

Special Publication No. 18-08

2018 Bristol Bay Sockeye Salmon Processing Capacity Survey Summary

by

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and

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March 2018

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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

SPECIAL PUBLICATION NO. 18-08

**2018 BRISTOL BAY SOCKEYE SALMON PROCESSING CAPACITY
SURVEY SUMMARY**

by

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March 2018

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This document should be cited as follows:

Poetter, A. D., and J. Shriver. 2018. 2018 Bristol Bay sockeye salmon processing capacity survey summary. Alaska Department of Fish and Game, Special Publication No. 18-08, Anchorage.

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ABSTRACT

The 2018 Bristol Bay Sockeye Salmon Processing Capacity Survey Summary reports results of the Alaska Department of Fish and Game, Division of Commercial Fisheries survey of the 12 major Bristol Bay sockeye salmon processors. There was a 100% response rate from those processors who account for 99.4% of all 2017 sockeye salmon purchased in Bristol Bay. This survey provides estimates of total intended purchases, daily processing capacity, “in Bristol Bay” tender fleet capacity, and long haul tender fleet capacity. The results of this survey found the 2018 Bristol Bay total intended purchases of 41.71 million fish is approximately 4.12 million fish (10%) higher than the forecast harvest of 37.59 million fish. The survey estimated a maximum daily processing capacity of 2.43 million fish per day which could be sustained for approximately 20 days.

Keywords: Bristol Bay, salmon, processing capacity, forecast

INTRODUCTION

The Alaska Department of Fish and Game (ADF&G) completed a survey of 12 salmon processors who intend to buy sockeye salmon in Bristol Bay during the 2018 season. This 2018 Bristol Bay sockeye salmon processing capacity survey had a 100% response rate. All 12 processing companies completed and returned the survey. All the processors surveyed had purchased salmon in Bristol Bay during the 2017 season; and taken together, accounted for 99.4% of the sockeye salmon purchased in Bristol Bay during the 2017 season. Individual processor’s salmon capacities are protected as confidential information under Alaska statute (AS 16.05.815(a)). This document provides a nonconfidential summary of the 2018 Bristol Bay sockeye salmon processing capacity survey.

The Bristol Bay area commercial salmon fishery includes all coastal and inland waters east of a line from Cape Newenham to Cape Menchikof (Figure 1). The area includes nine 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 five 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 ranges while harvesting fish in excess of those ranges through orderly fisheries. In addition, regulatory management plans have been adopted for individual species in certain districts. The Bristol Bay sockeye salmon capacity survey estimates processing capacity for the entire Bristol Bay area and does not breakup capacity by district.

Results of the processing capacity survey should be viewed in relationship to the ADF&G sockeye salmon forecast (Appendix A). The primary function of the salmon forecast has always been to provide processors and harvesters an indication of what ADF&G is anticipating in salmon returns for the coming season. The 2018 sockeye salmon forecast for Bristol Bay is 51.28 million fish with a range of 40.68 to 61.88 million. This is 18% greater than the most recent 10-year average of Bristol Bay total runs (42.71 million) and 41% greater than the long-term mean of 33.78 million fish. All river systems are expected to meet their spawning escapement goals. Escapement goals for all Bristol Bay river systems are calculated to be 12.2 million. A run of 51.28 million sockeye salmon would allow for a potential total harvest of 39.08 million fish, 37.59 million fish in Bristol Bay and 1.49 million fish in the South Peninsula fisheries. A Bristol

Bay harvest of this size is 35% greater than the most recent 10-year average harvest of 28.91 million, which has ranged from 15.43 million to 38.81 million, and is 87% greater than the long-term harvest average of 20.85 million fish (1963 to present).

BACKGROUND

The ADF&G Division of Commercial Fisheries conducted the first statewide salmon processing capacity survey in 1978 and continued conducting voluntary and informal surveys of statewide processing capacity throughout the 1990s. Beginning in 2001, ADF&G conducted formal salmon capacity surveys in which survey forms were mailed to selected processors who represented the majority of processing capacity in Alaska. These surveys were formal, but still voluntary. The voluntary nature of the surveys changed in 2004, when regulations were enacted that made participation a regulatory requirement (5 AAC 39.132). In addition, the regulations clarified that individual surveys were confidential under AS 16.05.815(a). In 2008, the division phased out salmon capacity surveys for all fishing regions except Bristol Bay. Bristol Bay surveys were not conducted in the years 2012 to 2014 as processing capacity was not a preseason concern. The division decided to resume processing capacity surveys in light of the large forecasts that began in 2015. Large harvests have the potential to cause processing capacity bottlenecks, especially if run timing is compressed.

A large projected harvestable surplus can prompt questions about allowing foreign processing vessels into the internal waters of the State of Alaska. The Bristol Bay sockeye salmon processing capacity survey is an instrument that can be used to determine whether domestic processors have enough capacity to handle the expected harvest. The Magnuson–Stevens Fishery Conservation and Management Act provides the framework requirements that must be met before foreign processing ships are allowed into the internal waters of the state. The Magnuson–Stevens Fishery Conservation and Management Act requires the governor to determine whether adequate domestic processing capacity exists and whether that capacity will be used to process the available harvest, before allowing any foreign processors into state waters (16 U.S.C. § 1856(c)). Should the governor receive a request to bring foreign processing ships into the internal waters of the state to process salmon in Bristol Bay in 2018; information from this survey would be considered by the governor, along with other information, in determining whether foreign vessels should be allowed to enter the internal waters of the State of Alaska to process salmon (16 U.S. Code § 1856(c); 5 AAC 39.198).

Capacity is measured as a combination of actual physical processing capacity and the intent of processors to purchase and process salmon during the season in aggregate. Processors were asked to report the maximum amount of sockeye salmon in pounds that they intend to purchase and process during the upcoming Bristol Bay salmon fishing season.

Results of the 2018 Bristol Bay sockeye salmon capacity survey should be interpreted as a snapshot of anticipated processing capacity that is made months before the fishery opens. As processors finalize operational plans and assess the domestic and world markets for salmon, their plans may change between the time of the survey and the salmon fishing season. The salmon capacity estimated in this report is not guaranteed, nor is there an implied guarantee that all fishermen will have buyers for all their salmon.

METHODS

Processors were selected to receive survey forms based on two sources of information: ADF&G 2016 Commercial Operator's Annual Report (COAR) data and 2017 ADF&G fish ticket data. Processors were selected for inclusion in the survey if the processor reported buying more than 100,000 pounds of Bristol Bay sockeye salmon on their 2016 COAR reports or if, according to fish ticket records, the processor bought more than 100,000 pounds of Bristol Bay sockeye salmon in 2017. These criteria identified 12 commercial salmon processing companies to receive surveys. These 12 companies represented 20 processing operations (by processor code) in Bristol Bay. Surveys were emailed on January 11, 2018 with a completion deadline of February 9, 2018. Compilation and analysis of the survey data began on February 21, 2018. In the survey, processors were asked to estimate the amount of sockeye salmon they intended to purchase during the 2018 season from Bristol Bay. A copy of the ADF&G 2018 Bristol Bay sockeye salmon forecast was provided with the survey forms (Appendix B).

All processors that responded to the survey reported their intended purchases and capacity in pounds. To compare the survey capacity with the forecasted harvest (in numbers of fish), the survey capacity in pounds was divided by the 5-year (2013–2017) mean weight of 5.51 pounds per fish (Table 1) to convert capacity to numbers of fish. After the survey capacity was converted to numbers of fish, the projected capacity was compared to the forecasted return.

BRISTOL BAY SOCKEYE SALMON PROCESSING CAPACITY

TOTAL INTENDED PURCHASES

This survey provides an estimate of the total intended purchases for the entire season. The 12 surveyed processors indicated that they are prepared to purchase and process 229.80 million pounds or 41.71 million sockeye salmon during the 2018 Bristol Bay salmon season (Table 2). The total intended purchases is approximately 4.12 million fish (10%) above the forecast harvest of 37.59 million fish (Table 2).

DAILY PROCESSING CAPACITY

In the 2018 Bristol Bay sockeye salmon processing capacity survey (Appendix B), processors were asked to estimate their daily processing capacity and to estimate the number of days their facility could operate at that daily capacity. They were also asked by what date they expect their facility to operate at their quoted daily capacity.

The total daily capacity reported in the survey was 13.38 million pounds or 2.43 million fish (Table 3). Surveyed processors expect to be able to sustain daily processing capacity for approximately 20 days. The mean date processors expect to be at their reported daily capacity is June 24, 2018 (Table 3).

The comparison of projected capacity to harvest forecast and past peak daily harvests allows an evaluation of industries capability to harvest this year's forecast. The projected daily capacity exceeds most historic peak daily harvests. At the maximum projected daily harvest capacity of 2.43 million fish per day, the forecast 37.59 million fish harvest could be achieved in approximately 15 days. The 2018 projected 2.43 million fish daily processing capacity has been

exceeded five days in the past 5 years (Table 4). It should be noted that processor limits likely restricted the daily maximums listed in Table 4, but it is not accounted for in this review.

Operating at maximum daily capacity is contingent on a number of factors that include, but are not limited to, mechanical operations, logistics, and employee availability. Although it appears that if every processor is operating at their reported daily capacity there would be sufficient daily capacity to handle a peak landing of salmon, this does not guarantee that all Bristol Bay salmon permit holders will have a buyer at all times during this season.

IN BRISTOL BAY TENDER FLEET

Most Bristol Bay processors provide tenders that service locally inside of Bristol Bay waters. This fleet of tenders is considered the *in-Bristol Bay* tender fleet. Surveyed processors were asked if their company intends to provide tenders during the 2018 season, their tender fleet's *in-Bristol Bay* holding capacity, and the date they expect to have all their tenders available. Processors were asked to consider only their *in-Bristol Bay* fleet's capacity and exclude any additional capacity provided by their long-haul tender fleet.

Of the 12 companies surveyed, 11 will provide tenders inside Bristol Bay waters. The reported *in-Bristol Bay* tender fleet holding capacity is 46.98 million pounds, or 8.53 million salmon (Table 5). The mean date that the companies expect to have their tenders available is June 18, 2018.

LONG HAUL TENDER FLEET

Some Bristol Bay processors provide long haul tenders that transport fish from Bristol Bay to other processing facilities around the state. Long haul tenders allow processors to purchase more salmon during the peak of the season. Surveyed processors were asked if their company intends to provide long haul-tenders during the 2018 season, their long-haul tender daily capacity and season capacity.

Of the 12 companies surveyed, four reported that they will provide long haul tender services. The reported long haul tender daily capacity is 5.22 million pounds or 947 thousand fish. The season capacity was reported as 12 million pounds or 2.18 million fish. There is no way to predict when and where long-haul tenders will be used, and it is unlikely that all will deploy at the same time.

SUMMARY

The 2018 Bristol Bay sockeye salmon processing capacity survey had a 100% response rate from the 12 processing companies surveyed. The capacity survey is an estimate of the aggregate capacity for the entire season and is made many months before the start of the season.

The results of this survey found the 2018 Bristol Bay sockeye salmon total intended purchases is approximately 4.12 million fish higher than the forecast harvest of 37.59 million fish. The survey estimated a maximum daily harvest capacity of 2.43 million fish per day which could be sustained for approximately 20 days. Total processing capacity, as estimated from total intended purchases, from the 2018 survey of 229.80 million pounds (41.71 million fish) increased by 28.5 million pounds (5.44 million fish) from the 2017 estimated total processing capacity (36.27 million fish). The 2018 estimated daily processing capacity of 13.38 million pounds (2.43 million salmon) is slightly less when compared with the 2017 estimated daily capacity of 13.53

million pounds (2.44 million fish). These estimates are not directly comparable for a variety of reasons (fish weight, forecast, tender numbers, etc.) but are useful to provide context and understand this year's processing capabilities. It is also helpful to note that the processing capacity survey in recent years (2015–2017) has provided a reliable estimate of total capacity in that the total purchases met or exceeded the survey's projected total purchases.

TABLES AND FIGURES

Table 1.–Mean Bristol Bay sockeye salmon weights in pounds, 2001–2017.

Year	Mean weight
2001	6.7
2002	6.1
2003	6.3
2004	5.8
2005	6.3
2006	5.8
2007	5.8
2008	5.8
2009	5.9
2010	5.8
2011	6.1
2012	5.7
2013	6.0
2014	5.6
2015	5.3
2016	5.4
2017	5.4
5-yr. Avg.	5.5

Table 2.–Comparison of the 2018 Bristol Bay sockeye salmon harvest forecast and projected intended purchases.

	Number of salmon	Pounds of salmon
Projected Harvest	37.59 million	207.12 million
Projected Intended Purchases	41.71 million	229.80 million
Difference (surplus of capacity)	4.12 million	22.68 million

Table 3.–Projected daily processing capacity, duration, and start date for 2018 Bristol Bay sockeye salmon.

Number of salmon	Pounds of salmon	Duration	Mean start date
2.43 million	13.38 million	20 Days	6/24/2018

Table 4.–Salmon daily landings, 5-year daily mean, minimum, and maximum, in numbers of fish, Bristol Bay, 2013–2017*.

Date of Landing (MM/DD)	2013	2014	2015	2016	2017	5 Yr. Daily Mean	5 Yr. Daily Minimum	5 Yr. Maximum
06/25	939,243	1,458,791	222,338	119,964	859,780	720,023	119,964	1,458,791
06/26	1,191,241	1,903,878	266,935	277,999	1,534,471	1,034,905	266,935	1,903,878
06/27	851,459	2,656,823	359,254	586,872	734,605	1,037,803	359,254	2,656,823
06/28	966,002	2,094,884	602,857	443,786	365,105	894,527	365,105	2,094,884
06/29	933,169	1,273,626	677,687	358,455	144,042	677,396	144,042	1,273,626
06/30	1,481,104	1,265,110	962,114	531,335	232,201	894,373	232,201	1,481,104
07/01	1,196,211	1,046,503	984,353	917,902	71,230	843,240	71,230	1,196,211
07/02	775,245	1,384,731	1,335,670	1,114,978	642,456	1,050,616	642,456	1,384,731
07/03	571,279	1,600,237	1,371,061	1,531,181	3,716,432	1,758,038	571,279	3,716,432
07/04	349,930	1,895,292	1,119,434	1,133,039	2,916,221	1,482,783	349,930	2,916,221
07/05	142,548	1,998,527	713,686	1,154,506	1,767,668	1,155,387	142,548	1,998,527
07/06	182,304	1,250,072	958,028	1,495,947	2,310,840	1,239,438	182,304	2,310,840
07/07	78,718	964,051	1,042,702	1,509,926	2,284,010	1,175,881	78,718	2,284,010
07/08	199,246	1,498,389	1,475,821	1,692,683	2,116,335	1,396,495	199,246	2,116,335
07/09	310,819	1,463,862	1,953,972	1,584,331	2,230,949	1,508,787	310,819	2,230,949
07/10	740,952	1,002,443	2,305,153	2,376,205	1,848,042	1,654,559	740,952	2,376,205
07/11	339,457	994,526	2,495,292	1,646,800	1,543,234	1,403,862	339,457	2,495,292
07/12	289,343	1,158,866	2,231,846	2,154,526	1,982,925	1,563,501	289,343	2,231,846
07/13	182,531	635,340	2,098,899	2,077,066	1,619,271	1,322,621	182,531	2,098,899
07/14	105,620	386,287	2,161,125	2,108,358	1,706,941	1,293,666	105,620	2,161,125
07/15	108,044	209,838	2,414,858	2,526,160	1,506,853	1,353,151	108,044	2,526,160
07/16	93,335	138,441	1,664,051	1,810,609	898,324	920,952	93,335	1,810,609
07/17	67,976	112,016	1,660,494	1,578,994	1,084,927	900,881	67,976	1,660,494
07/18	47,922	99,278	1,362,440	1,457,706	1,251,305	843,730	47,922	1,457,706
07/19	17,484	31,909	1,132,118	1,338,268	623,853	628,726	17,484	1,338,268
07/20	2,034	27,889	784,126	1,182,134	325,297	464,296	2,034	1,182,134

* Daily processor capacity limits constrained daily landings during portions of 2014, 2015, and 2017.

Table 5.—Estimated *in-Bristol Bay* tender fleet holding capacity, 2018.

Number of salmon	Pounds of salmon
8.53 million	46.98 million

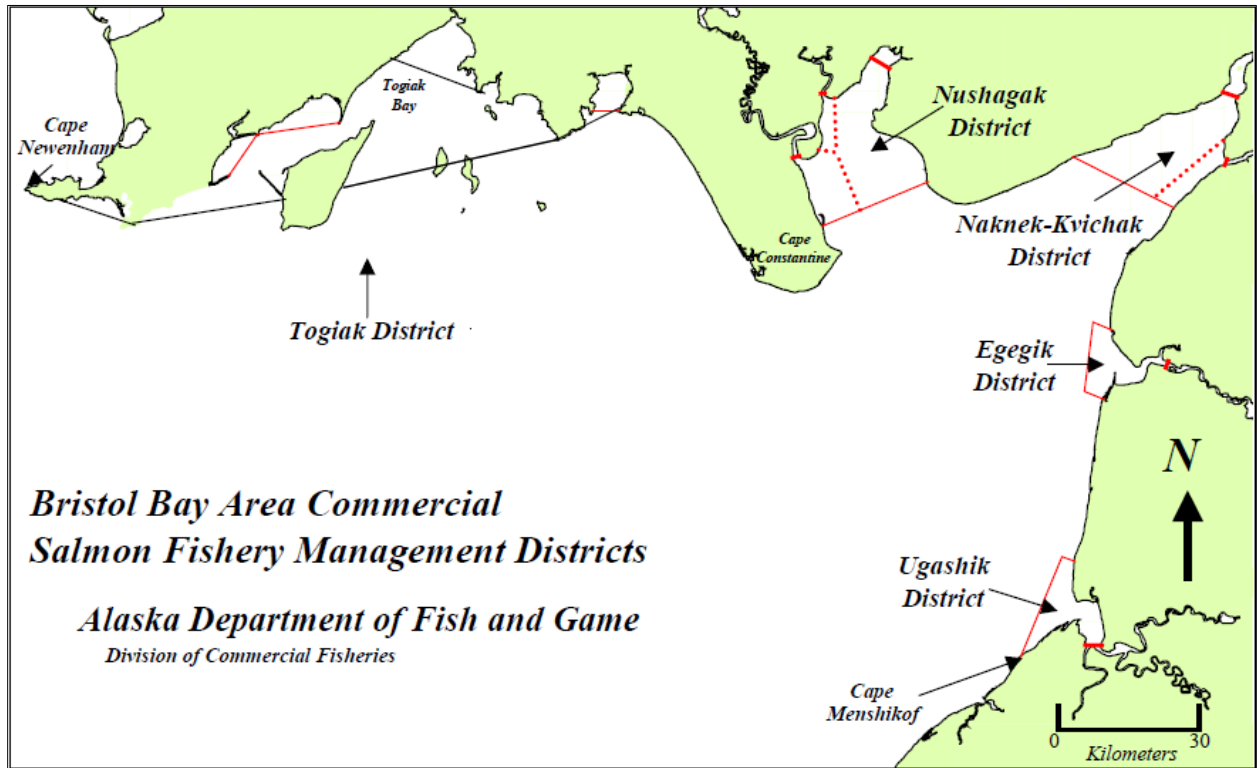


Figure 1.—Bristol Bay area commercial salmon fisheries management districts.

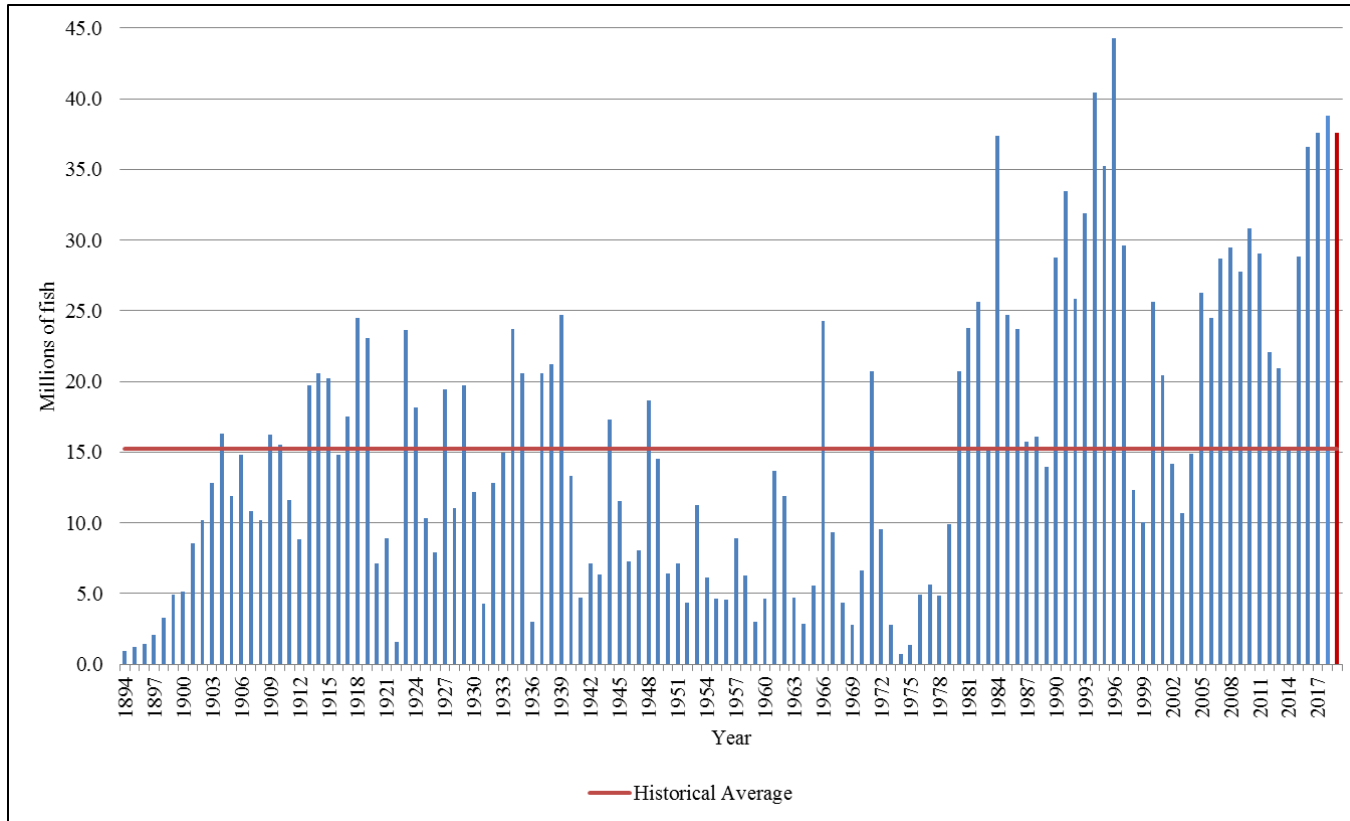


Figure 2.—Bristol Bay commercial sockeye salmon harvests, in thousands of fish, 1893–2017, with 2018 projected harvest and historical average (1893–2017).

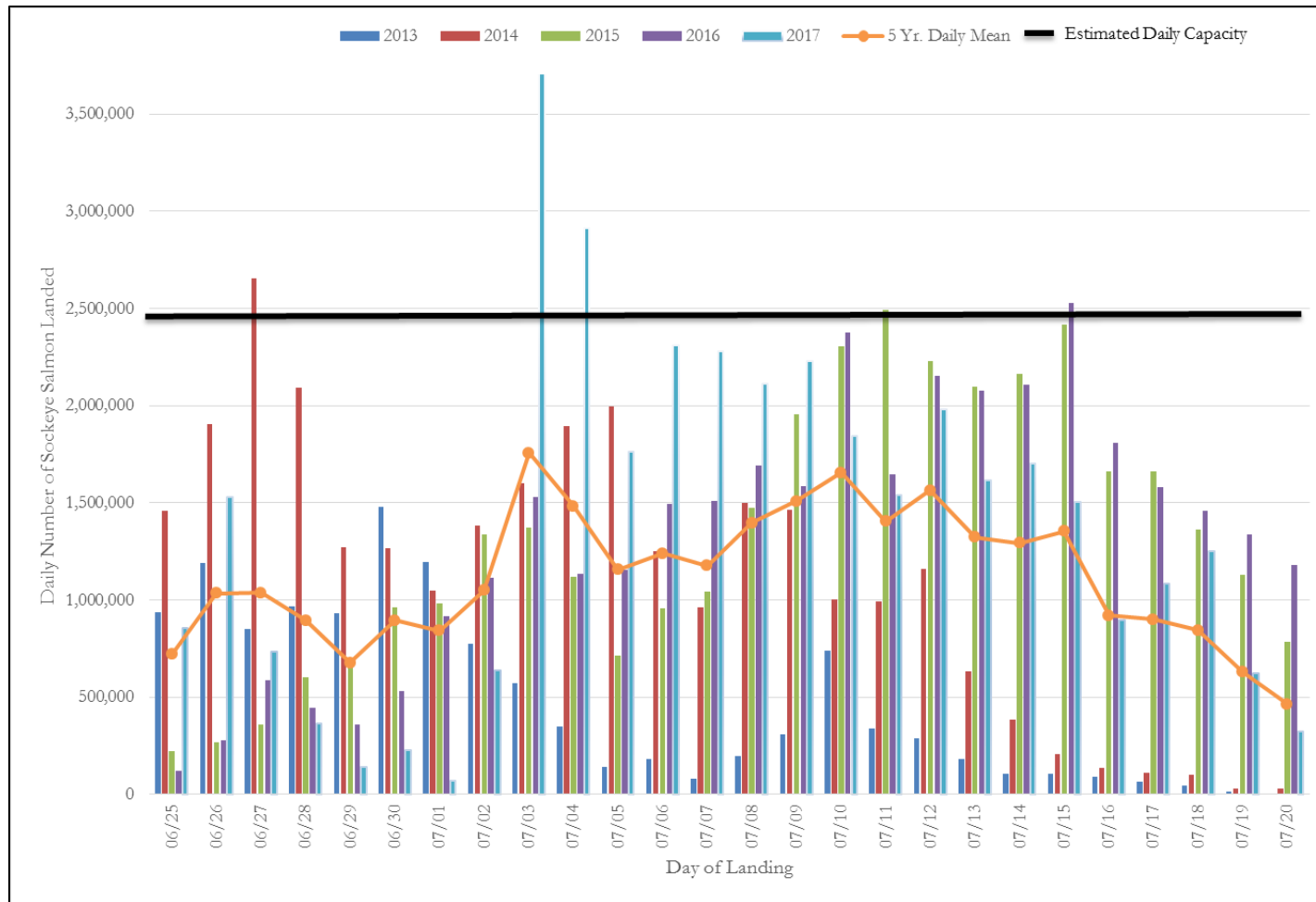


Figure 3.—Bristol Bay sockeye salmon daily landings, 2013–2017, with 5-year daily mean, and 2018 estimated daily capacity.

Note: Daily processor capacity limits constrained daily landings during portions of 2014, 2015, and 2017.

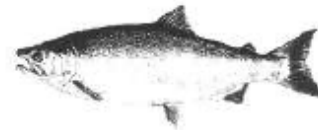
APPENDICES

Appendix A.–2018 Bristol Bay sockeye salmon forecast. (Note: Page and figure numbers within this forecast apply only to this appendix.)

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



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 Date Issued: 11/14/2017

2018 BRISTOL BAY SOCKEYE SALMON FORECAST

FORECAST AREA: Bristol Bay

SPECIES: Sockeye Salmon

FORECAST OF THE 2018 RUN:

TOTAL PRODUCTION:	Forecast (millions)	Forecast Range (millions)
Total Run	51.28	40.68–61.88
Escapement	12.20	
Commercial Common Property Harvest	39.08	
Bristol Bay Harvest	37.59	
South Peninsula Harvest	1.49	
Inshore Run	49.79	

METHODS

The 2018 Bristol Bay sockeye salmon forecast is the sum of individual predictions of nine river systems (Kvichak, Alagnak, Naknek, Egegik, Ugashik, Wood, Igushik, Nushagak, and Togiak rivers) and four age classes (ages 1.2, 1.3, 2.2, and 2.3, plus ages 0.3 and 1.4 for the Nushagak River). 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. Models based on the most recent three and five years of returns were also evaluated. In general, models chosen were those with statistically significant parameters and/or the best past performance (accuracy and precision). Performance was evaluated using absolute deviation, absolute percent error, and percent error between forecasted and observed returns. These performance metrics were calculated and considered for each model across the most recent 10 year time frame.

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 2016.

RESULTS

A total of 51.28 million sockeye salmon (range 40.68–61.88 million) are expected to return to Bristol Bay in 2018. This is 18% greater than the most recent 10-year average of Bristol Bay total runs (42.71 million) and 41% greater than the long-term mean of 33.78 million fish. All systems are expected to meet their spawning escapement goals.

Where practical, the department will manage escapements proportional to the run size and relative to the historical record (5AAC 06.355(d)(1)). Escapement is projected as the 75th quartile of the escapement range if the forecast is above the historical trend line (Wood, Igushik, Nushagak, and Togiak rivers). Escapement is projected as the midpoint (50th quartile) of the escapement range if the forecast is in line with the historical trend (Egegik River). Escapement is projected as the 25th quartile of the escapement goal range if the forecast is below the historical trend line (Kvichak, Naknek, and Ugashik rivers in 2018; Table 1, Figures 1–9). Because it is passively managed, the Alagnak River exploitation rate is assumed to be the same as the Kvichak River exploitation rate and therefore the escapement is projected to be the total run forecast minus expected harvest. Preseason harvest projections are provided to aid industry in planning. Once the run begins to develop the department relies on catch and escapement data for management decisions.

A run of 51.28 million sockeye salmon would allow for a potential total harvest of 39.08 million fish, 37.59 million fish in Bristol Bay and 1.49 million fish in the South Peninsula fisheries. A Bristol Bay harvest of this size is 35% greater than the most recent 10-year harvest of 28.91 million which has ranged from 15.43 million to 38.81 million, and is 87% greater than the long-term harvest average of 20.85 million fish (1963 to present).

The run forecast for each district and river system is as follows: 16.64 million to Naknek-Kvichak District (8.36 million to the Kvichak River, 4.41 million to the Alagnak River, and 3.87 million to the Naknek River); 9.12 million to the Egegik District; 2.87 million to the Ugashik District; 21.79 million to the Nushagak District (12.31 million to the Wood River, 7.36 million to the Nushagak River, and 2.13 million to the Igushik River); and 0.86 million to the Togiak District (Table 1).

We forecast the 2018 run will consist of 18.43 million age-1.2 fish (36% of the total run), 6.03 million age-2.2 fish (12% of the total run), 22.55 million age-1.3 fish (44% of the total run), and 4.13 million age-2.3 fish (8% of the total run; Table 1).

DISCUSSION

Historically, sockeye salmon runs to Bristol Bay have been highly variable. The Bristol Bay total run has averaged 33.78 million from 1963 through 2017 and has averaged 42.71 million fish during the most recent 10-year period. Forecasting future salmon returns is inherently difficult and uncertain. We have used similar methods since 2001 to produce the Bristol Bay sockeye salmon forecast which have performed well when applied to Bristol Bay as a whole. Since 2001, our forecasts have, on average, under-forecast the run by 11% and have ranged from 44% below actual run in 2014 to 19% above actual run in 2011. Forecasted harvests have had a mean absolute percent error of 14% since 2001.

Individual river forecasts have greater uncertainty compared to Bay-wide forecasts. Since 2001, on average, we have under-forecasted the returns to the Alagnak (-46%), Togiak (-20%), Kvichak (-21%), Wood (-13%), Nushagak (-20%), and Naknek (-7%) rivers, and over-forecasted returns to Igushik (14%), Egegik (16%), and Ugashik (0.4%). Over-forecasting returns to some rivers while under-forecasting returns to other rivers means that the overall Bristol Bay forecast is generally more accurate than the forecast to any individual river. The Nushagak District had a record breaking run in 2017. This was largely driven by robust returns from the 2013 brood year, which manifested as very large age 1.1 returns in the Wood River in 2016 and age 1.2 returns in the Wood and Nushagak rivers in 2017. Whether or not the 2013 brood year can sustain these very large returns and produce a large age 1.3 return in the Nushagak River is a major point of uncertainty in the 2018 forecast. Returns of the 2013 brood year to multiple stocks have been impressive to date, particularly in the Nushagak District. It is unclear how much longer the 2013 brood year can over-perform relative to the historical record.

The department would like to thank the Bristol Bay Fisheries Collaborative (BBFC) for funding assistance in 2017. The BBFC began in 2016 and is an agreement between ADF&G and the Bristol Bay Science and Research Institute (BBSRI) to work together with stakeholders to restore a world-class fishery management system and raise funds to support and maintain management. This agreement is supported by ADF&G, BBSRI, drift and set net fishermen, processors, municipalities, villages, support industries and other stakeholders. A list of organizations that committed financial support to the BBFC in 2017, as well as additional information about this agreement can be found at <https://www.bbsri.org/bbfc>.

Greg Buck and Katie Sechrist
Bristol Bay Research Staff

2018 Bristol Bay Sockeye Salmon Forecast

November 14, 2017

Table 1.–Forecast of total run, escapement, and harvest of major age classes of sockeye salmon returning to Bristol Bay river systems in 2018.

DISTRICT	River	Millions of Sockeye Salmon							South Peninsula *	BB Inshore
		Forecasted Production by Age Class				Total	Forecasted			
		1.2	2.2	1.3	2.3		Escapement	Harvest		
NAKNEK-KVICHAK										
	Kvichak	4.30	1.05	2.61	0.40	8.36	4.00	4.12	0.24	8.12
	Alagnak	1.67	0.01	2.72	0.01	4.41	2.11	2.17	0.13	4.28
	Naknek	1.51	0.53	1.25	0.58	3.87	1.10	2.65	0.11	3.75
	Total	7.48	1.59	6.58	0.99	16.64	7.21	8.95	0.48	16.16
EGEGIK										
		1.19	3.67	1.48	2.77	9.12	1.40	7.45	0.27	8.85
UGASHIK										
		0.42	0.62	1.54	0.29	2.87	0.73	2.06	0.08	2.78
NUSHAGAK										
	Wood	8.00	0.13	4.13	0.04	12.31 ^b	1.53	10.42	0.36	11.95
	Igushik	0.59	0.01	1.50	0.02	2.13	0.34	1.73	0.06	2.06
	Nushagak	0.56	0.00	6.64	0.01	7.36	0.77	6.38	0.21	7.14
	Total	9.16	0.14	12.28	0.07	21.79	2.63	18.53	0.63	21.16
TOGLAK										
		0.18	0.01	0.66	0.01	0.86	0.23	0.61 ^c	0.03	0.84
BRISTOL BAY										
		18.43	6.03	22.55	4.13	51.28	12.20	37.59	1.49	49.79
		36%	12%	44%	8%	100%				

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

^a Projected harvest is based on the current 5 year running average exploitation rate of 2.9%.

^b Nushagak River forecast includes age-0.3 (91) and age-1.4 (137,507) fish.

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

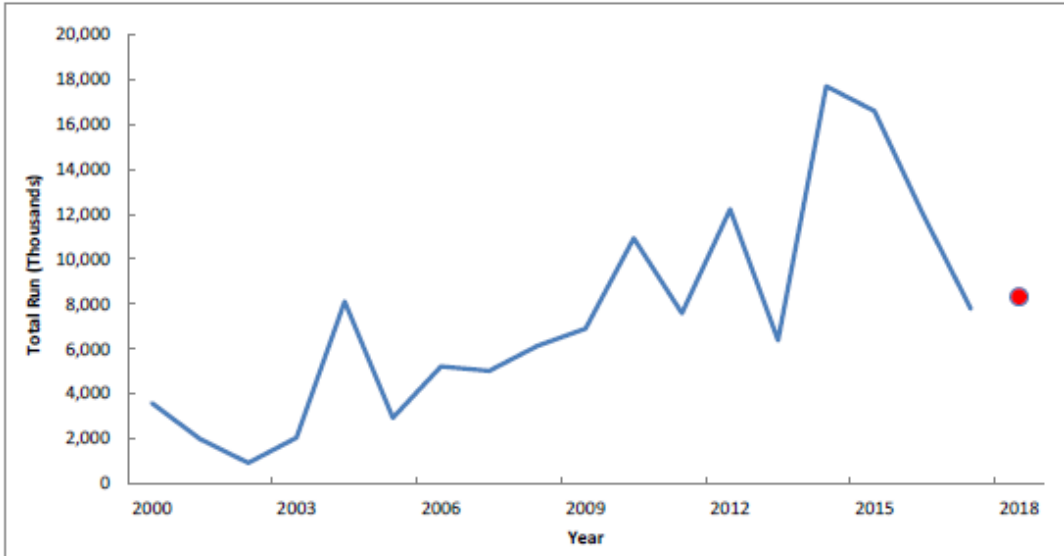


Figure 1.–Kvichak River total sockeye salmon run 2000–2017 (line) and the 2018 forecast (circle).

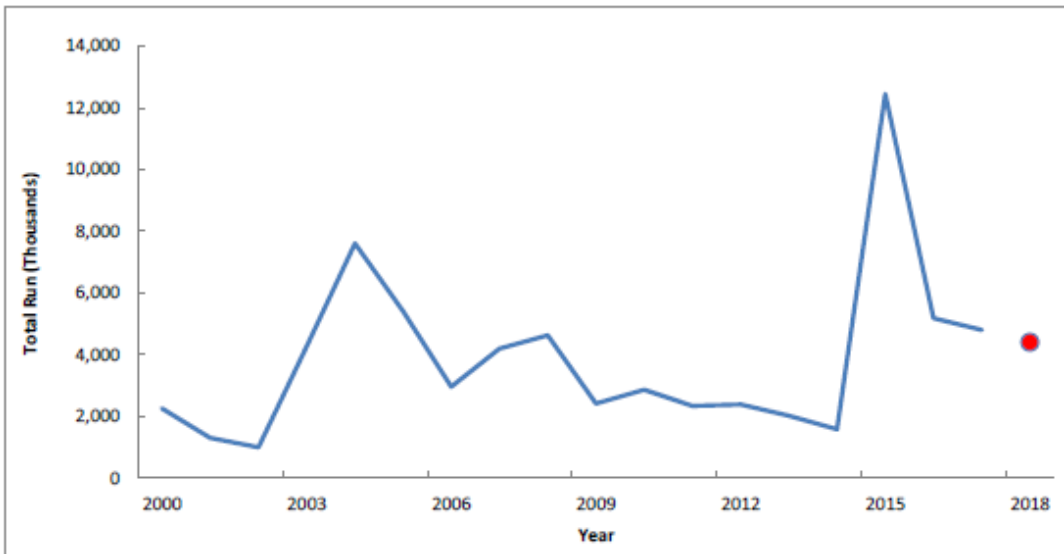


Figure 2.–Alagnak River total sockeye salmon run 2000–2017 (line) and the 2018 forecast (circle).

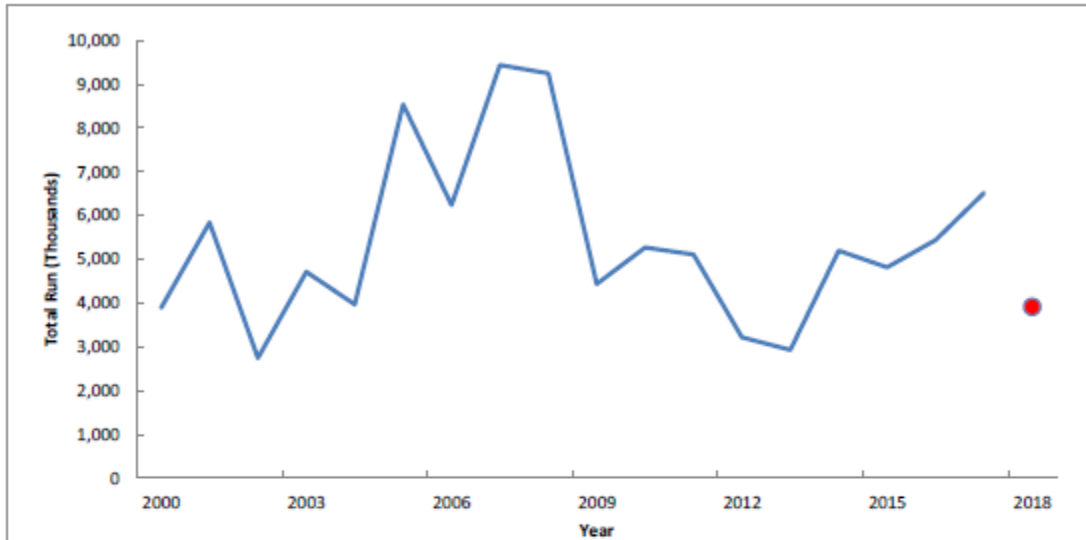


Figure 3.–Naknek River total sockeye salmon run 2000–2017 (line) and the 2018 forecast (circle).

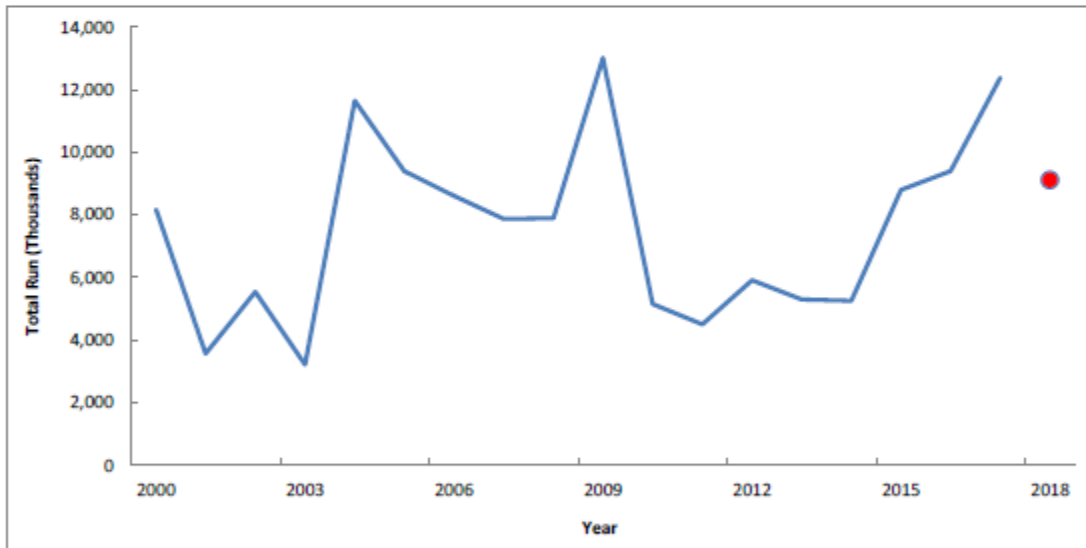


Figure 4.–Egegik River total sockeye salmon run 2000–2017 (line) and the 2018 forecast (circle).

2018 Bristol Bay Sockeye Salmon Forecast

November 14, 2017

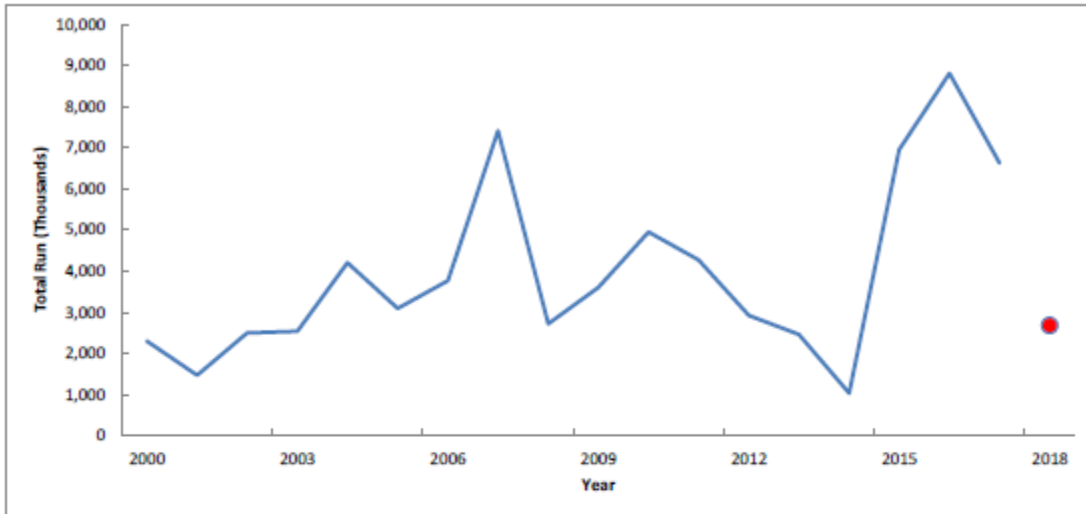


Figure 5.–Ugashik River total sockeye salmon run 2000–2017 (line) and the 2018 forecast (circle).

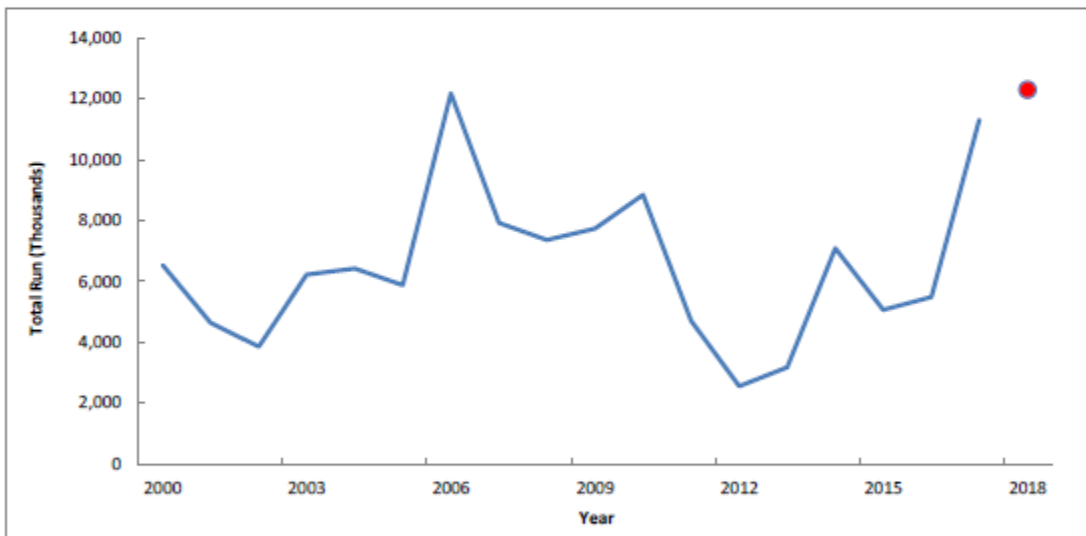


Figure 6.–Wood River total sockeye salmon run 2000–2017 (line) and the 2018 forecast (circle).

2018 Bristol Bay Sockeye Salmon Forecast

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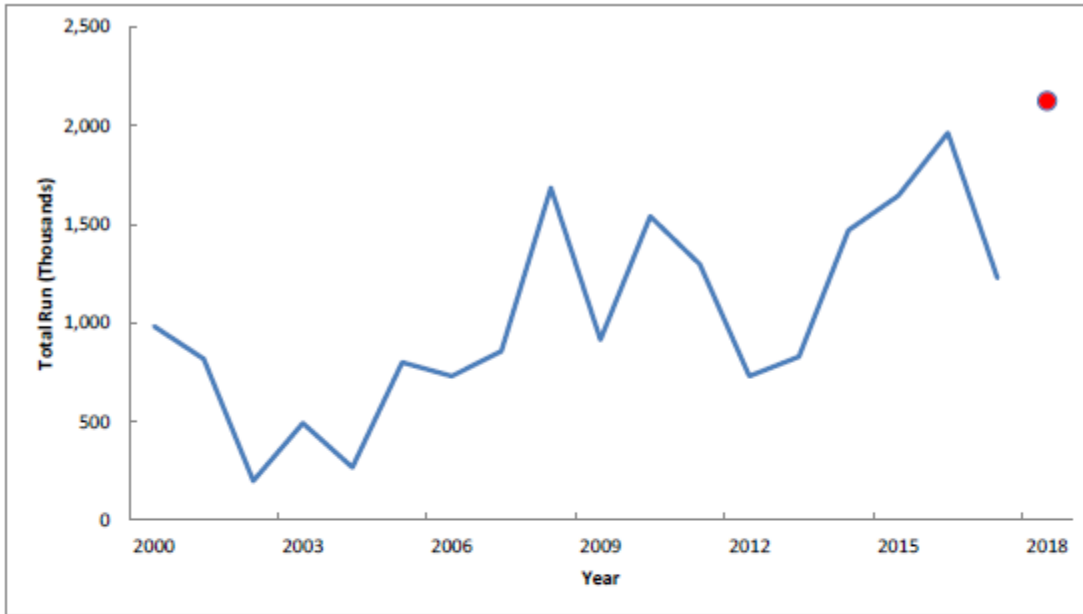


Figure 7.–Igushik River total sockeye salmon run 2000–2017 (line) and the 2018 forecast (circle).

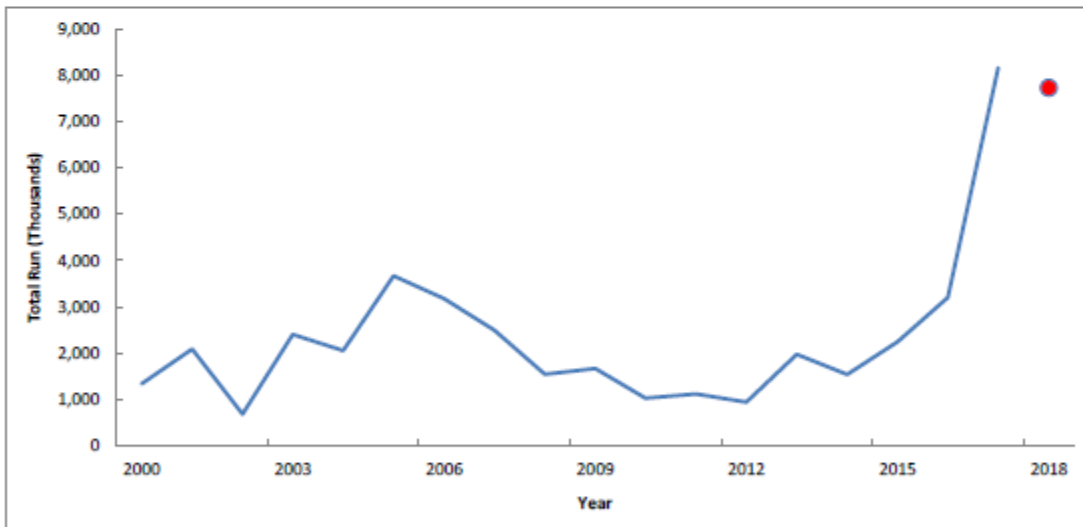


Figure 8.–Nushagak River total sockeye salmon run 2000–2017 (line) and the 2018 forecast (circle).

2018 Bristol Bay Sockeye Salmon Forecast

November 14, 2017

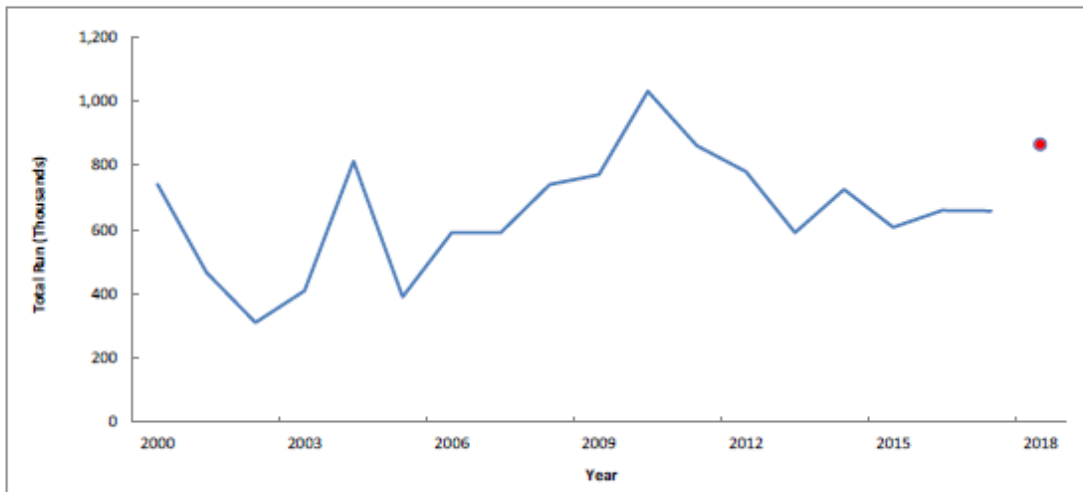


Figure 9.—Togiak River total sockeye salmon run 2000–2017 (line) and the 2018 forecast (circle).

Appendix B.–2018 Bristol Bay sockeye salmon survey question screenshots.

2018 Bristol Bay Sockeye Salmon Processing Capacity Survey

Please answer the following questions about your plans to purchase sockeye salmon in Bristol Bay in 2018 by February 9, 2018. Thank you for your time and quick response to this survey. Your cooperation is greatly appreciated. If you have any questions, please phone Jennifer at (907) 465-6133 or Aaron Poetter at (907) 267-2295.

Please note that all capacity data provided in this survey is **protected as confidential** information under Alaska Statute 16.05.815

1. Does your company intend to purchase and process Bristol Bay sockeye salmon during the 2018 season?

Yes

No

2018 Bristol Bay Sockeye Salmon Processing Capacity Survey

Total Planned Purchases 2018 Bristol Bay

2. Please enter the amount of sockeye salmon your company intends to purchase in Bristol Bay in the 2018 season. Please provide this answer in POUNDS of fish.

Amount (in POUNDS)

2018 Bristol Bay Sockeye Salmon Processing Capacity Survey

Daily Processing Capacity

Please tell us about your company's daily processing capacity.

3. What is your company's Daily Processing Capacity of sockeye salmon in Bristol Bay in 2018? Please provide the answer in POUNDS of fish.

Daily Processing Capacity:

4. How many days could your company sustain the daily processing capacity listed in Question 3?

Number of Days

5. What date do you expect to be at the daily processing capacity listed in Question 3?

Date

6. Comments on Daily Processing Capacity?

2018 Bristol Bay Sockeye Salmon Processing Capacity Survey

Tenders

In this section please tell us about your company's "In-Bristol Bay" tender fleet. Please DO NOT include information about your long haul tender fleet in this section.

*** 7. Does your company provide tenders?**

Yes

No

2018 Bristol Bay Sockeye Salmon Processing Capacity Survey

Tenders continued

8. What is your tender fleet's "In Bristol Bay" holding capacity in POUNDS of fish? Please DO NOT include long hauls.

In-Bristol Bay holding capacity:

9. What date do you expect to have all your tenders in Bristol Bay?

Date

10. Comments on your company's tender fleet capacity?

2018 Bristol Bay Sockeye Salmon Processing Capacity Survey

Long Haul Tender Fleet

Please tell us about your company's long haul tender fleet

*** 11. Will your company provide long haul tenders?**

Yes

No

2018 Bristol Bay Sockeye Salmon Processing Capacity Survey

Long Haul Tender Fleet Continued

12. What is the DAILY capacity of your long haul tender fleet in POUNDS of fish?

Daily Capacity

13. What is the SEASON capacity of your long haul tender fleet in POUNDS of fish?

Season Capacity:

14. Comments on your long haul tender fleet capacity?

2018 Bristol Bay Sockeye Salmon Processing Capacity Survey

Final Page

*** 15. Are there factors that would affect your company's ability to increase average daily capacity, and sustain this capacity at peak level, that you would like to tell us about such as changes in fleet size, access to processing workers, etc.?**