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WCVI Salmon Bulletin

West Coast of Vancouver Island Chinook

Terminal Return Forecast for 2026

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South Coast Area Stock Assessment

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SUMMARY

- The 2026 forecast return of Somass River Chinook (aka Stamp River, Somass River and Robertson Creek Chinook), including both natural and hatchery-born Chinook to the terminal area of Barkley Sound and Alberni Inlet, is 189,000 adults (95% CI: 138,000 – 254,000).
- Terminal Chinook returns of Conuma River, Nitinat River, and aggregated smaller west coast Vancouver Island (“Other WCVI”) indicator stocks are forecasted separately but combine to be 89,000 in 2026 (95% CI: 64,000 – 123,000).
- A portion of the aggregated “Other WCVI” Chinook forecast includes returns to the Burman River; however, a separate Burman River forecast is also produced to inform management of near-terminal marine fisheries in Nootka Sound. The Burman River Chinook forecast is 3,500 (95% CI: 1,800 – 6,400).
- The forecast of aggregate terminal abundance (sum of all hatchery and wild indicator stocks, including Somass is 279,000 for adults (95% CI: 202,000 – 377,000).
- The overall expected adult age composition of the WCVI aggregate terminal Chinook run is 50% age-3, 44% age-4, and 6% age-5.
- The 2025 terminal return of Somass Chinook was 120,528 adults (ages 3-5) and 13,014 jacks (age-2 males). The pre-season forecast was 31% lower than the observed adult return.
- The 2025 aggregate terminal return (*i.e.* excluding catch in pre-terminal fisheries) of WCVI Chinook index stocks—including Somass—was estimated at 243,000 adults (age 3-5) and 15,000 jacks. The pre-season prediction was 34% lower than the estimated aggregate adult return.
- Spawner levels in the Southwest Vancouver Island (SWVI) Conservation Unit (CU) remain generally below lower biological benchmarks, though relatively stable, in spite of persistent efforts to rebuild stocks, with fewer than 200 spawners in some rivers. The Northwest Vancouver Island (NWVI) spawner levels have improved over the last ten years, exceeding upper biological benchmarks in some years, though the contribution of hatchery strays to the overall escapement is under review in both CUs due to recent observations of a significant component (30-50%) in a few of the recent surveys. Wild WCVI Chinook, therefore, remains a stock of concern.

BACKGROUND

Chinook salmon spawn in more than 100 medium and large rivers along the west coast of Vancouver Island (WCVI), with approximately 60 systems having escapement records of at least 100 spawners. Under Canada’s Wild Salmon Policy, stock status is assessed for a set of wild indicator populations within Conservation Units (CUs), which group biologically and genetically similar populations. Three Chinook CUs are defined for the WCVI: Southwest Vancouver Island (SWVI; DFO Statistical Areas 20–24,

spanning San Juan to Clayoquot Sound), Nootka–Kyuquot (Areas 25–26), and Northwest Vancouver Island (NWVI; Area 27, including Quatsino Sound).

The average aggregate terminal return (catch and escapement) of WCVI Chinook is approximately 156,000, ranging from about 30,000 to 330,000 over the period from 1996–2025 (*Table 1*). A substantial portion of the annual terminal return and spawning escapement is hatchery-origin fish (*Figure 1*). About 20 WCVI populations receive some form of hatchery enhancement to supplement natural spawning. Annual releases total about 15 million Chinook smolts, the majority (~13 million) originating from three major hatcheries located on the Stamp, Nitinat, and Conuma rivers. Additional enhancement occurs in nearby systems through both direct releases and straying. A further ~2 million smolts are released annually from smaller facilities, including volunteer- and community-based programs.

Natural-origin Chinook within the WCVI Stock Management Unit (SMU) which includes the three CUs are currently assessed as being in critical status (i.e., below the Conservation Unit limit reference point; DFO 2025a, 2025b). Contributing factors include declining and persistently low abundance of natural-origin spawners, erosion of genetic diversity (largely associated with hatchery straying), and shifts in life-history traits, including reduced size-at-age and earlier age-at-maturity, with smaller females producing fewer eggs (DFO 2025a, 2025b).

Somass River Chinook includes the enhanced Robertson Creek Hatchery (RCH) stock, which serves as the coded-wire tag (CWT) indicator stock used by the Pacific Salmon Commission. This single stock provides key information on survival, exploitation rates, and marine distribution of WCVI Chinook. Detailed annual assessments and forecasts of the RCH stock support broader WCVI stock assessment, and management actions applied to this stock in pre-terminal fisheries are assumed to have similar effects on other WCVI populations.

Forecasts are also developed for non-CWT indicator WCVI Chinook stocks, including Conuma, Nitinat, and an aggregated “Other WCVI” group. The aggregated group includes Pacific Salmon Commission (PSC) indicator systems (Artlish, Burman, Gold, Kaouk, Marble, Tahsis, and Tashish rivers) as well as extensive indicator systems (Bedwell, Colonial, Cypre, Leiner, Megin, Moyeha, Nahmint, San Juan, Sarita, Tranquil, and Zeballos rivers).

A portion of the “Other WCVI” forecast includes returns to the Burman River; however, a separate Burman River forecast is also produced to inform management of near-terminal marine fisheries in Nootka Sound. These fisheries, commonly referred to as the Muchalat Inlet/Matchlee Bay fisheries, are known to encounter both Burman River and neighbouring Gold River Chinook stocks.

FORECAST METHODOLOGY

A new forecasting methodology was implemented in 2025 (Power et al. 2025), using a sibling regression model for each WCVI stock group (Somass, Conuma, Nitinat, and Other WCVI). These models considered the relationship between adjacent age classes

from the same brood year using historical abundance data of WCVI Chinook. For each forecast, log-transformed abundances of age-2, age-3, and age-4 Chinook were regressed against the log-transformed abundances of age-3, age-4, and age-5 fish, respectively. Abundance was defined as total returns, including WCVI terminal harvest (excludes non-WCVI and pre-terminal fisheries) and both hatchery and natural escapement to each system.

Predicted abundances for each age class, along with their associated variances, were summed under the assumption of independence among age classes. Model performance comparisons using mean absolute percentage error (MAPE) showed that the sibling regression approach (MAPE = 21%) improved upon the previous cohort analysis method (MAPE = 26%) for Somass returns over the 2000–2024 period (Power et al. 2025).

Abundance data are available from the early 1980s; however, the time series exhibited non-stationarity, specifically changes in the relationships among age classes over time. As a result, the dataset was restricted to data from 2000 onward. An exception was made for the “Other WCVI” group, for which data were further limited to 2015 onward, as this was the first year that both harvest and escapement data were recorded for forecasting purposes.

Using the more recent data range has shifted forecast outputs compared to the previous cohort analysis model. Specifically, the updated approach predicts a higher proportion of younger returning fish (more age-3 and fewer age-5 individuals), based on sibling relationships. This pattern is consistent with both local observations and findings reported in the literature (Lamborn et al. 2025; Ohlberger et al. 2018; Lewis et al. 2015; Roni & Quinn 1995; Ricker 1981).

For the Burman River, a single model was used to forecast the terminal adult (ages 3–5) Chinook return to the Burman River since 2025. The forecast represents the combined total of natural- and hatchery-origin Burman Chinook harvested within Nootka Sound and Esperanza Inlet (to 1 nautical mile offshore) and escapement to the Burman River. It excludes any Burman-origin fish that may stray to other systems. Consistent with other WCVI forecasts, a sibling regression approach was applied which uses stock-specific age-at-return estimates derived from scale data, along with stock identification based on DNA and otolith analysis for the period 2016–2025. For years with limited biological resolution for stock identification (i.e., 2014 and 2015, which relied largely on thermal mark data), the Conuma hatchery harvest rate (defined as the proportion of Conuma hatchery-origin fish in the harvest relative to the total Conuma hatchery return) was applied to Burman natural and hatchery escapement estimates to approximate the Burman-specific harvest component of the return. Results in 2025 indicated that the forecast performance was poor, with a MAPE of 56.4%, indicating low predictive accuracy. Alternative models explored in 2025 (Power et al. 2025) similarly demonstrated limited predictive skill.

FORECAST PERFORMANCE FOR THE 2025 RETURN

The 2025 forecast predicted an aggregate terminal adult return of WCVI index stocks (i.e., excluding catch in pre-terminal fisheries) of 159,726, with predicted adult returns of 83,343, 32,467, 21,104, and 22,812 to Somass, Conuma, Nitinat and Other WCVI, respectively (*Table 1*). The estimated 2025 aggregate terminal adult return was 243,162. The estimated age composition at return of the WCVI aggregate was 37%, 42% and 14% for 3-, 4- and 5-year-old Chinook, respectively (*Table 2*). Overall, the total estimated 2025 WCVI adult Chinook return was 34% higher than the 2025 forecast (*Table 1*).

2026 FORECAST

Terminal return of Somass Chinook

The forecasted terminal return of adult Somass Chinook to Barkley Sound and Alberni Inlet in 2026 is 189,449 (95% CI: 138,380 - 254,487; *Figure 2*). The Somass River's predicted adult age composition is 61%, 36%, and 3% for age-3, age-4, and age-5 fish, respectively. The above-average forecast for 2026 is driven primarily by the strong return of jacks (age-2) in 2025, which translates into a high predicted proportion of age-3 fish in 2026.

Terminal return of Conuma Chinook

The predicted terminal return of Conuma Chinook to Area 25 is 41,671 (95% CI: 29,168–58,221; *Figure 3*). The predicted adult age composition is 21%, 62% and 17% for 3-, 4- and 5-year-old fish, respectively.

Terminal return of Nitinat Chinook

The predicted terminal return of Nitinat Chinook to Area 22 is 18,431 (95% CI: 13,679–24,393; *Figure 4*). The predicted adult age composition is 36%, 54% and 10% for 3-, 4- and 5-year-old fish, respectively.

Terminal return of Other WCVI Chinook

The predicted terminal return of Other WCVI index stocks (see list in *Table 3*) is 29,124 (95% CI: 20,842–40,266, *Figure 5*). The predicted adult age composition is 27%, 63% and 10% for 3-, 4- and 5-year-old fish, respectively. This forecast return results largely from enhanced index stocks. In most recent years, spawner abundances of wild indicator stocks within WCVI Conservation Units have been below provisional upper biological benchmarks and, in the case of the SWVI CU, below the lower biological benchmark in many recent years (*Figure 7*).

Terminal return of Burman Chinook

The predicted adult terminal return of Burman Chinook is 3,457 (95% CI: 1,803- 6,367) with an age composition of 35 %, 54% and 11% for 3-, 4-, and 5-year-old fish, respectively, using the sibling forecast (*Figure 6, Table 4*). Note that Burman is included in the Other WCVI forecast but is also forecasted separately for management purposes.

ESCAPEMENT TARGET FOR SOMASS CHINOOK

The Chinook escapement target for the Somass River is adjusted annually based on the 7.1-million-egg target for Robertson Creek Hatchery broodstock, plus a fixed escapement goal for spawners in the Stamp River. In 2023, the Area 23 Harvest Committee reached a consensus to adopt a spawner escapement target of 14,600 adult spawners for the Stamp River (Brown 2023; watershed-area-based spawner habitat capacity estimate from Brown et al. 2026). An egg target for Robertson Creek Hatchery of 9 million was agreed to be appropriate because it includes a 2 million egg buffer above the hatchery's 7.1 million egg target to account for uncertainty in the forecasted sex ratio. Thus, the adult escapement target for the Somass Chinook is calculated annually as 14,600 adults plus the expected number of spawners needed to attain 9 million eggs for Robertson Creek Hatchery based on forecasted age and sex ratios (18,987). Accordingly, the target for 2026 is 33,587 adult spawners.

2026 FISHERY MANAGEMENT

Based on the pre-season forecasts, directed terminal fisheries are expected for all sectors for Robertson and Conuma hatchery Chinook. Directed terminal harvests for Nitinat Chinook are expected for Food, Social and Ceremonial (FSC) and recreational fisheries. Terminal fisheries may occur for other smaller hatchery-supported stocks on the WCVI. Excess Salmon to Spawning Requirement (ESSR) fisheries by local First Nations may occur at Robertson and Nitinat hatcheries, as well as a surplus to escapement fishery by the Five Nations at Conuma Hatchery. More details on WCVI Chinook management plans will be available when the 2026/2027 Southern Salmon Integrated Fisheries Management Plan is released later this summer.

SOURCES OF UNCERTAINTY

The sibling regression model produced a mean absolute percentage error (MAPE) of 21.8% for Somass Chinook terminal return forecasts over the 2001–2025 period (Figure 2), indicating that predicted returns differed from observed values by approximately $\pm 22\%$ on average. This approach reduces uncertainty associated with shifting maturation rates; however, this remains a key source of uncertainty that should be periodically re-evaluated. Additional sources of uncertainty include limitations in the sibling regression inputs, changes in pre-terminal exploitation patterns, and variability in ocean conditions associated with climate change.

Forecast uncertainty is higher for other WCVI Chinook stocks included in this bulletin due to generally lower-quality assessment data compared with the Robertson Creek Hatchery indicator stock (a component of the Somass return). These limitations include incomplete age composition data, relatively high uncertainty in spawner abundance estimates (particularly for extensive indicator stocks), and greater uncertainty in pre-terminal catch estimates. Furthermore, survival, exploitation, and maturation dynamics may differ substantially between these stocks and the Robertson Creek indicator stock. Retrospective analyses for return years 2001–2025 indicate that MAPE values for other WCVI stocks ranged from 17% to 49%.

Across all WCVI terminal forecasts, two primary sources of uncertainty are maturation rates and pre-terminal exploitation. In recent decades, WCVI Chinook have exhibited increased maturation rates, resulting in younger age-at-return distributions (*Figure 8*; Brown et al. 2026). Changes in maturation timing affect the expected contribution of older age classes relative to historical averages (Lewis et al. 2015). Forecast reliability is also influenced by pre-terminal exploitation in target and non-target fisheries in Alaska and British Columbia, which varies by an unknown quantity annually and thus, is not explicitly incorporated in the terminal return forecasts. Variability in exploitation patterns may arise from changes in fishery regulations, relative stock abundance in mixed-stock fisheries, shifts in marine distribution, and changes in stock-specific maturation rates.

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APPENDIX—FIGURES AND TABLES

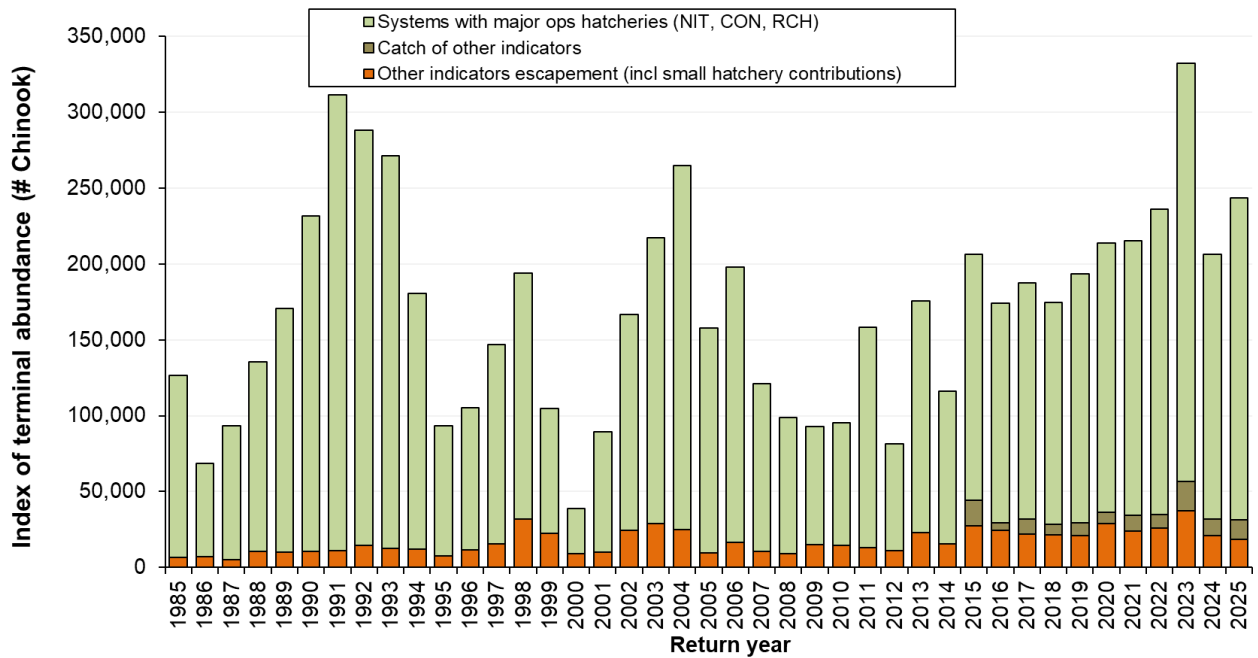


Figure 1. Aggregate terminal Chinook return of WCVI indicator stocks, including major production hatcheries (Robertson Creek, Conuma and Nitinat) and all other indicator stocks—many of which are also supplemented with smaller hatchery production.

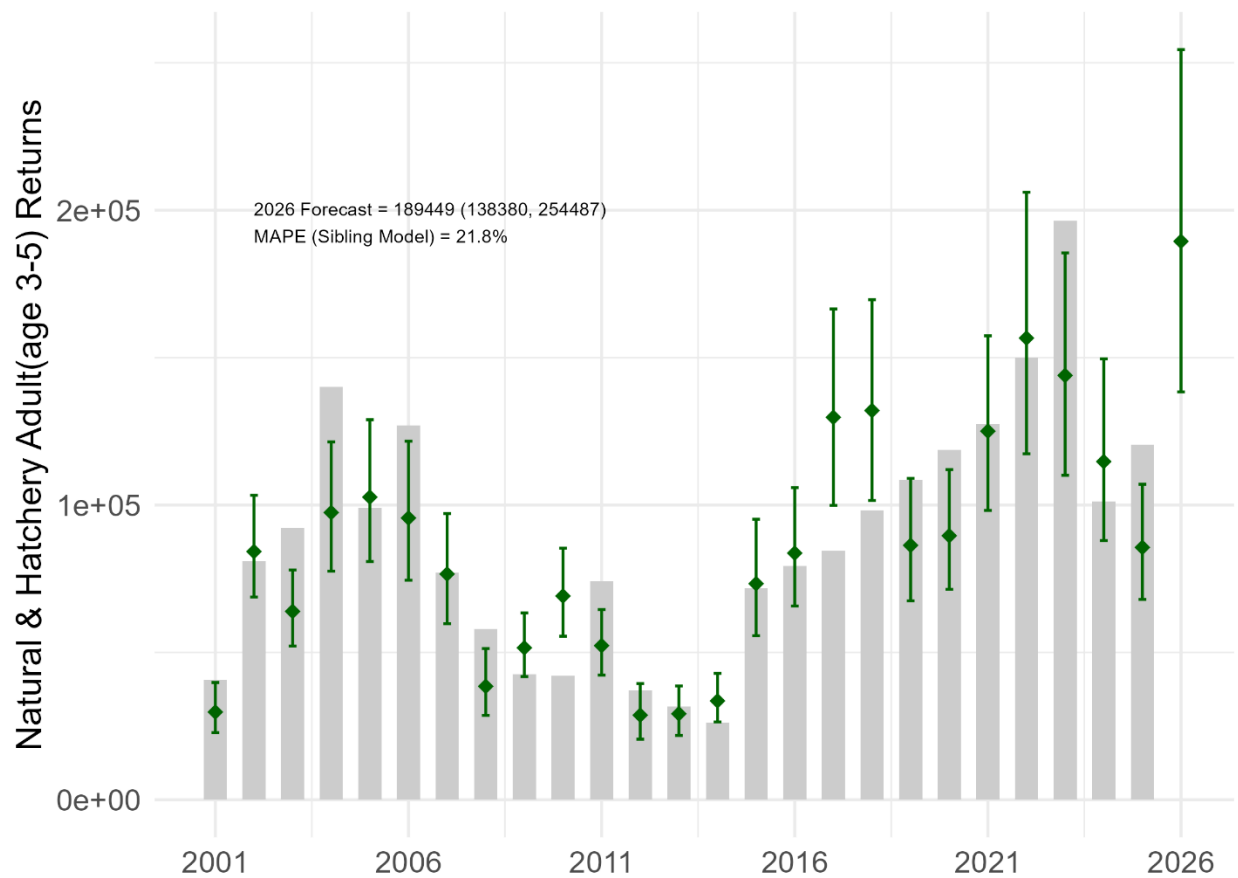


Figure 2. Somass adult Chinook (ages 3+) forecast predictions for 2026 [189,449 (138,380– 254,487)] and retrospective performance of the sibling regression forecasting method since 2001. The gray bars represent the returns for each year, with the green diamonds representing the forecasted values surrounded by their associated 95% CI error bars.

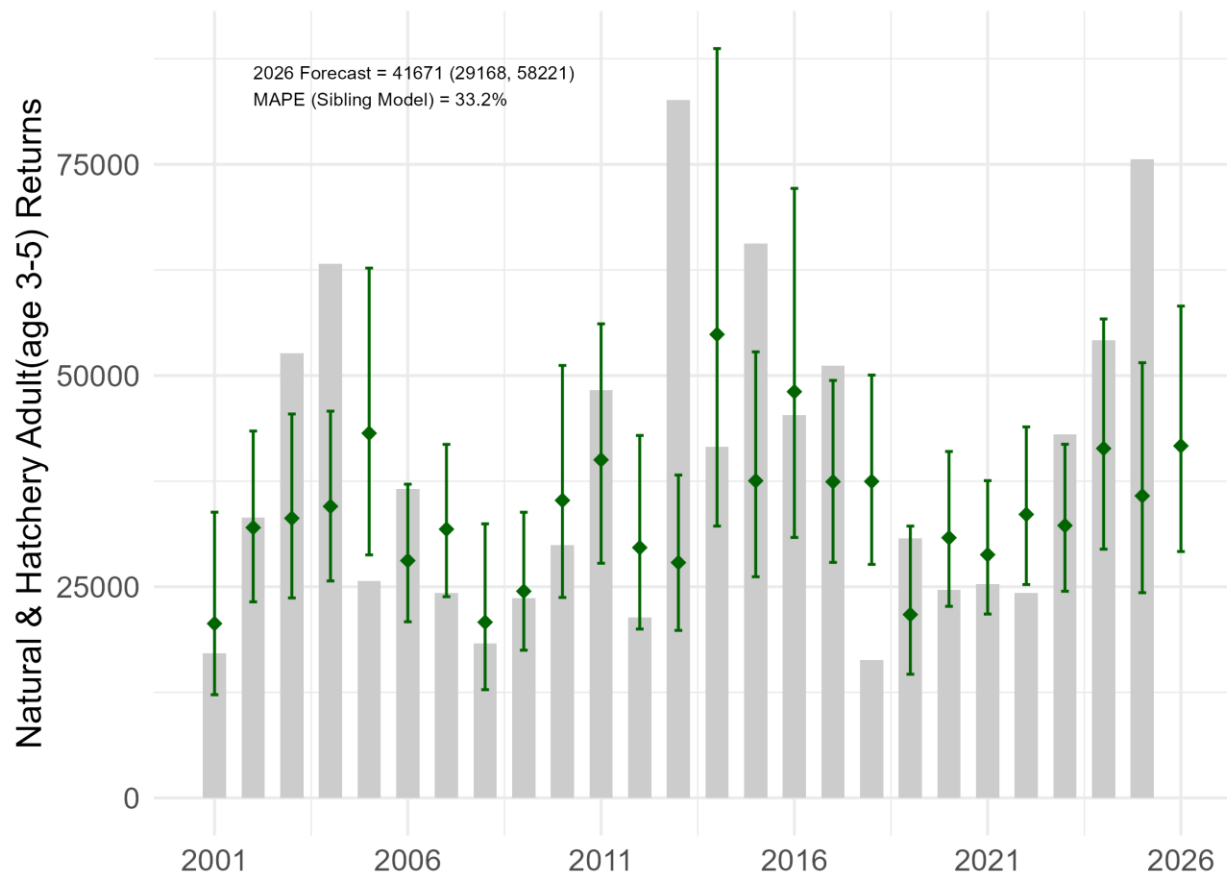


Figure 3. Conuma adult Chinook (ages 3+) forecast predictions for 2026 [41,671 (29,168 – 58,221)] and retrospective performance of the sibling regression forecasting method since 2001. The gray bars represent the returns for each year, with the green diamonds representing the forecasted values surrounded by their associated 95% CI error bars.

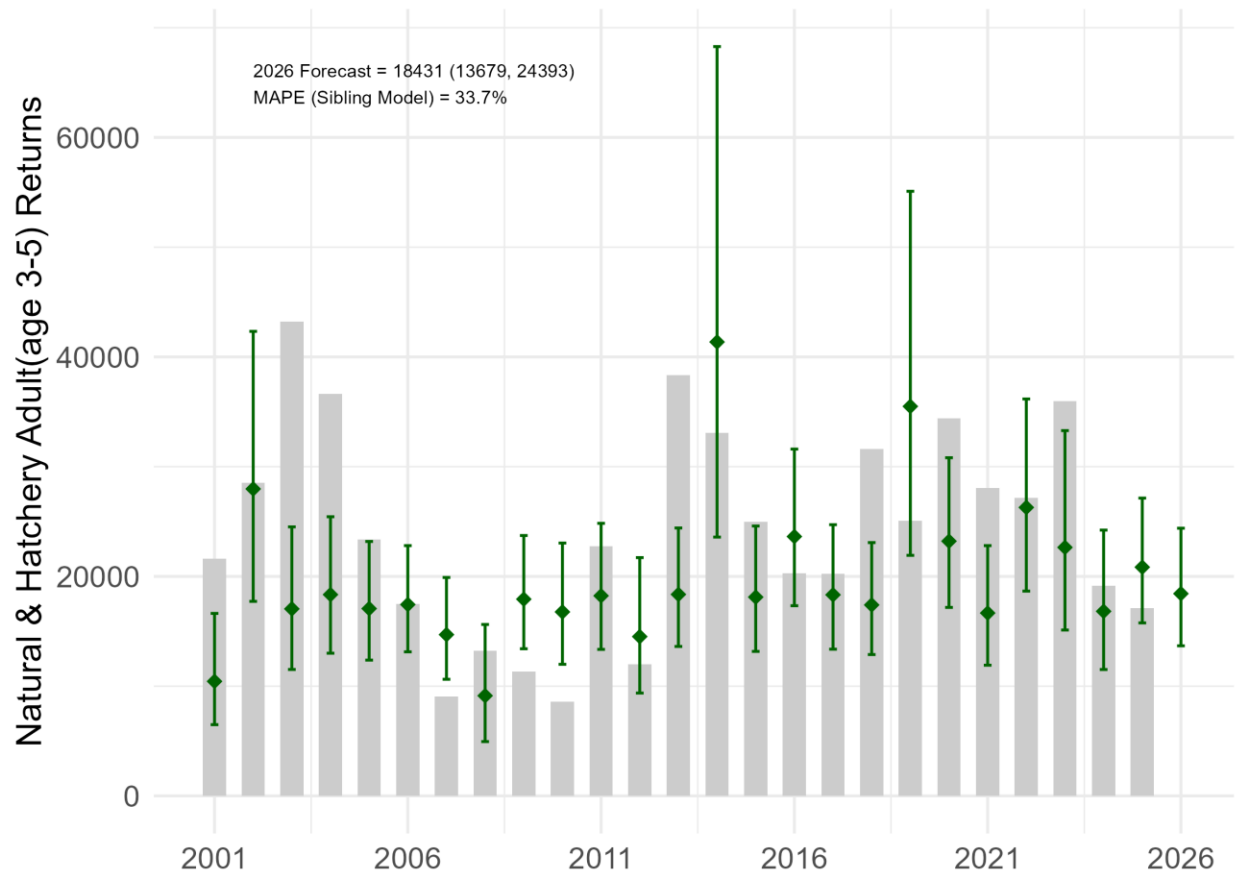


Figure 4. Nitinat adult Chinook (ages 3+) forecast predictions for 2026 [18,431 (13,679 – 24,393)] and retrospective performance of the sibling regression forecasting method since 2001. The gray bars represent the returns for each year, with the green diamonds representing the forecasted values surrounded by their associated 95% CI error bars.

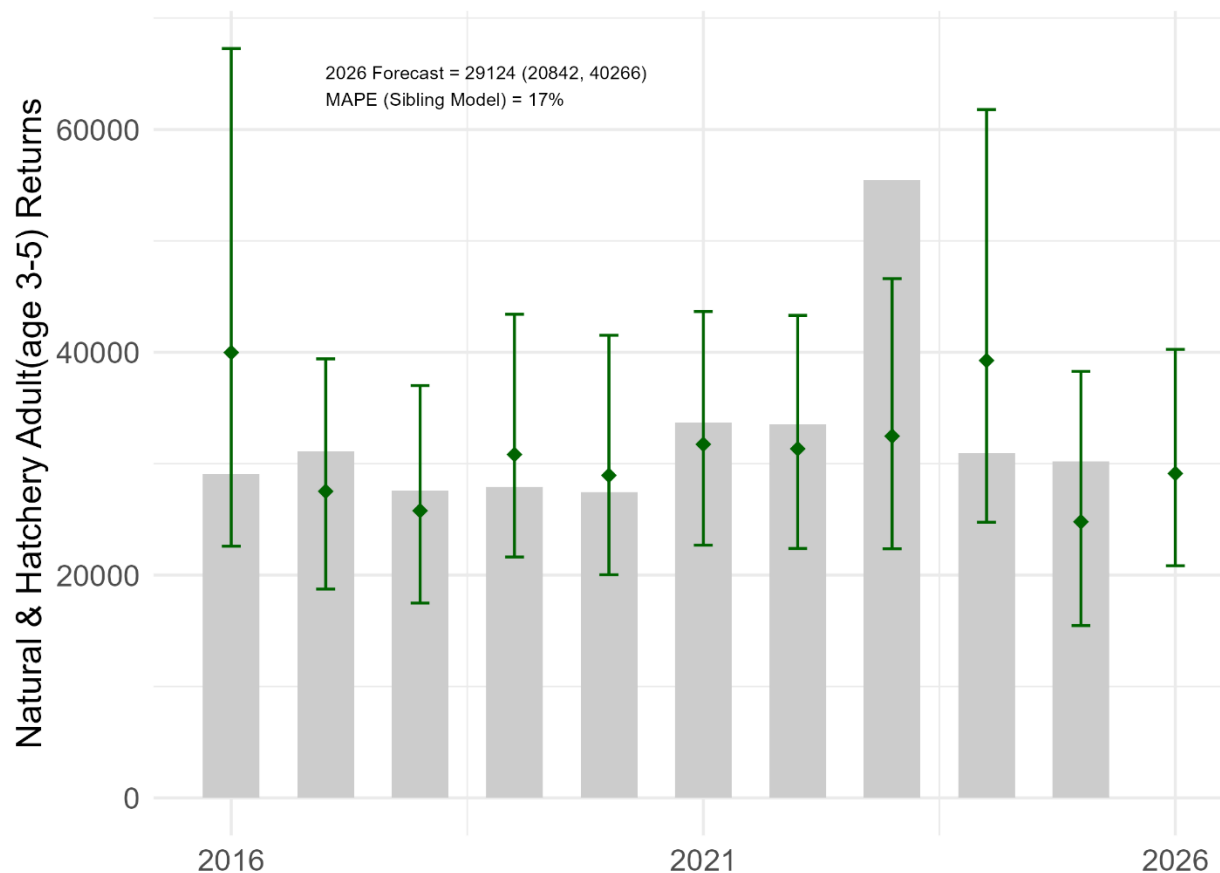


Figure 5. Other WCVI adult Chinook (ages 3+) forecast predictions for 2026 [29,124 (20,842-40,266)] and retrospective performance of the sibling regression forecasting method since 2016. The gray bars represent the returns for each year, with the green diamonds representing the forecasted values surrounded by their associated 95% CI error bars.

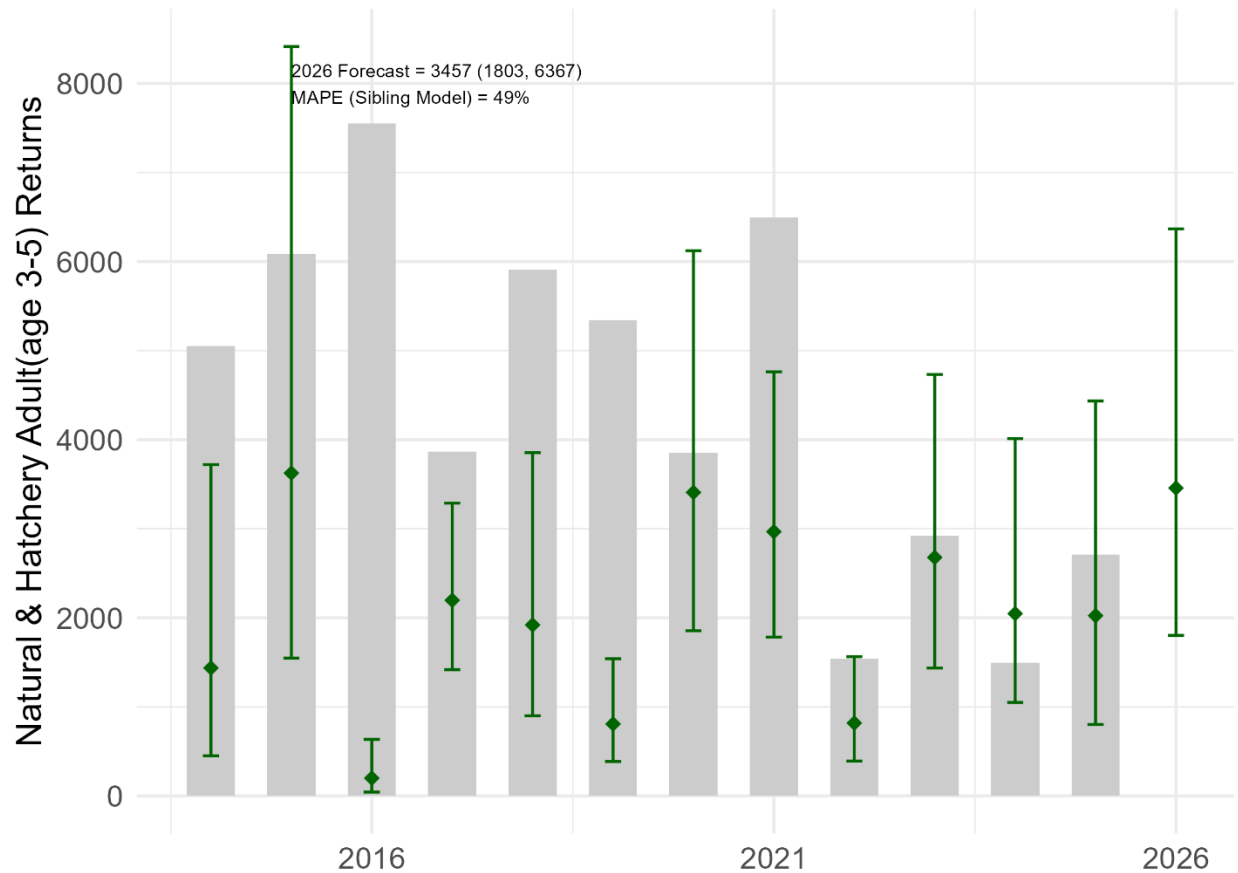


Figure 6. Burman adult Chinook (ages 3+) forecast predictions for 2026 [3,457 (1,803 – 6,367)] and retrospective performance of the sibling regression forecasting method since 2014. The gray bars represent the returns for each year, with the green diamonds representing the forecasted values surrounded by their associated 95% CI error bars.

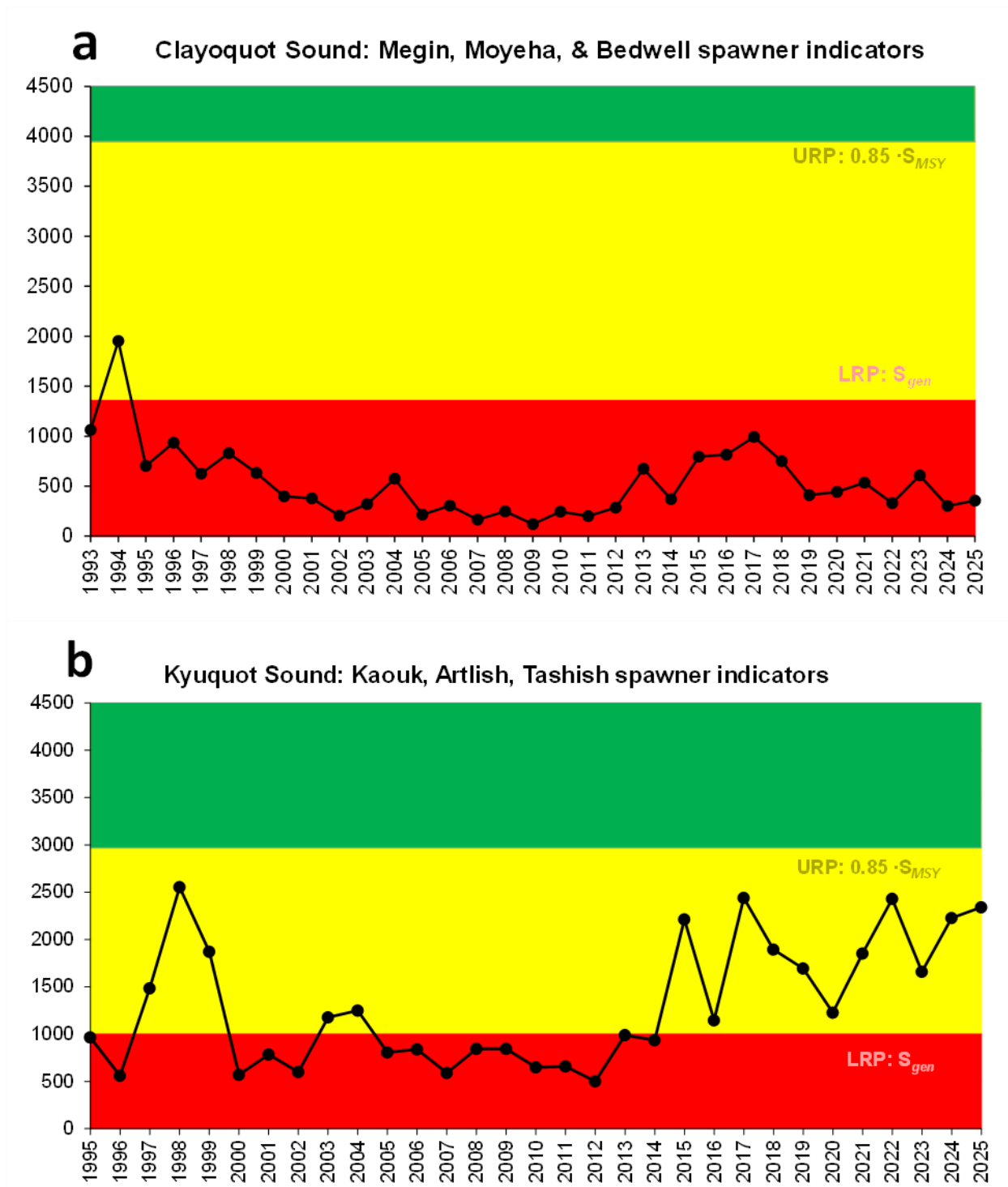


Figure 7. WCVI Chinook spawner abundances of a) SWVI and b) NWVI CUs relative to provisional lower (red) and upper (green) biological benchmarks (S_{gen} and $0.85\% S_{MSY}$, respectively; S_{MSY} for index stocks is estimated in Holt et al. 2023). For each CU, spawner abundances are the summed estimates for wild index stocks that receive little or no enhancement. The upper and lower biological benchmarks are summed across the same wild index stocks.

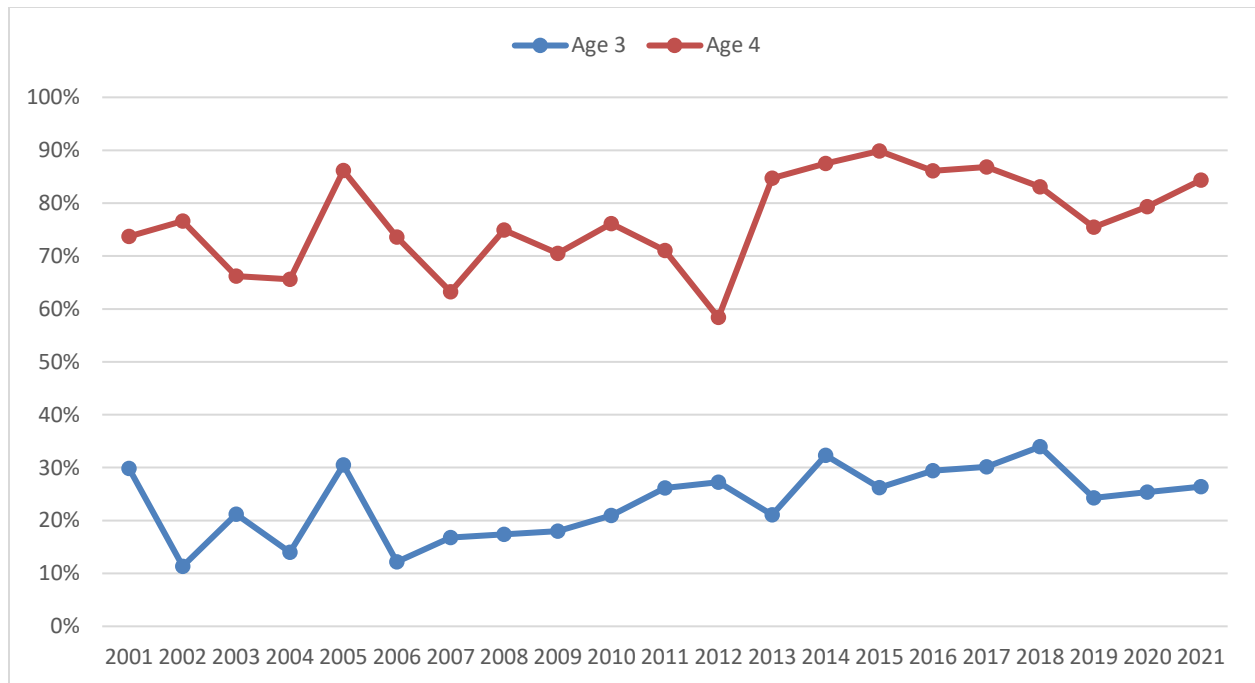


Figure 8. Maturation rates for Stamp/RCH Chinook estimated from the CTC's CWT-based cohort analysis. All age 5 fish are assumed to be mature, and <2% of fish mature at age 2. Data provided by PSC Chinook Technical Committee (CTC)

Table 1. The performance of 2025 WCVI Chinook adult (age 3-5 years) terminal return forecasts. The percentage error of the forecast is the discrepancy between predicted and observed returns. Note: Average and Forecast values were rounded to 1000, the WCVI average-aggregate return (1996-2025) value is presented as the total and does not equal the sum of the average return by stock.

Stock(s)	Average adult return (1996–2025)	2025 Observed	2025 Forecast Range	2025 Forecast Prediction	% Error
Somass	80,000	120,528	65,000 – 105,000	83,000	-31%
Conuma	37,000	75,549	22,000 – 48,000	33,000	-56%
Nitinat	25,000	17,078	16,000 – 28,000	21,000	+24%
Other WCVI*	34,000	30,007	13,000 – 40,000	23,000	-24%
Total	156,000	243,162	115,000 – 220,000	160,000	-34%

*An aggregate of the Pacific Salmon Commission indicators (Artlish, Burnam, Gold, Kaouk, Marble, Tahsis, & Tashish rivers) and “extensive” indicators (Bedwell, Colonial, Cypre, Leiner, Megin, Moyeha, Nahmint, San Juan, Sarita, Tranquil, & Zeballos rivers).

Table 2. Estimated 2025 returns of WCVI Chinook index stocks to the terminal WCVI area (i.e., after pre-terminal Canadian fisheries).

Stock(s)	Age					Age 3-5 Total	Total
	2	3	4	5	6		
Somass	13,217	66,764	43,826	9,938	33	120,528	133,778
Conuma	497	15,901	39,726	19,922	66	75,549	76,112
Nitinat	639	4,732	11,577	769	18	17,078	17,735
Other WCVI*	1,013	8,456	14,861	6,690	188	30,007	31,208
Total (% Total Run)	15,366 (6%)	95,853 (37%)	109,990 (42%)	37,319 (14%)	305 (0%)	243,162	258,833

*An aggregate of the Pacific Salmon Commission indicators (Artlish, Burnam, Gold, Kaouk, Marble, Tahsis, & Tashish rivers) and “extensive” indicators (Bedwell, Colonial, Cypre, Leiner, Megin, Moyeha, Nahmint, San Juan, Sarita, Tranquil, & Zeballos rivers).

Table 3. 2026 pre-season terminal run size expectations for indexed WCVI Chinook populations in addition to Somass (RCH). The total is the terminal run prediction for the WCVI aggregate (*i.e.*, summed index stocks). Note: Numbers rounded to 1000s. If the total is different, it is because the individual stock forecasts were summed and then rounded to the 1000s.

Stock(s)	Age						Total	Range
	3	%	4	%	5	%		
Somass	115,000	61%	68,000	36%	6,000	3%	189,000	138,000 – 254,000
Conuma	9,000	21%	26,000	62%	7,000	17%	42,000	29,000 – 58,000
Nitinat	7,000	36%	10,000	54%	2,000	10%	18,000	14,000 – 24,000
Other WCVI*	8,000	27%	18,000	63%	3,000	10%	29,000	21,000 – 40,000
Total	138,000	50%	122,000	44%	18,000	6%	279,000	202,000 – 377,000

*An aggregate of the Pacific Salmon Commission indicators (Artlish, Burman, Gold, Kaouk, Marble, Tahsis, & Tashish rivers) and “extensive” indicators (Bedwell, Colonial, Cypre, Leiner, Megin, Moyeha, Nahmint, San Juan, Sarita, Tranquil, & Zeballos rivers).

Table 4. Burman Chinook 2026 pre-season terminal run size prediction. Burman is included in Other WCVI but broken out separately for management purposes. Numbers are rounded to the 100s.

Method	Range	Prediction
Terminal Run Sibling Method	1,800 – 6,400	3,500