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Genetic Stock Composition Analysis of Chinook Salmon (Oncorhynchus tshawytscha) Bycatch Samples from the 2020 Bering Sea Pollock Trawl Fisheries

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Genetic Stock Composition Analysis of Chinook Salmon (Oncorhynchus tshawytscha) Bycatch Samples from the 2020 Bering Sea Pollock Trawl Fisheries

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ABSTRACT

Genetic analysis of Chinook salmon (Oncorhynchus tshawytscha) captured as bycatch in the 2020 Bering Sea-Aleutian Island (BSAI) trawl fishery for walleye pollock (Gadus chalcogrammus) was undertaken to determine the overall stock composition of the bycatch and examine variation in stock compositions across space and time. Samples were genotyped for 37 single nucleotide polymorphism (SNP) DNA markers and stock compositions were estimated using a SNP baselined developed by the Alaska Department of Fish and Game (ADF&G). Genetic samples were collected using a systematic random sampling protocol where one out of every 10 Chinook salmon encountered was sampled. Based on analysis of 2,614 Chinook salmon bycatch samples, Coastal Western Alaska was the largest contributor (52%), with smaller contributions from British Columbia (15%), North Alaska Peninsula (13%), and West Coast US (7%) The proportional contribution of Western Alaska stocks was higher than the average over the last ten years (44%) and the proportion of Middle (2%) and Upper Yukon (2%) stocks was about average (2% and 4%, respectively). In total, we estimated that 16,796 (16,032-17,561 95% CI) fish were caught from Coastal Western Alaska stocks, 670 (396-981 95% CI) were caught from the Middle Yukon and 729 (517-968 95% CI) were caught from the Upper Yukon. The number of fish caught from the Coastal Western Alaska stock was substantially higher than the 10-year average and represented the second highest catch in the last decade. In general, the contributions of southern stocks (British Columbia and West Coast US) were lower than average in 2020 declining since 2018, contributions from Western Alaska were above average, and all other stock groups were similar to their 10-year average.

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INTRODUCTION

Pacific salmon (Oncorhynchus spp.) are prohibited species in the federally managed Bering Sea groundfish fisheries, which are subject to management rules (NPMFC 2017a) that are in part designed to reduce prohibited species catch, hereafter referred to as "bycatch". It is important to understand the stock composition of Pacific salmon caught in these fisheries, which take place in areas that are known feeding habitat for multiple brood years of Chinook salmon (Oncorhynchus tshawytscha) from many different localities in North America and Asia (Myers et al. 2007, Davis et al. 2009). Chinook salmon are economically valuable and highly prized in commercial, subsistence, and sport fisheries. Determining the geographic origin of salmon caught in federally managed fisheries is essential to understanding the effects that fishing has on Chinook salmon stock groups, especially those with conservation concerns (NPFMC 2017a). This report provides genetic stock identification results for the Chinook salmon bycatch samples collected from the Bering Sea walleye pollock (pollock; Gadus chalcogrammus) trawl fishery. National Marine Fisheries Service (NMFS) geographical statistical areas (NMFS area) associated with the Bering Sea groundfish fishery (NMFS areas 509-524) and Alaska Department of Fish and Game (ADF&G) statistical areas grids (Fig. 1) are used to describe the spatial distribution of the Chinook salmon bycatch and genetic samples.

Amendment 91 to the North Pacific Fishery Management Council (NPFMC) Fishery Management Plan (FMP) for groundfish of the Bering Sea Aleutian Island (BSAI) Management Area was enacted in 2010 and included retention of all salmon caught in the pollock fishery. In 2011, a systematic random sampling design recommended by Pella and Geiger (2009) was

 $^{^1\,\}underline{http://www.adfg.alaska.gov/static/fishing/PDFs/commercial/chart03_bs.pdf}$

implemented by the Alaska Fisheries Science Center's (AFSC) Fisheries Monitoring and Analysis Division's (FMA) North Pacific Groundfish and Halibut Observer Program (Observer Program) to collect genetic samples from one out of every 10 Chinook salmon encountered as bycatch in the Bering Sea pollock fishery.

In 2020, genetic samples were collected by the Observer Program from the Chinook salmon caught as bycatch in the Bering Sea pollock fishery. The number of available samples and the unbiased sampling methodology facilitated the extrapolation of the sample stock composition to the overall Chinook bycatch from the Bering Sea pollock trawl fishery in 2020. Samples were collected from both the Bering Sea "A" season which started 01/01/2020 and ended 06/09/2021, and the Bering Sea "B" season which started 6/10/2020 and ended 12/31/2020. Stock composition analyses were performed using the single nucleotide polymorphism (SNP) baseline provided by ADF&G (Templin et al. 2011), the same baseline that was used previously to estimate stock composition of samples from the 2005-2019 Chinook salmon bycatch (NMFS 2009; Guyon et al. 2010a,b; Guthrie et al. 2012-2021; Larson et al. 2013).

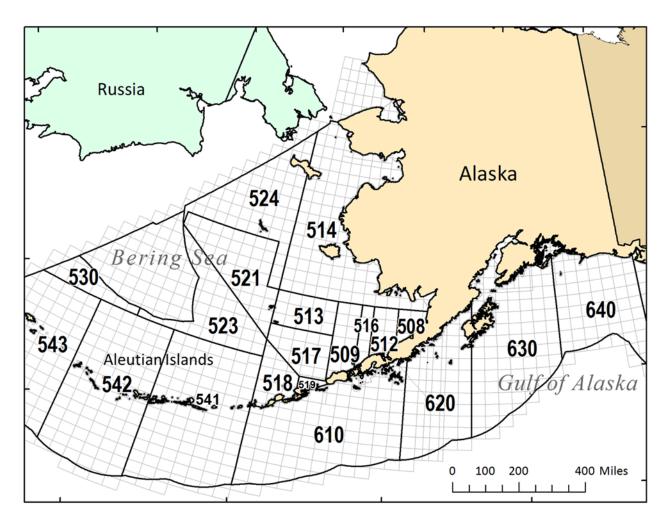


Figure 1. -- NMFS (outlined in black) and ADF&G (outlined in light gray) statistical areas associated with the Bering Sea and Gulf of Alaska groundfish fisheries.

SAMPLE DISTRIBUTION

Samples were collected from Chinook salmon bycatch by the Observer Program for analysis at AFSC's Auke Bay Laboratories (ABL). Axillary process tissues and 3-4 scales were stored in coin envelopes which were labeled, frozen, and shipped to ABL for analysis. Scales were collected as an additional source for ageing and a backup for genetic analysis.

In 2020, an estimated 32,294 Chinook salmon were taken in the bycatch of BSAI pollock trawl fisheries (NMFS 2021). The Chinook salmon bycatch estimate is 6% below the historical average (34,589) between 1991 and 2019, and far below the highest overall Chinook bycatch in

2007 when an estimated 122,195 fish were taken (Fig. 2). Of the total 2020 bycatch, 18,369 were from the trawl "A" season and 13,925 were from the "B" season. For the genetic analysis, the "B" season started on 6/01/20 (Statistical Week 23) because all but one of the "A" season samples were collected by 4/18/20. This difference is reflected in Appendix 2.

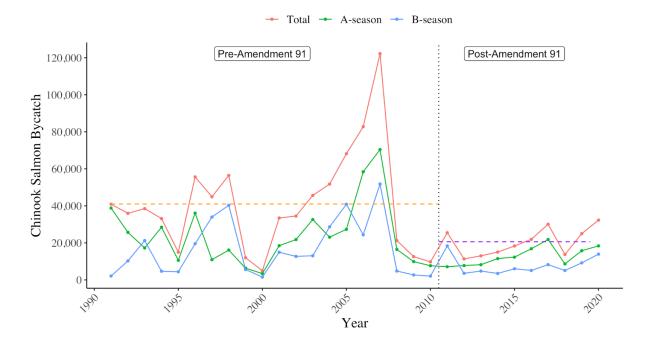


Figure 2. -- Annual "A" and "B" season estimates for the Chinook salmon bycatch from the Bering Sea pollock trawl fishery (NMFS 2021). The yellow dashed line shows the average bycatch before Amendment 91 and the purple shows the average after.

In 2020, there were 3,241 genetic samples received from the Bering Sea Chinook salmon bycatch collected by the Observer Program; of those samples, 2,614 were successfully genotyped for an overall genotyped sampling rate of 8.1% ("A" season N = 1,371 fish, 7.5% sampling rate; "B" season N = 1,243 fish, 8.9% sampling rate).

Potential biases primarily introduced through spatial and temporal aspects of genetic sample collection from the bycatch are well documented and have the potential to affect resulting stock composition estimates (Pella and Geiger 2009). The distributions of 2020 Chinook salmon bycatch genetic samples were evaluated by comparing the collection of genetic samples with the

overall bycatch distribution (Fig. 3). The temporal distribution of samples collected and successfully genotyped was evaluated across the two fishing seasons (Fig. 3). The sample spatial distribution was compared with the total bycatch by NMFS statistical area (NMFS area) over time (Fig. 3). While there was minor over- and under-sampling, genetic samples were generally spatially and temporally representative of the total Chinook bycatch (Fig. 3), since most under- and oversampled collections are from small bycatch collections.

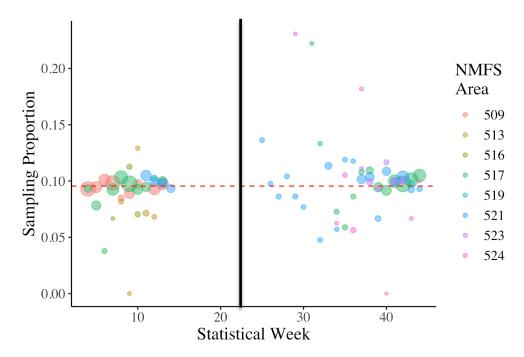


Figure 3. -- Proportion of Bering Sea Chinook salmon bycatch sampled for genetic analysis by statistical week and NMFS Statistical Areas. The size of the circles correspond to the number of bycatch fish. Weeks 4-20 correspond to the groundfish "A" season, whereas weeks 24-48 correspond to the "B" season. The black line delineates the "A" and "B" seasons. Sample sizes smaller than five not shown.

GENETIC STOCK COMPOSITION - PROCEDURE

DNA was extracted from axillary process tissues with Machery-Nagel kits (Allentown, PA) SNP genotyping was performed using Genotyping-in-Thousands by Sequencing (GTseq; Campbell et al. 2015) chemistry that uses short-read sequencing on an Illumina platform to interrogate the 37 SNP DNA markers represented in the Chinook salmon baseline (Templin et al.

2011; Appendix 4. The SNP baseline contains genetic information for 172 populations of Chinook salmon grouped into 11 geographic regions (also known as stock groups or reporting groups; Appendix 1). Proof tests performed previously have shown the baseline to be suitable for stock composition analysis using the regional reporting groups defined in Appendix 1 (Templin et al. 2011).

Sequencing libraries were prepared using the GT-seq protocol (Campbell, et al. 2015).

PCR was performed on extracted DNA with primers that amplify 37 SNP loci (Templin et al. 2011). These PCR products were then indexed in a barcoding PCR, normalized using SequalPrep plates (Invitrogen) and each 96 well plate was subsequently pooled after Sequel prep normalization. Next, a double-sided bead size selection was 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 were 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 were joined with FLASH2 (Magoč & Salzberg, 2011; https://github.com/dstreett/FLASH2). Merged reads were genotyped with the R package GTscore (McKinney; https://github.com/gjmckinney/GTscore). Individuals with low quality multilocus genotypes (< 80% of loci scored) were discarded. We re-genotype 3% of all project individuals as quality control measures.

From the 2020 Chinook salmon bycatch from the Bering Sea pollock trawl fishery, a total of 3,241 samples were analyzed of which 2,614 samples were successfully genotyped for 30 or more of the 37 SNP loci, a successful genotyping rate of 81%. The successfully genotyped samples had genetic information for an average of 36 of 37 markers from both the "A" (n = 1,371) and "B" (n = 1,243) seasons. Unfortunately, the Dutch Harbor air cargo carrier left a large

percentage of the "A" season samples in their warehouse unfrozen for over a month, which resulted in the lowered genotyping success rate for the "A" season. We were pleasantly surprised that we were able to extract as much genotypic information as we did given this logistical error.

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 (Moran and Anderson 2019). For all estimates, the Dirichlet prior parameters for the stock proportions were defined by region to be 1/(GCg), where Cg is the number of baseline populations in region g, and G is the number of regions. To ensure convergence to the posterior distribution, 11 separate MCMC chains of 70,000 iterations (burn-in of 35,000) of the non-bootstrapped model were run, with 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 and Rubin 1992) estimated with the gelman.diag function in the *coda* library (Plummer et al. 2006) within R. Once chain convergence was confirmed, inference was conducted with the conditional genetic stock identification model with bootstrapping over reporting groups (70,000 MCMC iterations, burn-in of 35,000, 100 bootstrap iterations).

GENETIC STOCK COMPOSITION - RESULTS

For "A" and "B" seasons combined, 69% of the bycatch samples were estimated to be from Alaska river systems flowing into the Bering Sea (Appendix 1, Reg. Num. numbers 2-5) with the Coastal Western Alaska region contributing the most (52%), followed by the North Alaska

Peninsula (13%). Thirty-one percent of all of the samples were from the southern (Appendix 1, Reg. Num. numbers 6, 9-11) regions, with the British Columbia (15%) region contributing the most, followed by the West Coast US (7%) and Northwest GOA (6%) regions (Appendix 2, Fig. 5).

The stock composition results indicate that 81% of the 1,371 Chinook salmon samples from the "A" season originated from Alaska river systems flowing into the Bering Sea with the largest contributions from Coastal Western Alaska region (52%) and the North Alaska Peninsula (25%). The remaining 19% were from southern regions with British Columbia (12%) contributing the most, followed by the West Coast US (3%) (Appendix 2, fig. 5). In the "B" season, 58% percent of the 1,243 "B" season samples originated from Alaska river systems flowing into the Bering Sea with the largest contribution from Coastal Western Alaska region (54%), while 32% were from southern regions; British Columbia (18%), West Coast US (11%), and Northwest GOA (9%) regions (Appendix 2, Fig. 5).

Using information from the ANSWERS tool provided by AKFIN (NMFS 2022), geographical (ADF&G statistical areas) aggregations were developed to investigate how stock compositions might vary among smaller areas of interest to the NPFMC. It should be noted that some of these strata overlap, with some samples being used in multiple analyses.

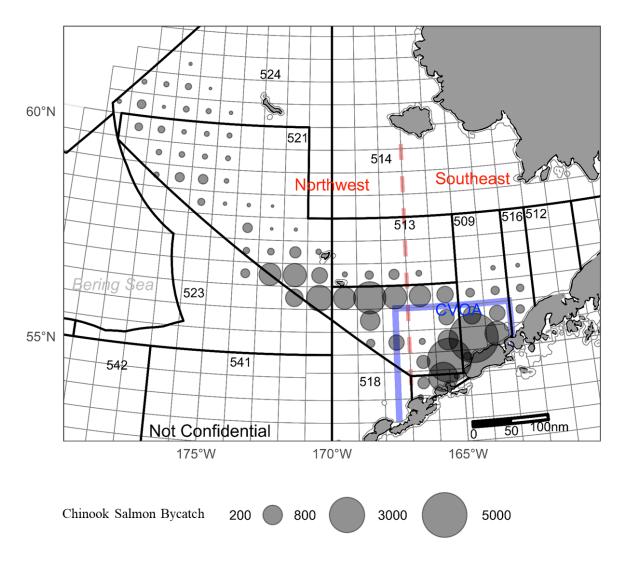


Figure 4. -- Location of sample strata used in comparative stock composition estimates from the 2020 Bering Sea Chinook salmon bycatch. Circles represent the amount of total bycatch in each stratum. The red dashed line delineates the Northwest and Southeast strata, while the solid blue line shows the boundary of the CVOA (NMFS 2021).

The "A" season estimates were developed for overlapping strata with sufficient numbers of samples (Appendix 2; Figs. 4, 5); Catcher Vessel Operation Area (CVOA) (659 samples, Figs. 4, 5), NMFS Statistical Area 509 (578 samples; Figs. 1, 5), Southeast Bering (792 samples, Figs. 4, 5), and Northwest Bering (579 samples, Figs. 4, 5). Over 73% of the Chinook salmon bycatch in the CVOA, NMFS Area 509 and Southeast Bering strata during the "A" season were from Alaska river systems flowing into the Bering Sea. For the CVOA, NMFS area 509, and

Southeast Bering Sea during the "A" season, most fish were from Coastal Western Alaska (47%, 46%, and 47%, respectively) followed by North Alaska Peninsula at (26%, 26% and 28%). The largest southern components for CVOA, NMFS Area 509 and Southeast Bering Sea during the "A" season were British Columbia (18%, 20% and 16%, respectively) and West Coast US (5%, 5% and 4%). For the Northwest Bering "A" season stratum, 88% of the bycatch was estimated to

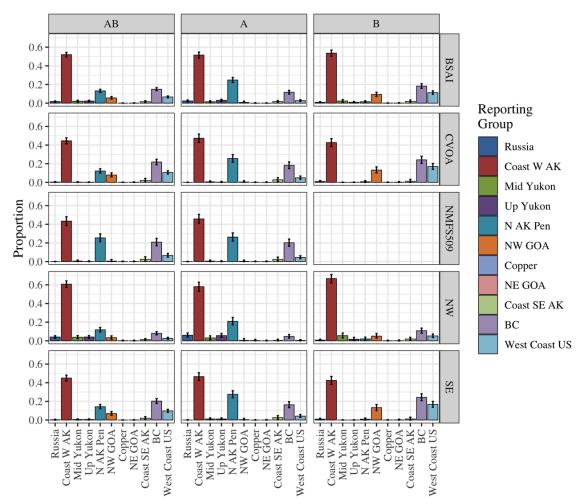


Figure 5. -- Stock composition estimates with 95% credible intervals of the 2020 BSAI Chinook salmon bycatch for overall (3,241 samples) "A" and "B" seasons; CVOA overall (1,325 samples), "A" and "B" season; NMFS area 509 overall (1,332 samples) and "A" season (bottom); Northwest Bering overall (1,150 samples), "A" and "B" seasons; and Southeast Bering overall (1,464 samples) "A and "B" seasons (NMFS 2021)

be from Alaska river systems flowing into the Bering Sea, with the largest contributions from Coastal Western Alaska (58%) followed by North Alaska Peninsula (21%), Upper Yukon (6%)

and Mid Yukon (3%). Six percent of the stock composition was estimated to be from southern regions, with most fish from British Columbia (5%).

For the "B" season, stock composition estimates were developed for CVOA (766 samples, Figs. 4, 5), Southeast Bering (672 samples, Figs. 4, 5), and Northwest Bering (372 samples, Figs. 4, 5) (NMFS 2021). For the Northwest Bering "B" season stratum, 76% of the stock composition was estimated to be from Alaska river systems flowing into the Bering Sea, which includes the largest contributor Coastal Western Alaska (67%). Twenty-three percent of the stock composition was estimated to be from southern regions, where the largest contributors were British Columbia (11%), Northwest GOA (5%) and West Coast US (5%).

Fifty-six percent of the "B" season stock composition estimates for the CVOA and Southeast Bering were from southern regions (Fig. 5, Appendix 2). The largest contributors were British Columbia (25% for CVOA, 24% for Southeast Bering), West Coast US (16% for CVOA, 17% for Southeast Bering), and Northwest GOA (13%). The major contributor from the Bering Sea was Coastal Western Alaska at 43% for CVOA and Southeast Bering. It is important to note that CVOA is a subsection of the Southeast Bering where most of the bycatch occurs.

Both the CVOA and Southeast Bering "B" season samples had a higher proportion of fish from southern regions (56%) than the "B" season overall (41%). The stock compositions were highly variable in the CVOA and Southeast Bering across the seasons. It is notable that the contribution from the West Coast US region increased from 5% to 17% for CVOA and Southeast Bering strata from the "A" and "B" seasons while the contribution from the Northern Alaska Peninsula region decreased from ~27% to almost zero in the same time frame. The Northwest GOA region increased from almost zero to 13% between the CVOA and Southeast Bering "A" and "B" seasons. The largest differences in the Northwest Bering between the "A" and "B"

seasons were the increase of Coastal Western Alaska from 58% to 67% and the decrease of North Alaska Peninsula from 21% to 2%.

COMPARISON WITH PREVIOUS ESTIMATES

About 60% of the Chinook salmon bycatch in 2020 occurred during the "A" season (Fig. 2), which is similar to most previous years since 2011. As in most previous years (with the exception of 2017), stock compositions from the analysis of the 2020 "A" season Chinook salmon bycatch showed that the majority of fish originated from river systems flowing into the Bering Sea (81%; Fig. 6). The Coastal Western Alaska region was the largest contributor in the 2020 "A" season, consistent with every year except 2017. The 2020 "B" season stock composition estimates from Coastal Western Alaska at 52% was higher than 2018 and 2019 (~30%), with Coastal Western Alaska contributions in all three of these years being substantially more than 2016 and 2017 when Coastal Western Alaska stock proportions were closer to 15% (Fig. 6, Appendix 3). Contrastingly, the higher levels of southern stock groups contributions observed from 2015 to 2018 are continuing to decrease. The estimated relative contributions from these more southern regions in the "B" season previously increased from a low of 20% in 2011 to a high of 86% in 2017, declining to 63% in 2018, and bumping up slightly to 67% in 2019, then dropping to 41% in 2020 (Fig. 6, Appendix 3).

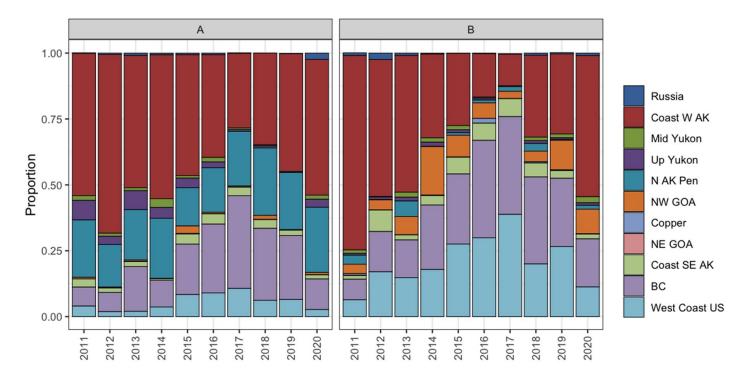


Figure 6. -- Annual "A" season (left) and "B" season (right) genetic stock composition estimates for 2011-2020 from the Bering Sea Chinook salmon bycatch.

When the stock compositions were analyzed on a yearly basis, the Coastal Western Alaska region shows variable contributions over time, but it was generally trending downward since 2011 until 2017, and since 2018 it has been trending upwards (Fig. 7). The 2020 North Alaska Peninsula region contribution of 13% was about average compared to previous years (Fig. 7). The Upper and Middle Yukon River, GOA, and Coastal Southeast Alaska contributions continued to be low in 2020, while contributions from the British Columbia and West Coast US regions have generally decreased from 2017 to 2020 (Fig. 7).

The estimated numbers of Chinook salmon caught as bycatch from Coastal Western Alaska stocks has varied from a high of 17,421 in 2011 to a low of 4,635 in 2018 (Fig. 7, Appendices 2, 3). Total catches of Coastal Western Alaska stocks were relatively stable from 2012 to 2018 and were consistently below 8,000 fish. In 2019, the catch increased slightly to near 10,000. In 2020 the catch further increased to nearly 17,000, close to the high in 2011.

Catches from the North Alaska Peninsula stock group have been relatively consistent over the last decade, ranging from ~2,500 to 5,000. Catches of southern stocks from British Columbia and the US West Coast peaked in 2017 at ~15,000 fish but generally range between 5,000 and 10,000. Catches of these two stocks in 2020 were the lowest since 2015. It is important to note these catch estimates represent the removals by region in each year but they cannot be used as is to represent any trends in the impact rates to particular regions over time because the amount of bycatch and areas fished vary. Stock-specific impacts are best estimated with adult equivalency models (Ianelli and Stram 2015).

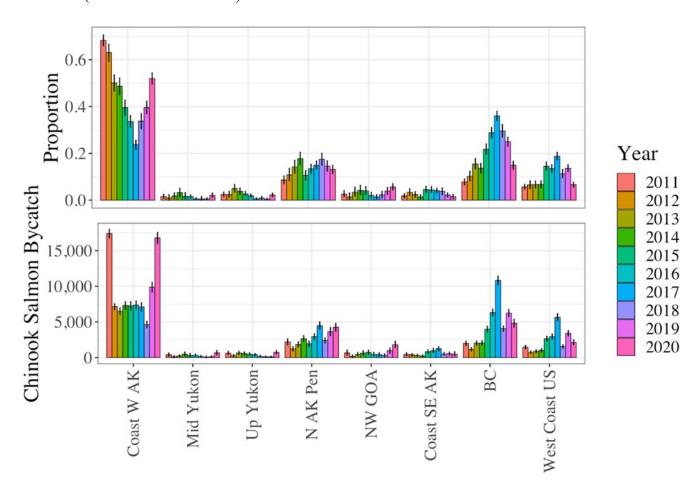


Figure 7. -- Annual (2011-2020) stock composition estimates with 95% credible intervals from the Bering Sea Chinook salmon bycatch (Top). Annual (2011-2020) bycatch estimates in numbers of fish with 95% credible intervals from the Bering Sea Chinook salmon bycatch (Bottom). Regions with low catches, Russia (Avg. N = 145) Copper (Avg. N = 22), and Northeast GOA (Avg. N = 6) were omitted.

AGE COMPOSITION ANALYSIS

Ageing Methods

Obtaining ages is important for parameterizing adult equivalency models and can also provide information on specific cohorts that can be used to better understand stock composition trends. The AFSC genetics program received paired genetic and scale samples from the Observer program. Scales were removed from sample envelopes and cleaned of dried slime and grit by moistening the scale with RO water and gently rubbing the scale between thumb and forefinger. Clean scales were then moistened and the sculptured side of the scale was mounted up on the scale gum card. Acetate impressions of each card of scales were made with a PHI PW22OH scale press. All acetate impressions were delivered to the ADF&G Mark Tag and Age Lab (MTA Lab) for age estimation. All age estimates are stored in the AKFIN database with paired observer information.

BSAI Ages

Of the 2,926 scales that were pressed, 1,782 scales were successfully read by the ADF&G MTA Lab (Fig. 8). The most common freshwater and saltwater zone error codes were inverted and wrong species. The most common freshwater age was 1 (79.2%), followed by age 0 (20.7%) whereas the most common saltwater ages were 2 (46.9%), 3 (30.9%), and 1 (14.8%). Of the three-, four-, and five-year-old fish caught in the BSAI trawl fishery, the majority were from Coastal Western Alaska (48.58%, 53.27%, and 56.03%, respectively). Middle and Upper Yukon stock groups contributed a relatively small amount, with the largest contribution of Middle Yukon stocks to the age-4 and age-5 mixtures (2.7 and 2.8%) and Upper Yukon to the age-5 and age-6 mixtures (7.7% and 6.6%). The North Alaska Peninsula stock groups comprised the largest

proportion of the oldest age class of fish, 6-year-olds (59.5%), with progressively declining contributions at younger ages. Northwest Gulf of Alaska stock groups comprised 10.9% and 4.8% of the age-3 and age-4 mixtures but contributed less than 1% to age-5 and age-6 mixtures. The southernmost stock groups (BC and West Coast US) were predominately age-3 and age-4 when captured, comprising 32.1% and 23.3%, respectively.

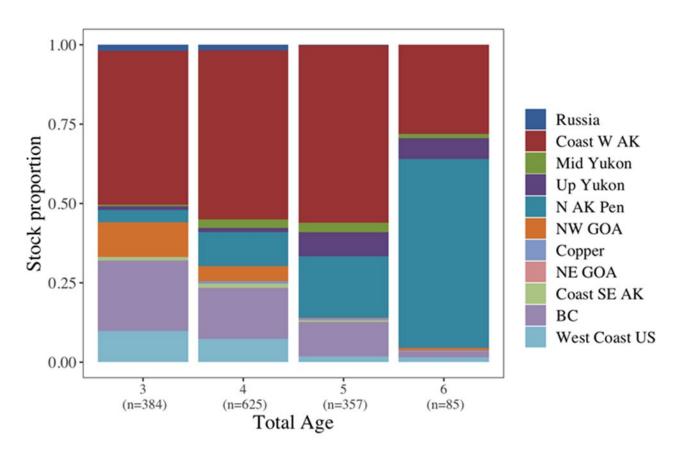


Figure 8. -- Stock Composition of the four age classes of Bering Sea Chinook salmon bycatch. The number of successfully aged samples is below the respective bars.

SUMMARY

Stock composition estimates of the Chinook salmon bycatch inform pollock and salmon fishery managers of the biological effects of the incidental take of salmon in the trawl fishery (Ianelli and Stram 2015). The incidental harvest of Chinook salmon in the Bering Sea pollock fishery averaged 34,258 salmon per year between 1991 and 2019 (29-year average), with a peak

of 121,195 in 2007 and a low of 4,961 in 2000 (Fig. 2; NMFS 2021). The Bering Sea Chinook salmon bycatch has abated somewhat in more recent years. The incidental harvest between 1991 and 2010 averaged 40,976 and after the implementation Amendment 91 between 2011 and 2019 the average dropped to 19,328 (Fig.2; NMFS 2021). In 2020, a total of 32,294 Chinook salmon were caught, which is below the 28-year average, but above the 9-year post-Amendment 91 average.

Sampling Issues

With the implementation of systematic random sampling, 2020 is the tenth year from which representative samples have been collected from the Chinook salmon bycatch. Systematic random sampling represents a substantial effort on the part of the Observer Program to develop standardized protocols for collecting sets of samples from numerous observers both at sea and in shore-based processing plants, the results of which are clearly apparent in the representative nature of the sample sets (Figs. 3). The number of successfully genotyped Chinook salmon from the Bering Sea bycatch samples was 2,614 corresponding to an effective overall sampling rate in 2020 of 8.1%, despite mishandling of samples noted earlier by a Dutch Harbor air cargo carrier.

Stock Composition Estimates

The proportions of Chinook salmon originating from Alaska rivers flowing into the Bering Sea accounted for most of the catches in early post-amendment 91 years, but southern regions have accounted for larger and larger proportions in more recent years with a maximum in 2017, where southern stocks accounted for more than half of the bycatch. The 2018-2020 data may signal a change to this pattern, with Chinook salmon originating from Alaska rivers flowing into the Bering Sea accounting for more than two-thirds of the bycatch in 2020 (Appendices 2, 3). The stock composition of the Chinook salmon bycatch from the 2019 "A" season differed

from the "B" season, demonstrating temporal changes (Appendix 2; Figs. 5 and 6). This was especially apparent for the North Alaska Peninsula (25% and 2%) region. The largest contributor to both "A" and "B" season fisheries was the Coastal Western Alaska region which increased slightly from "A" to "B" (52% to 54%).

Spatial analysis showed that the stock compositions varied within season depending upon where the salmon were caught. For example, during the "B" season a higher proportion of Coastal Western Alaska Chinook salmon were intercepted in the northwestern area of the Bering Sea, and a higher proportion of southern origin Chinook salmon were intercepted in the southeastern area of the Bering Sea (Fig. 5). Analysis of bycatch by age indicated that fish from the Coastal Western Alaska region were encountered at similar rates across the primary ages (3, 4, 5). Fish from southern stocks (NW GOA, British Columbia, and West Coast US) were encountered more frequently at younger ages. This is the first analysis year where age estimates have been widely available and more scale are currently ageing additional years to investigate temporal trends in stock compositions by age. It is notable that the North Alaska Peninsula stock group comprised the largest proportion of the oldest age class of fish.

Application of Estimates

Stock composition estimates for the 2020 Bering Sea Chinook salmon bycatch were mostly representative of the overall bycatch for this year and are presented in relative contributions as well as estimated numbers of fish. The extent to which any salmon stock group is impacted by the bycatch of the Bering Sea trawl fishery is dependent on many stock-specific factors including 1) the overall numbers of the stock in the bycatch, 2) the ages of the salmon caught in the bycatch by stock group, 3) the ages of the returning salmon by stock group, and 4) the total annual run-size of the affected stock groups. Because the effect of stock-specific

numbers of Chinook salmon in the bycatch is moderated by several factors, a higher contribution of a particular stock group in one year does not necessarily imply greater impact than a smaller estimate the next.

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APPENDICES

Appendix 1. -- Chinook salmon populations in the ADF&G SNP baseline with the regional designations used in the analyses of this report. S. = South, R. = River, H. = Hatchery, and L. = Lake.

	Reg			Reg	
Population name	Num.	Region	Population name	Num.	Region
Bistraya River	1	Russia	Henshaw Creek	3	Mid Yukon
Bolshaya River	1	Russia	Kantishna River	3	Mid Yukon
Kamchatka River late	1	Russia	Salcha River	3	Mid Yukon
Pakhatcha River	1	Russia	Sheenjek River	3	Mid Yukon
Andreafsky River	2	Coast W AK	S. Fork Koyukuk River	3	Mid Yukon
Aniak River	2	Coast W AK	Big Salmon River	4	Up Yukon
Anvik River	2	Coast W AK	Blind River	4	Up Yukon
Arolik River	2	Coast W AK	Chandindu River	4	Up Yukon
Big Creek	2	Coast W AK	Klondike River	4	Up Yukon
Cheeneetnuk River	2	Coast W AK	Little Salmon River	4	Up Yukon
Eek River	2	Coast W AK	Mayo River	4	Up Yukon
Gagaryah River	2	Coast W AK	Nisutlin River	4	Up Yukon
George River	2	Coast W AK	Nordenskiold River	4	Up Yukon
Gisasa River	2	Coast W AK	Pelly River	4	Up Yukon
Golsovia River	2	Coast W AK	Stewart River	4	Up Yukon
Goodnews River	2	Coast W AK	Takhini River	4	Up Yukon
Kanektok River	2	Coast W AK	Tatchun Creek	4	Up Yukon
Kisaralik River	2	Coast W AK	Whitehorse Hatchery	4	Up Yukon
Kogrukluk River	2	Coast W AK	Black Hills Creek	5	N AK Pen
Kwethluk River	2	Coast W AK	King Salmon River	5	N AK Pen
Mulchatna River	2	Coast W AK	Meshik River	5	N AK Pen
Naknek River	2	Coast W AK	Milky River	5	N AK Pen
Nushagak River	2	Coast W AK	Nelson River	5	N AK Pen
Pilgrim River	2	Coast W AK	Steelhead Creek	5	N AK Pen
Salmon RPitka Fork	2	Coast W AK	Anchor River	6	NW GOA
Stony River	2	Coast W AK	Ayakulik River	6	NW GOA
Stuyahok River	2	Coast W AK	Benjamin Creek	6	NW GOA
Takotna River	2	Coast W AK	Chignik River	6	NW GOA
Tatlawiksuk River	2	Coast W AK	Crescent Creek	6	NW GOA
Togiak River	2	Coast W AK	Crooked Creek	6	NW GOA
Tozitna River	2	Coast W AK	Deception Creek	6	NW GOA
Tuluksak River	2	Coast W AK	Deshka River	6	NW GOA
Unalakleet River	2	Coast W AK	Funny River	6	NW GOA
Beaver Creek	3	Mid Yukon	Juneau Creek	6	NW GOA
Chandalar River	3	Mid Yukon	Karluk River	6	NW GOA
Chena River	3	Mid Yukon	Kasilof River mainstem	6	NW GOA

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	Kerr Creek	9	Coast SE AK	Robertson Creek	10	BC
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	King Creek	9	Coast SE AK	Sarita River	10	BC

	Reg			Reg	
Population name	Num.	Region	Population name	Num.	Region
Stuart River summer	10	BC	Lower Deschutes R. fall	11	West Coast US
Sustut River	10	BC	Lyons Ferry H. summer/fall	11	West Coast US
Torpy River summer	10	BC	Makah National Fish H. fall	11	West Coast US
Wannock River	10	BC	McKenzie River spring	11	West Coast US
Alsea River fall	11	West Coast US	Sacramento River winter	11	West Coast US
Carson Hatchery spring	11	West Coast US	Siuslaw River fall	11	West Coast US
Eel River fall	11	West Coast US	Soos Creek Hatchery fall	11	West Coast US
Forks Creek fall	11	West Coast US	Upper Skagit River summer	11	West Coast US
Hanford Reach	11	West Coast US			
Klamath River	11	West Coast US			

Appendix 2. -- Regional Rubias stock composition percentage estimates, standard deviations (SD), 95% credible intervals (CI), and estimated numbers of Chinook salmon from the the 2020 Bering Sea pollock trawl fisheries. Sample sizes are adjacent to the stratum designation. Total catch is the census for each stratum from AKFIN reports (NMFS 2021). Estimated numbers of fish for aged fish are for only the number of fish aged.

for age	d fish are	for only	the nu	umber of fish ag								
				N=1,371)		"B" Sea	_				Sea all	(N=3,241)
Region	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI
Russia	435	2.4		(1.5,3.4)	123	0.9	0.28	(0.4,1.5)	552		0.30	(1.2,2.3)
Coast W AK	9,469	51.5	1.64	(48.3,54.7)	7,467	53.6	1.68	(50.3,56.9)	16,796	52.0	1.21	(49.6,54.4)
Mid Yukon	281	1.5	0.49	(0.7,2.6)	318	2.3	0.73	(1.0,3.8)	670	2.1	0.47	(1.2,3.0)
Up Yukon	557	3.0	0.54	(2.1,4.2)	130	0.9	0.41	(0.3, 1.8)	729	2.3	0.36	(1.6,3.0)
N AK Pen	4,553	24.8	1.41	(22.1,27.6)	208	1.5	0.48	(0.7,2.5)	4,247	13.1	0.84	(11.5,14.8)
NW GOA	143	0.8	0.53	(0.3,2.1)	1,295	9.3	1.12	(7.2,11.6)	1,825	5.7	0.68	(4.4, 7.1)
Copper	0	0.0	0.11	(0.0,0.4)	7	0.0	0.08	(0.0,0.3)	0	0.0	0.06	(0.0,0.2)
NE GOA	3	0.0	0.10	(0.0,0.3)	12	0.1	0.15	(0.0,0.5)	14	0.0	0.10	(0.0,0.3)
Coast SE AK	297	1.6	0.55	(0.7,2.8)	249	1.8	0.73	(0.5,3.3)	497	1.5	0.47	(0.7,2.6)
BC	2,138	11.6	1.01	(9.7,13.6)	2,548	18.3	1.25	(15.9,20.8)	4,824	14.9	0.84	(13.3,16.6)
West Coast US	494	2.7	0.47	(1.9,3.7)	1,569	11.3	0.95	(9.5, 13.2)	2,141	6.6	0.52	(5.7,7.7)
Total Catch	18,369				13,925				32,294			
		CVOA '				CVOA "	B" (N			CVOA	(N=1,3)	
Region	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI
Russia	0		0.05	(0.0,0.1)	88		0.41	(0.3,1.9)	65	0.4	0.20	(0.0,0.8)
Coast W AK	4,696		2.29	(42.8,51.8)	3,796	42.6		(38.3,46.8)	8,035	44.6	1.64	(41.4,47.8)
Mid Yukon	56		0.38	(0.1,1.5)	0		0.08	(0.0,0.2)	42		0.18	(0.0,0.7)
Up Yukon	20		0.28	(0.0,1.0)	2		0.09	(0.0,0.3)	23		0.13	(0.0,0.5)
N AK Pen	2,538	25.6	2.05	(21.6,29.7)	60	0.7	0.51	(0.0,1.9)	2,199	12.2	1.16	(10.0, 14.5)
NW GOA	36		0.48	(0.1,1.8)	1,175	13.2		(10.1, 16.5)	1,421	7.9	1.09	(5.9,10.2)
Copper	0	0.0	0.12	(0.0,0.4)	3	0.0	0.10	(0.0,0.3)	0	0.0	0.07	(0.0,0.3)
NE GOA	4	0.0	0.17	(0.0,0.6)	14	0.2	0.25	(0.0,0.9)	16	0.1	0.14	(0.0,0.5)
Coast SE AK	272	2.7	1.06	(0.9,5.0)	105	1.2	0.88	(0.0,3.2)	370	2.1	0.96	(0.4,4.2)
BC	1,818	18.3	1.81	(14.9, 21.9)	2,150	24.1	1.91	(20.5,27.9)	3,934	21.8	1.48	(18.9,24.7)
West Coast US	486	4.9	0.87	(3.4,6.8)	1,514	17.0	1.57	(14.1,20.2)	1,917	10.6	0.90	(8.9,12.5)
Total Catch	9,925				8,907				18,022			
		NW Bei	ring S.	"A" (N=579)		NW Ber	ing S.	"B" (N=571)		NW Bei	ing S.	(N=1,150)
Region	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI
Russia	394	6.0	1.10	(4.0,8.3)	50	0.8	0.38	(0.3,1.7)	522	4.1	0.65	(2.9,5.4)
Coast W AK	3,808	58.1		(53.1,62.8)	4,177	66.7		(62.2,71.1)	7,785		1.77	(57.2,64.2)
Mid Yukon	201		1.00	(1.4,5.3)	347		1.33	(3.1,8.3)	488		0.85	(2.3,5.6)
	367		1.03				0.89	, , ,	526			
Up Yukon				(3.7,7.8)	106			(0.3,3.7)		4.1		(2.8,5.6)
N AK Pen	1,369		2.00	(17.1,25.0)	127		0.82	(0.7,3.9)	1,511		1.22	(9.5,14.3)
NW GOA	32	0.5	0.63	(0.1,2.4)	316		1.27	(2.8, 7.8)	428	3.3	0.91	(1.7,5.3)
Copper	20	0.3	0.42	(0.1, 1.6)	5	0.1	0.17	(0.0,0.6)	16	0.1	0.19	(0.0,0.7)
NE GOA	1	0.0	0.25	(0.0,0.7)	5	0.1	0.25	(0.0,0.9)	7	0.1	0.19	(0.0,0.7)
Coast SE AK	29	0.4	0.51	(0.0,1.8)	123	2.0	0.75	(0.7,3.7)	168	1.3	0.46	(0.5,2.3)
BC	305	4.7	0.95	(2.9,6.7)	675	10.8	1.36	(8.3,13.6)	1,027	8.0	0.85	(6.4,9.8)
West Coast US	29		0.32	(0.0,1.3)	327		0.97	(3.5,7.3)	336		0.50	(1.7,3.7)
Total Catch	6,557	0.4	0.52	(0.0,1.5)	6,258	3.2	0.77	(3.3,7.3)	12,815	2.0	0.50	(1.7,5.7)
2 Star Catori		SE Berir	1g S. "	A" (N=792)		SE Berir	1g S. "	'B" (N=672)		SE Berir	1g S. ((N=1,464)
Region	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI
Russia	0	0.0		(0.0,0.4)	75		0.40	(0.3,1.9)	67	0.3		(0.0,0.8)
Coast W AK	5,431		2.07	(42.5,50.6)	3,282	42.5		(38.2,46.7)	8,725		1.54	(42.0,48.0)
Mid Yukon	132		0.49	(0.4,2.3)	0		0.08	(0.0,0.2)	114		0.26	(0.2,1.2)
Up Yukon	131		0.53	(0.3,2.3)	2		0.09	(0.0,0.3)	116		0.28	(0.2,1.2)
N AK Pen	3,214		1.91	(23.9,31.4)	68		0.54	(0.1,2.1)	2,772		1.15	(12.1,16.6)
NW GOA	48		0.48	(0.1,1.7)	1,024		1.64	(10.2,16.6)	1,355		0.96	(5.2,9.0)
Copper	0		0.09	(0.0,0.3)	2		0.10	(0.0,0.3)	0		0.06	(0.0,0.2)
NE GOA	4		0.14	(0.0,0.3) $(0.0,0.4)$	14		0.25	(0.0,0.9)	15		0.00	(0.0,0.2) $(0.0,0.4)$
Coast SE AK	303		0.99	(0.8,4.7)	86	1.1	0.23	(0.0,3.0)	378		0.82	(0.4,3.6)
BC	1,905		1.62	(13.3,19.7)	1,877	24.3		(20.8,28.1)	3,939		1.29	(17.9,23.0)
West Coast US	491		0.79	(2.8,5.9)	1,295	16.8		(13.8,19.9)	1,904		0.82	(8.3,11.5)
001 00401 00	7/1	7.2	0.17	(2.0,0.7)	1,473	10.0	1.01	(10.0,17.7)	1,707	7.0	0.02	(0.5,11.5)
Total Catch	11,659				7,726				19,385			

		Area 50	9 "A" ((N=578)		Area 50	9 (N=6	507)		Bering S	Sea Ag	e 3 (N=384)
Region	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI
Russia	0	0.0	0.00	(0.1,0.0)	0	0.0	0.00	(0.1,0.0)	7	1.9	0.76	(0.7,3.6)
Coast W AK	3,912	45.7	40.95	(2.4,45.7)	3,843	43.4	38.79	(2.4,43.4)	187	48.6	2.94	(42.8,54.3)
Mid Yukon	46	0.5	0.04	(0.4,0.4)	51	0.6	0.11	(0.4, 0.5)	2	0.4	0.50	(0.0,1.8)
Up Yukon	8	0.1	0.01	(0.2,0.0)	7	0.1	0.00	(0.2,0.0)	5	1.2	0.66	(0.2,2.8)
N AK Pen	2,249	26.3	22.08	(2.2,26.3)	2,254	25.5	21.43	(2.1,25.4)	14	3.8	1.32	(1.5,6.7)
NW GOA	24	0.3	0.06	(0.4,0.1)	49	0.6	0.16	(0.6,0.2)	42	10.9	2.23	(6.9, 15.6)
Copper	0	0.0	0.00	(0.1,0.0)	0	0.0	0.00	(0.1,0.0)	0	0.0	0.11	(0.0,0.3)
NE GOA	2	0.0	0.00	(0.2,0.0)	0	0.0	0.00	(0.2,0.0)	1	0.2	0.39	(0.0,1.4)
Coast SE AK	202	2.4	0.66	(1.1,2.2)	221	2.5	0.65	(1.2,2.3)	4	1.0	0.64	(0.0,2.5)
BC	1,729	20.2	16.51	(1.9,20.2)	1,847	20.9	17.01	(2.0,20.8)	85	22.1	2.25	(17.9,26.7
West Coast US	383	4.5	3.02	(0.8,4.4)	582	6.6	4.77	(1.0,6.5)	38	9.9	1.65	(6.9, 13.4)
Total Catch	8,554				8,854				384			
		Bering S	Sea Ag	e 4 (N=384)		Bering	Sea Ag	e 5 (N=384)		Bering S	Sea Ag	e 6 (N=384)
Region	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI
Russia	11	1.7	0.58	(0.7,3.0)	0	0.1	0.23	(0.0,0.8)	0	0.0	0.36	(0.0,1.1)
Coast W AK	333	53.3	2.36	(48.6,57.9)	200	56.0	3.04	(49.9,61.9)	24	28.1	5.87	(17.2,40.1)
Mid Yukon	17	2.7	1.10	(0.8,5.0)	10	2.9	1.14	(1.0,5.5)	1	1.3	2.06	(0.0, 7.0)
Up Yukon	8	1.3	0.81	(0.2,3.1)	27	7.7	1.61	(4.8,11.0)	6	6.6	3.17	(1.6, 13.9)
N AK Pen	67	10.7	1.60	(7.8, 14.0)	69	19.3	2.50	(14.6,24.3)	51	59.5	6.10	(47.3,71.1
NW GOA	30	4.8	1.31	(2.6,7.7)	1	0.3	0.64	(0.0,2.2)	1	0.8	1.61	(0.0,5.8)
Copper	5	0.7	0.56	(0.3,2.1)	2	0.5	0.49	(0.1, 1.8)	0	0.2	0.78	(0.0,2.7)
NE GOA	0	0.0	0.18	(0.0,0.6)	1	0.2	0.71	(0.0,2.6)	0	0.1	0.77	(0.0,2.6)
Coast SE AK	8	1.3	0.88	(0.0,3.3)	1	0.4	0.58	(0.0,2.0)	0	0.0	1.00	(0.0,3.5)
BC	100	16.1	1.62	(13.0,19.4)	39	10.9	1.71	(7.7,14.4)	2	1.9	1.67	(0.3,6.2)
West Coast US	46	7.3	1.05	(5.4, 9.5)	7	1.9	0.72	(0.7, 3.5)	1	1.5	1.41	(0.0,5.2)

Total Catch

Appendix 3. — Regional BAYES stock composition percentage estimates and estimated numbers of previous years of Chinook salmon from the Bering Sea pollock trawl fisheries. The BAYES mean estimates are also provided with standard deviations (SD), and the 95% credible intervals (CI). Sample sizes are adjacent to stratum designation. Total catch is the actual catch for that year.

Part	the 95%	credible i	ntervals	(CI). S	ample sizes are				ignation. Total c	atch is th	e actual	catch	for that year.
Russia S	2019			son (N				son (l			Bering S	Sea all	(N=2,310)
Const MAK CADS 448 167 (41,548) 2812 304 188 CASALH 9901 306 120 (20,10) Up Yukon 369 0.0 0.11 (00,00) 155 0.6 0.35 (0.1 0.1 10 0.4 0.8 (0.120) NAK Pen 3420 2.17 150 (188,437) 1.03 0.11 21 (0.01,61) 3.03 1.04 10 (1.04) (2.14)	Region		Mean								Mean	SD	95% CI
Mat Nukon					(, ,				(, ,				
CP Valor A P A A B A A B B A A B B										-			
NA Pen SA Pen													
NW COA 36 0.2 0.37 (00.01) 1.12 1.43 1.85 1.41 0.99 0.00 0.09 (00.02) Copper 3 0.00 0.00 (00.01) 6 0.1 0.21 (00.07) 5 0.0 0.07 (00.02) Coast SEAK 3.88 2.0 0.55 (0.0.32) 2.25 0.75 (1.54.4) 550 2.0 0.07 (0.0.2) West Coast US 1.025 6.5 0.5 (3.79) 2.46 1.26 1.92 0.25 0.00 (21.15) 1.02 0.00 (21.15) 1.02 0.00 (21.15) 1.02 0.00 0.01 (21.15) 1.02 0.00 0.00 0.01 1.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.02 0.03 0.00 0.00 0.00 0.00 0.00 0.00 0.00	•								` ' /				
Capper									` ' /	-			
Net Coor	NW GOA					-							
Page	Copper					17	0.2	0.25	(0.0,0.9)		0.0	0.09	
No. No					. , ,				` ' '				
Total Catch 16.738 15.738 15.0 15.0 15.738 15.738 15.0 15.738 15.738 15.738 15.0 15.738			2.0					0.75					
Part		-											
Part			6.5	0.67	(5.3,7.9)		26.6	1.59	(23.5,29.8)		13.6	0.74	(12.2,15.1)
Region		15,738				9,246		_					
Russia				_									
Maid Yukon 2.974 3.48 2.01 (3.10,38.8) 1.613 3.1.1 2.50 (26.23.60) 4.635 3.88 1.64 0.37.0 Maid Yukon 3.6 0.83 0.02.1.7 55 1.1 1.79 (0.02.8) 62 0.5 5.1 (0.01.6) NAK Pen 2.187 2.56 1.86 (0.21.79) 1.53 2.9 1.05 (1.25.2) 2.395 1.75 1.29 (1.00.00) NGOA 1.62 1.5 0.00 (0.00.0) 2.90 0.00 0.00 0.00.00													
Mid Viskon Ge Ge Ge Ge Ge Ge Ge G													
Up Yukon 69 0.8 0.8 0.8 0.21, m) 55 1.1 0.79 0.02, m) 1.12 0.95 0.31 0.41, m) 0.41 0.41, m) N A K Pen 2187 2.56 1.86 2.21,293 1.53 2.21 0.5 (1.25,22) 2.395 1.55 1.29 (15,020) 1.10 0.10,33 0.90 4.0 1.34 (1.87,00 312 2.3 0.90 0.10,31 0.10,33 0.00 0.00,50 0.00,						-				-			
NAK Pen 2,187 25.6 1.86 (22.1,29.3) 153 2.9 1.05 (1.2,50.2) 2.98 1.05 1.12 1.50,000 (1.0,00) 1.04 1.134 (1.1,20.9) 3.12 2.3 0.09 (1.0,30) (1.0,40) 3.3 2.2 0.09 (1.0,00) (0.0,00) 0.00 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>													
NN GOA 126 1.5 0.84 (0.1.3.3) 209 4.0 1.34 (1.8.7.0) 312 2.3 0.69 (1.1.3.8) Copper 2 0.0 0.00 (0.00.0) 2 0.0 0.01 0.01 0.00	•												
Copper 2 0.0 0.00 (0.00,02) 26 0.5 0.3 0.00 0.0 0.00 0.0 0.00		-											
NE GOA 6 0.1 0.20 (0.0,0.6) 2 0.0 0.00,0.5 4 0.0 0.09 (0.0,0.3) Coats EAK 279 3.3 0.79 (1.9,5.0) 273 3.3 1.66 (2.2,8.7) 5.50 2.2,8.7 509 3.7 0.70 (2.4,5.2) BC 2333 273 1.62 (24,3.0) 1.1,15 3.0 2.50 (2.8,1.8) 4.00 2.96 (2.1,3.1) 1.30 1.25 1.1,25 1.1 9.0 0.0 1.0 1.0 0.0 1.0 0.0 1.0 0.0 1.0 0.0 1.0 0.0 1.0 0.0 1.0 0.0 0.0 1.0 0.0													
Coast SE AK 279 3.3 0.79 (1.9,50) 273 5.3 1.66 (2.2,87) 5.09 3.7 0.70 (2.4,52.2) BC 2,333 27.3 1.62 (242,30.6) 1,715 330 2.56 (28.1,38.1) 4.606 29.6 1.35 (270,32.3) West Coast US 8,535 Use 1 4.5,80) 1.575 5.91 1.642.39 1.575 1.3 Use 1 (96.13.1) Region Est.# Mean SD 95%CI Est.# Mean 95%CI Est.# Mean <t< td=""><td>* *</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	* *												
BC 2,333 27.3 1.62 (24,23,06) 1,715 33.0 2.56 (28,13.8.1) 4,060 29.6 1.35 (27,032.3) Total Catch 8,535 Summary 520 1.93 95% CI Est.# Mean SD 95% CI CI 0.010,010,010,010,010,000,010 CI 0.010,010,000,010,000,010,010,000,010 CI 0.010,010,010,010,010,010,010 CI 0.010,010,010,010,010,010,0									` ' /				
Part													
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		-				-				-			
2017 "A" "S=1 + Mean SD 95% CI Est. #			6.2	0.89	(4.5,8.0)		20.0	1.91	(16.4,23.9)		11.3	0.91	(9.6,13.1)
Region Est. # Mean SD 95% CI Est. # Mean SD 95% CI Est. # Mean SD 95% CI Russia 35 0.2 0.12 (0.0.05) 19 0.2 0.19 (0.0.07) 54 0.2 0.10 (0.1,0.4) Coast W AK 6,118 28.3 1.23 (25.93.08) 1,019 12.0 1.33 (9.5,14.7) 7,113 23.7 0.99 (21.72.56) Mid Yukon 136 0.6 0.20 (0.2,1.2) 29 0.3 0.33 (0.01.1) 162 0.5 0.21 (0.2,1.0) NAK Pen 4,465 2.07 1.15 (18.5,23.0) 154 1.8 0.59 (0.8,3.1) 4,490 14.9 0.87 (13.3,16.7) NW GOA 78 0.4 0.39 (0.0,14) 231 2.7 0.79 (1.3,44) 406 1.4 0.45 (0.6,2.3) NE GOA 13 0.1 0.00 0.00,01 0.0 0.0 0.0 <td></td> <td>8,535</td> <td></td> <td></td> <td></td> <td>5,191</td> <td></td> <td></td> <td></td> <td>13,726</td> <td></td> <td></td> <td></td>		8,535				5,191				13,726			
Russia 35 0.2 0.12 (0.0,0.5) 19 0.2 0.19 (0.0,0.7) 54 0.2 0.10 (0.1,0.4) Coast W AK 6,118 28.3 1.23 (25.9,30.8) 1,019 12.0 1.33 (9.5,14.7) 7,113 23.7 0.99 (21.7,25.6) Mid Yukon 136 0.6 0.26 (0.2,1.2) 29 0.3 0.33 (0.0,1.1) 162 0.5 0.21 (0.2,1.0) Up Yukon 156 0.7 0.27 (0.3,1.3) 1 0.0 0.04 (0.0,0.1) 162 0.5 0.20 (0.2,1.0) NAK Pen 4,465 20.7 1.15 (18.5,23.0) 154 1.8 0.59 (0.83.1) 4,490 14.9 0.87 (13.3,16.7) NW GOA 78 0.4 0.39 (0.0,1.1) 10 0.1 1.18 (0.0,0.6) 3 0.0 0.3 (0.0,0.1) NE GOA 13 0.12 (0.0,0.4) 2	2017		"A" Sea	son (N	N=1,866)		"B" Sea	son (N	N=753)		Bering S	Sea all	(N=2,619)
Coast W A K 6,118 28.3 1.23 25.9,30.8) 1,019 12.0 1.33 (0.5,14.7) 7,113 23.7 0.99 (21.7,25.6) Mid Yukon 136 0.6 0.26 (0.2,1.2) 29 0.3 0.33 (0.0,1.1) 162 0.5 0.21 (0.2,1.0) Up Yukon 156 0.7 0.27 (0.3,1.3) 1 0.0 0.04 (0.0,0.1) 162 0.5 0.20 (0.2,1.0) NAK Pen 4,465 20.7 1.15 (18.5,23.0) 154 1.8 0.59 (0.8,3.1) 4,490 14.9 0.87 (13.3,16.7) NW GOA 78 0.4 0.39 (0.0,1.4) 231 2.7 0.79 (1.3,4.4) 406 1.4 0.45 (0.6,2.3) Copper 2 0.0 0.0 (0.0,0.6) 0.3 0.0 0.0 0.0 (0.0,0.6) 3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Region	Est. #			95% CI	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI
Mid Yukon 136 0.6 0.26 (0.2,1.2) 29 0.3 0.33 (0.0,1.1) 162 0.5 0.21 (0.2,1.0) Up Yukon 156 0.7 0.27 (0.3,1.3) 1 0.0 0.04 (0.0,0.1) 162 0.5 0.20 (0.2,1.0) NAK Pen 4,465 20.7 1.15 (18.5,23.0) 154 1.8 0.59 (0.8,3.1) 4,490 14.9 0.87 (13.3,16.7) NW GOA 78 0.4 0.39 (0.0,1.4) 231 2.7 0.79 (1.3,4.4) 406 1.4 0.45 (0.6,2.3) Copper 2 0.0 0.04 (0.0,0.1) 10 0.1 0.18 (0.0,0.6) 3 0.0 <th< td=""><td>Russia</td><td>35</td><td>0.2</td><td>0.12</td><td>(0.0,0.5)</td><td>19</td><td>0.2</td><td>0.19</td><td>(0.0,0.7)</td><td>54</td><td>0.2</td><td>0.10</td><td>(0.1,0.4)</td></th<>	Russia	35	0.2	0.12	(0.0,0.5)	19	0.2	0.19	(0.0,0.7)	54	0.2	0.10	(0.1,0.4)
Up Yukon 156 0.7 0.27 (0.3,1.3) 1 0.0 0.04 (0.0,0.1) 162 0.5 0.20 (0.2,1.0) N AK Pen 4,465 20.7 1.15 (18.5,23.0) 154 1.8 0.59 (0.8,3.1) 4,490 14.9 0.87 (13.3,16.7) NW GOA 78 0.4 0.39 (0.0,14) 231 2.7 0.79 (1.3,4.4) 406 1.4 0.45 (0.6,2.3) Copper 2 0.0 0.04 (0.0,0.1) 10 0.1 0.18 (0.0,0.6) 3 0.0 0.03 (0.0,0.1) NE GOA 13 0.1 0.12 (0.0,0.4) 2 0.0 0.8 (0.0,0.2) 9 0.0 0.07 (0.0,0.3) Coast SEAK 691 3.52 1.8 (32,937.6) 3,141 37.1 2.01 (33,241.0) 10,812 36.0 1.03 34.0 30.0 30.0 30.0 30.0 30.0 30.0 30.0<	Coast W AK	6,118	28.3	1.23	(25.9,30.8)	1,019	12.0	1.33	(9.5, 14.7)	7,113	23.7	0.99	(21.7,25.6)
Up Yukon 156 0.7 0.27 (0.3,1.3) 1 0.0 0.04 (0.0,0.1) 162 0.5 0.20 (0.2,1.0) N AK Pen 4,465 20.7 1.15 (18.5,23.0) 154 1.8 0.59 (0.8,3.1) 4,490 14.9 0.87 (13.3,16.7) NW GOA 78 0.4 0.39 (0.0,14) 231 2.7 0.79 (1.3,4.4) 406 1.4 0.45 (0.6,2.3) Copper 2 0.0 0.04 (0.0,0.1) 10 0.1 0.18 (0.0,0.6) 3 0.0 0.03 (0.0,0.1) NE GOA 13 0.1 0.12 (0.0,04) 2 0.0 0.8 (0.0,0.2) 9 0.0 0.07 (0.0,0.3) Coast SEAK 691 3.2 1.8 (32,3.3) 3.75 6.8 1.24 (4.59.3) 1.221 4.1 0.52 (3.1,5.1) BC 7.609 35.2 1.8 (32,9.37.6) 3,141 <td>Mid Yukon</td> <td>136</td> <td>0.6</td> <td>0.26</td> <td>(0.2, 1.2)</td> <td>29</td> <td>0.3</td> <td>0.33</td> <td>(0.0,1.1)</td> <td>162</td> <td>0.5</td> <td>0.21</td> <td>(0.2, 1.0)</td>	Mid Yukon	136	0.6	0.26	(0.2, 1.2)	29	0.3	0.33	(0.0,1.1)	162	0.5	0.21	(0.2, 1.0)
NAK Pen 4,465 20.7 1.15 (18.5,23.0) 154 1.8 0.59 (0.8,31) 4,490 14.9 0.87 (13.3,16.7) NW GOA 78 0.4 0.39 (0.0,14) 231 2.7 0.79 (1.3,44) 406 1.4 0.45 (0.6,2.3) Copper 2 0.0 0.04 (0.0,0.1) 10 0.1 0.18 (0.0,0.6) 3 0.0 0.03 (0.0,0.1) NE GOA 13 0.1 0.12 (0.0,0.4) 2 0.0 0.08 (0.0,0.2) 9 0.0 0.07 (0.0,0.3) Coast SEAK 691 3.2 0.54 (2.2,4.3) 575 6.8 1.24 (4.5,9.3) 1,221 4.1 0.52 (3.1,5.1) BC 7,609 35.2 1.18 (32,937.6) 3,141 37.1 2.01 (33.2,41.0) 10,812 36.0 1.03 (34.0,38.0) West Coast US 23,03 10.7 0.75 (9.2,12.2) <td>Up Yukon</td> <td>156</td> <td>0.7</td> <td>0.27</td> <td>(0.3,1.3)</td> <td>1</td> <td>0.0</td> <td>0.04</td> <td></td> <td>162</td> <td>0.5</td> <td>0.20</td> <td></td>	Up Yukon	156	0.7	0.27	(0.3,1.3)	1	0.0	0.04		162	0.5	0.20	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	•												
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NE GOA 13 0.1 0.12 (0.0,0.4) 2 0.0 0.08 (0.0,0.2) 9 0.0 0.07 (0.0,0.3) Coast SE AK 691 3.2 0.54 (2.2,4.3) 575 6.8 1.24 (4.5,9.3) 1,221 4.1 0.52 (3.1,5.1) BC 7,609 35.2 1.18 (32.9,37.6) 3,141 37.1 2.01 (33.2,41.0) 10,812 36.0 1.03 (34.0,38.0) West Coast US 2,303 10.7 0.75 (9.2,12.2) 3,291 38.8 1.87 (35.2,42.5) 5,642 18.8 0.81 (17.2,20.4) $\frac{2016}{2016}$ $\frac{8.473}{2016}$ $\frac{9.5\%}{2016}$ PI St. # Mean SD 95% PI													
Coast SEAK 691 3.2 0.54 (2.2,4.3) 575 6.8 1.24 (4.5,9.3) 1,221 4.1 0.52 (3.1,5.1) BC 7,609 35.2 1.18 (32,9,37.6) 3,141 37.1 2.01 (33.2,41.0) 10,812 36.0 1.03 (34.0,38.0) West Coast US 2,303 10.7 0.75 (92,12.2) 3,291 38.8 1.87 (35.2,42.5) 5,642 18.8 0.81 (17.2,20.4) Total Catch 21,603 "A" Secondon Neclean Neclea									(, ,				
BC $7,609$ $3.5.2$ 1.18 $(32.9,37.6)$ $3,141$ 37.1 2.01 $(33.2,41.0)$ $10,812$ 36.0 1.03 $(34.0,38.0)$ West Coast US $2,303$ 10.7 0.75 $(9.2,12.2)$ 3.291 38.8 1.87 $(35.2,42.5)$ $5,642$ 18.8 0.81 $(17.2,20.4)$ Total Catch $21,603$ $8,473$ $8,473$ 8.473 $8.$													
West Coast US 2,303 10.7 0.75 $(9.2,12.2)$ $3,291$ 38.8 1.87 $(35.2,42.5)$ $5,642$ 18.8 0.81 $(17.2,20.4)$ Total Catch $21,603$ $8,473$ 8473 <th< td=""><td></td><td>691</td><td></td><td></td><td></td><td></td><td></td><td>1.24</td><td></td><td></td><td>4.1</td><td>0.52</td><td></td></th<>		691						1.24			4.1	0.52	
Total Catch 21,603 8,473 30,076 2016 "A" Season (N=1,488) "B" Season (N=422) Bering Sea all (N=1.910) Region Est. # Mean SD 95% PI Est. # Mean SD 95% PI Russia 108 0.6 0.25 (0.2,1.2) 12 0.2 0.24 (0.0,0.9) 114 0.5 0.19 (0.2,1.0) Coast W AK 6,570 39.0 1.46 (36.2,41.9) 843 16.5 2.14 (12.5,20.8) 7,372 33.6 1.28 (31.2,36.2) Mid Yukon 283 1.7 0.40 (1.0,2.5) 18 0.4 0.60 (0.0,2.0) 327 1.5 0.34 (0.9,2.2) Up Yukon 365 2.2 0.43 (1.4,3.1) 34 0.7 0.48 (0.0,1.8) 406 1.9 0.35 (1.2,2.6) N AK Pen 2,839 16.9 1.17 (14.6,19.2) 56 1.1 0.72 (0.0,2.8) 2,927 13.4 0.96	BC	7,609	35.2	1.18	(32.9,37.6)	3,141	37.1	2.01	(33.2,41.0)	10,812	36.0	1.03	(34.0,38.0)
2016 "A" Season (N=1,488) "B" Season (N=422) Bering Sea all (N=1,910) Region Est. # Mean SD 95% PI Russia 108 0.6 0.25 (0.2,1.2) 12 0.2 0.24 (0.0,0.9) 114 0.5 0.19 (0.2,1.0) (0.2,1.0) Coast W AK 6,570 39.0 1.46 (36.2,41.9) 843 16.5 2.14 (12.5,20.8) 7,372 33.6 1.28 (31.2,36.2) Mid Yukon 283 1.7 0.40 (1.0,2.5) 18 0.4 0.60 (0.0,2.0) 327 1.5 0.34 (0.9,2.2) Up Yukon 365 2.2 0.43 (1.4,3.1) 34 0.7 0.48 (0.0,1.8) 406 1.9 0.35 (1.2,2.6) N AK Pen 2,839 16.9 1.17 (14.6,19.2) 56 1.1 0.72 (0.0,2.8) 2,927 13.4 0.96 (11.5,15.3) NW GOA 94 0.6 0.46 (0.0,1.6) 298 5.9 1.54 (3.1,9.1) 458 2.1 0.62 (1.0,3.4) Copper 3 0.0 0.06 (0.0,0.2) 90 1.8 0.73 (0.6,3.4) 75 0.3 0.18 (0.1,0.8) NE GOA 2 0.0 0.07 (0.0,0.2) 2 0.0 0.13 (0.0,0.3) 2 0.0 0.07 (0.0,0.1) Coast SE AK 663 3.9 0.72 (2.6,5.4) 333 6.5 1.70 (3.6,10.2) 971 4.4 0.64 (3.3,5.8) BC 4,394 26.1 1.26 (23.7,28.6) 1,888 37.0 2.68 (31.8,42.3) <t< td=""><td>West Coast US</td><td>2,303</td><td>10.7</td><td>0.75</td><td>(9.2,12.2)</td><td>3,291</td><td>38.8</td><td>1.87</td><td>(35.2,42.5)</td><td>5,642</td><td>18.8</td><td>0.81</td><td>(17.2,20.4)</td></t<>	West Coast US	2,303	10.7	0.75	(9.2,12.2)	3,291	38.8	1.87	(35.2,42.5)	5,642	18.8	0.81	(17.2,20.4)
Region Est. # Mean SD 95% PI Est. # Mean SD 95% PI Est. # Mean SD 95% PI Russia 108 0.6 0.25 (0.2,1.2) 12 0.2 0.24 (0.0,0.9) 114 0.5 0.19 (0.2,1.0) Coast W AK 6,570 39.0 1.46 (36.2,41.9) 843 16.5 2.14 (12.5,20.8) 7,372 33.6 1.28 (31.2,36.2) Mid Yukon 283 1.7 0.40 (1.0,2.5) 18 0.4 0.60 (0.0,2.0) 327 1.5 0.34 (0.9,2.2) Up Yukon 365 2.2 0.43 (1.4,3.1) 34 0.7 0.48 (0.0,1.8) 406 1.9 0.35 (1.2,2.6) N AK Pen 2,839 16.9 1.17 (14.6,19.2) 56 1.1 0.72 (0.0,2.8) 2,927 13.4 0.96 (11.5,15.3) NW GOA 94 0.6 0.46 (0.0,1.6) 298 5.9	Total Catch	21,603				8,473				30,076			
Russia 108 0.6 0.25 (0.2,1.2) 12 0.2 0.24 (0.0,0.9) 114 0.5 0.19 (0.2,1.0) Coast W AK 6,570 39.0 1.46 (36.2,41.9) 843 16.5 2.14 (12.5,20.8) 7,372 33.6 1.28 (31.2,36.2) Mid Yukon 283 1.7 0.40 (1.0,2.5) 18 0.4 0.60 (0.0,2.0) 327 1.5 0.34 (0.9,2.2) Up Yukon 365 2.2 0.43 (1.4,3.1) 34 0.7 0.48 (0.0,1.8) 406 1.9 0.35 (1.2,2.6) N AK Pen 2,839 16.9 1.17 (14.6,19.2) 56 1.1 0.72 (0.0,2.8) 2,927 13.4 0.96 (11.5,15.3) NW GOA 94 0.6 0.46 (0.0,1.6) 298 5.9 1.54 (3.1,9.1) 458 2.1 0.62 (1.0,3.4) Copper 3 0.0 0.06 (0.0,0.2) <td>2016</td> <td></td> <td>"A" Sea</td> <td></td> <td></td> <td></td> <td>"B" Sea</td> <td>son (l</td> <td></td> <td></td> <td></td> <td>Sea al</td> <td>l (N=1.910)</td>	2016		"A" Sea				"B" Sea	son (l				Sea al	l (N=1.910)
Coast W AK 6,570 39.0 1.46 (36.2,41.9) 843 16.5 2.14 (12.5,20.8) 7,372 33.6 1.28 (31.2,36.2) Mid Yukon 283 1.7 0.40 (1.0,2.5) 18 0.4 0.60 (0.0,2.0) 327 1.5 0.34 (0.9,2.2) Up Yukon 365 2.2 0.43 (1.4,3.1) 34 0.7 0.48 (0.0,1.8) 406 1.9 0.35 (1.2,2.6) N AK Pen 2,839 16.9 1.17 (14.6,19.2) 56 1.1 0.72 (0.0,2.8) 2,927 13.4 0.96 (11.5,15.3) NW GOA 94 0.6 0.46 (0.0,1.6) 298 5.9 1.54 (3.1,9.1) 458 2.1 0.62 (1.0,3.4) Copper 3 0.0 0.06 (0.0,0.2) 90 1.8 0.73 (0.6,3.4) 75 0.3 0.18 (0.1,0.8) NE GOA 2 0.0 0.07 (0.0,0.2)	Region				95% PI				95% PI				95% PI
Mid Yukon 283 1.7 0.40 (1.0,2.5) 18 0.4 0.60 (0.0,2.0) 327 1.5 0.34 (0.9,2.2) Up Yukon 365 2.2 0.43 (1.4,3.1) 34 0.7 0.48 (0.0,1.8) 406 1.9 0.35 (1.2,2.6) N AK Pen 2,839 16.9 1.17 (14.6,19.2) 56 1.1 0.72 (0.0,2.8) 2,927 13.4 0.96 (11.5,15.3) NW GOA 94 0.6 0.46 (0.0,1.6) 298 5.9 1.54 (3.1,9.1) 458 2.1 0.62 (1.0,3.4) Copper 3 0.0 0.06 (0.0,0.2) 90 1.8 0.73 (0.6,3.4) 75 0.3 0.18 (0.1,0.8) NE GOA 2 0.0 0.07 (0.0,0.2) 2 0.0 0.13 (0.0,0.3) 2 0.0 0.07 (0.0,0.1) Coast SE AK 663 3.9 0.72 (2.6,5.4) 333<	Russia				(0.2,1.2)	12			(0.0,0.9)	114	0.5	0.19	(0.2, 1.0)
Up Yukon 365 2.2 0.43 (1.4,3.1) 34 0.7 0.48 (0.0,1.8) 406 1.9 0.35 (1.2,2.6) N AK Pen 2,839 16.9 1.17 (14.6,19.2) 56 1.1 0.72 (0.0,2.8) 2,927 13.4 0.96 (11.5,15.3) NW GOA 94 0.6 0.46 (0.0,1.6) 298 5.9 1.54 (3.1,9.1) 458 2.1 0.62 (1.0,3.4) Copper 3 0.0 0.06 (0.0,0.2) 90 1.8 0.73 (0.6,3.4) 75 0.3 0.18 (0.1,0.8) NE GOA 2 0.0 0.07 (0.0,0.2) 2 0.0 0.13 (0.0,0.3) 2 0.0 0.07 (0.0,0.1) Coast SE AK 663 3.9 0.72 (2.6,5.4) 333 6.5 1.70 (3.6,10.2) 971 4.4 0.64 (3.3,5.8) BC 4,394 26.1 1.26 (23.7,28.6) 1,88	Coast W AK	6,570			(36.2,41.9)	843			(12.5,20.8)	7,372	33.6	1.28	(31.2, 36.2)
N AK Pen 2,839 16.9 1.17 (14.6,19.2) 56 1.1 0.72 (0.0,2.8) 2,927 13.4 0.96 (11.5,15.3) NW GOA 94 0.6 0.46 (0.0,1.6) 298 5.9 1.54 (3.1,9.1) 458 2.1 0.62 (1.0,3.4) Copper 3 0.0 0.06 (0.0,0.2) 90 1.8 0.73 (0.6,3.4) 75 0.3 0.18 (0.1,0.8) NE GOA 2 0.0 0.07 (0.0,0.2) 2 0.0 0.13 (0.0,0.3) 2 0.0 0.07 (0.0,0.1) Coast SE AK 663 3.9 0.72 (2.6,5.4) 333 6.5 1.70 (3.6,10.2) 971 4.4 0.64 (3.3,5.8) BC 4,394 26.1 1.26 (23.7,28.6) 1,888 37.0 2.68 (31.8,42.3) 6,312 28.8 1.14 (26.6,31.0) West Coast US 1,506 9.0 0.81 (7.4,10.6) <td>Mid Yukon</td> <td>283</td> <td></td> <td></td> <td></td> <td>18</td> <td></td> <td></td> <td>(0.0,2.0)</td> <td></td> <td>1.5</td> <td>0.34</td> <td>(0.9,2.2)</td>	Mid Yukon	283				18			(0.0,2.0)		1.5	0.34	(0.9,2.2)
NW GOA 94 0.6 0.46 (0.0,1.6) 298 5.9 1.54 (3.1,9.1) 458 2.1 0.62 (1.0,3.4) Copper 3 0.0 0.06 (0.0,0.2) 90 1.8 0.73 (0.6,3.4) 75 0.3 0.18 (0.1,0.8) NE GOA 2 0.0 0.07 (0.0,0.2) 2 0.0 0.13 (0.0,0.3) 2 0.0 0.07 (0.0,0.1) Coast SE AK 663 3.9 0.72 (2.6,5.4) 333 6.5 1.70 (3.6,10.2) 971 4.4 0.64 (3.3,5.8) BC 4,394 26.1 1.26 (23.7,28.6) 1,888 37.0 2.68 (31.8,42.3) 6,312 28.8 1.14 (26.6,31.0) West Coast US 1,506 9.0 0.81 (7.4,10.6) 1,524 29.9 2.33 (25.4,34.5) 2,960 13.5 0.82 (11.9,15.1)	Up Yukon					34							
Copper 3 0.0 0.06 (0.0,0.2) 90 1.8 0.73 (0.6,3.4) 75 0.3 0.18 (0.1,0.8) NE GOA 2 0.0 0.07 (0.0,0.2) 2 0.0 0.13 (0.0,0.3) 2 0.0 0.07 (0.0,0.1) Coast SE AK 663 3.9 0.72 (2.6,5.4) 333 6.5 1.70 (3.6,10.2) 971 4.4 0.64 (3.3,5.8) BC 4,394 26.1 1.26 (23.7,28.6) 1,888 37.0 2.68 (31.8,42.3) 6,312 28.8 1.14 (26.6,31.0) West Coast US 1,506 9.0 0.81 (7.4,10.6) 1,524 29.9 2.33 (25.4,34.5) 2,960 13.5 0.82 (11.9,15.1)		2,839				56	1.1	0.72					
NE GOA 2 0.0 0.07 (0.0,0.2) 2 0.0 0.13 (0.0,0.3) 2 0.0 0.07 (0.0,0.1) Coast SE AK 663 3.9 0.72 (2.6,5.4) 333 6.5 1.70 (3.6,10.2) 971 4.4 0.64 (3.3,5.8) BC 4,394 26.1 1.26 (23.7,28.6) 1,888 37.0 2.68 (31.8,42.3) 6,312 28.8 1.14 (26.6,31.0) West Coast US 1,506 9.0 0.81 (7.4,10.6) 1,524 29.9 2.33 (25.4,34.5) 2,960 13.5 0.82 (11.9,15.1)		94											
Coast SE AK 663 3.9 0.72 (2.6,5.4) 333 6.5 1.70 (3.6,10.2) 971 4.4 0.64 (3.3,5.8) BC 4,394 26.1 1.26 (23.7,28.6) 1,888 37.0 2.68 (31.8,42.3) 6,312 28.8 1.14 (26.6,31.0) West Coast US 1,506 9.0 0.81 (7.4,10.6) 1,524 29.9 2.33 (25.4,34.5) 2,960 13.5 0.82 (11.9,15.1)	Copper	3			(0.0,0.2)	90	1.8	0.73	(0.6,3.4)	75			(0.1,0.8)
BC 4,394 26.1 1.26 (23.7,28.6) 1,888 37.0 2.68 (31.8,42.3) 6,312 28.8 1.14 (26.6,31.0) West Coast US 1,506 9.0 0.81 (7.4,10.6) 1,524 29.9 2.33 (25.4,34.5) 2,960 13.5 0.82 (11.9,15.1)	NE GOA	2				2			(0.0,0.3)				(0.0,0.1)
West Coast US 1,506 9.0 0.81 (7.4,10.6) 1,524 29.9 2.33 (25.4,34.5) 2,960 13.5 0.82 (11.9,15.1)	Coast SE AK	663	3.9	0.72	(2.6,5.4)	333			(3.6, 10.2)	971	4.4	0.64	(3.3,5.8)
	BC	4,394			(23.7,28.6)	1,888	37.0	2.68	(31.8,42.3)	6,312	28.8	1.14	(26.6,31.0)
Total Catch 16,828 5,098 21,926	West Coast US		9.0	0.81	(7.4,10.6)		29.9	2.33	(25.4,34.5)	2,960	13.5	0.82	(11.9,15.1)
	Total Catch	16,828				5,098				21,926			

Appendix 3 Continued												
2015		"A" Sea	_			"B" Sea						(N=1,757)
Region	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI
Russia	75	0.6	0.29	(0.2,1.3)	5	0.1	0.20	(0.0,0.7)	93	0.5	0.21	(0.2,1.0)
Coast W AK	5,644	45.9	1.87	(42.2,49.5)	1,651	27.4	2.36	(22.9, 32.1)	7,256	39.6	1.60	(36.4,42.7)
Mid Yukon	119	1.0	0.76	(0.0,2.7)	97	1.6	0.67	(0.6,3.2)	304	1.7	0.71	(0.6,3.2)
Up Yukon	448	3.6	0.68	(2.4,5.1)	65	1.1	0.55	(0.2,2.3)	502	2.7	0.48	(1.9,3.7)
N AK Pen	1,785	14.5	1.33	(12.0,17.2)	60	1.0	0.85	(0.0,3.0)	1,943	10.6	1.00	(8.7, 12.6)
NW GOA	349	2.8	0.82	(1.4,4.6)	496	8.2	1.95	(4.6, 12.3)	724	4.0	0.83	(2.5,5.7)
Copper	21	0.2	0.36	(0.0,1.3)	3	0.1	0.12	(0.0,0.4)	11	0.1	0.18	(0.0,0.7)
NE GOA	2	0.0	0.10	(0.0,0.2)	4	0.1	0.22	(0.0,0.7)	4	0.0	0.11	(0.0,0.3)
Coast SE AK	475	3.9	0.72	(2.6,5.4)	381	6.3	1.39	(3.8, 9.3)	828	4.5	0.67	(3.3,5.9)
BC	2,355	19.1	1.21	(16.8,21.6)	1,603	26.6	2.06	(22.6,30.7)	3,998	21.8	1.08	(19.7,24.0)
West Coast US	1,030	8.4	0.84	(6.8,10.1)	1,659	27.5	1.95	(23.8,31.4)	2,665	14.5	0.88	(12.9,16.3)
Total Catch	12,304				6,025				18,329			
2014	· · · · ·	"A" Sea	ason (N	V=1,066)	,	"B" Sea	son (N	J=319)		Bering S	Sea all	(N=1,385)
Region	Est. #	Mean	SD	95% CI		Mean	SD	95% CI	Est. #	Mean	SD	95% CI
Russia	74	0.6	0.26	(0.2,1.2)	13	0.4		(0.0,1.7)	96	0.6		(0.3,1.2)
Coast W AK	6,301		2.17	(50.4,58.8)	1,109	31.8	3.09	(25.8,37.9)	7,314	48.7		(45.2,52.2)
Mid Yukon	380		1.24	(1.2,5.9)	58	1.7	0.98	(0.1,3.9)	484		0.91	(1.5,5.1)
Up Yukon	477	4.1	0.79	(2.7,5.8)	55	1.6	0.86	(0.3,3.6)	564	3.8	0.66	(2.6,5.1)
N AK Pen	2,624	22.7	1.58	(19.7,25.9)	3	0.1	0.31	(0.0,1.0)	2,666	17.7	1.35	(15.2,20.4)
NW GOA	16	0.1		(0.0,1.1)	642		2.68	(13.4,23.9)	630		1.00	(2.4,6.3)
Copper	10		0.05	(0.0, 1.1) $(0.0, 0.1)$	5		0.37	(0.0,1.3)	5	0.0		(0.0,0.3)
NE GOA	1	0.0	0.05	(0.0,0.1) $(0.0,0.1)$	3	0.1		(0.0,1.3) $(0.0,1.1)$	3	0.0	0.09	(0.0,0.3) (0.0,0.2)
Coast SE AK	68		0.05		124		1.41		207	1.4	0.43	(0.6, 2.3)
BC			0.30	(0.0,1.4)	855		2.59	(1.3,6.7)				(0.6,2.3)
West Coast US	1,174 422	3.7	0.98	(8.3,12.2)	624		2.39	(19.6,29.7)	2,049	13.6	1.01	, , ,
Total Catch		3.7	0.03	(2.5,5.0)		17.9	2.21	(13.8,22.4)	1,013	6.7	0.76	(5.2,8.3)
									15 021			
	11,539	" A " Sar	son (N	J-702)	3,492	"P" Saa	son (N	I-454)	15,031	Baring 9	Seo oll	(NI-1 246)
2013		"A" Sea				"B" Sea						(N=1,246)
2013 Region	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI
2013 Region Russia	Est. #	Mean 0.9	SD 0.40	95% CI (0.4,1.7)	Est. #	Mean 0.9	SD 0.50	95% CI (0.2,2.0)	Est. #	Mean 0.9	SD 0.30	95% CI (0.4,1.5)
Region Russia Coast W AK	Est. # 74 4,135	Mean 0.9 50.2	SD 0.40 2.20	95% CI (0.4,1.7) (46.0,54.5)	Est. # 43 2,490	Mean 0.9 51.9	SD 0.50 2.80	95% CI (0.2,2.0) (46.4,57.3)	Est. # 117 6,530	Mean 0.9 50.1	SD 0.30 1.80	95% CI (0.4,1.5) (46.7,53.5)
Region Russia Coast W AK Mid Yukon	Est. # 74 4,135 91	Mean 0.9 50.2 1.1	SD 0.40 2.20 0.60	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6)	Est. # 43 2,490 91	Mean 0.9 51.9 1.9	SD 0.50 2.80 1.00	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2)	Est. # 117 6,530 235	Mean 0.9 50.1 1.8	SD 0.30 1.80 0.70	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1)
Region Russia Coast W AK Mid Yukon Up Yukon	Est. # 74 4,135 91 593	Mean 0.9 50.2 1.1 7.2	SD 0.40 2.20 0.60 1.10	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4)	Est. # 43 2,490 91 67	Mean 0.9 51.9 1.9 1.4	SD 0.50 2.80 1.00 0.90	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4)	Est. # 117 6,530 235 652	Mean 0.9 50.1 1.8 5.0	SD 0.30 1.80 0.70 0.80	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen	Est. # 74 4,135 91 593 1,573	Mean 0.9 50.2 1.1 7.2 19.1	SD 0.40 2.20 0.60 1.10 1.80	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8)	Est. # 43 2,490 91 67 283	Mean 0.9 51.9 1.9 1.4 5.9	SD 0.50 2.80 1.00 0.90 1.50	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0)	Est. # 117 6,530 235 652 1,851	Mean 0.9 50.1 1.8 5.0 14.2	SD 0.30 1.80 0.70 0.80 1.40	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA	Est. # 74 4,135 91 593 1,573 41	Mean 0.9 50.2 1.1 7.2 19.1 0.5	SD 0.40 2.20 0.60 1.10 1.80 0.70	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4)	Est. # 43 2,490 91 67 283 331	Mean 0.9 51.9 1.9 1.4 5.9 6.9	SD 0.50 2.80 1.00 0.90 1.50 1.80	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7)	Est. # 117 6,530 235 652 1,851 443	Mean 0.9 50.1 1.8 5.0 14.2 3.4	SD 0.30 1.80 0.70 0.80 1.40 1.00	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper	Est. # 74 4,135 91 593 1,573 41 8	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5)	Est. # 43 2,490 91 67 283 331 5	Mean 0.9 51.9 1.9 1.4 5.9 6.9 0.1	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.30	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9)	Est. # 117 6,530 235 652 1,851 443 13	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1	SD 0.30 1.80 0.70 0.80 1.40 1.00 0.20	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA	Est. # 74 4,135 91 593 1,573 41 8	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4)	Est. # 43 2,490 91 67 283 331 5	Mean 0.9 51.9 1.4 5.9 6.9 0.1 0.0	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.30 0.20	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4)	Est. # 117 6,530 235 652 1,851 443 13 0	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0	SD 0.30 1.80 0.70 0.80 1.40 1.00 0.20 0.10	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK	Est. # 74 4,135 91 593 1,573 41 8 0 157	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.10 0.70	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4)	Est. # 43 2,490 91 67 283 331 5 0	Mean 0.9 51.9 1.9 1.4 5.9 6.9 0.1 0.0	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.30 0.20 1.10	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5)	Est. # 117 6,530 235 652 1,851 443 13 0 313	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4	SD 0.30 1.80 0.70 0.80 1.40 1.00 0.20 0.10 0.60	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC	Est. # 74 4,135 91 593 1,573 41 8 0 157 1,400	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9 17.0	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.10 0.70 1.40	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4) (14.2,19.8)	Est. # 43 2,490 91 67 283 331 5 0 91 686	Mean 0.9 51.9 1.9 1.4 5.9 6.9 0.1 0.0 1.9 14.3	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.30 0.20 1.10 1.90	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5) (10.8,18.2)	Est. # 117 6,530 235 652 1,851 443 13 0 313 2,020	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4 15.5	SD 0.30 1.80 0.70 0.80 1.40 1.00 0.20 0.10 0.60 1.10	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6) (13.4,17.8)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC West Coast US	Est. # 74 4,135 91 593 1,573 41 8 0 157 1,400	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.10 0.70	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4)	Est. # 43 2,490 91 67 283 331 5 0 91 686 710	Mean 0.9 51.9 1.9 1.4 5.9 6.9 0.1 0.0 1.9 14.3	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.30 0.20 1.10	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5)	Est. # 117 6,530 235 652 1,851 443 13 0 313 2,020 873	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4	SD 0.30 1.80 0.70 0.80 1.40 1.00 0.20 0.10 0.60	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC West Coast US Total Catch	Est. # 74 4,135 91 593 1,573 41 8 0 157 1,400	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9 17.0	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.10 0.70 1.40	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4) (14.2,19.8)	Est. # 43 2,490 91 67 283 331 5 0 91 686	Mean 0.9 51.9 1.4 5.9 6.9 0.1 0.0 1.9 14.3 14.8	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.30 0.20 1.10 1.90	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5) (10.8,18.2) (11.6,18.2)	Est. # 117 6,530 235 652 1,851 443 13 0 313 2,020	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4 15.5	SD 0.30 1.80 0.70 0.80 1.40 1.00 0.20 0.10 0.60 1.10	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6) (13.4,17.8)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC West Coast US	Est. # 74 4,135 91 593 1,573 41 8 0 157 1,400 165 8,237	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9 17.0 2.0	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.70 1.40 0.60	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4) (14.2,19.8) (1.0,3.3)	Est. # 43 2,490 91 67 283 331 5 0 91 686 710	Mean 0.9 51.9 1.9 1.4 5.9 6.9 0.1 0.0 1.9 14.3	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.30 0.20 1.10 1.90 1.70	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5) (10.8,18.2) (11.6,18.2)	Est. # 117 6,530 235 652 1,851 443 13 0 313 2,020 873 13,034	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4 15.5 6.7 Bering S	SD 0.30 1.80 0.70 0.80 1.40 1.00 0.20 0.10 0.60 1.10 0.80	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6) (13.4,17.8) (5.2,8.2)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC West Coast US Total Catch 2012 Region	Est. # 74 4,135 91 593 1,573 41 8 0 157 1,400 165 8,237	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9 17.0 2.0 "A" Sea	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.10 0.70 1.40 0.60	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4) (14.2,19.8) (1.0,3.3)	Est. # 43 2,490 91 67 283 331 5 0 91 686 710 4,797	Mean 0.9 51.9 1.4 5.9 6.9 0.1 0.0 1.9 14.3 14.8 "B" Sea	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.30 0.20 1.10 1.90 1.70	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5) (10.8,18.2) (11.6,18.2)	Est. # 117 6,530 235 652 1,851 443 13 0 313 2,020 873 13,034 Est. #	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4 15.5 6.7 Bering S	SD 0.30 1.80 0.70 0.80 1.40 1.00 0.20 0.10 0.60 1.10 0.80	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6) (13.4,17.8) (5.2,8.2) (N=1,111) 95% CI
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC West Coast US Total Catch Russia	Est. # 74 4,135 91 593 1,573 41 8 0 157 1,400 165 8,237 Est. #	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9 17.0 2.0 "A" Sea Mean 0.5	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.70 1.40 0.60 SD 0.27	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4) (14.2,19.8) (1.0,3.3) N=759) 95% CI (0.2,1.2)	Est. # 43 2,490 91 67 283 331 5 0 91 686 710 4,797 Est. #	Mean 0.9 51.9 1.4 5.9 6.9 0.1 0.0 1.9 14.3 14.8 "B" Sea Mean 2.4	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.30 0.20 1.10 1.70 SD 0.83	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5) (10.8,18.2) (11.6,18.2) (11.6,18.2)	Est. # 117 6,530 235 652 1,851 443 13 0 313 2,020 873 13,034 Est. #	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4 15.5 6.7 Bering S Mean 1.1	SD 0.30 1.80 0.70 0.80 1.40 1.00 0.20 0.10 0.60 1.10 0.80 Sea all SD 0.32	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6) (13.4,17.8) (5.2,8.2) (N=1,111) 95% CI (0.6,1.8)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC West Coast US Total Catch 2012 Region Russia Coast W AK	Est. # 74 4,135 91 593 1,573 41 8 0 157 1,400 165 8,237	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9 17.0 2.0 "A" Sea Mean 0.5 67.8	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.70 1.40 0.60 SD 0.27 2.22	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4) (14.2,19.8) (1.0,3.3)	Est. # 43 2,490 91 67 283 331 5 0 91 686 710 4,797	Mean 0.9 51.9 1.4 5.9 6.9 0.1 0.0 1.9 14.3 14.8 "B" Sea Mean 2.4 52.1	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.30 0.20 1.10 1.90 1.70 SD 0.83 2.92	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5) (10.8,18.2) (11.6,18.2)	Est. # 117 6,530 235 652 1,851 443 13 0 313 2,020 873 13,034 Est. #	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4 15.5 6.7 Bering S Mean 1.1 63.1	SD 0.30 1.80 0.70 0.80 1.40 1.00 0.20 0.10 0.60 1.10 0.80 Sea all SD 0.32 1.83	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6) (13.4,17.8) (5.2,8.2) (N=1,111) 95% CI (0.6,1.8) (59.4,66.6)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC West Coast US Total Catch Russia	Est. # 74 4,135 91 593 1,573 41 8 0 157 1,400 165 8,237 Est. #	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9 17.0 2.0 "A" Sea Mean 0.5 67.8 1.2	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.70 1.40 0.60 SD 0.27 2.22 0.82	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4) (14.2,19.8) (1.0,3.3) N=759) 95% CI (0.2,1.2)	Est. # 43 2,490 91 67 283 331 5 0 91 686 710 4,797 Est. #	Mean 0.9 51.9 1.4 5.9 6.9 0.1 0.0 1.9 14.3 14.8 "B" Sea Mean 2.4 52.1	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.30 0.20 1.10 1.70 SD 0.83	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5) (10.8,18.2) (11.6,18.2) (11.6,18.2)	Est. # 117 6,530 235 652 1,851 443 13 0 313 2,020 873 13,034 Est. #	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4 15.5 6.7 Bering S Mean 1.1 63.1	SD 0.30 1.80 0.70 0.80 1.40 1.00 0.20 0.10 0.60 1.10 0.80 Sea all SD 0.32	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6) (13.4,17.8) (5.2,8.2) (N=1,111) 95% CI (0.6,1.8)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC West Coast US Total Catch 2012 Region Russia Coast W AK	Est. # 74 4,135 91 593 1,573 41 8 0 157 1,400 165 8,237 Est. # 42 5,266	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9 17.0 2.0 "A" Sea Mean 0.5 67.8 1.2 3.1	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.70 1.40 0.60 SD 0.27 2.22 0.82 0.82	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4) (14.2,19.8) (1.0,3.3) N=759) 95% CI (0.2,1.2) (63.4,72.1)	Est. # 43 2,490 91 67 283 331 5 0 91 686 710 4,797 Est. # 86 1,863	Mean 0.9 51.9 1.4 5.9 0.1 0.0 1.9 14.3 14.8 "B" Sea Mean 2.4 52.1 0.2 1.0	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.20 1.10 1.90 1.70 SD 0.83 2.92 0.32 0.64	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5) (10.8,18.2) (11.6,18.2) =352) 95% CI (1.1,4.3) (46.3,57.7) (0.0,1.1) (0.1,2.5)	Est. # 117 6,530 235 652 1,851 443 13 0 313 2,020 873 13,034 Est. # 126 7,152	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4 15.5 6.7 Bering S Mean 1.1 63.1 1.0	SD 0.30 1.80 0.70 0.80 1.40 1.00 0.20 0.10 0.60 1.10 0.80 Sea all SD 0.32 1.83	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6) (13.4,17.8) (5.2,8.2) (N=1,111) 95% CI (0.6,1.8) (59.4,66.6)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC West Coast US Total Catch 2012 Region Russia Coast W AK Mid Yukon	Est. # 74 4,135 91 593 1,573 41 8 0 157 1,400 165 8,237 Est. # 42 5,266 92	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9 17.0 2.0 "A" Sea Mean 0.5 67.8 1.2 3.1 16.2	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.70 1.40 0.60 SD 0.27 2.22 0.82 0.82 1.88	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4) (14.2,19.8) (1.0,3.3) V=759) 95% CI (0.2,1.2) (63.4,72.1) (0.0,3.1)	Est. # 43 2,490 91 67 283 331 5 0 91 686 710 4,797 Est. # 86 1,863	Mean 0.9 51.9 1.4 5.9 0.1 0.0 1.9 14.3 14.8 "B" Sea Mean 2.4 52.1 0.2 1.0	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.20 1.10 1.90 1.70 SD 0.83 2.92 0.32	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5) (10.8,18.2) (11.6,18.2) 3=352) 95% CI (1.1,4.3) (46.3,57.7) (0.0,1.1)	Est. # 117 6,530 235 652 1,851 443 13 0 313 2,020 873 13,034 Est. # 126 7,152 115	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4 15.5 6.7 Bering S Mean 1.1 63.1 1.0 2.4	SD 0.30 1.80 0.70 0.80 1.40 1.00 0.20 0.10 0.60 1.10 0.80 Sea all SD 0.32 1.83 0.59	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6) (13.4,17.8) (5.2,8.2) (N=1,111) 95% CI (0.6,1.8) (59.4,66.6) (0.0,2.3)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC West Coast US Total Catch Russia Coast W AK Mid Yukon Up Yukon Up Yukon	Est. # 74 4,135 91 593 1,573 41 8 0 157 1,400 165 8,237 Est. # 42 5,266 92 241	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9 17.0 2.0 "A" Sea Mean 0.5 67.8 1.2 3.1 16.2	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.70 1.40 0.60 SD 0.27 2.22 0.82 0.82	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4) (14.2,19.8) (1.0,3.3) V=759) 95% CI (0.2,1.2) (63.4,72.1) (0.0,3.1) (1.6,4.8)	Est. # 43 2,490 91 67 283 331 5 0 91 686 710 4,797 Est. # 86 1,863 6 35	Mean 0.9 51.9 1.4 5.9 0.1 0.0 1.9 14.3 14.8 "B" Sea Mean 2.4 52.1 0.2 1.0 0.1	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.20 1.10 1.90 1.70 SD 0.83 2.92 0.32 0.64	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5) (10.8,18.2) (11.6,18.2) =352) 95% CI (1.1,4.3) (46.3,57.7) (0.0,1.1) (0.1,2.5)	Est. # 117 6,530 235 652 1,851 443 13 0 313 2,020 873 13,034 Est. # 126 7,152 115 271	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4 15.5 6.7 Bering S Mean 1.1 63.1 1.0 2.4 10.8	SD 0.30 0.70 0.80 1.40 0.20 0.10 0.60 1.10 0.80 Sea all SD 0.32 1.83 0.59 0.60	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6) (13.4,17.8) (5.2,8.2) (N=1,111) 95% CI (0.6,1.8) (59.4,66.6) (0.0,2.3) (1.3,3.7)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC West Coast US Total Catch 2012 Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen	Est. # 74 4,135 91 593 1,573 41 8 0 157 1,400 165 8,237 Est. # 42 5,266 92 241 1,256	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9 17.0 2.0 "A" Sea Mean 0.5 67.8 1.2 3.1 16.2 0.2	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.70 1.40 0.60 SD 0.27 2.22 0.82 0.82 1.88	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4) (14.2,19.8) (1.0,3.3) N=759) 95% CI (0.2,1.2) (63.4,72.1) (0.0,3.1) (1.6,4.8) (12.7,20.0)	Est. # 43 2,490 91 67 283 331 5 0 91 686 710 4,797 Est. # 86 1,863 6 35 3	Mean 0.9 51.9 1.4 5.9 0.1 0.0 1.9 14.3 14.8 "B" Sea Mean 2.4 52.1 0.2 1.0 0.1	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.20 1.10 1.90 1.70 SD 0.83 2.92 0.32 0.64 0.25 1.44	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5) (10.8,18.2) (11.6,18.2) =352) 95% CI (1.1,4.3) (46.3,57.7) (0.0,1.1) (0.1,2.5) (0.0,0.8)	Est. # 117 6,530 235 652 1,851 443 13 0 313 2,020 873 13,034 Est. # 126 7,152 115 271 1,227	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4 15.5 6.7 Bering S Mean 1.1 63.1 1.0 2.4 10.8 1.4	SD 0.30 0.70 0.80 1.40 0.20 0.10 0.60 1.10 0.82 SEa all SD 0.32 1.83 0.59 0.60 1.35	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6) (13.4,17.8) (5.2,8.2) (N=1,111) 95% CI (0.6,1.8) (59.4,66.6) (0.0,2.3) (1.3,3.7) (8.3,13.6)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC West Coast US Total Catch 2012 Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA	Est. # 74 4,135 91 593 1,573 41 8 0 157 1,400 165 8,237 Est. # 42 5,266 92 241 1,256 19	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9 17.0 2.0 "A" Sea Mean 0.5 67.8 1.2 3.1 16.2 0.2 0.0	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.70 1.40 0.60 SD 0.27 2.22 0.82 0.82 1.88 0.35	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4) (14.2,19.8) (1.0,3.3) V=759) 95% CI (0.2,1.2) (63.4,72.1) (0.0,3.1) (1.6,4.8) (12.7,20.0) (0.0,1.2)	Est. # 43 2,490 91 67 283 331 5 0 91 686 710 4,797 Est. # 86 1,863 6 35 3 135	Mean 0.9 51.9 1.4 5.9 0.1 0.0 1.9 14.3 14.8 "B" Sea Mean 2.4 52.1 0.2 1.0 0.1 3.8	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.20 1.10 1.90 1.70 SD 0.83 2.92 0.32 0.64 0.25 1.44 0.17	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5) (10.8,18.2) (11.6,18.2) =352) 95% CI (1.1,4.3) (46.3,57.7) (0.0,1.1) (0.1,2.5) (0.0,0.8) (1.3,6.9)	Est. # 117 6,530 235 652 1,851 443 13 0 313 2,020 873 13,034 Est. # 126 7,152 115 271 1,227 155	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4 15.5 6.7 Bering S Mean 1.1 63.1 1.0 2.4 10.8 1.4	SD 0.30 1.80 0.70 0.80 1.40 1.00 0.20 0.10 0.80 Sea all SD 0.32 1.83 0.59 0.60 1.35 0.73 0.07	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6) (13.4,17.8) (5.2,8.2) (N=1,111) 95% CI (0.6,1.8) (59.4,66.6) (0.0,2.3) (1.3,3.7) (8.3,13.6) (0.2,3.1)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC West Coast US Total Catch 2012 Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper	Est. # 74 4,135 91 593 1,573 41 8 0 157 1,400 165 8,237 Est. # 42 5,266 92 241 1,256 19 2	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9 17.0 2.0 "A" Sea Mean 0.5 67.8 1.2 3.1 16.2 0.2 0.0 0.1	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.70 1.40 0.60 SD 0.27 2.22 0.82 0.82 1.88 0.35 0.12 0.26	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4) (14.2,19.8) (1.0,3.3) 3=759) 95% CI (0.2,1.2) (63.4,72.1) (0.0,3.1) (1.6,4.8) (12.7,20.0) (0.0,1.2) (0.0,0.3)	Est. # 43 2,490 91 67 283 331 5 0 91 686 710 4,797 Est. # 86 1,863 6 35 3 135 2	Mean 0.9 51.9 1.4 5.9 6.9 0.1 0.0 1.9 14.3 14.8 "B" Sea Mean 2.4 52.1 0.2 1.0 0.1 3.8 0.1 0.1	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.20 1.10 1.90 1.70 SD 0.83 2.92 0.64 0.25 1.44 0.17	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5) (10.8,18.2) (11.6,18.2) 3=352) 95% CI (1.1,4.3) (46.3,57.7) (0.0,1.1) (0.1,2.5) (0.0,0.8) (1.3,6.9) (0.0,0.5)	Est. # 117 6,530 235 652 1,851 443 13 0 313 2,020 873 13,034 Est. # 126 7,152 115 271 1,227 155 2	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4 15.5 6.7 Bering \$ Mean 1.1 63.1 1.0 2.4 10.8 1.4 0.0 0.1	SD 0.30 1.80 0.70 0.80 1.40 1.00 0.20 0.10 0.80 Sea all SD 0.32 1.83 0.59 0.60 1.35 0.73 0.07	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6) (13.4,17.8) (5.2,8.2) (N=1,111) 95% CI (0.6,1.8) (59.4,66.6) (0.0,2.3) (1.3,3.7) (8.3,13.6) (0.2,3.1) (0.0,0.2)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC West Coast US Total Catch 2012 Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Copper	Est. # 74 4,135 91 593 1,573 41 8 0 157 1,400 165 8,237 Est. # 42 5,266 92 241 1,256 19 2 6 128	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9 17.0 2.0 "A" Sea Mean 0.5 67.8 1.2 3.1 16.2 0.2 0.0 0.1 1.7	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.70 1.40 0.60 SD 0.27 2.22 0.82 0.82 1.88 0.35 0.12 0.26 0.78	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4) (14.2,19.8) (1.0,3.3) 3=759) 95% CI (0.2,1.2) (63.4,72.1) (0.0,3.1) (1.6,4.8) (12.7,20.0) (0.0,1.2) (0.0,0.3) (0.0,0.9) (0.3,3.4)	Est. # 43 2,490 91 67 283 331 5 0 91 686 710 4,797 Est. # 86 1,863 6 35 3 135 2 2	Mean 0.9 51.9 1.4 5.9 6.9 0.1 0.0 1.9 14.3 14.8 "B" Sea Mean 2.4 52.1 0.2 1.0 0.1 3.8 0.1 0.1 8.2	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.20 1.10 1.90 1.70 SD 0.83 2.92 0.64 0.25 1.44 0.17 0.20	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5) (10.8,18.2) (11.6,18.2) =352) 95% CI (1.1,4.3) (46.3,57.7) (0.0,1.1) (0.1,2.5) (0.0,0.8) (1.3,6.9) (0.0,0.5) (0.0,0.6)	Est. # 117 6,530 235 652 1,851 443 13 0 313 2,020 873 13,034 Est. # 126 7,152 115 271 1,227 155 2 6 381	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4 15.5 6.7 Bering S Mean 1.1 63.1 1.0 2.4 10.8 1.4 0.0 0.1 3.4	SD 0.30 1.80 0.70 0.80 1.40 0.20 0.10 0.60 1.10 0.32 1.83 0.59 0.60 1.35 0.73 0.07 0.17 0.73	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6) (13.4,17.8) (5.2,8.2) (N=1,111) 95% CI (0.6,1.8) (59.4,66.6) (0.0,2.3) (1.3,3.7) (8.3,13.6) (0.2,3.1) (0.0,0.2) (0.0,0.6) (2.0,4.9)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC West Coast US Total Catch 2012 Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK	Est. # 74 4,135 91 593 1,573 41 8 0 157 1,400 165 8,237 Est. # 42 5,266 92 241 1,256 19 2 6	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9 17.0 2.0 "A" Sea Mean 0.5 67.8 1.2 3.1 16.2 0.2 0.0 0.1 1.7 7.3	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.70 1.40 0.60 0.27 2.22 0.82 0.82 1.88 0.35 0.12 0.26 0.78 1.12	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4) (14.2,19.8) (1.0,3.3) ¥=759) 95% CI (0.2,1.2) (63.4,72.1) (0.0,3.1) (1.6,4.8) (12.7,20.0) (0.0,1.2) (0.0,0.3) (0.0,0.9) (0.3,3.4) (5.2,9.6)	Est. # 43 2,490 91 67 283 331 5 0 91 686 710 4,797 Est. # 86 1,863 6 35 3 135 2 2 292	Mean 0.9 51.9 1.4 5.9 6.9 0.1 0.0 1.9 14.3 14.8 "B" Sea Mean 2.4 52.1 0.2 1.0 0.1 3.8 0.1 0.1 8.2 15.3	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.20 1.10 1.70 SD 0.83 2.92 0.64 0.25 1.44 0.17 0.20 1.84 2.24	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5) (10.8,18.2) (11.6,18.2) 4=352) 95% CI (1.1,4.3) (46.3,57.7) (0.0,1.1) (0.1,2.5) (0.0,0.8) (1.3,6.9) (0.0,0.5) (0.0,0.6) (4.5,11.9) (11.2,20.0)	Est. # 117 6,530 235 652 1,851 443 13 0 313 2,020 873 13,034 Est. # 126 7,152 115 271 1,227 155 2 6	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4 15.5 6.7 Bering \$ Mean 1.1 63.1 1.0 2.4 10.8 1.4 0.0 0.1 3.4 10.2	SD 0.30 1.80 0.70 0.80 1.40 0.20 0.10 0.60 1.10 0.80 Sea all SD 0.32 1.83 0.59 0.60 1.35 0.73 0.07 0.17 0.73 1.01	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6) (13.4,17.8) (5.2,8.2) (N=1,111) 95% CI (0.6,1.8) (59.4,66.6) (0.0,2.3) (1.3,3.7) (8.3,13.6) (0.2,3.1) (0.0,0.2) (0.0,0.6) (2.0,4.9) (8.3,12.3)
Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC West Coast US Total Catch 2012 Region Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper Russia Coast W AK Mid Yukon Up Yukon N AK Pen NW GOA Copper NE GOA Coast SE AK BC	Est. # 74 4,135 91 593 1,573 41 8 0 157 1,400 165 8,237 Est. # 42 5,266 92 241 1,256 19 2 6 128 568	Mean 0.9 50.2 1.1 7.2 19.1 0.5 0.1 0.0 1.9 17.0 2.0 "A" Sea Mean 0.5 67.8 1.2 3.1 16.2 0.2 0.0 0.1 1.7 7.3	SD 0.40 2.20 0.60 1.10 1.80 0.70 0.10 0.70 1.40 0.60 SD 0.27 2.22 0.82 0.82 1.88 0.35 0.12 0.26 0.78	95% CI (0.4,1.7) (46.0,54.5) (0.0,2.6) (5.1,9.4) (15.7,22.8) (0.0,2.4) (0.0,0.5) (0.0,0.4) (0.8,3.4) (14.2,19.8) (1.0,3.3) 3=759) 95% CI (0.2,1.2) (63.4,72.1) (0.0,3.1) (1.6,4.8) (12.7,20.0) (0.0,1.2) (0.0,0.3) (0.0,0.9) (0.3,3.4)	Est. # 43 2,490 91 67 283 331 5 0 91 686 710 4,797 Est. # 86 1,863 6 35 3 135 2 2 292 547	Mean 0.9 51.9 1.4 5.9 6.9 0.1 0.0 1.9 14.3 14.8 "B" Sea Mean 2.4 52.1 0.2 1.0 0.1 3.8 0.1 0.1 8.2 15.3	SD 0.50 2.80 1.00 0.90 1.50 1.80 0.20 1.10 1.70 SD 0.83 2.92 0.32 0.64 0.25 1.44 0.17 0.20 1.84	95% CI (0.2,2.0) (46.4,57.3) (0.4,4.2) (0.0,3.4) (3.4,9.0) (3.5,10.7) (0.0,0.9) (0.0,0.4) (0.1,4.5) (10.8,18.2) (11.6,18.2) 4=352) 95% CI (1.1,4.3) (46.3,57.7) (0.0,1.1) (0.1,2.5) (0.0,0.8) (1.3,6.9) (0.0,0.5) (0.0,0.6) (4.5,11.9)	Est. # 117 6,530 235 652 1,851 443 13 0 313 2,020 873 13,034 Est. # 126 7,152 115 271 1,227 155 2 6 381 1,159	Mean 0.9 50.1 1.8 5.0 14.2 3.4 0.1 0.0 2.4 15.5 6.7 Bering \$ Mean 1.1 63.1 1.0 2.4 10.8 1.4 0.0 0.1 3.4 10.2	SD 0.30 1.80 0.70 0.80 1.40 0.20 0.10 0.60 1.10 0.32 1.83 0.59 0.60 1.35 0.73 0.07 0.17 0.73	95% CI (0.4,1.5) (46.7,53.5) (0.6,3.1) (3.5,6.7) (11.6,17.0) (1.8,5.5) (0.0,0.7) (0.0,0.3) (1.3,3.6) (13.4,17.8) (5.2,8.2) (N=1,111) 95% CI (0.6,1.8) (59.4,66.6) (0.0,2.3) (1.3,3.7) (8.3,13.6) (0.2,3.1) (0.0,0.2) (0.0,0.6) (2.0,4.9)

Appen	4: 2	Can	لممتنه
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2011		"A" Sea	ason (N	N=695)		"B" Sea	ason (N	N=1,778)		Bering S	Sea all	(N=2,473)
Region	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI	Est. #	Mean	SD	95% CI
Russia	12	0.2	0.16	(0.0,0.6)	184	1.0	0.25	(0.6,1.6)	196	0.8	0.19	(0.5,1.2)
Coast W AK	3,856	54.0	2.28	(49.6,58.5)	13,549	73.8	1.28	(71.3,76.2)	17,421	68.3	1.16	(66.0, 70.6)
Mid Yukon	127	1.8	0.76	(0.6,3.6)	233	1.3	0.46	(0.5,2.2)	411	1.6	0.46	(0.8, 2.5)
Up Yukon	526	7.4	1.12	(5.3,9.7)	119	0.7	0.35	(0.1, 1.4)	627	2.5	0.47	(1.6,3.4)
N AK Pen	1,556	21.8	1.94	(18.1,25.7)	628	3.4	0.65	(2.2,4.8)	2,201	8.6	0.81	(7.1,10.3)
NW GOA	41	0.6	0.60	(0.0,2.2)	654	3.6	0.89	(2.0,5.5)	663	2.6	0.67	(1.4,4.1)
Copper	1	0.0	0.07	(0.0,0.2)	105	0.6	0.30	(0.0,1.2)	69	0.3	0.24	(0.0,0.8)
NE GOA	1	0.0	0.09	(0.0,0.2)	26	0.1	0.24	(0.0,0.8)	13	0.1	0.12	(0.0,0.4)
Coast SE AK	218	3.1	0.86	(1.6,4.9)	259	1.4	0.46	(0.6,2.4)	459	1.8	0.41	(1.1,2.6)
BC	515	7.2	1.13	(5.1, 9.6)	1,425	7.8	0.71	(6.4,9.2)	1,984	7.8	0.62	(6.6, 9.0)
West Coast US	283	4.0	0.78	(2.6,5.6)	1,181	6.4	0.61	(5.3,7.7)	1,461	5.7	0.49	(4.8,6.7)
Total Catch	7,137	·	<u> </u>		18,362				25,504			

68. Apails 60 2 1 T V C TRAGRICUTGACCATE ATTRICTGACCATE CREATER CATTER C	Appendix 4 37 S	NP DNA ma	arkers repres	ented ir	n the Chinook salmon baseline			
	Locus	Ploidy SN	Ppos Allele	1 Allel	e2 Probe1	Probe2	Primer	Primer Conc. (uM)
Ob_ETIFIA 2 I A C CACATGAGAGAATATATG CTGAAGAAAGAATATG CTGAACTCACAAGACACTTG 0 Ob_EAFGA 2 I G A CTTGAATGCATATGG CTTGATAGAATACGA CTTGATAGAATACGA COLOR DECIDIO (TICTURA TICTURA) 0 Ob_GOP 2 I A T CGCATTAGCATAGACA CACATATAGACTATACGA CACATATAGACTATACACA CACATATAGACTATACACATACACA COLOR DECIDIO (TICTURA) 0 COLOR DECIDIO (TICTURA) 0 CACATATACATAGACTACACACACA CACATATACATAGACTACACACATACACA 0 COLOR DECIDIO (TICTURA) 0 CACATATACATAGACTACACACATACACA 0 CACATATACATAGACTACACACATACACA 0 CACATATACATACACACATACACACA 0 CACATACACACACACACACACACACACACACACACACAC	Ots_AsnRS-60	2	1 T	С	TGAGTCCCTGACCAGC	AGTCCCCGACCAGC	CCGACGCCTCACTGAGT	0.16
O	Ots_E2-275	2	1 A	G	CCCCCATATTGCTG	CCCCACATTGCTG	GGTGCCACTTTAGTATAGCTGCTTA	0.16
06_16700 2 1.6 T CACGATTACCAATGAACA CACGATTACCAATTAACAA CAAAAATGCTATCCACAATAACTCGAAATAACTGA 0 06_6071 2 1.8 T TGACTCTCACACTATCGC TGACTCTCACACTATCACCT CACTAAATATCCTTACACTACACACA 0 06_678138 2 1.6 A CACTACTTAACGCTCTT CACTAAATAATCTCTTACACTTACAGTCTTACACGACACA 0 06_687375 2 1.7 ATCAACCTGCGACCACA CAACGACACACACA GGGATAACAGGTGTTCACACA 0 06_687375 2 1.7 ATCACACTGCGCATTAA ATAACATTGCCACCTTAA CACCGGCCCCCAAAATCAAG 0 06_687476 2 1.7 ATCACATTGCCACCACACA CTCCCTAGATTAAAACACACCACACACACACACACACACA	Ots_ETIF1A	2	1 A	C	CAACTGAAGAAAATAATATG	CTGAAGAAAAGAATATG	TCTGAACTCACCAAAGGAACACTTG	0.16
OG GE 1 1 T GACTICAGCA[TA]CTG GACTICTCTGCA[TA]CTG GGGIACTGGACCAGAGACA 0 06_GPH3188 2 1 C T ATCAGACTGACTGACCACA CACAGACTTAACATGCTTT CACAGACTTACATATCTCTATCATCTACATCTCTACACAGACA 0 06_GPH318 2 1 C T ATCAGACTGACGACACA CACAGCTGACAACACA GACAGACACACACACACACACACACACACACACACACAC	Ots_FARSLA-220	2	1 G	A	CCTTGGATGGGATGTG	CCTTGGATAGGATGTG	GTTCGTGGGATTGTTCAATGTTCAT	0.16
OB. (PBH338) 2 1 6 A CACTACATTACAGGGATT CACTACATTACATGCTTTACATTCATTTCATACAGTGAAAAA 0.0 OB. (PBH318) 2 1 C T ATCACAGTGAGACAAA CAAGCTGACAACACA GGTGATAACAGGTGTCCACCAA 0.0 OB. (SR1-375) 2 1 C T TICTIGTGAGCGAGGGA TETAGGGATCAGGA CAGCCGCCCCAAAATCAAG 0.0 OB. (SR1-375) 2 1 C T TICTIGTGAGCGTCAGGA TETTGAGCAGTCAGGA CAGCCGCCCCAAAATCAAG 0.0 OB. (SR1-375) 2 1 C T TICTIGTGAGTCACCAAA CACCGCAGCACCACAC CACCGAGAGGGGTTTTGATAAAACAAGGG 0.0 OB. (SR1-375) 2 1 C T TICTIGTGGTATTCATT TICTIGTGGTGATTCATT CACCTAGTTGACACACACACT CACCGAGAGTTTGCACTTTGAGT 0.0 OB. (SR1-176) 2 1 A T CACGTAGAGTATTACATT CACCTAGTGCACACACTTGACACACACACT 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Ots_FGF6A	2	1 G	T	CACGATTAGCAATGAACAA	CACGATTAGCAATTAACAA	TCAAAAATGTCTATCCAACAAATACTCTGAAAAATATTG	0.16
O	Ots_GH2	2	1 A	T	TGACTCTCAGCA[TA]CTG	TGACTCTCTGCA[TA]CTG	GCGTACTGAGCCTGGATGACA	0.08
	Ots_GPDH-338	2	1 G	A	CCACTACTTAACGTGCTTT	CCACTACTTAACATGCTTT	CACTAAATATTCCTTATCATTTCATACTAAGTCTGAAGAA	0.32
O	Ots_GPH-318	2	1 C	T	ATCAAGCTGACGAACCA	CAAGCTGACAAACCA	GGTGATAACAGGTGTTGCACCAA	0.08
O	Ots_GST-207	2	1 C	T	ATGAGAGAGTCTTTCTCTGTT	ATGAGAGAGTCTTTTTCTGTT	GGAGAACATGCATCACCATTCAAG	0.16
Os. Infinity Os.	Ots_GST-375	2	1 C	T	TTTCTTGTAGGCGTCAGAG	TCTTGTAGGCATCAGAG	CAGCCCGTCCCAAAATCAAG	0.16
OS HSP90B-100 2 1 C T TCTATGGTGTAATTCATT CACCTTAGTTCACCCCACACATG 0 OS JSP-11-76 2 1 A T CTCATGGTAAATAAATAA CTGCCTAGTTAAATAAATAA CACCTAGTTCACCCCACGTGGAAATAAGT 0 OS JSP-11-76 2 1 A T CTCATGTTCACATCTCACTCACTCACTCACTCACTCACTC	Ots_GTH2B-550	2	1 C	G	ATAACATCTGCAGCATTAA	ATAACATGTGCAGCATTAA	CACAGGAAGGACGTGTTTTGATG	0.32
OS_IGF-II-76 2 1 A T CIGCCTAGITAAATAAATA CIGCCTAGITAAATTAAATA GIGAGGCCGTCAGITGAAATAAGT 0 08s_Isins-250 2 1 G A ACAGAAGATITICGACTCC ACAGAAGATITICGACTCC CAGCGTGACTTGGACTTTCC 0 0s_LB2-92 2 1 G A ACAGAAGATTATCACTTCC ACAGAAGATTACATTTC CACCTGAACCTCACTGTGT 0 0s_LW8-p-688 2 1 T G TITAACAAGAAAATTATCACTTC CAAGAAGTTATACATTTC CAACCTGACCTGTGT 0 0s_MIRC1 2 1 T G CTGCACCGTGAGAG GTCCACATGCAGAGAG 0 0s_MIRC1 2 1 T G CTGCACCGCACTTG CTGCACCTGCTGTA GTCCTCACGGACACATGTG 0 0s_MIC2 1 T G CCCCAAGGCCACTTG CTCACACTGGTAAAGAGACACTTG GTCCTCACGGAACACATGTG 0 0s_P450 2 1 T A CCCCCAAGTACTTTT CTCACACTGATTTT CTCACACTGATACACATGT GTCCTCACGAACACATGTG 0 0s_RC2-58 2 1 A G ATCACAGTATATAACAT CTCATGACATATACATATACATACATACACACCACTACTGTGTT	Ots_hnRNPL-533	2	1 A	T	CATTTACCAGTTCTCACACAC	TTTACCAGTTCACACACAC	TCTTTGATATTGAGCTCATAAAAGCAAGGT	0.16
OS Blaros-250 2 1 G A ACAGAAGATITTCGACTCC ACAGAAGATITTCGACTCC GAGAGATITTCGACTCTC GAGCAGACTTCGACTTGGT 0 08 s LB-292 2 1 G A CATCATGTCGACGCCTG ATCATGTCAAGCCTG CACCTGAACCTCCACTGTGT 0 08 s LWSp-688 2 1 T C TITAACAGAAAATTATACATITT CAAGAAGGTTACACTTC CAACTCCCATGTGT CAATTCTCCCATGACCAG GCCCACTTCTCCAGTACATGTGT 0 08 s MHC2 1 T G CTGGACGTTTCGTA CTGGACGTTCGTA GTCCACACTCCTCCAGTGACAGAG 0 08 s MHC2 1 T G CTGGACGGTTCTGTA CTCGACGCGCTTG GTCCTCACTGGGTCAAGAG 0 08 s MHC2 1 T G CCAACGCCGACTTG CTCGACGAGATTACAGAG GTCCACAGAGACCAGTGG 0 08 s P450 2 1 T A CCCCGAGATCATTT CCCCGAGACTTTTT CTGCAGGAGATTACAAATG 0 08 s P420 2 1 A G ATGTATTGAACTATACAT TGCTTCACATATACAAATCGACCAGATTGAGTC 0 08 s RAGB 2 1 A 1 T CTCACGAGATAAGACTCACACAATACACAT TGCAC	Ots_HSP90B-100	2	1 C	T	TCTATGGTGTGATTCATT	TTCTATGGTGTAATTCATT	CACCTTAGTTCCACGCAACATG	0.16
OS_LEI-292 2 1 G A CATCATGTCAGGCCTG ATCATGTCAAGCCTG CACCTGAACCTCCACTGTGT 0 OIS_LWSop-638 2 1 T C TITAACAAGAAAATTATACATTTC CAAGAAAGTTATACATTTC CAATTACCTTTCTCAGCCCTGTGT 0 OIS_MHCL 2 1 G A CATCATCCCGTGACCAG GTCCACATTCTCCAGTACATGTATGG 0 OIS_MHCL 2 1 T G CTGGACCGTTGTAA CTGGACCGTGTCTGA GTCCTCAGCTGCGTCAAGGAG OIS_MHCL 2 1 C G CTGGACCGTTTGTA CTCTCACACTTGG GTGCTCAGGACCATTGG OIS_NODI 2 1 C G CCCAAGGCCACTTG CCAACCCCGACTTG GTGCTCCAGGACCATGG OIS_P450 2 1 C G CCCAAGACTTTTT CCCGAAGACTTTTT TAGCGGAGATTTATCAAGAG OIS_P420 2 1 C T CTCTCACATTATAACT CCTGACTGTTAATGACAAGA O OIS_P420-558 2 1 C T TCCACAGTATAACAAAACACTAACAAT AGGTTCACTGTTAATGATTAACAAGACTAACAAACAACTAACAATAACAATAACAATAACAATAACAATAACAATAACAATAACAATAACAATAACAATAACAATAACAAAAAA	Ots_IGF-I.1-76	2	1 A	T	CTGCCTAGTTAAATAAAATA	CTGCCTAGTTAAATTAAATA	GGTAGGCCGTCAGTGTAAAATAAGT	0.32
OS LWSOp-638 2 1 T C ΤΤΑΑCAAGAAAATTATACATTTC CAAGAAAGTTATACATTTC CAAGAAAGTTATACATTTC CAATTACTCTTTCTCAGCCCTGTGT 0 OIS_MHCI 2 1 G A CATCATCCCGTGAGCAG TCATCATCCCATGAGCAG GTCCACATTCTCCAGTACATGTATGG 0 OIS_MHC2 2 1 T G CTGGACGTTTCTCTAT CTCGACGGTCTGAAGAG 0 OIS_NODIO 2 1 C G CTCGACGGACTTT CTCGACGGACCATGG 0 OIS_PH2 2 1 A G CCCGACGACTTT CCCGACGACTTTTATACAAACTTGAACAAGA 0 OIS_PH2 2 1 A G CTCTACAGTATGAACTATG CTCTACAATTGAACTATG CATTGCCGGTTTTTTCCAGAAAGCCAGATGAC 0 OIS_PH2 2 1 A G CTCTACAGATAACAATTACATT CTCTACAAATTGAACTATG CATTTCCACGAAAAGCCAGATGAC 0 OIS_PH2 1 1 C CTCACGGATAAAGGTCCCA CTCAGGATCACTGTTTCGT CATTTCCACGAAAAGCCAGATTTCCGTT 0 OIS_SCH 2 1 A T ATTCCAAGGATCACATTTTT ATTCCAAGGTCTAATTTTCCT CCCAATACAGCACCACCACTACAGTACATTTCCGT	Ots_Ikaros-250	2	1 G	A	ACAGAAGATTTTCGGCTGC	ACAGAAGATTTTCGACTGC	GAGGCTGACTTGGACTTTGC	0.16
OIS MHCI 2 1 G A CATCATCCCGTGAGCAG TEATCATCCCATGAGCAG GTCCACATTCTCCAGTACATGTATGG 0 OIS_MHC2 2 1 T G CTGGAGCGTTCTGTA CTGGAGCGTGCTGTA GTCCTCAGCTGGGTCAGAGG 0 OIS_MHD1 2 1 C G CCACACGCCGACTTG CCACACGCGACTTG GTCCTCAGGAACCATGTG OIS_P450 2 1 T A CCCCGAAGTACTTT CCCGAAGACCTTTT TGCAGGAGATTTATCAACTGTCAAGAG 0 OIS_P420 2 1 A G ATGATTGTTCATTTAATG TGTATTGTTTAATG CTTGGCTGTTTGTGATCAAGATG CTGGCTGTTTGGTACAAGATG 0 OIS_RAGG 2 1 A G ATGATGTAACATATGA CTTTCAACATATGAACTAT CATTTCCACGAAAACCCAGTACTGC 0 OIS_RC2-558 2 1 A T ATCACAGGAGATAAGGTCCCA CAGGGAGTAAGGTCCCA TGCCATCATAAACAACTAACAACTAACAATCAATCAT AGGGTTACTCCCGTTGTGTTCTTCT 0 OIS_SCHEPR2-135 2 1 A T ATTCACAAGTCAAATTTT ATTCACAAGTCAATTTTTTC ATTCACAAGTCACACTACTTTTTTTC AGGTTACTCCCCCCAATTTTGGAT 0 OIS_SCHEPR2-135	Ots_LEI-292	2	1 G	A	CATCATGTCAGGCCTG	ATCATGTCAAGCCTG	CACCTGAACCTCCACTGTGT	0.16
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Ots_LWSop-638	2	1 T	C	TTTAACAAGAAAATTATACATTTC	CAAGAAAGTTATACATTTC	CAATTACTCTTTCTCAGCCCTGTGT	0.16
OIS_NODI 2 1 C G CCAACGCCGACTTG CCAACGCCGACTTG GTGCTGCAGGAACCATGTG CO OIS_P450 2 1 T A CCCCGAAGTACTTTT CCCGAAGACCTTTT TGAGCGAGATTTATCAAACTGTCAAAGA D OIS_P450 2 1 A G ATGTATTGTTCATTTAATG TGTATTGTTCGTTTAATG CCTGGTCTGTTTGTGATCAAGATG D OIS_RAGG 2 1 C T CTCTACAGTATGAACTAATG CTCTACAATAGACTATG CATTTCCACGAAAAGCCAGATGAC D OIS_RCL25S8 2 1 A - TGCATGTAACAAATAACAT TGCATGTAAACAAT AAGGTCTACTCCGGTTGATGTCGGT D OIS_SCNEPCL29S 2 1 A T ATCAAGGTAAGAGTCCCA CAGGAGTAGGGTCCCA TGCCATCATAAACAACCTAACAAGTAACAT AGGTTCTCTGTGTGT D OIS_SERPCL29S 2 1 A T ATTCAAAGTCAAATTTT ATTCAAAGTCTAATTTT ATTCAAAGTCTAATTTT CCAAATTGGTTCTAGTGGAT D OIS_SENPCL-29S 2 1 A T ATTCAAAGTTCAATTAA AAGGTTATCGTTTTTT CTAAGGTTCTCAGCTTTGTGGATTTGGATTTGGATTTTTT CTAAGTTCTCTCTCTCTCTCTGAGAACCAAGAGACACAAGACACAAGACACAAGACACAAGACACAAGACACAAGACACAC	Ots_MHC1	2	1 G	A	CATCATCCCGTGAGCAG	TCATCATCCCATGAGCAG	GTCCACATTCTCCAGTACATGTATGG	0.16
OS_P450 2 1 T A CCCCGAAGIACTTTT CCCGAAGAACTTTT TGAGCGAGATTTATCAAACTGTCAAGAG CCCGAAGAACTTTT OIS_PH2 2 1 A G ATGIATTGTTCATTTAATG TGTATTGTTCATTTAATG CCTGGTCTGTTTGTGATCAAGATG CCCGAAGAAGCCAGATGAC CCCGAAGAACGCCAGATGAC CCCGAAGAACGCCAGATGAC CCCGAAGAACGCCAGATGAC CCCGAAGAACACACACACACACACACACACACACACACA	Ots_MHC2	2	1 T	G	CTGGAGCGTTTCTGTA	CTGGAGCGTGTCTGTA	GTCCTCAGCTGGGTCAAGAG	0.16
OS_PH2 2 1 A G ATGTATTGTTCATTTAATG TGTATTGTTCGTTTAATG CCTGGTCTTTGTGATCAAGATG 0 OIS_RAG3 2 1 C T CTCTACAGTATGAACTATG CTCTACAATATGAACTATG CATTTCCACGAAAAGCCAGATGAC 0 OIS_RFC2-558 2 1 A - TGCATGTAACAAATAACAT TGCATGTAACATAACAT AAGGTCTACTCCGGTTGTATTCGGT 0 OIS_ST-1 2 1 T C TACAGGGATAAGGTCGCA CAGGGATAAGGTCGCA TGCATGTAATTTT CCAAATACAGACCAACTACTGTGT 0 OIS_SCIRPC1-209 2 1 A T ATTCAACGTTTTTTC ATTCAACGTTTTTTC CTAAGGTCTTCCTGCCTAATGTGGAT 0 OIS_SERPC1-209 2 1 A T CATTCAAGTTCAATTAA AAGATATGGTTCAATTAA CAAGTTCTCCTCCCTAATGTGGAT 0 OIS_SUB 2 1 A G TCAAAGATTCAATTAA AAGATATGGTTCAATTAA AAGATATGGCTTTCTGCATTTGGAATGCAATTCGGAACCAAGAACGA 0 OIS_SUB_SIDP_182 2 1 C T CACGTGTCCAGTTCTATTT ATGTCACTTAACGTCTTTCATTTT TCAAAGACATCGAACCAAGAACGA 0 OIS_SUB_SIDP_182 2 <t< td=""><td>Ots_NOD1</td><td>2</td><td>1 C</td><td>G</td><td>CCAACGCCGACTTG</td><td>CCAACGCCGACTTG</td><td>GTGCTGCAGGAACCATGTG</td><td>0.08</td></t<>	Ots_NOD1	2	1 C	G	CCAACGCCGACTTG	CCAACGCCGACTTG	GTGCTGCAGGAACCATGTG	0.08
OS_RAGS 2 1 C T CICTACAGTATGAACTATG CICTACAATATGAACTATG CATTTCCACGAAAAGCCCAGATGAC D. OIS_RFC2-558 2 1 A - TGCATGTAACAAATAACAT TGCATGTAACATAACAT AAGGTCTACTCCGGTTGTATTCGGT D. OIS_ST-1 2 1 T C TACAGGAGATAAGGTCCCA CAGGAGATAGGGTCCCA TGCCATCATAAACAACCTAACAAGTAACT D. OIS_SCRPC1-209 2 1 A T ATTCAAAGTCAAATTTT ATTCAAAGTCTAATTTT CCAAATACAGACCAGCTACTTGTGT D. OIS_SL 2 1 A T CATTCAGCTTTTTTC ATTCAAGGTCTAATTTT CCAAATACGACCAGCTACTTGTGT D. OIS_SL 2 1 A T CATTCAGCTTTTTTC ATTCAAGGTTCAATTTA AAGATATGGTTCAATTTA AATATTGGCTTTCTGCGCTAATGTGGAT D. OIS_SWS1op-182 2 1 T A ATGTACTTTAACGATTCATTT ATGTACTTTAACGTTTCATTT TCCAAAGACATCGAACACAAGAACGA D. OIS_TAPBP 2 1 C T CAGCTGTCAGTTCT TGCTCCAGGTCTC GCCAATACGGGTTCGAACTGT D. OIS_u2021-161 2 1 T	Ots_P450	2	1 T	A	CCCCGAAGTACTTTT	CCCGAAGAACTTTT	TGAGCGAGATTTATCAAACTGTCAAAGA	0.32
OIS_RFC2-558 2 1 A - TOCATGTAACAATAACAT TOCATGTAACAATAACAT AAGGTCTACTCCGGTTGTATTCGGT OUS_CREAT OIS_SF-1 2 1 T C TACAGGAGATAAGGTCGCA CAGGAGATAGGGTCGCA TOCCATCATAAACAACCTAACAAGTAACT OUS_CATCATAAACAACCTAACAAGTAACT OIS_SCRFP2-135 2 1 A T ATTCAAAGTCAAATTTT ATTCAAAGTCTAATTTT CCAAATACAGACCAGCTACTTGTGT OUS_CAATACAGACCAGCTACTTGTGT OUS_CAATACAGACCAGCTACTTGTGT OUS_CAATACAGACCAGCTACTTGTGT OUS_CAATACAGACCAGCTACTTGTGT OUS_CAATACAGACCAGCTACTTGTGT OUS_CAATACAGACCAGCTACTTGTGT OUS_CAATACAGACCAGCTACTTGTGT OUS_CAATACAGACCAGCTACTTGTGT OUS_CAATACAGACCAGATAGCACTTTGGGAT OUS_CAATACAGACACAGAACCAACACAACA	Ots_Prl2	2	1 A	G	ATGTATTGTTCATTTAATG	TGTATTGTTCGTTTAATG	CCTGGTCTGTTTGTGATCAAGATG	0.16
Ots_S7-1 2 1 T C TACAGGAGATAAGGTCGCA CAGGAGATAGGGTCGCA TGCCATCATAAACAACTAACAAGTAACT 0.0 Ots_SCIkF2R2-135 2 1 A T ATTCAAAGTCAAATTTT ATTCAAAGTCTAATTTT CCAAATACAGACCAGCTACTTGTGT 0.0 Ots_SERPC1-209 2 1 A T CAATCAGGCTTTTTTC ATTCAGCATTTTTTC CTAAGTTCTTCTGCCTAATGTGGAT 0.0 Ots_SL 2 1 A G TCAAAGATATGATTCAATTAA AAGATATGGTTCAATTAA AATATTGGCTTTCTGAGAATGCATTTGG 0.0 Ots_SWSlop-182 2 1 T A ATGTACTTTAACGATTCATTT ATGTACTTTAACGTTCATTT TCAAAGACATCGAACACAAGAACGA 0.0 Ots_TAPBP 2 1 C T CAGCTGTCCAGTTCTG CAGTTGTCCAGTTCTG TTTCTCATCCTTCTCTCTCTCTCTCAGTCT 0.0 Ots_u202-161 2 1 T A AGCTAGTGCAGCTA[AC] AGCTAGTGCATAGCAGCTA[AC] CACTTTTGACTTTACATGGAACTTAACTCAT 0.0 Ots_u211-85 2 1 G T TCCCCAAGTCGAGTGTG CCCAAAGTCAAGTGTG TCCCCAAGTCAAGTAATG 0.0 Ots_u4-92 2 1 T C CTGTGTTAACTTTAACCATAAT TCTGTGTTAACTGTAATTTTT TAGAAAAGTAAAAGTAAAGTAAAGTAAAGTAAAGT	Ots_RAG3	2	1 C	T	CTCTACAGTATGAACTATG	CTCTACAATATGAACTATG	CATTTCCACGAAAAGCCAGATGAC	0.32
Ots_SCIkF2R2-135 2 1 A T ATTCAAAGTCAAATTTT CCAAATACAGACCAGCTACTTGTGT 0.0 Ots_SERPC1-209 2 1 A T CATTCAGCTTTTTTC ATTCAAAGTCAATTTT CCAAATACAGACCAGCTACTTGTGT 0.0 Ots_SL 2 1 A G TCAAAGATATGATTCAATTAA AAGATATGGTTCAATTAA AATATTGGCTTTCTGAGAATGCATTTGG 0.0 Ots_SWS1op-182 2 1 T A ATGTACTTTAACGATTCATTT ATGTACTTTAACGTTCATTT TCAAAGACATCGAACACAAGAACGA 0.0 Ots_APBP 2 1 C T CAGCTGTCCAGTTCTG CAGTTGCCAGTTCTG TTCTCATCCTTCTCTCTCTCTCTCTCTCTCTCCAGTCT 0.0 Ots_u202-161 2 1 A G TGCTCCAGATCTC TGCTCCAGGTCTC GCCAATAGCGGTTCTGAACTGT CACTTTTGACTTTACATGGAACTTAACTCAT 0.0 Ots_u21-85 2 1 C T TCCCAAAGTCGAGTGTG CCCAAAGTCAAGTGTG TGGTGAGAGCACCTTTAAATGTCTT 0.0 Ots_u4-92 2 1 T C CTGGTTGAATTTAACATAAT TCTGTGTTGAATTTAACGTAAT ATCCAAGGAGCCCCATTAAAGTATATATACCACTAAAGGACAT 0.0 Ots_u6-75 2 1 C T TTAGTCAACTGTTGTTTT TTAGTCAACTGTTATTTTT GAAAAAGTAAAGTAAAG	Ots_RFC2-558	2	1 A	-	TGCATGTAACAAATAACAT	TGCATGTAACATAACAT	AAGGTCTACTCCGGTTGTATTCGGT	0.08
Cots_SERPCI-209 2 1 A T CATTCAGCTTTTTTC ATTCAGCATTTTTC CTAAGTTCTCTGCCTAATGIGGAT 0. Cots_SL 2 1 A G TCAAAGATATGATTCAATTAA AAGATATGGTTCAATTAA AATATTGGCTTTCTGAGAATGCATTTGG 0. Cots_SWS1op-182 2 1 T A ATGTACTTTAACGATTCATT ATGTACCTTTCATTT TCAAAGACACCAAGAACGA 0. Cots_TAPBP 2 1 C T CAGCTGTCCAGTTCTG CAGTTCTG TTCCAGGTCTC TTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTC	Ots_S7-1	2	1 T	C	TACAGGAGATAAGGTCGCA	CAGGAGATAGGGTCGCA	TGCCATCATAAACAACCTAACAAGTAACT	0.32
Ots_SL 2 1 A G TCAAAGATATGATTCAATTAA AAGATATGATTCAATTAA AAGATATGGTTCAATTAA AATATTGGCTTTCTGAGAATGCATTTGG 0. Ots_SWS1op-182 2 1 T A ATGTACTTTAACGATTCATTT ATGTACGTTTCATTT TCAAAGACACAAGAACGA 0. Ots_TAPBP 2 1 C T CAGCTGTCCAGTTCTG CAGTTCTG TTTCCAGTCTCTCTCTCTCTCTCTCTCAGTCT 0. Ots_U202-161 2 1 T A AGCTAGTGCTTAGCAGCTA[AC] AGCTAGTGCATAGCAGCTA[AC] CACTTTGACTTTAACGTTTCATTT CACTTTTACATGGAACTTAACTCAT 0. Ots_U211-85 2 1 C T TCCCAAAGTCGAGCTGG CCCAAAGTCAGGTGTG TTGGAAAAAGGCCTC CCCCAAAGTCAGAGCAGCTACGAGCTACGAGCTACGAACGTAACTGT 0. Ots_U4-92 2 1 T C T TTAGTCAACTGTTTTT TTAGTCAACTGTTATTTTT GAAAAGGACCCCATTAAAAGATTAACAAAGACAAT 0. Ots_U6-75 2 1 C T TTAGTCAACTGTTTTTT TTAGTCAACTGTTATTTTT GAAAAAGTAAAAGTAAAAGTAAAAGTAAAAGTAAAAGACAAT 0. Ots_U6-75 2 1 C T TTAGTCAACTGTTGTTTTT TTAGTCAACTGTTATTTTT GAAAAAGTAAAAGTAAAAGTAAAAGTAAAAGACAAT 0. Ots_U6-75 2 1 C T TTAGTCAACTGTTGTTTTT TTAGTCAACTGTTATTTTT GAAAAAGTAAAAGTAAAAGTAAAAGTAAAAGTAAAAGACAAT 0. Ots_U6-75 2 1 C T TTAGTCAACTGTTGTTTTT TTAGTCAACTGTTATTTTT GAAAAAGT	Ots_SClkF2R2-135	2	1 A	T	ATTCAAAGTCAAATTTT	ATTCAAAGTCTAATTTT	CCAAATACAGACCAGCTACTTGTGT	0.16
Ots_SWS1op-182 2 1 T A ATGTACTTTAACGATTCATTT ATGTACGTTTCATTT TCAAAGACATCGAACACAAGAACGA 0.2 Ots_TAPBP 2 1 C T CAGCTGTCCAGTTCTG CAGTTCTG TTTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCT	Ots_SERPC1-209	2	1 A	T	CATTCAGCTTTTTTTC	ATTCAGCATTTTTC	CTAAGTTCTTCCTGCCTAATGTGGAT	0.16
Ots_TAPBP 2 1 C T CAGCTGTCCAGTTCTG CAGTTGTCCAGTTCTG TTTCTCATCCTTCTCTCTCAGTCT OX OXs_Tnsf 2 1 A G TGCTCCAGATCTC TGCTCCAGGTCTC GCCAATACGGGTTCTGAACTGT OX OXs_u202-161 2 1 T A AGCTAGTGCTTAGCAGCTA[AC] OXs_u211-85 2 1 C T TCCCAAAGTCGAGTGTG CCCAAAGTCAAGTGTG TGGTGAAAAAGTAAATGTCTT OXs_u212-158 2 1 G A CTGGAAGAAGGCCTC CTGGAAAAAGGCCTC CTGGAAAAAGGCCTC CTGGAAAAAGGCCTC CTGGAAAAAGGCCTC CTGGAAAAAGGCCTC CTGGAAAAAGGCCTC CTGGAAAAAGGCCTC CTGGAAAAAGGCCTC CTGGAAAAAGGCCTC CTGGAAAAAGGACCCCCATTAAAGATTT CTGTGTTGAATTTAACGTAAT CTGTGTTGAATTTATCTTTT GAAAAAGTAAAAGTAAAAGTATAAAGACAAT OX OX_u6-75 2 1 C T TTAGTCAACTGTTTTT TTAGTCAACTGTTATTTTT GAAAAAGTAAAAGTAAAAGTATAAAGACAAT OX	Ots_SL	2	1 A	G	TCAAAGATATGATTCAATTAA	AAGATATGGTTCAATTAA	AATATTGGCTTTCTGAGAATGCATTTGG	0.16
Ots_Tnsf 2 1 A G TGCTCCAGATCTC TGCTCCAGGTCTC GCCAATACGGGTTCTGAACTGT 0. Ots_u202-161 2 1 T A AGCTAGTGCTTAGCAGCTA[AC] AGCTAGTGCATAGCAGCTA[AC] CACTTTTGACTTTACATGGAACTTAACTCAT 0. Ots_u211-85 2 1 C T TCCCAAAGTCGAGTGTG CCCAAAGTCAAGTGTG TGGGAGAGAGCAGCTTAAATGTCTT 0. Ots_u212-158 2 1 G A CTGGAAGAAGGCCTC CTGGAAAAAGGCCTC CCCCATATGAGACGCTACAGTAATG 0. Ots_u4-92 2 1 T C TTAGTCAACTGTTTTT TTAGTCAACTGTATTTTT GAAAAAGTAAAAGTAAAAGTATAACAAAAGAAAGCAAAT 0. Ots_u6-75 2 1 C T TTAGTCAACTGTTTTTT TTAGTCAACTGTTATTTTT GAAAAAGTAAAAGTAAAAGTAAAAGTATAACCACTAAAGACAAT 0.	$Ots_SWS1op\text{-}182$	2	1 T	A	ATGTACTTTAACGATTCATTT	ATGTACTTTAACGTTTCATTT	TCAAAGACATCGAACACAAGAACGA	0.32
Ots_u202-161 2 1 T A AGCTAGTGCTTAGCAGCTA[AC] AGCTAGTGCATAGCAGCTA[AC] CACTTTTGACTTTACATGGAACTTAACTCAT 0.0 Ots_u211-85 2 1 C T TCCCAAAGTCGAGTGTG CCCAAAGTCAAGTGTG TGGTGAGAGCAGCTTTAAATGTCTT 0.0 Ots_u212-158 2 1 G A CTGGAAGAAGGCCTC CTGGAAAAAGGCCTC CCCCATATGAGACCGCTACAGTAATG 0.0 Ots_u4-92 2 1 T C CTGTGTTGAATTTAACATAAT TCTGTGTTGAATTTAACGTAAT ATCCAAGGAGCCCCATTAAAGATTT 0.0 Ots_u6-75 2 1 C T TTAGTCAACTGTTGTTTT TTAGTCAACTGTTATTTT GAAAAAGTAAAAGTAAAAGTATAACCACTAAAGACAAT 0.0 Ots_u6-75 2 1 C T TTAGTCAACTGTTGTTTTT TTAGTCAACTGTTATTTTT GAAAAAGTAAAAGTAAAAGTAAAAGTAAAAGTAAAAGACAAT 0.0 Ots_u6-75 2 1 C T TTAGTCAACTGTTGTTTTT TTAGTCAACTGTTATTTTT GAAAAAGTAAAAAGTAAAAGTAAAAAGTAAAAAGTAAAAAA	Ots_TAPBP	2	1 C	T	CAGCTGTCCAGTTCTG	CAGTTGTCCAGTTCTG	TTTCTCATCCTTCTCTCCAGTCT	0.08
Ots_u211-8521 CTTCCCAAAGTCGAGTGTGCCCAAAGTCAAGTGTGTGGTGAGAGCAGCTTTAAATGTCTT0.Ots_U212-15821 GACTGGAAGAAGGCCTCCTGGAAAAAGGCCTCCCCCATATGAGACGCTACAGTAATG0.Ots_u4-9221 TCCTGTGTTGAATTTAACATAATTCTGTGTTGAATTTAACGTAATATCCAAGGAGCCCCATTAAAGATTT0.Ots_u6-7521 CTTTAGTCAACTGTTGTTTTTTAGTCAACTGTTATTTTGAAAAAGTAAAAGTAAAAGTAAAAGTATAACCACTAAAGACAAT0.	Ots_Tnsf	2	1 A	G	TGCTCCAGATCTC	TGCTCCAGGTCTC	GCCAATACGGGTTCTGAACTGT	0.16
Ots_U212-158 2 1 G A CTGGAAGAAGGCCTC CTGGAAAAAGGCCTC CCCCATATGAGACGCTACAGTAATG 0. Ots_u4-92 2 1 T C CTGTGTTGAATTTAACATAAT TCTGTGTTGAATTTAACGTAAT ATCCAAGGAGCCCCATTAAAGATTT 0. Ots_u6-75 2 1 C T TTAGTCAACTGTTGTTTT TTAGTCAACTGTTATTTT GAAAAAGTAAAAGTAAAAGTAAAAGTATAACCACTAAAGACAAT 0.	Ots_u202-161	2	1 T	A	AGCTAGTGCTTAGCAGCTA[AC]	AGCTAGTGCATAGCAGCTA[AC]	CACTTTTGACTTTACATGGAACTTAACTCAT	0.32
Ots_u4-9221 TCCTGTGTTGAATTTAACATAATTCTGTGTTGAATTTAACGTAATATCCAAGGAGCCCCATTAAAGATTT0.Ots_u6-7521 CTTTAGTCAACTGTTGTTTTTTAGTCAACTGTTATTTTTGAAAAAGTAAAAGTAAAAGTAAAAGTATATACCACTAAAGACAAT0.	Ots_u211-85	2	1 C	T	TCCCAAAGTCGAGTGTG	CCCAAAGTCAAGTGTG	TGGTGAGAGCAGCTTTAAATGTCTT	0.16
Ots_u6-75 2 1 C T TTAGTCAACTGTTGTTTT TTAGTCAACTGTTATTTTT GAAAAAGTAAAAGTAAAAGTATATACCACTAAAGACAAT 0	Ots_U212-158	2	1 G	A	CTGGA A GA A GGCCTC	CTGGAAAAAGGCCTC	CCCCATATGAGACGCTACAGTAATG	0.16
	Ots_u4-92	2	1 T	C	CTGTGTTGAATTTAACATAAT	TCTGTGTTGAATTTAACGTAAT	ATCCAAGGAGCCCCATTAAAGATTT	0.16
Ots_zP3b-215 2 1 G T CCAAATATCCTACCGTGATG CAAATATCCTACCAGTGATG TGCTGAGGACCATCTGCAATTC 0.	Ots_u6-75	2	1 C	T	TTAGTCAACTGTTGTTTTT	TTAGTCAACTGTTATTTTT	GAAAAAGTAAAGTAAAAGTAAAGTATTATACCACTAAAGACAA	Γ 0.32
	Ots_zP3b-215	2	1 G	T	CCAAATATCCTACCCGTGATG	CAAATATCCTACCAGTGATG	TGCTGAGGACCATCTGCAATTC	0.16



U.S. Secretary of Commerce Gina M. Raimondo

Under Secretary of Commerce for Oceans and Atmosphere
Dr. Richard W. Spinrad

Assistant Administrator, National Marine Fisheries Service. Also serving as Acting Assistant Secretary of Commerce for Oceans and Atmosphere, and Deputy NOAA Administrator

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