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Advisory Announcement

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2025 NOAA FISHERIES–ALASKA DEPARTMENT OF FISH AND GAME SOUTHEAST ALASKA PINK SALMON HARVEST FORECAST

The Southeast Alaska (SEAK) pink salmon harvest in 2025 is predicted to be in the *average* range with a point estimate of **29 million fish (80% prediction interval: 16–53 million fish)**. The categorical ranges of pink salmon harvest in SEAK were formulated from the 20th, 40th, 60th, and 80th percentiles of historical harvest over the 64-year period 1960–2023:

Category	Range (millions)	Percentile
Poor	Less than 11	Less than 20th
Weak	11 to 19	20th to 40th
Average	19 to 33	40th to 60th
Strong	33 to 48	60th to 80th
Excellent	Greater than 48	Greater than 80th

Forecast Methods

The NOAA Alaska Fisheries Science Center, Auke Bay Laboratories (NOAA) initiated the Southeast Alaska Coastal Monitoring (SECM) project in 1997 to better understand the effects of climate and nearshore ocean conditions on year-class strength of salmon and other ecologically related species (Orsi et al. 2000). Since 2018, the SECM project has been conducted cooperatively by NOAA and the Alaska Department of Fish and Game (ADF&G) using the ADF&G research vessel *Medeia*, and the two agencies have combined efforts to produce a joint pink salmon harvest forecast using SECM data (Piston et al. 2019). We plan to continue coordination between agencies and explore ways to further expand the SECM survey to provide a wide variety of valuable information to the fishing industry.

The 2025 SEAK pink salmon harvest forecast (Figures 1 and 2) was primarily based on juvenile pink salmon abundance indices collected by the SECM project in northern SEAK inside waters. These data were obtained from systematic surface trawl surveys conducted annually in June and July in upper Chatham and Icy Straits and have been shown to be highly correlated with the harvest of adult pink salmon in the following year (Wertheimer et al. 2011). The 2024 juvenile pink salmon abundance index based on the average vessel-calibrated, log-transformed standardized catch per unit effort (CPUE) in either June or July, whichever month had the highest average in a given year (standardized juvenile catches are based on 20-minute trawl sets), was 1.66. Using only the years with data collected on the research vessel *Medeia* (2018–2024), this CPUE is the highest index since 2020 and falls just above average for juvenile even-year CPUE indices (*Medeia* average 1.61; *Medeia* range 1.2–2.2).

The forecasts for 2025 were created using a modified approach initially described by Wertheimer et al. (2006) and later adapted by Orsi et al. (2016) and Murphy et al. (2019). The current forecast assumes a log-normal error structure (Miller et al. 2022) and is based on a multiple regression model. This model integrates vessel-calibration coefficients estimated within the model, applied to raw CPUE as a proxy for abundance, along with an odd/even year factor to account for potential cyclical abundance patterns, and temperature data from the SECM survey (Piston et al. 2021) or satellite sea surface temperature (SST) data (Huang et al. 2017). This year, the CPUE calculation differs from prior forecasts: the raw CPUE term was set to the maximum value of the log-transformed, standardized catch (from 20-minute trawl sets) for either June or July, depending on which month yielded the highest value in each year. The raw CPUE was then adjusted by a model-derived vessel calibration coefficient. A total of 18 models were considered for the 2025 forecast, with model performance evaluated based on the one-step-ahead mean absolute percent error (MAPE) for the last five years, along with AICc values (Burnham and Anderson 2004), parameter significance, and adjusted R-squared values. The optimal model included vessel-calibration coefficients, raw CPUE, an odd/even year factor, and the satellite SST variable from northern SEAK in May. Based on this model, the 2025 forecast falls within the average range, with a point estimate of 29 million fish (80% prediction interval: 16 to 53 million fish).

Forecast Discussion

The 2025 harvest forecast of 29 million pink salmon is slightly above the recent 10-year average harvest of 26 million, but approximately 60% of the parent-year (2023) harvest of 48 million. Parent-year escapement indices exceeded the biological escapement goal ranges in the Southern Southeast and Northern Southeast Inside Subregions and were near the upper bound of the escapement goal range in the Northern Southeast Outside Subregion. Juvenile pink salmon in the 2024 SECM survey trawls were smaller than average in length but had higher than average energy density (1997–2024).

Poor forecast accuracy in recent odd years (2021 and 2023) led to a review of odd/even year treatment in the forecast model and potential issues with vessel-calibration coefficients. Historically, separate odd- and even-year models were avoided due to limited years in the dataset and similar trends observed in both broodlines until 2006. Including an odd/even year factor now aligns better with the 1-ocean-year life history of pink salmon, accounting for recent odd/even year harvest and escapement differences. The model also addressed errors potentially introduced by observed vessel-calibration coefficients by replacing them with model-estimated coefficients, based on 25 years of vessel-specific raw CPUE data, which better accounts for variations in vessel efficiency over the SECM survey's long history.

While uncertainties are inherent in salmon forecasts, the NOAA/ADF&G joint pink salmon harvest forecast has maintained a strong track record (Figure 2), despite the unique forecasting challenges for pink salmon (Haeseker et al. 2005). For the 2025 season, the department will manage the commercial purse seine fisheries based on inseason data. Aerial escapement surveys and fishery performance data will continue to be key tools for making inseason management decisions.

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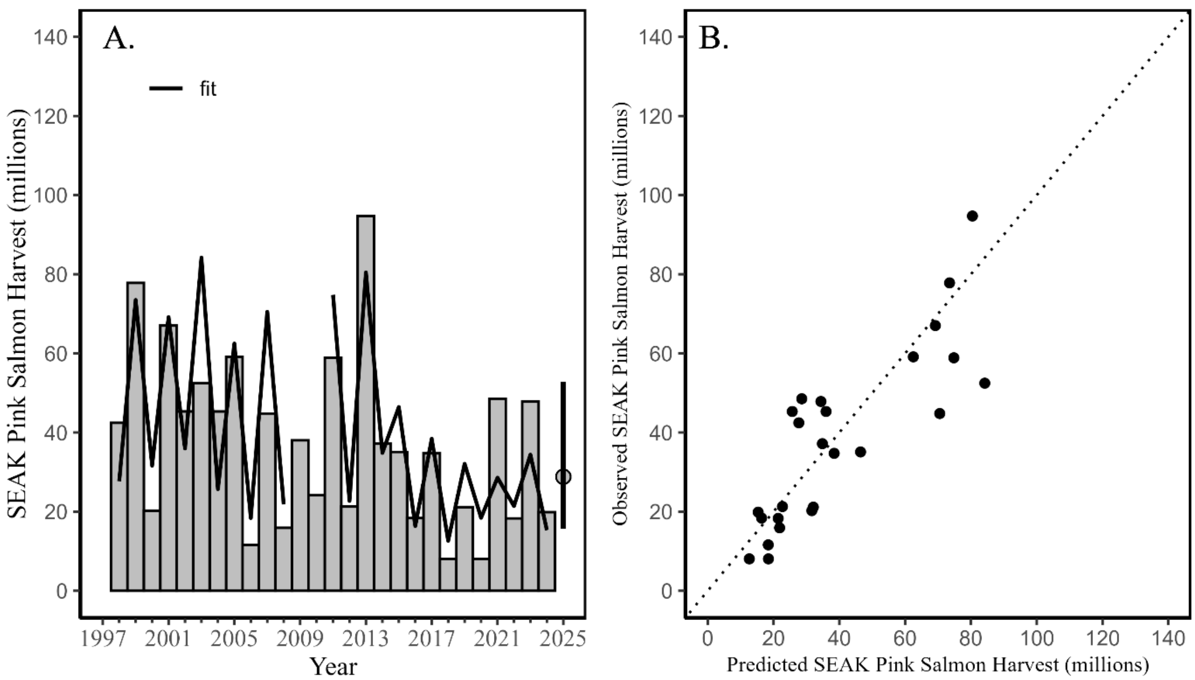

Figure 1. Forecast model fit (hindcasts) for total Southeast Alaska (SEAK) pink salmon harvest, 1998–2024 by year (A) and by the fitted values (B) for the model based on the model-estimated vessel-calibration coefficients, raw CPUE, an odd- and even-year factor, and May satellite sea surface temperature readings in northern Southeast Alaska inside waters. In panel A, the 2025 forecast is shown as a grey circle with the 80% prediction interval as a black vertical line. The observed SEAK pink salmon harvest is represented by the grey bars and the model fit is shown by the black line in panel A. In panel B, the dotted line represents a one-to-one line; circles above the line represent hindcasts that produced a point estimate lower than the actual harvest and circles below the line represent hindcasts that produced a point estimate higher than the actual harvest.

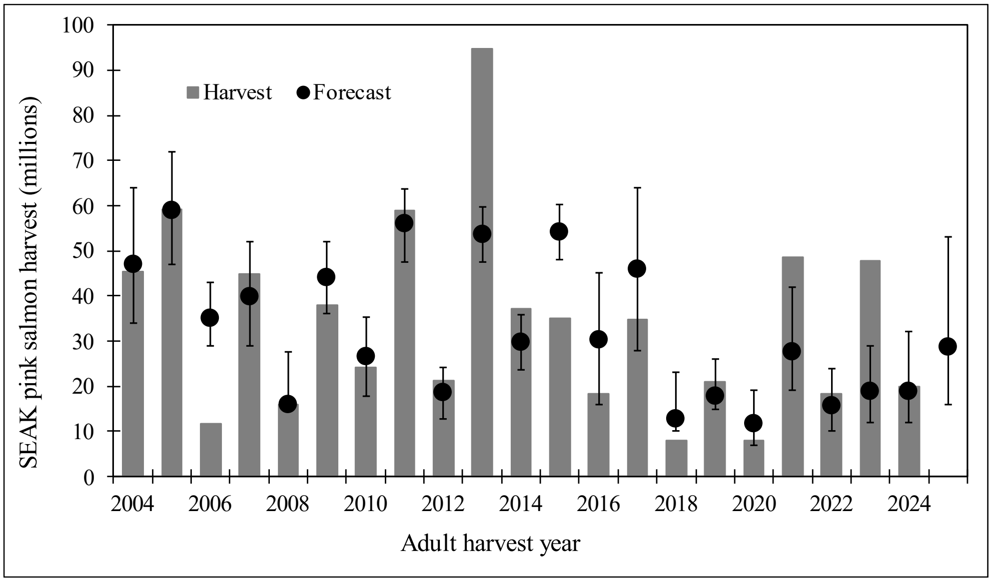

Figure 2. Preseason forecasts compared to the annual SEAK pink salmon harvest, 2004–2024. The error bars represent either 80% confidence or 80% prediction intervals of the forecasts, depending on the modeling method used.

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