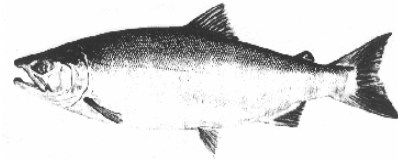


**ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES
NEWS RELEASE**



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2009 BRISTOL BAY SOCKEYE SALMON FORECAST

The 2009 Bristol Bay sockeye salmon forecast and harvest projection are provided below.

FORECAST AREA: Bristol Bay

SPECIES: Sockeye Salmon

FORECAST OF THE 2009 RUN:

TOTAL PRODUCTION:	Forecast (millions)	Forecast Range (millions)
Total Run	33.78	24.66–42.90
Escapement	8.74	
Commercial Common Property Harvest	25.04	
Bristol Bay Harvest	23.99	
South Peninsula Harvest	1.05	

METHODS

The forecast for the sockeye salmon run to Bristol Bay in 2009 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 1976–2005 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. Tested models were also evaluated for time series trends. The 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 2006 through 2008.

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 run predictions for the 2001 through 2008 runs.

RESULTS

A total of 33.78 million sockeye salmon are expected to return to Bristol Bay in 2009. This prediction is 4% lower than the previous 10-year mean of total runs (35.23 million; range of 17.83 million to 46.04 million). The 80% confidence bounds for the 2009 forecasted run ranged from 24.66 million to 42.90 million. All systems are expected to exceed their minimum spawning escapement goals.

A run of 33.78 million sockeye salmon can potentially produce a total harvest of 25.04 million fish if escapement goals are met for managed stocks and industry is capable of taking the surplus fish. The projected harvest includes a harvest of 23.99 million fish in Bristol Bay and 1.05 million fish in the South Peninsula fisheries. A Bristol Bay harvest of 23.99 million sockeye salmon would be 8% higher than the previous 10-year mean harvest (22.20 million; range of 10.36 million to 29.46 million).

The forecasted run to each district and river system is as follows: 12.11 million to Naknek-Kvichak District (5.30 million to Kvichak River; 2.03 million to Alagnak River; 4.79 million to Naknek River); 9.59 million to Egegik District; 2.38 million to Ugashik District; 8.93 million to Nushagak District (5.01 million to Wood River; 1.66 million to Nushagak River; 2.26 million to Igushik River) and 0.77 million to Togiak District (Table 1).

The 2009 inshore run forecasted to the Kvichak River is 5.30 million sockeye salmon with a projected harvest of 2.65 million sockeye salmon (2.48 million in Bristol Bay and 0.16 million in South Peninsula). The harvest projection is based upon an escapement goal minimum of 2 million with a recommended 50% harvest rate. The current escapement goal ranges are 2 million to 10 million for off-cycle years: and 6 million to 10 million for pre-peak/peak years. There is a recommended 50% harvest rate on both off-cycle and pre-peak/peak years. The 2009 Kvichak sockeye salmon run would have been classified as a pre-peak year. However, the 2009 Kvichak River sockeye salmon run will be treated like the traditional off-cycle run with a 50% harvest rate and minimum escapement goal of 2 million spawners rather than a traditional pre-peak/peak run with a 50% harvest rate and minimum escapement goal of 6 million spawners. This change is analogous to what occurred in 2005. A pre-peak/peak escapement goal, largely composed of 5-year-old 2-ocean fish, was originally established because it was believed that production differed from that of off-cycle years and therefore, it was advantageous to separate the two goals. However, currently the production of pre-peak/peak versus off-cycle years shows similarity such that we cannot conclude they are different. Additionally, average total runs for pre-peak and peak years have decreased from roughly 20 to 30 million from 1979 through 1995 to less than 9 million since 1999. Based on the relatively weak forecast of 5-year-old 2-ocean fish in 2009, this shift in abundance will continue.

The forecasted total run of 33.78 million sockeye salmon is expected to be comprised of 16.62 million age 1.3 fish (49%) followed by 9.41 million age 1.2 fish (28%), 4.58 million age 2.2 fish (14%), 3.02 million age 2.3 fish (9%), 0.075 million age 0.3 (<1%) and 0.078 million age 1.4 fish (<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 2008 was 4% below the total run. The forecasts since 2001 have averaged 9% below the actual total run. The forecasted run differences have ranged from 25% below actual run in 2007 to 9% above actual run in 2001. The expected harvests have averaged 5% below actual harvest since 2001. The expected harvest differences have ranged from 17% below actual harvest in 2006 to 33% 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 (-39%), Togiak (-21%), Nushagak (-21%), Naknek (-15%), and Wood (-6%) rivers and over-forecast returns to Igushik (5%), Egegik (22%), Kvichak (30%). An example of the large variability can be observed in the forecasts to the Kvichak. We over-forecasted the returns to Kvichak by 93% from 2001 through 2004 and under-forecasted the returns to the Kvichak from 2005 through 2008.

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 due to incorrectly allocating the catch among the rivers, which results in overestimating the total run (catch + escapement) to some of the rivers and underestimating the 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 2009 run will be dominated by age 1.3 fish (49%), followed by age 1.2 fish (28%), age 2.2 fish (14%) and age 2.3 fish (9%). There is always some uncertainty in our forecast of returns by age class. However, we expect the overall uncertainty in 2009 to be similar to what occurred in 2008. During 2008, our forecast of age 1.2 fish (33%) was similar to the return (35%). We slightly under-forecast age 1.3 fish (49% forecast compared to 56% return) and over-forecast the returns of age 2.2 (9% forecast compared to 6% return) and age 2.3 (9% forecast compared to 2% return).

The 2009 forecast of 33.78 million is approximately 21% lower than recent total runs to Bristol Bay. The total run has averaged approximately 43 million sockeye salmon during the last 5-years (2004–2008). The lower forecast in 2009 is not unexpected. Ocean temperatures have been colder in the North Pacific during the past 2 years (2007 and 2008). Colder ocean temperatures usually result in reduced marine survival of sockeye salmon. We are not sure how recent colder water temperatures will ultimately affect the overall return of sockeye salmon to Bristol Bay in 2009.

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Table 1.—Forecasted production, escapement, and harvest of major age classes of sockeye salmon returning to Bristol Bay river systems in 2009.

DISTRICT River	Bristol Bay (Millions of Sockeye Salmon)					Forecasted		South Peninsula Harvest ^a
	Forecasted Production by Age Class				Total	Escapement	Harvest	
	1.2	2.2	1.3	2.3				
NAKNEK- KVICHAK								
Kvichak	2.05	1.75	1.47	0.04	5.30	2.65	2.48	0.16
Alagnak	0.70	0.01	1.27	0.05	2.03	1.02 ^b	0.95	0.06
Naknek	1.29	0.59	2.44	0.46	4.79	1.10	3.54	0.15
Total	4.04	2.35	5.18	0.55	12.11	4.76	6.97	0.38
EGEGIK	1.69	1.74	3.85	2.31	9.59	1.10	8.19	0.30
UGASHIK	0.68	0.28	1.40	0.02	2.38	0.85	1.45	0.07
NUSHAGAK ^c								
Wood	2.18	0.11	2.68	0.04	5.01	1.10	3.76	0.16
Igushik	0.51	0.09	1.64	0.03	2.26	0.23	1.96	0.07
Nushagak	0.26	0.00	1.22	0.03	1.66 ^d	0.55	1.06	0.05
Total	2.94	0.19	5.54	0.10	8.93	1.88	6.78	0.28
TOGIAK ^e	0.06	0.02	0.65	0.04	0.77	0.15	0.60	0.02
BRISTOL BAY								
TOTAL	9.41	4.58	16.62	3.02	33.78	8.74	23.99	1.05
	28%	14%	49%	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 3.1% 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 (75,000) and age 1.4 (78,000).

^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.