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2024 Bristol Bay Sockeye Salmon Processing Capacity Survey Summary

by

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and

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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	
milliliter	mL	west	W	(multiple)	R
millimeter	mm	copyright	©	correlation coefficient (simple)	r
		corporate suffixes:		covariance	cov
Weights and measures (English)		Company	Co.	degree (angular)	$^\circ$
cubic feet per second	ft ³ /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	\geq
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 (for example)	e.g.	less than or equal to	\leq
pound	lb	Federal Information Code	FIC	logarithm (natural)	ln
quart	qt	id est (that is)	i.e.	logarithm (base 10)	log
yard	yd	latitude or longitude	lat or long	logarithm (specify base)	log ₂ , etc.
		monetary symbols (U.S.)	\$, ¢	minute (angular)	'
Time and temperature		months (tables and figures): first three letters	Jan, ..., Dec	not significant	NS
day	d	registered trademark	®	null hypothesis	H_0
degrees Celsius	°C	trademark	™	percent	%
degrees Fahrenheit	°F	United States (adjective)	U.S.	probability	P
degrees kelvin	K	United States of America (noun)	USA	probability of a type I error (rejection of the null hypothesis when true)	α
hour	h	U.S.C.	United States Code	probability of a type II error (acceptance of the null hypothesis when false)	β
minute	min	U.S. state	use two-letter abbreviations (e.g., AK, WA)	second (angular)	"
second	s			standard deviation	SD
Physics and chemistry				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				

SPECIAL PUBLICATION NO. 24-12

**2024 BRISTOL BAY SOCKEYE SALMON PROCESSING CAPACITY
SURVEY SUMMARY**

by

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ABSTRACT

The 15 primary salmon processing companies in Bristol Bay were surveyed to estimate the expected capacity to purchase and process sockeye salmon, by number and weight of fish, in the summer of 2024. Out of the 15 processing companies surveyed, 13 completed and returned the survey. These companies provided estimates of total intended purchases, daily processing capacity, “in-Bristol Bay” tender fleet capacity, and long-haul tender fleet capacity. Bristol Bay companies intend to purchase 168.91 million pounds of sockeye salmon in 2024, a 36% decrease from 2022 when the survey was last conducted. The 168.91 million pounds converts to approximately 33.12 million fish; this is 8.11 million fish more than the forecasted harvestable surplus of 25.01 million fish. The survey estimated a maximum daily processing capacity of 2.36 million fish per day, sustainable for approximately 18 days.

Keywords: Bristol Bay, sockeye salmon, processing capacity, forecast, harvest

INTRODUCTION

The Alaska Department of Fish and Game (ADF&G) surveyed 15 commercial salmon processing companies who intend to purchase sockeye salmon *Oncorhynchus nerka* in Bristol Bay during the 2024 season. Out of the 15 processing companies surveyed, 13 completed and returned the survey. All but one of the companies surveyed had recorded salmon landings in Bristol Bay during the 2023 season. Taken together, these companies accounted for 99.8% of the recorded landings of sockeye salmon landed in Bristol Bay during the 2023 season. Individual companies’ salmon-processing capacities are protected as confidential information under Alaska statute (AS 16.05.815(a)). This document provides a nonconfidential summary of the 2024 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 9 major river systems: Naknek, Kvichak, Alagnak, Egegik, Ugashik, Wood, Nushagak, Igushik, and Togiak. Collectively, these rivers are home to the largest commercial sockeye salmon *O. nerka* fishery in the world. Sockeye salmon are by far the most abundant salmon species that return to Bristol Bay each year, but Chinook *O. tshawytscha*, chum *O. keta*, coho *O. kisutch*, and—in even years—pink salmon *O. gorbuscha* returns are important to the fishery as well. The Bristol Bay area is divided into 5 management districts (Naknek-Kvichak, Egegik, Ugashik, Nushagak, and Togiak) that correspond to major river systems. The management objective for each river is to achieve salmon escapements within established 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. This survey estimates processing capacity for the entire Bristol Bay area and does not summarize capacity by district.

Results of this processing capacity survey should be viewed in relationship to the ADF&G sockeye salmon forecast (Vega 2023; Appendix A). The primary function of the salmon forecast is to provide processors and harvesters with an indication of the salmon return anticipated by ADF&G for the coming season. The 2024 sockeye salmon forecast for Bristol Bay is 39.00 million fish (range 24.89–53.12 million fish). The 2024 forecast is 35% smaller than the most recent 10-year average of Bristol Bay total runs (60.20 million fish) and 6% greater than the long-term (1963–2023) average of 36.83 million fish. All systems are expected to meet their spawning escapement goals. In total, sockeye salmon escapement goals in Bristol Bay range from 5.70 million fish at the lower bound to 19.95 million fish at the upper bound. The 2024 forecasts are for an escapement of 12.89 million fish and harvestable surplus of 25.01 million fish (Vega 2023). A Bristol Bay harvest the size of this year’s harvestable surplus would be 65% smaller than the

most recent 10-year average harvest of 38.47 million fish and 11% larger than the long-term average harvest of 22.53 million fish (1963 to present).

BACKGROUND

ADF&G 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 processing capacity surveys in which survey forms were mailed to selected companies who represented most of the 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, ADF&G phased out salmon capacity surveys for all fishing regions except Bristol Bay and has conducted these surveys as needed since. Surveys were not conducted from 2012 to 2014, but large forecasts prompted the division to conduct the survey again for the 2015 season. The processing capacity survey was not conducted in 2020 or 2021 after the results of several consecutive surveys suggested processing capacity in Bristol Bay was relatively stable at around 40 million fish (Poetter and Larsen 2019). Large harvests in recent years and the record-size forecast for 2022 prompted ADF&G to conduct a new processing capacity survey for the 2022 season. Large harvests have the potential to cause processing capacity bottlenecks, especially if salmon 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 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, 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 2024 Bristol Bay sockeye salmon capacity survey should be interpreted as a snapshot of anticipated processing capacity made months before the fishery opens. As companies 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 fishers will have buyers for all their salmon.

METHODS

Companies were selected to receive survey forms based on 2 sources of information: the 2022 Commercial Operator’s Annual Report (COAR) and 2023 commercial fishery fish tickets¹. Companies were selected for inclusion in the survey if one of their processing facilities reported purchasing more than 100,000 pounds of Bristol Bay sockeye salmon on their 2022 COAR, or if one of their processing facilities recorded landings of more than 100,000 pounds of Bristol Bay sockeye salmon in 2023. These criteria identified 15 commercial salmon processing companies to receive surveys. These 15 companies represented 25 processing facilities (as determined by distinct processor code) in Bristol Bay. Surveys were emailed on January 10, 2024, with a completion deadline of January 31, 2024. In the survey, companies were asked to estimate the amount of sockeye salmon, in pounds, they intended to purchase during the 2024 season from Bristol Bay. A copy of the ADF&G 2024 Bristol Bay sockeye salmon forecast was provided with the survey forms (Appendix B).

All companies that responded to the survey reported their intended purchases and capacity in pounds. The 5-year (2019–2023) mean weight of 5.10 pounds per fish (Table 1), as recorded on fish tickets, was used to convert survey capacity in pounds to numbers of fish.

After converting to numbers of fish, the projected capacity was compared to the 2024 sockeye salmon forecast by Vega (2023; Appendix A).

BRISTOL BAY SOCKEYE SALMON PROCESSING CAPACITY

TOTAL INTENDED PURCHASES

This survey provides an estimate of the total intended purchases for the entire season. The 13 companies that responded indicated they are prepared to purchase and process 168.91 million pounds, or 33.12 million fish during the 2024 Bristol Bay salmon season (Table 2). The total intended purchases are approximately 8.11 million fish over the forecasted Bristol Bay available harvest surplus of 25.01 million fish (Table 2).

DAILY PROCESSING CAPACITY

In the 2024 Bristol Bay sockeye salmon processing capacity survey (Appendix B), companies were asked to estimate their daily processing capacity and to estimate the number of days their facilities could operate at that daily capacity. They were also asked by what date they expect their facilities to operate at their quoted daily capacity.

The total daily capacity reported in the survey was 12.02 million pounds or 2.36 million fish (Table 3). Companies expect to be at or near full capacity by July 4 and expect to sustain this capacity for approximately 18 days (range 4–30 days).

The comparison of projected capacity to harvest forecast and past peak daily harvests allows an evaluation of the industry’s capability to harvest this year’s forecast. At the maximum projected daily harvest capacity of 2.36 million fish per day, the projected intended purchases of 33.12 million fish could be achieved in approximately 14 days. The highest number of daily landings on

¹ Statewide electronic fish ticket database. 1st edition. Alaska Department of Fish and Game, Division of Commercial Fisheries. 1985 to present. (Accessed February 16, 2024). [URL not publicly available because some information is confidential.]

record for Bristol Bay occurred on July 2, 1993, when approximately 4.86 million fish were harvested (ADF&G, 2024, unpublished data). The 2024 maximum projected daily harvest capacity of 2.36 million fish has been met several times in the last 5 years (Table 4, Figure 2). Processor limits likely restricted the daily maximums listed in Table 4, but this is not accounted for in this review.

Operating at maximum daily capacity is contingent on several factors including fish size and run timing, mechanical operations, logistics (tender performance, grading systems, etc.), and employee availability. Operating at peak capacity also does not guarantee that all Bristol Bay salmon permit holders will always have a buyer during this season.

IN-BRISTOL BAY TENDER FLEET

Most Bristol Bay processing companies provide tenders that service waters within Bristol Bay. This fleet of tenders is considered the *in-Bristol Bay* tender fleet. Surveyed companies were asked if their company intends to provide tenders during the 2024 season, their tender fleet's *in-Bristol Bay* holding capacity, and the date they expect to have all their tenders available. Companies were asked to consider only their *in-Bristol Bay* fleet capacity and exclude any additional capacity provided by their long-haul tender fleet.

Of the 13 companies that responded to the survey, 10 will provide tenders inside Bristol Bay waters. The reported *in-Bristol Bay* tender fleet holding capacity is estimated to be 48.06 million pounds, or 9.42 million fish (Table 3). Companies expect to have their tenders become available sometime between June 15 and July 1, 2024.

LONG-HAUL TENDER FLEET

Some Bristol Bay processing companies provide long-haul tenders that transport fish from Bristol Bay to other processing facilities around the state. Long-haul tenders allow companies to purchase more salmon during the peak of the season. Surveyed companies were asked if any of their facilities intend to provide long-haul tenders during the 2024 season, their long-haul tender daily capacity and season capacity.

Of the 13 companies that responded to the survey, 2 reported that they will provide long-haul tender services. The reported long-haul tender daily capacity is 2.60 million pounds or 0.51 million fish (Table 3). The season capacity was reported as 2.79 million pounds or 0.55 million fish (Table 3). This is a decrease from 2022, when 7 companies planned to provide long-haul tenders, with a projected daily capacity of 8.50 million pounds (1.67 million fish) and season capacity of 44.30 million pounds (8.70 million fish; Donnellan and Nemeth 2022). Long-haul tenders will be in most use during the peak of the season, and it is not known how many will deploy at the same time.

SUMMARY

The 2024 Bristol Bay sockeye salmon processing capacity survey had an 87% response rate from the 15 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 2024 Bristol Bay sockeye salmon total intended purchases is approximately 8.11 million fish higher than the forecasted harvest surplus of 25.01 million fish (Table 2). The survey estimated a maximum daily harvest capacity of 2.36 million fish per day,

sustainable for approximately 18 days. The total intended purchases are lower in 2024 than 2022, the last time this survey was conducted. Total intended purchases fell approximately 36% (168.91 million pounds in 2024 vs. 265.17 million pounds in 2022; Donnellan and Nemeth 2022), and the peak daily capacity fell approximately 25% (12.02 million lb in 2024 vs 16.02 million lb in 2022; Table 3; Donnellan and Nemeth 2022). 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 (2015–2022) has provided a reliable estimate of total capacity in that the total purchases were similar to the survey's projected total purchases.

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TABLES AND FIGURES

Table 1.—Bristol Bay sockeye salmon mean weights in pounds, calculated using commercial fisheries fish tickets, 2019–2023.

Year	Mean weight
2019	5.18
2020	5.06
2021	4.73
2022	5.01
2023	5.54
5-yr. Avg.	5.10

Table 2.—Comparison of the 2024 Bristol Bay sockeye salmon harvest forecast and projected intended purchases. Salmon assumed to weigh 5.10 lb.

	Number of salmon	Pounds of salmon
Projected harvestable surplus ^a	25.01 million ^a	127.55 million ^b
Projected intended purchases	33.12 million ^b	168.91 million ^c
Difference (surplus of capacity) ^d	0 million	0 million

^a From Vega 2023.

^b Estimated, using 5-year average weight of 5.10 lb/salmon.

^c Survey results from this study.

^d Intended purchases are greater than projected harvest surplus, therefore there is no expected surplus of capacity

Table 3.—Projected processing capacities for 2024 Bristol Bay sockeye salmon.

	Number of salmon ^a	Pounds of salmon ^b
Daily capacity	2.36 million	12.02 million
In-Bristol Bay tender capacity	9.42 million	48.06 million
Daily long-haul tender capacity	0.51 million	2.60 million
Season long-haul tender capacity	0.55 million	2.79 million

^a Estimated, using 5-year average weight of 5.10 lb/salmon.

^b Survey results from this study.

Table 4.—Salmon daily landings, 5-year daily mean, minimum, and maximum, in numbers of fish, Bristol Bay, 2019–2023.

Date of landing (MM/DD)	2019	2020 ^a	2021	2022 ^a	2023	5 Yr. Daily Mean	5 Yr. Daily Minimum	5 Yr. Maximum
06/25	665,905	278,996	516,512	743,912	111,418	463,349	111,418	743,912
06/26	736,693	450,273	1,101,197	2,026,242	850,718	1,033,025	450,273	2,026,242
06/27	825,698	196,281	845,483	2,310,737	1,025,095	1,040,659	196,281	2,310,737
06/28	1,073,022	364,536	493,629	1,464,080	723,200	823,693	364,536	1,464,080
06/29	1,464,405	547,176	506,105	1,427,514	936,663	976,373	506,105	1,464,405
06/30	1,550,247	435,372	2,212,010	3,476,252	1,668,670	1,868,510	435,372	3,476,252
07/01	1,565,592	393,904	2,451,489	3,598,457	2,608,015	2,123,491	393,904	3,598,457
07/02	1,634,447	668,085	1,702,298	2,109,671	2,274,441	1,677,788	668,085	2,274,441
07/03	1,615,194	1,285,575	1,415,986	2,269,288	2,976,271	1,912,463	1,285,575	2,976,271
07/04	1,884,219	1,235,380	1,774,304	3,722,601	1,487,877	2,020,876	1,235,380	3,722,601
07/05	2,134,912	2,439,527	2,465,718	3,265,642	2,231,181	2,507,396	2,134,912	3,265,642
07/06	2,195,473	3,146,623	2,979,448	2,690,164	1,811,550	2,564,652	1,811,550	3,146,623
07/07	2,420,146	2,637,869	2,722,767	3,209,149	834,281	2,364,842	834,281	3,209,149
07/08	2,542,075	2,475,549	1,771,160	3,003,432	483,379	2,055,119	483,379	2,542,075
07/09	2,262,362	2,256,116	2,272,007	2,847,196	1,101,967	2,147,930	1,101,967	2,847,196
07/10	1,892,344	1,613,143	1,654,001	2,877,469	2,077,489	2,022,889	1,613,143	2,877,469
07/11	2,129,125	2,635,553	1,977,064	2,906,992	763,500	2,082,447	763,500	2,906,992
07/12	2,047,372	2,252,867	2,436,266	2,347,444	617,346	1,940,259	617,346	2,436,266
07/13	1,625,872	1,478,401	2,493,640	1,950,601	2,538,926	2,017,488	1,478,401	2,538,926
07/14	1,482,499	2,155,753	1,530,286	2,356,300	3,326,581	2,170,284	1,482,499	3,326,581
07/15	1,306,486	2,005,387	1,347,560	1,703,465	2,157,452	1,704,070	1,306,486	2,157,452
07/16	1,321,234	1,493,825	1,016,512	851,120	1,479,671	1,232,472	851,120	1,493,825
07/17	1,072,764	1,145,402	629,342	771,402	1,043,301	932,442	629,357	1,145,402
07/18	647,133	970,260	402,561	607,026	705,133	666,423	402,561	970,260
07/19	1,023,092	768,345	291,596	769,893	959,581	762,501	291,596	1,023,092
07/20	670,974	756,647	385,956	345,578	770,739	585,979	345,578	770,739

^a Daily processor capacity was limited or constrained during portions of the 2020, 2022 and 2024 seasons.

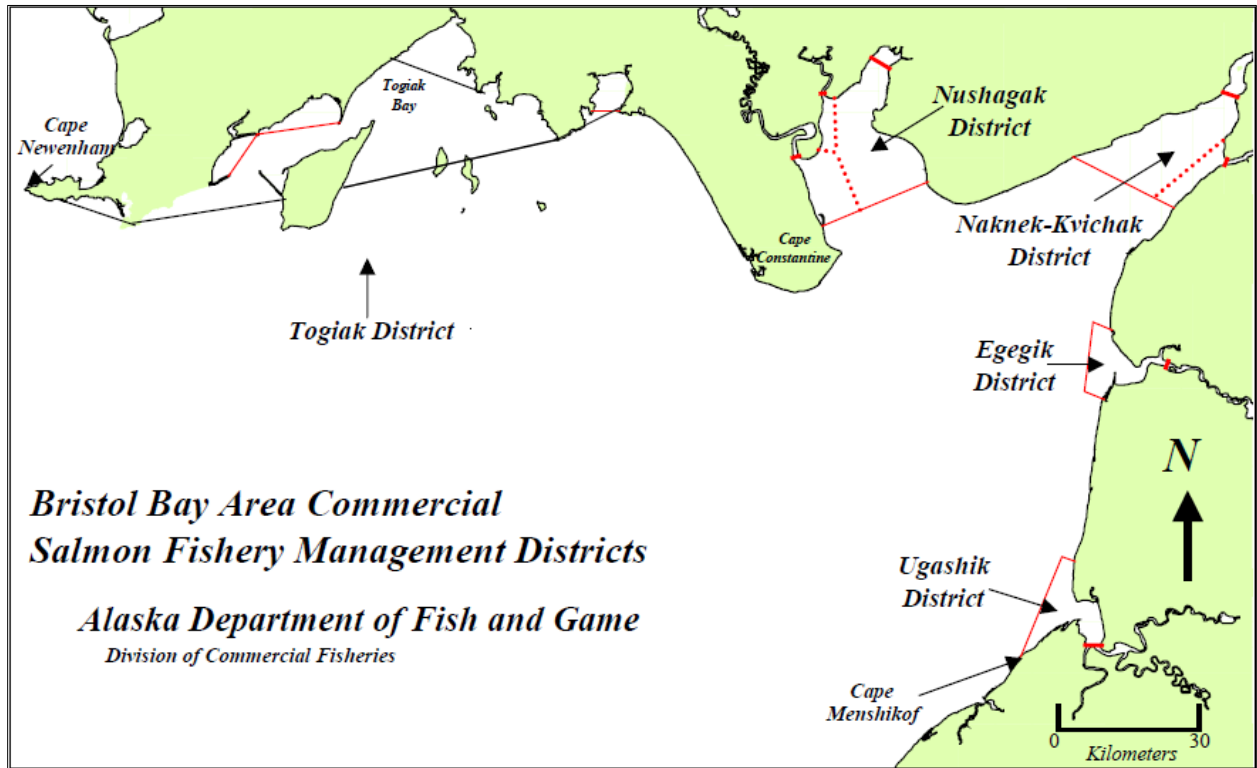


Figure 1.—Bristol Bay area commercial salmon fisheries management district.

APPENDICES

2024 Bristol Bay Sockeye Salmon Forecast

FORECAST OF THE 2024 RUN:

	Forecast (millions)	Forecast range (millions)
TOTAL PRODUCTION:		
Total run	39.00	24.89–53.12
Escapement	12.89	
Total harvestable surplus	26.11	
Bristol Bay harvestable surplus	25.01	
South Peninsula	1.10	
Inshore Run	37.90	

The sockeye salmon total run forecast for Bristol Bay in 2024 is predicted to be **average** with a point estimate of **39.00 million fish and a range of 24.89 to 53.12 million fish (80% confidence interval)**. Categorical ranges of sockeye salmon total run strength were formulated from percentiles of total runs from 1961 to 2023 (Appendix A: Table 1). Since 2001, our preseason forecasts have underforecast the actual run by 15% on average, ranging from 36% below in 2014 to 21% above in 2011.

Appendix A. Table 1.–Categorical ranges of sockeye salmon total run and this year’s forecast in bold.

Category	Range (millions)	Percentile
Poor	Less than 20	Less than 20th
Weak	20 to 28	20th to 40th
Average	28 to 42	40th to 60th
Strong	42 to 53	60th to 80th
Excellent	Greater than 53	Greater than 80th

1. Does your company intend to purchase and process Bristol Bay sockeye salmon during the 2024 season?
2. Please enter the amount of sockeye salmon your company intends to purchase in Bristol Bay in the 2024 season. Please provide this answer in **pounds** of fish.
3. What is your company's maximum **Daily Processing Capacity** of sockeye salmon in **pounds** of fish?
4. What **Date** do you expect to be at the maximum daily processing capacity listed in Question 3?
5. What is the estimated **Date Range** your company can sustain the maximum daily processing capacity listed in Question 3?
6. Comments on Daily Processing Capacity?
7. Does your company provide tenders? (**yes or no**)
8. If "Yes" what is your tender fleet's "In-Bristol Bay" holding capacity in **Pounds** of fish?
Please DO NOT include long hauls.
9. What **Date** do you expect to have all your tenders in Bristol Bay?
10. Comments on your company's tender fleet capacity?
11. Will your company provide long haul tenders? (**yes or no**)
12. If "Yes", what is the daily capacity of your long-haul tender fleet in **Pounds** of fish?
13. What is the **Season Capacity** of your long-haul tender fleet in **Pounds** of fish?
14. Comments on your company's long haul tender fleet capacity?
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 worker, etc.?