

Genetic Stock Composition Analysis of Chum Salmon from the Prohibited Species Catch of the 2025 Bering Sea Walleye Pollock Trawl Fishery

Preliminary Report

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Executive Summary ¹

We analyzed genetic stock compositions of chum salmon (*Oncorhynchus keta*) prohibited species catch (PSC) samples collected from the 2025 walleye pollock (*Gadus chalcogrammus*) fishery in the Bering Sea. Samples were genotyped for 84 single nucleotide polymorphism markers from which stock contributions were estimated using a range-wide chum salmon baseline developed by the Alaska Department of Fish and Game. The non-chinook salmon PSC was 151,214 fish (150,938 chum salmon in the B season), substantially lower than the 10-year average of 297,085. In addition to the reduction in overall bycatch, the proportion of Western Alaska fish in the bycatch was 3.4%, considerably lower than the long-term average of 14.4%. An estimated 5,204 (4,342-6,197) chum salmon originating from Western Alaska were captured as bycatch which was lower than the mean of 35,914 chum salmon from 2011 to 2024. The overall proportion of the Upper/Middle Yukon reporting group was 1.1% of the bycatch, a decrease from 4.8% in 2024; however, with the increase in overall bycatch numbers the estimated number of Upper Middle Yukon fish was relatively similar to the previous year (1,650 in 2024 and 1,560 in 2025). The proportion of the Southwest Alaska chum salmon remained low, accounting for 1.5% of the bycatch, with an estimated 2,222 (1,455-3,099) fish caught in 2025. In aggregate, Western Alaska, Upper/Middle Yukon, and Southwest Alaska comprised 6% of the bycatch which represents 8,987 chum salmon. The Eastern Gulf of Alaska / Pacific Northwest reporting group comprised the largest proportion of the bycatch (43.9%), similar in proportion to estimates from 2015 (51.4%) and 2020 (42.5%). The SE Asia and NE Asia reporting groups comprised 21.0% and 29.1% of the bycatch, respectively. Consistent with historic trends, the highest proportion and number of Western Alaska chum salmon are from bycatch in the eastern portion of the pollock fishing grounds. The average location of bycatch from all three processing sectors (catcher processor, mothership, and shoreside) was shifted northwest relative to prior years likely in response to strategies to avoid Western Alaska chum salmon. The catcher processor sector, consistent with prior years, was the furthest northwest while the shoreside sector was the furthest east. Because of the differences in fleet distributions, the Western Alaska reporting group made up a larger proportion of the shoreside and mothership sector's bycatch, whereas the Asia reporting groups made up a larger proportion of the catcher processors bycatch.

¹ *Disclaimer* - These represent preliminary analyses of the 2025 chum salmon genetic data. Numerous plots in this report display fishery information. All data are non-confidential. Data have been aggregated and any data point with fewer than three unique vessels has been removed.

Catch Summary

Temporal Trends

The chum salmon prohibited species catch (PSC), referred to as “bycatch” throughout this report, in the B season of the Bering Sea walleye pollock trawl fishery was 150,983 fish in 2025 (Fig. 1). This was 145,628 fish fewer than the 10-year average of 297,085 (SD 151,738), but an increase from the last two years. As is typical, over 97% of the bycatch of chum salmon occurred in the B season (10 June through 1 November).

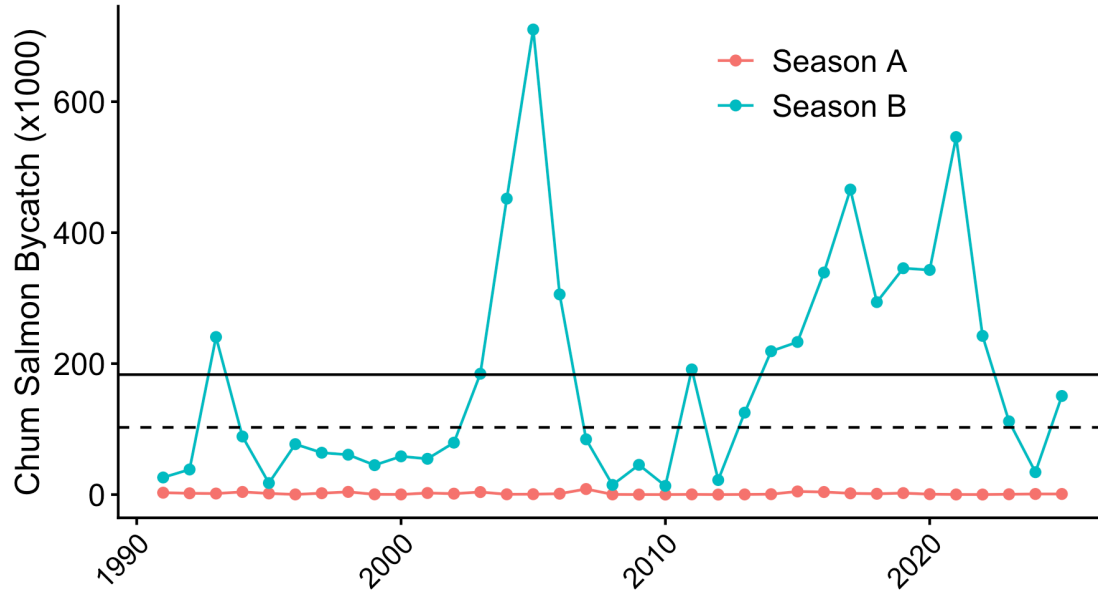


Figure 1: Chum salmon prohibited species catch (PSC) for the A and B seasons from the Bering Sea pollock-directed trawl fisheries. The solid horizontal line represents the mean PSC and the dashed line represents the median PSC from 1991 to 2024.

Within the B season, the chum salmon bycatch was bimodal, characterized by two peaks. The first smaller peak occurred in late August (statistical week 34), while the second larger peak occurred in mid-September (statistical week 38; Fig. 2 top panel). These two weeks accounted for 49% of the total bycatch. Relative to prior years, the timing of the bycatch was quite late, with 50% of the bycatch occurring around week 34 (Fig. 2 bottom panel). This timing was most similar to years 2012 and 2020 and about 2 weeks later than normal.

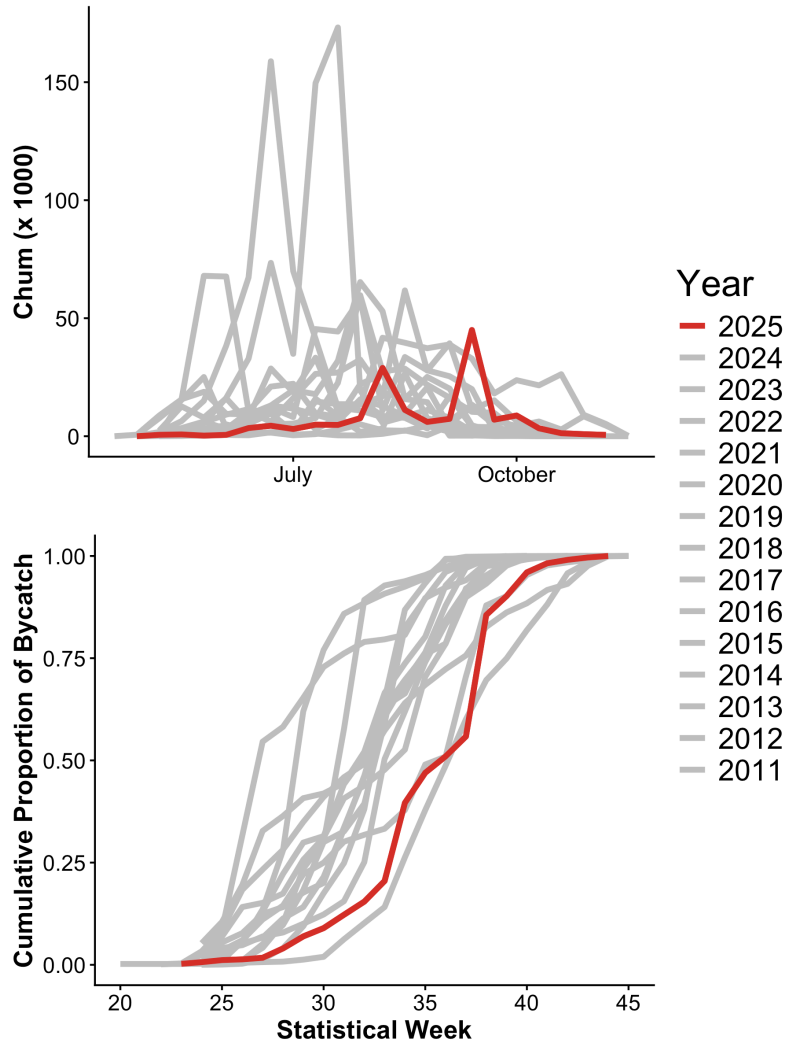


Figure 2: Number of chum salmon caught during the B-season (top) and cumulative proportion of chum salmon catch (bottom) from the Bering Sea pollock trawl fishery by statistical week for years 2011 to 2025.

Spatial Trends

The geographical distribution of the 2025 chum salmon bycatch differed from prior years. Of the spatial clusters previously defined by the Alaska Fisheries Science Center (AFSC) Auke Bay Laboratory (ABL) Genetics Program the greatest numbers of chum salmon bycatch were encountered clusters 4 and 2 where 37.7% and 36.6% of the bycatch was caught respectively. Contrary to prior years, relatively little bycatch occurred in cluster 1 (Fig. 1 orange area). The highest number of chum salmon caught as bycatch came from Alaska Department of Fish and Game (ADF&G) statistical area 675500 where 36,458 chum salmon were caught. The second largest number of chum salmon caught was 13,148 in statistical area 655430. Combined, these two statistical areas account for 33% of the total bycatch.

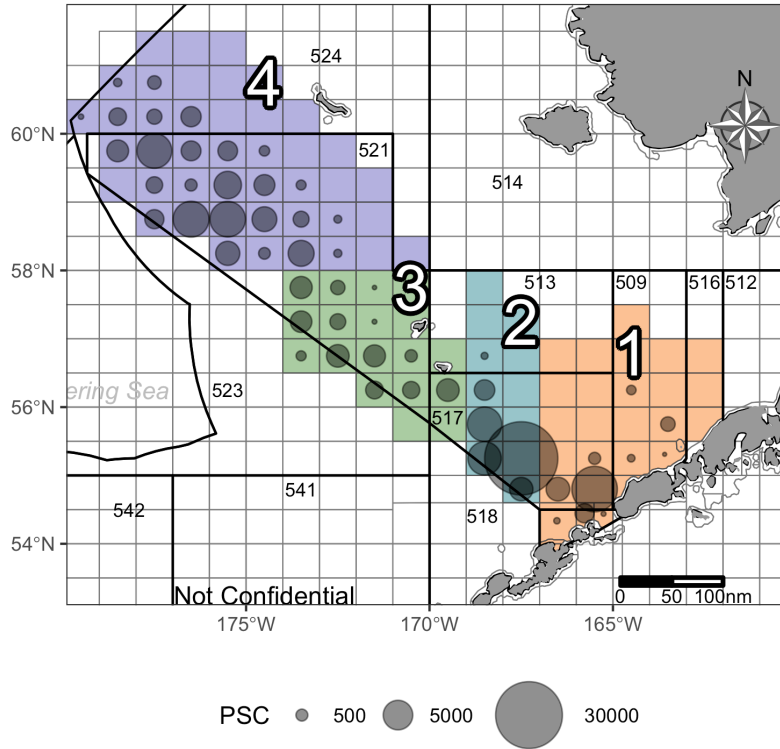


Figure 3: Spatial distribution of chum salmon bycatch caught in the 2025 Bering Sea B-season pollock fishery. ADF&G statistical areas are highlighted based on the four geographic strata assigned in prior genetic analyses.

To evaluate bycatch hotspots, areas where there were large catches of chum salmon relative to total pollock catch, we calculated the bycatch rates defined as the number of chum salmon per metric ton of pollock harvested (chum/mt. pollock) for each of the ADF&G statistical areas (Fig. 4). The average bycatch rate, across statistical areas, was 0.32 chum/mt. pollock - with a low of 0.01 and a high of 2.64 chum/mt. pollock. Evaluated at individual ADF&G statistical areas, 3 of the 5 highest bycatch rates were in cluster 2 and 6 of the 10 highest were in cluster 4 (Fig. 4). Averaged across statistical areas within clusters, cluster 2 had the largest bycatch rate at 0.99 chum/mt. pollock while clusters 1 and 3 had relatively similar rates, 0.11 and 0.13 respectively. Cluster 4 had a slightly higher average rate, 0.17 chum/mt. pollock, with high variability among statistical areas.

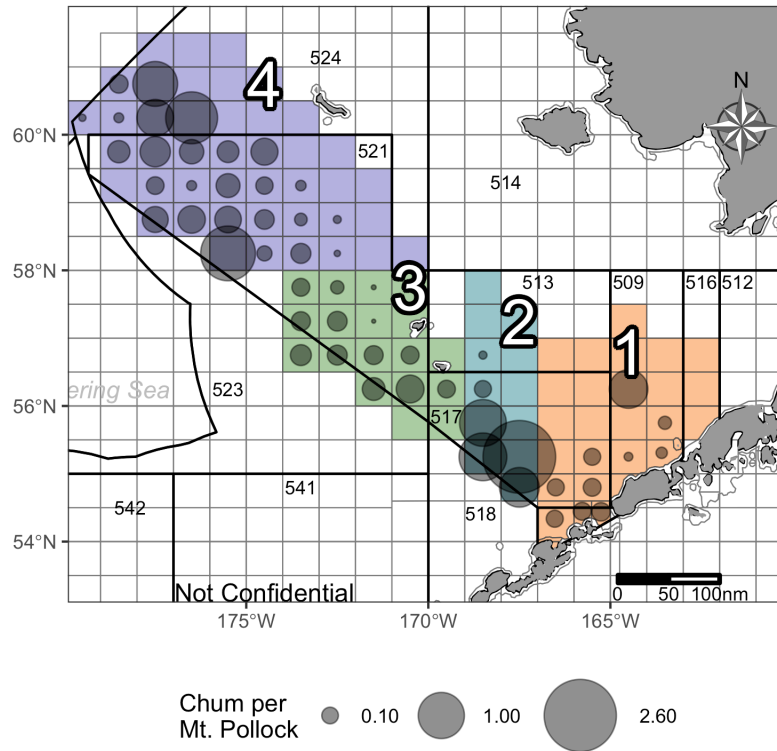


Figure 4: Spatial distribution of chum salmon bycatch rates, calculated as total chum salmon bycatch divided by total metric tons of pollock harvested, in the 2025 Bering Sea B-season pollock fishery. ADF&G statistical areas are highlighted based on the four geographic strata assigned in prior genetic analyses.

We evaluated shifts in the distribution of the chum salmon bycatch by plotting the centroid (average location of the bycatch) calculated for each year by sector. The spatial arrangement of the centroid was investigated for associations with a variety of environmental covariates including the Pacific Decadal Oscillation (PDO), warm pool, sea ice extent, and eastern Bering Sea surface temperature (shown). Climate data were downloaded from [NOAA's Physical Science Laboratory climate indices data repository](#).

In 2025 the average location of all the sectors' bycatch was shifted northwest (Fig. 5, left column). The average location of the bycatch from the CP and S sectors was the furthest Northwest of the timeseries. The mothership sector was also shifted relative to prior years, only exceeded by 2023 and 2015 (Fig. 5; middle row right column). The mean Eastern Bering Sea temperature in 2025 was 5.08°C, slightly warmer than the average from 2011-2024 (4.72°C). It appears that in years with lower sea surface temperatures in the Eastern Bering Sea the centroid of the shoreside sector, and to a lesser extent the mothership sector, is further on the shelf (Fig. 5). It should be noted that few cold years (2011-2013) contribute to this observation and most occur early in the time series.

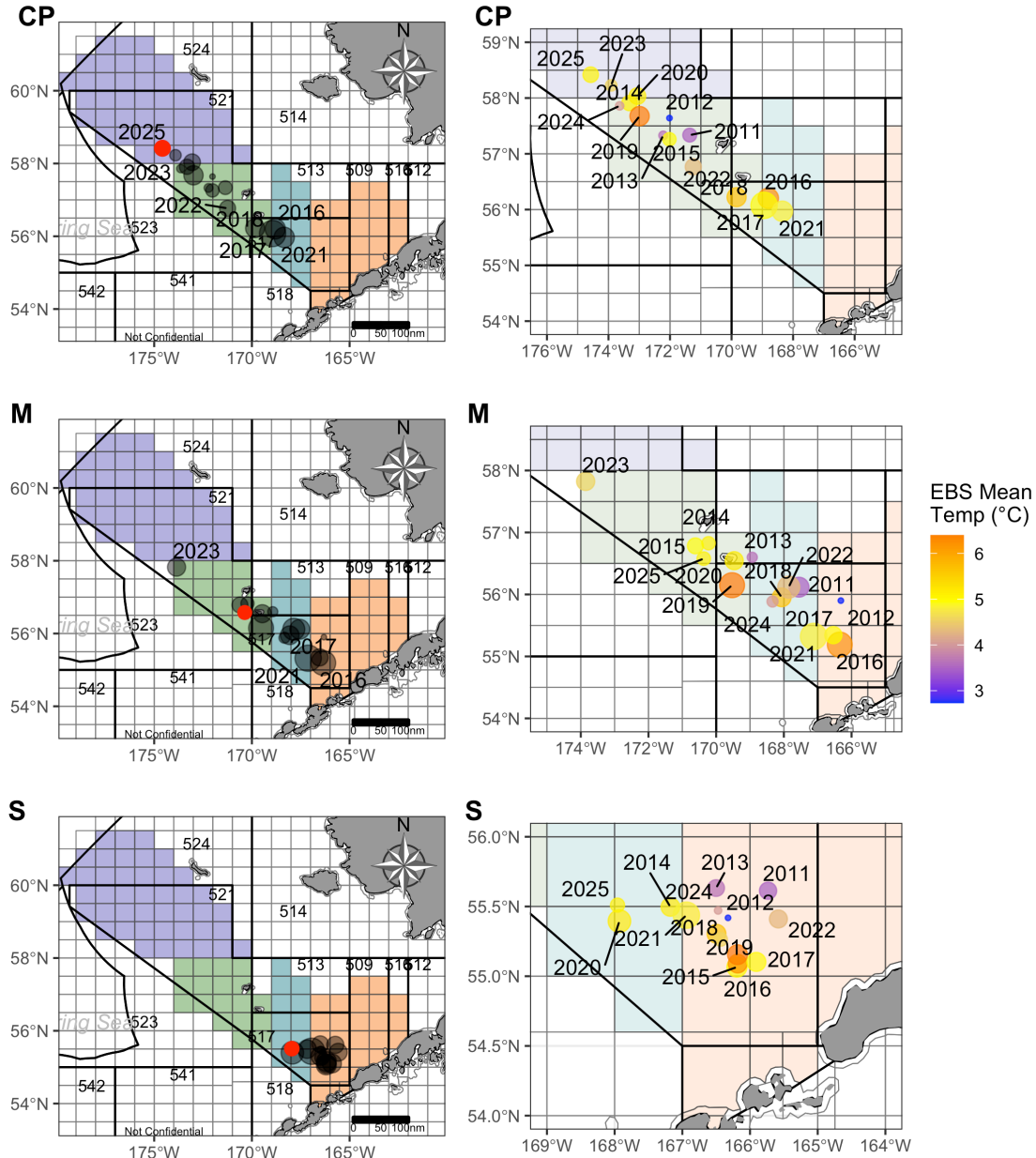


Figure 5: Change in the spatial distribution of chum salmon bycatch as measured by the centroid of the bycatch by sector; catcher-processor (CP), mothership (M) and shoreside (S). Point sizes reflect the relative size of the bycatch. The left column highlights the most recent year, 2025 (red) over all genetic report cluster areas, while the right column zooms into the sectors spatial extend with points colored by the mean sea surface temperature (°C).

Bycatch Genotyping Summary

Data from the AFSC Fisheries Monitoring and Analysis North Pacific Observer Program (Observer Program), total chum salmon bycatch, and genetic sample information were downloaded from the AFSC schema in the Alaska Fisheries Information Network (AKFIN) database. The ABL Genetics Program received 4,719 genetic samples from the Bering Sea and Aleutian Islands (BSAI) and 89 samples from the Gulf of Alaska (GOA) that were collected by the Observer Program in 2025.

After inventorying the genetic samples, the genetics lab determined that there was sufficient capacity to genotype all of the samples that were received. DNA from 4,719 genetic samples, 100% of the total genetic samples received from the Observer Program, was extracted and amplified for the 84-SNP locus GTseq panel (Appendix II Table A1). Samples that were not genotyped for at least 80% of the GTseq panel (minimum of 68 loci) were omitted from analyses. Of the 4,719 samples amplified, 4,241 were of adequate quality to include (89.9% of the total sample).

We re-amplified and genotyped 2% of samples for quality control (QC). The scores of these QC samples were compared with the scores from the originally genotyped samples to estimate the genotyping error rates. The average agreement over loci was 98.4%, and the average agreement among individuals was also high (98.6%), indicating high genotyping accuracy and correct sample organization. This ensured that the GTseq assay was consistent and provided confidence that the mixtures we analyzed contained the correct genetic samples.

Genetic Stock Composition

Stock composition analyses for the 2025 chum salmon samples were performed with the Bayesian conditional mixed stock analysis (MSA) approach with bootstrapping over reporting groups implemented in the R package *rubias* v0.4.1 (Moran and Anderson 2019). Mixture genotypes were compared to an updated version of WASSIP baseline [DeCovich et al. (2012); Data provided by ADF&G and populations listed in Appendix II Table A2] in which populations were grouped into regional reporting groups (Fig. A1) that were consistent with prior analyses based on the Fisheries and Oceans Canada (DFO) chum salmon microsatellite baseline (Beacham et al. 2009).

Overall Trends

Western Alaska comprised 3.4% of the bycatch, greatly reduced from the long-term average of 14.4% from 2011 to 2024. Both SW Alaska and the Upper/Middle Yukon comprised relatively minor portions of the bycatch, 1.5% and 1.1% respectively. Consistent with prior years, Asia stocks comprised a substantial fraction (50.1%) of the chum salmon bycatch in the B season. The contribution from the NE Asia reporting group (29.1%) was a minor decrease from 2024 and similar in magnitude to estimate from 2020 and 2022. The SE Asia reporting group showed a substantial increase in relative proportion in the bycatch since 2022. SE Asia comprised 21% of the bycatch in 2025, a slight reduction from the high of 24.4% in 2024, but above the long-term average of 15.5%. While the EGOA/PNW comprised about the same proportion of the bycatch as the NE Asia reporting group last year (28.5%), this year its contribution increased to 43.9%.

There is a clear cyclical pattern of contribution between the NE Asia and EGOA/PNW reporting groups (Fig. 6) with a strong negative correlation ($r = -0.85$).

Table 1: Regional stock composition estimates of chum salmon from the 2025 Bering Sea, B-season pollock fishery ($PSC = 150,983$; $n = 4,220$). The estimated number of chum salmon bycatch, the 95% CI for the estimated number, mean proportion, 95% credible intervals, $P = 0$ statistic (the probability that a stock composition estimate is effectively zero [Munro et al. 2012]), and the Gelman-Rubin shrink factor (SF).

Region	Est. num.	Est. CI	Mean	2.5%	97.5%	P=0	SF
SE Asia	32,629	30,655-34,637	0.210	0.197	0.222	0.00	1.00
NE Asia	43,145	41,035-45,320	0.291	0.277	0.305	0.00	1.00
W Alaska	5,204	4,342-6,197	0.034	0.028	0.040	0.00	1.00
Up/Mid Yukon	1,560	1,071-2,148	0.011	0.008	0.015	0.00	1.00
SW Alaska	2,222	1,455-3,099	0.015	0.011	0.020	0.00	1.01
E GOA/PNW	66,220	63,934-68,522	0.439	0.424	0.454	0.00	1.00

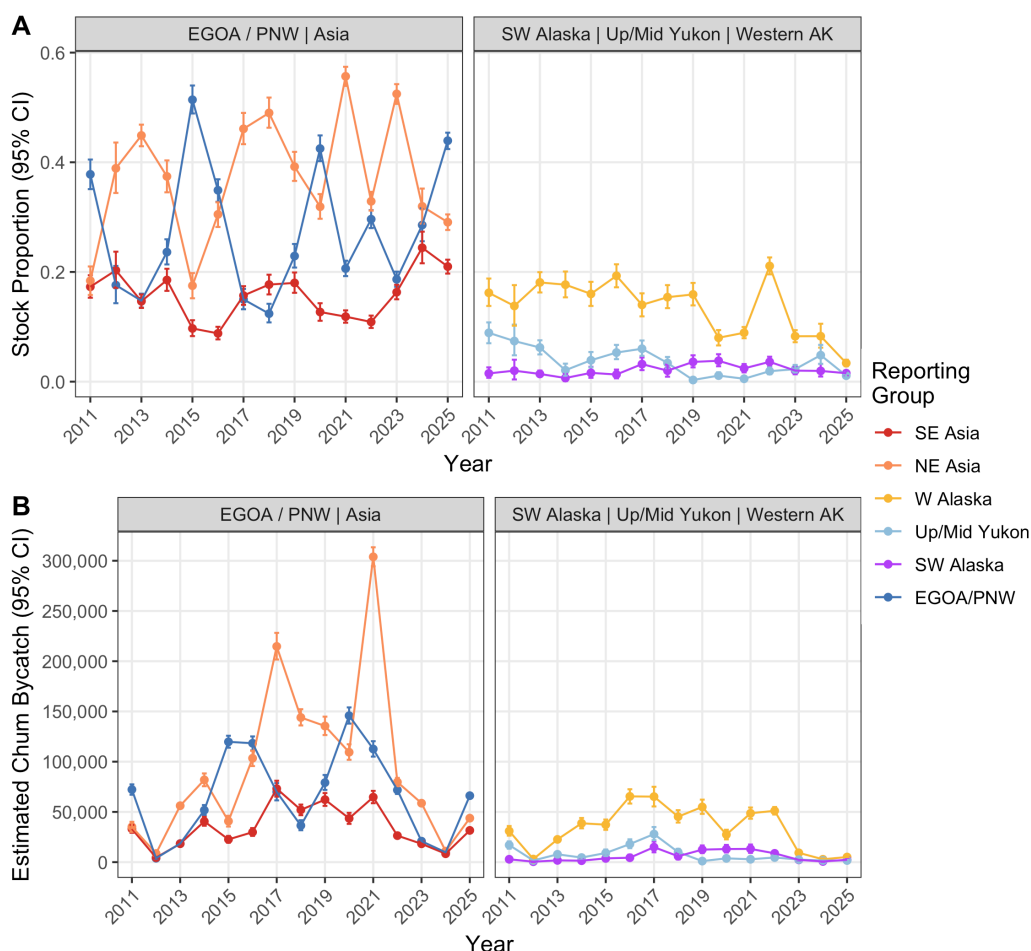


Figure 6: Annual bycatch estimates of B season chum salmon PSC from 2011 to 2025. (A) stock proportions with 95% credible intervals, (B) Estimated number of chum salmon with 95% credible intervals.

Temporal Trends

The B season was divided into Early (pre week 30), Middle (weeks 30-34) and Late (post week 34) time periods to evaluate whether regional group contributions changed through the season. As noted above, bycatch numbers increased through the season with the majority of chum salmon caught in the Late time period (Fig. 2). There was a notable shift in the catch composition among the time periods for several reporting groups. The Western Alaska reporting group was highest in the Early period where it comprised 9.2% of the bycatch, declined to 5.9% in the Middle period and 1.3% by the Late period (Fig. 7). Similarly, the proportions of the Upper/Middle Yukon and SW Alaska reporting groups were greatest during the early period, and decreased in the middle and late periods. Both the NE and SE Asia reporting groups peaked in the Middle period and dropped substantially by the Late period. The NE Asia reporting group increased from 32.1% in the Early to a high of 42.3% in the Middle period, and decreased to 22.4% in the Late period. The only stock to show an increase between the Early and Middle to the late period was the EGOA/PNW reporting group. It increased from an average of 21.1% in the Early and Middle periods to 58.7% in the Late period (Fig. 7).

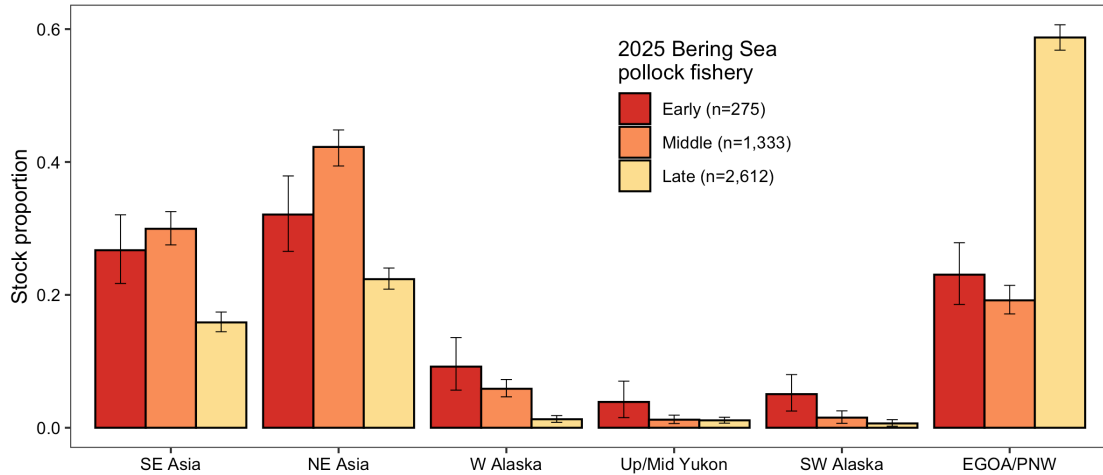


Figure 7: Stock composition estimates for the chum salmon bycatch from the Early, Middle, and Late periods of the 2025 Bering Sea, B-season pollock fishery. Sample sizes for each mixture provided in the figure legend.

While there is substantial intra-year variability in the trends observed among the three time periods there are some general trends (Fig. 8). Typically, SE Asia comprises a larger proportion of earlier bycatch while NE Asia comprises a smaller proportion of early bycatch. Western Alaska typically comprises a smaller proportion of the late bycatch, although has substantial variability among years in both the Early and Middle periods. Similarly, the Early period typically is the largest proportion of the Upper/Middle Yukon and Southwest Alaska regional groups. The EGOA/PNW reporting group increases in relative proportion from the Early and Middle to the Late period. It should be noted that the boxplot (Fig. 8) compares the annual mean estimate and ignores the uncertainty (credible intervals) that surround the point estimates. It is not uncommon for means to differ, but credible intervals to overlap.

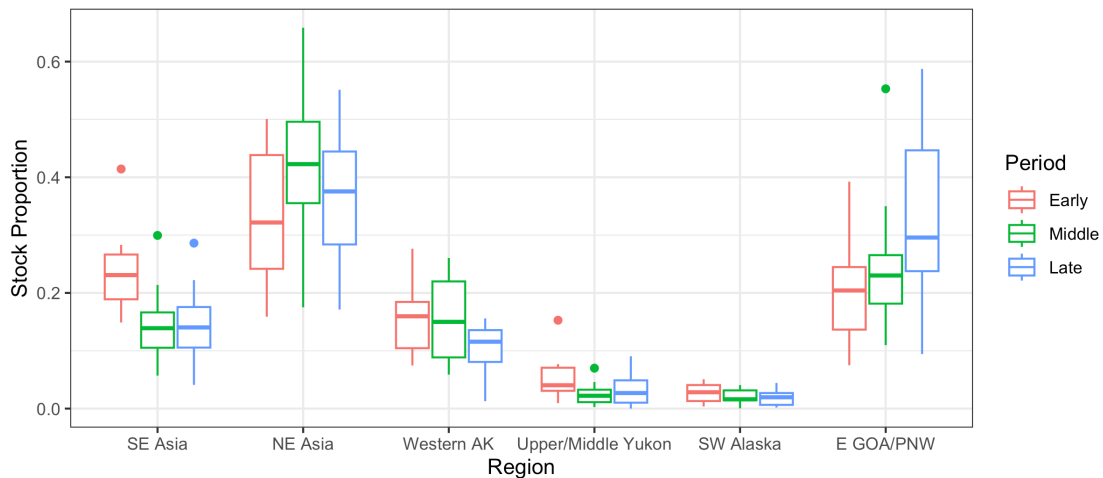


Figure 8: Boxplot of mean stock composition estimates for the chum salmon bycatch from the Early, Middle, and Late periods from 2011-2025 Bering Sea, B-season pollock fishery.

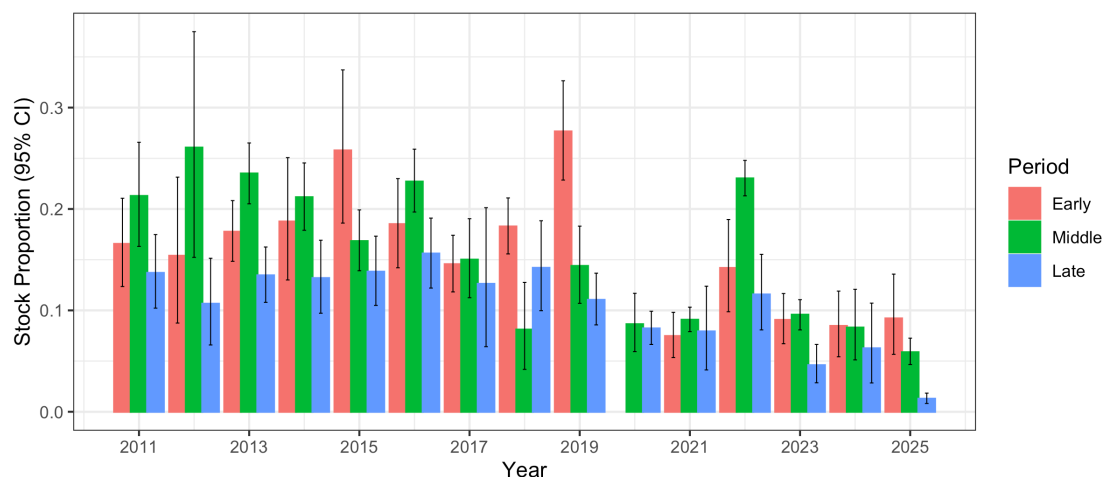


Figure 9: Mean stock composition estimates for the Western Alaska reporting group from the Early, Middle, and Late periods from 2011-2025 Bering Sea, B-season pollock fishery.

When we compare the estimates of the Western Alaska reporting group from 2011 to 2025 (Fig. 9), we see substantial overlap in the credible intervals for some year/period combinations owing to low sample sizes. However, there is a fairly consistent signal of Western Alaska comprising a smaller proportion of the bycatch in the Late period compared to the Early or Middle periods.

Spatial Trends

Analyses where the bycatch has been divided into mixtures based on longitude, with 170°W as the dividing line have historically shown that the relative contribution of the Western Alaska, Upper/Middle Yukon, Southwestern Alaska, and EGOA/PNW reporting groups generally increases closer to the Alaska Peninsula (East of 170°W). In 2025, this was true for the Western Alaska, Southwestern Alaska, and EGOA/PNW reporting groups while the Upper/Middle Yukon was slightly higher West of 170°W (Fig. 10). The relative contribution of the Asia reporting groups, alternatively, are generally larger for mixtures West of 170°W. This was true for both of the Asia reporting groups in 2025. The SE Asia reporting group; comprising 36.6% of the bycatch west of 170°W and 5.8% of the bycatch east of 170°W while the NE Asia reporting group comprising 43.7% of the bycatch west of 170°W and 14.9% of the bycatch east of 170°W (Fig. 10).

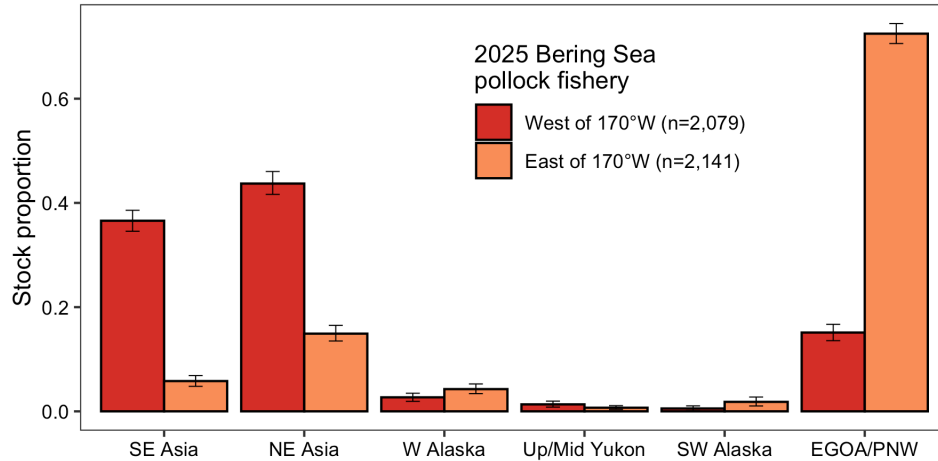


Figure 10: Stock composition estimates for the chum salmon bycatch from the 2025 Bering Sea, B-season pollock fishery from the U.S. waters of the Bering Sea west of 170°W and the southeastern Bering Sea east of 170°W.

Spatiotemporal Trends

The ABL genetics program has previously separated the Bering Sea into finer-scale spatial strata (4 clusters of ADFG statistical areas based on the zones defined in Haynie and Pfeiffer (2013) to evaluate economic and climate drivers of the fishery), and incorporated temporal stratification (Early and Late) to evaluate the spatiotemporal stock specific contributions. In 2025, all but the Cluster 2 Early analyses could be performed.

The NE and SE Asia reporting group results are consistent with the very strong spatial trends noted in the East and West of 170° analyses. Both groups show a substantial decrease in the proportion of bycatch in clusters 1 and 2 compared to that in clusters 3 and 4. Decreasing from three temporal periods, averaged over space, to two temporal periods within clusters lessened the generally decreasing proportion of these groups in the temporal analyses, except for the SE Asia reporting group in cluster 1 (Fig. 11). The EGOA/PNW represented generally increasing proportions of the bycatch from West (cluster 4) to east (cluster 1) and from early to late periods. Notably, the EGOA/PNW group comprised 81.6% of the bycatch in cluster 2 late, which equated to 26,374 chum salmon of the total bycatch of 32,283.

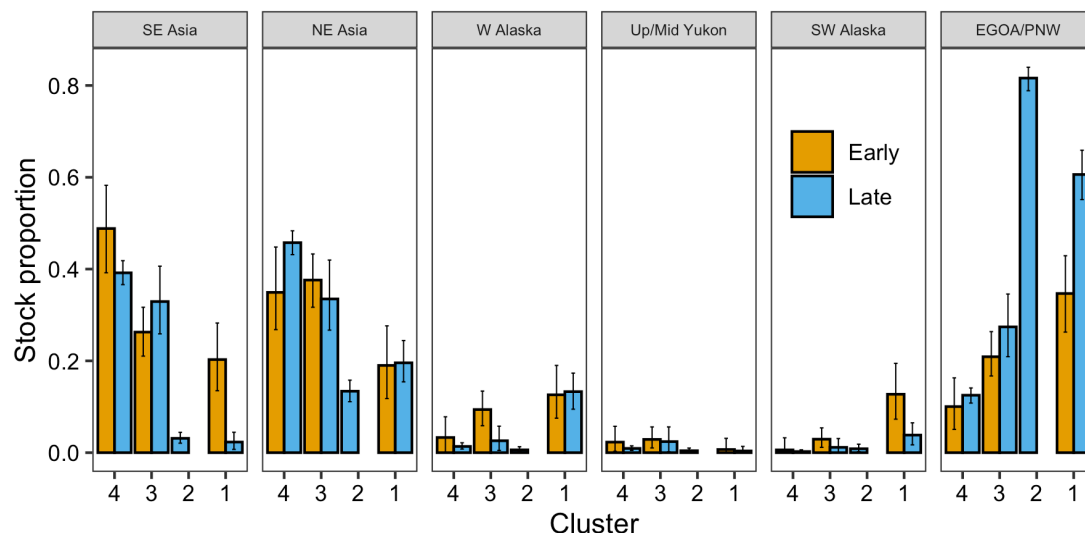


Figure 11: Stock composition estimates for the chum salmon collected from four spatial clusters along the continental shelf edge during Early (Weeks 24-32) and Late (Weeks 33-43) time periods of the 2024 Bering Sea, B-season pollock fishery. Clusters are ordered from west (cluster 4) to east (cluster 1).

The Western Alaska reporting group displayed generally consistent patterns from the individual spatial and temporal analyses. Western Alaska comprised larger proportions in the early analyses of clusters 4 and 3 and a larger proportion of the bycatch in cluster 1 relative to all other clusters; however, there was no difference in the early and late estimates from cluster 1. Southwest Alaska showed similar trends, although with larger differences in the early vs. late estimates from within cluster 1. The Upper/Middle Yukon group, comprised relatively higher proportions in the early vs. late period across all clusters and, consistent with the spatial trends described above, a larger proportion in clusters 3 and 4 relative to clusters 2 and 1.

Sector Trends

Reporting group contributions to the 2025 chum salmon bycatch from each fishing sector were consistent with historic patterns. The Western Alaska regional group comprised a larger proportion of the shoreside sectors (5.1%) and mothership sectors (6.6%) bycatch compared to the catcher processor sector (2.0%). The total number of Western Alaska chum salmon caught by the shoreside sector (3,599) was substantially larger than that caught by the catcher-processor (1,268) or mothership sector (514). The overall proportion of the Upper/Middle Yukon group was similar for the CP and M sectors (1.4% and 1.2%, respectively), and lower for the shoreside sector (0.6%).

As is typical, the catcher processor sector which fishes further to the west (Fig. 5) and encounters most of its chum salmon bycatch in clusters 4, 3, and 2 had a higher proportion of both Asia regional groups than either the mothership and shoreside sectors. As is typical, the proportion of Asia reporting groups in the mothership sectors bycatch was intermediate to that of the catcher processor and shoreside sector (Fig. 12A). Similarly, the EGOA/PNW shows the opposite pattern - comprising the largest segment of the shoreside sectors bycatch and decreasing in contribution to the bycatch of the mothership and catcher processor sectors. Despite the

mothership proportions for NE Asia, SE Asia, and EGOA/PNW being intermediate between the CP and S sector estimates, because of the much lower overall bycatch encountered by the sector, the total number of chum salmon caught from these regional groups is much smaller than in other sectors (Fig. 12B).

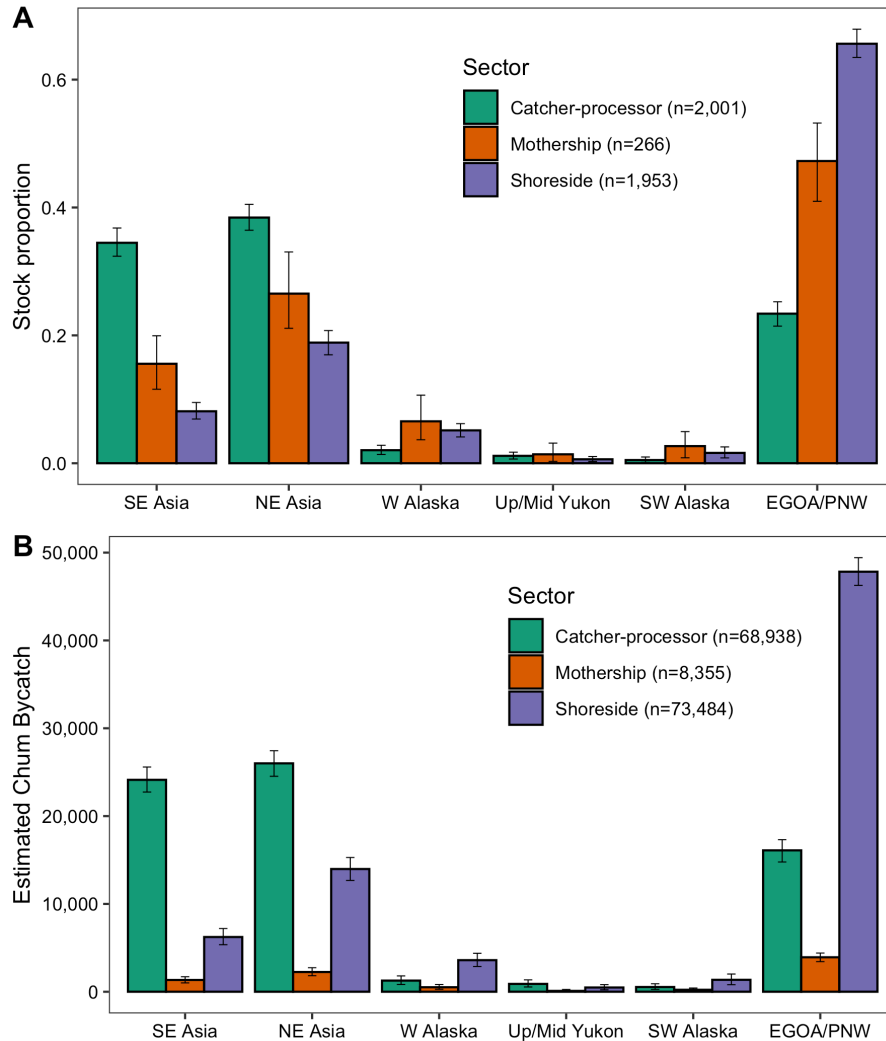


Figure 12: Stock composition estimates for the proportion (A) and total number of chum salmon bycatch (B) from the 2025 Bering Sea, B-season pollock fishery from the catcher-processor, shoreside, and mothership fishing sectors. Sample sizes for mixture analysis given in top legend and sector specific bycatch totals given in bottom legend.

Summary of Coastal Western Alaska and Upper/Middle Yukon stocks

In 2025 there was an increase in the overall bycatch from 2024, but a drastic reduction in the proportion represented by the Coastal Western Alaska genetic group. In 2025, 5,204 (4,342-6,197 CI) Western Alaska chum salmon were caught in the pollock fishery during the B-season. Additionally, 1,560 (1,071-2,148 CI) Upper/Middle Yukon and 2,222 (1,455-3,099 CI) Southwest Alaska chum salmon were caught. Combined, these three reporting groups accounted

for 6% of the total bycatch which represents 8,987 chum salmon. This is slightly higher than the 5,155 chum salmon caught from these groups in 2024, but substantially smaller than the average of 50,071 from 2011-2024.

The Western Alaska reporting group was encountered in its highest proportions East of 170°W as has been the historic trend (4.3% East of 170°W compared to 2.7% West of 170°W.). While representing a smaller fraction of the overall bycatch, the Southwest Alaska reporting group showed a similar pattern comprising 1.8% of the bycatch East of 170°W and 0.6% West of 170°W. Alternatively, the Upper/Middle Yukon comprised a larger proportion of the bycatch West of 170°W (1.3% compared to 0.7%).

As a result of different fleet distributions, the relative proportion of Western Alaska chum salmon encountered by the catcher-processor versus the mothership and shoreside sectors differed substantially. In 2025 the catcher processor sector encountered much of their bycatch further north and west than the mothership and shoreside sectors. Because of these spatial differences in chum salmon bycatch distribution, the Western Alaska reporting group comprised a larger proportion of the shoreside and motherships sectors' bycatch (5.1% and 6.6%, respectively) compared to the catcher-processor sector (2.0%). In contrast, the proportion of Upper/Middle Yukon was lowest for the Shoreside sector 0.6% compared to an average of 1.3% in the M and CP sectors. With the largest overall bycatch and largest proportion of the aggregated Western Alaska, Upper/Middle Yukon, and Southwest Alaska reporting groups, the shoreside sector caught more chum salmon from these regional groups (5,446) than either the mothership (837) or the catcher processor (2,704) sectors.

Acknowledgements

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Appendix I - GSI Estimates

Regional stock composition estimates of chum salmon samples from the 2025 Bering Sea, B-season pollock trawl fishery. The estimated number of chum salmon bycatch, the 95% CI for the estimated number, mean proportion, 95% credible intervals, $P = 0$ statistic (the probability that the estimated proportion is 0), and the Gelman-Rubin shrink factor (SF; convergence diagnostic).

B-season (PSC = 150,983; n = 4220)

Region	Est. num.	Est. CI	Mean	2.5%	97.5%	P=0	SF
SE Asia	32,629	30,655-34,637	0.210	0.197	0.222	0.00	1.00
NE Asia	43,145	41,035-45,320	0.291	0.277	0.305	0.00	1.00
W Alaska	5,204	4,342-6,197	0.034	0.028	0.040	0.00	1.00
Up/Mid Yukon	1,560	1,071-2,148	0.011	0.008	0.015	0.00	1.00
SW Alaska	2,222	1,455-3,099	0.015	0.011	0.020	0.00	1.01
E GOA/PNW	66,220	63,934-68,522	0.439	0.424	0.454	0.00	1.00

Early (PSC = 10,156; n = 275)

Region	Est. num.	Est. CI	Mean	2.5%	97.5%	P=0	SF
SE Asia	2,846	2,306-3,392	0.267	0.217	0.320	0.00	1.00
NE Asia	3,144	2,590-3,722	0.321	0.265	0.379	0.00	1.00
W Alaska	949	588-1,365	0.092	0.057	0.136	0.00	1.00
Up/Mid Yukon	397	166-715	0.039	0.015	0.070	0.00	1.00
SW Alaska	530	268-830	0.051	0.025	0.080	0.00	1.00
E GOA/PNW	2,288	1,813-2,768	0.230	0.186	0.278	0.00	1.00

Middle (PSC = 49,446; n = 1333)

Region	Est. num.	Est. CI	Mean	2.5%	97.5%	P=0	SF
SE Asia	15,061	13,871-16,266	0.299	0.275	0.325	0.00	1.00
NE Asia	20,542	19,208-21,838	0.423	0.394	0.448	0.00	1.00
W Alaska	2,777	2,174-3,431	0.059	0.047	0.073	0.00	1.00
Up/Mid Yukon	580	296-944	0.012	0.006	0.019	0.00	1.00
SW Alaska	913	495-1,410	0.015	0.007	0.025	0.00	1.00
E GOA/PNW	9,571	8,571-10,593	0.192	0.171	0.214	0.00	1.00

Late (PSC = 91,381; n = 2612)

Region	Est. num.	Est. CI	Mean	2.5%	97.5%	P=0	SF
SE Asia	15,031	13,772-16,415	0.159	0.145	0.174	0.00	1.00
NE Asia	19,815	18,382-21,280	0.224	0.209	0.240	0.00	1.00
W Alaska	1,278	843-1,804	0.013	0.008	0.018	0.00	1.00
Up/Mid Yukon	894	501-1,348	0.011	0.007	0.016	0.00	1.00
SW Alaska	689	307-1,193	0.006	0.002	0.012	0.00	1.01
E GOA/PNW	53,670	51,895-55,406	0.587	0.568	0.606	0.00	1.00

East of 170° (PSC = 78,262; n = 2141)

Region	Est. num.	Est. CI	Mean	2.5%	97.5%	P=0	SF
SE Asia	4,777	3,966-5,559	0.058	0.048	0.069	0.00	1.00
NE Asia	11,462	10,359-12,673	0.149	0.135	0.165	0.00	1.00
W Alaska	3,463	2,763-4,268	0.043	0.034	0.053	0.00	1.00
Up/Mid Yukon	499	239-834	0.007	0.004	0.011	0.00	1.00
SW Alaska	1,446	820-2,173	0.018	0.010	0.027	0.00	1.02
E GOA/PNW	56,612	55,042-58,197	0.725	0.706	0.744	0.00	1.00

West of 170° (PSC = 72,721; n = 2079)

Region	Est. num.	Est. CI	Mean	2.5%	97.5%	P=0	SF
SE Asia	27,231	25,775-28,778	0.366	0.346	0.386	0.00	1.00
NE Asia	31,140	29,551-32,800	0.437	0.416	0.460	0.00	1.00
W Alaska	1,703	1,150-2,291	0.027	0.019	0.035	0.00	1.00
Up/Mid Yukon	1,073	675-1,529	0.013	0.008	0.020	0.00	1.00
SW Alaska	544	253-919	0.006	0.002	0.011	0.00	1.00
E GOA/PNW	11,029	9,959-12,162	0.151	0.136	0.167	0.00	1.00

Cluster 1 Early (PSC = 4,703; n = 129)

Region	Est. num.	Est. CI	Mean	2.5%	97.5%	P=0	SF
SE Asia	969	659-1,338	0.203	0.135	0.282	0.00	1.00
NE Asia	906	571-1,296	0.190	0.118	0.276	0.00	1.00
W Alaska	593	354-892	0.126	0.075	0.190	0.00	1.00
Up/Mid Yukon	50	2-170	0.007	0.000	0.031	0.30	1.00
SW Alaska	538	260-871	0.127	0.073	0.195	0.00	1.00
E GOA/PNW	1,644	1,223-2,061	0.347	0.263	0.429	0.00	1.00

Cluster 1 Late (PSC = 12,582; n = 331)

Region	Est. num.	Est. CI	Mean	2.5%	97.5%	P=0	SF
SE Asia	347	142-613	0.023	0.007	0.045	0.00	1.00
NE Asia	2,423	1,894-3,016	0.196	0.154	0.244	0.00	1.00
W Alaska	1,745	1,249-2,258	0.133	0.095	0.173	0.00	1.00
Up/Mid Yukon	43	0-176	0.004	0.000	0.014	0.12	1.00
SW Alaska	481	204-823	0.038	0.017	0.065	0.00	1.00
E GOA/PNW	7,541	6,845-8,189	0.606	0.551	0.659	0.00	1.00

Cluster 2 Late (PSC = 32,283; n = 929)

Region	Est. num.	Est. CI	Mean	2.5%	97.5%	P=0	SF
SE Asia	1,124	772-1,551	0.031	0.021	0.044	0.00	1.00
NE Asia	4,169	3,469-4,926	0.134	0.111	0.158	0.00	1.00
W Alaska	184	44-397	0.006	0.001	0.013	0.00	1.00
Up/Mid Yukon	153	37-339	0.004	0.001	0.010	0.00	1.00
SW Alaska	276	67-598	0.008	0.002	0.018	0.00	1.00
E GOA/PNW	26,374	25,503-27,148	0.816	0.789	0.840	0.00	1.00

Cluster 3 Early (PSC = 9,875; n = 271)

Region	Est. num.	Est. CI	Mean	2.5%	97.5%	P=0	SF
SE Asia	2,649	2,121-3,185	0.263	0.210	0.317	0.00	1.00
NE Asia	3,574	2,997-4,144	0.376	0.317	0.433	0.00	1.00
W Alaska	911	550-1,304	0.094	0.059	0.134	0.00	1.00
Up/Mid Yukon	378	155-696	0.029	0.010	0.056	0.00	1.00
SW Alaska	291	115-537	0.029	0.012	0.054	0.00	1.00
E GOA/PNW	2,068	1,628-2,577	0.209	0.167	0.264	0.00	1.00

Cluster 3 Late (PSC = 5,788; n = 161)

Region	Est. num.	Est. CI	Mean	2.5%	97.5%	P=0	SF
SE Asia	1,961	1,538-2,409	0.329	0.259	0.406	0.00	1.00
NE Asia	1,859	1,466-2,313	0.335	0.267	0.420	0.00	1.00
W Alaska	154	36-355	0.026	0.005	0.058	0.00	1.00
Up/Mid Yukon	151	33-345	0.024	0.002	0.056	0.02	1.00
SW Alaska	75	11-197	0.012	0.001	0.031	0.01	1.00
E GOA/PNW	1,585	1,234-1,994	0.274	0.209	0.346	0.00	1.00

Cluster 4 Early (PSC = 3,879; n = 122)

Region	Est. num.	Est. CI	Mean	2.5%	97.5%	P=0	SF
SE Asia	1,905	1,555-2,244	0.488	0.392	0.583	0.00	1.00
NE Asia	1,282	960-1,637	0.349	0.268	0.448	0.00	1.00
W Alaska	131	2-311	0.033	0.000	0.078	0.03	1.00
Up/Mid Yukon	84	6-227	0.023	0.003	0.057	0.00	1.00
SW Alaska	66	6-178	0.006	0.000	0.032	0.35	1.00
E GOA/PNW	409	225-656	0.100	0.051	0.163	0.00	1.00

Cluster 4 Late (PSC = 51,426; n = 1477)

Region	Est. num.	Est. CI	Mean	2.5%	97.5%	P=0	SF
SE Asia	20,495	19,187-21,836	0.392	0.366	0.418	0.00	1.00
NE Asia	23,166	21,854-24,433	0.458	0.431	0.483	0.00	1.00
W Alaska	668	360-1,068	0.014	0.008	0.022	0.00	1.00
Up/Mid Yukon	508	264-822	0.009	0.005	0.015	0.00	1.00
SW Alaska	163	37-382	0.002	0.000	0.006	0.01	1.00
E GOA/PNW	6,423	5,618-7,264	0.125	0.108	0.141	0.00	1.00

Catcher-processor (PSC = 68,938; n = 2001)

Region	Est. num.	Est. CI	Mean	2.5%	97.5%	P=0	SF
SE Asia	24,127	22,738-25,590	0.345	0.324	0.368	0.00	1.00
NE Asia	26,006	24,532-27,443	0.384	0.364	0.405	0.00	1.00
W Alaska	1,268	827-1,806	0.020	0.014	0.028	0.00	1.00
Up/Mid Yukon	895	547-1,355	0.012	0.007	0.017	0.00	1.00
SW Alaska	540	267-910	0.005	0.001	0.010	0.01	1.00
E GOA/PNW	16,099	14,774-17,315	0.234	0.214	0.253	0.00	1.00

Mothership (PSC = 8,355; n = 266)

Region	Est. num.	Est. CI	Mean	2.5%	97.5%	P=0	SF
SE Asia	1,340	1,009-1,709	0.156	0.116	0.199	0.00	1.00
NE Asia	2,248	1,827-2,738	0.265	0.211	0.330	0.00	1.00
W Alaska	514	279-820	0.066	0.037	0.107	0.00	1.00
Up/Mid Yukon	98	9-263	0.014	0.003	0.032	0.00	1.00
SW Alaska	225	75-424	0.027	0.009	0.050	0.00	1.00
E GOA/PNW	3,928	3,432-4,407	0.473	0.410	0.532	0.00	1.00

Shoreside (PSC = 73,484; n = 1953)

Region	Est. num.	Est. CI	Mean	2.5%	97.5%	P=0	SF
SE Asia	6,233	5,357-7,200	0.081	0.069	0.095	0.00	1.00
NE Asia	13,975	12,675-15,287	0.189	0.170	0.208	0.00	1.00
W Alaska	3,599	2,876-4,382	0.051	0.041	0.062	0.00	1.00
Up/Mid Yukon	486	226-808	0.006	0.003	0.010	0.00	1.00
SW Alaska	1,360	803-2,017	0.016	0.008	0.026	0.00	1.01
E GOA/PNW	47,827	46,269-49,421	0.656	0.635	0.679	0.00	1.00

Appendix II - GSI Methods

Sequencing libraries are prepared using the Genotyping-in-Thousands by Sequencing (GT-seq) protocol (Campbell 2015). PCR is performed on extracted DNA with primers that amplify 84 SNP loci in the WASSIP chum panel (DeCovich et al. 2012). These PCR products are then indexed in a barcoding PCR, normalized using SequelPrep plates (Invitrogen) and each 96 well plate is subsequently pooled. Next, a double-sided bead size selection is performed using AMPure XP beads (Beckman Coulter), using ratios of beads to library of 0.5x to remove non-target larger fragments and then 1.2x to retain the desired amplicon. Libraries are sequenced on a MiSeq (Illumina) using a single 150-cycle lane run with 2×75 bp paired-end (PE) chemistry. PE reads for each individual are joined with FLASH2 (Magoč & Salzberg, 2011; <https://github.com/dstrett/FLASH2>). Merged reads are genotyped with the R package GTscore (McKinney; <https://github.com/gjmckinney/GTscore>). Individuals with low quality multilocus genotypes (<80% of loci scored) are discarded. We re-genotype 5% of all project individuals as quality control measures.

Mixtures were created by separating sampled fish into spatial and temporal groups from observer data from the AKFIN database. Genetic stock identification was performed with the conditional genetic stock identification model in the R package rubias v0.4.1 (Moran and Anderson 2019). As described previously (Gray 2010), with minor changes to regional group names, baseline populations were grouped into six regions: Southeast Asia (SE Asia), Northeast Asia (NE Asia), Western Alaska (W Alaska), Upper/Middle Yukon (Up/Mid Yukon), Southwest Alaska (SW Alaska), and the Eastern GOA/Pacific Northwest (EGOA/PNW). For population names and reporting group see Table A2. For all estimates, the Dirichlet prior parameters for the stock proportions were defined by region to be $1/(GC_g)$, where C_g is the number of baseline populations in region g , and G is the number of regions. To ensure convergence to the posterior distribution, six separate MCMC chains of 100,000 iterations (burn-in of 50,000) of the non-bootstrapped model were run, which each chain starting at disparate values of stock proportions; configured such that for each chain 95% of the mixture came from a single designated reporting group (with probability equally distributed among the populations within that reporting group) and the remaining 5% equally distributed among remaining reporting groups. The convergence of chains for each reporting group estimate was assessed with the Gelman-Rubin statistic (Gelman 1992) estimated with the `gelman.diag` function in the `coda` library (Plummer 2006) within R. Once chain convergence was confirmed, inference was conducted with the conditional genetic stock identification model with bootstrapping over reporting groups (MCMC chains of 50,000 iterations, burn-in of 25,000, 50 bootstrap iterations).

The stock composition estimates were summarized by the mean, standard deviation, median, 95% credible interval (2.5th and 97.5th percentile of the MCMC iterates in the posterior output), and $P = 0$, which is the probability that a stock composition estimate is effectively zero (Munro et al. 2012). The $P = 0$ statistic is the frequency of the last half of the MCMC iterates of each chain for which the individual regional contribution to the mixture was less than a threshold of $0.5E^{-6}$. This statistic may be more useful than the credible interval for assessing the presence or absence of minor stocks. Stock specific total catch was also estimated with rubias and summarized by the mean and 95% credible interval (2.5th and 97.5th percentile of the posterior distribution).

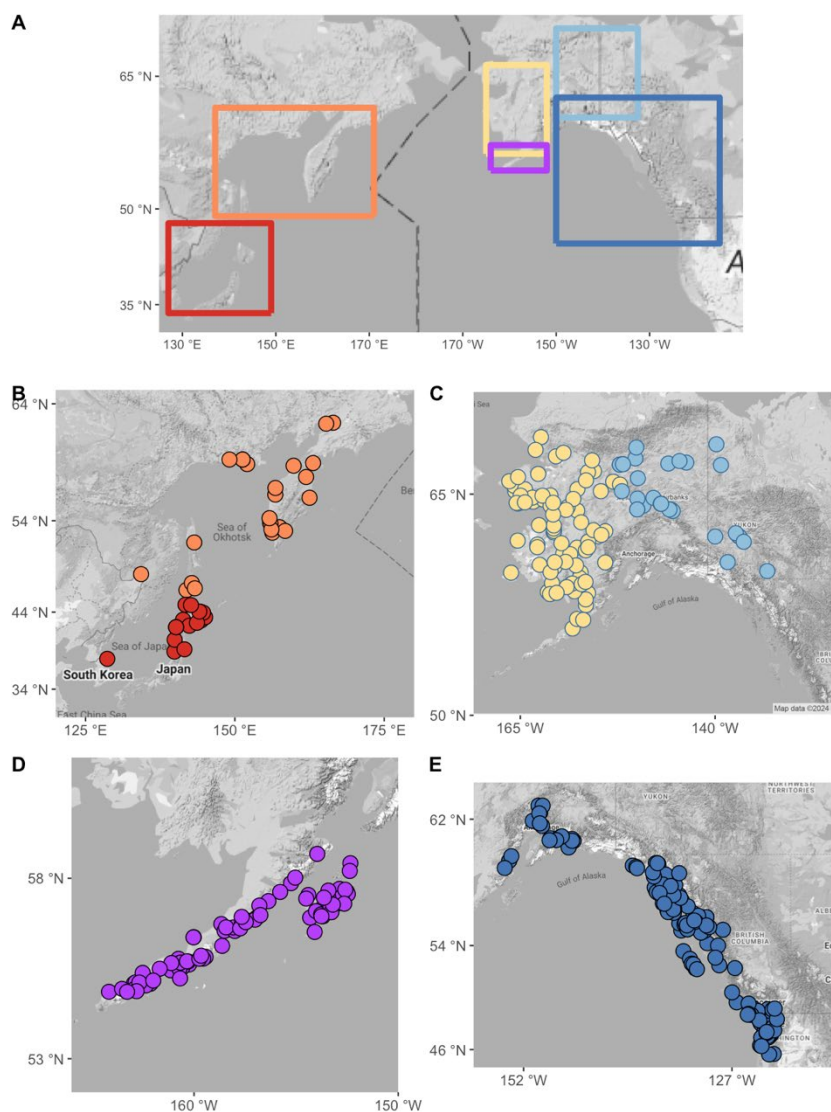


Figure A1: Six reporting groups of baseline chum salmon populations used in this report, circles represent individual populations represented in the baseline (See Table A2). (A) Range wide distribution of the six reporting groups. (B) SE Asia (red) and NE Asia (orange), (C) W Alaska (Yellow) and Up/Mid Yukon (Mid Blue), (D) SW Alaska (purple), and (E) EGOA/PNW (dark blue) reporting group.

Appendix II Table A1: Single nucleotide polymorphisms included in the 84-SNP panel used for stock composition analysis of chum salmon bycatch samples from the 2025 Bering Sea B-season pollock trawl fishery.

Locus	Ploidy	SNPpos	Allele1	Allele2	Probe1	Probe2	Primer	Primer Conc. (uM)
Oke_ACOT-100	2	1	C	G	CTTCCGCTCTCTACTCC	TTCCGCTCTGTACTCC	TCAGGGACGATAAAGGGATCATCTT	0.2000
Oke_ATP5L-105	2	1	C	G	AGTATATTGAGATGAATCCAC	ATATTGAGATGAATGCCAC	GTGCACACCAATCCATTTCTGAAT	0.2500
Oke_AhR1-78	2	1	G	A	CAGCCTCGGTGCCAT	TCAGCCTCAGTGCCAT	AGCAGAACCCAGCACCTACAG	0.2000
Oke_CATB-60	2	1	C	T	CAGGAACGGGTATGAG	CAGGAACGAGTATGAG	GCTTCTATGGGTCTCTACTACCGTAT	0.2500
Oke_CD81-108	2	1	G	T	TCCGGCATGTCCAG	TCCGGCATTTCCAG	CAGTATCATCATACAGCACAGATACAACA	0.2500
Oke_CD81-173	2	1	A	C	CAGTCACAGAGAGTCAC	AGTCACAGCGAGTCAC	GATGACTGGAGTCAGCTTGA	0.2000
Oke_CKS-389	2	1	G	A	AAATGAATGATAATGTGTTCTG	AAATGAATGATAATATGTTCTG	GGGCCATTCTCTGAGTTTCAGT	0.2500
Oke_CKS1-94	2	1	G	T	TCTGGATAAAATTTGTGTATTC	TTCTGGATAAAATTTGTATTTC	TCTTCGACATGTTTAAATCGAACAGAAGT	0.2500
Oke_DCX-87	2	1	A	T	CCTGTTTGTGTAACCGTA	CCTGTTTGTGTAACCGTA	GTCAACCCAGAACAAATAGAATGAGTCT	0.2500
Oke_FANK1-166	2	1	C	T	CTACAGCCCGGCTGTG	CTACAGCCAGCTGTG	ACTCAGCTGTGGTAGAGACAGA	0.2500
Oke_FBXL5-61	2	1	G	A	TCTGAGGGAAACTGC	TCTGAGGAAACTGC	TGGTGTGTAACGTCAGTGACTTAAG	0.3000
Oke_GHII-3129	2	1	G	A	CAGGGCGACTCTAT	ACAGGGCAACTCTAT	GTCAAGCTGATACCACTCAAATCTCA	0.3000
Oke_GPDH-191	2	1	T	A	CGGAGCCACTTCCAGTA	CGGAGCCACTACCACTA	CCTGTACCTATAGGGCAACTTCAC	0.2000
Oke_GPH-105	2	1	T	G	CCAGTAATTTGGTATTTTGA	CCAGTAATTTGGTCTTTTGA	CAGATCAACCTGGAAAAATATCTGATGT	0.2500
Oke_HP-182	2	1	A	C	AGAAAAGGTGAGCTAGTATG	AAAAGGTGAGCTCGTATG	CGATGACTCCAAAGAAGTTGCT	0.2500
Oke_IL8r2-406	2	1	T	G	AAACACAAAACCCC	AAACACAAAACCCC	GGATGGACATTACAGTCTGGTT	0.2000
Oke_KPNA2-87	2	1	T	A	ACAGAACAGAAACAGTG	AACAGAACAGTAACAGTG	AGGCAGCCAGGTAAAGTCAGTA	0.1875
Oke_LAMP2-186	2	1	A	G	TAACCTTTACAAAGCACTGC	AACCTTTACAAAGCACTGC	TTCTAGCATGACCCAATGAAAGG	0.2500
Oke_MLRN-63	2	1	G	A	CTGGTGATTGACGATCC	CTGGTGATTAACGATCC	CCATTTCAGCATTGCCAGATTGAAA	0.2500
Oke_Moesin-160	2	1	T	G	CATTTTGTAATTTCTAATTTAAGC	ATTTTGTAATTTCTAATGTTAAGC	TTTCAGCAATGAAGAGAACATCAAACTG	0.2500
Oke_NUPR1-70	2	1	G	T	TATGAGGACGGGTACA	TATGAGGACTGGTACA	AGACGGTGAACCTCTGCTGTAGA	0.3000
Oke_PPA2-635	2	1	C	T	TGCGCTCCCCCGCTC	TTATTGCGCTCTCCCGCTC	ACACAACTGACCATATTGACTTTCCA	0.2500
Oke_RFC2-618	2	1	G	A	CAGCTCCTGGACTCA	CAGCTCCTAGACTCA	GACAAATGTGTTAGTGTAGGCTTCAC	0.2000
Oke_RH1op-245	2	1	C	T	AGTGGTGAAGCCTC	TAGTGGTAAAGCCTC	TGGCCGATCTCTTCATGGTAATC	0.2500
Oke_RS27-81	2	1	G	A	TGTCCAGGCGTCATGA	TGTCCAGGCATCATGA	GCAACAAAGTGGACTATCACATTGAA	0.3000
Oke_RSPRY1-106	2	1	A	T	TAGTCTCTTTACATAATCTC	TAGTCTCTTTACTTAATCTC	GTCTCTCTATCTTCCACTTACCT	0.2500
Oke_TCP1-78	2	1	A	G	ATACTGCTCCAGAGACG	CTGCTCCAGGACG	CTCCAGGGCATCAGCAAATG	0.2000
Oke_Tf-278	2	1	C	A	ATTTTACAGTTGACATTCAA	TTTTTACAGTTGAAATTCAA	GCCACAATTGTAATTCTAGATCCAGAGT	0.2500
Oke_U1008-83	2	1	A	G	CCGTTCTCTTCTTGGACAC	CGTTCTCTTCTTGGACAC	GTCAACAAACATCCTGCGAATG	0.3000
Oke_U1010-251	2	1	A	G	ATAGAGGTGAGCATTGACAT	TAGAGGTGAGCACTGACAT	CACCTCAATCAATCAATGTATTATATAAGCCA	0.1875
Oke_U1012-241	2	1	C	G	ATGGAAAAAGAACTGTTACT	ATGGAAAAAGAACTCTTACT	GCAGAGGTATATACCAATTTTAGATGCA	0.2500
Oke_U1015-255	2	1	A	G	CAAACACACACAGAGCC	AACACACGACAGCC	CAGAGTGACAGTAATACGCATACA	0.2500
Oke_U1016-154	2	1	C	T	CCATGTTTGCGGTATGT	CCATGTTTGCGAGTATGT	GCAGGTTGCTAAGTCATGTTACACA	0.3000
Oke_U1017-52	2	1	C	T	AGAGAGTTGTCTTCATC	AGAGAGTTGTCAATCATC	TGGCAATGGGATGTCAAGTTATGA	0.3000
Oke_U1018-50	2	1	C	T	CTGGGCACGTACAGCT	CTGGGCACATACAGCT	TCCAGGTGCTGACAATGTAAAGT	0.3000
Oke_U1022-139	2	1	A	G	CTGGAACATGAAGCAAA	TGGAACATGGAGCAAA	AACATTAATACTGTGGTTTTGACCTCTTG	0.2500
Oke_U1023-147	2	1	A	C	CATCAGGGAAAGCCTACAAA	AGGGAAAGCCGACAAA	TCTTAAATGGAGAGCGATTAAATGAAGG	0.2500
Oke_U1024-113	2	1	A	G	CCAGAAACAACCTTAATAT	CAGAAACAACCTCAATAT	CATGCTGGTGAATTTATGGACAATGT	0.2500
Oke_U1025-135	2	1	G	T	ACTTAGTCTATTTGTAACCTT	ACTTAGTCTATTTTAACTTT	GGCTAGGGTCTTATTTGGACCAT	0.2500
Oke_U2007-190	2	1	C	G	CTAAAAGCTGAGAATAAAT	AAAGCTGACAATAAAT	ACAGGCTGTGATGAGTTAAACATGTAAA	0.2500
Oke_U2011-107	2	1	G	T	TTCTGTGAGATATTAG	TTCTGTGAGATATTAG	CCGTTTCTGTCAGACTCTGGTAAA	0.1250
Oke_U2015-151	2	1	C	T	AATTGATCACGATCATTC	ATTGATCACAATCATTC	GCATTTTATCTCAAACCTTTCAACTGACA	0.2500

Appendix II Table A1

Locus	Ploidy	SNPpos	Allele1	Allele2	Probe1	Probe2	Primer	Primer Conc. (uM)
Oke_U2025-86	2	1	G	A	ACTTTTGTGTCGTTTTTTT	ACTTTTGTGTCATTTTTTTT	AAATCCCCATGGAGAAACACAATGA	0.2000
Oke_U2029-79	2	1	C	T	AGGTGTACTGAAGAGAC	AGGTGTACTAAAGAGAC	GGTTTGATTTCGTCCGGATTGA	0.2500
Oke_U2032-74	2	1	G	A	CAATAAAGTGCTAGGTGTCC	CAATAAAGTGCTAAGTGTC	GCTATTCCAATGTAAATCCTGTACTGTGT	0.2000
Oke_U2034-55	2	1	C	T	ATGTCAAATCACGCTGATG	ATGTCAAATCACACTGATG	GGGAAGAAAAGCCTACCATAAACAG	0.2500
Oke_U2035-54	2	1	G	A	CACCAATAACGTCCTAATC	CACCAATAACATCCTAATC	CGCCAATAACGCTCCAACAAC	0.2500
Oke_U2041-84	2	1	G	T	CAGATCCGGTGTATGC	ACAGATCCTGTGTATGC	CCAGACCATGTGCTTGTGTCATA	0.2500
Oke_U2043-51	2	1	G	A	TCTGGAGGCGTATTGG	CTGGAGGCATATTGG	CACAAACCTACTACAGACAGCAGTT	0.2000
Oke_U2048-91	2	1	A	C	CAGCCTCATAAGATGTTA	CAGCCTCATAAGCTGTTA	AGTTGGGTCCTAAAGATGATCATTTGCT	0.2000
Oke_U2050-101	2	1	C	T	AATTGATCTACAGCTGCACG	AATTGATCTACAACCTGCACG	CTCTGAGTGTACAAATCACATATCGT	0.2000
Oke_U2053-60	2	1	C	T	CACACATATGAGATGCC	CACACATATAAGATGCC	TCTGCTTTTGTCTCTCACCAA	0.1875
Oke_U2054-58	2	1	C	T	ATGCCCAATTACGTCAGCA	TGCCCAATTACATCAGCA	CGTCTCATTCAGCTCTTTGATGTC	0.2000
Oke_U2056-90	2	1	G	T	CGAAGTGATGAAGGTGACAA	CGAAGTGATGAATGTGACAA	CCATCAGCTCACCATTACACTGT	0.1875
Oke_U2057-80	2	1	A	G	CACGTTTCTCTTTCTC	ACGTTTCTCTCTTTCTC	GCAGTTGTCATGGCAGTAAGG	0.2500
Oke_U212-87	2	1	C	A	CTTGTGACATTCTCTCT	CTTGTGACATTACTCTCT	TTGATTCACTCAAGGTGAGCAGATT	0.2500
Oke_U302-195	2	1	C	A	TTGTCAAAGGAATCATTT	TGTCAAAGGAATAATTT	GACCCTCAGCTATTTAAAGAACCTCAA	0.2500
Oke_U504-228	2	1	A	G	TGGCTCAAACCTTG	TTGGCTCGAACCTTG	CTTAACCTCAGTCACACCAACTCACT	0.2500
Oke_U506-110	2	1	C	T	TTGTAAGTTGTGGCTAAAA	TTGTAAGTTGTGACTAAAA	CGTGGTTGGTTTCATTGACTCTCA	0.2000
Oke_U507-286	2	1	T	G	CTGCTGTTTCATAAAAGTA	CTGCTGTTTCATACAAGTA	TGGTCATAGCTTGCACTGTACAAA	0.3000
Oke_U509-219	2	1	C	T	CCTCTCTGCAGGGCT	CCCTCTCTACAGGGCT	GCACCCACCTGGCTT	0.1250
Oke_arf-319	2	1	T	C	CTGTGTGAATTGCCTC	CTGTGTGAACCTGCCTC	TGCAGAAACTGATCATTTGGTAGTGG	0.1875
Oke_azin1-90	2	1	C	T	CCTTTATCTGAGGAAGCTG	CCTTTATCTGAAGAAGCTG	GGGAATAGTGTCAATTGGGATGCAT	0.2500
Oke_brd2-118	2	1	C	T	ATGACGAAGCTCTCC	ATGACGAAAGCTCTCC	CTCAAGCCCTCCCACTCA	0.2000
Oke_brp16-65	2	1	C	T	ACGTTGCCTGTCCAC	ACGTTGCCTATCCAC	TCCACGTCACTCAGCATGATG	0.2500
Oke_ccd16-77	2	1	A	C	CCAGCCCCCTCTGAAA	AGCCCCGCTGAAA	TGTCTTCAGAATCCAATGCTTTCCT	0.1875
Oke_e2ig5-50	2	1	C	T	CATCTTTGATCTGTGCCATT	TCATCTTTGATCTATGCCATT	GCACTGCTCATTCTGTACATG	0.2500
Oke_eif4g1-43	2	1	G	T	CTGAGATTCTTCATCTTTAC	TGAGATTCTTCATATTTAC	GCACCCAACAGTTTCATCATGTAAGT	0.2500
Oke_f5-71	2	1	C	T	CAGGTGCGTGCAGTAA	TCAGGTGCATGCAGTAA	CTCAAATTTCCCTTTGACATCAATTCATCA	0.2500
Oke_gdh1-62	2	1	C	T	TTCTGTGTCCCGTGACCT	CTGTGTCCCATGACCT	CCACGTGATACAGGGAGATGTG	0.2000
Oke_glx1-78	2	1	C	T	TGGGCATTTAGAGTTTATT	TGGGCATTTAGAATTTATT	CGCTCCGTCCAGTGATGTC	0.2500
Oke_il-1racp-67	2	1	G	A	CGTACGAGATGTAGATGT	CGTACGAGATATAGATGT	AATTGCTCCTCCTCGCTATTTCTC	0.2000
Oke_mgll-49	2	1	A	T	ATTATGGGTGTTCCCC	TTATGGGAGTTCCCC	ACATTGTAATCTGTATTAGTCCAATGCAGAC	0.2500
Oke_nc2b-148	2	1	A	C	TTTAGTTCTAGTCAAAAGTAG	TAGTTCTAGTCCAAAGTAG	CCAGCCTATTTCTTTAGTGCATATGA	0.2500
Oke_pgap-111	2	1	C	T	AGCTAGCAGGCTAAAG	AGCTAGCAAGCTAAAG	TGCAGATCTCAATTTGAACGACCTAT	0.2000
Oke_psm9-57	2	1	C	T	CATTGGCGGTGTAACG	TCATTGGCAGTGTAAACG	ACTGTAGTGACTGCATTTTCATATTGCT	0.2000
Oke_rab5a-117	2	1	C	T	CAGCTGTTTTTCTTGTAGCCT	AGCTGTTTTTCTTATAGCCT	GGGAATAACAGTCATTGCAGCATTT	0.2000
Oke_ras1-249	2	1	T	G	CACCAAGGTAAAAAT	CCAAGGAAAAAT	GGATGACTAAGAGCGACTGTATGTG	0.2500
Oke_serpin-140	2	1	A	T	CAAGAACTGACCTTAGACAC	AAGAACTGACCTTGTACAC	TCCACAGTGAGTAATAAGTTGCACAT	0.2000
Oke_slc1a3a-86	2	1	C	T	CCCAACGCGGTGATG	CCCAACGCGGTGATG	TGTCTTCATCTGTGGACTCTTACA	0.3000
Oke_sylc-90	2	1	A	T	ATATCTTTGAGACTAGATTAA	CTTTGAGACAAGATTAA	TTGAGAAAACCACTGGTCTTACAAG	0.1875
Oke_thic-84	2	1	C	T	ATGGAATGACAGCAATGT	ATGGAATGACAACAATGT	GCTGCTGTCTTAAACCACATCTACA	0.2500
Oke_u200-385	2	1	G	T	CATTATCTCCTGAATGTA	CATTATCTCCATGAATGTA	CCCATAATTTTGCAACCCTAGTCACA	0.2000
Oke_u217-172	2	1	T	C	CACCTTTACAAAAACA	CACCTTTACGAAAAACA	GGATGGAAGAAGTTAGTTGTGTCAGA	0.3000

Appendix II Table A2: Chum salmon populations in the Alaska Department of Fish and Game (ADF&G) single nucleotide baseline. The baseline consists of 42,071 chum salmon from 382 populations arranged into six genetic reporting groups used in this report.

Population	Reporting Group	Samples	Population	Reporting Group	Samples
Abashiri River	SE Asia	79	Ozerki Hatchery - Bistraya River broodstock	NE Asia	93
Chitose River	SE Asia	108	Palana River	NE Asia	140
Gakko River	SE Asia	78	Paratunka River	NE Asia	94
Kushiro River	SE Asia	79	Penzhina River	NE Asia	43
Namdae River	SE Asia	90	Pymta River	NE Asia	147
Nishibetsu River	SE Asia	80	Tauy River	NE Asia	41
Sasanai River	SE Asia	77	Tym River	NE Asia	53
Shari River	SE Asia	75	Udarnitza River	NE Asia	44
Shinzunai River	SE Asia	80	Utka River	NE Asia	40
Teshio River	SE Asia	78	Vorovskaya River	NE Asia	101
Tokachi River	SE Asia	78	Beaver Creek	W Alaska	110
Tokoro River	SE Asia	69	Upper Nushagak River	W Alaska	97
Tokushibetsu River	SE Asia	80	Agiapuk River	W Alaska	114
Tsugaruishi River	SE Asia	80	Alagnak River	W Alaska	176
Yurappu River - early	SE Asia	80	American River	W Alaska	86
Yurappu River - late	SE Asia	80	Andreafsky River	W Alaska	180
Amur River	NE Asia	90	Aniak River	W Alaska	92
Belogolovaya River	NE Asia	45	Yellow River	W Alaska	80
Bistraya River	NE Asia	66	Swift River	W Alaska	94
Bolshaya River	NE Asia	93	Belt Creek	W Alaska	69
Hailula River	NE Asia	48	Big River	W Alaska	94
Hairusova River	NE Asia	85	Black River	W Alaska	93
Kalininka River	NE Asia	89	Blue Violet Creek - Meshik	W Alaska	74
Kamchatka River	NE Asia	49	Whale Mountain Creek	W Alaska	95
Kanchalan River	NE Asia	77	Big Creek	W Alaska	69
Kol River	NE Asia	123	Pumice Creek	W Alaska	189
Kulkuty River	NE Asia	49	California Creek	W Alaska	88
Magadan (Magadanka River?)	NE Asia	77	Chuilnak River	W Alaska	92
Naiba - Sakhalin Island	NE Asia	54	Clear Creek	W Alaska	94
Oklan River	NE Asia	75	Dakli River	W Alaska	53
Ola River	NE Asia	78	Eldorado River	W Alaska	122
Ossora River	NE Asia	87	Fish River	W Alaska	92

Appendix II Table A2 continued

Population	Reporting Group	Samples	Population	Reporting Group	Samples
George River	W Alaska	95	Osviak River	W Alaska	121
Gisasa River	W Alaska	106	Otter Creek	W Alaska	61
Goodnews River	W Alaska	275	Pikmiktalik River	W Alaska	95
Henshaw Creek - early	W Alaska	94	Pilgrim River	W Alaska	75
Holokuk River	W Alaska	103	Rodo River	W Alaska	69
Huslia River	W Alaska	95	Salmon River	W Alaska	95
Inmachuk River	W Alaska	91	Kobuk River - Selby Slough	W Alaska	90
Iowithla River	W Alaska	95	Serpentine River	W Alaska	82
Kaltag River	W Alaska	92	South Fork Koyukuk River - Early	W Alaska	90
Kanektok River	W Alaska	94	South Fork Kuskokwim River	W Alaska	95
Kasigluk River	W Alaska	68	Shaktoolik River	W Alaska	94
Kelly River (Noatak R)	W Alaska	95	Snake River	W Alaska	172
Kobuk River - at Kiana	W Alaska	95	Solomon River	W Alaska	144
Kisaralik River	W Alaska	93	Stony River	W Alaska	150
Klutuspak Creek	W Alaska	70	Stuyahok River	W Alaska	281
Kobuk River - Salmon River (Mile 4)	W Alaska	99	Sunshine Creek	W Alaska	47
Kogrukluk River	W Alaska	95	Takotna River	W Alaska	136
Kokwok River	W Alaska	131	Tatlawiksuk River	W Alaska	243
Koyuk River	W Alaska	43	Togiak River	W Alaska	262
Kwethluk River	W Alaska	143	Tolstoi Creek	W Alaska	95
Kwiniuk River	W Alaska	94	Tozitna River	W Alaska	92
Mekoryuk River	W Alaska	104	Tubutulik River	W Alaska	135
Hot Springs Creek	W Alaska	174	Tuluksak River	W Alaska	92
Melozitna River	W Alaska	91	Unalakleet River	W Alaska	237
Mulchatna River	W Alaska	91	Ungalik River	W Alaska	147
Necons River	W Alaska	133	Wandering Creek	W Alaska	50
Niukluk River	W Alaska	93	Windy Fork Kuskokwim River	W Alaska	93
Noatak River	W Alaska	92	Innoko River	W Alaska	85
Nome River	W Alaska	94	American River - NE Kodiak	SW Alaska	95
Nulato River	W Alaska	189	Dog Bay Creek	SW Alaska	95
Nuluk River	W Alaska	48	Alligator Hole	SW Alaska	183
Nunsatuk River	W Alaska	92	Main Creek	SW Alaska	85

Appendix II Table A2 continued

Population	Reporting Group	Samples	Population	Reporting Group	Samples
Barling Bay Creek - early	SW Alaska	92	Braided Creek - Meshik	SW Alaska	94
Barling Bay Creek - late	SW Alaska	78	Midway Creek	SW Alaska	94
Barling Bay Creek - middle	SW Alaska	288	Moffett Creek	SW Alaska	95
Bear Bay Creek	SW Alaska	187	Nakalilok River	SW Alaska	95
Belkofski River	SW Alaska	87	Natalia Bay Creek	SW Alaska	95
Big River	SW Alaska	95	Cape Seniavin	SW Alaska	96
Big Sukhoi	SW Alaska	189	Northeast Creek	SW Alaska	94
Canoe Bay River	SW Alaska	186	Sapsuk River	SW Alaska	144
Chichagof Bay	SW Alaska	180	Right Head Moller Bay	SW Alaska	95
Coal Creek	SW Alaska	94	Ocean Beach	SW Alaska	78
Coleman Creek	SW Alaska	95	Olds River	SW Alaska	93
Coxcomb Creek	SW Alaska	89	Pass Creek	SW Alaska	94
Deadman River	SW Alaska	95	Pauls Lake	SW Alaska	45
Deer Valley	SW Alaska	91	Peterson Lagoon	SW Alaska	181
Delta Creek	SW Alaska	95	Portage Creek	SW Alaska	190
Dog Salmon Creek	SW Alaska	65	NE Portage Creek	SW Alaska	94
Dry Bay River	SW Alaska	71	Right Head Moller Bay	SW Alaska	94
Eagle Harbor	SW Alaska	94	Rough Creek	SW Alaska	77
Foster Creek	SW Alaska	182	Ruby's Lagoon	SW Alaska	92
Frosty Creek	SW Alaska	190	Rudy Creek	SW Alaska	93
Hidden Basin Creek	SW Alaska	95	Russel Creek	SW Alaska	280
Ilnik River	SW Alaska	49	Russian Creek	SW Alaska	185
Ivanof River	SW Alaska	181	Sandy Cove	SW Alaska	186
Joshua Green River	SW Alaska	92	Shoe Creek	SW Alaska	95
Kaiugnak Lagoon	SW Alaska	93	Sitkinak Island	SW Alaska	93
Karluk Lagoon	SW Alaska	83	Smokey Hollow Creek	SW Alaska	86
Kiavak Portage	SW Alaska	76	Spiridon River	SW Alaska	89
Kizhuyak River	SW Alaska	174	Saint Catherine Cove	SW Alaska	171
Kujulik River	SW Alaska	93	Stepovak Bay	SW Alaska	143
Lawrence Valley Creek	SW Alaska	190	Stepovak River	SW Alaska	94
Little John Lagoon	SW Alaska	172	Sturgeon River	SW Alaska	109
Meshik River	SW Alaska	78	Traders Cove	SW Alaska	76

Appendix II Table A2 continued

Population	Reporting Group	Samples	Population	Reporting Group	Samples
Uganik River	SW Alaska	175	Porcupine River	Up/Mid Yukon	92
Volcano Bay	SW Alaska	95	Pelly River	Up/Mid Yukon	84
Kitoi Bay Hatchery	SW Alaska	194	Salcha River - Early	Up/Mid Yukon	150
Plenty Bear Creek - Meshik	SW Alaska	138	Salcha River - Late	Up/Mid Yukon	45
Aniakchak River	SW Alaska	94	South Fork Koyukuk River - Late	Up/Mid Yukon	92
Kialagvik Creek	SW Alaska	177	Sheenjek River	Up/Mid Yukon	266
AlagogshakCreek	SW Alaska	94	Tanana River	Up/Mid Yukon	95
Chiginagak Bay River	SW Alaska	159	Tatchun River	Up/Mid Yukon	176
North Fork Creek	SW Alaska	71	Teslin River	Up/Mid Yukon	178
Amber Bay	SW Alaska	89	Toklat River	Up/Mid Yukon	182
Gull Cape Creek	SW Alaska	186	Toklat River - Sushana River	Up/Mid Yukon	94
Wiggly Creek - Cinder River	SW Alaska	177	24 Mile - Chilkat River	EGOA/PNW	85
West Kiliuda Creek	SW Alaska	87	Admiralty Creek	EGOA/PNW	64
Zachary Bay	SW Alaska	76	Akwe River	EGOA/PNW	103
Zachar River	SW Alaska	66	Alouette River	EGOA/PNW	95
Seventeenmile Slough	Up/Mid Yukon	90	Alsek River	EGOA/PNW	84
Big Creek	Up/Mid Yukon	100	Pybus Bay	EGOA/PNW	59
Black River - fall	Up/Mid Yukon	88	Bag Harbor (Haida Gwaii)	EGOA/PNW	49
Bluff Cabin Creek	Up/Mid Yukon	99	Beartrap Creek	EGOA/PNW	582
Big Salt River	Up/Mid Yukon	69	Big Mission Creek	EGOA/PNW	56
Chandalar River	Up/Mid Yukon	148	Big Qualicum River	EGOA/PNW	72
Chena River	Up/Mid Yukon	254	Black Bay	EGOA/PNW	128
Clearwater Creek	Up/Mid Yukon	78	Brown's Peak Creek	EGOA/PNW	94
Delta River	Up/Mid Yukon	149	Carmen Lake	EGOA/PNW	67
Donjek River	Up/Mid Yukon	60	Carroll Creek - Summer run	EGOA/PNW	201
Fishing Branch	Up/Mid Yukon	477	Chilkat River - mainstem	EGOA/PNW	76
Henshaw Creek - late	Up/Mid Yukon	60	Chumilna Creek	EGOA/PNW	83
Jim River	Up/Mid Yukon	278	Coco Harbor	EGOA/PNW	99
Kantishna River	Up/Mid Yukon	94	Constantine Creek	EGOA/PNW	499
Kluane River	Up/Mid Yukon	163	Conuma River	EGOA/PNW	96
Middle Fork Koyukuk River	Up/Mid Yukon	178	Cruz Cove	EGOA/PNW	50
Minto Slough	Up/Mid Yukon	169	Dewatto River - fall run	EGOA/PNW	74

Appendix II Table A2 continued

Population	Reporting Group	Samples	Population	Reporting Group	Samples
Disappearance Creek - fall run	EGOA/PNW	310	Kalama Creek	EGOA/PNW	56
Donkey Bay	EGOA/PNW	98	Karta River	EGOA/PNW	56
Dosewillips River - summer run	EGOA/PNW	88	Keta River	EGOA/PNW	45
Dry Bay Creek	EGOA/PNW	94	Keta Creek	EGOA/PNW	95
East Alsek River	EGOA/PNW	85	Kitasoo Creek	EGOA/PNW	169
Ecstall	EGOA/PNW	50	Kitimat River	EGOA/PNW	104
Elwha River	EGOA/PNW	93	Kitwanga River	EGOA/PNW	74
Fish Creek - summer	EGOA/PNW	187	Klahini River - Unuk River	EGOA/PNW	50
Fish Creek - early	EGOA/PNW	131	Klehini River	EGOA/PNW	92
Fish Creek - late	EGOA/PNW	49	Lagoon Creek - fall run	EGOA/PNW	172
Ford Arm Lake - fall	EGOA/PNW	95	Lake Creek	EGOA/PNW	95
Gail Creek	EGOA/PNW	94	Lauras Creek	EGOA/PNW	95
Game Creek	EGOA/PNW	44	Little Creek - fall run	EGOA/PNW	95
Gastineau	EGOA/PNW	40	Lilliwaup Creek - summer	EGOA/PNW	45
Goldstream River	EGOA/PNW	95	Lilliwaup Creek - fall	EGOA/PNW	92
Grays River - fall run	EGOA/PNW	93	Long Bay	EGOA/PNW	159
Gunnuk Creek Hatchery	EGOA/PNW	95	Lover's Cove	EGOA/PNW	50
Hamilton Creek - fall run	EGOA/PNW	78	Little Qualicum River	EGOA/PNW	98
Hamma Hamma River	EGOA/PNW	197	Lower Skagit River - fall run	EGOA/PNW	91
Harding River	EGOA/PNW	58	Little Susitna River	EGOA/PNW	134
Harris River	EGOA/PNW	65	DIPAC Macaulay Salmon Hatchery - Andrew Creek	EGOA/PNW	294
Herman Creek	EGOA/PNW	94	Mace Creek (Haida Gwaii)	EGOA/PNW	48
Heerman Creek	EGOA/PNW	47	Medvejie Hatchery - Andrew Creek Stock	EGOA/PNW	147
Hidden Falls Hatchery - summer run	EGOA/PNW	95	Mill Creek	EGOA/PNW	82
Hidden Inlet	EGOA/PNW	82	Mole River	EGOA/PNW	89
Hood Bay	EGOA/PNW	133	McNeil River	EGOA/PNW	108
Humpback Creek	EGOA/PNW	94	Nahmint River	EGOA/PNW	96
I-205 Seeps - fall run	EGOA/PNW	72	Nakat Inlet - summer	EGOA/PNW	95
Inch Creek	EGOA/PNW	181	Nakwasina River	EGOA/PNW	93
Iniskin River	EGOA/PNW	94	Nanaimo River	EGOA/PNW	77
Jimmycomelately Creek - summer run	EGOA/PNW	92	North Arm Creek	EGOA/PNW	132
Johns Creek - summer run	EGOA/PNW	92	North Creek - fall run	EGOA/PNW	95