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Mixed Stock Analysis of Chinook Salmon Harvested in Southeast Alaska Commercial Troll Fisheries, 2010–2014

by

Sara Gilk-Baumer

Danielle F. Evenson

and

William D. Templin

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Alaska Department of Fish and Game **Divisions of Sport Fish and Commercial Fisheries**

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Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat or long
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	*e*
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	*E*
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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by

Sara Gilk-Baumer and William D. Templin
Alaska Department of Fish and Game, Division of Commercial Fisheries, Anchorage

and

Danielle F. Evenson
Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1565

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Sara Gilk-Baumer and William D. Templin
Alaska Department of Fish and Game, Division of Commercial Fisheries,
333 Raspberry Road, Anchorage AK 99518, USA

Danielle F. Evenson
Alaska Department of Fish and Game, Division of Commercial Fisheries
1255 W. 8th Street, Juneau AK 99811-5526, USA

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ABSTRACT

The Southeast Alaska (SEAK) troll fishery harvests Chinook salmon originating from Alaska, British Columbia, and the Pacific Northwest. Owing to its mixed stock nature, the overall SEAK Chinook salmon fishery is managed as one of 3 such fisheries under provisions of the Pacific Salmon Treaty (PST) Agreement. The Alaska Department of Fish and Game has used genetic mixed stock analysis to estimate the stock composition of Chinook salmon harvested in the SEAK troll fishery since 2004 based on a genetic baseline developed by the Genetic Analysis of Pacific Salmonids group for use in PST fisheries. Genetic methods allow direct estimation of the major stock groups contributing to fisheries. This project estimated the relative stock composition of seasonal troll fishery harvests from fishery accounting years 2010 to 2014 (Oct. 1, 2009–Sept. 30, 2014). The major contributors to the Southeast Alaska troll fisheries on an annual basis are the *Andrew Creek*, *Southern Southeast Alaska*, *British Columbia Coast/ Haida Gwaii*, *West Coast Vancouver Island*, *Interior Columbia River (Summer/Fall)*, *North Oregon Coast*, *Washington Coast*, and *South Thompson* reporting groups. Results indicate considerable temporal and spatial variation in the composition of troll harvests within years, but consistent patterns of composition across years. Stock composition data from this and other stock assessments are being used to provide fisheries information including stock-specific run reconstructions and forecasting of transboundary river run sizes, determining the origin of catches in the SEAK troll fishery by age to assist in evaluation of the Pacific Salmon Commission Chinook Model, and estimating some terminal run sizes of some stocks in the PST area that drive the SEAK fishery.

Key words: Chinook salmon, Southeast Alaska, troll fishery, mixed stock analysis, stock composition in fisheries, microsatellite, Pacific Salmon Treaty

INTRODUCTION

Chinook salmon *Oncorhynchus tshawytscha* are commercially harvested in Southeast Alaska (SEAK) and Yakutat troll fisheries in State of Alaska and Federal Exclusive Economic Zone waters east of Cape Suckling and north of Dixon Entrance (Skannes et al. 2016). This area is divided into 4 quadrants for stock assessment purposes: Northern Outside (NO), Northern Inside (NI), Southern Outside (SO), and Southern Inside (SI; Figure 1). The troll fishery harvests mixed stocks[1] of Chinook salmon, including salmon originating from Alaska, British Columbia (BC), and the Pacific Northwest, and is therefore under the jurisdiction of the Pacific Salmon Treaty (PST). The principles of the PST call for cooperative management and research on fisheries harvesting Chinook salmon from populations in Canada and the U.S., and variable annual Chinook harvest ceilings to limit interceptions of Chinook salmon in SEAK and 2 other mixed stock fisheries along the North American coast as per PST Annexes and related Agreements (CTC 2017).

The annual all-gear harvest limit for Chinook salmon in SEAK is specified in Chapter 3, Annex IV of the PST. The majority of the PST harvest limit is allocated to the commercial troll fishery under State of Alaska management plans (i.e., the purse seine fishery is allocated 4.3% of the harvest, the gillnet fishery is allocated 2.9% of the harvest, and the setnet fishery is allocated 1,000 fish; the remaining portion of the annual ceiling is allocated 80% to the troll fishery and 20% to the sport fishery). Thus, careful monitoring of the troll harvest throughout seasonal fisheries is essential to prevent exceedance of the annual ceiling (Pryor et al. 2009; Skannes et al. 2016).

The annual SEAK troll harvest occurs over 3 seasonal fisheries: winter, spring, and summer. The winter fishery occurs from October 11 to April 30 of the following year, or until the guideline

[1] In this report, *population* refers to a locally interbreeding group of salmon distinguished by a distinct combination of genetic, phenotypic, life history, and habitat characteristics, and *stock* refers to an aggregation of one or more populations that occur in the same geographic area and are managed as a unit. *Reporting groups* refers to an aggregation of one or more stocks that can be identified using genetic mixed stock analysis.

harvest level of 45,000 Chinook salmon is reached. The fishery is split into early winter (October 11–December 31) and late winter (January 1–April 30) components, and the open fishing area is restricted to within the troll boundary of the outer coast surf line. The spring troll fishery (May 1 or earlier through June 30) is managed to target Chinook salmon from SEAK hatcheries, many of which are exempt from the annual ceiling. The summer troll fishery accounts for the majority of the annual Chinook salmon harvest. This fishery is closely monitored and managed to prevent the harvest from exceeding the troll portion of the annual ceiling, by allowing Chinook salmon retention during 2 or more periods. The first summer troll fishery opening on July 1 allows harvest in the high Chinook salmon abundance areas (Figure 2) and is intended to not exceed 70% of the remaining troll portion of the annual ceiling. Once the July fishery is closed, Chinook salmon retention by the troll fleet is not allowed unless it is determined that additional openings will not result in exceedance of the annual ceiling. August (and sometimes September) openings are used in most years to allow troll retention if it is determined that the annual ceiling will not be exceeded and if an August (and September) fishery is allowed, the areas of high Chinook abundance remain closed to Chinook salmon retention.

The annual PST Chinook salmon ceiling for SEAK is dependent on the projected abundance of Chinook salmon forecasted by the Chinook Technical Committee (CTC) using the PSC (Pacific Salmon Commission) Chinook Model (CTC 2017; Skannes et al. 2016). The PSC Chinook Model uses catch, escapement, coded wire tag (CWT) recovery, and recruitment information to forecast relative abundance of stocks in PST fisheries. Relative stock proportion information is an important component of the PSC Chinook Model, and currently CWT data are used for this purpose. However, reliance on stock composition estimates solely from CWT data can be problematic because CWTs are only applied to a subset of indicator stocks contributing to the fishery, and the resulting estimates of escapement and terminal run size of important stocks are often not available or are poorly determined. Genetic mixed stock analysis (MSA) provides a complementary set of accurate, precise, and reliable stock composition estimates for major contributors to the fishery.

Mixed stock analysis has been used extensively to estimate the contribution of genetic aggregates of Chinook salmon to mixed stock fisheries occurring throughout the PST area (Hess et al. 2011; Blankenship et al. 2007;[2] Beacham et al. 2012; Templin et al. 2011). This method uses the genetic variation in allele frequencies at multiple loci among populations (baseline) to estimate the contribution of each stock to a mixture given the multilocus genotypes of fish in the mixture. Since 1999, the State of Alaska Department of Fish and Game (ADF&G) has used MSA based on coastwide baselines (Teel et al. 1999; Seeb et al. 2007) to estimate the composition of Chinook salmon harvested in the commercial troll fishery (Crane et al. 2000; Templin et al. 2011; Gilk-Baumer et al. 2013). These MSA estimates are being integrated to the extent possible into the PSC coordinated coastwide stock assessment system.

Genetic MSA is possible for PST fisheries due to the CTC-funded Genetic Analysis of Pacific Salmonids (GAPS) project, a cooperative project among 10 laboratories with the goal of developing a coastwide standardized DNA baseline for stock identification of Chinook salmon (Moran et al. 2004). This process began in 2002, and a standardized baseline was available

[2] Blankenship, S., K. I. Warheit, J. Von Bargen, and D. A. Milward. 2007. Unpublished WDFW molecular genetics laboratory report submitted to the Pacific Salmon Commission-Chinook Technical Committee. Genetic stock identification determines inter-annual variation in stock composition for legal and sub-legal Chinook captured in the Washington Area-2 nontreaty troll fishery.

during the summer of 2005 (Seeb et al. 2007). The baseline can identify 44 reporting groups in mixtures with acceptable accuracy and precision (Seeb et al. 2007). For the SEAK fisheries, these were combined into 26 reporting groups based on management needs and stock presence (Table 1). This baseline continues to be improved through the addition of more populations; the current baseline (version 3.0) contains allele frequencies from 357 populations contributing to PSC fisheries, ranging from the Situk River in Alaska to the Central Valley of California (Appendix A1).

The information reported herein are the results of multiple annual projects that used MSA based on the standardized baseline of microsatellites to provide independent estimates of the stock composition of Chinook salmon harvested in the SEAK troll fishery from Accounting Years[3] (AY) 2010 to 2014.

OBJECTIVES

The goal of this MSA program was to estimate the stock composition of Chinook salmon harvested in SEAK commercial troll fisheries during AY 2010–2014. Project objectives included the following:

1. Sample Chinook salmon from the SEAK troll fishery harvests in a representative manner to provide stock composition estimates of the harvest within 5% of the true value 90% of the time.
2. Survey Chinook salmon sampled from the SEAK troll fishery for individual genotypes at the 13 microsatellite loci in the coastwide baseline.
3. Estimate the relative contribution of 26 fine-scale reporting groups to the following seasonal fisheries in AY 2010–2014:
    a. early winter (October–December) and late winter (January–April) troll fisheries in the NO quadrant, and across all quadrants;
    b. spring troll fisheries (May–June) with separate estimates for Chinook salmon harvested in the NO, NI, and SI quadrants; and
    c. summer troll fisheries (July–September) with separate estimates for the first Chinook salmon opening and subsequent openings combined for Chinook salmon harvested across all quadrants and in the NO quadrant alone.

METHODS

FISHERY SAMPLING

Traditionally, sample sizes for the estimation of stock composition have been set at 400 individuals per stratum for fishery samples from highly mixed locations where many stocks contribute to the harvest (e.g., Seeb et al. 2000). According to sampling theory, under the worst-case scenario (3 stocks contributing equal proportions) a sample of this size should provide estimates of relative proportions within 5% of the true value 90% of the time (Thompson 1987) when stocks are genetically identifiable. The same statistical approach indicates that under

[3] The PST accounting year begins with the start of the winter fishery on October 11 of the previous calendar year and ends the following September; e.g., AY 2010 is October 1, 2009, through September 30, 2010.

worst-case conditions, a sample size of 200 will be within approximately 7% of the true value 90% of the time. Thus, given these levels of precision and accuracy and the need to balance costs of fisheries sampling, sample sizes were set to target a minimum 400 samples per stratum for the following strata:

1. Early winter fishery (October–December)
    a. NO quadrant
    b. Regionwide
2. Late winter fishery (January–April)
    a. NO quadrant
    b. Regionwide
3. Spring fishery (April–June)
    a. NO quadrant
    b. NI quadrant
    c. SI quadrant
4. Summer fishery (July–September)
    a. First retention period (July)
        i. NO quadrant
        ii. Regionwide
    b. Second and subsequent retention periods (August–September)
        i. NO quadrant
        ii. Regionwide

When necessary, sample goals were moved between ports to achieve minimum sample sizes for some strata (Tables 2, 3). Goals varied between years depending on expectations for deliveries (processor availability), availability of port samplers, and the vagaries of each seasonal fishery.

Details regarding port sampling procedures are outlined in Buettner et al. (2017). In short, Chinook salmon were targeted for collection from landings at processors at various ports in SEAK (Table 2, 3; Figure 1). Fish were selected for sampling without regard to size, sex, presence of an adipose fin, or position in the vessel hold or tote, and sampling was conducted in such a manner to be as representative as possible of that week's commercial catch. Axillary processes (the modified and elongated structure found at the anterior base of the pelvic fin) were excised from each fish and placed in a 2 ml cryovial in at least 95% denatured ethanol. Troll fishermen were interviewed to determine the quadrant (NO, NI, SO, or SI) from which the Chinook salmon were harvested. At the end of the season, samples were shipped air cargo back to the ADF&G Gene Conservation Laboratory in Anchorage for analysis. Associated data were archived as part of the age-sex-length database maintained by ADF&G.

MIXED STOCK ANALYSIS

Laboratory Analysis

Samples were assayed for 13 microsatellite loci developed by the GAPS group for use in Treaty fisheries (CTC standardized baseline loci; Seeb et al. 2007). DNA was extracted from axillary process tissue using DNeasy, 96-tissue kits (QIAGEN Valencia CA). Polymerase chain reaction (PCR) was carried out in 10 ul reaction volumes (10 mM Tris-HCl, 50 mM KCl, 0.2 mM each dNTP, 0.5 units Taq DNA polymerase [Promega, Madison, WI]) using an Applied Biosystems (AB, Foster City CA) thermocycler. Primer concentrations, $MgCl_2$ concentrations, and the corresponding annealing temperature for each primer are available in Seeb et al. (2007). PCR

fragment analysis was done on an AB 3730 capillary DNA sequencer. A 96-well reaction plate was loaded with 0.5 ul PCR product along with 0.5 ul of GS500LIZ (AB) internal lane size standard and 9.0 ul of Hi-Di (AB). PCR bands were visualized and separated into bin sets using AB GeneMapper software v4.0. All laboratory analyses followed protocols accepted by the CTC.

Genetic data were collected as individual multilocus genotypes. According to the convention implemented by the CTC, at each locus, a standardized allele is one that has a recognized holotype specimen from which the standardized allele can be reproduced using commonly applied fragment analysis techniques. By the process of sizing the alleles from the holotype specimens, any individual laboratory should be able to convert allele sizes obtained in the ADF&G laboratory to standardized allele names. Genotype data were stored as GeneMapper (*.fsa) files on a network drive that was backed up nightly. Long-term storage of the data was in an *Oracle* database (LOKI) on a network drive maintained by ADF&G computer services.

Several measures were implemented to ensure the quality of data produced. First, each individual tissue sample was assigned a unique accession identifier. At the time DNA was extracted or analyzed from each sample, a sample sheet was created that linked each individual sample's code to a specific well number in a uniquely numbered 96-well plate. This sample sheet then followed the sample through all phases of the project, minimizing the risk of misidentification of samples through human-induced errors. Second, genotypes were assigned to individuals using a system in which 2 people score the genotype data independently. Discrepancies between the 2 sets of scores were then resolved with one of 2 possible outcomes: (1) one score was accepted and the other rejected, or (2) both scores were rejected and no score was retained. Lastly, approximately 8% of the individuals, 8 samples from each 96-well DNA extraction plate, were reanalyzed for all loci. This enabled detection and correction of laboratory mistakes and allowed estimation of genotyping error rates. Error rates were calculated as the number of conflicting genotypes, divided by the total number of genotypes examined.

Statistical Analysis

Mixture Subsampling

Representative mixtures of individuals for MSA were created by subsampling individuals from the collected tissue samples in proportion to harvest by quadrant. The harvest of Chinook salmon in each quadrant for a given troll fishery opening was obtained from the ADF&G Mark, Tag, and Age Laboratory website (https://mtalab.adfg.alaska.gov/CWT/reports/default.aspx) using the criteria in Table 4. The relative proportion of the total period harvest that was caught in each quadrant was then calculated for each fishery opening.

A total of 11 mixtures were necessary from each accounting year to generate stock composition estimates for the strata described above. For regionwide (all quadrant) estimates, separate mixtures were made for the (1) NO quadrant and (2) all other quadrants combined, and then pooled into regionwide estimates by weighting by each quadrant's harvest proportion. For each fishery and quadrant, individual samples were randomly selected from the entire set of samples available from each quadrant such that the contribution of each quadrant to the sample mixture reflected the composition of the harvest. When sufficient samples were available, the target sample size for each mixture was 400. In some cases, fewer than 400 individuals were available; in these cases, a minimum sample size was set at 200. In some cases, fewer than 200 individuals were available to generate an estimate. Although a sample size below 200 did not meet

objectives for precision and accuracy, strata with sample sizes of 100–200 were deemed somewhat informative and thus estimates were generated, but only to the 4 broad-scale reporting groups outlined in Table 1. No estimates were generated for sample sizes less than 100.

BAYES Analysis

The stock compositions of fishery mixtures were estimated using the program BAYES (Pella and Masuda 2001). The Bayesian method of MSA estimates the proportion of stocks caught within each fishery using 4 pieces of information: (1) a baseline of allele frequencies for each population, (2) the grouping of populations into the reporting groups desired for MSA, (3) prior information about the stock proportions of the fishery, and (4) the genotypes of fish sampled from the fishery.

The baseline of allele frequencies for Chinook salmon populations was obtained from the GAPS database (http://www.nwfsc.noaa.gov/research/divisions/cb/genetics/standardization.cfm; Appendix A1). Results from 100% proof tests indicate that the 26 fine-scale reporting groups used herein can be identified in mixtures with a 91% correct allocation or better (Appendix B1).

The choice of prior information about stock proportions in a fishery (the prior probability distribution hereafter referred to as the *prior*) is important for increasing MSA accuracy (Habicht et al. 2012a). In this analysis, the estimated stock proportions from the previous year in a given stratum were used as the prior for that stratum across years (i.e., 2009 estimates were used as prior parameters when generating 2010 estimates; Gilk-Baumer et al. 2013). The prior information about stock proportions was incorporated in the form of a Dirichlet probability distribution. The sum of all prior parameters was set to 1 (prior weight), which is equivalent to adding 1 fish to each mixture (Pella and Masuda 2001).

For each fishery mixture, 5 independent Markov Chain Monte Carlo (MCMC) chains of 40,000 iterations were run with different starting values and the first 20,000 iterations were discarded to remove the influence of the initial start values. In order to assess the among-chain convergence, the Gelman-Rubin shrink factors computed for all stock groups in BAYES were examined (Gelman and Rubin 1992). If a shrink factor for any stock group in a mixture was greater than 1.2, the mixture was reanalyzed with 80,000 iterations. If a mixture still had a shrink factor greater than 1.2 after the reanalysis, results from the 5 chains were averaged and a note was made in the results. We combined the second half of the 5 chains to form the posterior distribution and tabulated mean estimates, 90% credibility intervals, and standard deviations from a total of 100,000 iterations. In addition, we report the marginal median of the posterior distribution as a measure of central tendency for stock proportions (Pella and Masuda 2001). Misallocations to reporting groups that are either absent or at low proportions within mixtures can occur in MSA when the discriminant methods do not produce perfect identifiability (Pella and Milner 1987; Pella and Masuda 2001). Previous work has shown that the posterior distribution of these misallocations can be highly skewed and the mean is much more sensitive to extreme values than the median (e.g., Habicht et al. 2012b).

For regionwide estimates for the winter and summer fisheries, estimates from (1) the NO quadrant and (2) all other quadrants combined were pooled into total area estimates by weighting each quadrant's estimate by their respective harvest proportions (stratified estimator). This analysis is described in detail in Templin et al. (2011).

For ease of interpretation and visual presentation, the 26 fine-scale reporting groups were condensed into 17 medium-scale reporting groups (Table 1). The 17 reporting groups included 16 individual reporting groups, each of which were estimated to have contributed at least 5% to the harvest in at least one seasonal fishery, and an additional *Other* group composed of the remaining reporting groups. The fine-scale reporting groups were also combined into 4 broad-scale reporting groups for describing trends on a larger scale. When reporting groups were combined, credibility intervals were calculated from the raw BAYES output using the new groupings.

RESULTS

FISHERY SAMPLING

For each accounting year, sampling of Chinook salmon from the commercial troll harvest began with the early winter fishery in October of the preceding calendar year (October 11–December 31), and continued into April with the late winter fishery (January 1–late April). Goals were not always met for all fishery periods, ports, and quadrants (Table 2, 3). This was primarily caused by inclement weather reducing the fishing effort in the early winter periods or less intensive harvest sampling during portions of the harvest season. Sample sizes were sufficient to generate estimates to fine-scale reporting groups in all years and time periods except for the NO quadrant of the early winter fishery in AY 2010; for this year and quadrant, estimates were generated to the 4 broad-scale reporting groups only (Table 1).

Sampling of Chinook salmon during the spring troll fishery occurred between April and June. Similar to winter fisheries, sample goals were not always met for every port or quadrant (Table 2, 3). This was primarily caused by less intensive harvest sampling or lack of fishing effort in those areas, particularly for the NI quadrant. Sample sizes were between 100 and 200 for estimates from the NI quadrant in all 5 years, and estimates were generated to the 4 broad-scale reporting groups only (Table 1).

Sampling of Chinook salmon during the first retention period of the summer troll fishery occurred in July of each year, and during a second retention period in August when it occurred. In AY 2012, the second retention period extended into September. No second retention period occurred in AY 2013. Sample goals were not always met for every port or quadrant (Table 2, 3). This was primarily caused by less intensive harvest sampling or lack of fishing effort in those quadrants. However, sample sizes were sufficient to generate estimates to the fine-scale reporting groups in all years and time periods when fisheries occurred.

MIXED STOCK ANALYSIS

Laboratory Analysis

Quality control demonstrated a low error rate for all years of samples analyzed. A total of 1,512 fish were examined for quality control, or 19,656 genotype comparisons. The discrepancy rate was 1.2% over all projects.

Statistical Analysis

Early Winter Troll Fishery

There was considerable annual variation in the stock contribution to the regionwide harvest in the early winter Chinook salmon troll fishery between AY 2010 and AY 2014. For broad-scale

reporting groups (Figure 3), the greatest contributor to harvest was *Alaska* in AY 2010 (43%), the *US South* in AY 2011 (57%) and AY 2014 (32%), and *Canada* in AY 2012 (40%) and AY 2013 (37%). The *Transboundary* reporting group contributed between less than 1–2% of the harvest in all years.

When considering medium-scale reporting groups, the largest contributors to the regionwide early winter troll fishery were the *Interior Columbia Su/F*, *S Southeast Alaska*, and *BC Coast/Haida Gwaii* reporting groups (Figure 4). *S Southeast Alaska* was the largest contributor in AY 2010 (32%) and 2013 (24%), *Interior Columbia Su/F* was the largest contributor in AY 2011 (27%) and 2014 (34%), and *BC Coast/Haida Gwaii* was the largest contributor in AY 2012 (19%). Also contributing to harvest in most years were the *East Vancouver* (range: 5–16%), *West Vancouver* (range: 3–11%), *Andrew* (range: 2–11%), and *Puget Sound* (range: 4–9%) reporting groups. Results for the 26 fine-scale reporting groups are available in Appendices C1 and C2.

When considering harvest from the NO quadrant only, the *BC Coast/Haida Gwaii* reporting group was the largest contributor in AY 2011 (30%), whereas the *Interior Columbia Su/F* group was the largest in subsequent years (range: 26–44%; Figure 5). Results for 26 fine-scale reporting groups are available in Appendices C3 and C4.

Late Winter Troll Fishery

The stock composition of the regionwide harvest in the late winter Chinook troll fishery was relatively consistent between AY 2010 and AY 2014. For broad-scale reporting groups (Figure 3), *Canada* was consistently the largest contributor in all 5 years (range: 50–61%). Both the *US South* (range: 17–32%) and *Alaska* (range: 8–23%) reporting groups were also important contributors in all years. The contribution of the *Transboundary* reporting group was low in all years (range: 1–7%).

When considering medium-scale reporting groups, the largest contributor to the regionwide late winter fishery in all 5 years was *West Vancouver* (range: 20–35%; Figure 6). Other large contributors were *BC Coast/Haida Gwaii* (range: 11–20%), *Interior Columbia Su/F* (range: 7–20%), and *S Southeast Alaska* (range: 5–16%). Other important contributors in some years were *South Thompson* (13% in AY 2010 and 9% in AY 2014), *Willamette Sp* (8% in AY 2010 and 10% in AY 2012), and *Andrew* (9% in AY 2010). Results for the 26 fine-scale reporting groups are available in Appendices C5 and C6.

When considering harvest from the NO quadrant only, stock contributions were similar to regionwide estimates, although northern (*Taku*, *Andrew*, *Stikine*, and *S Southeast Alaska*) stocks comprised less of the fishery, and the proportion of southern U.S. stocks (*Puget Sound* to *Mid Oregon Coast*) was higher in all years (Figure 7). Fine-scale results for 26 reporting groups are available in Appendices C7 and C8.

Spring Troll Fishery

During the spring troll fisheries in the NI and SI quadrants of SEAK from AY 2010 to AY 2014, the *Alaska* broad-scale reporting group was generally the largest contributor to the harvest followed by the *Canada* group (Figure 8). In the NO quadrant, *Alaska* and *Canada* reporting groups contributed the highest proportions in AY 2010–2012. In AY 2013 and AY 2014, however, the *US South* group contributed increasingly larger components, and *Alaska* contributed reduced components to the NO and NI quadrants.

In the NO quadrant, the *Alaska* component was largely composed of the *Andrew* reporting group, which is primarily production from hatcheries that use Andrew Creek broodstock (Figure 9). *Canada* generally contributed equal amounts (approximately 40%) to harvests, approximately half of which was of *West Vancouver* origin (Figures 8, 9). Between AY 2012 and AY 2014, decreasing proportions from *Alaska* were mirrored by increasing proportions of Chinook salmon from the *US South* (Figure 8), generally from the *Interior Columbia Su/Fa* group (Figure 9). Contributions from the transboundary reporting groups (mainly from *Taku*) decreased over this period from 14% (AY 2010) to 2% (AY 2014). Fine-scale results for 26 reporting groups are available in Appendices C9 and C10.

In the NI quadrant, the *Alaska* reporting group was the highest contributor in all 5 accounting years, but decreased in AY 2013 and 2014 (Figure 8; range: 39–65%). The next highest contributor was the *Canada* reporting group in AY 2010–2013 (range: 19–32%), followed by the *US South* reporting group in AY 2014 (28%). Estimates are not available for the 17 medium-scale reporting groups or the 26 fine-scale reporting groups because sample sizes were not sufficient to meet accuracy and precision standards.

In the SI quadrant, the *Alaska* reporting group was the largest contributor in all years (Figure 8; range: 49–71%), followed by the *Canada* (range: 13–26%) and *Transboundary* (range: 7–16%) reporting groups. Harvests were dominated by the *S Southeast Alaska* reporting group in all 5 accounting years (range: 38–47%; Figure 10). The *Andrew* reporting group was the next highest, and contributed 12–28% each year. Fine-scale results for 26 reporting groups are available in Appendices C11 and C12.

Summer Troll Fishery, First Retention Period

The stock composition of summer Chinook salmon troll fisheries was more varied than other seasonal fisheries in SEAK, and had greater representation of non-Alaska stocks. At the broad-scale reporting groups during the first retention period, the *US South* reporting group dominated the stock composition in all 5 years, and showed an increasing trend over this period (range: 49–77%; Figure 11). At the same time, contributions from the *Canada* reporting group decreased (range: 19–38%). The *Alaska* reporting group contributed 4–16% of the total each year, and contributions of the *Transboundary* reporting group were low each year (range: <1–2%).

At the medium-scale, the first retention period of the summer troll fishery was increasingly dominated by the *Interior Columbia Su/F* reporting group. In AY 2010, the *South Thompson* reporting group was the largest contributor to the regionwide harvest (26%), but *Interior Columbia Su/F* was the largest contributor in AY 2011 through 2014 (range: 22–52%; Figure 12). The *Washington Coast* reporting group was the next largest contributor in all years (range: 7–16%), followed by the *North Oregon Coast* (range: 7–10%) and *West Vancouver* (range: 7–11%) reporting groups. The *S Southeast Alaska* reporting group contributed 2–9% in AY 2010 through 2014, and the *Andrew* reporting group contributed 7% in AY 2012. Fine-scale results for 26 reporting groups are available in Appendices C13 and C14.

Stock compositions in the NO quadrant during the first retention period were similar to estimates for the entire area, with harvests dominated by the *Interior Columbia Su/F* reporting group in most years (range: 21–52%; Figure 13;). Also important were the *South Thompson* (range: 6–24%), *Washington Coast* (range: 11–21%), *North Oregon Coast* (range: 7–13%), and *West Vancouver* (range: 6–9%) reporting groups. Fine-scale results for 26 reporting groups are available in Appendices C15 and C16.

Summer Troll Fishery, Second Retention Period

In the second retention period at the broad-scale reporting groups, the *US South* reporting group was the largest contributor in all accounting years that the fishery occurred (AY 2010–2012 and 2014; range: 64–76%; Figure 11). The *Canada* (range: 14–18%) and *Alaska* (range: 8–20%) reporting groups made up the next largest proportions in all 4 years, whereas contributions of the *Transboundary* reporting group were low (range: <1–2%).

At the medium-scale reporting groups, the largest contributor to the regionwide second retention periods troll fishery in all 4 years was the *Interior Columbia Su/F* reporting group (range: 19–56%; Figure 14). Other higher-contribution reporting groups were the *Washington Coast* (range: 6–16%), *North Oregon Coast* (range: 6–16%), and *S Southeast Alaska* (range: 6–13%) groups. Fine-scale results for 26 reporting groups are available in Appendices C17 and C18.

Stock compositions in the NO quadrant during the second retention periods were similar to estimates for the entire area, with the *Interior Columbia Su/F* reporting group comprising the largest portion of the harvest in most years (range: 23–65%; Figure 15). Other major contributors were the *Washington Coast* reporting group (range: 7–23%), followed by the *North Oregon Coast* group (range: 7–18%). Fine-scale results for 26 reporting groups are available in Appendices C19 and C20.

DISCUSSION

TEMPORAL AND SPATIAL PATTERNS DURING STUDY YEARS

Genetic mixed stock analysis based on the microsatellites for Chinook salmon was successfully used to estimate the stock composition of the commercial troll fishery harvests in SEAK during AY 2010–2014. These estimates demonstrate variation in the composition of the harvest in the commercial fishery across areas, seasons, and years.

When each of the seasonal fisheries is considered at finer-scale levels, the composition of the harvest is variable among years. For example, during the winter fisheries, the prevalence of the *Interior Columbia Su/F* reporting group decreased from the early winter fishery to the late winter fishery. This group was consistently strong throughout the winters of 2011 to 2014. At the same time, the *West Vancouver* reporting group increased from the early winter fishery to the late winter fishery—it was the most prominent contributor in all 5 years. Similarly, the *BC Coast/Haida Gwaii* and *S Southeast Alaska* made up large proportions of the winter fishery from 2010 to 2014.

During the spring fishery, when fishing effort is directed at the harvest of Alaska-origin stocks, *S Southeast Alaska* and *Andrew* reporting groups combined made up the largest portion of the harvest in the SI quadrant. In the NO quadrant, Alaska and transboundary stocks make up the majority of harvest from 2010 to 2012, the *West Vancouver* group was an important contributor in all years, and the *Interior Columbia Su/F* group was the largest contributor in 2013 and 2014. This reflects the decreasing productivity of Southeast Alaska and transboundary stocks beginning in 2013, and an increasing trend in the productivity of Interior Columbia River stocks during the same timeframe (CTC 2017). The largest contribution of the transboundary reporting groups (*Taku* and *Stikine*) during any given year occurred during the spring troll fishery, but overall there was a decreasing trend in transboundary stock harvest in the inside quadrants; this

corresponds with the reported decreasing escapement and decreased productivity of the Alsek, Taku, and Stikine river stocks (CTC 2017).

The first retention period of the summer troll fishery has increasingly been dominated by the *Interior Columbia Su/F* reporting group ranging from 20% in 2010 to 52% in 2014. This increase corresponds to increasing productivity of this stock group as evidenced by terminal run size estimates (CTC 2017). At the same time, the *S Southeast Alaska* and *South Thompson* stock groups decreased across years, whereas the *West Vancouver*, *Washington Coast*, and *North Oregon Coast* groups remained relatively consistent, contributing 6–11% each.

The first and second retention periods of summer troll fishery are usually separated by 4 to 6 weeks and the contribution by some reporting groups can vary widely between these periods. For example, the *South Thompson* reporting group contributed 6–24% in July and 1–5% in August and September. Though there was variability from year to year, in general there was a trend for increasing proportions of non-Alaskan stocks over time within years.

Variation in stock composition also occurs among the fishery quadrants. In general, stock contribution estimates based on samples from the NO quadrant had the most diverse stock compositions and the highest proportion of stocks originating south of Alaska. There were notable decreasing trends observed for harvests of the *N Southeast Alaska* stock group in the NI quadrant across years, which corresponds to decreasing escapements, terminal run sizes, and decreased productivity for the constituent stocks (CTC 2017). Similarly, a decreasing trend across years was observed for the *S Southeast Alaska* stock group in the SI quadrant that mirrors decreases in escapements to Unuk, Keta, Blossom, and Chickamin rivers; a decrease in productivity of these wild stocks; and decreased survival of hatchery stocks of Chinook in southern Alaska. For summer fisheries, stock contribution estimates based on samples from the NO quadrant were similar to estimates based on samples from all quadrants. This is likely a reflection of the high proportion of fish harvested in this quadrant relative to the other quadrants.

COMPARISONS WITH PREVIOUS STUDIES

With the inclusion of the data reported herein and similar studies dating back to AY 2004 (Gilk-Baumer et al. 2013), some interesting long-term trends can be observed for SEAK troll fisheries. In general, across most fisheries in recent years, in the prevalence of southern U.S. stocks (i.e., stocks originating from California, Oregon, Washington, or Idaho) has increased and the prevalence of Alaska and transboundary river stocks has decreased. This is most obvious in fisheries where the largest proportion of fish are harvested in the NO quadrant. These trends correspond with increased productivity of southern U.S. stocks, particularly Columbia River stocks, and were mirrored by decreased productivity of some Canadian and Alaska stocks.

Specific comparisons between analyses using the most recent microsatellite baseline (this report) and those using older microsatellite baselines (2004–2009; Gilk-Baumer et al. 2013) can be made, but must be interpreted carefully as both the number of populations and reporting groups changed between the studies. Gilk-Baumer et al. (2013) used CTC Version 2.1 baseline with 176 populations and 44 reporting groups, and this report uses the current CTC Version 3.0 of the CTC baseline, which contains 357 populations combined into 26 reporting groups. In several cases, reporting groups from Gilk-Baumer et al. (2013) were combined into more comprehensive groups: *Lower Fraser*, *Mid Fraser*, and *Upper Fraser* groups into *Fraser*; *Mid and Upper Columbia River (Sp)* and *Snake River (Sp/Su)* into *Columbia Sp*; *Upper Columbia (Su/F)*, *Deschutes (F)*, and *Snake (F)* into *Interior Columbia Su/F*; and *Rogue*, *N California/S Oregon*

Coast, *Klamath*, *California Coast*, *Central Valley (W)*, *Central Valley (Sp)*, and *Central Valley (F)* into *S Oregon/California*. In addition, other notable changes between CTC Version 2.1 (Gilk-Baumer et al. 2013) and Version 3.0 (this report) include better representation of Chinook salmon stocks, particularly from Canada and the Columbia River. The baseline is continually being improved as samples from additional rivers are collected and analyzed.

Because of the changes in the genetic baselines since 2004, comparisons across years are more reliable at the broad-scale than at finer scale levels. At the broad-scale level there is less overall variation year to year, but when seasonal fisheries are considered individually, the variation in stock composition is more pronounced. There was considerable annual variation in the stock contribution to the regionwide harvest in the early winter Chinook troll fishery during the 11-year period from AY 2004 to AY 2014 (Figure 16). For broad-scale reporting groups, the *US South* group has the highest estimated contribution in AY 2005, AY 2011, and AY 2014; the *Canada* reporting group was prominent in all years, the *Alaska* reporting group was variable, and the *Transboundary* reporting group was consistently low in all years. By contrast, the stock composition of the regionwide harvest in the late winter Chinook troll fishery was relatively consistent across years (Figure 16). For broad-scale reporting groups in the late winter fishery, *Canada* was consistently the largest contributor in all 11 years, both the *US South* and *Alaska* reporting groups were also important contributors in all years, and the contribution of the *Transboundary* reporting group was low in all years. During the spring troll fishery, the *Alaska* broad-scale reporting group was the largest contributor to the harvest in inside quadrants, followed by the *Canada* group (Figure 17). In the NO quadrant, the *Alaska* and *Canada* groups were both major contributors to the spring fishery each year until AY 2013, when the *Alaska* contribution declined and *US South* made up a larger component of the harvest. The stock composition of summer Chinook troll fisheries was more varied than other seasonal fisheries in SEAK, and had greater representation of non-Alaska stocks (Figure 18). At the broad-scale level during the first summer troll retention period, the *US South* reporting group was the largest contributor to the regionwide stock composition in all but 3 years (AY 2006–2008), followed by the *Canada* reporting group. During the second summer troll retention period, the *US South* reporting group was dominant in the regionwide stock composition in all 10 years that the fishery occurred, whereas the annual contributions of the *Canada* reporting group were prominent yet variable, and the *Transboundary* reporting group was consistently low.

APPLICATIONS TO THE PACIFIC SALMON TREATY

These results present a comprehensive assessment using MSA to estimate the stock composition of the SEAK troll fishery. Stock composition data from this program are currently being used in several other studies with a broad array of applications:

1. These estimates have already proven considerably valuable for fishery management in terminal and near-terminal areas and are being used in run reconstructions to generate better forecasts of run strength for transboundary rivers under Chapter One of the PST.
2. These MSA stock composition estimates are being combined with individual assignment, otolith marks, CWTs, ages, and harvest information to provide independent abundance estimates of some PSC Chinook Model stocks to assist in evaluation of the PSC Chinook Model. The PSC Chinook Model cannot be reliably used to determine the composition of the harvest in SEAK because (1) it does not include fish originating from transboundary rivers (i.e., Taku, Stikine, and Alsek rivers); (2) only 1 of its 30 model stocks originates from

SEAK and it only represents a small proportion of the SEAK Chinook salmon natural production; and (3) the model is based on *treaty Chinook*, which excludes nearly all of the Southeast Alaska hatchery-produced Chinook salmon harvested in SEAK fisheries. The more appropriate way to estimate the composition of SEAK Chinook salmon fishery is to apply fishery stock composition data from MSA to catch data. This approach has been successfully applied to the SEAK commercial troll fishery from 1999 through 2012 (Templin et al. 2011; Gilk-Baumer et al. 2013), and is currently being applied to much of the SEAK Chinook salmon fishery.

3. Bernard et al. (2014) investigated using genetic analysis in combination with CWTs to estimate terminal run size of Chinook salmon in 2011 from 4 large stock groups that are major contributors to SEAK troll and sport fisheries: West Coast Vancouver Island, Washington Coast, North Oregon Coast, and Upper Columbia River Falls. This "driver stock" method has proven successful at estimating the terminal run size of several of the stocks that are major contributors to the SEAK fishery and has resulted in an ongoing annual effort.

CONCLUSIONS

1. There is considerable spatial and temporal variation in stock composition within years, but more consistent patterns of contribution across years.
2. The reporting groups that contribute the highest proportion of fish to the SEAK troll fisheries on an annual basis are *Andrew*, *S Southeast Alaska*, *West Vancouver*, and *Interior Columbia Su/F*. Other reporting groups, such as *North Oregon Coast*, *Washington Coast*, and *South Thompson* were also major contributors during some of the seasonal fisheries.
3. The spring fishery is mainly composed of stocks from SEAK and the associated transboundary rivers.

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TABLES AND FIGURES

Table 1.–Reporting groups for the Chinook salmon coastwide baseline used to report stock composition of SEAK troll fishery harvests.

	Population	26 reporting groups	17 reporting groups	4 reporting groups
1	1	*Situk*	*Other*	*Alaska*
2	2-5	*Alsek*	*Other*	*Transboundary*
3	6-10	*N Southeast Alaska*	*Other*	*Alaska*
4	11-17	*Taku*	*Taku*	*Transboundary*
5	18-21	*Andrew*	*Andrew*	*Alaska*
6	22-28	*Stikine*	*Stikine*	*Transboundary*
7	29-42	*S Southeast Alaska*	*S Southeast Alaska*	*Alaska*
8	43-51	*Nass*	*Other*	*Canada*
9	52-78	*Skeena*	*Skeena*	*Canada*
10	79-97	*BC Coast/Haida Gwaii*	*BC Coast/Haida Gwaii*	*Canada*
11	98-113	*West Vancouver*	*West Vancouver*	*Canada*
12	114-123	*East Vancouver*	*East Vancouver*	*Canada*
13	124-157	*Fraser*	*Other*	*Canada*
14	158-166	*Lower Thompson*	*Other*	*Canada*
15	167-172	*North Thompson*	*Other*	*Canada*
16	173-180	*South Thompson*	*South Thompson*	*Canada*
17	181-212	*Puget Sound*	*Puget Sound*	*US South*
18	213-223	*Washington Coast*	*Washington Coast*	*US South*
19	224-226	*West Cascades Sp*	*Other*	*US South*
20	227-240	*Lower Columbia F*	*Lower Columbia F*	*US South*
21	241-246	*Willamette Sp*	*Willamette Sp*	*US South*
22	247-302	*Columbia Sp*	*Other*	*US South*
23	303-320	*Interior Columbia Su/F*	*Interior Columbia Su/F*	*US South*
24	321-331	*North Oregon Coast*	*North Oregon Coast*	*US South*
25	332-339	*Mid Oregon Coast*	*Mid Oregon Coast*	*US South*
26	340-357	*S Oregon/California*	*Other*	*US South*

Note: Population numbers are listed in Appendix A1. Populations were combined into (1) 26 fine-scale reporting groups, (2) 17 medium-scale reporting groups, and (3) 4 broad-scale reporting groups.

Table 2.–Sampling goals and numbers of fish sampled at processors from troll-caught Chinook salmon landings at ports in SEAK for mixed stock analysis.

Fishery	Port	Quadrants Represented[a]	AY 2010 Goal	AY 2010 Actual	AY 2011 Goal	AY 2011 Actual	AY 2012 Goal	AY 2012 Actual	AY 2013 Goal	AY 2013 Actual	AY 2014 Goal	AY 2014 Actual
Winter (October–April)												
Early Winter												
	Craig	SO, SI, NI	20	20	20	20	20	8	20	20	20	24
	Juneau	NI, NO	30	30	30	30	30	28	30	30	30	30
	Ketchikan	SI	40	30	40	40	40	40	40	40	40	36
	Petersburg	NI, SI	25	25	25	25	25	25	25	25	25	25
	Sitka	NO	400	175	400	300	400	350	400	220	400	399
	Yakutat	NO	30	30	30	30	30	30	30	30	30	25
			545	310	545	445	545	481	545	365	545	540
Late Winter												
	Craig	SO, SI, NI	20	20	20	20	20	0	20	16	20	16
	Juneau	NI, NO	30	30	30	25	30	30	30	30	30	30
	Ketchikan	SI	60	60	60	40	60	60	60	60	60	60
	Petersburg	NI, SI	40	40	40	34	40	40	40	40	40	40
	Sitka	NO	350	350	350	260	350	350	350	349	350	350
	Yakutat	NO	30	30	30	30	30	30	30	30	30	0
			530	530	530	409	530	510	530	525	530	500
Spring (May–June)												
	Craig	SO	0	0	0	0	0	0	0	0	100	97
	Hoonah	NO	75	75	75	0	0	0	0	0	0	0
	Juneau	NI, NO	200	187	200	200	275	253	275	175	275	151
	Ketchikan	SI, NI	200	219	200	215	200	200	200	237	200	300
	Petersburg	NI, SI	100	99	100	98	100	100	100	99	100	100
	Sitka	NO	300	300	1,000	522	300	300	300	300	300	300
	Wrangell	SI, NI	300	262	300	251	300	246	300	182	300	200
	Yakutat	NO	0	0	0	0	0	0	500	500	500	384
			1,175	1,142	1,875	1,286	1,175	1,099	1,675	1,493	1,775	1,532
Summer (July–September)												
Retention Period 1												
	Craig	SO	160	160	400	384	160	160	160	160	250	250
	Elfin Cove	NO	0	0	0	0	0	0	0	60	60	60

-continued-

Table 2.–Page 2 of 2.

Fishery	Port	Quadrants Represented[a]	AY 2010 Goal	AY 2010 Actual	AY 2011 Goal	AY 2011 Actual	AY 2012 Goal	AY 2012 Actual	AY 2013 Goal	AY 2013 Actual	AY 2014 Goal	AY 2014 Actual
Summer (cont.)												
Retention Period 1 (cont.)												
	Hoonah	NO	40	40	0	0	40	40	0	0	0	0
	Juneau	NO	0	0	100	155	50	0	60	0	100	0
	Ketchikan	SI, SO	100	93	100	100	100	100	100	100	300	269
	Pelican	NO	60	50	100	93	60	60	60	0	60	40
	Petersburg	NI, SI	60	60	60	60	60	54	60	34	150	95
	Port Alexander	NI	50	50	100	50	50	40	50	50	100	40
	Sitka	NO	300	300	1,000	1,000	300	300	300	300	300	450
	Yakutat	NO	30	30	150	149	30	30	30	30	50	47
			800	783	2,010	1,991	850	784	820	734	1,370	1,251
Retention Period 2												
	Craig	SO	60	60	300	299	60	60	0	0	250	150
	Elfin Cove	NO	0	0	0	0	0	0	0	0	60	0
	Hoonah	NO, NI	40	40	0	0	40	40	0	0	0	0
	Juneau	NO	0	0	50	30	50	50	0	0	100	0
	Ketchikan	SI	50	50	50	50	50	50	0	0	150	172
	Pelican	NO	60	10	75	75	60	60	0	0	120	60
	Petersburg	NI, SI	60	49	60	50	60	60	0	0	150	100
	Port Alexander	NI	50	50	50	50	50	50	0	0	100	100
	Sitka	NO	300	300	600	300	300	300	0	0	300	510
	Yakutat	NO	30	10	50	50	30	30	0	0	50	5
			650	569	1,235	904	700	700	0	0	1,280	1,097
	Total		3,700	3,334	6,195	5,035	3,800	3,574	3,570	3,117	5,500	4,915

[a] Quadrant names are abbreviated as follows: Northern Outside (NO), Northern Inside (NI), Southern Outside (SO), and Southern Inside (SI).

Note: No second retention period occurred in 2013.

Table 3.–Samples collected by quadrant for each seasonal troll fishery, 2010–2014.

Year	Fishery	Quadrant				Total
		NO	SO	NI	SI	
2010	Early Winter	208	20	48	34	310
	Late Winter	410	12	38	70	530
	Spring	552	0	104	486	1,142
	Summer 1	420	210	100	53	783
	Summer 2	355	60	94	60	569
2011	Early Winter	340	20	42	43	445
	Late Winter	315	4	17	73	409
	Spring	691	0	111	484	1,286
	Summer 1	1,397	434	100	60	1,991
	Summer 2	455	299	100	50	904
2012	Early Winter	393	8	30	50	481
	Late Winter	401	0	23	86	510
	Spring	462	0	182	455	1,099
	Summer 1	430	210	84	60	784
	Summer 2	475	60	105	60	700
2013	Early Winter	254	20	33	58	365
	Late Winter	403	16	20	86	525
	Spring	919	0	134	440	1,493
	Summer 1	390	210	83	51	734
	Summer 2	0	0	0	0	0
2014	Early Winter	431	12	44	52	539
	Late Winter	374	16	28	78	496
	Spring	819	97	105	511	1,532
	Summer 1	597	440	85	129	1,251
	Summer 2	575	230	200	92	1,097

Table 4.–Selection criteria used to generate the Commercial Harvest Expansion Report on the ADF&G Mark, Tag, and Age Lab website.

Criteria	Values
Years	2010, 2011, 2012, 2013, 2014
Species	410
Gear Class Codes	5
Harvest Codes	11, 13
Time Code	P
Time Value Range	1, 54
Area Code	Q- Quadrants
Districts	ALL
Quadrants	NE, NW, SE, SW (correspond to NI, NO, SI, and SO, respectively)
Stat Area Values	ALL

Source: https://mtalab.adfg.alaska.gov/CWT/reports/default.aspx

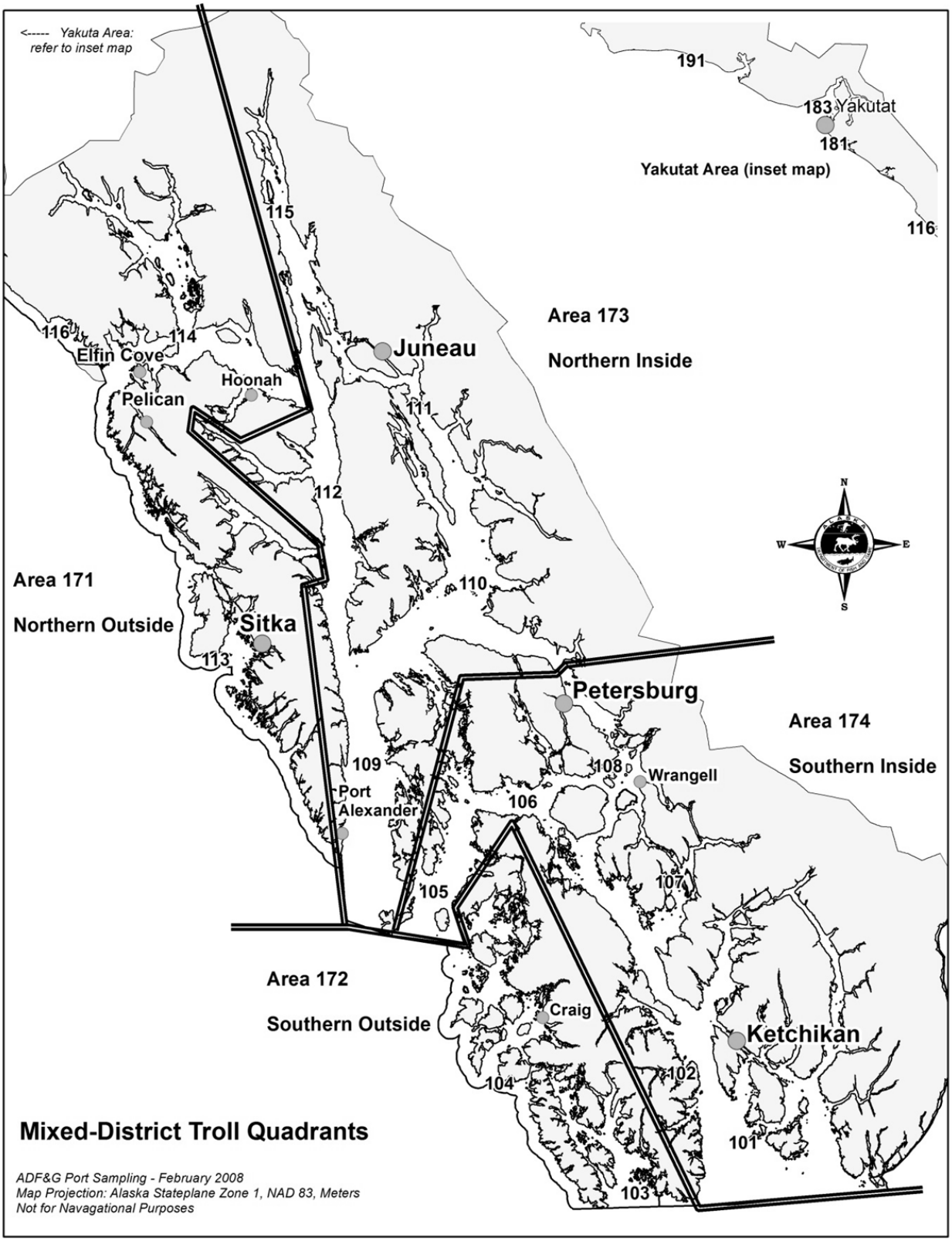

Figure 1.–Location of Southeast Alaska troll fishing quadrants and ports.

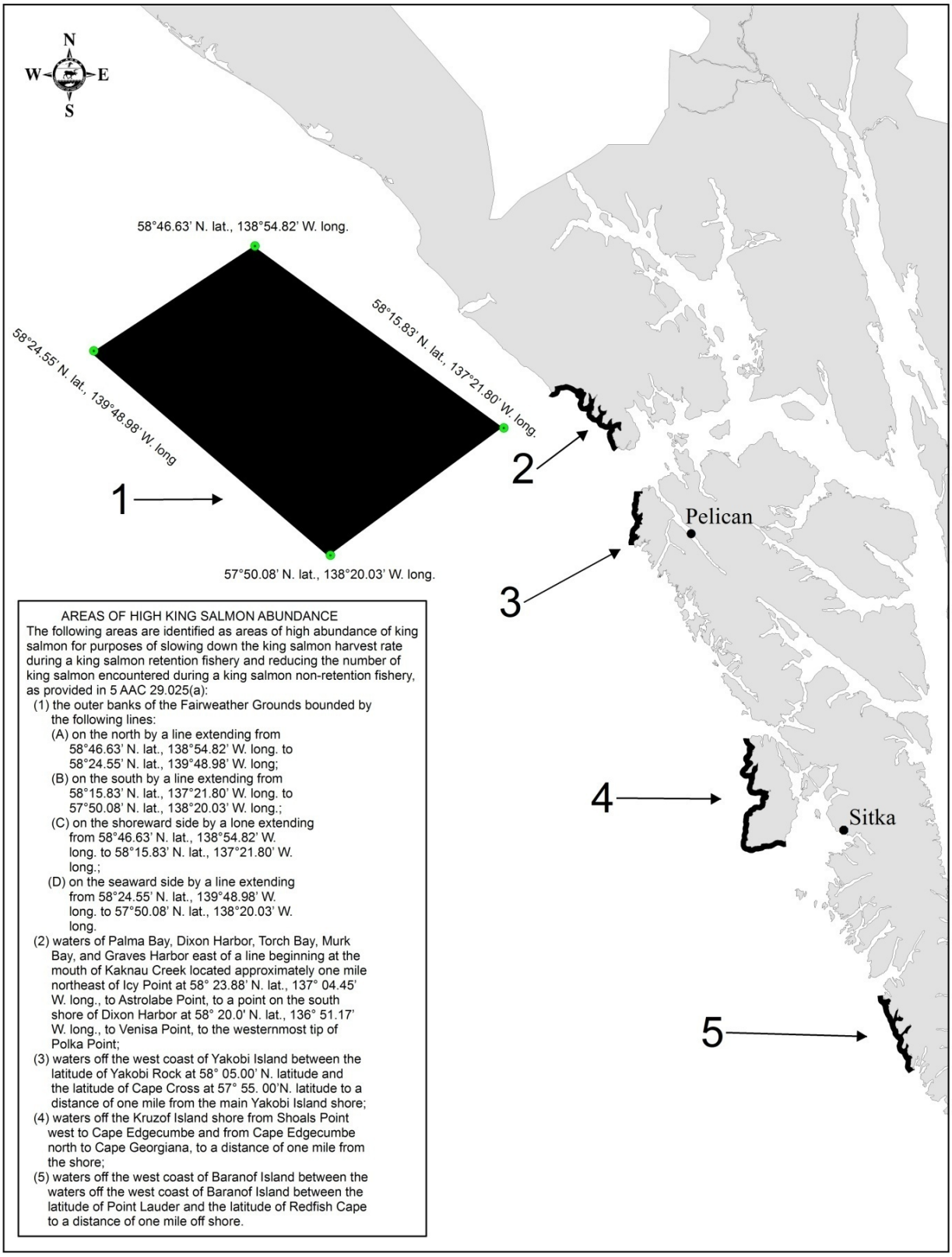

Figure 2.–Southeast Alaska areas of high Chinook salmon abundance closed to trolling for all species following the initial Chinook salmon opening in the summer troll season.

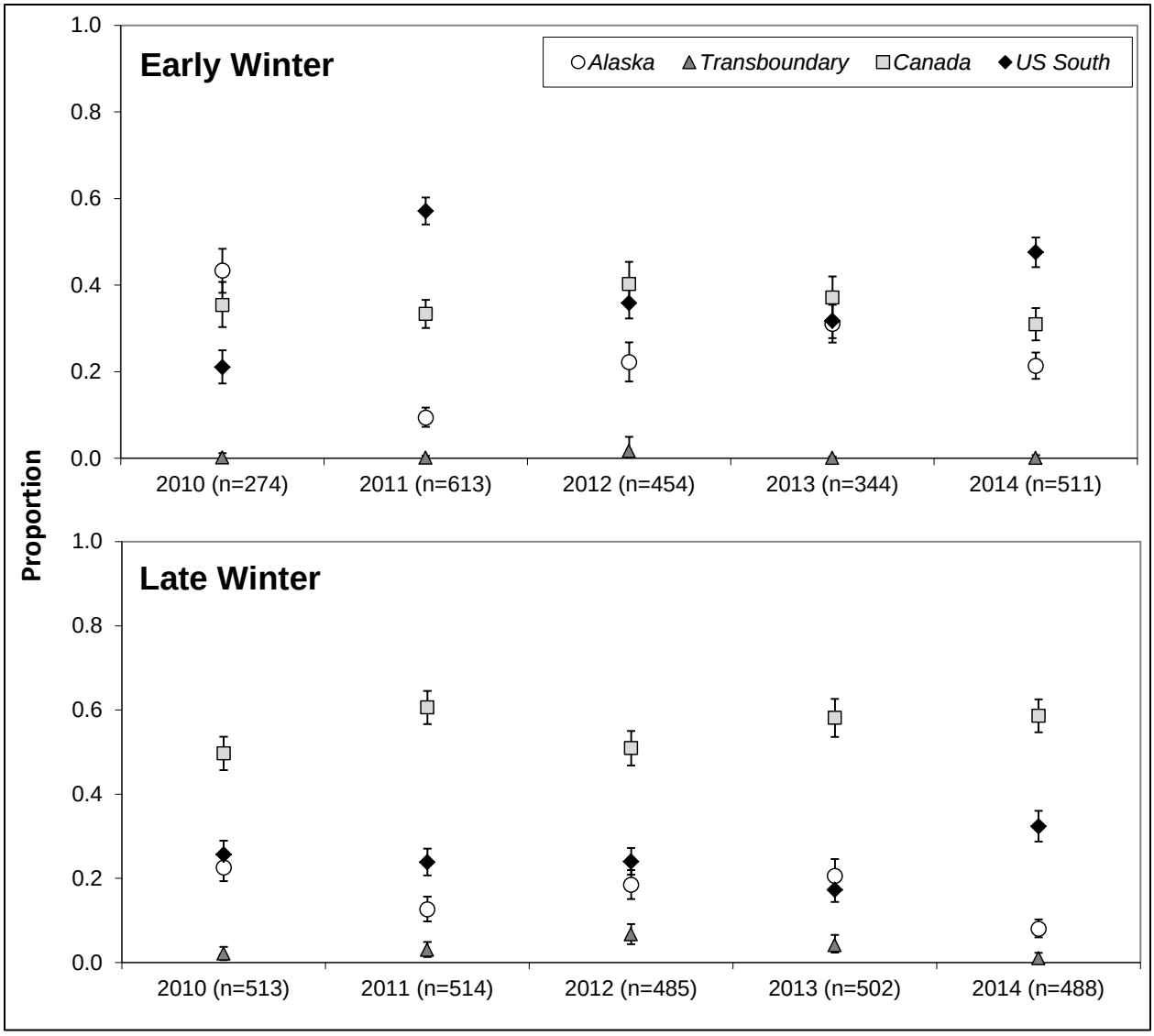

Figure 3.–Estimated contributions and 90% credibility intervals of 4 broad-scale reporting groups of Chinook salmon to the early and late winter troll fishery harvests in SEAK, AY 2010–2014.

Note: Reporting groups are described in Table 1.

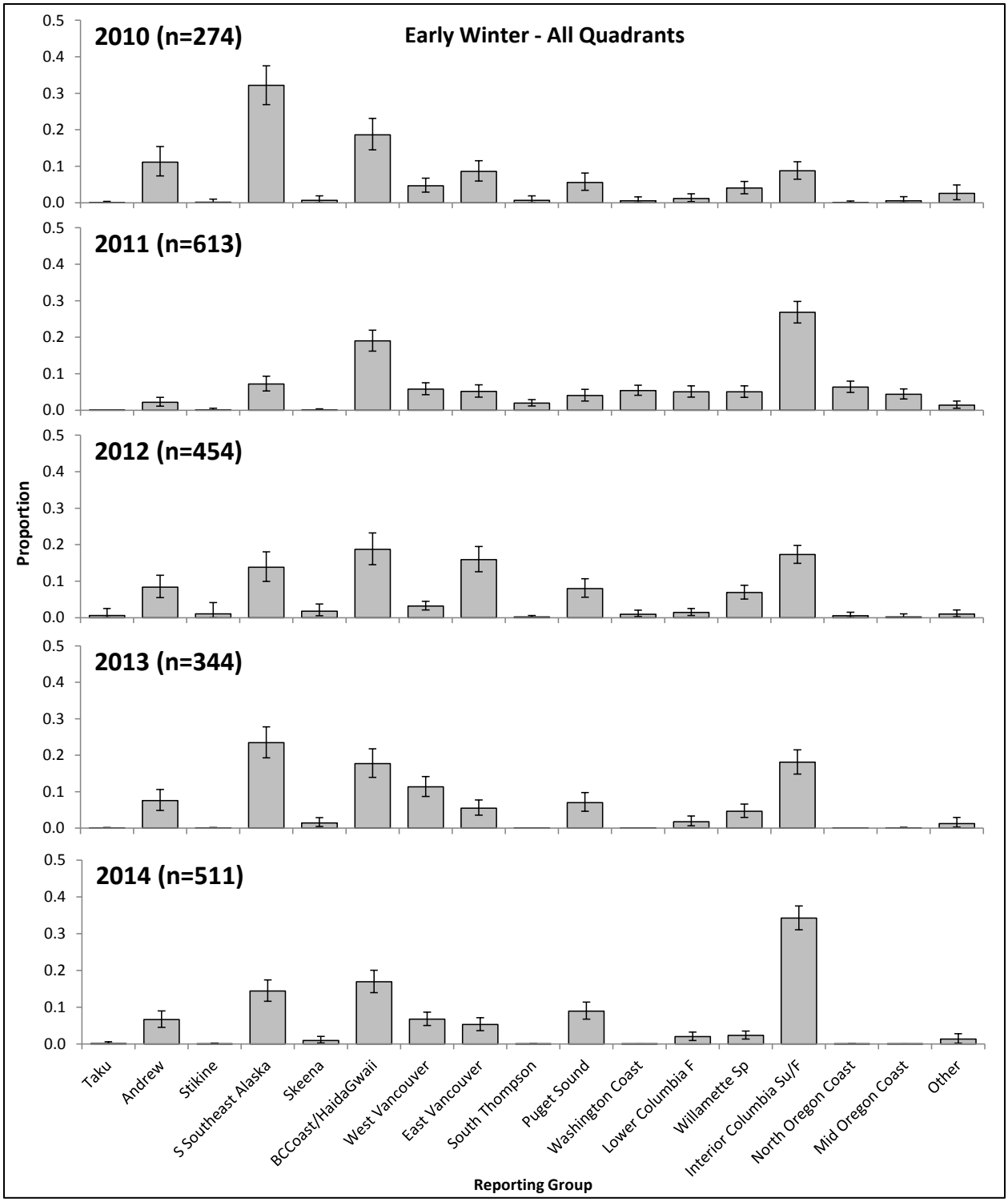

Figure 4.–Estimated contributions and 90% credibility intervals of 17 medium-scale reporting groups of Chinook salmon to the regionwide early winter troll fishery harvest in SEAK, AY 2010–2014.

Note: Reporting groups are described in Table 1.

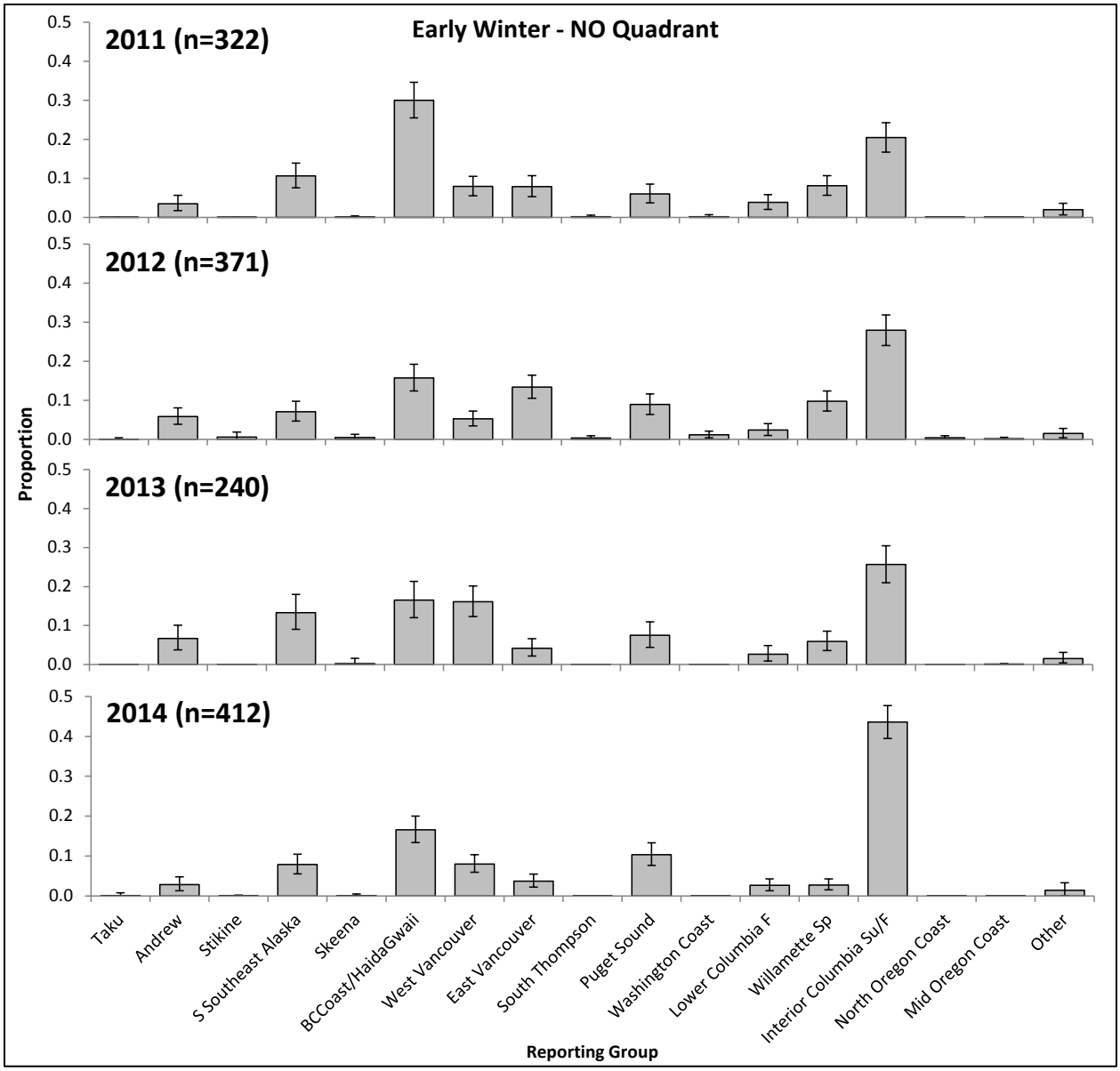

Figure 5.–Estimated contributions and 90% credibility intervals of 17 medium-scale reporting groups of Chinook salmon to the early winter troll fishery harvest in the Northern Outside quadrant in SEAK, AY 2011–2014.

Note: Insufficient sample sizes were available to generate medium-scale reporting group estimates for AY 2010.
Note: Reporting groups are described in Table 1.

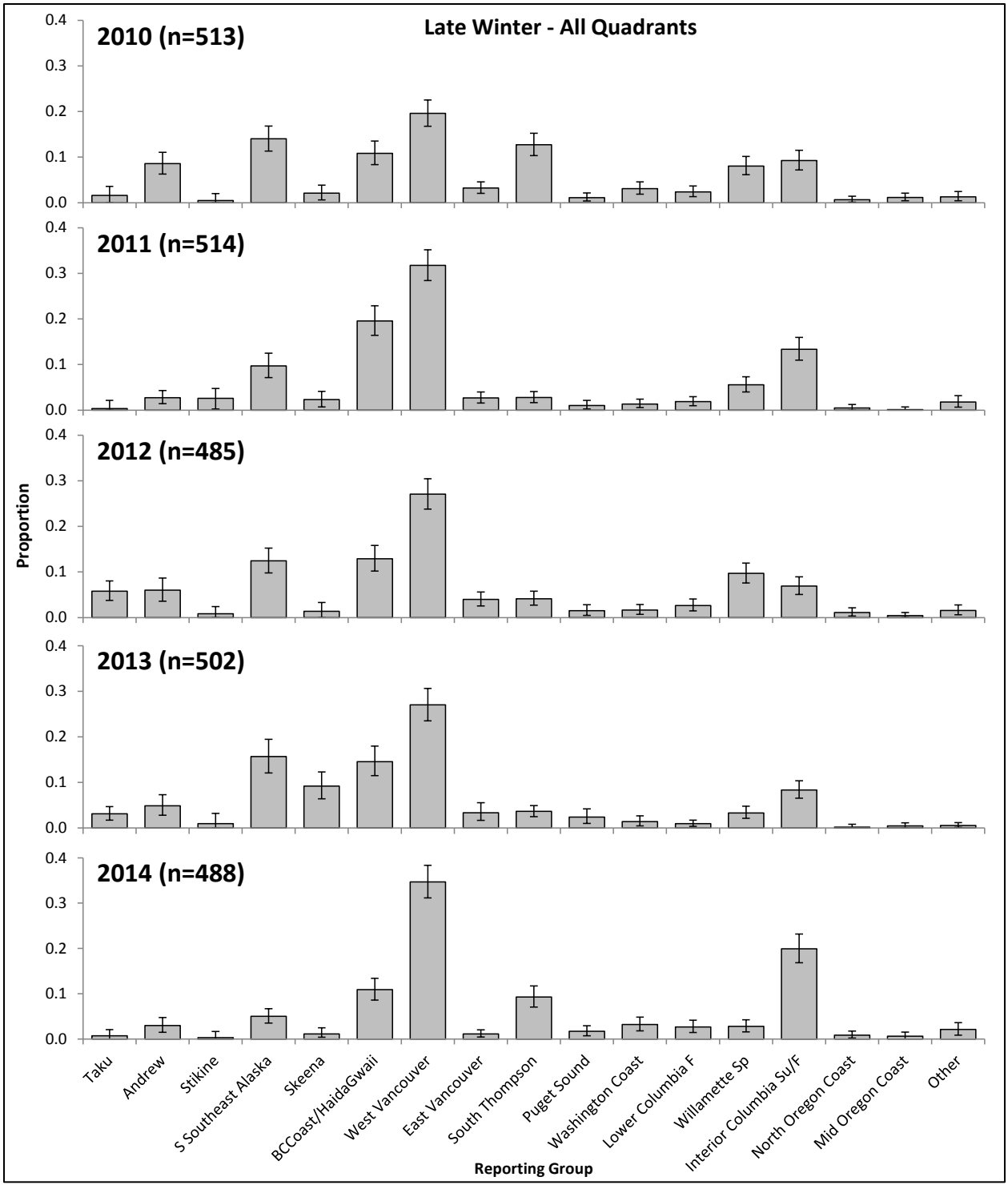

Figure 6.–Estimated contributions and 90% credibility intervals of 17 medium-scale reporting groups of Chinook salmon to the regionwide late winter troll fishery harvest in SEAK, AY 2010–2014.

Note: Reporting groups are described in Table 1.
Note: AY 2011 results did not converge at 80,000 iterations and are an average of 5 chains in BAYES.

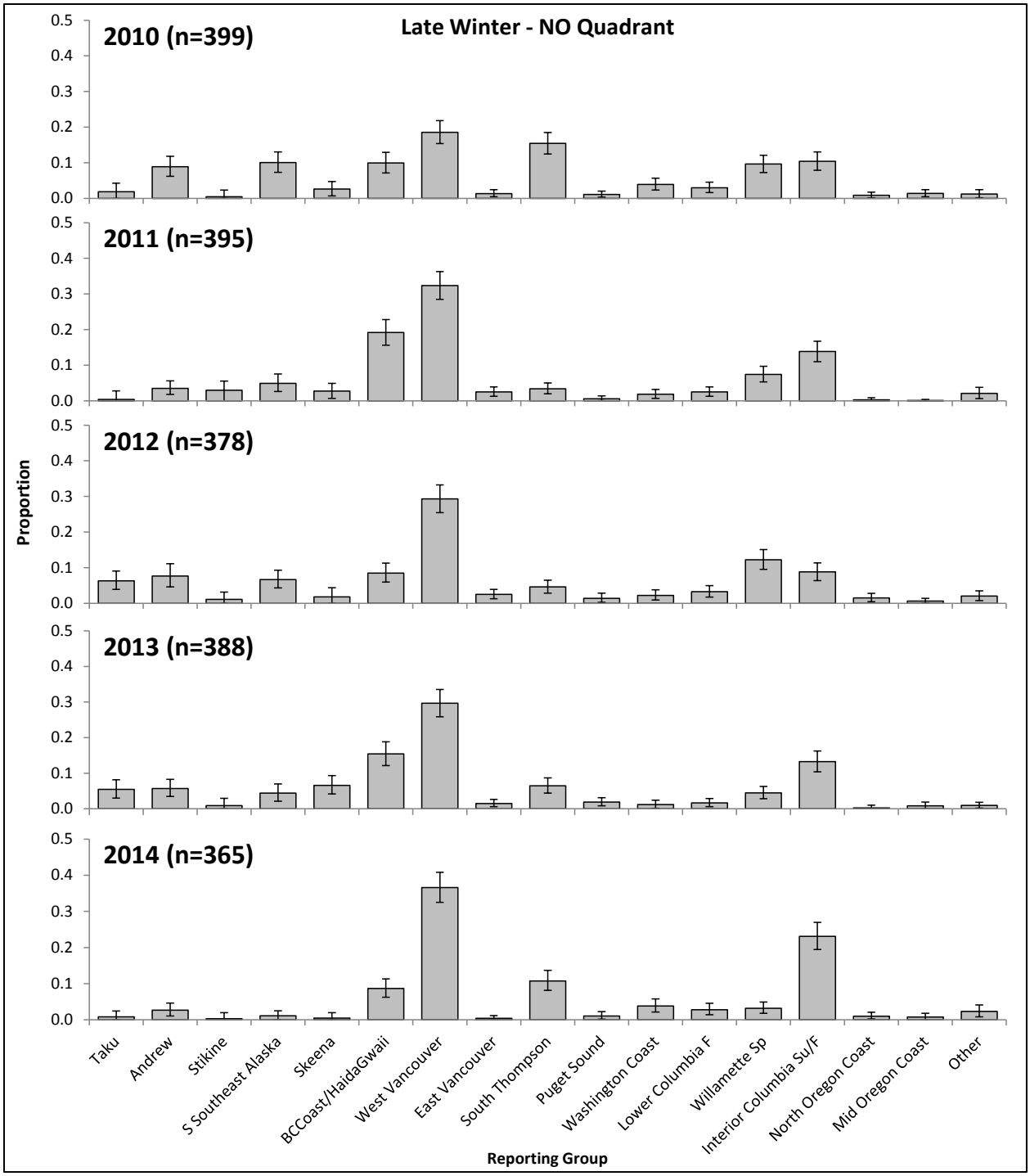

Figure 7.–Estimated contributions and 90% credibility intervals of 17 medium-scale reporting groups of Chinook salmon to the late winter troll fishery harvest in the Northern Outside quadrant in SEAK, AY 2010–2014.

Note: Reporting groups are described in Table 1.

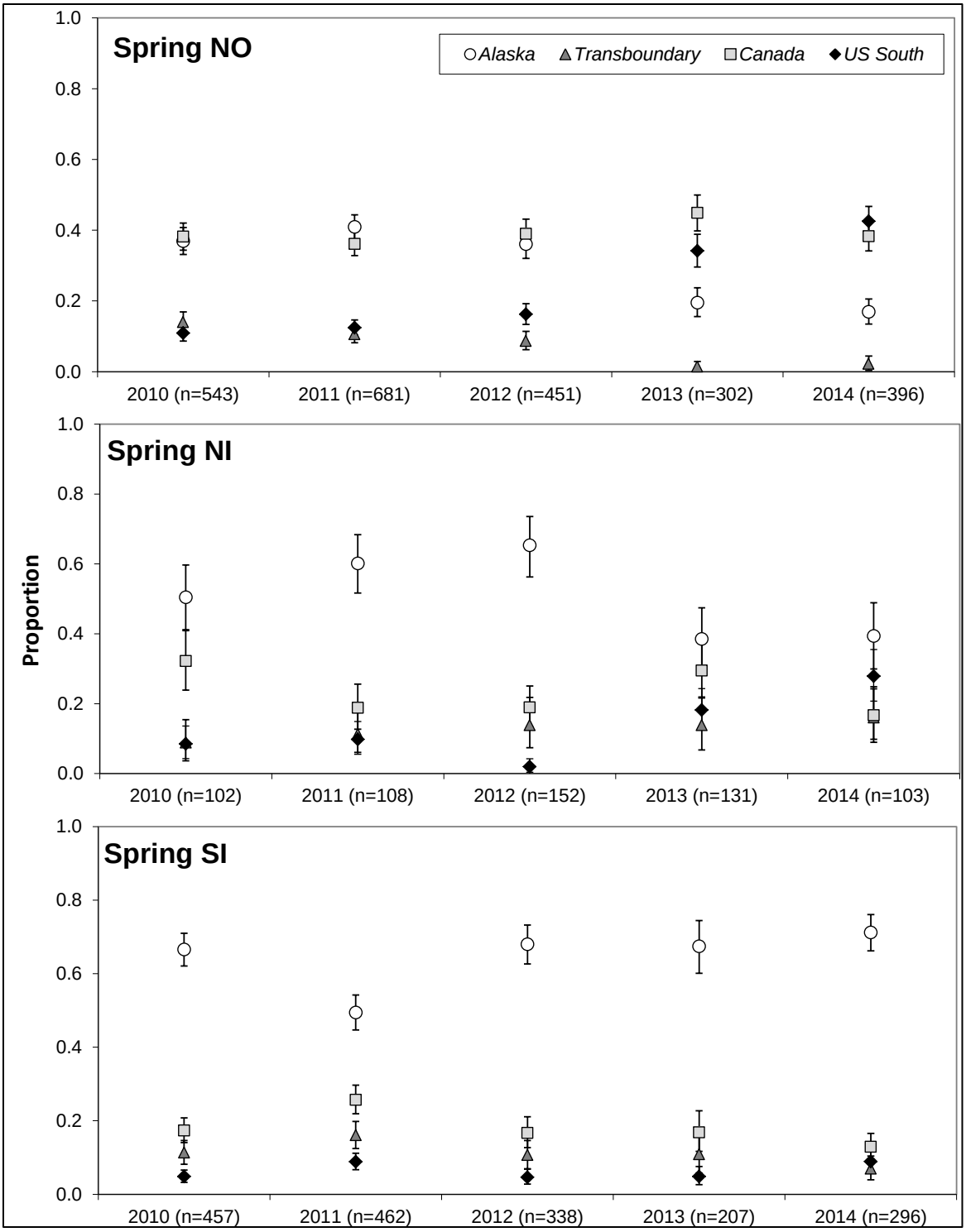

Figure 8.–Estimated contributions and 90% credibility intervals of 4 broad-scale reporting groups of Chinook salmon to the spring troll fishery harvest in the Northern Outside (NO), Northern Inside (NI), and Southern Inside (SI) quadrants in SEAK, AY 2010–2014.

Note: Reporting groups are described in Table 1.
Note: Inadequate sample sizes precluded estimating stock compositions for Spring NI for medium- and fine-scale reporting groups.

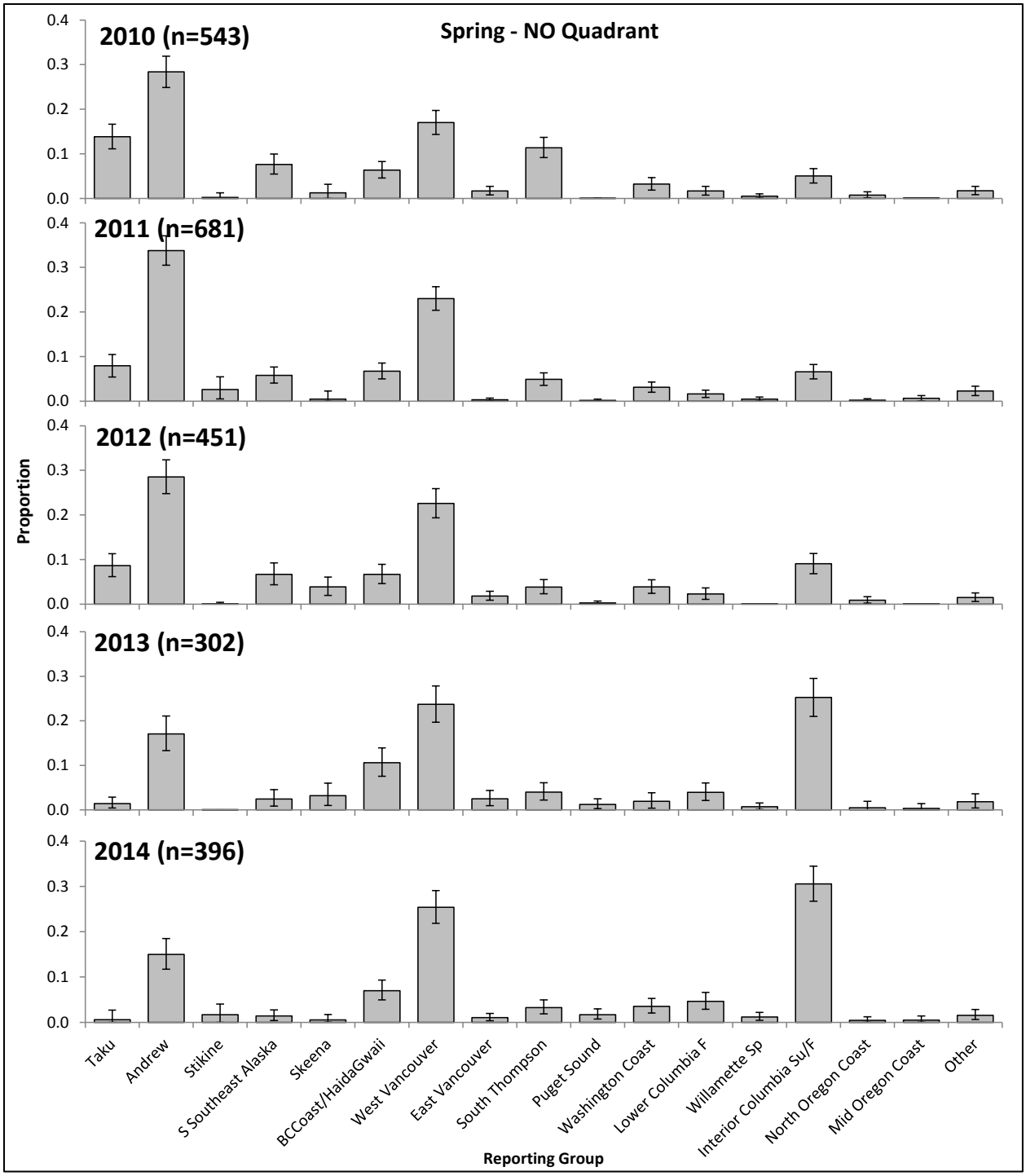

Figure 9.–Estimated contributions and 90% credibility intervals of 17 medium-scale reporting groups of Chinook salmon to the spring troll fishery harvest in the Northern Outside quadrant of SEAK, AY 2010–2014.

Note: Reporting groups are described in Table 1.

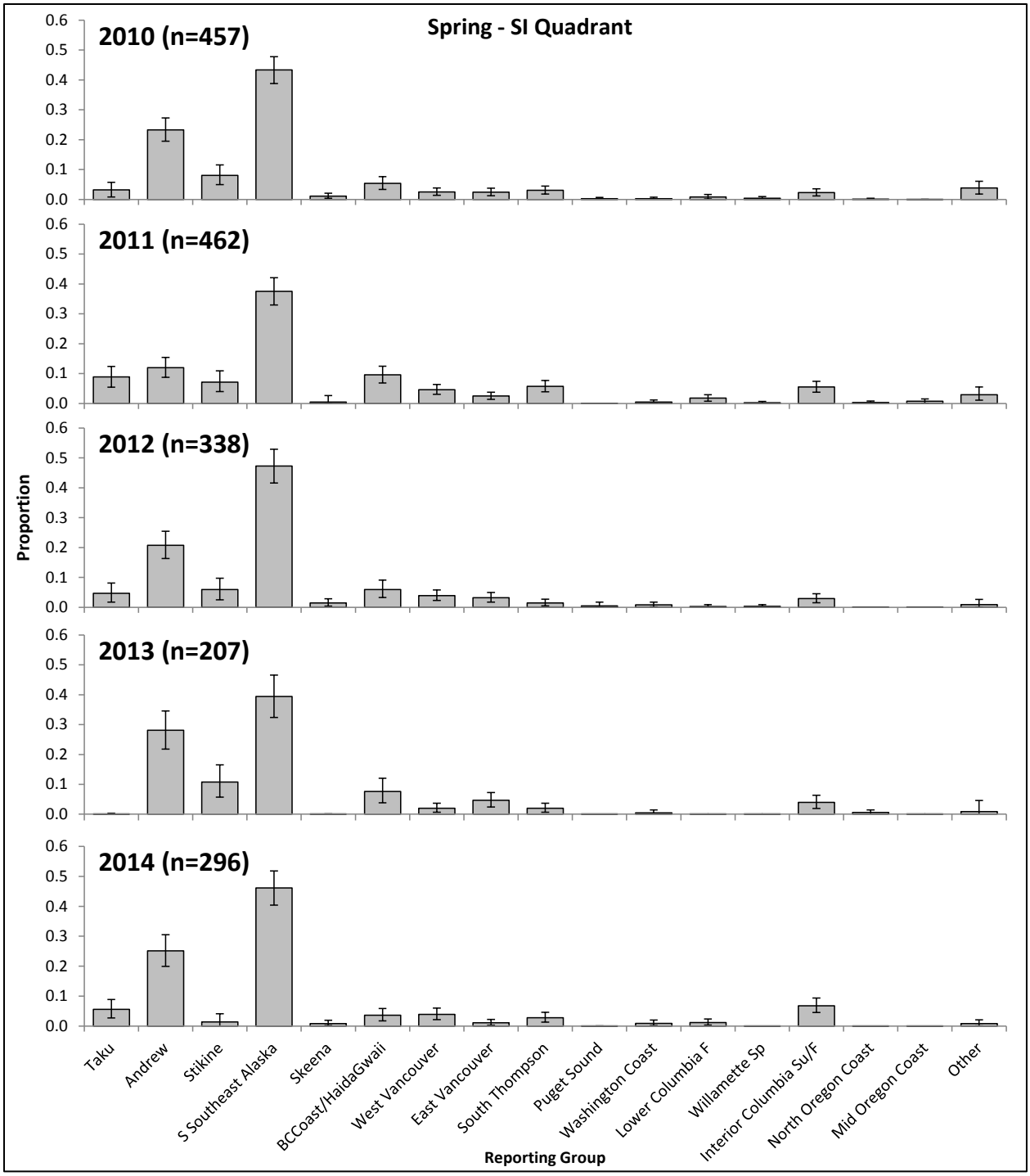

Figure 10.–Estimated contributions and 90% confidence intervals of 17 medium-scale reporting groups of Chinook salmon to the spring troll fishery harvest in the Southern Inside quadrant of SEAK, AY 2010–2014.

Note: Reporting groups are described in Table 1.

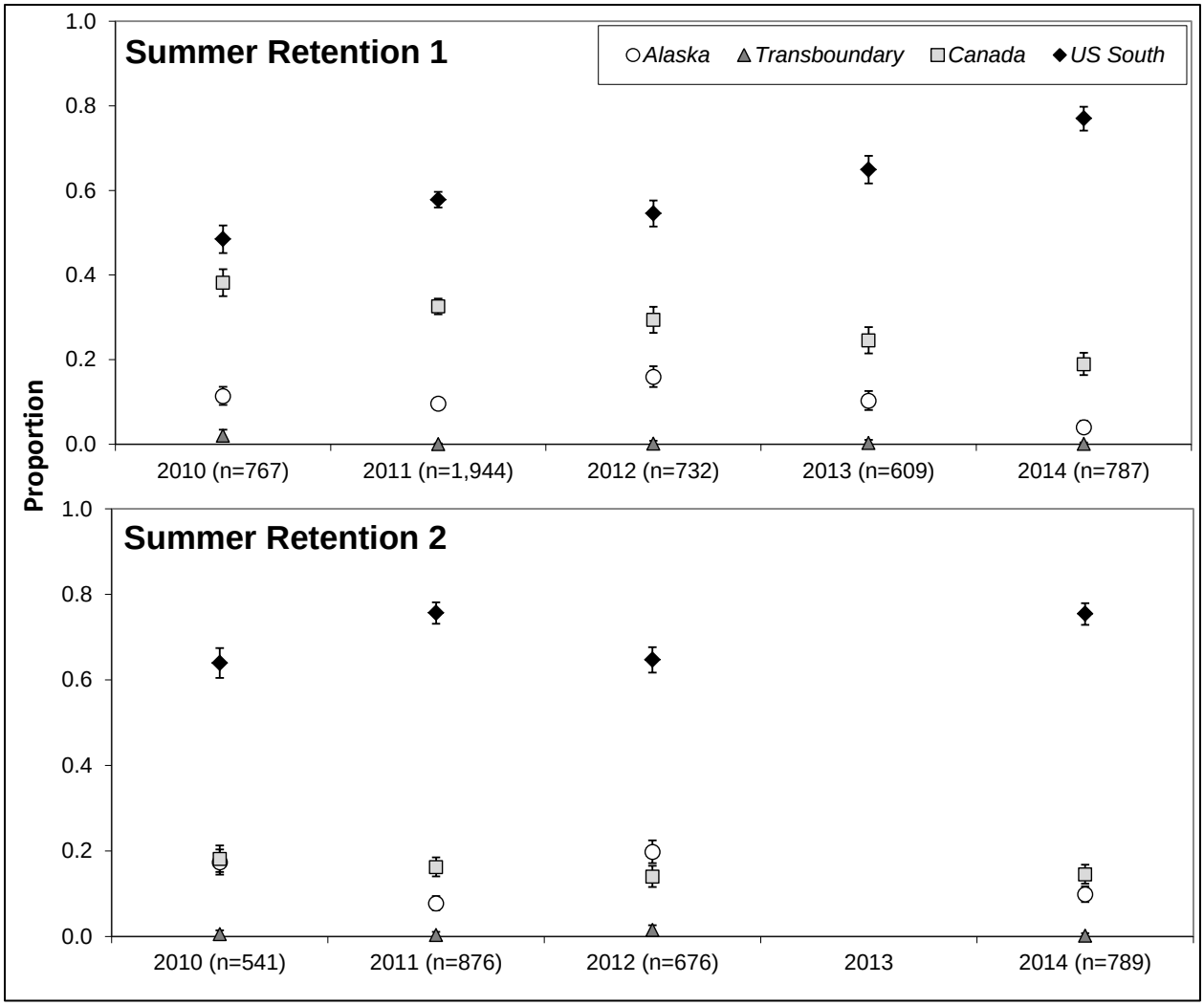

Figure 11.–Estimated contributions and 90% credibility intervals of 4 broad-scale reporting groups of Chinook salmon to the first and following retention periods of the summer troll fishery harvest in SEAK, AY 2010–2014. No second retention period occurred in AY 2013.

Note: Reporting groups are described in Table 1.

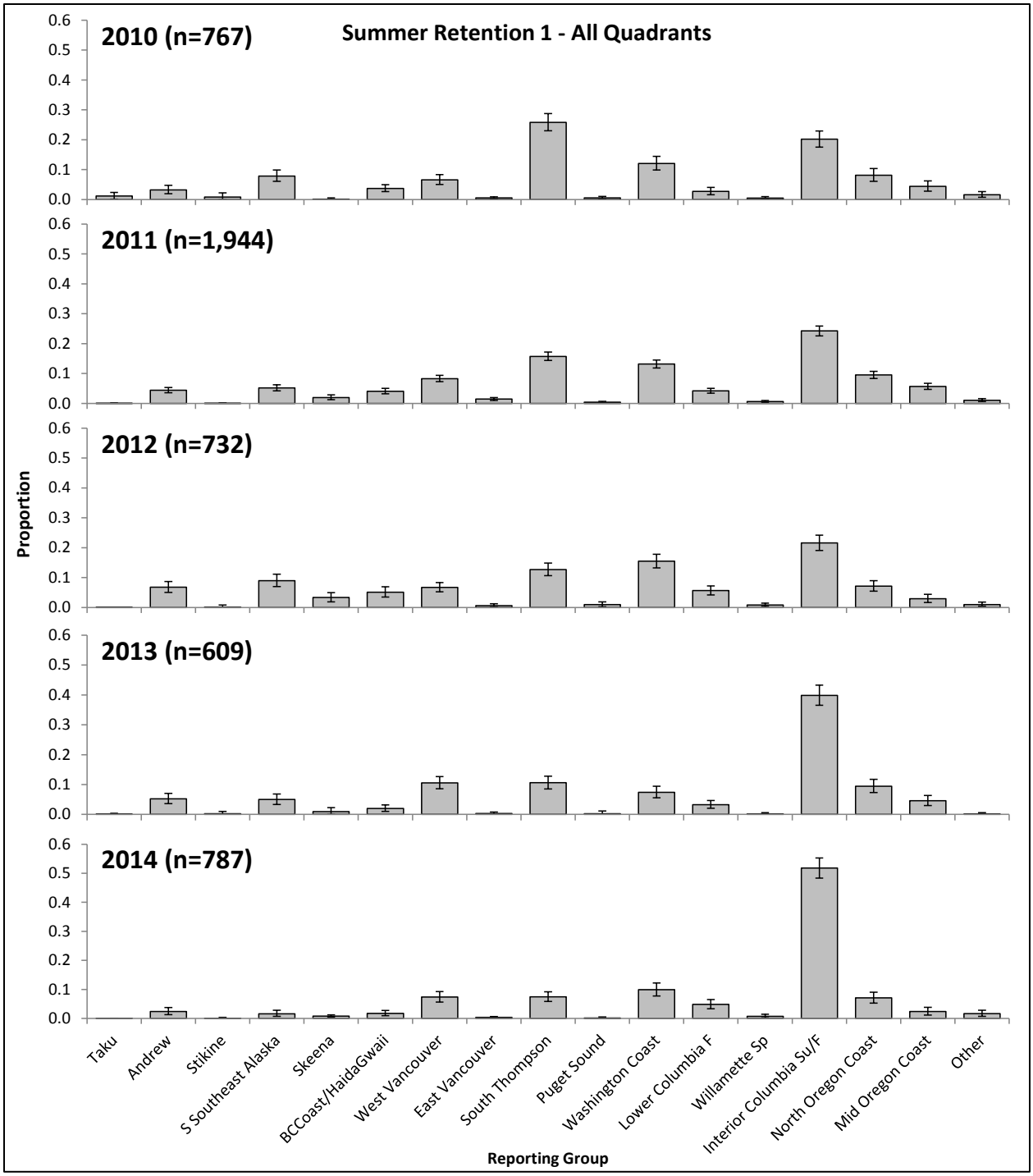

Figure 12.–Estimated contributions and 90% credibility intervals of 17 medium-scale reporting groups of Chinook salmon to the first retention period of the regionwide summer troll fishery harvest in SEAK, AY 2010–2014.

Note: Reporting groups are described in Table 1.

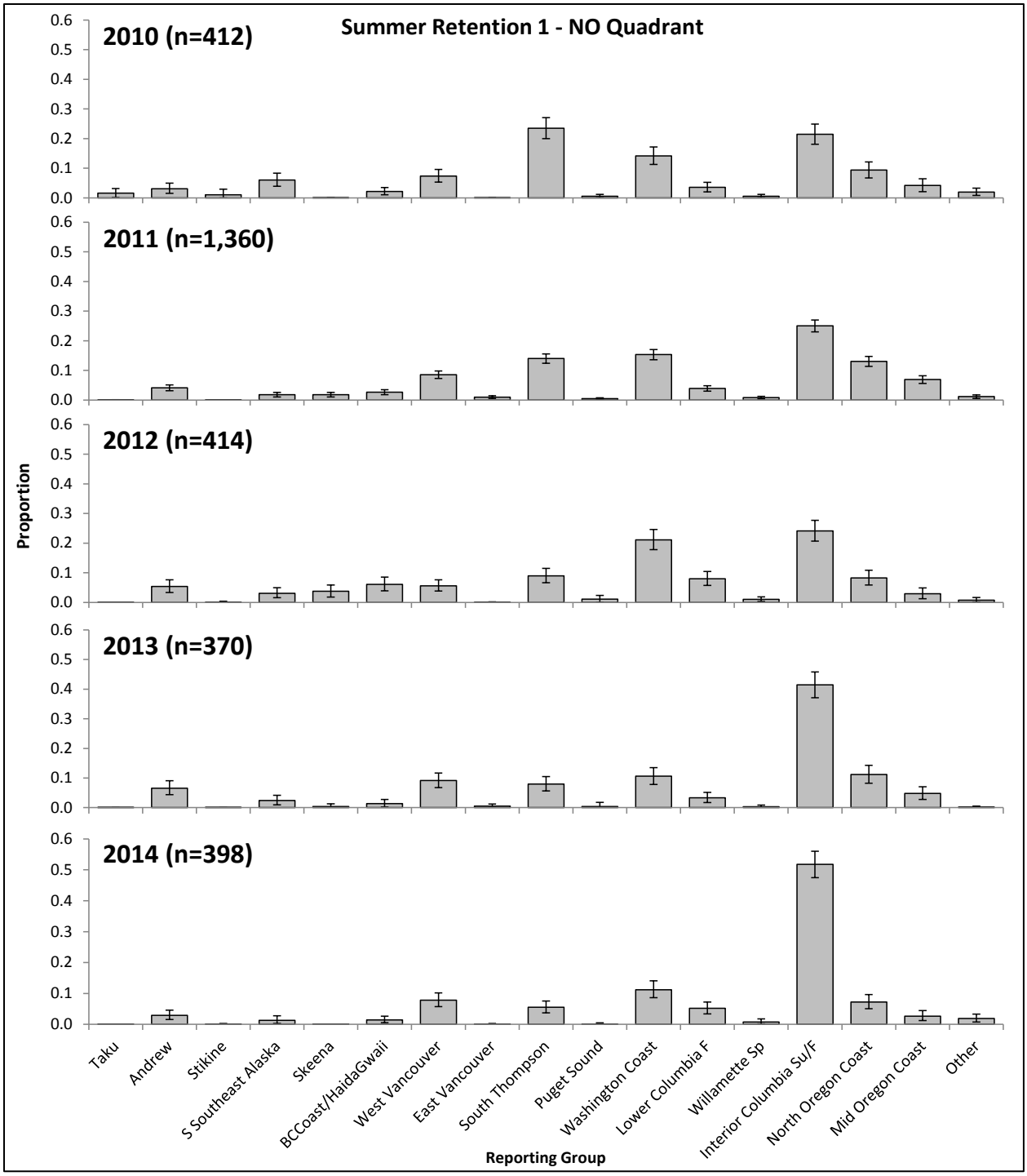

Figure 13.–Estimated contributions and 90% credibility intervals of 17 medium-scale reporting groups of Chinook salmon to the first retention period of the summer troll fishery harvest in the Northern Outside quadrant of SEAK, AY 2010–2014.

Note: Reporting groups are described in Table 1.
Note: AY 2012 results did not converge at 80,000 iterations and are an average of 5 chains in BAYES.

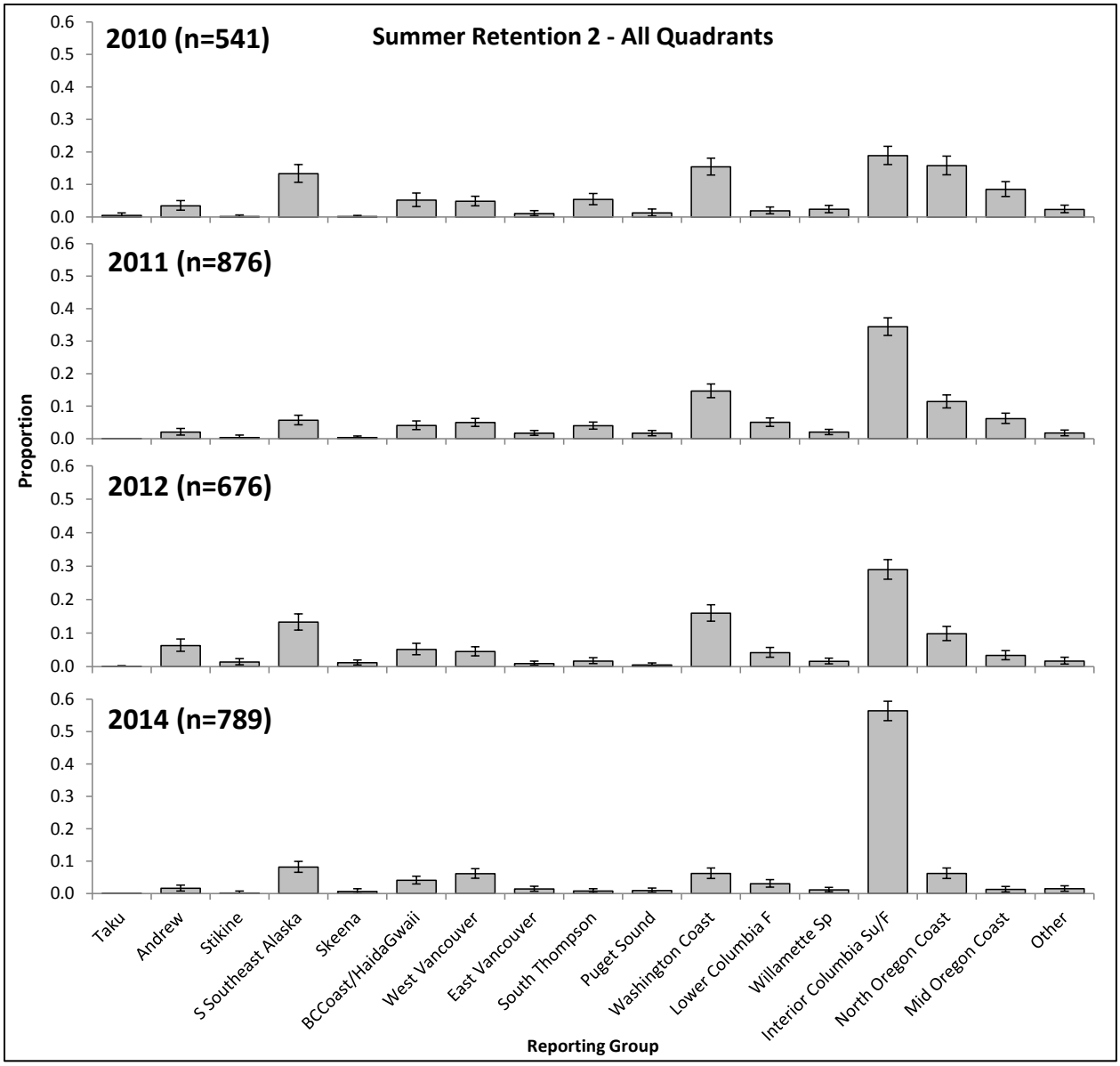

Figure 14.–Estimated contributions and 90% credibility intervals of 17 medium-scale reporting groups of Chinook salmon to the second retention period of the regionwide summer troll fishery harvest in SEAK, AY 2010–2012 and 2014. No second retention period occurred in AY 2013.

Note: Reporting groups are described in Table 1.

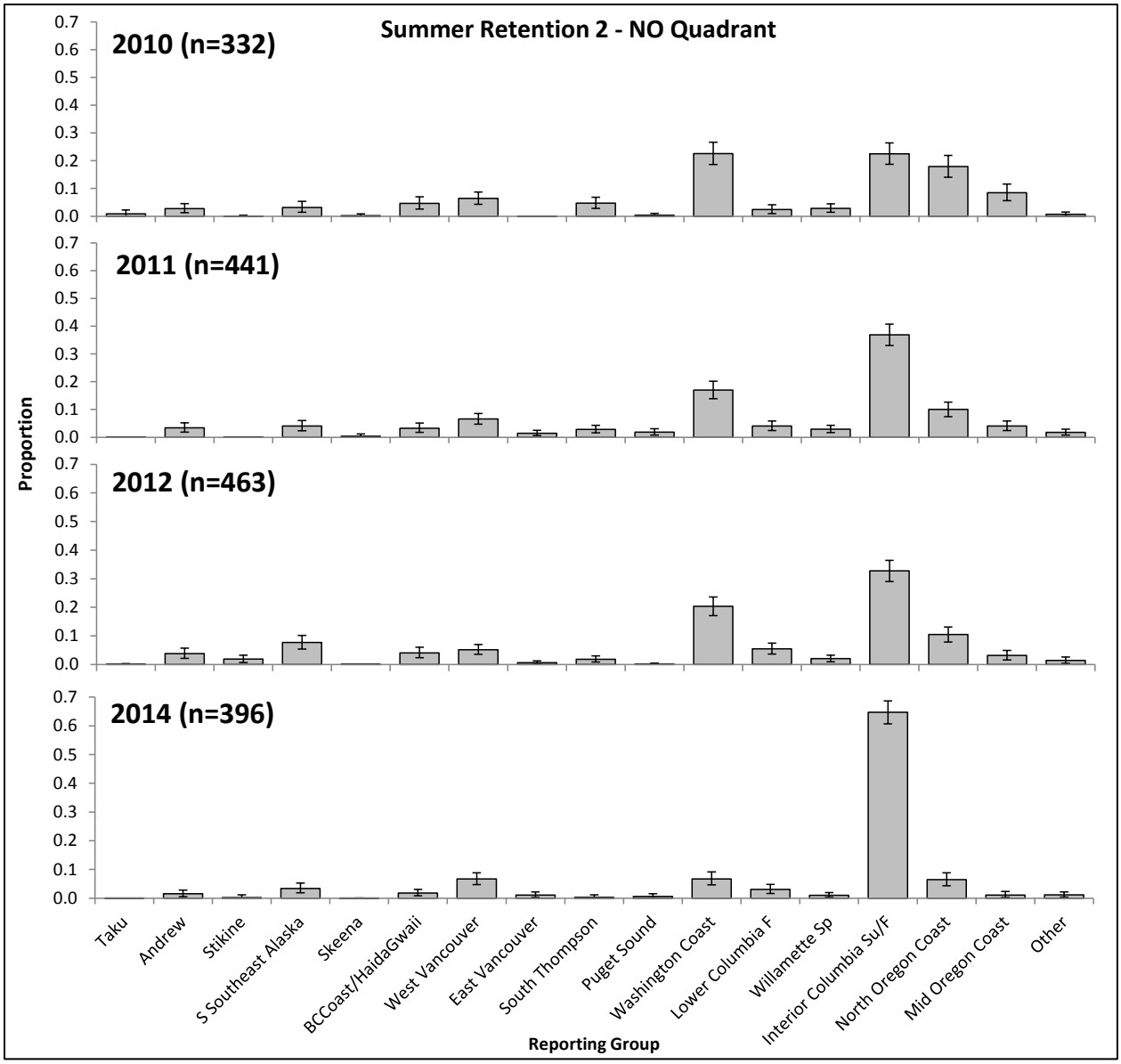

Figure 15.–Estimated contributions and 90% credibility intervals of 17 medium-scale reporting groups of Chinook salmon to the second period of the summer troll fishery harvest in the Northern Outside quadrant of SEAK, AY 2010–2012 and 2014. No second retention period occurred in AY 2013.

Note: Reporting groups are described in Table 1.

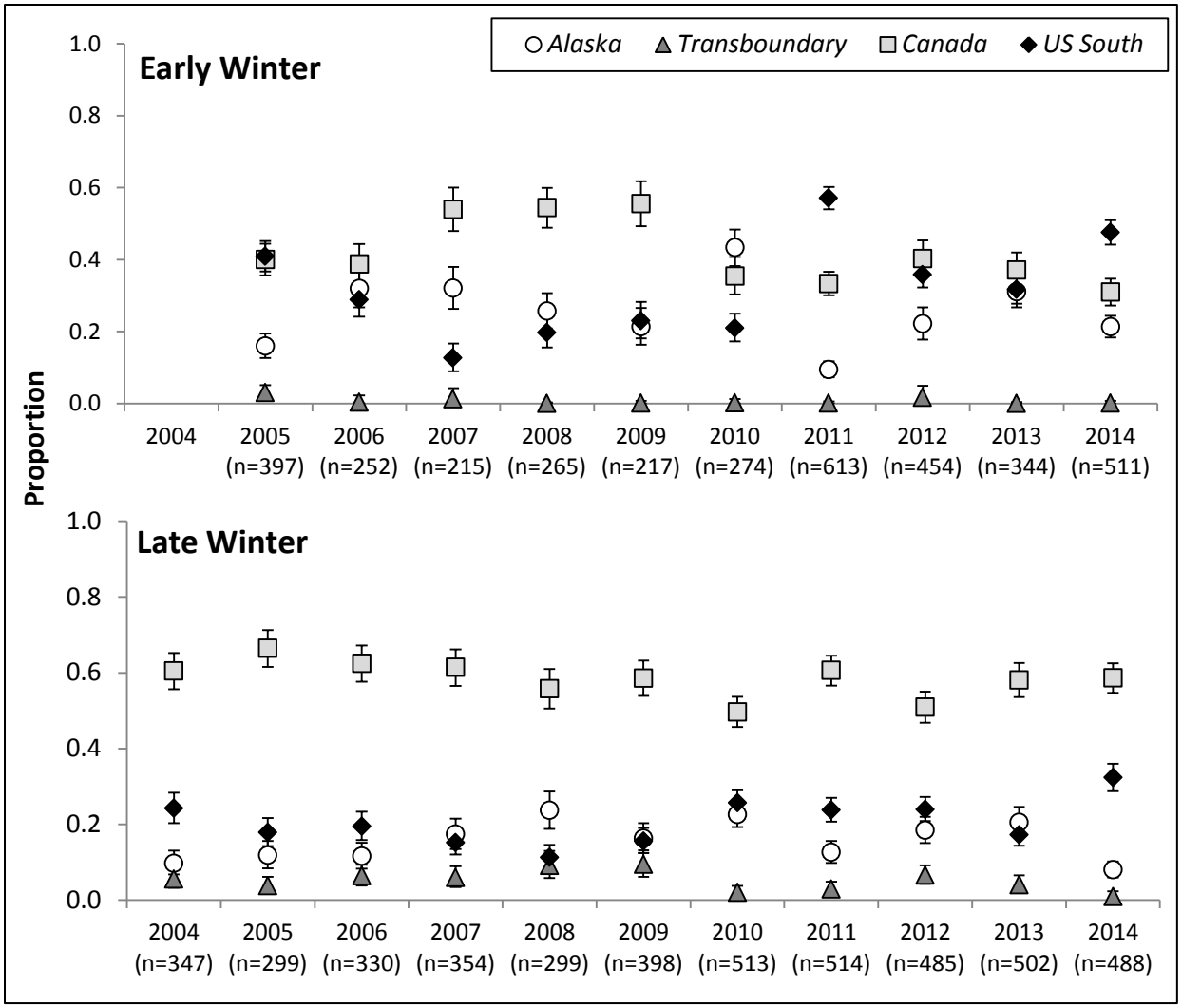

Figure 16.–Estimated contributions and 90% credibility intervals of 4 broad-scale reporting groups of Chinook salmon to the regionwide winter troll fishery harvests in SEAK, AY 2004–2014.

Note: Estimates prior to 2010 were generated using CTC version 2.1 of the baseline (Gilk-Baumer et al. 2013). Early winter troll samples were taken from Sitka only in 2004; thus regionwide estimates are not available for that year.

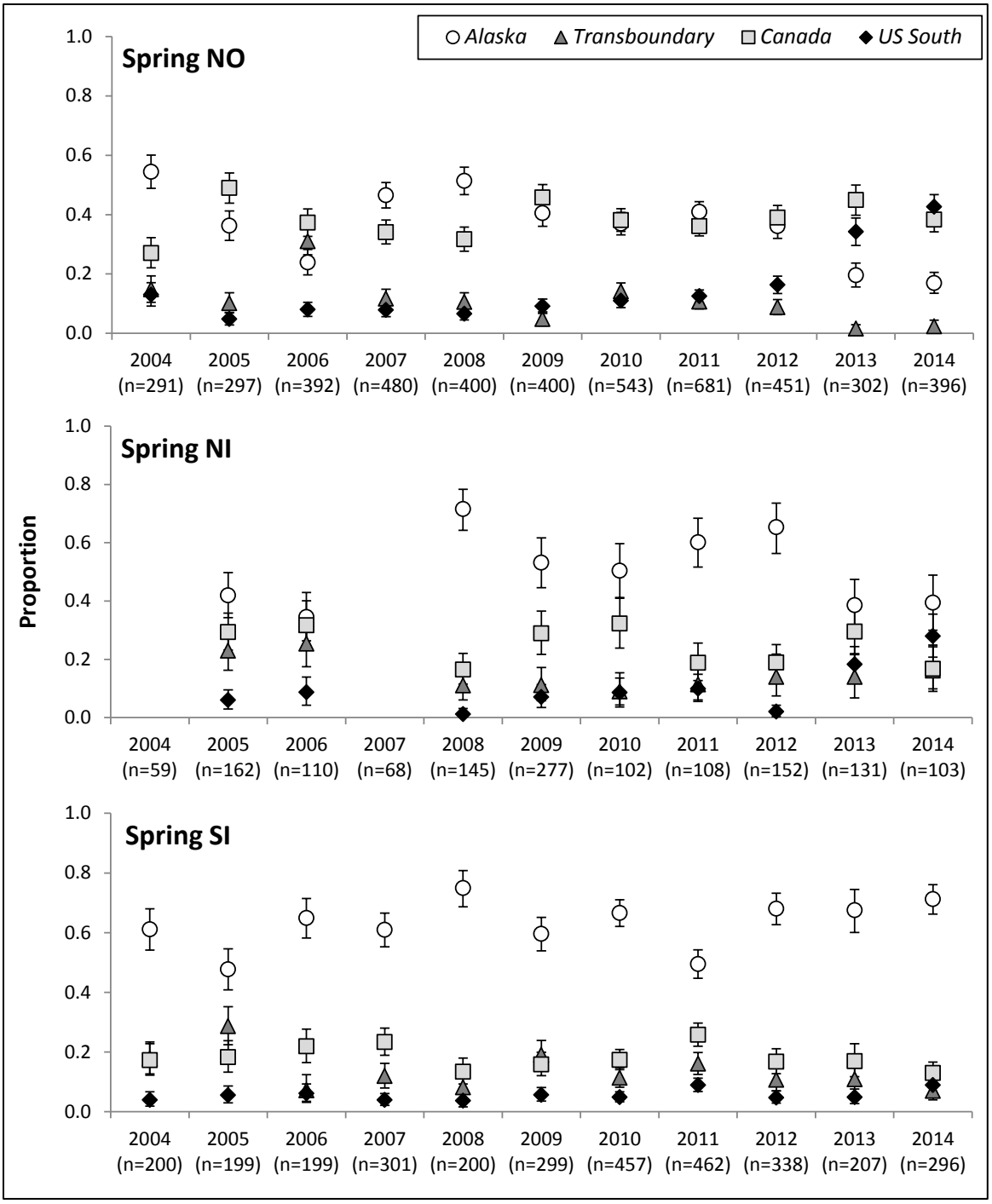

Figure 17.–Estimated contributions and 90% credibility intervals of 4 broad-scale reporting groups of Chinook salmon to the spring troll fishery harvests in the Northern Outside (NO), Northern Inside (NI), and Southern Inside (SI) quadrants of SEAK, AY 2004–2014.

Note: Estimates prior to 2010 were generated using CTC version 2.1 of the baseline (Gilk-Baumer et al. 2013). Insufficient sample sizes were available to generate estimates for the AY 2004 and 2007 spring troll in the NI quadrant.

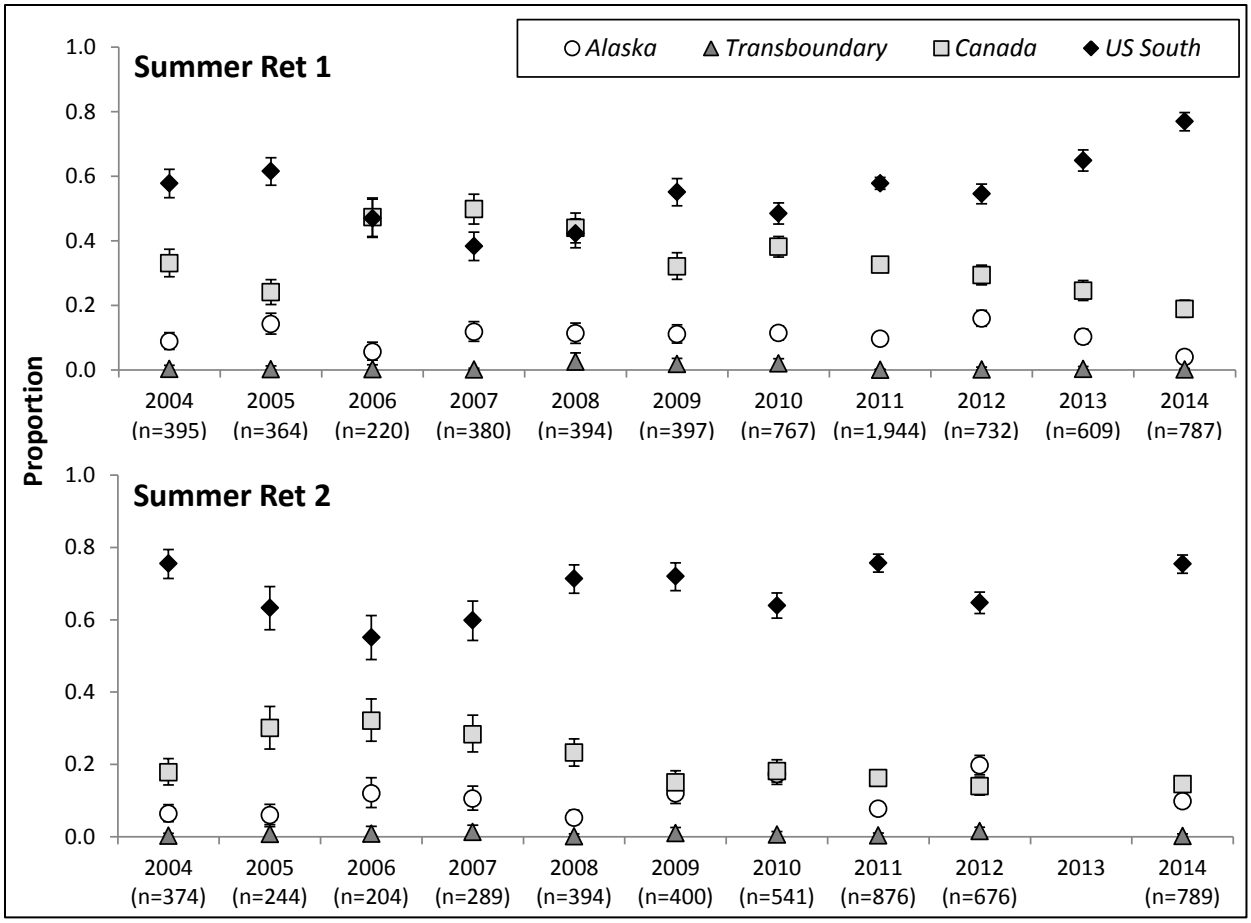

Figure 18.–Estimated contributions and 90% credibility intervals of 4 broad-scale reporting groups of Chinook salmon to the regionwide summer troll fishery harvests in SEAK, AY 2004–2014.

Note: Estimates prior to 2010 were generated using CTC version 2.1 of the baseline (Gilk-Baumer et al. 2013). No second retention period occurred in AY 2013.

APPENDIX A: BASELINE POPULATIONS

Appendix A1.–Location and collection details for each population of Chinook salmon included in the coastwide baseline of microsatellite data.

Fine-scale Reporting Group		Pop No.[a]	Population	N	Run Time[b]	Origin[c]	Life Stage	Collection Date
1	*Situk*	1	Situk River	127		W	Adult	1988, 1990, 1991, 1992
2	*Alsek*	2	Blanchard River	349		W	Adult	2000, 2001, 2002, 2003
		3	Goat Creek	62		W	Adult	2007, 2008
		4	Klukshu River	238		W	Adult	1987, 1989, 1990, 1991, 2000, 2001
		5	Takhanne River	196		W	Adult	2000, 2001, 2002, 2003, 2008
3	*N Southeast Alaska*	6	Big Boulder Creek	138		W	Adult	1992, 1995, 2004
		7	Tahini River--Macaulay Hatchery	77		H	Adult	2005
		8	Tahini River	119		W	Adult	1992, 2004
		9	Kelsall River	153		W	Adult	2004
		10	King Salmon River	143		W	Adult	1989, 1990, 1993
4	*Taku*	11	Dudidontu River	233		W	Adult	2002, 2004, 2005, 2006
		12	Kowatua Creek	288		W	Adult	1989, 1990, 2005
		13	Little Tatsamenie River	684		W	Adult	1999, 2005, 2006, 2007
		14	Little Trapper River	74		W	Adult	1999
		15	Upper Nahlin River	132		W	Adult	1989, 1990, 2004
		16	Nakina River	428		W	Adult	1989, 1990, 2004, 2005, 2006, 2007
		17	Tatsatua Creek	171		W	Adult	1989, 1990
5	*Andrew*	18	Andrew Creek	131		W	Adult	1989, 2004
		19	Andrew Creek–Crystal Hatchery	207		H	Adult	2005
		20	Andrew Creek–Macaulay Hatchery	135		H	Adult	2005
		21	Andrew Creek–Medvejie Hatchery	177		H	Adult	2005
6	*Stikine*	22	Christina River	164		W	Adult	2000, 2001, 2002
		23	Craig River	96		W	Adult	2001
		24	Johnny Tashoots Creek	62		W	Adult	2001, 2004, 2005, 2008
		25	Little Tahltan River	126		W	Adult	2001. 2004
		26	Shakes Creek	164		W	Adult	2000, 2001, 2002, 2007
		27	Tahltan River	80		W	Adult	2008
		28	Verrett River	482		W	Adult	2000, 2002, 2003, 2007
7	*S Southeast Alaska*	29	Chickamin River	126		W	Adult	1990, 2003
		30	King Creek	136		W	Adult	2003
		31	Butler Creek	190		W	Adult	2004
		32	Leduc Creek	43		W	Adult	2004
		33	Humpy Creek	124		W	Adult	2003
		34	Chickamin River–Little Port Walter H.	218		H	Adult	1993, 2005
		35	Chickamin River–Whitman Hatchery	193		H	Adult	2005
		36	Clear Creek	134		W	Adult	1989, 2003, 2004
		37	Cripple Creek	141		W	Adult	1988, 2003
		38	Gene's Lake	92		W	Adult	1989, 2003, 2004

-continued-

Fine-scale Reporting Group		Pop No.[a]	Population	N	Run Time[b]	Origin[c]	Life Stage	Collection Date
		39	Kerr Creek	151		W	Adult	2003, 2004
		40	Unuk River–Little Port Walter H.	149		H	Adult	2005
		41	Keta River	200		W	Adult	1989, 2003, 2004
		42	Blossom River	190		W	Adult	2004
8	*Nass*	43	Cranberry River	158		W	Adult	1996, 1997
		44	Damdochax River	63	Su	W	Adult	1996
		45	Ishkheenickh River	192			Adult	2004, 2006
		46	Kincolith River	220	Su	W	Adult	1996, 1999
		47	Kiteen River	54			Adult	2006
		48	Kwinageese River	67	Su	W	Adult	1996, 1997
		49	Meziadin River	45			Adult	1996
		50	Oweegie Creek	147	Su	W	Adult	1996, 1997, 2004
		51	Tseax River	198			Adult	1995, 1996, 2002, 2006, 2008
9	*Skeena*	52	Cedar River	112	Su	W	Adult	1996
		53	Ecstall River	149	Su	W	Adult	2000, 2001, 2002
		54	Exchamsiks River	106			Adult	1995, 2009
		55	Exstew River	140			Adult	2009
		56	Gitnadoix River	170			Adult	1995, 2009
		57	Kitsumkalum River (Lower)	449	Su	W	Adult	1996, 1998, 2001, 2009
		58	Kasiks River	60			Adult	2006
		59	Zymagotitz River	119			Adult	2006, 2009
		60	Zymoetz River (Upper)	54			Adult	1995, 2004, 2009
		61	Kispiox River	88			Adult	1995, 2004, 2006, 2008
		62	Kitseguecla River	258			Adult	2009
		63	Kitwanga River	169			Adult	1996, 2002, 2003
		64	Shegunia River	78			Adult	2009
		65	Sweetin River	60			Adult	2004, 2005, 2008
		66	Bear River	99			Adult	1991, 1995, 1996, 2005
		67	Kluakaz Creek	98			Adult	2007, 2008, 2009
		68	Kluayaz Creek	144			Adult	2007, 2008, 2009
		69	Kuldo Creek	170			Adult	2008, 2009
		70	Osti Creek	90			Adult	2009
		71	Sicintine River	105		W	Adult	2009
		72	Slamgeesh River	125			Adult	2004, 2005, 2006, 2007, 2008, 2009
		73	Squingala River	259			Adult	2008, 2009
		74	Sustut River	337	Su	W	Adult	1995, 1996, 2001, 2002, 2005, 2006
		75	Babine River	105	Su	H	Adult	1996
		76	Bulkley River (Upper)	206	Su	W	Adult	1991, 1998, 1999

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Appendix A1.–Page 3 of 10.

Fine-scale Reporting Group		Pop No.[a]	Population	N	Run Time[b]	Origin[c]	Life Stage	Collection Date
		77	Morice River	105			Adult	1991, 1995, 1996
		78	Suskwa River	85			Adult	2004, 2005, 2009
10	*BC Coast/Haida Gwaii*	79	Yakoun River	131			Adult	1989, 1996, 2001
		80	Atnarko Creek	142	Su	H	Adult	1996
		81	Chuckwalla River	46			Adult	1999, 2001, 2005
		82	Dean River	175			Adult	2002, 2003, 2004, 2006
		83	Dean River (Upper)	176			Adult	2001, 2002, 2003, 2004, 2006
		84	Docee River	42			Adult	1999, 2002, 2007
		85	Kateen River	128			Adult	2004, 2005
		86	Kilbella River	50			Adult	2001, 2005
		87	Kildala River	197			Adult	1999, 2000
		88	Kitimat River	135	Su	H	Adult	1997
		89	Kitlope River	181			Adult	2004, 2006
		90	Takia River	46			Adult	2002, 2003, 2006
		91	Wannock River	129	F	H	Adult	1996
		92	Capilano River	75			Adult	1999
		93	Cheakamus River	54	F		Adult	2006, 2007, 2008
		94	Devereux River	148	F	W	Adult	1997, 2000
		95	Klinaklini River	198	F	W	Adult	1997, 1998, 2002
		96	Phillips River	287			Adult	2000, 2004, 2006, 2007, 2008
		97	Squamish River	181	F	H	Adult	2003
11	*West Vancouver*	98	Burman River	218			Adult	1985, 1989, 1990, 1991, 1992, 2000, 2002, 2003
		99	Conuma River	140	F	H	Adult	1997
		100	Gold River	258			Adult	1983, 1985, 1986, 1987, 1992, 2002
		101	Kennedy River (Lower)	320			Adult	2005, 2007, 2008
		102	Marble River	136	F	H	Adult	1996, 1999, 2000
		103	Nahmint River	43			Adult	2002, 2003
		104	Nitinat River	125	F	H	Adult	1996
		105	Robertson Creek	124	F	H	Adult	1996, 2003
		106	San Juan River	175			Adult	2001, 2002
		107	Sarita River	137	F	H	Adult	1997, 2001
		108	Tahsis River	174	F	W	Adult	1996, 2002, 2003
		109	Thornton Creek	158			Adult	2001
		110	Tlupana River	58			Adult	2002, 2003
		111	Toquart River	68			Adult	1999, 2000
		112	Tranquil Creek	227	F	W	Adult	1996, 1999, 2004
		113	Zeballos River	148			Adult	2002, 2005, 2006, 2007, 2008
12	*East Vancouver*	114	Chemainus River	202			Adult	1996, 1999

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Appendix A1.–Page 4 of 10.

Fine-scale Reporting Group		Pop No.[a]	Population	N	Run Time[b]	Origin[c]	Life Stage	Collection Date
		115	Nanaimo River (Fall)	122	F	H	Adult	1996, 2002
		116	Nanaimo River (Summer)	166	Su	H	Adult	1996, 2002
		117	Nanaimo River (Spring)	94	Sp	W	Adult	1998
		118	Nanaimo River (Upper)	114			Adult	2003, 2004
		119	Nimpkish River	68			Adult	2004
		120	Puntledge River (Fall)	279	F	H	Adult	2000, 2001
		121	Puntledge River (Summer)	255	Su	H	Adult	1998, 2000, 2006
		122	Qualicum River	79	F	H	Adult	1996
		123	Quinsam River	143	F	H	Adult	1996, 1998
13	*Fraser*	124	Harrison River	216	F		Adult	1999, 2002
		125	Big Silver Creek	54	Sp	W	Adult	2004, 2005, 2006, 2007, 2008
		126	Birkenhead River	154	Sp	W	Adult	1998, 1999, 2001, 2002, 2005, 2006
		127	Pitt River (Upper)	65	Sp	W	Adult	2004, 2005, 2006, 2007, 2008
		128	Maria Slough	271	Su	W	Adult	1999, 2000, 2001, 2002, 2005
		129	Baezaeko River	80			Adult	1984, 1985
		130	Bridge River	157			Adult	1996
		131	Cariboo River	76	Su	W	Adult	1996, 2007, 2008
		132	Cariboo River (Upper)	166	Sp	W	Adult	2001
		133	Chilcotin River	201	Sp	W	Adult	1996, 1997, 1998, 2001
		134	Chilcotin River (Lower)	173	Sp	W	Adult	1996, 2000, 2001
		135	Chilko River	144	Sp	W	Adult	1995, 1999, 2001, 2002
		136	Cottonwood River (Upper)	118			Adult	2004, 2007, 2008
		137	Elkin Creek	190	Su	W	Adult	1996
		138	Endako River	42			Adult	1997, 1998, 2000
		139	Nazko River	179			Adult	1983, 1984, 1985
		140	Nechako River	128	Su	W	Adult	1992, 1996
		141	Portage Creek	138			Adult	2002, 2004, 2005, 2006, 2008
		142	Quesnel River	119	Su	W	Adult	1996, 1997
		143	Stuart River	125	Su	W	Adult	1996
		144	Taseko River	120			Adult	1997, 1998, 2002
		145	Bowron River	78	Sp	W	Adult	1997, 1998, 2001, 2003
		146	Fontoniko Creek	46			Adult	1996
		147	Goat River	46			Adult	1997, 2000, 2001, 2002
		148	Holmes River	100			Adult	1996, 1999, 2000, 2001, 2002
		149	James Creek	53			Adult	1984, 1988
		150	McGregor River	119			Adult	1997
		151	Morkill River	152	Su	W	Adult	2001
		152	Salmon River (Fraser)	153	Sp	W	Adult	1996, 1997

-continued-

Appendix A1.–Page 5 of 10.

Fine-scale Reporting Group		Pop No.[a]	Population	N	Run Time[b]	Origin[c]	Life Stage	Collection Date
		153	Slim Creek	113	Sp	W	Adult	1996, 1998, 2001
		154	Swift Creek	120	Sp	W	Adult	1996, 2000
		155	Fraser River above Tete Jaune	183			Adult	2001
		156	Torpy River	135	F	W	Adult	2001
		157	Willow River	37	Sp	W	Adult	1997, 2002, 2004
14	*Lower Thompson*	158	Coldwater River	109			Adult	1995, 1997, 1998, 1999
		159	Coldwater River (Upper)	69			Adult	2004, 2005, 2006
		160	Deadman River	256	Sp	H	Adult	1997, 1998, 1999, 2006
		161	Lois River	259	Sp	W	Adult	1997, 1999, 2001, 2006, 2008
		162	Nicola Hatchery	135	Sp	H	Adult	1998, 1999
		163	Nicola River	88			Adult	1998, 1999
		164	Spius Creek	52			Adult	1998, 1999
		165	Spius Creek (Upper)	82			Adult	2001, 2006
		166	Spius Hatchery	95	Sp	H	Adult	1996, 1997, 1998
15	*North Thompson*	167	Blue River	57			Adult	2001, 2002, 2003, 2004, 2006, 2007
		168	Clearwater River	112	Su	W	Adult	1997
		169	Finn Creek	174			Adult	1996, 1998, 2002, 2006, 2008
		170	Lemieux Creek	56			Adult	2001, 2002, 2004, 2006
		171	North Thompson River	77			Adult	2001
		172	Raft River	105	Su	W	Adult	2001, 2002, 2006, 2008
16	*South Thompson*	173	Adams River	76	Su	H	Adult	1996, 2001, 2002
		174	Bessette Creek	103			Adult	1998, 2002, 2003, 2004, 2006, 2008
		175	Eagle River	76			Adult	2003, 2004
		176	Shuswap River (Lower)	93			Adult	1996, 1997
		177	Shuswap River (Middle)	149	Su	H	Adult	1997, 2001
		178	South Thompson River	73			Adult	1996, 2001
		179	Salmon River	126			Adult	1997, 1998, 1999
		180	Thompson River (Lower)	175	F	W	Adult	2001, 2008
17	*Puget Sound*	181	Dungeness River	123		W	Adult	2004
		182	Elwha Hatchery	209	F	H	Adult/Juv	1996, 2004
		183	Elwha River	139		W	Adult/Juv	2004, 2005
		184	Upper Cascade River	43	Sp	W	Adult	1998, 1999
		185	Marblemount Hatchery	91	Sp	H	Adult	2006
		186	North Fork Nooksack River	137	Sp	H,W	Adult	1998, 1999
		187	North Fork Stilliguamish River	290	Su	H,W	Adult	1996, 2001, 2004
		188	Samish Hatchery	74	F	H	Adult	1998
		189	Upper Sauk River	120	Sp/Su	W	Adult	1994, 1998, 1999, 2006
		190	Skagit River (Summer)	99	Su	W	Adult	1994, 1995

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Fine-scale Reporting Group		Pop No.[a]	Population	N	Run Time[b]	Origin[c]	Life Stage	Collection Date
		191	Skagit River (Lower; Fall)	95	F	W	Adult	1998, 2006
		192	Skagit River (Upper)	53	Su	W		1998
		193	Skykomish River	73	Su	W	Adult	1996, 2000
		194	Snoqualmie River	49		W		2005
		195	Suiattle River	122	Sp	W	Adult	1989, 1998, 1999
		196	Wallace Hatchery	191	Su	H	Adult	1996, 2004, 2005
		197	Bear Creek	204	Su/F	W	Adult	1998, 1999, 2003, 2004
		198	Cedar River	170	Su/F	W	Adult	1994, 2003, 2004
		199	Nisqually River–Clear Creek Hatchery	132	F	H	Adult	2005
		200	Grovers Creek Hatchery	95	Su/F	H	Adult	2004
		201	Hupp Springs Hatchery	90	Sp	H	Adult	2002
		202	Issaquah Creek	166	Su/F	H,W	Adult	1999, 2004
		203	Nisqually River	94	Su/F	W	Adult	1998, 1999, 2000, 2006
		204	South Prairie Creek	78	F	W	Adult	1998, 1999, 2002
		205	Soos Creek	178	F	H	Adult	1998, 2004
		206	Univ of Washington Hatchery	125	Su/F	H	Adult	2004
		207	Voights Hatchery	93	F	H	Adult	1998
		208	White River	146	Sp	H	Adult	1998
		209	George Adams Hatchery	131	F	H	Adult	2005
		210	Hamma Hamma River	128	F	W	Adult	1999, 2000, 2001
		211	North Fork Skokomish River	87	F	W	Adult	1998, 1999, 2000, 2004, 2005, 2006
		212	South Fork Skokomish River	96	Su/F	H,W	Adult	2005, 2006
18	*Washington Coast*	213	Forks Creek Hatchery	140	F	H	Adult	2005
		214	Hoh River (Fall)	115	F	W	Adult	2004, 2005
		215	Hoh River (Spring/Summer)	138	Sp/Su	W	Adult	1995, 1996, 1997, 1998, 2005, 2006
		216	Hoko Hatchery	73	F	H,W	Adult	2004, 2006
		217	Humptulips Hatchery	60	F	H	Adult	1990
		218	Makah Hatchery	128	F	H	Adult	2001, 2003
		219	Queets River	53	F	W	Adult	1996, 1997
		220	Quillayute River	52	F	W	Adult	1995, 1996
		221	Quinault River	54	F	W	Adult	1995, 1997, 1998
		222	Quinault Hatchery	82	F	H	Adult	2001, 2006
		223	Sol Duc Hatchery	94	Sp	H	Adult	2003
19	*West Cascades Sp*	224	Cowlitz Hatchery (Spring)	124	Sp	H		2004
		225	Kalama Hatchery	133	Sp	H		2004
		226	Lewis Hatchery	116	Sp	H		2004

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Fine-scale Reporting Group		Pop No.[a]	Population	N	Run Time[b]	Origin[c]	Life Stage	Collection Date
20	*Lower Columbia F*	227	Abernathy Creek	89	F	W	Adult	1995, 1997, 1998, 2000
		228	Abernathy Hatchery	91	F	H	Adult	1995
		229	Coweeman River	109	F	W	Adult	1996, 2006
		230	Cowlitz Hatchery (Fall)	116	F	H		2004
		231	Elochoman River	88	F	W	Adult	1995, 1997
		232	Green River	55	F	W	Adult	2000
		233	Lewis River (Fall)	79	F	W	Adult	2003
		234	Lewis River (Lower; Summer)	83	F	W	Adult	2004
		235	Lewis River (Summer)	128	F	W	Adult	2004
		236	Sandy River (Fall)	106	F	W	Adult	2002, 2004
		237	Washougal River	108	F	W	Adult	1995, 1996, 2006
		238	Big Creek Hatchery	95	F	H	Juvenile	2004
		239	Elochoman Hatchery	94	F	H	Juvenile	2004
		240	Spring Creek	194	F	H	Juvenile	2001, 2002, 2006
21	*Willamette Sp*	241	Sandy River (Spring)	63	Sp	W	Adult	2006
		242	McKenzie Hatchery	127	Sp	H	Adult	2002, 2004
		243	McKenzie River	90	Sp	W	Juvenile	1997
		244	North Fork Clackamas River	62	Sp	W	Juvenile	1997
		245	North Santiam Hatchery	125	Sp	H	Adult	2002, 2004
		246	North Santiam River	83	Sp	W	Juvenile	1997
22	*Columbia Sp*	247	Klickitat Hatchery	82	Sp	H	Adult	2002, 2006
		248	Klickitat River (Spring)	40	Sp	W	Adult	2005
		249	Shitike Creek	127	Sp	H	Juvenile	2003, 2004
		250	Warm Springs Hatchery	127	Sp	H		2002, 2003
		251	Granite Creek	54	Sp	W	Adult	2005, 2006
		252	John Day River (upper mainstem)`	65	Sp	W	Adult	2004, 2005, 2006
		253	Middle Fork John Day River	83	Sp	W	Adult	2004, 2005, 2006
		254	North Fork John Day River	105	Sp	W	Adult	2004, 2005, 2006
		255	American River	116	Sp	W	Adult	2003
		256	Upper Yakima Hatchery	179	Sp	H	Adult	1998
		257	Little Naches River	73	Sp	W	Adult	2004
		258	Yakima River (Upper)	46	Sp	W	Adult	1992, 1997
		259	Naches River	64	Sp	W	Adult	1989, 1993
		260	Carson Hatchery	168	Sp	H		2001, 2004, 2006
		261	Entiat Hatchery	127	Sp	H	Juvenile	2002
		262	Little White Salmon Hatchery (Spring)	93	Sp	H	Juvenile	2005
		263	Methow River (Spring)	85	Sp	H	Juvenile	1998, 2000
		264	Twisp River	122	Sp	W	Adult	2001, 2005

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Fine-scale Reporting Group	Pop No.[a]	Population	N	Run Time[b]	Origin[c]	Life Stage	Collection Date
	265	Wenatchee Hatchery	43	Sp	H	Adult	1998, 2000
	266	Wenatchee River	62	Sp	W	Adult	1993
	267	Tucannon River	112	Sp/Su	W	Adult	2003
	268	Chamberlain Creek	45	Sp/Su	W	Juvenile	2006
	269	Crooked Fork Creek	100	Sp/Su	W	Juvenile	2005, 2006
	270	Dworshak Hatchery	81	Sp/Su	H	Adult	2005
	271	Lochsa River	125	Sp/Su	H	Adult	2005
	272	Lolo Creek	92	Sp/Su	W	Adult/Juv.	2001, 2002
	273	Newsome Creek	75	Sp/Su	W	Adult	2001, 2002
	274	Rapid River Hatchery	136	Sp/Su	H		1997, 1999, 2002
	275	Rapid River Hatchery	46	Su	H	Juvenile	2001, 2002
	276	Red River/South Fork Clearwater	172	Sp/Su	H	Adult	2005
	277	Catherine Creek	111	Sp/Su	W	Adult	2002, 2003
	278	Lookingglass Hatchery	188	Sp/Su	H	Juvenile	1994, 1995, 1998
	279	Minam River	136	Sp/Su	W		1994, 2002, 2003
	280	Wenaha Creek	46	Sp/Su	W	Juvenile	2002
	281	Imnaha River	132	Sp/Su	W		1998, 2002, 2003
	282	Bear Valley Creek	45	Sp/Su	W	Juvenile	2006
	283	Johnson Creek	186	Sp/Su	W	Adult/Juv.	2001, 2002, 2003
	284	Johnson Hatchery	92	Sp/Su	H	Juvenile	2002, 2003, 2004
	285	Knox Bridge	90	Su	W	Juvenile	2001, 2002
	286	McCall Hatchery	80	Su	H	Juvenile	1999, 2001
	287	Poverty Flat	88	Su	W	Juvenile	2001, 2002
	288	Sesech River	115	Sp/Su	W		2001, 2002, 2003
	289	Stolle Meadows	91	Su	W	Juvenile	2001, 2002
	290	Big Creek	142	Sp/Su	W	Adult	2001, 2002, 2003
	291	Big Creek (Lower)	74	Su	W	Juvenile	1999, 2002
	292	Big Creek (Upper)	87	Su	W	Juvenile	1999, 2002
	293	Camas Creek	42	Sp/Su	W	Juvenile	2006
	294	Capehorn Creek	51	Sp/Su	W	Juvenile	2006
	295	Marsh Creek	95	Su	W	Juvenile	2001, 2002
	296	Decker Flat	78	Su	W	Juvenile	1999, 2002
	297	Valley Creek (Lower)	94	Su	W	Juvenile	1999, 2002
	298	Valley Creek (Upper)	95	Su	W	Juvenile	1999, 2002
	299	East Fork Salmon River	141	Sp/Su	W	Adult	2004, 2005
	300	Pahsimeroi River	71	Sp/Su	W	Adult	2002
	301	Sawtooth Hatchery	260	Sp/Su	H	Adult/Juv.	2002, 2003, 2005, 2006
	302	West Fork Yankee Fork	59	Sp/Su	W	Juvenile	2005

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Fine-scale Reporting Group		Pop No.[a]	Population	N	Run Time[b]	Origin[c]	Life Stage	Collection Date
23	*Interior Columbia Su/F*	303	Hanford Reach	163	Su/F	W		1999, 2000, 2001
		304	Klickitat River (Summer/Fall)	149	Su/F	W	Adult	1994, 2005
		305	Little White Salmon Hatchery (Fall)	94	Su/F	H	Juvenile	2006
		306	Marion Drain	131	Su/F	W	Adult	1989, 1992
		307	Methow River (Summer)	115	Su/F	W		1992, 1993, 1994
		308	Okanagan River	72	Su/F	W	Adult	2000, 2002, 2003, 2004, 2006, 2007, 2008
		309	Priest Rapids Hatchery	181	Su/F	H	Juvenile	1998, 1999, 2000, 2001
		310	Priest Rapids Hatchery	67	Su/F	H	Adult	1998
		311	Umatilla Hatchery	90	F	H	Adult	2006
		312	Umatilla Hatchery	94	Su/F	H	Adult	2003
		313	Wells Dam Hatchery	128	Su/F	H		1993
		314	Wenatchee River	119	Su/F	W	Adult	1993
		315	Yakima River (Lower)	102	Su/F	W	Adult	1990, 1993, 1998
		316	Deschutes River (Lower)	101	F	W		1999, 2001, 2002
		317	Deschutes River (Upper)	128	Su/F	W	Juvenile	1998, 1999, 2002
		318	Clearwater River	88	F	W	Adult	2000, 2001, 2002
		319	Lyons Ferry	185	F	H	Adult	2002, 2003
		320	Nez Perce Tribal Hatchery	123	F	H	Adult	2003, 2004
24	*North Oregon Coast*	321	Alsea River	108	F	W	Adult	2004
		322	Kilchis River	44	F		Adult	2000, 2005
		323	Necanicum Hatchery	50	F	H,W	Adult	2005
		324	Nehalem River	131	F	W	Adult	2000, 2002
		325	Nestucca Hatchery	119	F	H	Adult	2004, 2005
		326	Salmon River	83	F		Adult	2003
		327	Siletz River	107	F	W	Adult	2000
		328	Trask River	123	F	W	Adult	2005
		329	Wilson River	120	F	W	Adult	2005
		330	Yaquina River	113	F	W	Adult	2005
		331	Siuslaw River	105	F	W	Adult	2001
25	*Mid Oregon Coast*	332	Coos Hatchery	58	F	H	Adult	2005
		333	Coquille River	118	F	W	Adult	2000
		334	Elk River	129	F	H	Adult	2004
		335	South Coos Hatchery	73	F	H	Adult	2005
		336	South Coos River	45	F	W	Adult	2000
		337	South Umpqua Hatchery	128	F	H,W	Adult	2002
		338	Sixes River	107	F	W	Adult	2000, 2005
		339	Umpqua Hatchery	132	Sp	W	Adult	2004

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	Fine-scale Reporting Group	Pop No.[a]	Population	N	Run Time[b]	Origin[c]	Life Stage	Collection Date
26	*S Oregon/California*	340	Applegate Creek	110	F	W	Adult	2004
		341	Cole Rivers Hatchery	126	Sp	H	Adult	2004
		342	Klaskanine Hatchery	96	F	H	Juvenile	2009
		343	Chetco River	136	F	W	Adult	2004
		344	Klamath River	111	F	W	Adult	2004
		345	Trinity Hatchery (Fall)	144	F	H	Adult	1992
		346	Trinity Hatchery (Spring)	127	Sp	H	Adult	1992
		347	Eel River	122	F	W	Adult	2000, 2001
		348	Russian River	142	F	W	Juvenile	2001
		349	Battle Creek	99	F	W	Adult	2002, 2003
		350	Butte Creek	61	F	W	Adult	2002, 2003
		351	Feather Hatchery (Fall)	129	F	H	Adult	2003
		352	Stanislaus River	61	F	W	Adult	2002
		353	Butte Creek	101	Sp	W	Adult	2002, 2003
		354	Deer Creek	42	Sp	W	Adult	2002
		355	Feather Hatchery (Spring)	144	Sp	H	Adult	2003
		356	Mill Creek	76	Sp	W	Adult	2002, 2003
		357	Sacramento River (Winter)	95	Wi	W, H	Adult	1992-1995, 1997, 1998, 2001, 2003, 2004

[a] Population numbers given correspond to the population numbers referenced in Table 1.

[b] Run timing components are abbreviated as Sp (spring), Su (summer), F (fall), and Wi (winter). Blanks indicate unknown run timing.

[c] Origin categories are abbreviated as H (hatchery) or W (wild). Blanks indicate unknown origin.

APPENDIX B: PROOF TEST RESULTS

Appendix B1.–Results of 100% proof tests for 26 fine-scale reporting groups listed in Table 1 and Appendix A1. Tests were conducted by sampling 200 individuals without replacement and analyzing them as a mixture against the reduced baseline. These tests provide an indication of the power of the baseline for MSA under the assumption that all populations are represented in the baseline. The accepted guideline for correct allocation of single-reporting group tests is that they exceed 90% to be considered adequate (Seeb et al. 2000). Results are an average of 10 single-chain mixtures, including mean correct allocation (**Est**), standard deviation (SD), and lower (Lo) and upper (Hi) 90% credibility intervals.

Rep		Reporting Group																									
Grp		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	**Est**	**0.99**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	**Est**	0.00	**0.99**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	0.01	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	**Est**	0.00	0.00	**0.99**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	**Est**	0.00	0.00	0.00	**0.98**	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.99	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	**Est**	0.00	0.00	0.00	0.00	**0.98**	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.00	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.00	1.00	0.01	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	**Est**	0.00	0.00	0.00	0.07	0.01	**0.91**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.03	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.03	0.00	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.14	0.02	0.96	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	**0.99**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.01	0.01	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Rep Grp		Reporting Group																									
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
8	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.98**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.01	0.01	0.00	0.01	1.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.96**	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.99	0.01	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.95**	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.98	0.00	0.06	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
11	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.99**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.99**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.99**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.99**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.99**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Rep Grp		Reporting Group 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
16	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.99**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.99**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.99**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
19	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.90**	0.02	0.02	0.06	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.01	0.02	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.03	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.95	0.05	0.04	0.09	0.00	0.00	0.00	0.00
20	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.95**	0.00	0.00	0.00	0.00	0.01	0.03
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.01	0.01
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.01
	Hi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.97	0.00	0.00	0.01	0.00	0.02	0.05
21	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.99**	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.00	0.00	0.00	0.00	0.00	0.00
22	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.99**	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.01	0.00	0.00	0.00
23	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.99**	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00	0.00
	Hi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.01

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Rep Grp		Reporting Group																									
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
24	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.99**	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00
	Hi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	1.00	0.01	0.01
25	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	**0.96**	0.02
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.01
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.01
	Hi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.01	0.00	0.00	0.00	0.98	0.04
26	**Est**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.99**
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	Lo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98
	Hi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.00

APPENDIX C: ESTIMATED CONTRIBUTION

Appendix C1.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the harvest during the regionwide early winter troll fishery in SEAK, AY 2010–2012.

		AY 2010 (n = 274)					AY 2011 (n = 613)					AY 2012 (n = 454)				
					90% CI					90% CI					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	*Alsek*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000
4	*Taku*	0.001	0.002	0.000	0.000	0.004	0.000	0.001	0.000	0.000	0.000	0.006	0.009	0.000	0.000	0.025
5	*Andrew*	0.112	0.025	0.110	0.074	0.154	0.022	0.007	0.021	0.011	0.035	0.084	0.019	0.082	0.055	0.116
6	*Stikine*	0.001	0.004	0.000	0.000	0.010	0.001	0.002	0.000	0.000	0.006	0.011	0.014	0.005	0.000	0.041
7	*S Southeast Alaska*	0.322	0.032	0.322	0.269	0.376	0.072	0.012	0.071	0.053	0.093	0.138	0.025	0.137	0.099	0.181
8	*Nass*	0.014	0.011	0.012	0.001	0.034	0.005	0.004	0.004	0.000	0.014	0.001	0.005	0.000	0.000	0.004
9	*Skeena*	0.007	0.006	0.005	0.000	0.019	0.001	0.002	0.000	0.000	0.004	0.018	0.011	0.016	0.006	0.038
10	*BC Coast/Haida Gwaii*	0.186	0.026	0.185	0.145	0.231	0.190	0.017	0.190	0.162	0.219	0.187	0.026	0.186	0.145	0.232
11	*West Vancouver*	0.047	0.012	0.046	0.029	0.067	0.058	0.010	0.057	0.042	0.075	0.032	0.007	0.032	0.021	0.045
12	*East Vancouver*	0.086	0.017	0.085	0.060	0.115	0.052	0.010	0.051	0.036	0.070	0.159	0.021	0.158	0.126	0.195
13	*Fraser*	0.008	0.006	0.006	0.001	0.020	0.008	0.004	0.008	0.003	0.016	0.003	0.003	0.003	0.000	0.008
14	*Lower Thompson*	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
15	*North Thompson*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	*South Thompson*	0.006	0.006	0.004	0.000	0.019	0.020	0.005	0.019	0.012	0.029	0.002	0.002	0.001	0.000	0.006
17	*Puget Sound*	0.056	0.015	0.055	0.034	0.081	0.040	0.010	0.040	0.025	0.057	0.080	0.015	0.079	0.056	0.107
18	*Washington Coast*	0.006	0.005	0.004	0.000	0.016	0.054	0.008	0.054	0.041	0.069	0.010	0.006	0.008	0.003	0.021
19	*West Cascades Sp*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.003	0.004	0.001	0.012
20	*Lower Columbia F*	0.011	0.007	0.010	0.003	0.025	0.051	0.009	0.050	0.036	0.067	0.014	0.006	0.014	0.006	0.025
21	*Willamette Sp*	0.040	0.010	0.040	0.025	0.059	0.050	0.010	0.050	0.036	0.067	0.069	0.012	0.068	0.051	0.089
22	*Columbia Sp*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.002
23	*Interior Columbia Su/F*	0.087	0.015	0.087	0.065	0.112	0.268	0.018	0.268	0.239	0.298	0.173	0.015	0.173	0.149	0.198
24	*North Oregon Coast*	0.001	0.002	0.000	0.000	0.005	0.064	0.009	0.063	0.049	0.080	0.005	0.005	0.004	0.000	0.015
25	*Mid Oregon Coast*	0.006	0.006	0.004	0.000	0.017	0.044	0.009	0.044	0.031	0.059	0.002	0.004	0.000	0.000	0.010
26	*S Oregon/California*	0.003	0.005	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer) and F (fall).

Appendix C2.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the harvest during the regionwide early winter troll fishery in SEAK, AY 2013–2014.

		AY 2013 (n = 344)					AY 2014 (n = 511)				
					90% CI					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	*Alsek*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.000	0.000	0.000	0.000	0.000	0.003	0.003	0.002	0.000	0.008
4	*Taku*	0.000	0.002	0.000	0.000	0.002	0.001	0.002	0.000	0.000	0.006
5	*Andrew*	0.076	0.018	0.075	0.049	0.106	0.066	0.014	0.066	0.045	0.090
6	*Stikine*	0.000	0.002	0.000	0.000	0.002	0.000	0.001	0.000	0.000	0.002
7	*S Southeast Alaska*	0.235	0.026	0.234	0.193	0.278	0.144	0.018	0.144	0.116	0.174
8	*Nass*	0.002	0.006	0.000	0.000	0.016	0.008	0.007	0.007	0.000	0.021
9	*Skeena*	0.014	0.008	0.013	0.005	0.029	0.010	0.006	0.008	0.003	0.021
10	*BC Coast/Haida Gwaii*	0.177	0.024	0.176	0.140	0.217	0.169	0.018	0.169	0.140	0.200
11	*West Vancouver*	0.113	0.017	0.113	0.087	0.142	0.067	0.011	0.067	0.050	0.086
12	*East Vancouver*	0.055	0.013	0.054	0.036	0.077	0.053	0.011	0.052	0.036	0.072
13	*Fraser*	0.009	0.005	0.008	0.002	0.018	0.002	0.002	0.001	0.000	0.007
14	*Lower Thompson*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	*South Thompson*	0.000	0.001	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000
17	*Puget Sound*	0.070	0.016	0.069	0.046	0.098	0.090	0.014	0.089	0.067	0.114
18	*Washington Coast*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
19	*West Cascades Sp*	0.001	0.003	0.000	0.000	0.008	0.000	0.001	0.000	0.000	0.001
20	*Lower Columbia F*	0.018	0.008	0.017	0.006	0.033	0.020	0.007	0.019	0.010	0.032
21	*Willamette Sp*	0.046	0.011	0.046	0.029	0.066	0.023	0.007	0.023	0.013	0.035
22	*Columbia Sp*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.181	0.020	0.180	0.149	0.215	0.343	0.020	0.343	0.311	0.375
24	*North Oregon Coast*	0.000	0.001	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000
25	*Mid Oregon Coast*	0.000	0.002	0.000	0.000	0.003	0.000	0.001	0.000	0.000	0.000
26	*S Oregon/California*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

Appendix C3.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the harvest during the early winter troll fishery in the Northern Outside quadrant of SEAK, AY 2011–2013. Insufficient samples were available to generate fine-scale reporting group estimates in AY 2010.

		AY 2011 (n = 322)					AY 2012 (n = 371)					AY 2013 (n = 240)				
					90% CI					90% CI					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	*Alsek*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.000	0.001	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	*Taku*	0.000	0.001	0.000	0.000	0.000	0.001	0.003	0.000	0.000	0.004	0.000	0.001	0.000	0.000	0.000
5	*Andrew*	0.035	0.012	0.034	0.017	0.056	0.058	0.013	0.057	0.038	0.080	0.067	0.019	0.065	0.038	0.101
6	*Stikine*	0.000	0.001	0.000	0.000	0.000	0.005	0.007	0.003	0.000	0.019	0.000	0.001	0.000	0.000	0.000
7	*S Southeast Alaska*	0.106	0.019	0.105	0.076	0.139	0.070	0.016	0.069	0.047	0.098	0.133	0.027	0.132	0.090	0.180
8	*Nass*	0.005	0.006	0.002	0.000	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
9	*Skeena*	0.001	0.002	0.000	0.000	0.004	0.004	0.004	0.003	0.000	0.013	0.002	0.006	0.000	0.000	0.016
10	*BC Coast/Haida Gwaii*	0.300	0.028	0.299	0.255	0.346	0.157	0.021	0.156	0.124	0.192	0.165	0.028	0.164	0.120	0.213
11	*West Vancouver*	0.079	0.015	0.078	0.056	0.105	0.052	0.012	0.051	0.034	0.073	0.161	0.024	0.160	0.123	0.202
12	*East Vancouver*	0.078	0.016	0.077	0.053	0.107	0.134	0.018	0.133	0.105	0.164	0.041	0.014	0.040	0.022	0.066
13	*Fraser*	0.013	0.007	0.012	0.005	0.026	0.005	0.004	0.004	0.000	0.013	0.013	0.007	0.011	0.003	0.026
14	*Lower Thompson*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
16	*South Thompson*	0.001	0.002	0.000	0.000	0.005	0.003	0.003	0.002	0.000	0.009	0.000	0.000	0.000	0.000	0.000
17	*Puget Sound*	0.059	0.015	0.058	0.037	0.085	0.089	0.016	0.088	0.063	0.116	0.075	0.020	0.073	0.044	0.110
18	*Washington Coast*	0.001	0.003	0.000	0.000	0.007	0.011	0.005	0.010	0.004	0.021	0.000	0.001	0.000	0.000	0.000
19	*West Cascades Sp*	0.000	0.000	0.000	0.000	0.000	0.008	0.006	0.007	0.001	0.019	0.001	0.005	0.000	0.000	0.011
20	*Lower Columbia F*	0.038	0.012	0.037	0.020	0.059	0.023	0.009	0.022	0.010	0.040	0.026	0.012	0.024	0.009	0.048
21	*Willamette Sp*	0.080	0.015	0.079	0.057	0.107	0.097	0.016	0.096	0.073	0.124	0.059	0.015	0.058	0.036	0.086
22	*Columbia Sp*	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.204	0.023	0.203	0.167	0.242	0.279	0.024	0.278	0.240	0.318	0.256	0.029	0.255	0.210	0.304
24	*North Oregon Coast*	0.000	0.000	0.000	0.000	0.000	0.003	0.003	0.002	0.000	0.009	0.000	0.001	0.000	0.000	0.001
25	*Mid Oregon Coast*	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.005	0.000	0.002	0.000	0.000	0.003
26	*S Oregon/California*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

Appendix C4.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the harvest during the early winter troll fishery in the Northern Outside quadrant of SEAK, AY 2014.

		AY 2014 (n = 412)				
					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.000	0.000	0.000	0.000
2	*Alsek*	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.000	0.001	0.000	0.000	0.000
4	*Taku*	0.001	0.003	0.000	0.000	0.008
5	*Andrew*	0.029	0.011	0.028	0.013	0.048
6	*Stikine*	0.000	0.001	0.000	0.000	0.002
7	*S Southeast Alaska*	0.079	0.015	0.078	0.055	0.104
8	*Nass*	0.011	0.010	0.010	0.000	0.029
9	*Skeena*	0.001	0.002	0.000	0.000	0.005
10	*BC Coast/Haida Gwaii*	0.166	0.020	0.165	0.134	0.200
11	*West Vancouver*	0.080	0.013	0.079	0.059	0.103
12	*East Vancouver*	0.037	0.010	0.036	0.022	0.055
13	*Fraser*	0.003	0.003	0.002	0.000	0.009
14	*Lower Thompson*	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.000	0.000	0.000	0.000	0.000
16	*South Thompson*	0.000	0.000	0.000	0.000	0.000
17	*Puget Sound*	0.104	0.017	0.103	0.077	0.133
18	*Washington Coast*	0.000	0.000	0.000	0.000	0.000
19	*West Cascades Sp*	0.000	0.001	0.000	0.000	0.000
20	*Lower Columbia F*	0.027	0.009	0.026	0.013	0.043
21	*Willamette Sp*	0.028	0.008	0.027	0.015	0.043
22	*Columbia Sp*	0.000	0.000	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.436	0.025	0.436	0.395	0.477
24	*North Oregon Coast*	0.000	0.001	0.000	0.000	0.000
25	*Mid Oregon Coast*	0.000	0.001	0.000	0.000	0.000
26	*S Oregon/California*	0.000	0.000	0.000	0.000	0.000

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

Appendix C5.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the harvest during the regionwide late winter troll fishery in SEAK, AY 2010–2012.

		AY 2010 (n = 513)					AY 2011[b] (n = 514)					AY 2012 (n = 485)				
					90% CI					90% CI					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	*Alsek*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.001	0.000	0.006	0.000	0.000	0.000	0.000	0.000
4	*Taku*	0.016	0.012	0.017	0.000	0.036	0.003	0.007	0.000	0.000	0.022	0.058	0.013	0.057	0.038	0.081
5	*Andrew*	0.086	0.015	0.085	0.063	0.111	0.027	0.009	0.026	0.014	0.043	0.060	0.015	0.059	0.036	0.087
6	*Stikine*	0.005	0.007	0.000	0.000	0.020	0.026	0.013	0.026	0.003	0.047	0.008	0.008	0.007	0.000	0.024
7	*S Southeast Alaska*	0.140	0.017	0.139	0.113	0.168	0.097	0.016	0.097	0.072	0.125	0.124	0.017	0.124	0.098	0.152
8	*Nass*	0.006	0.005	0.005	0.000	0.015	0.009	0.006	0.008	0.000	0.020	0.011	0.006	0.010	0.002	0.022
9	*Skeena*	0.021	0.010	0.020	0.006	0.039	0.023	0.010	0.023	0.007	0.041	0.014	0.011	0.013	0.000	0.033
10	*BC Coast/Haida Gwaii*	0.108	0.016	0.108	0.083	0.135	0.196	0.020	0.195	0.164	0.229	0.129	0.017	0.128	0.102	0.158
11	*West Vancouver*	0.196	0.018	0.195	0.168	0.225	0.318	0.021	0.317	0.284	0.352	0.271	0.020	0.270	0.238	0.304
12	*East Vancouver*	0.032	0.008	0.031	0.020	0.046	0.027	0.007	0.026	0.016	0.040	0.040	0.009	0.039	0.026	0.056
13	*Fraser*	0.005	0.003	0.005	0.001	0.012	0.007	0.004	0.006	0.002	0.014	0.004	0.003	0.003	0.001	0.010
14	*Lower Thompson*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.001	0.002	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	*South Thompson*	0.127	0.015	0.127	0.103	0.152	0.028	0.007	0.027	0.017	0.041	0.041	0.009	0.041	0.027	0.058
17	*Puget Sound*	0.011	0.005	0.010	0.004	0.021	0.010	0.006	0.009	0.002	0.022	0.015	0.007	0.014	0.005	0.028
18	*Washington Coast*	0.031	0.008	0.030	0.019	0.046	0.014	0.006	0.013	0.005	0.024	0.017	0.007	0.016	0.007	0.029
19	*West Cascades Sp*	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.002	0.000	0.001	0.000	0.000	0.001
20	*Lower Columbia F*	0.024	0.007	0.023	0.013	0.037	0.018	0.006	0.018	0.010	0.030	0.026	0.008	0.026	0.015	0.041
21	*Willamette Sp*	0.080	0.012	0.080	0.061	0.101	0.056	0.010	0.055	0.040	0.073	0.097	0.013	0.096	0.076	0.119
22	*Columbia Sp*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.092	0.013	0.092	0.072	0.115	0.134	0.015	0.133	0.109	0.159	0.069	0.012	0.068	0.051	0.089
24	*North Oregon Coast*	0.006	0.004	0.006	0.001	0.014	0.005	0.004	0.004	0.000	0.012	0.011	0.005	0.011	0.004	0.021
25	*Mid Oregon Coast*	0.011	0.005	0.011	0.004	0.021	0.001	0.003	0.000	0.000	0.007	0.004	0.003	0.004	0.000	0.011
26	*S Oregon/California*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.002

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

[b] AY 2011 results did not converge at 80,000 iterations and are an average of 5 chains in BAYES.

Appendix C6.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the harvest during the regionwide late winter troll fishery in SEAK, AY 2013–2014.

		AY 2013 (n = 502)					AY 2014 (n = 488)				
					90% CI					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	*Alsek*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	*Taku*	0.031	0.009	0.031	0.017	0.047	0.007	0.007	0.006	0.000	0.021
5	*Andrew*	0.049	0.014	0.048	0.028	0.073	0.030	0.010	0.029	0.015	0.047
6	*Stikine*	0.010	0.011	0.006	0.000	0.032	0.003	0.006	0.000	0.000	0.017
7	*S Southeast Alaska*	0.157	0.022	0.156	0.121	0.194	0.050	0.010	0.050	0.035	0.067
8	*Nass*	0.000	0.002	0.000	0.000	0.001	0.009	0.006	0.008	0.000	0.020
9	*Skeena*	0.092	0.018	0.091	0.064	0.123	0.011	0.007	0.010	0.004	0.025
10	*BC Coast/Haida Gwaii*	0.146	0.020	0.145	0.115	0.180	0.109	0.015	0.109	0.086	0.134
11	*West Vancouver*	0.270	0.022	0.270	0.235	0.307	0.347	0.022	0.347	0.311	0.384
12	*East Vancouver*	0.034	0.012	0.032	0.017	0.055	0.011	0.005	0.011	0.005	0.020
13	*Fraser*	0.003	0.002	0.002	0.000	0.007	0.006	0.004	0.005	0.001	0.013
14	*Lower Thompson*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
16	*South Thompson*	0.036	0.007	0.036	0.025	0.049	0.093	0.014	0.092	0.070	0.117
17	*Puget Sound*	0.024	0.010	0.023	0.010	0.042	0.017	0.007	0.016	0.007	0.029
18	*Washington Coast*	0.014	0.007	0.013	0.005	0.027	0.032	0.009	0.031	0.018	0.048
19	*West Cascades Sp*	0.000	0.001	0.000	0.000	0.000	0.006	0.004	0.005	0.000	0.014
20	*Lower Columbia F*	0.009	0.004	0.009	0.004	0.017	0.027	0.008	0.026	0.014	0.042
21	*Willamette Sp*	0.033	0.008	0.032	0.021	0.048	0.028	0.008	0.027	0.016	0.042
22	*Columbia Sp*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.084	0.012	0.083	0.065	0.104	0.199	0.019	0.199	0.168	0.232
24	*North Oregon Coast*	0.002	0.003	0.000	0.000	0.008	0.008	0.005	0.008	0.002	0.017
25	*Mid Oregon Coast*	0.005	0.004	0.004	0.000	0.011	0.006	0.005	0.005	0.000	0.015
26	*S Oregon/California*	0.002	0.002	0.001	0.000	0.005	0.000	0.001	0.000	0.000	0.001

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

Appendix C7.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the harvest during the late winter troll fishery in the Northern Outside quadrant in SEAK, AY 2010–2012.

		AY 2010 (n = 399)					AY 2011 (n = 395)					AY 2012 (n = 378)				
					90% CI					90% CI					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	*Alsek*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.000	0.000	0.000	0.000	0.000	0.003	0.003	0.002	0.000	0.008	0.000	0.000	0.000	0.000	0.000
4	*Taku*	0.019	0.015	0.020	0.000	0.043	0.004	0.010	0.000	0.000	0.028	0.063	0.016	0.063	0.039	0.091
5	*Andrew*	0.089	0.017	0.088	0.062	0.118	0.035	0.012	0.034	0.018	0.056	0.077	0.020	0.076	0.046	0.111
6	*Stikine*	0.005	0.008	0.000	0.000	0.023	0.029	0.016	0.030	0.000	0.055	0.011	0.011	0.009	0.000	0.032
7	*S Southeast Alaska*	0.101	0.018	0.100	0.073	0.131	0.049	0.015	0.048	0.026	0.075	0.066	0.015	0.065	0.043	0.093
8	*Nass*	0.008	0.006	0.007	0.000	0.019	0.011	0.008	0.010	0.000	0.027	0.014	0.008	0.013	0.003	0.028
9	*Skeena*	0.026	0.012	0.025	0.007	0.047	0.027	0.013	0.027	0.007	0.049	0.018	0.015	0.017	0.000	0.044
10	*BC Coast/Haida Gwaii*	0.099	0.018	0.098	0.071	0.129	0.191	0.022	0.191	0.156	0.228	0.085	0.016	0.084	0.060	0.113
11	*West Vancouver*	0.185	0.020	0.185	0.154	0.218	0.323	0.024	0.323	0.285	0.363	0.293	0.024	0.293	0.255	0.332
12	*East Vancouver*	0.013	0.006	0.012	0.004	0.025	0.024	0.008	0.024	0.013	0.039	0.025	0.008	0.024	0.013	0.039
13	*Fraser*	0.002	0.003	0.001	0.000	0.008	0.006	0.004	0.005	0.001	0.014	0.005	0.004	0.005	0.001	0.013
14	*Lower Thompson*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.001	0.003	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	*South Thompson*	0.154	0.018	0.153	0.125	0.185	0.034	0.009	0.033	0.020	0.050	0.046	0.011	0.045	0.029	0.065
17	*Puget Sound*	0.010	0.005	0.010	0.003	0.020	0.005	0.005	0.004	0.000	0.014	0.014	0.008	0.013	0.003	0.029
18	*Washington Coast*	0.039	0.010	0.038	0.023	0.057	0.018	0.008	0.017	0.007	0.032	0.022	0.009	0.021	0.009	0.038
19	*West Cascades Sp*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
20	*Lower Columbia F*	0.029	0.009	0.029	0.016	0.045	0.025	0.008	0.024	0.013	0.039	0.032	0.010	0.031	0.017	0.050
21	*Willamette Sp*	0.096	0.015	0.095	0.072	0.121	0.074	0.013	0.073	0.053	0.097	0.122	0.017	0.121	0.095	0.151
22	*Columbia Sp*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.103	0.016	0.103	0.079	0.130	0.138	0.018	0.137	0.110	0.168	0.087	0.015	0.087	0.064	0.114
24	*North Oregon Coast*	0.008	0.005	0.007	0.001	0.018	0.002	0.003	0.001	0.000	0.009	0.015	0.007	0.014	0.005	0.028
25	*Mid Oregon Coast*	0.013	0.006	0.012	0.005	0.025	0.001	0.002	0.000	0.000	0.004	0.006	0.004	0.005	0.001	0.014
26	*S Oregon/California*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

Appendix C8.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the harvest during the late winter troll fishery in the Northern Outside quadrant in SEAK, AY 2013–2014.

		AY 2013 (n = 388)					AY 2014 (n = 365)				
					90% CI					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	*Alsek*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	*Taku*	0.055	0.016	0.054	0.030	0.082	0.008	0.009	0.007	0.000	0.025
5	*Andrew*	0.057	0.015	0.056	0.035	0.083	0.027	0.011	0.026	0.011	0.046
6	*Stikine*	0.009	0.010	0.006	0.000	0.029	0.003	0.007	0.000	0.000	0.020
7	*S Southeast Alaska*	0.044	0.015	0.043	0.021	0.070	0.011	0.007	0.010	0.001	0.025
8	*Nass*	0.000	0.001	0.000	0.000	0.000	0.011	0.007	0.010	0.000	0.024
9	*Skeena*	0.066	0.016	0.065	0.042	0.094	0.005	0.007	0.002	0.000	0.020
10	*BC Coast/Haida Gwaii*	0.154	0.020	0.153	0.121	0.189	0.086	0.016	0.086	0.062	0.113
11	*West Vancouver*	0.297	0.023	0.296	0.259	0.336	0.366	0.025	0.366	0.325	0.408
12	*East Vancouver*	0.015	0.006	0.014	0.006	0.026	0.004	0.004	0.003	0.000	0.012
13	*Fraser*	0.005	0.004	0.004	0.001	0.012	0.005	0.004	0.004	0.001	0.013
14	*Lower Thompson*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
16	*South Thompson*	0.064	0.013	0.063	0.044	0.087	0.108	0.017	0.107	0.081	0.137
17	*Puget Sound*	0.018	0.007	0.018	0.008	0.031	0.011	0.007	0.010	0.002	0.023
18	*Washington Coast*	0.011	0.007	0.010	0.001	0.024	0.038	0.011	0.037	0.022	0.058
19	*West Cascades Sp*	0.000	0.001	0.000	0.000	0.000	0.007	0.005	0.006	0.000	0.017
20	*Lower Columbia F*	0.016	0.007	0.015	0.006	0.029	0.028	0.010	0.027	0.014	0.046
21	*Willamette Sp*	0.044	0.011	0.043	0.028	0.063	0.032	0.010	0.031	0.018	0.049
22	*Columbia Sp*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.132	0.018	0.131	0.104	0.162	0.231	0.023	0.231	0.195	0.270
24	*North Oregon Coast*	0.002	0.004	0.000	0.000	0.010	0.010	0.006	0.009	0.003	0.021
25	*Mid Oregon Coast*	0.008	0.006	0.007	0.001	0.019	0.007	0.006	0.006	0.000	0.018
26	*S Oregon/California*	0.003	0.003	0.002	0.000	0.009	0.000	0.000	0.000	0.000	0.000

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

Appendix C9.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the harvest during the spring troll fishery in the Northern Outside quadrant in SEAK, AY 2010–2012.

		AY 2010 (n = 543)					AY 2011 (n = 681)					AY 2012 (n = 451)				
					90% CI					90% CI					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001
2	*Alsek*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.010	0.004	0.009	0.004	0.017	0.014	0.005	0.014	0.007	0.022	0.009	0.004	0.008	0.003	0.017
4	*Taku*	0.138	0.017	0.138	0.111	0.166	0.080	0.015	0.080	0.054	0.105	0.086	0.016	0.086	0.062	0.113
5	*Andrew*	0.284	0.021	0.283	0.249	0.319	0.338	0.020	0.337	0.305	0.371	0.285	0.023	0.285	0.248	0.324
6	*Stikine*	0.002	0.005	0.000	0.000	0.012	0.026	0.016	0.024	0.005	0.055	0.001	0.003	0.000	0.000	0.004
7	*S Southeast Alaska*	0.076	0.014	0.075	0.055	0.100	0.058	0.011	0.057	0.041	0.077	0.067	0.015	0.066	0.043	0.093
8	*Nass*	0.005	0.004	0.004	0.001	0.012	0.007	0.004	0.007	0.002	0.015	0.000	0.000	0.000	0.000	0.000
9	*Skeena*	0.012	0.011	0.012	0.000	0.032	0.005	0.008	0.000	0.000	0.023	0.038	0.013	0.037	0.020	0.061
10	*BC Coast/Haida Gwaii*	0.063	0.011	0.063	0.046	0.083	0.067	0.011	0.066	0.050	0.085	0.066	0.013	0.066	0.046	0.089
11	*West Vancouver*	0.170	0.016	0.169	0.144	0.197	0.230	0.016	0.230	0.204	0.257	0.226	0.020	0.225	0.194	0.259
12	*East Vancouver*	0.016	0.006	0.016	0.008	0.027	0.003	0.002	0.002	0.000	0.007	0.018	0.006	0.017	0.009	0.029
13	*Fraser*	0.002	0.002	0.001	0.000	0.006	0.001	0.001	0.000	0.000	0.003	0.002	0.002	0.002	0.000	0.007
14	*Lower Thompson*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.006
16	*South Thompson*	0.113	0.014	0.113	0.091	0.137	0.049	0.009	0.048	0.035	0.063	0.038	0.010	0.037	0.023	0.055
17	*Puget Sound*	0.000	0.001	0.000	0.000	0.000	0.001	0.002	0.001	0.000	0.004	0.002	0.002	0.002	0.000	0.007
18	*Washington Coast*	0.032	0.008	0.031	0.019	0.047	0.031	0.007	0.030	0.020	0.043	0.038	0.009	0.037	0.024	0.055
19	*West Cascades Sp*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.006
20	*Lower Columbia F*	0.016	0.006	0.015	0.007	0.027	0.016	0.005	0.015	0.008	0.025	0.022	0.008	0.022	0.011	0.037
21	*Willamette Sp*	0.004	0.003	0.004	0.001	0.010	0.004	0.003	0.004	0.001	0.009	0.000	0.001	0.000	0.000	0.001
22	*Columbia Sp*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.050	0.010	0.049	0.035	0.067	0.065	0.010	0.065	0.050	0.082	0.090	0.014	0.089	0.068	0.114
24	*North Oregon Coast*	0.007	0.004	0.006	0.001	0.015	0.002	0.002	0.001	0.000	0.005	0.008	0.005	0.007	0.002	0.017
25	*Mid Oregon Coast*	0.000	0.001	0.000	0.000	0.000	0.005	0.004	0.005	0.001	0.013	0.000	0.001	0.000	0.000	0.000
26	*S Oregon/California*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

Appendix C10.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the harvest during the spring troll fishery in the Northern Outside quadrant in SEAK, AY 2013–2014.

		AY 2013 (n = 302)					AY 2014 (n = 396)				
					90% CI					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	*Alsek*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.000	0.000	0.000	0.000	0.000	0.005	0.004	0.004	0.001	0.012
4	*Taku*	0.014	0.008	0.013	0.004	0.029	0.006	0.010	0.000	0.000	0.027
5	*Andrew*	0.171	0.024	0.170	0.133	0.211	0.150	0.021	0.149	0.117	0.185
6	*Stikine*	0.000	0.001	0.000	0.000	0.000	0.017	0.013	0.016	0.000	0.040
7	*S Southeast Alaska*	0.025	0.011	0.023	0.009	0.046	0.014	0.007	0.013	0.004	0.028
8	*Nass*	0.000	0.001	0.000	0.000	0.000	0.001	0.003	0.000	0.000	0.004
9	*Skeena*	0.032	0.015	0.030	0.010	0.060	0.005	0.006	0.003	0.000	0.017
10	*BC Coast/Haida Gwaii*	0.106	0.019	0.105	0.075	0.139	0.070	0.013	0.069	0.049	0.093
11	*West Vancouver*	0.237	0.025	0.236	0.197	0.278	0.254	0.022	0.254	0.219	0.291
12	*East Vancouver*	0.025	0.011	0.023	0.009	0.044	0.010	0.005	0.009	0.004	0.020
13	*Fraser*	0.007	0.005	0.006	0.001	0.016	0.005	0.004	0.004	0.001	0.012
14	*Lower Thompson*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.003	0.003	0.002	0.000	0.010	0.004	0.004	0.003	0.000	0.011
16	*South Thompson*	0.040	0.012	0.039	0.022	0.061	0.033	0.009	0.032	0.019	0.050
17	*Puget Sound*	0.012	0.007	0.010	0.003	0.025	0.017	0.007	0.016	0.007	0.030
18	*Washington Coast*	0.019	0.011	0.017	0.004	0.038	0.035	0.010	0.034	0.020	0.053
19	*West Cascades Sp*	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
20	*Lower Columbia F*	0.039	0.012	0.038	0.021	0.061	0.046	0.011	0.045	0.029	0.066
21	*Willamette Sp*	0.006	0.005	0.005	0.001	0.016	0.012	0.006	0.011	0.004	0.022
22	*Columbia Sp*	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.252	0.026	0.251	0.210	0.295	0.306	0.024	0.305	0.267	0.345
24	*North Oregon Coast*	0.004	0.007	0.000	0.000	0.019	0.004	0.004	0.003	0.000	0.012
25	*Mid Oregon Coast*	0.003	0.005	0.000	0.000	0.014	0.005	0.005	0.004	0.000	0.014
26	*S Oregon/California*	0.007	0.008	0.005	0.000	0.022	0.000	0.000	0.000	0.000	0.000

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

Appendix C11.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the harvest during the spring troll fishery in the Southern Inside quadrant in SEAK, AY 2010–2012.

		AY 2010 (n = 457)					AY 2011 (n = 462)					AY 2012 (n = 338)				
					90% CI					90% CI					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	*Alsek*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	*Taku*	0.032	0.015	0.032	0.008	0.058	0.089	0.021	0.089	0.054	0.124	0.047	0.019	0.046	0.018	0.081
5	*Andrew*	0.233	0.023	0.232	0.195	0.273	0.119	0.020	0.119	0.088	0.154	0.208	0.028	0.207	0.164	0.255
6	*Stikine*	0.080	0.020	0.079	0.050	0.116	0.071	0.021	0.069	0.040	0.110	0.059	0.022	0.058	0.026	0.097
7	*S Southeast Alaska*	0.433	0.027	0.433	0.388	0.478	0.375	0.028	0.375	0.330	0.421	0.473	0.034	0.473	0.416	0.529
8	*Nass*	0.022	0.011	0.021	0.007	0.042	0.022	0.012	0.020	0.008	0.047	0.008	0.010	0.003	0.000	0.026
9	*Skeena*	0.011	0.005	0.010	0.004	0.021	0.005	0.009	0.001	0.000	0.027	0.015	0.008	0.013	0.004	0.029
10	*BC Coast/Haida Gwaii*	0.054	0.013	0.053	0.034	0.076	0.096	0.017	0.095	0.069	0.125	0.059	0.018	0.057	0.033	0.091
11	*West Vancouver*	0.025	0.007	0.024	0.014	0.038	0.046	0.010	0.045	0.031	0.064	0.039	0.011	0.038	0.023	0.058
12	*East Vancouver*	0.024	0.008	0.023	0.013	0.038	0.025	0.007	0.024	0.014	0.038	0.032	0.010	0.031	0.018	0.050
13	*Fraser*	0.007	0.005	0.006	0.001	0.017	0.006	0.006	0.004	0.000	0.018	0.000	0.000	0.000	0.000	0.000
14	*Lower Thompson*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
16	*South Thompson*	0.030	0.008	0.029	0.018	0.045	0.057	0.012	0.056	0.039	0.077	0.014	0.007	0.013	0.005	0.027
17	*Puget Sound*	0.002	0.002	0.001	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.004	0.006	0.001	0.000	0.017
18	*Washington Coast*	0.003	0.003	0.002	0.000	0.008	0.004	0.004	0.003	0.000	0.012	0.008	0.005	0.007	0.001	0.018
19	*West Cascades Sp*	0.007	0.004	0.006	0.001	0.015	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	*Lower Columbia F*	0.008	0.005	0.007	0.002	0.017	0.017	0.007	0.017	0.008	0.030	0.002	0.003	0.001	0.000	0.009
21	*Willamette Sp*	0.004	0.003	0.003	0.000	0.010	0.002	0.002	0.002	0.000	0.007	0.003	0.003	0.002	0.000	0.009
22	*Columbia Sp*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.022	0.007	0.022	0.012	0.036	0.055	0.011	0.054	0.038	0.074	0.029	0.009	0.028	0.015	0.046
24	*North Oregon Coast*	0.001	0.002	0.000	0.000	0.004	0.003	0.003	0.002	0.000	0.008	0.000	0.000	0.000	0.000	0.000
25	*Mid Oregon Coast*	0.000	0.001	0.000	0.000	0.000	0.007	0.005	0.006	0.001	0.016	0.000	0.000	0.000	0.000	0.000
26	*S Oregon/California*	0.002	0.003	0.001	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

Appendix C12.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the harvest during the spring troll fishery in the Southern Inside quadrant in SEAK, AY 2013–2014.

		AY 2013 (n = 207)					AY 2014 (n = 296)				
					90% CI					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	*Alsek*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	*Taku*	0.001	0.003	0.000	0.000	0.003	0.056	0.019	0.055	0.027	0.089
5	*Andrew*	0.281	0.039	0.280	0.218	0.346	0.251	0.032	0.250	0.199	0.305
6	*Stikine*	0.108	0.033	0.105	0.057	0.165	0.014	0.014	0.010	0.000	0.041
7	*S Southeast Alaska*	0.394	0.043	0.393	0.324	0.466	0.461	0.035	0.461	0.404	0.518
8	*Nass*	0.007	0.016	0.000	0.000	0.046	0.004	0.006	0.002	0.000	0.016
9	*Skeena*	0.000	0.002	0.000	0.000	0.001	0.008	0.006	0.007	0.002	0.019
10	*BC Coast/Haida Gwaii*	0.076	0.025	0.074	0.038	0.120	0.036	0.013	0.035	0.017	0.059
11	*West Vancouver*	0.019	0.009	0.018	0.007	0.037	0.039	0.012	0.038	0.022	0.060
12	*East Vancouver*	0.046	0.015	0.045	0.024	0.073	0.011	0.006	0.010	0.003	0.022
13	*Fraser*	0.000	0.001	0.000	0.000	0.000	0.003	0.003	0.002	0.000	0.010
14	*Lower Thompson*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	*South Thompson*	0.019	0.010	0.018	0.007	0.037	0.028	0.010	0.026	0.013	0.046
17	*Puget Sound*	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
18	*Washington Coast*	0.004	0.005	0.002	0.000	0.014	0.009	0.006	0.008	0.002	0.020
19	*West Cascades Sp*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	*Lower Columbia F*	0.000	0.001	0.000	0.000	0.000	0.012	0.006	0.010	0.003	0.024
21	*Willamette Sp*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22	*Columbia Sp*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.039	0.014	0.037	0.019	0.064	0.068	0.015	0.067	0.045	0.094
24	*North Oregon Coast*	0.005	0.005	0.003	0.000	0.015	0.000	0.001	0.000	0.000	0.000
25	*Mid Oregon Coast*	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
26	*S Oregon/California*	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

Appendix C13.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the regionwide harvest during the first retention period of the summer troll fishery in SEAK, AY 2010–2012.

		AY 2010 (n = 767)					AY 2011 (n = 1,944)					AY 2012 (n = 732)				
					90% CI					90% CI					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%
1	*Situk*	0.001	0.001	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001
2	*Alsek*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.002	0.002	0.001	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.001	0.000	0.005
4	*Taku*	0.012	0.007	0.011	0.001	0.024	0.000	0.001	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.001
5	*Andrew*	0.032	0.009	0.032	0.020	0.048	0.044	0.005	0.044	0.035	0.053	0.068	0.011	0.067	0.050	0.087
6	*Stikine*	0.008	0.008	0.007	0.000	0.022	0.000	0.001	0.000	0.000	0.001	0.001	0.003	0.000	0.000	0.008
7	*S Southeast Alaska*	0.079	0.012	0.078	0.061	0.098	0.052	0.006	0.052	0.042	0.062	0.090	0.013	0.089	0.070	0.111
8	*Nass*	0.000	0.001	0.000	0.000	0.000	0.004	0.002	0.004	0.001	0.008	0.004	0.003	0.003	0.000	0.010
9	*Skeena*	0.002	0.002	0.001	0.000	0.006	0.020	0.005	0.019	0.013	0.029	0.034	0.009	0.033	0.019	0.050
10	*BC Coast/Haida Gwaii*	0.037	0.007	0.037	0.026	0.049	0.041	0.005	0.041	0.032	0.050	0.051	0.010	0.051	0.035	0.069
11	*West Vancouver*	0.066	0.010	0.066	0.050	0.084	0.083	0.006	0.083	0.073	0.094	0.067	0.009	0.067	0.052	0.083
12	*East Vancouver*	0.005	0.002	0.005	0.002	0.009	0.014	0.003	0.014	0.010	0.019	0.007	0.003	0.006	0.002	0.013
13	*Fraser*	0.004	0.003	0.003	0.000	0.010	0.006	0.002	0.006	0.003	0.010	0.001	0.001	0.001	0.000	0.004
14	*Lower Thompson*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.001	0.000	0.005
15	*North Thompson*	0.009	0.005	0.009	0.003	0.018	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.004
16	*South Thompson*	0.258	0.017	0.258	0.230	0.287	0.157	0.008	0.157	0.144	0.171	0.127	0.013	0.127	0.107	0.149
17	*Puget Sound*	0.005	0.003	0.005	0.002	0.011	0.004	0.002	0.004	0.002	0.007	0.010	0.005	0.009	0.003	0.019
18	*Washington Coast*	0.121	0.014	0.120	0.098	0.145	0.131	0.008	0.131	0.118	0.145	0.155	0.014	0.155	0.133	0.178
19	*West Cascades Sp*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	*Lower Columbia F*	0.027	0.007	0.027	0.016	0.040	0.042	0.005	0.042	0.034	0.051	0.056	0.009	0.056	0.042	0.072
21	*Willamette Sp*	0.004	0.003	0.004	0.001	0.010	0.006	0.002	0.006	0.003	0.009	0.008	0.003	0.008	0.004	0.014
22	*Columbia Sp*	0.000	0.001	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.202	0.016	0.201	0.175	0.229	0.242	0.010	0.242	0.226	0.259	0.216	0.016	0.215	0.191	0.242
24	*North Oregon Coast*	0.081	0.013	0.081	0.061	0.103	0.095	0.007	0.095	0.083	0.107	0.071	0.011	0.071	0.054	0.090
25	*Mid Oregon Coast*	0.044	0.010	0.043	0.028	0.062	0.057	0.006	0.057	0.047	0.067	0.029	0.008	0.029	0.016	0.044
26	*S Oregon/California*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

Appendix C14.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the regionwide harvest during the first retention period of the summer troll fishery in SEAK, AY 2013–2014.

		AY 2013 (n = 609)					AY 2014 (n = 787)				
					90% CI					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	*Alsek*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	*Taku*	0.000	0.002	0.000	0.000	0.003	0.000	0.001	0.000	0.000	0.001
5	*Andrew*	0.053	0.010	0.052	0.036	0.071	0.024	0.008	0.023	0.013	0.037
6	*Stikine*	0.003	0.004	0.001	0.000	0.010	0.001	0.002	0.000	0.000	0.004
7	*S Southeast Alaska*	0.050	0.011	0.049	0.033	0.068	0.016	0.007	0.015	0.007	0.028
8	*Nass*	0.001	0.001	0.000	0.000	0.003	0.000	0.001	0.000	0.000	0.002
9	*Skeena*	0.010	0.007	0.009	0.000	0.023	0.008	0.003	0.008	0.004	0.012
10	*BC Coast/Haida Gwaii*	0.020	0.007	0.019	0.010	0.032	0.017	0.006	0.016	0.009	0.027
11	*West Vancouver*	0.106	0.013	0.105	0.086	0.127	0.073	0.011	0.073	0.056	0.093
12	*East Vancouver*	0.003	0.002	0.003	0.000	0.008	0.003	0.002	0.003	0.001	0.007
13	*Fraser*	0.000	0.001	0.000	0.000	0.001	0.003	0.002	0.002	0.000	0.007
14	*Lower Thompson*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.000	0.001	0.000	0.000	0.001	0.010	0.005	0.009	0.003	0.019
16	*South Thompson*	0.106	0.013	0.106	0.086	0.128	0.074	0.010	0.074	0.059	0.091
17	*Puget Sound*	0.002	0.004	0.000	0.000	0.012	0.001	0.002	0.000	0.000	0.005
18	*Washington Coast*	0.074	0.012	0.073	0.055	0.094	0.099	0.014	0.098	0.077	0.122
19	*West Cascades Sp*	0.000	0.001	0.000	0.000	0.000	0.003	0.003	0.001	0.000	0.009
20	*Lower Columbia F*	0.033	0.008	0.032	0.020	0.047	0.048	0.010	0.048	0.034	0.065
21	*Willamette Sp*	0.002	0.002	0.001	0.000	0.006	0.007	0.004	0.006	0.002	0.015
22	*Columbia Sp*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.399	0.021	0.399	0.365	0.433	0.518	0.021	0.518	0.483	0.553
24	*North Oregon Coast*	0.095	0.013	0.094	0.073	0.117	0.070	0.012	0.070	0.053	0.090
25	*Mid Oregon Coast*	0.046	0.010	0.045	0.030	0.063	0.023	0.008	0.023	0.012	0.038
26	*S Oregon/California*	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.002

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

Appendix C15.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the harvest during first retention period of the summer troll fishery in the Northern Outside quadrant in SEAK, AY 2010–2012.

		AY 2010 (n = 412)					AY 2011 (n = 1,360)					AY 2012 [b] (n = 414)				
					90% CI					90% CI					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.002
2	*Alsek*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.003	0.003	0.002	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.003	0.003	0.002	0.000	0.008
4	*Taku*	0.016	0.009	0.015	0.001	0.031	0.000	0.001	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000
5	*Andrew*	0.031	0.010	0.030	0.015	0.049	0.041	0.006	0.041	0.032	0.051	0.054	0.013	0.053	0.034	0.076
6	*Stikine*	0.011	0.010	0.009	0.000	0.029	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.004
7	*S Southeast Alaska*	0.060	0.014	0.059	0.039	0.083	0.018	0.005	0.017	0.011	0.026	0.031	0.010	0.030	0.016	0.050
8	*Nass*	0.000	0.001	0.000	0.000	0.000	0.004	0.003	0.004	0.001	0.010	0.001	0.003	0.000	0.000	0.008
9	*Skeena*	0.000	0.001	0.000	0.000	0.000	0.018	0.005	0.017	0.011	0.026	0.037	0.012	0.037	0.018	0.059
10	*BC Coast/Haida Gwaii*	0.021	0.008	0.021	0.010	0.035	0.026	0.005	0.026	0.018	0.035	0.061	0.014	0.060	0.039	0.085
11	*West Vancouver*	0.073	0.013	0.073	0.053	0.096	0.085	0.008	0.085	0.073	0.098	0.056	0.012	0.055	0.039	0.076
12	*East Vancouver*	0.000	0.001	0.000	0.000	0.001	0.009	0.003	0.009	0.005	0.014	0.000	0.002	0.000	0.000	0.002
13	*Fraser*	0.004	0.004	0.003	0.000	0.013	0.006	0.003	0.006	0.003	0.011	0.002	0.002	0.002	0.000	0.007
14	*Lower Thompson*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.011	0.006	0.011	0.003	0.023	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
16	*South Thompson*	0.235	0.022	0.234	0.200	0.271	0.140	0.010	0.139	0.124	0.156	0.090	0.015	0.089	0.067	0.115
17	*Puget Sound*	0.005	0.004	0.004	0.001	0.012	0.004	0.002	0.004	0.001	0.008	0.011	0.007	0.010	0.000	0.024
18	*Washington Coast*	0.141	0.018	0.140	0.113	0.172	0.153	0.010	0.153	0.136	0.171	0.211	0.021	0.210	0.178	0.246
19	*West Cascades Sp*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	*Lower Columbia F*	0.035	0.010	0.034	0.021	0.053	0.039	0.006	0.038	0.030	0.048	0.080	0.014	0.079	0.058	0.104
21	*Willamette Sp*	0.005	0.004	0.004	0.001	0.012	0.008	0.002	0.007	0.004	0.012	0.010	0.005	0.009	0.003	0.019
22	*Columbia Sp*	0.000	0.001	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.214	0.021	0.213	0.181	0.249	0.250	0.012	0.250	0.230	0.270	0.241	0.021	0.241	0.207	0.277
24	*North Oregon Coast*	0.093	0.017	0.092	0.067	0.122	0.130	0.010	0.130	0.114	0.147	0.082	0.015	0.081	0.059	0.109
25	*Mid Oregon Coast*	0.041	0.013	0.041	0.021	0.064	0.068	0.008	0.068	0.056	0.082	0.029	0.011	0.028	0.012	0.049
26	*S Oregon/California*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

[b] AY 2012 results did not converge at 80,000 iterations and are an average of 5 chains in BAYES.

Appendix C16.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the harvest during first retention period of the summer troll fishery in the Northern Outside quadrant in SEAK, AY 2013–2014.

		AY 2013 (n = 370)					AY 2014 (n = 398)				
					90% CI					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	*Alsek*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	*Taku*	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
5	*Andrew*	0.066	0.014	0.065	0.044	0.091	0.029	0.009	0.028	0.015	0.046
6	*Stikine*	0.000	0.002	0.000	0.000	0.001	0.000	0.002	0.000	0.000	0.003
7	*S Southeast Alaska*	0.024	0.010	0.022	0.009	0.042	0.013	0.008	0.012	0.003	0.028
8	*Nass*	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.002
9	*Skeena*	0.004	0.004	0.003	0.000	0.013	0.000	0.002	0.000	0.000	0.000
10	*BC Coast/Haida Gwaii*	0.013	0.008	0.012	0.003	0.028	0.015	0.007	0.014	0.006	0.027
11	*West Vancouver*	0.091	0.015	0.090	0.067	0.117	0.078	0.014	0.078	0.057	0.102
12	*East Vancouver*	0.005	0.004	0.004	0.000	0.012	0.001	0.001	0.000	0.000	0.003
13	*Fraser*	0.000	0.001	0.000	0.000	0.002	0.003	0.003	0.002	0.000	0.008
14	*Lower Thompson*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.000	0.000	0.000	0.000	0.000	0.012	0.006	0.011	0.004	0.024
16	*South Thompson*	0.079	0.015	0.079	0.056	0.105	0.055	0.012	0.055	0.038	0.076
17	*Puget Sound*	0.003	0.007	0.000	0.000	0.018	0.001	0.002	0.000	0.000	0.005
18	*Washington Coast*	0.106	0.017	0.105	0.078	0.135	0.112	0.017	0.112	0.086	0.141
19	*West Cascades Sp*	0.000	0.001	0.000	0.000	0.000	0.003	0.004	0.001	0.000	0.012
20	*Lower Columbia F*	0.032	0.010	0.031	0.017	0.051	0.052	0.012	0.051	0.034	0.073
21	*Willamette Sp*	0.003	0.003	0.002	0.000	0.009	0.008	0.005	0.007	0.002	0.018
22	*Columbia Sp*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.414	0.026	0.414	0.371	0.458	0.517	0.026	0.517	0.475	0.560
24	*North Oregon Coast*	0.111	0.018	0.111	0.082	0.143	0.072	0.014	0.071	0.050	0.097
25	*Mid Oregon Coast*	0.047	0.013	0.046	0.028	0.070	0.026	0.010	0.025	0.012	0.045
26	*S Oregon/California*	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

Appendix C17.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the regionwide harvest during the second retention period of the summer troll fishery in SEAK, AY 2010–2012.

		AY 2010 (n = 541)					AY 2011 (n = 876)					AY 2012 (n = 676)				
					90% CI					90% CI					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	*Alsek*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.001	0.000	0.005
3	*N Southeast Alaska*	0.006	0.003	0.005	0.002	0.013	0.000	0.000	0.000	0.000	0.000	0.003	0.002	0.002	0.000	0.007
4	*Taku*	0.005	0.004	0.004	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.002
5	*Andrew*	0.034	0.009	0.034	0.021	0.050	0.020	0.006	0.020	0.011	0.031	0.063	0.011	0.062	0.045	0.082
6	*Stikine*	0.001	0.002	0.000	0.000	0.006	0.003	0.004	0.002	0.000	0.011	0.014	0.006	0.013	0.005	0.024
7	*S Southeast Alaska*	0.133	0.017	0.133	0.106	0.161	0.057	0.009	0.057	0.043	0.072	0.132	0.015	0.132	0.109	0.157
8	*Nass*	0.000	0.001	0.000	0.000	0.000	0.003	0.003	0.003	0.000	0.009	0.004	0.003	0.003	0.000	0.009
9	*Skeena*	0.001	0.002	0.000	0.000	0.005	0.003	0.003	0.003	0.000	0.008	0.011	0.005	0.011	0.005	0.019
10	*BC Coast/Haida Gwaii*	0.052	0.013	0.051	0.032	0.073	0.040	0.008	0.040	0.028	0.054	0.051	0.010	0.051	0.035	0.070
11	*West Vancouver*	0.048	0.009	0.047	0.034	0.064	0.049	0.008	0.049	0.037	0.062	0.045	0.008	0.044	0.032	0.059
12	*East Vancouver*	0.010	0.005	0.010	0.004	0.019	0.017	0.005	0.016	0.010	0.025	0.009	0.004	0.008	0.004	0.016
13	*Fraser*	0.017	0.006	0.016	0.008	0.028	0.009	0.004	0.009	0.004	0.016	0.003	0.002	0.003	0.001	0.008
14	*Lower Thompson*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.000	0.001	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000
16	*South Thompson*	0.054	0.010	0.053	0.038	0.072	0.039	0.007	0.039	0.029	0.051	0.016	0.005	0.016	0.009	0.026
17	*Puget Sound*	0.012	0.006	0.012	0.003	0.024	0.016	0.005	0.016	0.009	0.025	0.005	0.003	0.004	0.001	0.011
18	*Washington Coast*	0.154	0.016	0.154	0.129	0.181	0.147	0.013	0.146	0.126	0.168	0.159	0.015	0.159	0.135	0.185
19	*West Cascades Sp*	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.004	0.005	0.004	0.004	0.000	0.013
20	*Lower Columbia F*	0.019	0.007	0.018	0.009	0.030	0.050	0.008	0.050	0.037	0.064	0.041	0.009	0.041	0.028	0.057
21	*Willamette Sp*	0.023	0.007	0.023	0.013	0.036	0.020	0.005	0.020	0.012	0.029	0.016	0.005	0.015	0.008	0.025
22	*Columbia Sp*	0.000	0.000	0.000	0.000	0.000	0.003	0.002	0.002	0.000	0.007	0.000	0.000	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.188	0.017	0.188	0.161	0.217	0.345	0.016	0.344	0.318	0.372	0.290	0.018	0.290	0.261	0.319
24	*North Oregon Coast*	0.158	0.018	0.157	0.130	0.187	0.114	0.012	0.114	0.095	0.134	0.098	0.013	0.098	0.078	0.120
25	*Mid Oregon Coast*	0.085	0.014	0.084	0.063	0.109	0.062	0.010	0.061	0.047	0.078	0.033	0.008	0.032	0.020	0.048
26	*S Oregon/California*	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

Appendix C18.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the regionwide harvest during the second retention period of the summer troll fishery in SEAK, AY 2014. No second retention period occurred in AY 2013.

		AY 2014 (n = 789)				
					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.000	0.000	0.000	0.000
2	*Alsek*	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.000	0.000	0.000	0.000	0.000
4	*Taku*	0.000	0.001	0.000	0.000	0.001
5	*Andrew*	0.016	0.006	0.016	0.008	0.026
6	*Stikine*	0.002	0.003	0.000	0.000	0.008
7	*S Southeast Alaska*	0.082	0.010	0.082	0.066	0.099
8	*Nass*	0.004	0.003	0.004	0.000	0.010
9	*Skeena*	0.007	0.005	0.006	0.001	0.015
10	*BC Coast/Haida Gwaii*	0.041	0.007	0.041	0.030	0.054
11	*West Vancouver*	0.062	0.009	0.061	0.048	0.077
12	*East Vancouver*	0.014	0.005	0.014	0.008	0.023
13	*Fraser*	0.005	0.003	0.005	0.002	0.010
14	*Lower Thompson*	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.004	0.003	0.003	0.001	0.009
16	*South Thompson*	0.008	0.004	0.008	0.003	0.015
17	*Puget Sound*	0.009	0.004	0.009	0.004	0.017
18	*Washington Coast*	0.062	0.010	0.061	0.046	0.079
19	*West Cascades Sp*	0.001	0.001	0.000	0.000	0.003
20	*Lower Columbia F*	0.031	0.007	0.030	0.020	0.043
21	*Willamette Sp*	0.012	0.004	0.011	0.006	0.019
22	*Columbia Sp*	0.000	0.000	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.564	0.018	0.564	0.534	0.593
24	*North Oregon Coast*	0.062	0.010	0.062	0.047	0.079
25	*Mid Oregon Coast*	0.013	0.005	0.012	0.005	0.022
26	*S Oregon/California*	0.001	0.002	0.001	0.000	0.004

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

Appendix C19.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the harvest during second retention period of the summer troll fishery in the Northern Outside quadrant in SEAK, AY 2010–2012.

		AY 2010 (n = 332)					AY 2011 (n = 441)					AY 2012 (n = 463)				
					90% CI					90% CI					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%	Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	*Alsek*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.002	0.000	0.007
3	*N Southeast Alaska*	0.003	0.003	0.002	0.000	0.009	0.000	0.001	0.000	0.000	0.000	0.002	0.003	0.001	0.000	0.008
4	*Taku*	0.008	0.007	0.007	0.000	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.003
5	*Andrew*	0.027	0.010	0.026	0.013	0.045	0.034	0.010	0.033	0.019	0.052	0.038	0.011	0.037	0.021	0.057
6	*Stikine*	0.001	0.003	0.000	0.000	0.004	0.000	0.001	0.000	0.000	0.000	0.018	0.008	0.018	0.007	0.033
7	*S Southeast Alaska*	0.032	0.012	0.030	0.014	0.054	0.040	0.011	0.040	0.023	0.060	0.077	0.014	0.076	0.054	0.102
8	*Nass*	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
9	*Skeena*	0.002	0.003	0.000	0.000	0.009	0.004	0.004	0.003	0.000	0.012	0.000	0.001	0.000	0.000	0.000
10	*BC Coast/Haida Gwaii*	0.046	0.014	0.045	0.026	0.070	0.033	0.010	0.031	0.018	0.051	0.040	0.011	0.039	0.024	0.060
11	*West Vancouver*	0.064	0.014	0.063	0.043	0.088	0.065	0.012	0.065	0.047	0.086	0.051	0.011	0.051	0.035	0.070
12	*East Vancouver*	0.000	0.000	0.000	0.000	0.000	0.014	0.006	0.014	0.006	0.025	0.005	0.004	0.005	0.001	0.013
13	*Fraser*	0.003	0.003	0.002	0.000	0.009	0.009	0.005	0.009	0.003	0.018	0.004	0.003	0.004	0.001	0.010
14	*Lower Thompson*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.000	0.001	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000
16	*South Thompson*	0.047	0.012	0.046	0.028	0.068	0.028	0.008	0.027	0.016	0.043	0.018	0.007	0.017	0.008	0.030
17	*Puget Sound*	0.003	0.003	0.002	0.000	0.010	0.018	0.007	0.017	0.008	0.031	0.001	0.002	0.000	0.000	0.005
18	*Washington Coast*	0.226	0.025	0.225	0.186	0.267	0.170	0.019	0.169	0.139	0.202	0.203	0.020	0.202	0.171	0.236
19	*West Cascades Sp*	0.000	0.001	0.000	0.000	0.000	0.001	0.003	0.000	0.000	0.006	0.005	0.005	0.003	0.000	0.014
20	*Lower Columbia F*	0.023	0.010	0.022	0.010	0.041	0.040	0.011	0.040	0.024	0.059	0.054	0.012	0.053	0.036	0.074
21	*Willamette Sp*	0.028	0.009	0.027	0.014	0.045	0.029	0.008	0.028	0.017	0.043	0.019	0.007	0.019	0.009	0.032
22	*Columbia Sp*	0.000	0.000	0.000	0.000	0.000	0.005	0.004	0.004	0.001	0.013	0.000	0.001	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.224	0.023	0.224	0.187	0.264	0.368	0.023	0.368	0.330	0.407	0.327	0.022	0.326	0.290	0.364
24	*North Oregon Coast*	0.178	0.024	0.178	0.140	0.219	0.099	0.016	0.099	0.075	0.126	0.104	0.016	0.103	0.079	0.131
25	*Mid Oregon Coast*	0.084	0.018	0.083	0.056	0.116	0.040	0.011	0.039	0.024	0.059	0.031	0.010	0.030	0.015	0.049
26	*S Oregon/California*	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).

Appendix C20.–Estimated contributions of 26 fine-scale reporting groups of Chinook salmon to the harvest during second retention period of the summer troll fishery in the Northern Outside quadrant in SEAK, AY 2014. No second retention period occurred in AY 2013.

		AY 2014 (n = 396)				
					90% CI	
Reporting Group[a]		Mean	SD	Median	5%	95%
1	*Situk*	0.000	0.000	0.000	0.000	0.000
2	*Alsek*	0.000	0.000	0.000	0.000	0.000
3	*N Southeast Alaska*	0.000	0.000	0.000	0.000	0.000
4	*Taku*	0.000	0.001	0.000	0.000	0.000
5	*Andrew*	0.015	0.007	0.014	0.006	0.028
6	*Stikine*	0.002	0.004	0.000	0.000	0.011
7	*S Southeast Alaska*	0.034	0.010	0.033	0.019	0.053
8	*Nass*	0.000	0.000	0.000	0.000	0.000
9	*Skeena*	0.000	0.001	0.000	0.000	0.001
10	*BC Coast/Haida Gwaii*	0.018	0.007	0.017	0.008	0.031
11	*West Vancouver*	0.067	0.013	0.066	0.047	0.089
12	*East Vancouver*	0.011	0.006	0.010	0.003	0.022
13	*Fraser*	0.005	0.004	0.004	0.001	0.012
14	*Lower Thompson*	0.000	0.000	0.000	0.000	0.000
15	*North Thompson*	0.006	0.004	0.005	0.001	0.013
16	*South Thompson*	0.003	0.004	0.001	0.000	0.011
17	*Puget Sound*	0.006	0.005	0.005	0.000	0.016
18	*Washington Coast*	0.067	0.014	0.067	0.046	0.091
19	*West Cascades Sp*	0.001	0.002	0.000	0.000	0.004
20	*Lower Columbia F*	0.031	0.010	0.030	0.016	0.048
21	*Willamette Sp*	0.010	0.005	0.009	0.003	0.020
22	*Columbia Sp*	0.000	0.000	0.000	0.000	0.000
23	*Interior Columbia Su/F*	0.647	0.024	0.647	0.606	0.687
24	*North Oregon Coast*	0.065	0.014	0.064	0.044	0.088
25	*Mid Oregon Coast*	0.011	0.006	0.010	0.003	0.023
26	*S Oregon/California*	0.000	0.001	0.000	0.000	0.001

Note: Sample sizes (n), standard deviation (SD), and 90% credibility intervals are provided.

[a] Run timing components are abbreviated as Sp (spring), Su (summer), and F (fall).