

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



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2015 BRISTOL BAY SOCKEYE SALMON FORECAST

The 2015 Bristol Bay sockeye salmon forecast and harvest projections are provided below.

FORECAST AREA: **Bristol Bay**

SPECIES: **Sockeye Salmon**

FORECAST OF THE 2015 RUN:

	Forecast (millions)	Forecast Range (millions)
TOTAL PRODUCTION:		
Total Run	53.98	44.83–63.13
Escapement	13.46	
Commercial Common Property Harvest	40.52	
Bristol Bay Harvest	38.51	
South Peninsula Harvest	2.01	

METHODS

The 2015 Bristol Bay sockeye salmon forecast is the sum of individual predictions for nine river systems (Kvichak, Alagnak, Naknek, Egegik, Ugashik, Wood, Igushik, Nushagak-Mulchatna, 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 Nushagak River). Adult escapement and return data from brood years 1972–2011 were used in the analyses.

Predictions for each age class returning to a river system were calculated from models based on the relationship between adult returns and spawners or siblings from previous years. Tested models included simple linear regression and recent year averages. Models chosen were those with statistically significant parameters having the greatest past reliability (accuracy and precision)

based on mean absolute deviation, mean absolute percent error, and mean percent error between forecasts and actual returns for two time periods, 2012 through 2014 and 2010 through 2014.

The forecast range was the upper and lower values of the 80% confidence bounds for the total run forecast. The confidence bounds were calculated using deviations of actual runs from published predictions from 2001 through 2014.

RESULTS

A total of 53.98 million sockeye salmon (range 44.83–63.13 million) are expected to return to Bristol Bay in 2015. This prediction is 40% greater than the previous 10-year mean of total runs and 51% greater than the long-term mean of 32.43 million. All systems are expected to meet their spawning escapement goals.

A run of 53.98 million sockeye salmon can produce a potential total harvest of 40.52 million fish. The projected harvest includes 38.51 million fish in Bristol Bay and 2.01 million fish in the South Peninsula fisheries. A Bristol Bay harvest of 38.51 million would be 45% greater than the previous 10-year mean harvest (26.48 million; range of 15.42 million to 31.10 million), and 60% greater than the long-term mean of 24.05 million.

The run forecast to each district and river system is as follows: 28.80 million to Naknek-Kvichak District (15.38 million to Kvichak River; 1.24 million to Alagnak River; 12.18 million to Naknek River); 12.50 million to Egegik District; 3.70 million to Ugashik District; 8.37 million to Nushagak District (5.55 million to Wood River; 1.81 million to Nushagak River; 1.02 million to Igushik River); and 0.61 million to Togiak District (Table 1).

The total run forecast of 53.98 million sockeye salmon is expected to be comprised of 18.37 million age-1.3 fish (34%) followed by 16.87 million age-2.2 fish (31%), 13.61 million age-1.2 fish (25%), 5.01 million age-2.3 fish (9%), with minor age classes contributing to the remainder of the return (Table 1).

DISCUSSION

Forecasting future salmon returns is inherently difficult and uncertain. We have used similar methods since 2001 to produce the Bristol Bay sockeye salmon forecast. These forecast methods have performed well when looking at the Baywide forecast. Forecasts since 2001 have averaged 8.2% below the actual total run. Run forecast differences have ranged from 35.9% below actual run in 2014 to 20.6% above actual run in 2011. Forecasted harvests have averaged 2.2% below actual harvest since 2001 and harvest differences have ranged from 39% below actual harvest in 2014 to 35% above actual harvest in 2011.

Individual river forecasts have greater uncertainty compared to Baywide forecasts. Since 2001, on average, we have under-forecasted the returns to the Alagnak (-24%), Togiak (-15%), Kvichak (-11%), Wood (-7%), and Naknek (-3%) rivers and over-forecasted returns to Igushik (56%), Egegik (29%), Ugashik (13%), and Nushagak (1%) rivers.

The overall Bristol Bay forecasts have been fairly accurate since 2001 in spite of a large amount of individual river forecast variability. This is the result of over-forecasting returns to some rivers and under-forecasting returns to other rivers. The forecasts to individual rivers offset each other such that the overall Bristol Bay forecast has been more accurate than the individual forecasts.

Historically, total runs of sockeye salmon to Bristol Bay have been highly variable. The 2015 forecast of 53.98 million is above the long-term (1963–2014) historical average of 32.43 million, and above the recent ten-year (2005–2014) average of 38.64 million from 2005 to 2014.

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Table 1.—Forecast of total run, escapement, and harvest of major age classes of sockeye salmon returning to Bristol Bay river systems in 2015.

DISTRICT	River	Millions of Sockeye Salmon							
		Forecasted Production by Age Class				Total	Forecasted		South Peninsula ^a
		1.2	2.2	1.3	2.3		Escapement	Harvest	
NAKNEK-KVICHAK									
	Kvichak	3.15	9.71	1.68	0.83	15.38	7.69	7.12	0.57
	Alagnak	0.48	0.04	0.61	0.12	1.24	0.62 ^b	0.58	0.05
	Naknek	2.97	1.26	7.32	0.63	12.18	1.10	10.63	0.45
	Total	6.60	11.01	9.60	1.58	28.80	9.41	18.32	1.07
EGEGIK									
		2.63	5.12	1.62	3.14	12.50	1.10	10.94	0.46
UGASHIK									
		2.05	0.52	0.97	0.16	3.70	0.85	2.71	0.14
NUSHAGAK ^c									
	Wood	1.93	0.17	3.36	0.09	5.55	1.10	4.24	0.21
	Igushik	0.16	0.02	0.82	0.02	1.02	0.23	0.76	0.04
	Nushagak	0.12	0.01	1.56	0.01	1.81 ^d	0.60	1.14	0.07
	Total	2.20	0.20	5.74	0.11	8.37	1.93	6.14	0.31
TOGIAK ^e									
		0.12	0.03	0.43	0.03	0.61	0.18	0.41	0.02
BRISTOL BAY									
		13.61	16.87	18.37	5.01	53.98	13.46	38.51	2.01
		25%	31%	34%	9%	100%			

Note: This table summarizes the forecast of sockeye salmon in millions of fish. Any differences in addition are due to rounding.

^a The projected harvest accounts for the harvest of Bristol Bay sockeye salmon in the South Peninsula commercial salmon fisheries. The South Peninsula harvest has averaged 3.7% of the total Bristol Bay sockeye salmon production during the last 5 years.

^b The projected escapement to the Alagnak River was estimated based on exploiting the Alagnak River at the same exploitation rate as the Kvichak River.

^c Forecast for Snake River system was not included (1971–1991 average escapement was 18,000).

^d Nushagak River forecast includes age-0.3 (16,756) and age-1.4 (101,994) fish.

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