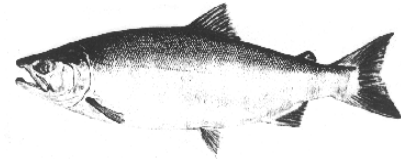


ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES
NEWS RELEASE



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2010 BRISTOL BAY SOCKEYE SALMON FORECAST

The 2010 Bristol Bay sockeye salmon forecast and harvest projection are provided below.

FORECAST AREA: **Bristol Bay**

SPECIES: **Sockeye Salmon**

FORECAST OF THE 2010 RUN:

	Forecast (millions)	Forecast Range (millions)
TOTAL PRODUCTION:		
Total Run	39.77	36.26–49.83
Escapement	8.01	
Commercial Common Property Harvest	31.76	
Bristol Bay Harvest	30.53	
South Peninsula Harvest	1.23	

METHODS

The forecast for the sockeye salmon run to Bristol Bay in 2010 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 1976–2006 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 also included simple linear regression and recent year averages. All models were evaluated for time series trends. 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 the years 2007 through 2009.

The forecast range was the upper and lower values of the mean percent error (MPE) of actual runs from published run predications. The confidence bounds were calculated by multiplying the forecast times the upper and lower MPE for the 2001 through 2009 runs.

RESULTS

A total of 39.77 million sockeye salmon are expected to return to Bristol Bay in 2010. This prediction is 13% higher than the previous 10-year mean of total runs (35.30 million; range of 17.83 million to 46.04 million). The forecast range is from 36.26 million to 49.83 million. All systems are expected to exceed their minimum spawning escapement goals.

A run of 39.77 million sockeye salmon can potentially produce a total harvest of 31.76 million fish if escapement goals are met for managed stocks and industry is capable of taking the surplus fish. The projected harvest includes 30.53 million fish in Bristol Bay and 1.23 million fish in the South Peninsula fisheries. A Bristol Bay harvest of 30.53 million would be 34% higher than the previous 10-year mean harvest (22.74 million; range of 10.66 million to 30.90 million).

The run forecast to each district and river system is as follows: 13.00 million to Naknek-Kvichak District (3.84 million to Kvichak River; 1.79 million to Alagnak River; 7.37 million to Naknek River); 10.63 million to Egegik District; 4.50 million to Ugashik District; 10.61 million to Nushagak District (6.18 million to Wood River; 2.32 million to Nushagak River; 2.11 million to Igushik River) and 1.03 million to Togiak District (Table 1).

The 2010 inshore run forecast to the Kvichak River is 3.84 million sockeye salmon with a projected harvest of 1.84 million (1.72 million in Bristol Bay and 0.12 million in South Peninsula). The harvest projection is based upon an escapement goal minimum of 2 million sockeye. The recommended escapement goal range is 2 million to 10 million with a 50% harvest rate.

The total run forecast of 39.77 million sockeye salmon is expected to be comprised of 15.49 million age-1.3 fish (39%) followed by 11.73 million age-1.2 fish (29%), 6.37 million age-2.2 fish (16%), 6.05 million age-2.3 fish (15%), 0.011 million age-0.3 fish (<1%) and 0.133 million age-1.4 fish (<1%) (Table 1).

DISCUSSION

Similar methods have been used to produce the Bristol Bay sockeye salmon forecast since 2001. These forecast methods have performed fairly well when looking at the overall Baywide forecast. There has been a tendency for the forecasts and projected harvests to be biased low in recent years. The forecast in 2009 was 19% below the total run. The forecasts since 2001 have averaged 11% below the actual total run. The run forecast differences have ranged from 26% below actual run in 2007 to 9% above actual run in 2001. The expected harvests have averaged 2% below actual harvest since 2001. The expected harvest differences have ranged from 22% below actual harvest in 2009 to 28% above actual harvest in 2004.

There is a much greater amount of uncertainty in our forecasts of returns to individual rivers. Since 2001, we have under-forecast the returns to the Alagnak (-35%), Togiak (-23%), Nushagak (-21%), Naknek (-12%), and Wood (-8%) rivers and over-forecast returns to Igushik (25%), Egegik (18%), and Kvichak (28%) rivers. An example of the large variability can be observed in

the forecasts to the Kvichak. We over-forecast the returns to Kvichak by an average of 97% from 2001 through 2004 during an unusually unproductive period and under-forecast the returns to the Kvichak by an average of -27% from 2005 through 2009 during a higher period of productivity. In large part, an individual river's forecast error is reflective of its current production as it relates to average historical production.

Even though there is large amount of variability around the forecasts to the individual rivers, the overall Baywide forecasts have been fairly accurate since 2001. This appears to have been the result of over-forecasting returns to some rivers and under-forecasting returns to other rivers. The forecasts to individual rivers have been offsetting each other such that the overall Baywide forecast has been more accurate than the individual forecasts. The main reason for this forecast discrepancy is probably incorrect allocation of catch among the rivers, which results in overestimating total run (catch + escapement) to some of the rivers and underestimating total run to other rivers. The department has been conducting a genetic stock identification program in Bristol Bay since 2006. Results from the genetics program will help provide estimates of stock composition of the catch in each of the districts and will ultimately provide reliable estimates of total run for sockeye salmon stocks in Bristol Bay in the future.

We anticipate the 2010 run will be dominated by age-1.3 sockeye (39%), followed by age-1.2 (29%), age-2.2 (16%) and age-2.3 (15%). There is always some uncertainty in our forecast of returns by age class. However, we expect the overall uncertainty in 2010 to be similar to what occurred in 2009. We over-forecast age-1.2 (28% forecast compared to 19% observed) and age-1.3 (49% forecast compared to 43% observed) sockeye in 2009. Conversely, we under-forecast age-2.2 (14% forecast compared to 27% observed) and age-2.3 (9% forecast compared to 8% observed).

The 2010 forecast of 39.77 million is not unexpected. Recent total runs to Bristol Bay have been fairly productive and stable. Since 2004, total runs have averaged 42.8 million and ranged from 39.3 million (2005) to 46.0 million (2007). We are not sure if this recent trend of productivity and stability will continue. Historically, total runs to Bristol Bay have been highly variable. If the 2010 forecast is accurate, it would be the 7th consecutive year where total run is close to or exceeds 40 million sockeye salmon.

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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 2010.

DISTRICT	River	Millions of Sockeye Salmon							South Peninsula ^a
		Total Run Forecast by Age Class				Total	Forecast		
		1.2	2.2	1.3	2.3		Escapement	Harvest	
NAKNEK-KVICHAK									
	Kvichak	1.74	0.65	0.98	0.47	3.84	2.00	1.72	0.12
	Alagnak	0.48	0.10	1.10	0.11	1.79	0.93 ^b	0.80	0.06
	Naknek	1.72	0.82	3.87	0.96	7.37	1.10	6.04	0.23
	Total	3.94	1.57	5.95	1.54	13.00	4.03	8.56	0.40
EGEGIK									
		1.35	4.02	1.34	3.92	10.63	1.10	9.20	0.33
UGASHIK									
		2.29	0.45	1.33	0.43	4.50	0.85	3.51	0.14
NUSHAGAK ^c									
	Wood	3.06	0.23	2.83	0.07	6.18	1.10	4.89	0.19
	Igushik	0.65	0.02	1.41	0.02	2.11	0.23	1.82	0.07
	Nushagak	0.29	0.01	1.84	0.03	2.32 ^d	0.55	1.70	0.07
	Total	4.00	0.27	6.09	0.11	10.61	1.88	8.41	0.33
TOGIAK ^e									
		0.15	0.06	0.78	0.04	1.03	0.15	0.85	0.03
BRISTOL BAY									
		11.73	6.37	15.49	6.05	39.77	8.01	30.53	1.23
		29%	16%	39%	15%	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 3.1% 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 (11,000) and age-1.4 (133,000) 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.