest was 8.7 million fish (Appendix A11) and the escapement was 1.8 million sockeye salmon, within the escapement goal range of 800,000 to 2.0 million (Appendix A12).

- The 2016 harvest of 8.7 million sockeye salmon ranked fourth in the 20-year span from 1996 to 2015 (Appendix A11).
- The midpoint of the run of July 9 was five days late, compared to the 1996–2015 average of July 4.
- Fish weights were below average.
- Managing for escapement takes priority over catch allocation resulting in higher allocation to the set gillnet fleet (Appendix A8).

### **2017**

The 2017 Egegik inshore run of 14.6 million (Appendix A4) was 37% above the forecast of 10.7 million sockeye salmon. The district harvest was 12.0 million (Appendix A11) with an escapement of 2.6 million sockeye salmon, above the escapement goal range of 800,000 to 2.0 million (Appendix A12).

- The 2017 sockeye salmon harvest of 12.0 million ranked first in the 20-year span from 1997 to 2016 and was 38% above the preseason forecast (Appendix A11).
- The 2017 run exhibited slightly late run timing; the midpoint was July 6 compared to the average of July 4.
- A large sustained volume of fish began arriving in the district on July 2–3. Combined with catches from other districts, the processing sector could not keep pace and catch limits were in place from July 3–11. This was the primary reason for the high escapement.
- Because of limited harvest capacity, single day escapement records occurred on July 4 and 5.

- The sockeye salmon harvest percentages were 87% drift gillnet, and 13% set gillnet compared to the 86% drift gillnet and 14% set gillnet stipulated in regulation (Appendix A8).

## **2018**

The 2018 Egegik inshore sockeye salmon run of 6.6 million (Appendix A6) was 28% below forecast and exhibited the latest run timing on record. The district harvest was 5.0 million sockeye salmon (Appendix A11), 33% below preseason expectations. Escapement was 1.6 million sockeye salmon, within the escapement goal range of 800,000 to 2.0 million (Appendix A12).

- The midpoint of the run was July 11, seven days later than the average of July 4.
- The 2.2 age class fish were absent, the run was supported by age 1.2 and 1.3 fish.
- Managing for escapement takes priority over catch allocation resulting in higher allocation to the set gillnet fleet.
- Harvest allocation was 81% drift gillnet and 19% set gillnet (Appendix A8). This was partially because of a small drift fleet as much of the drift effort in 2018 was attracted to the Nushagak District (Appendix A7).
- The Egegik River Special Harvest Area was used from July 7-12.

## **UGASHIK DISTRICT**

### **2016**

The 2016 inshore sockeye salmon run to the Ugashik District of 8.3 million fish (Appendix A2) was 70 % above the forecast of 4.9 million fish and ranks first in records dating back to 1904. The harvest was 6.6 million (Appendix A11) and cumulative escapement was 1.6 million sockeye salmon, above the escapement goal range of 500,000 to 1.4 million (Appendix A12).

- The midpoint of the run was July 13, three days later than the average of July 10.
- About 3,000 Pacific walrus hauled out on the beach just to the north of the district. In response to their presence, the north line of the district was moved south one mile to provide buffer space between the animals and the fishery.
- Harvest allocation was 91% drift gillnet and 9% set gillnet (Appendix A8).

### **2017**

The 2017 inshore sockeye salmon run to the Ugashik District of 6.9 million fish ranks fourth in the 20-year span from 1997 to 2017 (Appendix A4) and was 31 % above forecast. District harvest was approximately 5.7 million fish (Appendix A11) and cumulative escapement was 1.2 million sockeye salmon, within the escapement goal range of 500,000 to 1.4 million fish (Appendix A12).

- The 2017 harvest of 5.7 million sockeye salmon ranked second of 20 years between 1997 and 2016 and was more than twice the average of approximately 2.6 million fish (Appendix A11) for the same period.
- The midpoint of the run was July 12, two days later than the average of July 10.
- Pacific walrus hauled out again on the beach just to the north of the district, but there were less of them. The north line of the district was again moved south one mile to provide buffer space between the animals and the fishery.
- Fishermen were placed on catch limits from July 4–11.
- Harvest allocation was 92% drift gillnet and 8% set gillnet (Appendix A8).

## **2018**

The 2018 inshore sockeye salmon run to the Ugashik District of 3.9 million fish (Appendix A6) ranks seventh in the last 20 years (1998–2017) and was 37% above forecast. The Ugashik District harvest was 2.8 million fish (Appendix A11) with an escapement of 1.2 million sockeye salmon, within the escapement goal range of 500,000 to 1.4 million fish (Appendix A12).

- The midpoint of the run was July 17, seven days later than the July 10 average and among the latest on record.
- Harvest allocation was 79% drift gillnet and 21% set gillnet (Appendix A8). This was partially because of a small drift fleet, because much of the drift effort in 2018 was attracted to the Nushagak District (Appendix A7).
- Pacific walrus were not present during the season and the district boundaries reverted to the normal line described in regulation.

## **NUSHAGAK DISTRICT**

### **2016**

The 2016 inshore sockeye salmon run to the Nushagak District of 10.6 million fish was 1% above the preseason forecast of 10.4 million fish (Appendix A2). The harvest of 8.1 million sockeye salmon ranks sixth in the history of the Nushagak District (Appendix A11). Escapement into the Nushagak River was 680,513 and within the escapement goal range of 370,000–900,000 sockeye salmon. Wood River sockeye salmon escapement was 1.3 million, within the escapement goal range of 700,000–1.8 million fish. Sockeye salmon escapement to the Igushik River was 469,230 and above the escapement goal range of 150,000–400,000 fish (Appendix A2).

- Commercial fishing for sockeye salmon began on June 20 with the drift gillnet fleet which is earlier than average.
- All three rivers in the Nushagak District produced good numbers of fish. This resulted in the harvest of 8.1 million sockeye salmon and all escapement goals being met (Appendix A2).
- Nushagak River king (Chinook) salmon escapement was strong with 125,368 (Appendix A2) fish counted, just above the escapement goal range of 55,000–120,000.
- A late sockeye salmon run on the east side diverted some fishing effort from pink and coho salmon fishing in the Nushagak District. This resulted in lower harvests for those species than previous years (Appendix A2).

### **2017**

The 2017 inshore sockeye salmon run to the Nushagak District of 20.0 million fish was 135% above the preseason forecast of 8.3 million fish (Appendix A4). The harvest of 12.3 million sockeye salmon ranks second in the history of the Nushagak District (Appendix A11). Escapement into the Nushagak River was 2.9 million, above the escapement goal range of 370,000–900,000 sockeye salmon; Wood River escapement was 4.3 million, above the escapement goal range of 700,000–1.8 million sockeye salmon; and Igushik River escapement was 578,700, above the escapement goal range of 150,000–400,000 sockeye salmon (Appendix A4).

- The total run to the Nushagak District of just over 21 million for all species surpassed the previous record set in 2006 by 2.4 million fish (Appendix A4).

- Nushagak king salmon returns were late and small and sockeye salmon fishing was delayed for several days to allow additional king salmon escapement. This resulted in 700,000 and 500,000 sockeye salmon to escape into the Nushagak and Wood rivers before commercial fishing started.
- Nushagak River king salmon escapement was 56,961 (Appendix A4), within the escapement goal range but below the inriver goal of 95,000.
- Nushagak sockeye salmon escapement was 2.9 million, the second largest on record (Appendix A4).
- Wood River final escapement was 4.3 million sockeye salmon, above the upper end of the escapement goal range of 1.8 million sockeye salmon (Appendix A4).
- Processor limits were in place for periods of the season reducing harvest.

## **2018**

The 2018 inshore sockeye salmon run to the Nushagak District of 33.6 million fish was 54% above the preseason forecast of 21.8 million fish (Appendix A6). The harvest of 24.1 million sockeye salmon ranks first in the history of the Nushagak District (Appendix A11). Sockeye salmon escapement into the Nushagak River was 1.2 million, above the escapement goal range of 370,000–900,000 fish; Wood River escapement was 7.5 million, above the escapement goal range of 700,000–1.8 million sockeye salmon; and Igushik River escapement was 770,772, above the escapement goal range of 150,000–400,000 sockeye salmon (Appendix A6).

- 2018 produced a run of 33.6 million sockeye salmon, the largest run ever recorded in the Nushagak District.
- The harvest of 24.1 million sockeye salmon was the largest ever recorded in any district within Bristol Bay, and was almost four times the 20-year average (1998–2017) Nushagak District run size harvest of 6.4 million sockeye salmon (Appendix A11).
- Despite early and consistent fishing, the Wood, Nushagak, and Igushik rivers exceeded the upper ends of escapement goal ranges. The Wood River escapement in particular, at 7.5 million, was far above the upper end of the escapement goal range of 1.8 million (Appendix A6).
- The Nushagak River king salmon run was strong, with an escapement of 97,239 fish and a harvest of 35,243 king salmon during the directed sockeye salmon fishery (Appendix A6).

## **TOGIAK**

Togiak District differs substantially from other Bristol Bay districts. The run is much smaller with an average harvest of 558,000 sockeye salmon over the last 20 years (1998–2017) (Appendix A11). Run timing is later relative to the other districts and fishing effort is more generally local to Togiak and Twin Hills residents.

## **2016**

The 2016 inshore sockeye salmon run to the Togiak District of 845,849 fish was 28% above the preseason forecast of 660,000 fish (Appendix A2). The harvest of 645,803 sockeye salmon ranks seventh in the previous 20 years (1996–2015) (Appendix A11). Escapement into the Togiak River was 200,046, within the escapement goal range of 120,000–270,000 sockeye salmon (Appendix A12)

- The total run of 845,849 sockeye salmon was 10% above the 20-year average (Appendix A2).
- In 2016, run timing was 7–10 days late.
- The king salmon harvest of 3,831 was 44% below 20-year average but the largest since 2012 (Appendix A2).
- The board adopted a new regulation in 2015 that restricted vessels from participating in the Togiak salmon fishery until July 27 if the vessels had participated in salmon fishing in other districts of Bristol Bay. The 2016 season was the first year this regulation was in effect. Prior to the new regulation, the restriction applied to permits but not vessels.

## **2017**

The 2017 inshore sockeye salmon run to the Togiak District of 711,825 fish was 13% above the preseason forecast of 631,000 fish (Appendix A4). The harvest of 516,495 sockeye salmon ranks 12th in the 20 years from 1997 to 2016 (Appendix A11). Sockeye salmon escapement into the Togiak River was 195,330 and within the escapement goal range of 120,000–270,000 fish.

- The total run of 711,825 sockeye salmon (Appendix A4) was 7% below the long-term average of 764,000 fish.
- The king salmon harvest of 4,731 fish was 27% below the 1997–2016 average (Appendix A4).
- Fishing continued into early September and the Togiak District produced the largest coho salmon harvest since 1998: 54,503 (Appendix A4).

## **2018**

The 2018 inshore sockeye salmon run to the Togiak District of 1,370,177 fish was 59% above the preseason forecast of 860,000 fish (Appendix A6) and the largest on record for the Togiak District. The harvest of 858,407 and the escapement of 511,770 sockeye salmon both rank highest of all time (Appendix A6).

- Run timing based on tower counts was once again 7–10 days late, with the peak escapement count of 33,534 occurring on August 1.
- The king salmon harvest was 3,715, which was 41% below the 1998–2017 average (Appendix A6).
- Coho salmon harvest was 286% above the 20-year average with 42,891 fish harvested (Appendix A6).

## REFERENCES CITED

Dye, J. E., and L.K. Borden. *In prep.* Recreational fisheries in the Bristol Bay Management Area, 2016–2018. Alaska Department of Fish and Game, Fishery Management Report, Anchorage.

Halas, G., and G. Neufeld. 2018. An overview of the subsistence fisheries of the Bristol Bay Area. Alaska Department of Fish and Game, Division of Subsistence, Special Publication No. BOF 2018-04, Anchorage.



## **APPENDIX A**

Appendix A1.–Bristol Bay Area permits fished, by gear group, 1995-2018.

Year	Drift		Permits		% Fished		Set		Permits		% Fished		Drift and Set Total	
	Total	Fished	Dual <sup>a</sup>	Fished	Total	Fished	Total	Fished	Total	Fished	Total	Fished	Total	Fished
1995	1,888	1,882		100%	1,019	967	95%	2,855						
1996	1,891	1,884		100%	1,017	941	93%	2,832						
1997	1,899	1,875		99%	1,019	921	90%	2,820						
1998	1,899	1,858		98%	1,015	901	89%	2,800						
1999	1,898	1,847		97%	1,014	925	91%	2,823						
2000	1,890	1,823		96%	1,012	921	91%	2,811						
2001	1,883	1,566		83%	1,010	834	83%	2,717						
2002	1,878	1,183		63%	1,006	680	68%	2,558						
2003	1,867	1,389		74%	1,001	714	71%	2,581						
2004	1,860	1,426		77%	989	797	81%	2,849						
2005	1,862	1,526		82%	988	829	84%	2,850						
2006	1,859	1,567		84%	985	844	86%	2,844						
2007	1,862	1,621		87%	983	836	85%	2,845						
2008	1,863	1,636		88%	980	850	87%	2,843						
2009	1,863	1,642		88%	981	855	87%	2,844						
2010	1,863	1,731	360	93%	983	861	88%	2,846						
2011	1,862	1,747	224	94%	981	878	90%	2,846						
2012	1,862	1,740	326	93%	979	883	90%	2,841						
2013	1,862	1,709	313	92%	978	854	87%	2,840						
2014	1,863	1,751	312	93%	977	883	91%	2,840						
2015	1,863	1,744	309	94%	975	886	90%	2,838						
2016	1,863	1,714	353	93%	971	858	88%	2,834						
2017	1,863	1,728	357	95%	972	883	91%	2,835						
2018 <sup>b</sup>	1,863	1,733	372	92%	970	869	90%	2,833						
1998–2017 Avg.	1,869	1,651	325	88%	988	850	86%	2,806						

<sup>a</sup> Dual permit tracking did not begin until 2010.

<sup>b</sup> Preliminary data.

Appendix A2.—Total inshore run of salmon, in numbers of fish, Bristol Bay Area, 2016.

District	Sockeye	King	Chum	Pink	Coho	Total
Naknek–Kvichak Catch	13,468,744	2,955	236,969	12,231	1,156	13,722,055
Escapement: Kvichak Twr.	4,462,728	N.A.	N.A.	N.A.	N.A.	4,462,728
Naknek Twr.	1,691,910	N.A.	N.A.	N.A.	N.A.	1,691,910
Alagnak River <sup>a</sup>	1,775,820	1,283	N.A.	N.A.	N.A.	1,777,103
NK Subtotal	21,399,202	4,238	236,969	12,231	1,156	21,653,796
Egegik Catch	8,737,425	1,705	74,624	343	546	8,814,643
Escapement: Egegik Twr.	1,837,260	N.A.	N.A.	N.A.	N.A.	1,837,260
Egegik Subtotal	10,574,685	1,705	74,624	343	546	10,651,903
Ugashik Catch	6,629,596	1,591	72,534	1,498	<sup>b</sup>	6,707,024
Escapement: Ugashik Twr.	1,635,270	N.A.	N.A.	N.A.	N.A.	1,635,270
Ugashik Subtotal	8,264,866	1,591	72,534	1,498	0	8,342,294
Nushagak Catch	8,111,178	24,936	397,727	537,575	79,742	9,151,958
Escapement: Wood Twr.	1,309,707	N.A.	N.A.	N.A.	N.A.	1,309,707
Igushik	469,230	N.A.	N.A.	N.A.	N.A.	469,230
Nushagak	680,513	125,368	289,107	N.A.	N.A.	1,094,988
Nushagak Subtotal	10,570,628	150,304	686,834	537,575	79,742	12,025,083
Togiak Catch	645,803	3,831	187,508	217,194	9,346	1,063,682
Escapement: Togiak Twr.	200,046	N.A.	N.A.	N.A.	N.A.	200,046
Togiak R. & Trib.	N.A.	N.A.	N.A.	N.A.	N.A.	0
Kulukak	N.A.	N.A.	N.A.	N.A.	N.A.	0
Togiak Subtotal	845,849	3,831	187,508	217,194	9,346	1,263,728
Bristol Bay Catch	37,592,746	35,018	969,362	768,841	90,790	39,456,757
Bristol Bay Escapement	14,062,484	126,651	289,107	N.A.	N.A.	14,478,242
Bristol Bay Total Run	51,655,230	161,669	1,258,469	768,841	90,790	53,934,999

<sup>a</sup> Based on postseason aerial surveys.

<sup>b</sup> Ugashik coho catch is confidential.

Appendix A3.–Daily district registration of drift gillnet permit holders and dual permit registration, by district, Bristol Bay, 2016.

Date	Naknek-Kvichak		Egegik		Ugashik		Nushagak		Togiak <sup>a</sup>	
	Total	Dual	Total	Dual	Total	Dual	Total	Dual	Total	Total
1-Jun	1	2	5	0	0	0	1	0	0	7
2-Jun	2	2	5	0	0	0	2	0	0	9
3-Jun	2	2	7	0	0	0	2	0	0	11
4-Jun	2	2	8	0	1	0	2	0	0	13
5-Jun	2	2	8	0	1	0	2	0	0	13
6-Jun	2	2	8	0	1	0	2	0	0	13
7-Jun	2	2	15	4	1	0	5	0	1	24
8-Jun	6	2	18	4	1	0	5	0	1	31
9-Jun	8	2	24	4	4	0	10	0	1	47
10-Jun	9	4	26	4	4	0	11	0	2	52
11-Jun	16	2	40	10	10	0	12	0	4	82
12-Jun	16	2	37	8	10	0	12	0	4	79
13-Jun	20	4	43	12	19	6	12	0	4	98
14-Jun	57	30	108	72	34	32	19	2	5	223
15-Jun	72	0	116	0	45	0	26	0	5	264
16-Jun	87	22	139	54	53	28	34	2	6	319
17-Jun	104	26	164	62	52	26	43	4	6	369
18-Jun	119	34	156	54	49	24	86	26	8	418
19-Jun	128	38	159	58	53	26	175	74	9	524
20-Jun	159	52	189	78	59	26	291	134	9	707
21-Jun	231	78	258	102	95	46	335	154	12	931
22-Jun	248	78	305	128	142	72	404	186	15	1,114
23-Jun	254	82	309	128	156	76	452	206	16	1,187
24-Jun	275	86	357	148	167	80	474	216	24	1,297
25-Jun	287	92	370	162	197	94	492	228	26	1,372
26-Jun	297	94	379	168	202	96	490	228	28	1,396
27-Jun	308	94	390	172	205	96	506	240	28	1,437
28-Jun	312	96	399	178	231	106	518	244	30	1,490
29-Jun	318	102	401	176	238	110	508	238	34	1,499
30-Jun	327	108	403	178	242	114	515	244	34	1,521
1-Jul	384	136	401	176	245	116	510	242	34	1,574
2-Jul	467	160	388	168	252	120	462	210	35	1,604
3-Jul	483	168	383	166	251	118	429	204	38	1,584
4-Jul	550	212	368	158	245	114	409	196	39	1,611
5-Jul	581	220	355	146	259	118	406	194	42	1,643
6-Jul	619	238	356	144	263	118	396	186	42	1,676
7-Jul	625	246	357	146	264	118	390	182	43	1,679
8-Jul	625	246	357	146	262	116	385	178	43	1,672
9-Jul	622	246	366	150	267	118	368	166	43	1,666
10-Jul	627	248	353	148	278	126	341	154	43	1,642
11-Jul	646	262	352	148	281	126	341	154	43	1,663
12-Jul	675	272	336	142	297	134	329	152	43	1,680
13-Jul	681	272	302	124	295	132	306	138	43	1,627
14-Jul	708	280	290	118	291	132	301	134	43	1,633
15-Jul	767	312	290	118	292	134	300	134	43	1,692
16-Jul	790	324	281	112	292	134	289	130	43	1,695
Average <sup>b</sup>	429	159	320	134	209	97	364	167	30	1,352

Note: Total permit sum includes dual permit registrations.

<sup>a</sup> Dual boat registration is not permitted by regulation in Togiak District.

<sup>b</sup> Seasonal averages calculated for June 16 to July 16.

Appendix A4.–Total inshore run of salmon, in numbers of fish, Bristol Bay Area, 2017.

District	Sockeye	King	Chum	Pink	Coho	Total
Naknek–Kvichak Catch	8,256,792	2,681	249,716	173	4,757	8,514,119
Escapement: Kvichak Twr.	3,163,404	N.A.	N.A.	N.A.	N.A.	3,163,404
Naknek Twr.	1,899,972	N.A.	N.A.	N.A.	N.A.	1,899,972
Alagnak Twr.	2,041,824	435	N.A.	N.A.	N.A.	2,042,259
NK Subtotal	15,361,992	3,116	249,716	173	4,757	15,619,754
Egegik Catch	11,981,014	1,087	147,330	214	14,274	12,143,919
Escapement: Egegik Twr.	2,600,982	N.A.	N.A.	N.A.	N.A.	2,600,982
Egegik Subtotal	14,581,996	1,087	147,330	214	14,274	14,745,422
Ugashik Catch	5,705,967	1,332	88,127	143	7	5,705,967
Escapement: Ugashik Twr.	1,186,446	N.A.	N.A.	N.A.	N.A.	1,186,446
Ugashik Subtotal	6,892,413	1,332	88,127	143	7	6,892,413
Nushagak Catch	12,322,923	33,374	804,891	7,250	167,439	13,335,877
Escapement: Wood Twr.	4,274,224	N.A.	N.A.	N.A.	N.A.	4,274,224
Igushik	578,700	N.A.	N.A.	N.A.	N.A.	578,700
Nushagak	2,852,308	56,961	415,487	N.A.	N.A.	3,324,754
Nushagak Subtotal	20,028,153	90,335	1,220,378	7,250	167,439	21,513,555
Togiak Catch	516,495	4,731	204,518	26,798	54,503	807,045
Escapement: Togiak Twr.	195,330	N.A.	N.A.	N.A.	N.A.	195,330
Togiak R. & Trib.	N.A.	N.A.	N.A.	N.A.	N.A.	0
Kulukak	N.A.	N.A.	N.A.	N.A.	N.A.	0
Togiak Subtotal	711,825	4,731	204,518	26,798	54,503	1,002,375
Bristol Bay Catch	38,783,191	43,205	1,494,582	34,578	240,980	40,506,927
Bristol Bay Escapement	18,793,190	57,396	415,487	N.A.	N.A.	19,266,071
Bristol Bay Total Run	57,576,381	100,601	1,910,069	34,578	240,980	59,772,998

Appendix A5.–Daily district registration of drift gillnet permit holders and dual permit registration, by district, Bristol Bay, 2017.

Date	Naknek-Kvichak		Egegik		Ugashik		Nushagak		Togiak <sup>a</sup>	
	Total	Dual	Total	Dual	Total	Dual	Total	Dual	Total	Total
6/1	1	0	8	0	1	0	0	0	0	10
6/2	1	0	8	0	1	0	0	0	0	10
6/3	1	0	10	1	2	0	1	0	0	14
6/4	1	0	10	1	3	0	1	0	1	16
6/5	1	0	10	1	3	0	1	0	1	16
6/6	1	0	11	1	3	0	2	0	1	18
6/7	1	0	11	1	3	0	3	0	1	19
6/8	2	0	13	2	3	0	4	0	1	23
6/9	2	0	16	2	3	0	5	0	1	27
6/10	9	1	35	3	3	0	13	0	2	62
6/11	11	1	45	3	3	0	15	0	2	76
6/12	11	1	51	4	5	1	15	0	2	84
6/13	20	1	81	12	18	2	22	0	3	144
6/14	25	1	87	12	21	3	26	2	4	163
6/15	35	3	101	15	28	6	28	0	5	197
6/16	38	4	117	19	30	6	37	2	8	230
6/17	39	4	129	22	26	4	56	4	10	260
6/18	38	5	153	27	31	5	57	26	10	289
6/19	84	14	276	63	35	6	69	74	12	476
6/20	125	19	303	66	43	8	155	134	17	643
6/21	132	18	346	77	48	11	248	154	20	794
6/22	159	22	380	82	56	13	444	186	22	1,061
6/23	163	21	431	95	68	17	531	206	22	1,215
6/24	161	22	457	101	75	18	593	216	24	1,310
6/25	169	23	480	107	138	35	602	228	25	1,414
6/26	176	24	496	113	173	47	609	228	29	1,483
6/27	183	25	512	119	177	47	630	240	34	1,536
6/28	252	33	482	111	184	48	629	244	37	1,584
6/29	272	37	467	108	191	51	634	238	37	1,601
6/30	304	45	473	110	198	51	636	244	38	1,649
7/01	309	45	470	111	198	51	620	242	40	1,637
7/02	314	46	473	112	198	51	575	210	40	1,600
7/03	331	47	491	119	216	55	550	204	41	1,629
7/04	354	53	504	123	229	57	548	196	41	1,676
7/05	379	59	501	122	232	60	497	194	41	1,650
7/06	389	60	484	117	230	60	471	186	42	1,616
7/07	437	73	467	111	238	63	441	182	42	1,625
7/08	470	82	442	109	249	65	409	178	42	1,612
7/09	508	90	416	103	258	68	367	166	43	1,592
7/10	539	93	416	104	284	71	362	154	43	1,644
7/11	560	98	403	100	333	77	330	154	43	1,669
7/12	558	95	385	100	329	76	282	152	43	1,597
7/13	577	102	306	72	342	80	280	138	43	1,548
7/14	598	103	381	103	381	92	273	134	43	1,676
7/15	599	104	385	103	394	96	276	134	43	1,697
7/16	577	97	391	104	409	99	290	130	43	1,710
Average <sup>b</sup>	316	50	401	95	193	48	403	167	33	1,346

Note: Total permit sum includes dual permit registrations.

<sup>a</sup> Dual boat registration is not permitted by regulation in Togiak District.

<sup>b</sup> Seasonal averages calculated for June 16 to July 16.

Appendix A6.—Total inshore run of salmon, in numbers of fish, Bristol Bay Area, 2018<sup>a</sup>.

District	Sockeye	King	Chum	Pink	Coho	Total
Naknek–Kvichak Catch	8,606,353	1,330	314,872	16,858	6,503	8,945,916
Escapement: Kvichak Twr.	4,398,708	N.A.	N.A.	N.A.	N.A.	4,398,708
Naknek Twr.	2,221,152	N.A.	N.A.	N.A.	N.A.	2,221,152
Alagnak Twr.	1,581,426	998 <sup>b</sup>	N.A.	N.A.	N.A.	1,582,424
NK Subtotal	16,807,639	2,328	314,872	16,858	6,503	17,148,200
Egegik Catch	4,959,129	335	110,763	341	14,755	5,085,323
Escapement: Egegik Twr.	1,608,354	N.A.	N.A.	N.A.	N.A.	1,608,354
Egegik Subtotal	6,567,483	335	110,763	341	14,755	6,693,677
Ugashik Catch	2,771,783	1,073	91,376	0	0	2,864,232
Escapement: Ugashik Twr.	1,167,792	N.A.	N.A.	N.A.	N.A.	1,167,792
Ugashik Subtotal	3,939,575	1,073	91,376	0	0	4,032,024
Nushagak Catch	24,057,489	35,243	1,192,060	135,126	74,317	25,494,235
Escapement: Wood Twr.	7,507,254	N.A.	N.A.	N.A.	N.A.	7,507,254
Igushik	770,772	N.A.	N.A.	N.A.	N.A.	770,772
Nushagak	1,247,460	97,239	811,283	N.A.	111,455	2,267,437
Nushagak Subtotal	33,582,975	132,482	2,003,343	135,126	185,772	36,039,698
Togiak Catch	858,407	3,715	159,237	66,673	42,891	1,130,923
Escapement: Togiak Twr.	511,770	N.A.	N.A.	N.A.	N.A.	511,770
Togiak R. & Trib.	N.A.	N.A.	N.A.	N.A.	N.A.	0
Kulukak	N.A.	N.A.	N.A.	N.A.	N.A.	0
Togiak Subtotal	1,370,177	3,715	159,237	66,673	42,891	1,642,693
Bristol Bay Catch	41,253,161	41,696	1,868,308	218,998	138,466	43,520,629
Bristol Bay Escapement	21,014,688	98,237	811,283	N.A.	111,455	22,035,663
Bristol Bay Total Run	62,267,849	139,933	2,679,591	218,998	249,921	65,556,292

<sup>a</sup> Preliminary data.

Appendix A7.–Daily district registration of drift gillnet permit holders and dual permit registration, by district, Bristol Bay, 2018.

Date	Naknek-Kvichak		Egegik		Ugashik		Nushagak		Togiak <sup>a</sup>	
	Total	Dual	Total	Dual	Total	Dual	Total	Dual	Total	Total
1-Jun										
2-Jun	1	0	7	0			7	2	1	16
3-Jun	1	0	7	0			7	2	1	16
4-Jun	1	0	7	0			7	2	1	18
5-Jun	1	0	8	0			7	2	2	24
6-Jun	2	0	8	0			8	2	6	29
7-Jun	2	0	10	0			10	2	7	33
8-Jun	4	2	11	0			11	2	7	43
9-Jun	2	0	18	4			16	4	7	49
10-Jun	4	2	22	6			16	4	7	54
11-Jun	4	2	26	8	1	0	16	4	7	108
12-Jun	8	2	53	20	11	8	27	4	9	122
13-Jun	8	2	61	24	11	8	33	6	9	157
14-Jun	7	0	92	28	10	6	37	6	11	184
15-Jun	13	2	105	32	7	4	48	8	11	207
16-Jun	12	0	108	32	6	2	70	18	11	216
17-Jun	11	0	112	36	6	2	76	20	11	256
18-Jun	17	0	123	44	6	2	99	30	11	375
19-Jun	23	0	183	80	4	0	152	56	13	669
20-Jun	22	0	194	82	4	0	436	216	13	908
21-Jun	32	4	209	88	6	0	648	342	13	1121
22-Jun	39	6	245	102	6	0	817	442	14	1,215
23-Jun	40	6	255	98	20	8	881	460	19	1,307
24-Jun	43	8	261	100	23	8	960	510	20	1,367
25-Jun	44	8	286	100	21	8	994	524	22	1,493
26-Jun	83	14	328	122	21	8	1,034	538	27	1,545
27-Jun	104	24	336	122	25	10	1,053	548	27	1,558
28-Jun	117	28	331	118	31	12	1,052	542	27	1,567
29-Jun	133	30	337	118	38	18	1,032	532	27	1,607
30-Jun	144	32	359	134	54	22	1,022	524	28	1,641
1-Jul	152	30	378	140	63	26	1,020	520	28	1,642
2-Jul	170	36	371	136	70	30	1,003	514	28	1,636
3-Jul	180	38	378	144	79	36	967	492	32	1,623
4-Jul	191	38	371	142	99	42	928	482	34	1,600
5-Jul	215	48	318	114	118	54	913	470	36	1,625
6-Jul	254	58	313	112	128	58	894	464	36	1,684
7-Jul	304	88	308	112	131	60	905	476	36	1,679
8-Jul	310	86	292	106	132	62	908	476	37	1,672
9-Jul	314	86	279	102	127	58	915	476	37	1,673
10-Jul	318	86	252	84	122	58	943	490	38	1,693
11-Jul	326	90	257	88	122	60	950	490	38	1,722
12-Jul	326	90	260	90	121	60	977	504	38	1,697
13-Jul	324	88	260	90	122	60	953	488	38	1,629
14-Jul	330	92	257	90	121	60	883	434	38	1,490
15-Jul	345	100	259	94	130	66	718	354	38	1,573
16-Jul	397	134	314	134	144	76	679	326	39	1,682
Average <sup>b</sup>	181	48	277	103	72	33	798	408	28	1,392

Note: Total permit sum includes dual permit registrations.

<sup>a</sup> Dual boat registration is not permitted by regulation in Togiak District.

<sup>b</sup> Seasonal averages calculated for June 16 to July 16.



Appendix A8.—Allocation of sockeye salmon by district and gear type 1998–2018.<sup>a</sup>

		Percent Harvest by Gear Type <sup>a</sup>							
Year		Naknek–Kvichak		Egegik		Ugashik		Nushagak	
		Drift	Set	Drift	Set	Drift	Set	Drift	Set
1998	a	85	15	86	14	85	15	72	28
1999	a	85	15	85	15	89	11	73	27
2000	a	82	18	84	16	87	13	78	22
2001	a	77	23	85	15	80	20	79	21
2002	a	65	35	85	15	88	12	75	25
2003	a	66	34	80	20	88	12	84	16
2004	a, b	80	20	85	15	91	9	84	16
2005	a	78	22	82	18	87	13	85	15
2006	a	83	17	84	16	88	12	88	12
2007	a	81	19	84	16	92	8	80	20
2008	a	81	19	85	15	92	8	79	21
2009	a	80	20	85	15	87	13	77	23
2010	a	80	20	84	16	90	10	77	23
2011	a	83	17	84	16	88	12	77	23
2012	a	85	15	83	17	89	11	63	37
2013	a	84	<sup>16</sup>	85	15	90	10	78	22
2014	a	83	17	89	11	83	17	74	26
2015	a,	84	16	81	19	91	9	69	31
2016	a	83	17	82	18	91	9	67	33
2017	a	72	28	87	13	92	8	75	25
2018	a, c	71	29	81	19	79	21	82	18
1998–2018 Avg.		79	21	84	16	88	12	77	23
2016–2018 Avg.		75	25	83	17	87	13	75	24
Allocation		84	16	86	14	90	10	74	26

<sup>a</sup> Data from 1998 to 2018 for Naknek–Kvichak, Egegik, Ugashik, and Nushagak districts are for the allocation periods only.

<sup>b</sup> Excludes 1,656,924 fish harvested in the General District.

<sup>c</sup> Preliminary data.

Appendix A9.–Naknek–Kvichak District sockeye salmon allocation by gear type and percent of catch through the allocation period, 1998–2018.

Year	Drift Net	Set Net			Naknek River Special Harvest Area	
	Naknek-Kvichak Drift Net	Naknek Section	Kvichak Section	Combined Set Net	Drift Net	Set Net
1998	85% <sup>a</sup>	7%	8%	15% <sup>a</sup>		
1999	84% <sup>a</sup>	9%	7%	16% <sup>a</sup>	100%	0%
2000	82% <sup>a</sup>	10%	4%	18% <sup>a</sup>	79%	21%
2001	78% <sup>a</sup>	7%	1%	23% <sup>a</sup>	74%	26%
2002 <sup>b</sup>	65% <sup>a</sup>	0%	0%	35% <sup>a</sup>	65%	35%
2003	66% <sup>a</sup>	1%	0%	34% <sup>a</sup>	64%	36%
2004	80% <sup>a</sup>	9%	8%	20% <sup>a</sup>	88%	12%
2005	81% <sup>a</sup>	2%	1%	19% <sup>a</sup>	79%	21%
2006	83% <sup>a</sup>	5%	3%	17% <sup>a</sup>	79%	21%
2007	82% <sup>c</sup>	12%	6%	18% <sup>c</sup>	79%	21%
2008	81% <sup>c</sup>	12%	7%	19% <sup>c</sup>		
2009	80% <sup>c</sup>	11%	9%	20% <sup>c</sup>		
2010	80% <sup>c</sup>	10%	10%	20% <sup>c</sup>		
2011	83% <sup>c</sup>	10%	7%	17% <sup>c</sup>		
2012	85% <sup>c</sup>	7%	8%	15% <sup>c</sup>		
2013	84% <sup>c</sup>	8%	8%	16% <sup>c</sup>		
2014	83% <sup>c</sup>	9%	8%	17% <sup>c</sup>		
2015	84% <sup>c</sup>	8%	8%	16% <sup>c</sup>		
2016	82% <sup>c</sup>	9%	9%	18% <sup>c</sup>		
2017	70% <sup>c</sup>	16%	14%	30% <sup>c</sup>		
2018 <sup>d</sup>	71% <sup>c</sup>	17%	12%	29% <sup>c</sup>	84%	16%
1998–2018 Avg.	79%	9%	7%	21%	79%	24%
2016–2018 Avg.	74%	14%	12%	26%	84%	16%
Allocation	84%	8%	8%	16%	NA	NA

<sup>a</sup> Inriver catches included in total harvest percentage calculation.

<sup>b</sup> Entire season was fished in the NRSHA.

<sup>c</sup> Inriver catches excluded from total harvest percentage calculation.

<sup>d</sup> Preliminary data.

Appendix A10.–Nushagak District sockeye salmon allocation by gear type and percentage of catch, through the allocation period, 1998–2018.

Year		Nushagak			Wood River		
		Drift District	Nushagak Section	Set Net Igushik Section	Combined Section	Special Harvest Drift Net	Set Net
1998	a	72%	24%	4%	28%	79%	21%
1999	a	69%	25%	6%	31%	79%	21%
2000	b	80%	15%	5%	20%	70%	30%
2001	b	79%	17%	4%	21%		
2002	b	78%	21%	1%	22%	66%	34%
2003	b	84%	14%	2%	16%		
2004	b	84%	15%	1%	16%		
2005	b	85%	13%	2%	15%		
2006	b	88%	11%	2%	12%		
2007	b	80%	17%	3%	20%		
2008	b	79%	16%	5%	21%		
2009	b	77%	19%	4%	23%		
2010	b	77%	17%	5%	23%	70%	30%
2011	b	77%	16%	7%	23%		
2012	b	65%	28%	7%	35%	51%	49%
2013	b	78%	17%	5%	22%		
2014	b	77%	16%	7%	23%	16%	84%
2015	b	69%	22%	9%	31%		
2016	b	67%	22%	11%	33%		
2017	b	75%	18%	4%	22%		
2018	b, c	82%	16%	2%	18%		18%
1998–2018 Avg.		77%	19%	5%	22%	62%	36%
2016–2018 Avg.		75%	24%	6%	17%	-	18%
Allocation		74%	20%	6%	26%	NA	NA

<sup>a</sup> Allocation period June 1 to September 30.

<sup>b</sup> Allocation period June 1 to July 17.

<sup>c</sup> Preliminary data.

Appendix A11.—Sockeye salmon harvest by district, in numbers of fish, Bristol Bay Area, 1996–2018.

Year	Naknek–Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1996	8,215,028	10,809,115	4,411,055	5,693,563	462,897	29,591,658
1997	589,311	7,517,389	1,402,690	2,506,818	142,569	12,158,777
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 <sup>a</sup>
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	4,851,149	4,774,295	2,164,883	3,162,555	467,326	15,420,208
2014	13,776,111	6,925,328	1,506,909	6,445,967	441,474	29,095,789
2015	16,531,925	8,471,001	5,474,295	5,593,720	371,924	36,442,865
2016	13,468,744	8,737,425	6,629,596	8,111,178	645,803	37,592,746
2017	8,256,792	11,981,014	5,705,967	12,322,923	516,495	38,783,191
20-Year Avg.	8,012,510	6,730,745	2,830,239	6,424,871	557,760	24,553,563
1996–2015 Avg.	7,366,450	6,611,149	2,504,148	5,813,185	529,918	22,731,168
1997–2016 Avg.	7,629,136	6,507,564	2,615,075	5,934,066	539,064	23,152,278
1998–2007 Avg.	5,444,124	5,985,093	2,113,986	6,225,416	546,603	19,838,602
2008–2017 Avg.	10,580,896	7,476,398	3,546,492	6,624,326	568,916	28,797,028
2018 <sup>b</sup>	8,606,353	4,959,129	2,771,783	24,057,489	858,407	41,253,161

<sup>a</sup> Includes 3,995 fish not assigned to a district.

<sup>b</sup> Preliminary data.

Appendix A12.—Sockeye salmon escapement by district, in numbers of fish, Bristol Bay Area, 1998–2018.

Year	Kvichak <sup>a</sup>	Egegik <sup>b</sup>	Ugashik <sup>c</sup>	Nushagak <sup>d</sup>	Togiak <sup>e</sup>	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 <sup>f</sup>	231,196	14,227,822
2000	3,654,568	1,032,138	638,420	2,159,628 <sup>f</sup>	390,080	7,874,834
2001	3,194,708	968,872	866,368	2,765,440 <sup>f</sup>	338,616 <sup>g</sup>	9,102,876
2002	2,303,463	1,036,092	905,584	1,755,993 <sup>f</sup>	199,507	6,200,639
2003	5,627,974 <sup>h</sup>	1,152,120	790,202	2,295,963 <sup>f</sup>	261,851 <sup>g</sup>	10,128,110
2004	12,836,100 <sup>h</sup>	1,290,144	815,104	2,196,864 <sup>f</sup>	154,681 <sup>g</sup>	17,292,893
2005	9,283,980 <sup>h</sup>	1,621,734	799,612	2,968,962 <sup>f</sup>	155,778 <sup>g</sup>	14,830,066
2006	6,795,420 <sup>h</sup>	1,465,158	1,003,158	4,861,780 <sup>f</sup>	312,126 <sup>i</sup>	14,437,642
2007	8,221,926 <sup>h</sup>	1,432,500	2,599,186	2,461,579 <sup>f</sup>	269,646 <sup>i</sup>	14,984,837
2008	7,411,104 <sup>h</sup>	1,259,568	596,332	3,271,926 <sup>f</sup>	205,680 <sup>i</sup>	12,744,610
2009	4,406,424 <sup>h</sup>	1,146,276	1,364,338	2,317,569 <sup>f</sup>	313,946 <sup>i</sup>	9,548,553
2010	6,859,068 <sup>h</sup>	927,054	830,886	2,791,080 <sup>f</sup>	188,298 <sup>i</sup>	11,596,386
2011	4,325,220 <sup>h</sup>	961,200	1,029,853	1,947,577	190,970 <sup>i</sup>	8,454,820
2012	5,926,503	1,233,900	695,018	1,389,975	203,148 <sup>i</sup>	9,448,544
2013	4,122,686	1,113,630	898,110	2,465,791	128,118 <sup>i</sup>	8,728,335
2014	6,133,492	1,382,466	640,158	3,723,697	151,934 <sup>i</sup>	12,031,747
2015	15,033,216	2,160,792	1,564,638	3,389,330	218,700	22,366,676
2016	7,930,458	1,837,260	1,635,270	2,459,450	200,046	14,062,484
2017	7,105,200 <sup>h</sup>	2,600,982	1,186,446	7,705,232	195,330	18,793,190
20-Year Avg.	6,661,282	1,373,030	1,072,279	2,886,057	226,214	12,267,305
1998–2007 Avg.	6,397,226	1,283,746	1,100,453	2,625,947	252,811	11,757,070
2008–2017 Avg.	6,925,337	1,462,313	1,044,105	3,146,167	199,617	12,777,539
2018	8,201,286 <sup>h</sup>	1,608,354	1,167,792	9,525,486	511,770 <sup>i</sup>	21,014,688

<sup>a</sup> Includes counts from Kvichak Tower, Alagnak aerial survey, and Naknek Tower.

<sup>b</sup> Includes Egegik River. May include King Salmon River and Shoskey Creek.

<sup>c</sup> Includes Ugashik River. Also includes Mother Goose River, Dog Salmon River system 1991–2004.

<sup>d</sup> Includes Igushik, Nushagak-Mulchatna, Nuyakuk, Snake, and Wood rivers and Nushagak River sonar.

<sup>e</sup> Includes Togiak River/Lake and tributaries, Kulukak system, and other miscellaneous river systems.

<sup>f</sup> Snake River not surveyed.

<sup>g</sup> Only partial and/or late surveys of Togiak streams.

<sup>h</sup> Alagnak tower count only.

<sup>i</sup> Togiak River Tower count.

Appendix A13.—Average exvessel price per pound paid for salmon, by species, Bristol Bay Area, 1998–2018.

Year	Sockeye	King	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
1998–2007 Avg.	0.66	0.49	0.10	0.06	0.39
2008–2017 Avg.	1.08	1.04	0.29	0.20	0.64
2018 <sup>a</sup>	1.26	0.80	0.36	0.20	0.80

*Source:* OCEANAK Alaska Department of Fish and Game Commercial Operators Annual Report (COAR) Buying Subject Area. The department is not responsible for errors or deficiencies in reproduction, subsequent analysis, or interpretation.

*Note:* The exvessel price includes any reported 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.

<sup>a</sup> Does not include postseason adjustments.

Appendix A14.—Estimated exvessel value of the commercial salmon catch by species, in thousands of dollars, Bristol Bay Area, 1998–2018.

Year	Sockeye	King	Chum	Pink <sup>a</sup>	Coho	Total <sup>b</sup>
1998	66,530	1,226	242	7	727	72,688
1999	104,354	186	331		398	115,215
2000	78,214	152	228	16	687	84,756
2001	38,211	135	712		43	41,246
2002	31,962	277	287	0	18	32,479
2003	46,897	236	423		238	48,801
2004	76,175	634	423	171	150	79,119
2005	96,044	720	946		168	98,503
2006	110,372	1,240	1,441	19	191	93,110
2007	119,196	542	1,583		120	121,441
2008	118,028	297	1,344	171	401	111,919
2009	142,457	387	1,347		177	129,468
2010	176,784	495	1,743	1,567	470	185,027
2011	154,851	455	1,542		62	137,726
2012	139,675	338	1,475	860	345	115,356
2013	148,681	366	2,049		654	141,947
2014	217,311	311	1,214	1,209	1,990	221,610
2015	123,547	347	1,758		92	126,127
2016	192,349	361	1,688	547	312	155,717
2017	268,526	431	2,594		1,071	214,617
20-year Avg.	122,508	457	1,169	457	416	113,722
1998–2007 Avg.	76,795	535	662	43	274	78,736
2008–2017 Avg.	168,221	379	1,675	871	557	148,709
2018 <sup>c</sup>	275,489	347	4,305	158	731	281,030

Note: Value paid to fishermen. Derived from exvessel price per pound multiplied by weight of commercial catch. Blank cells represent no data.

<sup>a</sup> Includes even years only.

<sup>b</sup> Total may vary from actual sum due to rounding.

<sup>c</sup> Does not include post season adjustments.