Preliminary Preseason Forecast for Bristol Bay Sockeye Salmon in 2027 (UW-FRI)

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August 18, 2026

Background and Summary

This brief report provides a preliminary forecast for Bristol Bay sockeye salmon abundance for 2027, based upon data available at the time of the last Alaska Department of Fish and Game (ADF&G) daily inseason release (August 2026). As this preliminary forecast is made prior to the release of finalized data for the 2026 run, this should be considered as advisory rather than a formal forecast given its lower accuracy and aggregated summary across stocks. Our assessment of the statistical performance of this model for forecasting run size based on preliminary data demonstrates its distinct utility in forecasting aggregate abundance of sockeye salmon to Bristol Bay, with average errors of ~20% over the last two decades, compared to errors of ~15% for our official preseason forecasts over this same time frame.

Our 2027 preliminary Bristol Bay run size forecast is 44.2 million sockeye salmon, with a projected harvest of 28.6 million fish (158 million pounds). The formal **UW-FRI Preseason Forecast** will be released on the standard schedule in November 2026, which will include 2027 abundance estimates by age class for all nine rivers in Bristol Bay and the anticipated 2027 harvest in numbers and pounds.

Forecast Summary

The UW-FRI Preliminary (August) Preseason Forecast for 2027 Bristol Bay sockeye salmon run size is 44.2 million sockeye salmon. This preliminary forecast predicts that 54% of the 2027 total Bristol Bay run will be 2-ocean sockeye and 46% 3-ocean sockeye. The 2027 Preliminary Preseason Forecast of 44.2 million is 28% lower than the 2016-2025 (10-year) average of 61.0 million sockeye salmon, and 13% lower than the 2006-2025 (20-year) average of 50.8 million. **The projected 2027 inshore harvest is 28.6 million sockeye salmon or 158 million pounds, based on the average size of each age class of fish expected based on this run size**.

This preliminary preseason forecast for Bristol Bay sockeye salmon aligns with adult run size projections derived from the abundance of juvenile sockeye salmon in the Bering Sea, as quantified by NOAA and ADF&G surface trawl surveys conducted in 2025. These surveys indicate a projected 2027 run size ranging from 44.8 to 48.3 million salmon. The EBS juvenile forecast for the Bristol Bay run size in 2027 will be revised upon the completion of the 2026 juvenile Bering Sea survey.

Table 1. Projected harvest based on the 2027 Preliminary Preseason Forecast for Bristol Bay sockeye salmon. The projected harvest assumes a harvest of 1 million Bristol Bay sockeye salmon in the South Peninsula commercial fishery and a projected escapement of 14.6 million sockeye salmon. Projected weight-at-age for 2 and 3-ocean sockeye salmon is based on the average relationship between run size and weight at age. The projected harvest in millions of pounds is the expected harvest by ocean age, multiplied by the expected weight at age. The expected average weight of sockeye salmon in 2027 is 5.5 pounds.

Ocean Age	Forecast (millions of sockeye)	Projected Harvest (millions of sockeye)	Projected Weight at Age (pounds)	Projected Harvest (millions of pounds)
2	24.0	15.5	4.8	73.8
3	20.2	13.1	6.4	84.2
Total	***44.2***	***28.6***	Average: 5.5	***158.0***

Table 2. Preliminary Preseason Forecast for Bristol Bay sockeye salmon run size in 2027 in millions of sockeye salmon. For comparison the recent 10-year and 20-year average total run sizes are presented, and the percentage each age class represents in the overall 2027 forecast.

Age	Forecast (millions of sockeye)	Percent of Forecast
1.2	17.6	39.7%
1.3	16.3	36.8%
2.2	6.4	14.5%
2.3	3.9	8.9%
Bristol Bay Total	***44.2***	***100%***
2016-2025 Average	61.0	
2006-2025 Average	50.8	

Retrospective analysis of forecast performance, based on 1-year ahead predictions, indicates that for Bristol Bay this preliminary preseason forecast method has a higher overall mean absolute percent error (MAPE) of 19.4% for years 2006-2026, when compared to the official

(November) UW-FRI Preseason Forecast MAPE of 14.6%. The correlation between the preliminary forecast and the official preseason forecasts were $r = 0.8$ across these years.

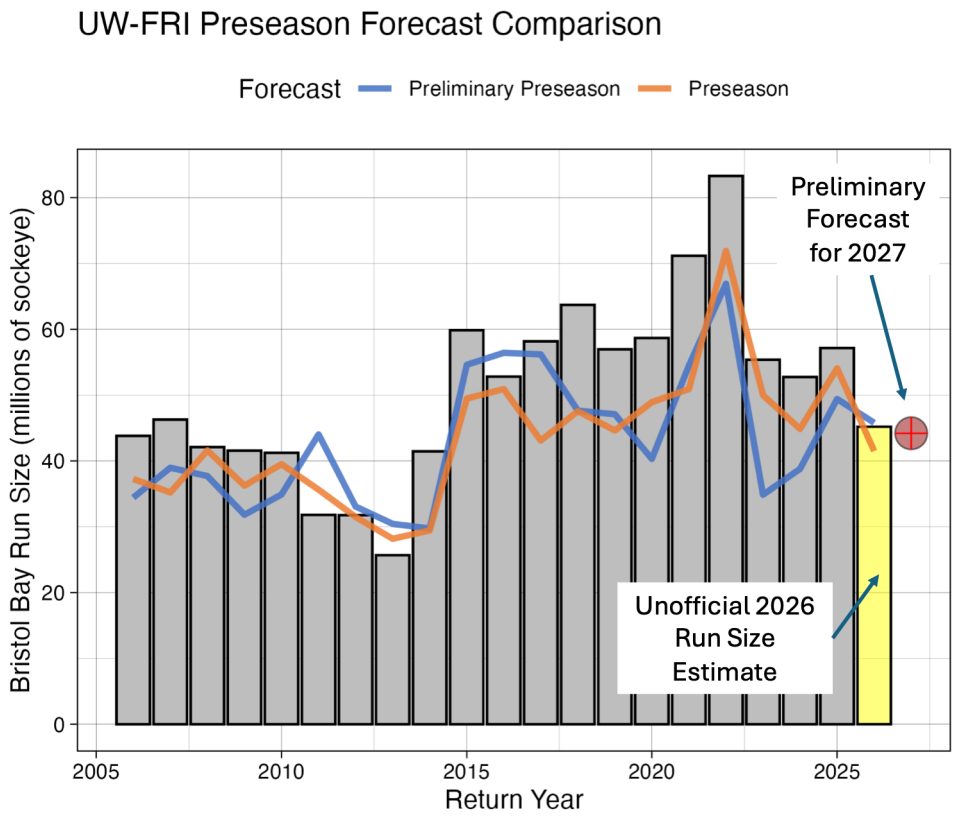

Figure 1. Retrospective (1-year) ahead predictions for Bristol Bay run size from the official UW-FRI Preseason Forecast (orange line) and the preliminary preseason forecast methods (blue line), compared with observed total run size in millions of sockeye salmon (bars). The red point is 2027 preliminary forecast.

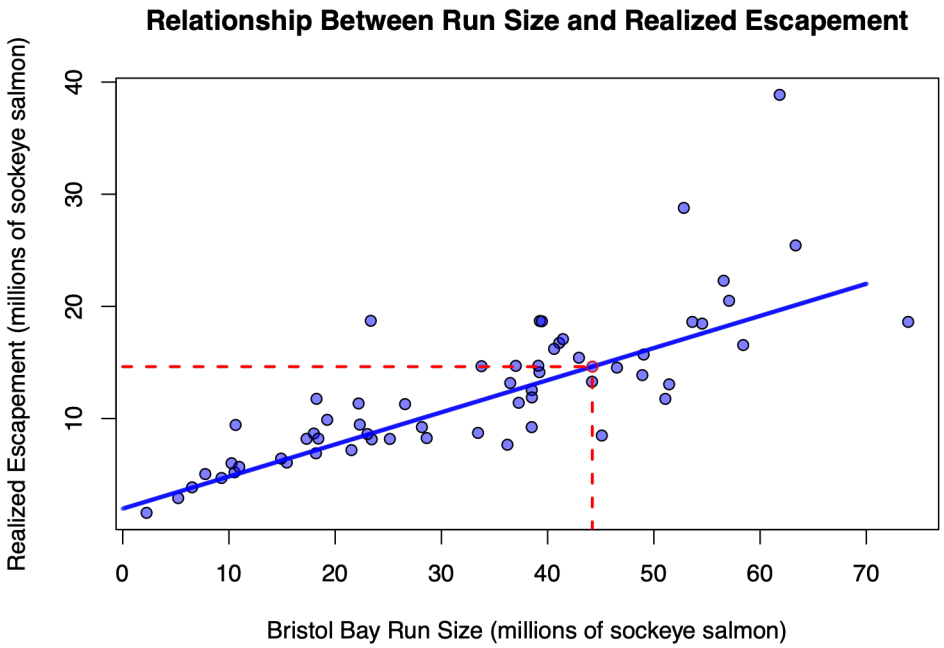

Figure 2. Linear relationship (blue line) between Bristol Bay run size and realized escapement. Points are individual years 1963-2025. The red dashed line highlights the expected escapement for 2027 of 14.6 million sockeye salmon.

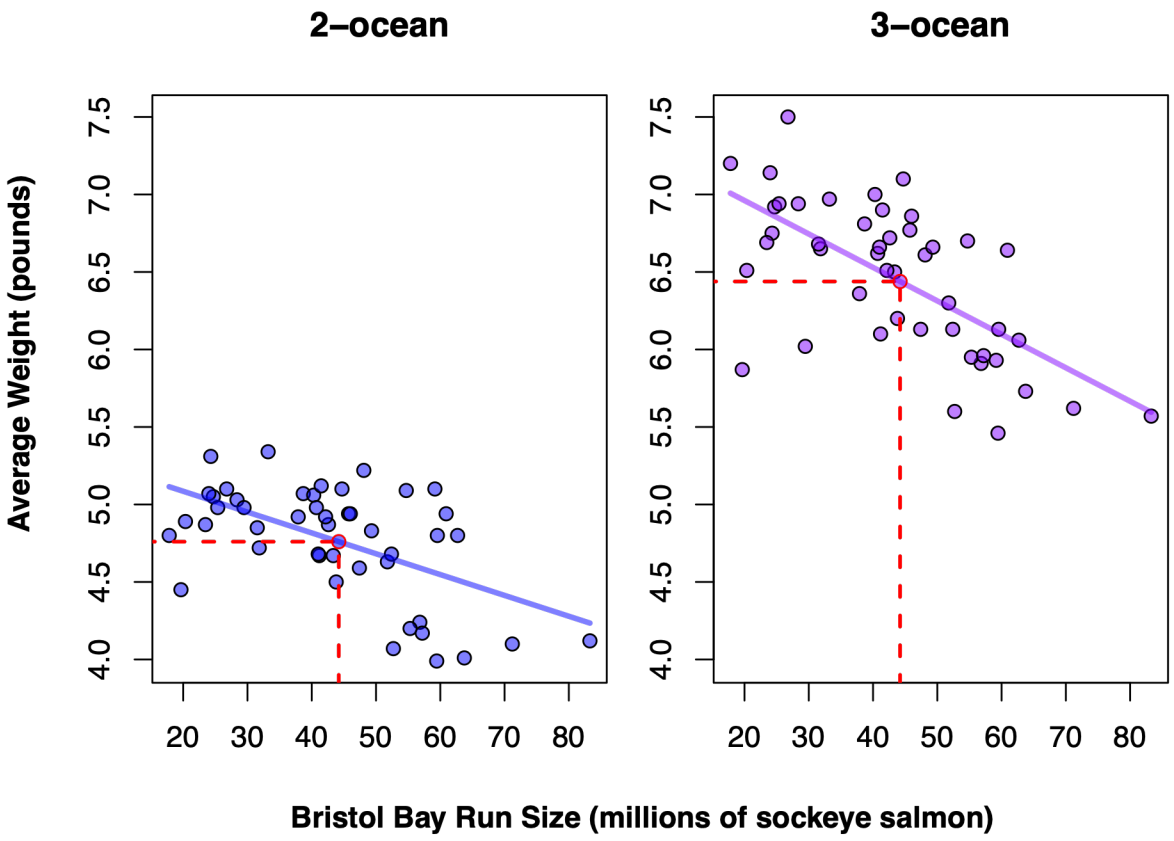

Figure 3. Relationship between annual Bristol Bay run size and the average weight of 2 and 3-ocean sockeye salmon for years 1980-2025. Solid lines describe the average relationship, while the red dashed lines highlight the prediction for sockeye salmon weight-at-age in 2027 of 4.8 pounds for 2-ocean sockeye salmon and 6.4 pounds for 3-ocean sockeye.

Methods

To generate this preliminary preseason forecast, the final ADF&G "daily" in season release describing total Bristol Bay catch and escapement was used in conjunction with the aggregate age composition reported by ADF&G.

The total catch plus escapement reported on the last "daily" (July 31, 2026) was scaled up to the expected 2025 Bristol Bay total (reconstructed) run size based on the observation that on average 94.5% of the total run size has been observed at the time of the last "daily" (2005-2026). The aggregate Bristol Bay age composition through July 25, 2026 provided by ADF&G was used to apportion the total 2026 run size estimate among reported age groups.

We primarily used Dynamic linear models (DLMs) to generate the 2027 preliminary forecast. This class of models allows for changes over time in both average run size by age class and the

relationship between forecasted age classes and members of the same cohort that returned in previous years (e.g., 1.3's predicted from 1.2's). For three of 4 age classes, DLMs showed the best performance in retrospective (1-year ahead) testing for years 2006-2025. DLMs with log-transformed predictor and response variables were used to generate the 2027 preliminary preseason forecast.

Projected inshore harvest in numbers by ocean age were calculated by subtracting the expected escapement based on the historical relationship between realized escapement and run size (1963-2025) and the assumed a South Peninsula harvest of 1 million Bristol Bay sockeye salmon. The projected inshore harvest in pounds was calculated by multiplying the expected weight per fish for 2 and 3-ocean sockeye salmon based on the relationship between weight-at-age and run size in past years by the projected harvest in numbers at age.

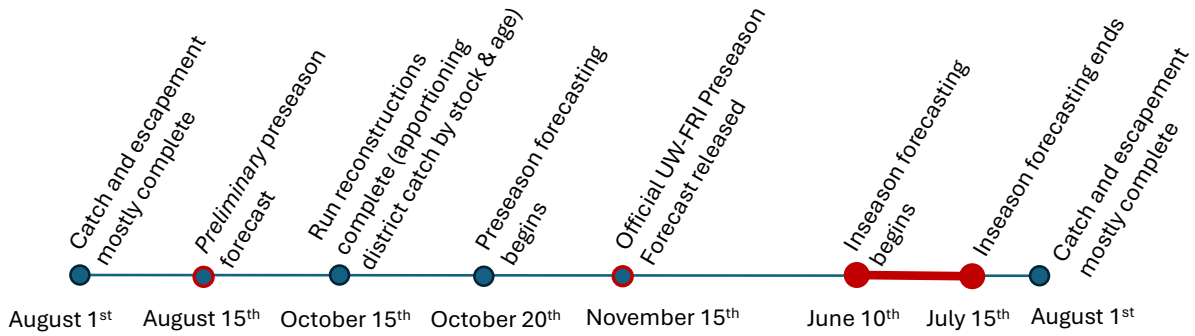

Figure 4. Timeline of UW-FRI forecasting timeline showing the average timing of the preliminary preseason forecast, official UW-FRI preseason forecast, and inseason forecasting cycle.

Acknowledgements

We would like to acknowledge the Alaska Department of Fish and Game (ADF&G) for making the data necessary for these analyses available both during and after the Bristol Bay fishing season.

Contact Information

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