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Harvest of Southeast Alaska Wild-Origin Chinook Salmon in the Southeast Alaska Troll and Sport Fisheries, 2005–2023

by

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November 2024

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

SPECIAL PUBLICATION NO. 24-15

HARVEST OF SOUTHEAST ALASKA WILD-ORIGIN CHINOOK SALMON IN THE SOUTHEAST ALASKA TROLL AND SPORT FISHERIES, 2005–2023

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ABSTRACT

Chinook salmon originating in Alaska, British Columbia, and the Pacific Northwest are harvested in Southeast Alaska (SEAK) commercial troll and sport fisheries. Owing to its mixed stock nature, the overall SEAK Chinook salmon fishery is managed as 1 of 3 aggregate abundance-based management fisheries under provisions of the Pacific Salmon Treaty Agreement. The Alaska Department of Fish and Game (ADF&G) has used coded wire tag (CWT) analysis since the 1970s for use domestically and in Pacific Salmon Treaty fisheries; ADF&G has also used genetic mixed stock analysis to estimate the stock composition of Chinook salmon harvests in the SEAK troll and sport fisheries—collectively—since 2004 based on a genetic baseline developed by the Genetic Analysis of Pacific Salmonids group for use in Pacific Salmon Treaty fisheries. This report provides estimates of harvest from SEAK-origin fish in total and for individual wild-and hatchery-origin fish, 2005–2023 using integrated CWT and genetic mixed stock analysis. The annual percentage of wild fish harvested ranged from 3% to 15% in the troll fishery and from 6% to 28% in the sport fishery.

Keywords: Chinook salmon, *Oncorhynchus tshawytscha*, Southeast Alaska, troll fishery, sport fishery, coded wire tag, CWT, mixed stock analysis, MSA, genetics, terminal harvest area, Ketchikan, Petersburgh, Wrangell, Pacific Salmon Commission, PSC, Pacific Salmon Treaty, PST

INTRODUCTION

This report provides estimates of large (≥28-inch total length) Alaska wild-origin Chinook salmon *Oncorhynchus tshawytscha* harvested in the Southeast Alaska (SEAK) commercial troll and sport fisheries from 2005 to 2023, along with a description of the methods used.

Chinook salmon originating from SEAK rivers, Transboundary rivers (TBR), and SEAK hatcheries are harvested throughout SEAK in commercial troll, net, and sport fisheries, along with stocks originating outside Alaska (CTC 2023). Of concern are the declines in abundance of SEAK and TBR wild stocks due to decreasing productivity (CTC 2024). In October 2017, the Alaska Board of Fisheries (BOF) accepted Alaska Department of Fish and Game's (ADF&G) recommendation to list the Unuk, Chilkat, and King Salmon Rivers as stocks of management concern (SOC), and in October 2020, the BOF designated the Taku, Stikine, Andrew Creek, and Chickamin as SOCs under the Policy for the Management of Sustainable Salmon Fisheries (5 AAC 39.222), due to the chronic inability of these stocks to meet the lower bound of the escapement goal range despite management efforts. These declines have led to restrictions in SEAK fisheries, including management actions in 2017 and SOC action plans in 2018 and 2022, designed to conserve these Chinook salmon stocks (Lum and Fair 2018a, 2018b; Hagerman et al. 2022; Meredith et al. 2022; Salomone et al. 2022).

ADF&G has conducted stock assessments for the SEAK hatchery aggregate since 1985. This is largely due to the SEAK Hatchery Add-on provision of the Pacific Salmon Treaty (PST) under the Pacific Salmon Commission (PSC), which stipulates that most SEAK hatchery Chinook salmon harvested in SEAK fisheries do not count against the annual PST harvest limit (PSC 2020; CTC 1992).

There are 34 known wild Chinook salmon stocks in SEAK, and ADF&G monitors escapement for 11 of them annually (Situk, Alsek, Chilkat, Taku, King Salmon, Stikine, Andrews, Unuk, Chickamin, Blossom, and Keta stocks). Three of these are TBR stocks (Alsek, Taku, and Stikine), while the remaining 8 are referred to as SEAK stocks. Currently, ADF&G conducts juvenile tagging projects on 4 SEAK and TBR stocks (Chilkat, Taku, Stikine, and Unuk), marking them with adipose fin clips and tagging them with coded wire tags (CWT). These projects generate estimates of escapement, harvest, run size, and harvest rates (see Appendix B). The SEAK and TBR Chinook stocks are managed domestically and under provisions of PST Chapter 3. In

addition, TBR stocks harvested in terminal and inriver areas are subject to PST Chapter 1 obligations.

Separating hatchery and wild salmon harvests in mixed stock marine fisheries is challenging, because unmarked hatchery and wild fish are visually indistinguishable. Most harvest estimates of wild stocks rely on indirect methods. However, combining CWT data with genetic mixed stock analysis (MSA) allows for direct estimation.

OBJECTIVES

1. Estimate the harvest (and SE) of large Chinook salmon by SEAK-origin (SEAK Hatchery and SEAK Wild) in the troll fishery by individual strata and for the entire SEAK region, 2005–2023.
2. Estimate the harvest (and SE) of large Chinook salmon by SEAK-origin (SEAK Hatchery and SEAK Wild) in the sport fishery by individual strata and for the entire SEAK region, 2005–2023.

METHODS

Contribution estimates based off recoveries of CWTs in the mixed stock fisheries allow direct estimation of harvest; however, coupled with robust catch sampling programs, this method is limited to tagged hatchery stocks having known release sizes and a handful of tagged wild stocks having estimated total abundances. Since 1985, ADF&G has used CWT data to estimate SEAK hatchery Chinook salmon contributions to SEAK commercial and sport fisheries. Although only a portion of SEAK hatchery and wild Chinook salmon production is coded-wire-tagged, for a given release, tagged fish are assumed to be representative of the untagged population (Bernard and Clark 1996).

Since 2004, ADF&G has used genetic MSA techniques to estimate the stock composition of Chinook salmon harvested in SEAK troll and sport fisheries. Genetic MSA enables direct estimation of major stock groups contributing to fisheries, including SEAK- and TBR-origin fish (Gilk-Baumer et al. 2013). However, current methods do not differentiate between hatchery and wild stocks from the same brood source. For this report, SEAK and TBR genetic MSA reporting groups are combined into one group (SEAK), while non-SEAK stocks are grouped as “Other.”

The harvest of SEAK and TBR wild stocks in the SEAK mixed stock fisheries is estimated by combining CWT and genetic MSA methodologies. In this analysis, genetic MSA is used to estimate the stock proportions of all (hatchery and wild) SEAK- and TBR-origin Chinook salmon. These proportions are then multiplied by the total harvest to estimate the number of SEAK and TBR fish harvested. Separately, recoveries of CWTs germane to the SEAK hatchery program, are used to estimate the harvest of SEAK hatchery fish. Assuming harvest estimates based off CWTs adequately represent SEAK hatchery production, and genetic MSA effectively represents SEAK- and TBR-origin Chinook salmon, the wild fish harvest is estimated by subtracting SEAK hatchery harvest from the total SEAK and TBR harvest. This approach, referred to as the “subtraction method” (Figure 1), is applied to the SEAK troll fisheries by season, and the SEAK sport fisheries by area, collectively accounting for 86% of all Chinook salmon harvested in SEAK from 2005 to 2023. Fisheries not included in this analysis were excluded due to insufficient or sporadic sample sizes and relatively small harvest numbers.

Three types of data are required to apply the subtraction method: 1) total harvest, 2) SEAK hatchery-origin harvest (based off CWTs), and 3) the proportion of SEAK harvest by stock group (based off genetic MSA). Harvest data are sourced from ADF&G fish tickets for the troll fishery, and from the statewide harvest survey (SWHS)[1] and the SEAK marine harvest studies program for the sport fishery (Jaenicke et al. 2024). Troll fishery harvest data are summarized using the "SEAK Add-On" program (D. Leonard, Division of Commercial Fisheries, ADF&G, Juneau, personal communication, 2024). Sport fishery harvest data are summarized by the ADF&G Division of Sport Fish (D. Tersteeg, Division of Sport Fish, ADF&G, Douglas, personal communication, 2024) and obtained from the Mark, Tag, and Age Lab's online database (DFGCWTOTOP[2]).

The commercial troll harvest of SEAK hatchery-origin fish is calculated using CWT recovery data collected by the SEAK port sampling program. These data are obtained from the ADF&G Mark, Tag, and Age Lab and summarized with the "SEAK Add-On" program (e.g., CTC 2024; PSC 2023). Sport harvest of SEAK hatchery-origin fish is calculated using CWT recovery data collected by the SEAK marine harvest studies program. These data are also obtained from the ADF&G Mark, Tag, and Age Lab and summarized for this report. Genetic MSA data are obtained from the ADF&G Gene Conservation Lab (Gilk-Baumer et al. 2013, 2017a–2018; Shedd et al. 2021a–2022; K. Shedd, Division of Commercial Fisheries, ADF&G, Anchorage, unpublished data).

In its simplest form, the subtraction method is:

$$\textit{Harvest of wild fish} = \textit{Harvest of all fish} - \textit{Harvest of hatchery fish}$$

Because the *Harvest of all fish* and *Harvest of hatchery fish* were estimated from numerous sources, a detailed methodology was developed to apply this equation. The method, notation, and formulae are described in Appendix A.

A list of the fisheries analyzed is presented in Table 1. For the commercial troll fishery, data were analyzed by season: early winter, late winter, spring, summer retention 1, and summer retention 2. The spring troll fishery is reported as an aggregate of spring fisheries, including spring, TBR terminal, and terminal exclusion area fisheries and the summer retention 2 fishery is an aggregate of the summer retention 2 and 3 fisheries. Troll fisheries not included in this report are experimental mark-selective fisheries (2016 and 2017), Metlakatla Indian Community Annette Island Reserve, and confiscated fish, which together represent less than 1% of the total commercial troll harvest.

The sport fishery was analyzed by area: Ketchikan, northern inside (Juneau, Haines, Skagway), Petersburg and Wrangell, and outside (Craig, Sitka, Gustavus, Elfin Cove, Glacier Bay, Yakutat). For both troll and sport fisheries, it was assumed that all harvest in terminal exclusion areas was of SEAK hatchery-origin, except in Yakutat, where fish were assumed to be SEAK wild-origin.

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[1] Alaska Sport Fishing Survey database [Internet]. 1996– . Anchorage, AK: Alaska Department of Fish and Game, Division of Sport Fish. Available from: http://www.adfg.alaska.gov/sf/sportfishingsurvey/.

[2] DFGCWTOTOP database [Internet]. 1976–present. Juneau, AK: Alaska Department of Fish and Game, Division of Commercial Fisheries, Mark, Tag and Age Laboratory. [accessed September 2024]. Available from: https://mtalab.adfg.alaska.gov/CWT/reports/default.aspx.

RESULTS

Results for the commercial troll and sport fisheries are presented in Tables 2–13, and Figures 2–7. The key findings highlight significant temporal and spatial variation in the percentage of Alaska wild Chinook salmon harvested in both fisheries. The annual percentage of wild fish harvested ranged from 3% to 15% in the troll fishery (Table 3), and 6% to 28% in the sport fishery (Table 4).

DISCUSSION

Following the implementation of SOC action plans in 2018 and 2022, the average annual harvest of wild Chinook salmon decreased by 63%, from 34,467 wild fish pre-SOC (2005–2017) to 12,649 (2018–2023; Table 2).

This reduction reflects both lower wild stock abundance and the effectiveness of management under SOC action plans. The decline in harvests of both hatchery and wild stocks indicates lower abundances, but without management action, harvest rates would have likely remained stable. Before SOC implementation, average harvest rates for exploitation indicator stocks were 26% for the Chilkat, 23% for the Taku, 27% for the Stikine, and 47% for the Unuk. After SOC actions, these rates dropped to 6%, 9%, 10%, and 29%, respectively (Appendix B). The shift in the hatchery-to-wild harvest ratio further underscores the impact of management. While reduced abundance explains some of the decline, the ratio of hatchery-to-wild fish shifted from 1.1 (2005–2017) to 1.5 (2018–2023; Table 2). This demonstrates that management measures have not only reduced pressure on wild stocks, but also sustained harvest opportunity for hatchery stocks.

A limitation of the subtraction method is that it can occasionally yield negative estimates when the SEAK wild harvest estimate is lower than the SEAK hatchery estimate. In such cases (e.g., 2016 outside sport, 2005 and 2011 early winter troll), the SEAK wild estimate was set to zero and noted accordingly. No adjustments were made to resolve discrepancies between genetic MSA and CWT estimates. However, it is important to note that negative estimates occurred in only 3 of 168 instances, and overall, wild harvest estimates using this method were highly precise, particularly when data were aggregated.

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[3] https://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2017-2018/se/rcs/rc007_ADF&G_Chinook_origins_memo.pdf https://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2021-2022/se/rcs/rc008_ADFG_King_Salmon_Origins_Technical_Memo.pdf

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TABLES AND FIGURES

Table 1.–Listing of fishery definitions for the Southeast Alaska troll and sport fisheries.

Gear	Fishery	Notes
Troll	Early winter	October 11 through December 31. By convention, harvest in this fishery was considered part of the following year's harvest and referred to as accounting year (i.e., accounting year [AY] = calendar year + 1).
	Late winter	January 1 through April 30 (or earlier if guideline harvest level of 45,000 was reached).
	Spring	May 1 (or earlier if the late winter fishery closes prior to April 30) through June 30. Areas open are designed to provide access to Alaska hatchery fish, and the length of the opening depends on the percentage of Alaska hatchery fish harvested.
	Terminal exclusion	Subset of the Spring fishery consisting of hatchery terminal areas: Hidden Falls, Neets Bay, Wrangell Narrows, and Anita Bay. Harvest in the terminal exclusion areas was considered a part of the Spring troll fishery (see Appendix A for methods).
	Transboundary river terminal	Subset of the Spring fishery consisting of directed and non-directed troll fisheries that take place in areas near the Taku and Stikine rivers. Harvest in transboundary river terminal fisheries was considered a part of the Spring troll fishery (see Appendix A for methods).
	Summer retention 1	July 1 until 70% of the remaining troll allocation is caught. The ending date of this fishery varies annually, ranging from July 4 to July 20.
	Summer retention 2+	Second or third week of August until the remaining troll allocation is caught. The ending date of this fishery varies annually, ranging from August 17 to September 20. A second retention period did not occur in 2013, 2015, and 2017. A third retention period occurred in 2023.
Sport	Ketchikan	Areas around Ketchikan and East Prince of Wales Island (Districts 101 and 102). Includes terminal marine shoreline harvest at Herring Cove and terminal freshwater harvest in Ketchikan Creek.
	Northern inside	Area around Juneau, Haines, and Skagway (Districts 111, 112, and 115). Includes terminal marine shoreline harvest near Macaulay Hatchery and Auke Bay and terminal freshwater harvest areas with no wild stocks.
	Petersburg - Wrangell	Areas around Petersburg and Wrangell (Districts 106, 107, and 108). Includes terminal marine and terminal marine shoreline harvest in the Wrangell Narrows Terminal Harvest Area and terminal freshwater harvest in Blind Slough.
	Outside	Areas around Craig, Sitka, Gustavus, Elfin Cove, Glacier Bay, and Yakutat (Districts 103, 113, 114, 116, 181, and 183). Includes terminal freshwater harvest in Sitka, West Prince of Wales Island, and Yakutat.

Table 2.–Harvest of Southeast Alaska (SEAK)-origin Chinook salmon in the SEAK commercial troll and sport fisheries, accounting years AY2005–2023.

			SEAK				SEAK Hatchery				SEAK Wild			
Accounting year	Total harvest	SE	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)
2005	420,401	2,821	115,316	4,481	27	1.1	58,416	4,639	14	1.1	57,044	6,450	14	1.5
2006	364,427	2,784	84,822	3,800	23	1.1	36,523	3,870	10	1.1	48,299	5,424	13	1.5
2007	347,276	2,858	98,239	3,754	28	1.1	51,427	3,887	15	1.1	46,813	5,404	13	1.6
2008	198,461	2,286	79,465	2,382	40	1.3	47,759	2,522	24	1.3	31,706	3,469	16	1.8
2009	238,491	2,989	74,603	2,019	31	0.9	42,753	2,155	18	0.9	31,850	2,953	13	1.3
2010	251,290	2,611	75,721	2,195	30	0.9	37,503	2,314	15	0.9	38,218	3,190	15	1.3
2011	305,944	2,187	71,436	1,966	23	0.7	37,101	2,159	12	0.7	34,334	2,919	11	1.0
2012	253,455	1,463	71,793	2,372	28	1.0	30,370	2,512	12	1.0	41,422	3,455	16	1.4
2013	203,132	2,046	55,237	2,025	27	1.0	31,652	2,145	16	1.1	23,585	2,950	12	1.5
2014	439,586	2,782	64,240	2,628	15	0.6	31,917	2,734	7	0.6	32,323	3,792	7	0.9
2015	348,294	2,296	68,723	2,320	20	0.7	37,880	2,459	11	0.7	30,844	3,380	9	1.0
2016	343,031	2,578	43,824	1,737	13	0.5	23,102	1,849	7	0.5	21,744	2,537	6	0.7
2017	177,285	1,869	28,526	1,105	16	0.6	18,636	1,180	11	0.7	9,890	1,617	6	0.9
2018	136,302	1,241	33,683	1,267	25	1.0	18,406	1,354	14	1.0	15,277	1,854	11	1.4
2019	137,328	1,206	28,162	963	21	0.7	15,619	1,065	11	0.8	12,542	1,436	9	1.1
2020	202,970	1,479	25,785	1,158	13	0.6	15,342	1,223	8	0.6	10,443	1,684	5	0.8
2021	204,859	2,236	30,647	1,146	15	0.6	19,862	1,260	10	0.6	10,785	1,703	5	0.9
2022	237,828	2,048	39,137	1,412	16	0.6	23,261	1,519	10	0.6	15,875	2,074	7	0.9
2023	201,856	2,910	27,705	952	14	0.5	16,734	1,059	8	0.5	10,971	1,424	5	0.7
Total	5,012,216	10,097	1,117,063	10,069	22	0.2	594,264	10,552	12	0.2	523,965	14,585	10	0.3

Note: Accounting year (AY) = harvest from the previous year in the early winter troll fishery (October 11–December 31); otherwise represents calendar year.

Note: Total harvest is from fish tickets, statewide harvest survey, and the SEAK marine sport creel program, and includes the small amount of unsampled harvest. Number SEAK, SEAK Hatchery, and SEAK Wild is computed by adding individual strata estimates together, and the standard error (SE) is computed by adding the squared SEs and taking its square root. Percent SEAK, SEAK Hatchery, and SEAK Wild is calculated by dividing Number SEAK, SEAK Hatchery, and SEAK Wild by Total harvest, and the SEs computed with the variance formula for the ratio of random variables. The Total row is either a sum (Total Harvest, Number SEAK, Number SEAK Hatchery, Number SEAK Wild), or a sum divided by Total harvest (Percent SEAK, Percent SEAK Hatchery, Percent SEAK Wild).

Table 3.–Harvest of Southeast Alaska (SEAK)-origin Chinook salmon in the SEAK commercial troll fishery, accounting years AY2005–2023.

Accounting year	Total harvest	Sampled harvest	SEAK				SEAK Hatchery				SEAK Wild			
			Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)
2005	338,451	338,024	72,190	4,318	21	1.3	35,825	1,199	11	0.4	36,510	4,481	11	1.3
2006	282,315	282,258	50,664	3,728	18	1.3	20,830	734	7	0.3	29,834	3,800	11	1.3
2007	268,146	267,985	63,324	3,616	24	1.3	30,432	1,009	11	0.4	32,892	3,754	12	1.4
2008	151,936	151,852	47,839	2,233	32	1.5	29,212	828	19	0.5	18,627	2,382	12	1.6
2009	175,644	175,335	38,399	1,874	22	1.1	20,558	752	12	0.4	17,841	2,019	10	1.2
2010	195,620	195,488	50,103	2,069	26	1.1	21,724	733	11	0.4	28,379	2,195	15	1.1
2011	242,569	242,558	46,517	1,751	19	0.7	25,923	892	11	0.4	20,594	1,966	8	0.8
2012	209,074	209,061	53,347	2,224	26	1.1	21,295	825	10	0.4	32,052	2,372	15	1.1
2013	149,541	149,485	33,852	1,897	23	1.3	18,287	707	12	0.5	15,565	2,025	10	1.4
2014	355,570	355,426	40,051	2,518	11	0.7	18,487	753	5	0.2	21,563	2,628	6	0.7
2015	269,862	269,836	42,153	2,172	16	0.8	22,330	814	8	0.3	19,823	2,320	7	0.9
2016	276,432	275,943	29,672	1,617	11	0.6	13,916	634	5	0.2	15,756	1,737	6	0.6
2017	129,649	126,536	15,656	1,025	12	0.8	8,662	413	7	0.3	6,994	1,105	6	0.9
2018	107,565	107,096	20,250	1,174	19	1.1	9,846	476	9	0.4	10,405	1,267	10	1.2
2019	109,364	108,623	17,671	849	16	0.8	9,232	455	8	0.4	8,438	963	8	0.9
2020	169,916	169,797	16,662	1,089	10	0.6	8,854	393	5	0.2	7,808	1,158	5	0.7
2021	163,210	162,886	19,053	1,018	12	0.6	12,963	525	8	0.3	6,089	1,146	4	0.7
2022	196,783	196,658	25,691	1,295	13	0.7	14,230	561	7	0.3	11,461	1,412	6	0.7
2023	143,377	142,709	16,530	831	12	0.6	11,560	464	8	0.3	4,971	952	3	0.7
Total	3,935,024	3,927,556	699,625	9,562	18	0.2	354,166	3,155	9	0.1	345,603	10,069	9	0.3

Note: Accounting year (AY) = harvest from the previous year in the early winter troll fishery (October 11–December 31); otherwise represents calendar year.

Note: Total harvest is from fish tickets and Sampled harvest is the amount of harvest sampled for both coded wire tags and genetics. Number SEAK, SEAK Hatchery, and SEAK Wild is computed by adding individual strata estimates together, and the standard error (SE) computed by adding the squared SEs and taking its square root. Percent SEAK, SEAK Hatchery, and SEAK Wild is calculated by dividing Number SEAK, SEAK Hatchery, and SEAK Wild by Total harvest and the SEs computed with the variance formula for the ratio of random variables. The Total row is either a sum (Total harvest, Number SEAK, Number SEAK Hatchery, Number SEAK Wild) or a sum divided by Total harvest (Percent SEAK, Percent SEAK Hatchery, Percent SEAK Wild).

Table 4.–Harvest of Southeast Alaska (SEAK)-origin Chinook salmon in the SEAK sport fishery, 2005–2023.

			SEAK				SEAK Hatchery				SEAK Wild			
Year	Total harvest	SE	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)
2005	81,950	2,821	43,126	2,035	53	3.1	22,591	1,536	28	2.1	20,534	2,549	25	3.2
2006	82,169	2,784	34,158	2,254	42	3.1	15,693	1,126	19	1.5	18,465	2,520	22	3.2
2007	79,291	2,858	34,915	2,024	44	3.0	20,994	1,610	26	2.2	13,920	2,586	18	3.3
2008	46,609	2,286	31,625	1,892	68	5.2	18,547	1,785	40	4.3	13,079	2,601	28	5.7
2009	63,156	2,989	36,204	2,356	57	4.6	22,195	2,100	35	3.7	14,009	3,156	22	5.1
2010	55,802	2,611	25,618	1,929	46	4.1	15,779	1,919	28	3.7	9,838	2,721	18	4.9
2011	63,386	2,187	24,919	1,369	39	2.6	11,178	1,000	18	1.7	13,741	1,695	22	2.8
2012	44,394	1,463	18,446	995	42	2.6	9,075	904	20	2.1	9,370	1,345	21	3.1
2013	53,647	2,046	21,385	1,104	40	2.6	13,365	1,166	25	2.4	8,019	1,606	15	3.0
2014	84,160	2,782	24,189	1,590	29	2.1	13,430	1,569	16	1.9	10,759	2,234	13	2.7
2015	78,458	2,296	26,571	1,290	34	1.9	15,550	1,301	20	1.8	11,021	1,832	14	2.4
2016	67,088	2,578	14,152	1,425	21	2.3	9,185	1,470	14	2.3	5,988	2,048	9	3.1
2017	50,749	1,869	12,871	865	25	1.9	9,975	986	20	2.1	2,896	1,311	6	2.6
2018	29,206	1,241	13,433	913	46	3.7	8,561	963	29	3.5	4,872	1,327	17	4.6
2019	28,705	1,206	10,491	525	37	2.4	6,387	673	22	2.5	4,104	853	14	3.0
2020	33,173	1,479	9,122	467	27	1.9	6,487	595	20	2.0	2,635	756	8	2.3
2021	41,973	2,236	11,594	707	28	2.2	6,899	666	16	1.8	4,696	971	11	2.4
2022	41,170	2,048	13,446	790	33	2.5	9,031	702	22	2.0	4,415	1,057	11	2.6
2023	59,147	2,910	11,175	799	19	1.6	5,174	423	9	0.8	6,001	904	10	1.6
Total	1,084,233	10,097	417,437	6,350	39	0.7	240,098	5,550	22	0.6	178,361	8,434	16	0.9

Note: Total harvest from 2005–2018 is from statewide harvest survey, and 2019–2023 is from the SEAK marine sport creel program. All harvest is sampled for coded wire tags and represented by genetic mixed stock analysis estimates. Number SEAK, SEAK Hatchery, and SEAK Wild is computed by adding individual strata estimates together, and the standard error (SE) computed by adding the squared SEs and taking its square root. Percent SEAK, SEAK Hatchery, and SEAK Wild is calculated by dividing Number SEAK, SEAK Hatchery, and Seak Wild by Total Harvest and the SEs computed with the variance formula for the ratio of random variables. The Total row is either a sum (Total harvest, Number SEAK, Number SEAK Hatchery, Number SEAK Wild), or a sum divided by Total harvest (Percent SEAK, Percent SEAK Hatchery, Percent SEAK Wild).

Table 5.–Harvest of Southeast Alaska (SEAK)-origin Chinook salmon in the early winter troll fishery, accounting years AY2005–2023.

Accounting year	Total harvest	SEAK				SEAK Hatchery				SEAK Wild			
		Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)
2005	12,991	2,481	337	19	2.6	2,626	324	20	2.5	0*	468	0	3.6
2006	13,952	4,520	516	32	3.7	2,307	225	17	1.6	2,213	563	16	4.0
2007	7,642	2,545	339	33	4.4	1,138	141	15	1.8	1,407	367	18	4.8
2008	5,169	1,334	176	26	3.4	1,020	163	20	3.2	314	240	6	4.6
2009	5,511	1,632	258	30	4.7	1,181	182	21	3.3	451	316	8	5.7
2010	8,715	3,797	357	44	4.1	2,175	190	25	2.2	1,622	404	19	4.6
2011	12,867	1,225	189	10	1.5	1,274	186	10	1.4	0*	265	0	2.1
2012	10,685	2,552	377	24	3.5	1,701	293	16	2.7	850	477	8	4.5
2013	8,188	2,549	256	31	3.1	1,008	208	12	2.5	1,541	330	19	4.0
2014	14,271	3,064	323	21	2.3	1,456	188	10	1.3	1,609	374	11	2.6
2015	24,138	2,975	409	12	1.7	1,022	170	4	0.7	1,953	443	8	1.8
2016	29,363	3,711	501	13	1.7	1,680	231	6	0.8	2,031	552	7	1.9
2017	6,573	783	141	12	2.1	171	55	3	0.8	612	151	9	2.3
2018	7,398	1,614	234	22	3.2	570	73	8	1.0	1,044	245	14	3.3
2019	5,907	2,604	233	44	3.9	981	120	17	2.0	1,623	262	27	4.4
2020	8,370	2,182	188	26	2.2	916	115	11	1.4	1,266	220	15	2.6
2021	6,312	1,991	155	32	2.4	1,277	155	20	2.5	714	219	11	3.5
2022	6,149	2,011	148	33	2.4	1,005	102	16	1.7	1,006	180	16	2.9
2023	4,598	1,230	124	27	2.7	521	99	11	2.1	709	158	15	3.4
Total	198,799	44,800	1,308	23	0.7	24,029	795	12	0.4	20,966	1,531	11	0.8

Note: Accounting year (AY) = calendar year + 1.

Note: Asterisks (*) indicate point estimates less than 0 that were set equal to 0; the standard error is from the original point estimate.

Note: Total harvest is from fish tickets. Percent SEAK is from genetic mixed stock analysis and Number SEAK is calculated by multiplying Total harvest by Percent SEAK. Number SEAK Hatchery is from coded wire tag recovery data, and Percent SEAK Hatchery is computed by dividing Number SEAK Hatchery by Total harvest. Number and Percent SEAK Wild are calculated by subtracting SEAK Hatchery from SEAK. The Total row is either a sum (Total harvest, Number SEAK, Number SEAK Hatchery, Number SEAK Wild), or a sum divided by Total harvest (Percent SEAK, Percent SEAK Hatchery, Percent SEAK Wild).

Table 6.–Harvest of Southeast Alaska (SEAK)-origin Chinook salmon in the late winter troll fishery, 2005–2023.

		SEAK				SEAK Hatchery				SEAK Wild			
Year	Total harvest	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)
2005	37,479	5,847	1,043	16	2.8	2,850	384	8	1.0	2,997	1,111	8	3.0
2006	34,970	6,260	1,135	18	3.2	1,686	205	5	0.6	4,574	1,154	13	3.3
2007	39,230	9,180	1,332	23	3.4	3,583	424	9	1.1	5,597	1,398	14	3.6
2008	16,655	5,463	764	33	4.6	1,834	212	11	1.3	3,628	793	22	4.8
2009	19,378	4,536	496	23	2.6	1,575	212	8	1.1	2,961	539	15	2.8
2010	33,821	8,325	888	25	2.6	3,199	288	9	0.9	5,126	933	15	2.8
2011	37,959	5,915	909	16	2.4	2,509	310	7	0.8	3,407	960	9	2.5
2012	37,217	9,333	1,022	25	2.7	4,194	408	11	1.1	5,140	1,101	14	3.0
2013	18,360	4,518	547	25	3.0	2,400	333	13	1.8	2,118	641	12	3.5
2014	42,263	3,807	701	9	1.7	1,726	246	4	0.6	2,081	743	5	1.8
2015	26,535	3,256	476	12	1.8	1,005	223	4	0.8	2,251	526	8	2.0
2016	22,928	2,589	401	11	1.8	963	178	4	0.8	1,626	439	7	1.9
2017	37,291	4,534	723	12	1.9	2,756	231	7	0.6	1,778	759	5	2.0
2018	4,569	832	104	18	2.3	174	44	4	1.0	658	113	14	2.5
2019	6,459	1,235	130	19	2.0	667	240	10	3.7	569	273	9	4.2
2020	7,440	1,194	151	16	2.0	251	78	3	1.0	943	170	13	2.3
2021	8,760	1,363	189	16	2.2	326	82	4	0.9	1,036	206	12	2.4
2022	22,089	3,672	341	17	1.5	1,323	144	6	0.6	2,350	370	11	1.7
2023	22,604	3,350	499	15	2.2	1,987	224	9	1.0	1,363	547	6	2.4
Total	476,007	85,209	3,129	18	0.7	35,007	1,120	7	0.2	50,202	3,324	11	0.7

Note: Total harvest is from fish tickets. Percent SEAK is from genetic mixed stock analysis and Number SEAK is calculated by multiplying Total harvest by Percent SEAK. Number SEAK Hatchery is from coded wire tag recovery data, and Percent SEAK Hatchery is computed by dividing Number SEAK Hatchery by Total harvest. Number and Percent SEAK Wild are calculated by subtracting SEAK Hatchery from SEAK. The Total row is either a sum (Total harvest, Number SEAK, Number SEAK Hatchery, Number SEAK Wild), or a sum divided by Total harvest (Percent SEAK, Percent SEAK Hatchery, Percent SEAK Wild).

Table 7.–Harvest of Southeast Alaska (SEAK)-origin Chinook salmon in the spring troll fishery, 2005–2023.

		SEAK				SEAK Hatchery				SEAK Wild			
Year	Total harvest	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)
2005	60,701	37,102	2,116	61	3.5	20,029	823	33	1.4	17,073	2,270	28	3.7
2006	37,936	24,155	1,472	64	3.9	10,638	507	28	1.3	13,517	1,557	36	4.1
2007	49,786	31,274	1,664	63	3.3	19,385	772	39	1.6	11,889	1,835	24	3.7
2008	41,132	31,239	1,363	76	3.3	22,440	693	55	1.7	8,798	1,529	21	3.7
2009	32,859	18,767	899	57	2.7	12,499	562	38	1.7	6,267	1,060	19	3.2
2010	29,785	19,309	824	65	2.8	11,987	484	40	1.6	7,322	955	25	3.2
2011	41,080	25,338	1,046	62	2.5	17,924	695	44	1.7	7,415	1,256	18	3.1
2012	25,565	15,883	752	62	2.9	10,470	483	41	1.9	5,414	894	21	3.5
2013	38,287	17,860	1,230	47	3.2	12,016	495	31	1.3	5,844	1,326	15	3.5
2014	43,808	18,949	1,101	43	2.5	10,356	451	24	1.0	8,593	1,190	20	2.7
2015	54,499	26,333	1,349	48	2.5	15,994	639	29	1.2	10,340	1,493	19	2.7
2016	42,780	17,575	1,045	41	2.4	9,122	468	21	1.1	8,453	1,145	20	2.7
2017	18,249	6,325	412	35	2.3	3,922	241	21	1.3	2,403	478	13	2.6
2018	8,395	6,451	89	77	1.1	4,776	229	57	2.7	1,675	246	20	2.9
2019	12,325	8,188	168	66	1.4	6,057	273	49	2.2	2,131	320	17	2.6
2020	13,600	5,510	179	41	1.3	4,499	219	33	1.6	1,011	283	7	2.1
2021	16,535	7,588	197	46	1.2	6,859	243	41	1.5	729	313	4	1.9
2022	15,699	8,257	203	53	1.3	6,559	249	42	1.6	1,698	321	11	2.0
2023	19,562	8,066	212	41	1.1	7,171	253	37	1.3	895	330	5	1.7
Total	602,583	334,169	4,519	55	0.7	212,702	2,184	35	0.4	121,467	5,019	20	0.8

Note: Total harvest is from fish tickets. Percent SEAK is from genetic mixed stock analysis and Number SEAK is calculated by multiplying Total harvest by Percent SEAK. Number SEAK Hatchery is from coded wire tag recovery data, and Percent SEAK Hatchery is computed by dividing Number SEAK Hatchery by Total harvest. Number and Percent SEAK Wild are calculated by subtracting SEAK Hatchery from SEAK. The Total row is either a sum (Total harvest, Number SEAK, Number SEAK Hatchery, Number SEAK Wild), or a sum divided by Total harvest (Percent SEAK, Percent SEAK Hatchery, Percent SEAK Wild).

Table 8.–Harvest of Southeast Alaska (SEAK)-origin Chinook salmon in the summer retention 1 troll fishery, 2005–2023.

		SEAK				SEAK Hatchery				SEAK Wild			
Year	Total harvest	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)
2005	151,128	21,762	3,259	14	2.2	7,078	622	5	0.4	14,684	3,318	10	2.2
2006	129,810	7,399	2,527	6	1.9	3,333	335	3	0.3	4,066	2,549	3	2.0
2007	140,549	16,725	2,811	12	2.0	5,385	436	4	0.3	11,340	2,845	8	2.0
2008	59,913	8,268	1,539	14	2.6	3,501	351	6	0.6	4,767	1,579	8	2.6
2009	84,575	8,970	1,378	11	1.6	3,454	349	4	0.4	5,516	1,421	7	1.7
2010	74,712	9,990	1,323	13	1.8	2,920	377	4	0.5	7,070	1,376	9	1.8
2011	120,916	11,633	996	10	0.8	3,294	401	3	0.3	8,339	1,074	7	0.9
2012	61,624	9,904	1,057	16	1.7	1,825	287	3	0.5	8,079	1,095	13	1.8
2013	84,650	8,926	1,312	11	1.6	2,864	318	3	0.4	6,062	1,350	7	1.6
2014	199,431	8,119	2,007	4	1.0	3,026	421	2	0.2	5,093	2,051	3	1.0
2015	164,664	9,589	1,582	6	1.0	4,310	420	3	0.3	5,279	1,637	3	1.0
2016	106,632	2,984	869	3	0.8	1,198	248	1	0.2	1,787	904	2	0.8
2017	64,423	4,014	581	6	0.9	1,813	237	3	0.4	2,200	628	3	1.0
2018	58,992	7,792	982	13	1.7	3,319	351	6	0.6	4,473	1,043	8	1.8
2019	58,558	4,719	740	8	1.3	1,050	190	2	0.3	3,669	764	6	1.3
2020	71,494	2,534	580	4	0.8	763	155	1	0.2	1,771	600	2	0.8
2021	70,465	4,248	756	6	1.1	2,564	370	4	0.5	1,684	842	2	1.2
2022	93,336	6,544	941	7	1.0	2,279	269	2	0.3	4,265	979	5	1.0
2023	86,068	3,368	610	4	0.7	1,644	290	2	0.3	1,724	676	2	0.8
Total	1,881,940	157,489	6,787	8	0.4	55,621	1,539	3	0.1	101,868	6,959	5	0.4

Note: Total harvest is from fish tickets. Percent SEAK is from genetic mixed stock analysis and Number SEAK is calculated by multiplying Total harvest by Percent SEAK. Number SEAK Hatchery is from coded wire tag recovery data, and Percent SEAK Hatchery is computed by dividing Number SEAK Hatchery by Total harvest. Number and Percent SEAK Wild are calculated by subtracting SEAK Hatchery from SEAK. The Total row is either a sum (Total harvest, Number SEAK, Number SEAK Hatchery, Number SEAK Wild), or a sum divided by Total harvest (Percent SEAK, Percent SEAK Hatchery, Percent SEAK Wild).

Table 9.–Harvest of Southeast Alaska (SEAK)-origin Chinook salmon in the summer retention 2+ troll fishery, 2005–2023.

		SEAK				SEAK Hatchery				SEAK Wild			
Year	Total harvest	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)
2005	75,725	4,998	1,531	7	2.0	3,242	347	4	0.5	1,755	1,570	2	2.1
2006	65,590	8,330	1,947	13	3.0	2,865	277	4	0.4	5,465	1,966	8	3.0
2007	30,778	3,601	718	12	2.3	941	174	3	0.6	2,660	739	9	2.4
2008	28,983	1,536	382	5	1.3	416	104	1	0.4	1,120	396	4	1.4
2009	33,012	4,495	703	14	2.1	1,848	221	6	0.7	2,646	737	8	2.2
2010	48,455	8,681	968	18	2.0	1,442	206	3	0.4	7,240	989	15	2.0
2011	29,736	2,406	343	8	1.2	923	150	3	0.5	1,483	375	5	1.3
2012	73,970	15,675	1,442	21	1.9	3,105	334	4	0.5	12,569	1,480	17	2.0
2013	0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
2014	55,653	6,112	710	11	1.3	1,924	301	3	0.5	4,188	771	8	1.4
2015	0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
2016	74,240	2,812	595	4	0.8	954	193	1	0.3	1,859	626	3	0.8
2017	0	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
2018	27,742	3,561	584	13	2.1	1,007	211	4	0.8	2,554	621	9	2.2
2019	25,374	925	272	4	1.1	478	156	2	0.6	447	313	2	1.2
2020	68,893	5,242	871	8	1.3	2,425	252	4	0.4	2,817	907	4	1.3
2021	60,814	3,863	605	6	1.0	1,937	222	3	0.4	1,926	645	3	1.1
2022	59,385	5,206	783	9	1.3	3,064	387	5	0.7	2,142	874	4	1.5
2023	9,877	517	93	5	0.9	237	86	2	0.9	280	126	3	1.3
Total	768,227	77,958	3,667	10	0.5	26,808	964	3	0.1	51,150	3,791	7	0.5

Note: A second retention period did not occur in 2013, 2015, and 2017.

Note: Total harvest is from fish tickets. Percent SEAK is from genetic mixed stock analysis, and Number SEAK is calculated by multiplying Total harvest by Percent SEAK. Number SEAK Hatchery is from coded wire tag recovery data, and Percent SEAK Hatchery is computed by dividing Number SEAK Hatchery by Total harvest. Number and Percent SEAK Wild are calculated by subtracting SEAK Hatchery from SEAK. The Total row is either a sum (Total harvest, Number SEAK, Number SEAK Hatchery, Number SEAK Wild), or a sum divided by Total harvest (Percent SEAK, Percent SEAK Hatchery, Percent SEAK Wild).

Table 10.–Harvest of Southeast Alaska (SEAK)-origin Chinook salmon in the Ketchikan area sport fishery, 2005–2023.

			SEAK				SEAK Hatchery				SEAK Wild			
Year	Total harvest	SE	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)
2005	17,557	1,376	13,682	1,170	78	9.0	10,623	1,190	61	8.3	3,059	1,669	17	12.3
2006	12,045	1,242	8,177	893	68	10.2	5,208	689	43	7.3	2,969	1,128	25	12.5
2007	12,519	1,051	9,485	872	76	9.4	5,359	851	43	7.7	4,126	1,219	33	12.2
2008	10,143	1,340	9,542	1,297	94	17.8	7,473	1,356	74	16.5	2,069	1,876	20	24.3
2009	19,250	2,277	16,575	1,947	86	14.4	11,557	1,757	60	11.6	5,018	2,623	26	18.4
2010	10,239	1,234	8,878	1,052	87	14.7	7,024	1,256	69	14.8	1,855	1,638	18	20.8
2011	12,429	1,167	9,687	977	78	10.7	3,903	608	31	5.7	5,783	1,151	47	12.2
2012	5,262	405	4,182	396	79	9.7	2,318	405	44	8.4	1,865	566	35	12.8
2013	10,428	958	7,426	747	71	9.7	4,913	851	47	9.2	2,513	1,133	24	13.4
2014	14,094	1,422	10,787	1,314	77	12.1	5,584	1,295	40	10.0	5,203	1,845	37	15.7
2015	13,455	1,054	8,003	759	59	7.3	4,739	772	35	6.4	3,264	1,083	24	9.7
2016	7,068	687	4,009	462	57	8.6	1,940	502	27	7.6	2,070	682	29	11.4
2017	7,372	701	4,142	436	56	8.0	2,452	364	33	5.9	1,690	568	23	9.9
2018	6,428	739	4,654	550	72	11.9	1,603	424	25	7.2	3,051	694	47	13.9
2019	4,179	601	2,845	389	68	13.5	1,547	437	37	11.7	1,297	585	31	17.9
2020	3,493	437	1,685	217	48	8.7	1,150	261	33	8.5	535	340	15	12.2
2021	4,759	936	2,126	413	45	12.4	677	176	14	4.6	1,449	449	30	13.2
2022	5,032	928	2,944	522	59	15.0	1,532	297	30	8.1	1,412	600	28	17.0
2023	9,333	1,685	3,625	661	39	10.0	1,482	280	16	4.1	2,143	718	23	10.8
Total	185,085	5,026	132,456	3,907	72	2.9	81,085	3,697	44	2.3	51,371	5,379	28	3.7

Note: Total harvest from 2005–2018 is from statewide harvest survey, and 2019–2023 is from the SEAK marine sport creel program. Percent SEAK is from genetic mixed stock analysis, and Number SEAK is calculated by multiplying Total harvest by Percent SEAK. Number SEAK Hatchery is from coded wire tag recovery data, and Percent SEAK Hatchery is computed by dividing Number SEAK Hatchery by Total harvest. Number and Percent SEAK Wild are calculated by subtracting SEAK Hatchery from SEAK. The Total row is either a sum (Total harvest, Number SEAK, Number SEAK Hatchery, Number SEAK Wild), or a sum divided by Total harvest (Percent SEAK, Percent SEAK Hatchery, Percent SEAK Wild).

Table 11.–Harvest of Southeast Alaska (SEAK)-origin Chinook salmon in the northern inside area sport fishery, 2005–2023.

			SEAK				SEAK Hatchery				SEAK Wild			
Year	Total harvest	SE	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)
2005	15,187	1,139	13,880	1,020	91	9.6	6,633	747	44	5.9	7,248	1,264	48	11.3
2006	11,371	957	10,789	822	95	10.8	4,061	504	36	5.4	6,728	965	59	12.0
2007	10,879	950	10,293	814	95	11.1	5,942	788	55	8.7	4,352	1,133	40	14.1
2008	10,545	1,152	10,044	1,019	95	14.2	5,917	945	56	10.9	4,127	1,390	39	17.9
2009	11,613	1,192	11,033	1,038	95	13.2	6,615	991	57	10.3	4,418	1,435	38	16.8
2010	9,956	1,610	9,351	1,439	94	21.0	5,180	1,360	52	16.0	4,170	1,979	42	26.4
2011	7,098	820	6,567	669	93	14.2	2,664	537	38	8.7	3,903	858	55	16.7
2012	5,799	574	5,300	531	91	12.9	3,111	597	54	11.6	2,189	799	38	17.3
2013	7,765	610	6,988	525	90	9.8	4,976	631	64	9.6	2,012	821	26	13.7
2014	6,986	671	5,761	504	82	10.7	3,281	533	47	8.9	2,479	734	35	13.9
2015	9,483	820	8,561	666	90	10.5	4,581	704	48	8.5	3,980	970	42	13.5
2016	3,528	443	3,040	326	86	14.2	1,556	407	44	12.8	1,484	522	42	19.1
2017	3,019	455	2,765	390	92	18.9	2,721	524	90	22.1	43	653	1	29.1
2018	3,720	562	3,574	543	96	20.6	2,748	561	74	18.8	826	781	22	27.9
2019	3,962	298	3,641	271	92	9.7	2,309	424	58	11.6	1,332	504	34	15.1
2020	3,695	259	3,300	238	89	9.0	2,610	458	71	13.3	690	516	19	16.1
2021	4,301	376	3,830	360	89	11.4	2,544	492	59	12.6	1,285	610	30	17.0
2022	5,097	501	4,455	420	87	11.9	2,855	420	56	9.9	1,600	594	31	15.5
2023	2,569	221	2,187	191	85	10.4	1,289	201	50	8.9	899	277	35	13.7
Total	136,573	3,503	125,359	3,049	92	3.2	71,593	2,930	52	2.5	53,767	4,228	39	4.1

Note: Total harvest from 2005–2018 is from statewide harvest survey, and 2019–2021 is from the SEAK marine sport creel program. Percent SEAK is from genetic mixed stock analysis, and Number SEAK is calculated by multiplying Total harvest by Percent SEAK. Number SEAK Hatchery is from coded wire tag recovery data, and Percent SEAK Hatchery is computed by dividing Number SEAK Hatchery by Total harvest. Number and Percent SEAK Wild are calculated by subtracting SEAK Hatchery from SEAK. The Total row is either a sum (Total harvest, Number SEAK, Number SEAK Hatchery, Number SEAK Wild), or a sum divided by Total harvest (Percent SEAK, Percent SEAK Hatchery, Percent SEAK Wild).

Table 12.–Harvest of Southeast Alaska (SEAK)-origin Chinook salmon in the Petersburg and Wrangell area sport fishery, 2005–2023.

			SEAK				SEAK Hatchery				SEAK Wild			
Year	Total harvest	SE	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)
2005	8,381	1,336	7,983	954	95	19.0	2,319	500	28	7.4	5,664	1,077	68	20.4
2006	9,923	1,026	9,444	902	95	13.4	4,146	671	42	8.0	5,298	1,125	53	15.6
2007	9,711	1,258	9,047	1,088	93	16.5	5,530	974	57	12.4	3,516	1,461	36	20.6
2008	5,254	710	4,993	569	95	16.8	2,241	441	43	10.2	2,753	720	52	19.6
2009	5,161	568	4,291	471	83	12.9	2,152	470	42	10.2	2,139	665	41	16.5
2010	3,808	581	3,457	399	91	17.4	1,076	301	28	9.0	2,382	500	63	19.6
2011	3,792	584	2,883	338	76	14.7	1,365	408	36	12.1	1,518	530	40	19.1
2012	3,451	464	2,810	353	81	15.0	1,083	319	31	10.2	1,727	475	50	18.1
2013	3,657	557	3,114	410	85	17.1	619	198	17	6.0	2,494	455	68	18.2
2014	5,118	652	4,521	585	88	16.0	2,731	613	53	13.8	1,790	848	35	21.1
2015	5,026	592	4,417	468	88	13.9	2,532	528	50	12.1	1,884	705	37	18.4
2016	6,630	1,285	5,472	1,229	83	24.5	3,038	1,214	46	20.3	2,435	1,727	37	31.8
2017	3,410	587	2,944	546	86	21.9	2,872	646	84	23.9	73	846	2	32.4
2018	2,920	462	2,590	430	89	20.4	2,015	522	69	20.9	575	676	20	29.2
2019	2,165	159	1,924	112	89	8.3	1,435	83	66	6.2	488	140	23	10.4
2020	2,748	459	2,372	277	86	17.6	1,456	143	53	10.3	916	312	33	20.4
2021	2,391	343	2,233	225	93	16.4	1,522	86	64	9.8	712	241	30	19.1
2022	2,786	308	2,612	233	94	13.3	1,630	108	59	7.5	982	257	35	15.3
2023	2,811	349	2,443	245	87	13.9	1,456	97	52	7.3	987	264	35	15.7
Total	89,143	3,163	79,550	2,613	89	4.3	41,218	2,310	46	3.1	38,332	3,488	43	5.3

Note: Total harvest from 2005–2018 is from statewide harvest survey, and 2019–2023 is from the SEAK marine sport creel program. Percent SEAK is from genetic mixed stock analysis, and Number SEAK is calculated by multiplying Total harvest by Percent SEAK. Number SEAK Hatchery is from coded wire tag recovery data, and Percent SEAK Hatchery is computed by dividing Number SEAK Hatchery by Total harvest. Number and Percent SEAK Wild are calculated by subtracting SEAK Hatchery from SEAK. The Total row is either a sum (Total harvest, Number SEAK, Number SEAK Hatchery, Number SEAK Wild), or a sum divided by Total harvest (Percent SEAK, Percent SEAK Hatchery, Percent SEAK Wild).

Table 13.–Harvest of Southeast Alaska (SEAK)-origin Chinook salmon in the outside area sport fishery, 2005–2023.

			SEAK				SEAK Hatchery				SEAK Wild			
Year	Total harvest	SE	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)	Number	SE	Percent (%)	SE (%)
2005	40,825	1,727	7,581	907	19	2.4	3,017	366	7	1.0	4,564	978	11	2.5
2006	48,830	2,059	5,748	1,672	12	3.5	2,278	297	5	0.6	3,470	1,698	7	3.5
2007	46,182	2,140	6,090	1,220	13	2.7	4,163	544	9	1.3	1,926	1,336	4	3.0
2008	20,667	1,264	7,045	732	34	4.1	2,916	509	14	2.6	4,130	891	20	4.9
2009	27,132	1,416	4,305	677	16	2.6	1,871	348	7	1.3	2,434	761	9	2.9
2010	31,799	1,539	3,931	621	12	2.0	2,499	407	8	1.3	1,432	743	5	2.4
2011	40,067	1,552	5,782	599	14	1.6	3,246	417	8	1.1	2,536	730	6	1.9
2012	29,882	1,197	6,153	654	21	2.3	2,564	443	9	1.5	3,590	790	12	2.8
2013	31,797	1,608	3,857	465	12	1.6	2,857	444	9	1.5	1,000	644	3	2.2
2014	57,962	2,200	3,121	455	5	0.8	1,833	351	3	0.6	1,287	574	2	1.0
2015	50,494	1,771	5,589	652	11	1.3	3,697	567	7	1.2	1,892	865	4	1.8
2016	49,862	2,080	1,630	450	3	0.9	2,652	520	5	1.1	0*	687	0	1.4
2017	36,948	1,565	3,019	326	8	0.9	1,929	384	5	1.1	1,090	504	3	1.4
2018	16,138	681	2,614	226	16	1.6	2,195	401	14	2.6	419	461	3	3.0
2019	18,399	989	2,082	196	11	1.2	1,096	273	6	1.5	987	336	5	2.0
2020	23,237	1,310	1,765	193	8	0.9	1,272	235	5	1.1	493	304	2	1.4
2021	30,522	1,965	3,405	386	11	1.5	2,156	405	7	1.4	1,250	559	4	2.0
2022	28,255	1,728	3,434	348	12	1.4	3,013	466	11	1.8	421	582	1	2.3
2023	44,434	2,337	2,920	325	7	0.8	947	225	2	0.5	1,972	395	4	1.0
Total	673,432	7,377	80,073	2,989	12	0.5	46,202	1,794	7	0.3	34,893	3,485	5	0.5

Note: Asterisks (*) indicate point estimates less than 0 that were set equal to 0; the standard error (SE) is from the original point estimate.

Note: Total harvest from 2005–2018 is from statewide harvest survey, and 2019–2023 is from the SEAK marine sport creel program. Percent SEAK is from genetic MSA and Number SEAK is calculated by multiplying Total harvest by Percent SEAK. Number SEAK Hatchery is from coded wire tag recovery data, and Percent SEAK Hatchery is computed by dividing Number SEAK Hatchery by Total harvest. Number and Percent SEAK Wild are calculated by subtracting SEAK Hatchery from SEAK. The Total row is either a sum (Total harvest, Number SEAK, Number SEAK Hatchery, Number SEAK Wild), or a sum divided by Total harvest (Percent SEAK, Percent SEAK Hatchery, Percent SEAK Wild).

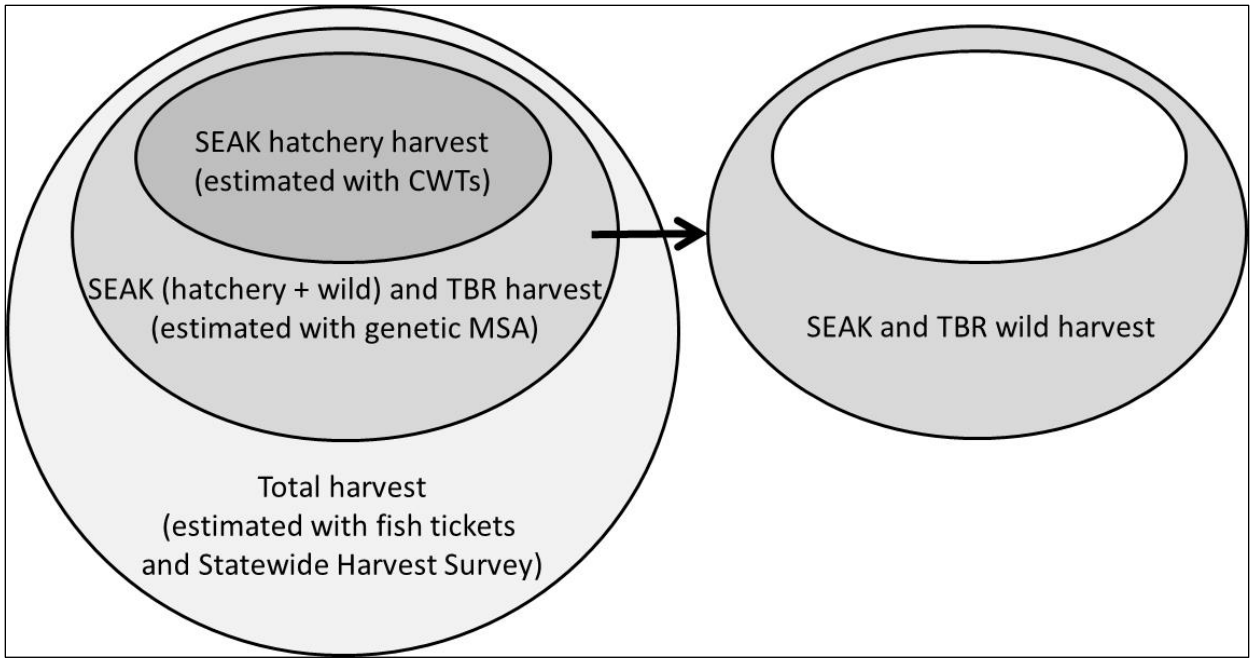

Figure 1.–Conceptual diagram showing how information from fish tickets, Statewide Harvest Survey, genetic mixed stock analyses (MSA), and coded wire tags (CWTs) were used to estimate the Southeast Alaska (SEAK) and Transboundary River (TBR) wild component of the harvest.

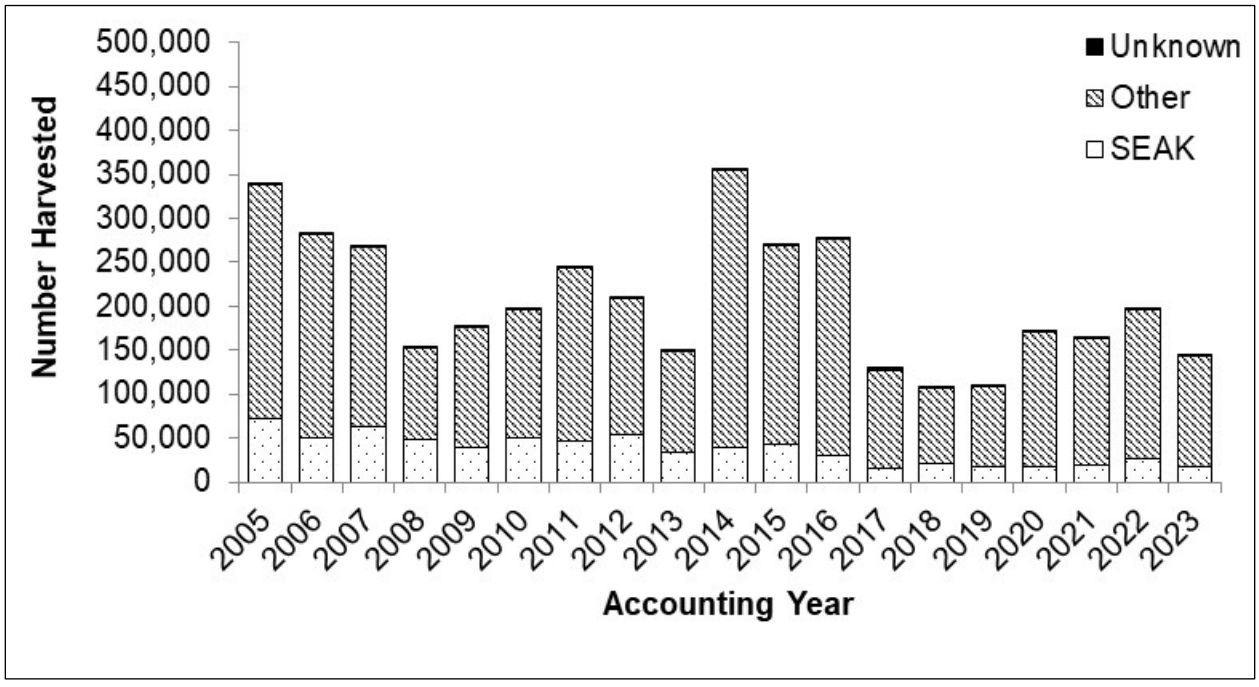

Figure 2.–Number of Chinook salmon harvested in the commercial troll fishery by SEAK and other stock groups, accounting years AY2005–2023. The number of SEAK and other fish harvested was estimated using the methods described in Appendix A, and the uncertainty for the number of SEAK Chinook harvested is shown in Table 3. Harvest not sampled for both genetics and CWT was considered unknown.

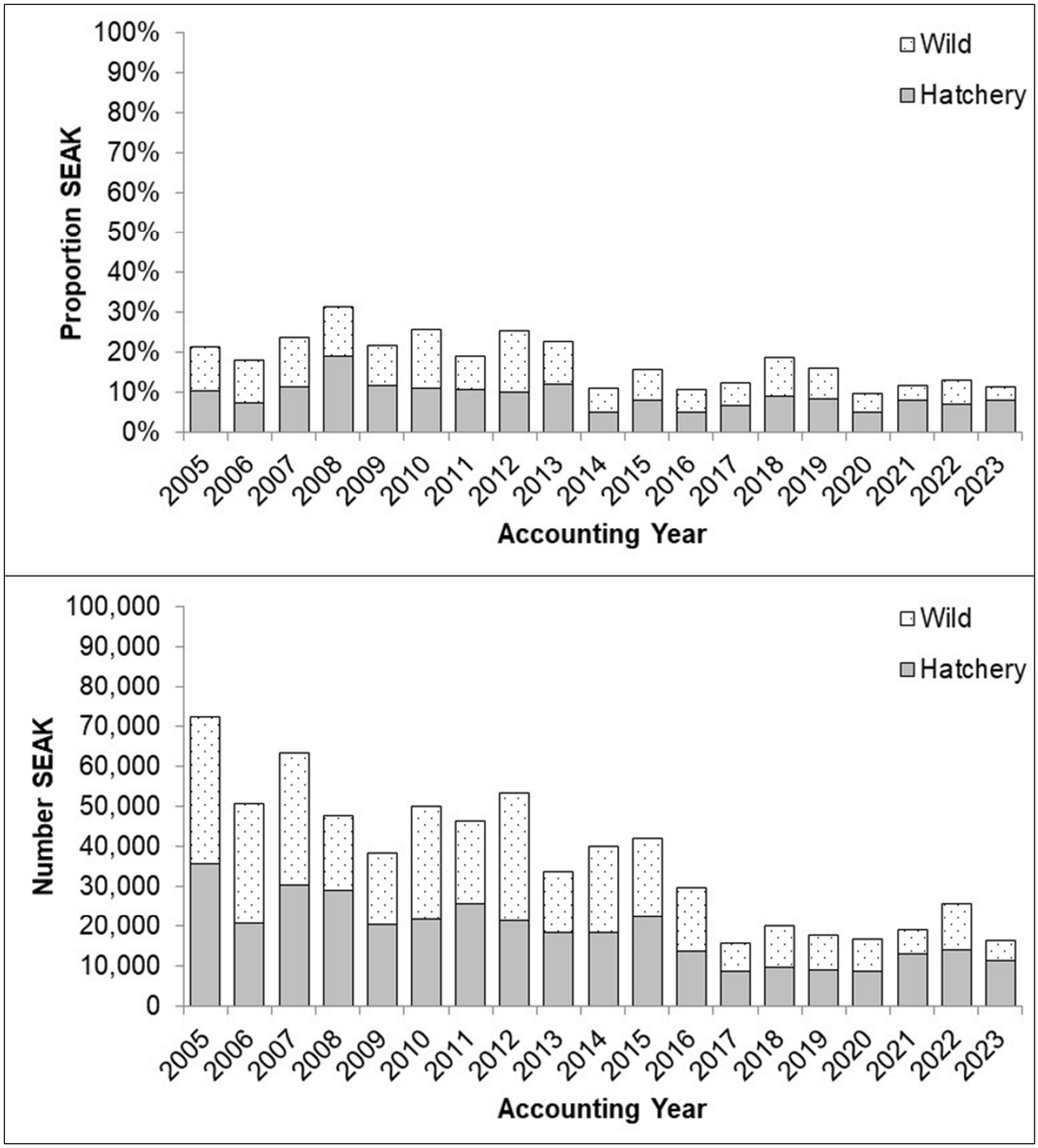

Figure 3.–Proportion (top panel) and number (bottom panel) of Southeast Alaska (SEAK) wild- and hatchery-origin Chinook salmon harvested by the commercial troll fishery, accounting years AY2005–2023.

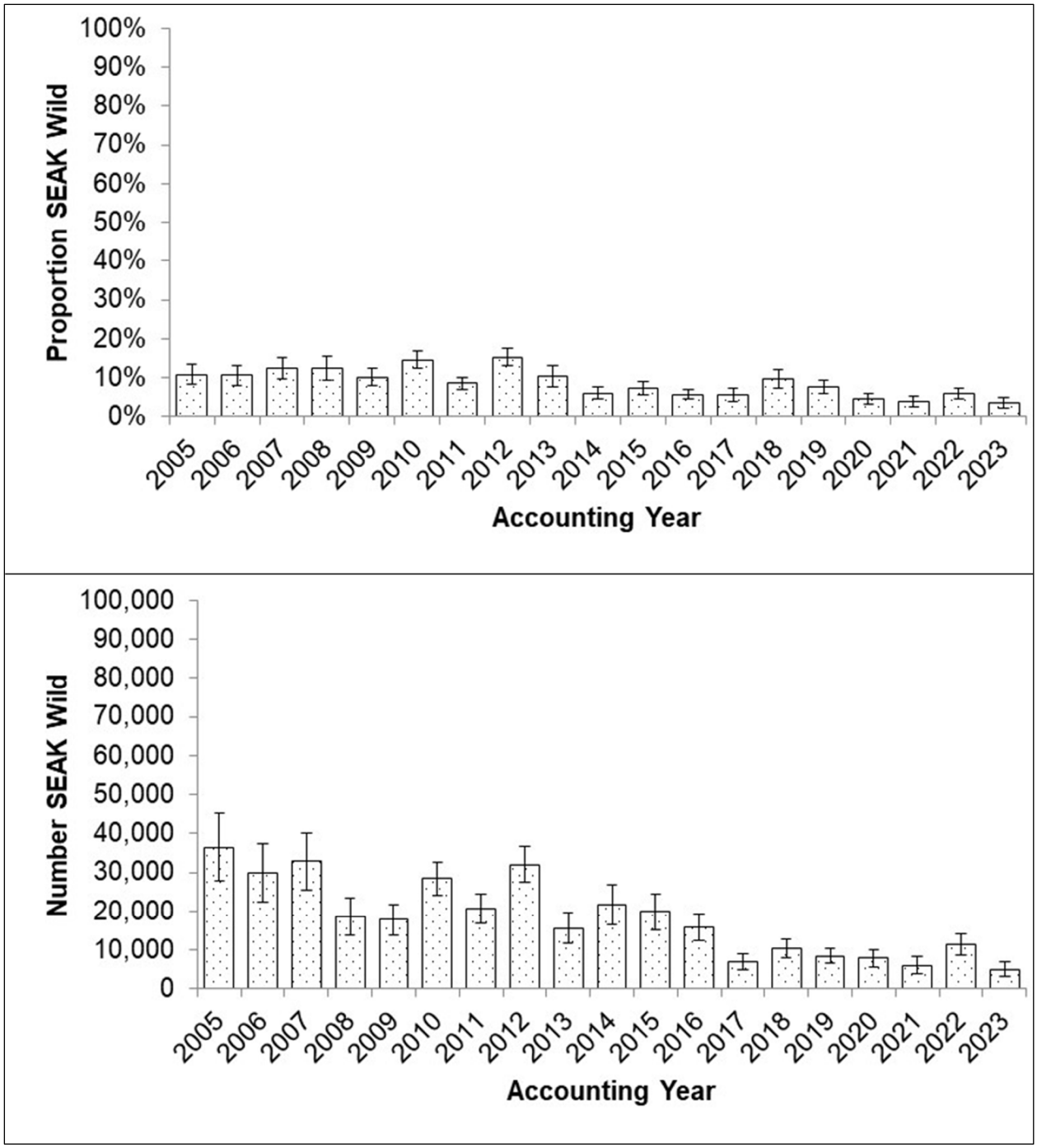

Figure 4.–Proportion (top panel) and number (bottom panel) of Southeast Alaska (SEAK) wild-origin Chinook salmon harvested by the commercial troll fishery, accounting years AY2005–2023. Error bars represent 95% confidence intervals.

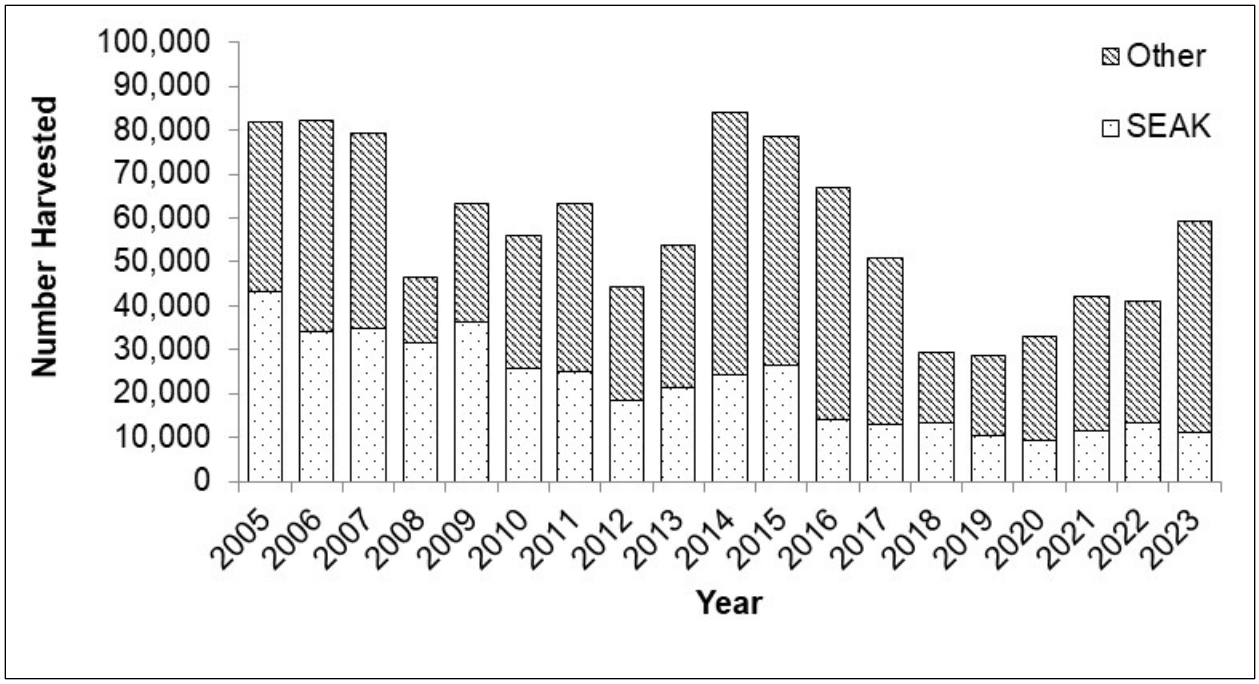

Figure 5.–Number of Chinook salmon harvested in the sport fishery by Southeast Alaska (SEAK) and other stock groups, 2005–2023. The number of SEAK and other harvested was estimated using the methods described in Appendix A, and the uncertainty for number SEAK is shown in Table 4.

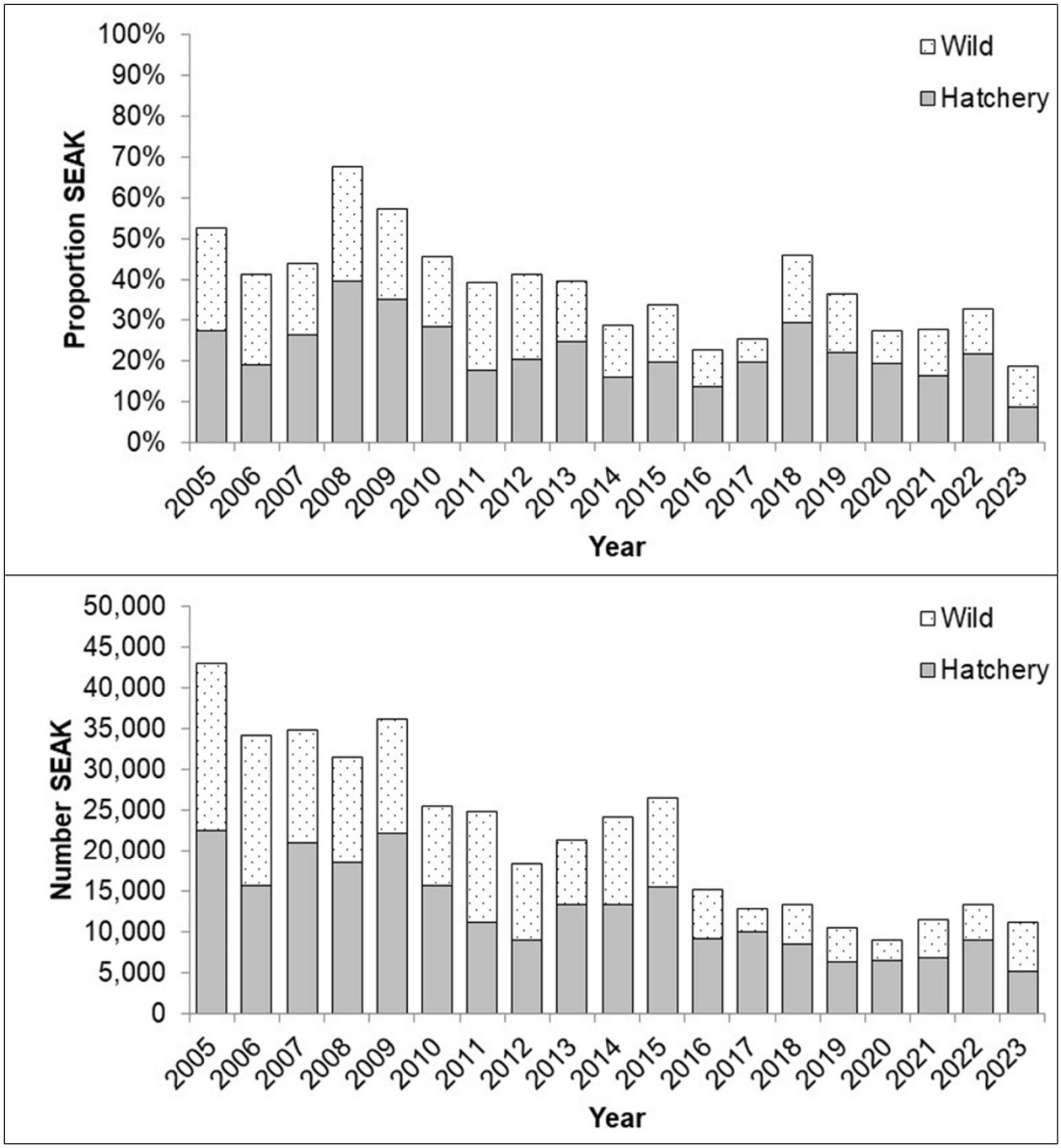

Figure 6.–Proportion (top panel) and number (bottom panel) of Southeast Alaska (SEAK) wild- and hatchery-origin Chinook salmon harvested by the sport fishery, 2005–2023.

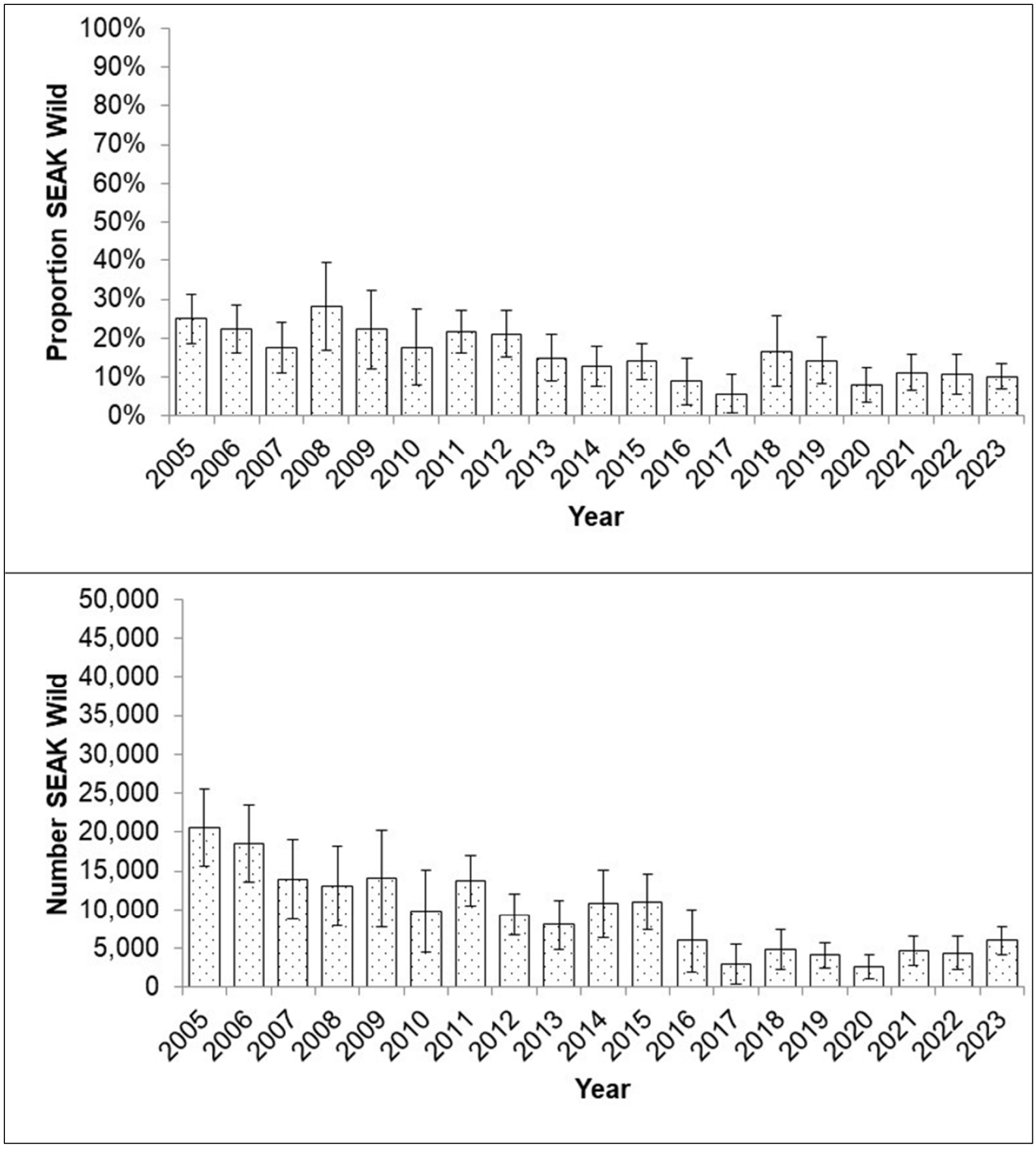

Figure 7.–Proportion (top panel) and number (bottom panel) of Southeast Alaska (SEAK) wild-origin Chinook salmon harvested by the sport fishery, 2005–2023. Error bars represent 95% confidence intervals.

APPENDIX A: PARAMETER NOTATION AND EQUATIONS USED IN THIS REPORT

Appendix A1.–Notation for parameters used in estimating wild harvest using coded wire tag (CWT) and genetic mixed stock analysis (MSA) data.

Symbol	Description
C_F	Number of fish harvested by fishery
$C_{F=Term}$	Number of fish harvested in terminal exclusion areas. By definition, $C_{F=Term} = H_{F=Term,S=SEAK}$ and $Var\left(H_{F=Term,S=SEAK}\right) = 0$, which assumes all fish harvested in terminal exclusion areas are SEAK hatchery-origin. Note: fish harvested in the Yakutat terminal exclusion area are assumed to be SEAK wild-origin, so $C_{F=Term(Yakutat)} = H_{F=Term(Yakutat),S=SEAK}$ and $Var\left(W_{F=Term(Yakutat),S=SEAK}\right) = 0$.
$P_{F,S}$	Proportion of fish harvested by fishery and stock (based off genetic MSA)
$C_{F,S}$	Number of fish harvested by fishery and stock
$H_{F,S}$	Number of hatchery-origin fish harvested by fishery and stock (based off CWTs)
$W_{F,S}$	Number of wild-origin fish harvested by fishery and stock
$PH_{F,S}$	Proportion of hatchery-origin fish harvested by fishery and stock
$PW_{F,S}$	Proportion of wild-origin fish harvested by fishery and stock

Appendix A2.–Notation for parameters used in estimating wild harvest using coded wire tag and genetic mixed stock analysis data.

A summary of the notation used in this report is provided in Appendix A1. Computations are stratified by fishery (denoted as F), where fishery is often defined by a combination of gear and either time or area. With the exception of harvest, all variables are indexed by stock (S). Unless otherwise noted, "stock" refers to stocks of both Southeast Alaska (SEAK) and Transboundary river (TBR) origin.

The number of fish harvested by stock and fishery is estimated as:

$$C_{F,S} = C_F P_{F,S} \tag{1}$$

where C_F is the total harvest in fishery F and $P_{F,S}$ is the proportion of harvest from stock S (based off genetic mixed stock analysis [MSA]). When harvest is known, the variance of the number of fish harvested by stock and fishery is:

$$var(C_{F,S}) = C_F^2 var(P_{F,S}) \tag{2}$$

and when harvest is estimated, the variance becomes:

$$var(C_{F,S}) = C_F^2 var(P_{F,S}) + P_{F,S}^2 var(C_F) + Var(C_F) var(P_{F,S}) \tag{3}$$

If there are multiple reporting groups to be combined (i.e., 2 or more genetic groups in the genetic MSA results), the proportion is $P_{F,S}$ calculated as:

$$P_{F,S} = \sum_{i=1}^{n} P_{F,i} \tag{4}$$

where n is the number of reporting groups being combined. The variance of $P_{F,S}$ is computed similarly, by substituting $var(P_{F,i})$ for $P_{F,i}$ in Equation 4. While combing reporting groups (i.e., $n > 1$) should yield the same estimate of $P_{F,S}$ as if $n = 1$, the variance $var(P_{F,S})$ will likely be overestimated because the variances of individual reporting groups are non-additive, especially when $P_{F,i} \approx 0$. Reporting groups vary by fishery and are defined by the Gene Conservation Laboratory (Gilk-Baumer et al. 2013, 2017a–2018; Shedd et al. 2021a–2022; K. Shedd, ADF&G, Division of Commercial Fisheries, Anchorage, unpublished data).

When combining multiple fisheries (i.e., 2 or more fisheries with genetic MSA results), the proportion is $P_{F,S}$ calculated as:

$$P_{F,S} = \frac{\sum_{j=1}^{m} C_j P_{j,S}}{\sum_{j=1}^{m} C_j} \tag{5}$$

where m is the number of fisheries. Combining reporting groups and fisheries can be generalized into a single equation:

$$P_{F,S} = \frac{\sum_{j=1}^{m} \sum_{i=1}^{n} C_j P_{j,i}}{\sum_{j=1}^{m} C_j} \tag{6}$$

which has variance:

$$var(P_{F,S}) = var\left(\frac{\sum_{j=1}^{m} \sum_{i=1}^{n} C_j P_{j,i}}{\sum_{j=1}^{m} C_j}\right) \tag{7}$$

-continued-

Assuming hatchery-origin Chinook salmon from stock *S* are adequately represented by coded wire tags (CWT), the number of wild fish harvested is estimated as:

$$W_{F,S} = C_{F,S} - H_{F,S} \tag{8}$$

with variance:

$$var(W_{F,S}) = var(C_{F,S}) + var(H_{F,S}) \tag{9}$$

The proportion of wild-origin fish harvested is:

$$PW_{F,S} = \frac{W_{F,S}}{C_F} \tag{10}$$

with variance:

$$var(PW_{F,S}) = var\left(\frac{W_{F,S}}{C_F}\right) = var(P_{F,S}) + var\left(\frac{H_{F,S}}{C_F}\right) \tag{11}$$

where $PH_{F,S}$, the proportion of hatchery-origin fish harvested, is estimated as:

$$PH_{F,S} = \frac{H_{F,S}}{C_F} \tag{12}$$

When harvest is known, the variance of $PH_{F,S}$ is:

$$var(PH_{F,S}) = \frac{var(H_{F,S})}{C_F^2} \tag{13}$$

and when harvest is estimated, the variance is approximated as:

$$var(PH_{F,S}) \approx \frac{H_{F,S}^2}{C_F^2}\left[\frac{var(H_{F,S})}{H_{F,S}^2} + \frac{var(C_F)}{C_F^2}\right] \tag{14}$$

Since both troll and sport genetic MSA and CWT sampling programs are occasionally limited to pre-terminal fisheries, the formulas for $C_{F,S}$ and $P_{F,S}$ require modification to account for harvest in terminal exclusion areas. It is assumed that harvest in terminal exclusion areas consist solely of SEAK hatchery-origin fish, except in Yakutat, where it is assumed to consist of SEAK wild-origin fish.

For the spring troll fishery, which is a combination of the spring, TBR terminal, and terminal exclusion areas fisheries (see Table 1 for a description of these fisheries), note the following definitions. The number of hatchery-origin fish harvested is set equal to the number of fish harvested in those areas, following the terminal harvest area assumption:

$$H_{F=Term,S=SEAK} = C_{F=Term} \tag{15}$$

This modifies the harvest of hatchery-origin fish in the overall spring fishery to:

$$\widetilde{H}_{F=Spring,S=SEAK} = H_{F=Spring,S=SEAK} + H_{F=TBR,S=SEAK} + H_{F=Term,S=SEAK} \tag{16}$$

-continued-

Similarly, the harvest of SEAK-origin fish is modified as follows:

$$\tilde{C}_{F=Spring,S=SEAK} = C_{F=Spring,S=SEAK}P_{F=Spring,S=SEAK} + C_{F=TBR,S=SEAK}P_{F=TBR,S=SEAK} + H_{F=Term,S=SEAK} \quad (17)$$

This updates the proportion of SEAK-origin fish harvested in the spring troll fishery:

$$\tilde{P}_{F=Spring,S=SEAK} = \frac{C_{F=Spring,S=SEAK} + C_{F=TBR,S=SEAK} + H_{F=Term,S=SEAK}}{C_{F=Spring} + C_{F=TBR} + C_{F=Term}} \quad (18)$$

In the sport fishery, most survey areas are a combination of pre-terminal and terminal fisheries. The number of hatchery-origin fish harvested in the terminal areas is similarly set equal to the number of fish harvested in those areas, following the terminal harvest area assumption:

$$H_{F=Term,S=SEAK} = C_{F=Term} \quad (19)$$

This modifies the harvest of hatchery-origin fish in the sport fishery to:

$$\widetilde{H}_{F=j,S} = H_{F=j,S=SEAK} + H_{j,F=Term,S=SEAK} \quad (20)$$

Similarly, the harvest of SEAK-origin fish is modified as:

$$\tilde{C}_{F=j,S=SEAK} = C_{F=j,S=SEAK}P_{F=j,S=SEAK} + H_{j,F=Term,S=SEAK} \quad (21)$$

Finally, the proportion of SEAK-origin fish harvested in the sport fishery is updated as:

$$\tilde{P}_{F=j,S=SEAK} = \frac{C_{F=j,S=SEAK} + H_{j,F=Term,S=SEAK}}{C_{F=j} + C_{j,F=Term}} \quad (22)$$

where *j* is an index denoting the sport fishery.

For outside sport fisheries, including the Yakutat terminal exclusion area, additional equations similar to Equations 16–22 are used. These equations are modified to incorporate terminal harvest in the Yakutat area, which is assumed to be SEAK wild-origin fish.

Note the application of Equation 16 and Equation 22 will alter the genetic MSA estimates of stock composition.

APPENDIX B: STOCK-SPECIFIC HARVEST ESTIMATES FOR THE CHILKAT, TAKU, STIKINE, AND UNUK RIVER STOCKS OF CHINOOK SALMON

Appendix B1.–Stock-specific harvest estimates for the Chilkat, Taku, Stikine, and Unuk River stocks of Chinook salmon in Southeast Alaska (SEAK), anticipated run years 2014–2023.

The tables provided in this appendix contain harvest estimates for the Chilkat, Taku, Stikine and Unuk stocks of wild Chinook salmon by anticipated run year (ARY), which runs from August 1 in year (ARY-1) to July 31 in year ARY. These are 4 out of 34 known wild Chinook salmon populations in SEAK and coded wire tag (CWT) programs have been in place on these stocks for several decades. Harvest estimates provided here use a combination of CWT and genetic mixed stock analysis (MSA) results. Estimates using genetic MSA performed by the ADF&G Gene Conservation Lab were used in Districts 108 and 111 and in other areas lacking quality CWT information, otherwise, CWT estimates using methodologies described in Bernard and Clark (1996) are provided throughout.

Information used to expand recovered CWTs is germane to the specific fishery, area, and time, and includes catch, number sampled, adipose fin clips observed, heads collected, and successfully read tags. Because catch totals are either gathered from fish tickets in commercial fisheries or estimated from catch sampling in sport fisheries, these data can often change throughout a season. In general, most sampling information is usually known soon after the sampling event and remains relatively stable.

Another important estimate used to expand wild CWTs is the mark fraction for a particular stock and brood year. Unlike hatchery programs which have a strong understanding of the fraction of the total production tagged with CWTs and marked with adipose fin clips at release (i.e., the marked fraction) at the time of tagging and marking, this is unknown in wild stock tagging programs. To solve for this, the mark fraction is estimated by sampling adults (age 3 to age 6) in their natal streams as they return to spawn. This provides accurate measures of the true marked fraction; however, it takes years to compile, and placeholder values of the marked fraction must be used for expansions until brood years are no longer active. Therefore, any estimates provided for at least the recent 2 years must always be viewed as preliminary.

The CWT and adipose fin clip marked fractions for the Chilkat and Unuk stocks are on par with those historically seen in the SEAK hatchery program (i.e., 10%); however, this is not the case for the TBR Taku and Stikine stocks which have lower marked fractions (i.e., 1–3%). As a result, and in support of obligations defined in Chapter 1 of the Pacific Salmon Treaty, more detailed genetic MSA programs were initiated in 2005 for Districts 108 and 111 to accurately delineate TBR Chinook salmon. And since Chilkat and Unuk stocks of Chinook salmon are brood stock sources used in several hatcheries in SEAK, GSI alone cannot differentiate between hatchery and wild stocks emphasizing the importance of the CWT program in place for the SEAK wild Chinook salmon stocks.

Appendix B2.–Harvest estimates for the Chilkat stock of Chinook salmon in various fisheries, areas, and time periods in Southeast Alaska (SEAK), anticipated run years 2014–2023. Estimates of total escapement, harvest and run, and associated harvest rates are also shown.

	Anticipated run year										
Fishery	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Average
					Harvest[a]						
Winter troll[b]			34	58							9
Spring troll[b]		57		45					15		12
Summer R1 troll[c]		42									4
Summer R2 troll[c]							10	11			2
Troll total		100	34	102			10	11	15		27
Early sport[d]	360	290		125							78
Late sport[d]	90		272		127		10	34		15	55
Sport total	449	290	272	125	127		10	34		15	132
Net total	640	316	17	11	69	87	59	28	27	69	132
Outside SEAK[e]			93								9
U.S. total	1,090	706	416	239	196	87	79	73	42	84	301
Canada total											
Total harvest	1,090	706	416	239	196	87	79	73	42	84	301
Total escapement[f]	1,529	2,452	1,380	1,173	873	2,028	3,180	2,038	1,582	2,234	1,847
Total run	2,619	3,158	1,796	1,412	1,069	2,115	3,259	2,111	1,624	2,318	2,148
					Harvest rate						
Winter troll[b]			1.9%	4.1%							0.4%
Spring troll[b]		1.8%		3.2%					0.9%		0.5%
Summer R1 troll[c]		1.3%									0.2%
Summer R2 troll[c]							0.3%	0.5%			0.1%
Troll total		3.2%	1.9%	7.2%			0.3%	0.5%	0.9%		1.3%
Early sport[d]	13.7%	9.2%		8.9%							3.6%
Late sport[d]	3.4%		15.1%		11.9%		0.3%	1.6%		0.6%	2.6%
Sport total	17.1%	9.2%	15.1%	8.9%	11.9%		0.3%	1.6%		0.6%	6.2%
Net total	24.4%	10.0%	0.9%	0.8%	6.5%	4.1%	1.8%	1.3%	1.7%	3.0%	6.2%
Outside SEAK[e]			5.2%								0.4%
U.S. total	41.6%	22.4%	23.2%	16.9%	18.3%	4.1%	2.4%	3.5%	2.6%	3.6%	14.0%
Canada total											
Total harvest rate	41.6%	22.4%	23.2%	16.9%	18.3%	4.1%	2.4%	3.5%	2.6%	3.6%	14.0%

Note: Anticipated run year = August 1–July 31.

[a] Harvests are germane to age-4 fish and older and are coded wire tag-based.

[b] Winter troll occurs from October of the prior year through April of the current year and spring troll occurs May through June of the current year.

[c] Troll Summer R1 occurs in July of the current year; Troll Summer R2 occurs from August through September of the prior year.

[d] The early sport occurs April through July of the current year; the late sport occurs in August of the prior year.

[e] Includes fish harvested in U.S. fisheries outside of SEAK such as the high seas trawl, Kodiak and Cook Inlet sport, drift gillnet fishery near Cordova (Area E).

[f] The gray cells indicate escapements below the lower bound of the biological escapement goal (BEG). The BEG range for the Chilkat stock is 1,750 to 3,500 large Chinook salmon.

Appendix B3.–Harvest estimates for the Taku stock of Chinook salmon in various fisheries, areas, and time periods in Southeast Alaska (SEAK), anticipated run years 2014–2023. Estimates of total escapement, harvest and run, and associated harvest rates are also shown.

	Anticipated run year										
Fishery	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Average
					Harvest[a]						
Winter troll[b]	291	417		438					527	488	216
Spring troll[b]	1,672	854	1,304	88			113	85	39	98	425
Summer R1 troll[c]		271						201	94		57
Summer R2 troll[c]											
Total troll	1,963	1,542	1,304	527			113	286	660	586	698
Total sport[d]	810	774	635	34	9	94	117	176	142	422	321
Total net	510	534	189	269	42	317	284	241	156	182	272
Outside SEAK[e]				1,626	1,719		537	104	65		405
Terminal District 108	1,320	784	824	179	50	229	323	341	211	271	453
Non-terminal	1,963	2,066	1,304	2,277	1,719	181	729	464	812	919	1,243
U.S. total	3,283	2,850	2,128	2,456	1,770	411	1,051	806	1,023	1,190	1,697
Canada total	2,472	2,447	1,630	250	7	10	94	40	33	25	701
Total harvest	5,755	5,297	3,758	2,706	1,777	421	1,145	846	1,056	1,215	2,398
Total escapement[f]	23,532	23,567	9,177	8,214	7,271	11,558	15,593	11,341	12,722	14,755	13,773
Total run	29,287	28,864	12,935	10,920	9,048	11,979	16,738	12,187	13,778	15,970	16,171
					Harvest rate						
Winter troll[b]	1.0%	1.4%		4.0%					3.8%	3.1%	1.3%
Spring troll[b]	5.7%	3.0%	10.1%	0.8%			0.7%	0.7%	0.3%	0.6%	2.6%
Summer R1 troll[c]		0.9%						1.6%	0.7%		0.4%
Summer R2 troll[c]											
Total troll	6.7%	5.3%	10.1%	4.8%			0.7%	2.3%	4.8%	3.7%	4.3%
Total sport[d]	2.8%	2.7%	4.9%	0.3%	0.1%	0.8%	0.7%	1.4%	1.0%	2.6%	2.0%
Total net	1.7%	1.9%	1.5%	2.5%	0.5%	2.6%	1.7%	2.0%	1.1%	1.1%	1.7%
Outside SEAK[e]				14.9%	19.0%		3.2%	0.9%	0.5%		2.5%
Terminal District 108	4.5%	2.7%	6.4%	1.6%	0.6%	1.9%	1.9%	2.8%	1.5%	1.7%	2.8%
Non-terminal	6.7%	7.2%	10.1%	20.9%	19.0%	1.5%	4.4%	3.8%	5.9%	5.8%	7.7%
U.S. total	11.2%	9.9%	16.5%	22.5%	19.6%	3.4%	6.3%	6.6%	7.4%	7.5%	10.5%
Canada total	8.4%	8.5%	12.6%	2.3%	0.1%	0.1%	0.6%	0.3%	0.2%	0.2%	4.3%
Total harvest rate	19.7%	18.4%	29.1%	24.8%	19.6%	3.5%	6.8%	6.9%	7.7%	7.6%	14.8%

Note: Anticipated run year = August 1–July 31.

[a] Harvests are germane to age-4 fish and older and are coded wire tag-based.

[b] Winter troll occurs from October of the prior year through April of the current year and spring troll occurs May through June of the current year.

[c] Troll Summer R1 occurs in July of the current year; Troll Summer R2 occurs from August through September of the prior year.

[d] Taku Chinook are inriver by mid-July and sport harvests occur primarily mid-April through June.

[e] Includes fish harvested in U.S. fisheries outside of SEAK such as the high seas trawl, Kodiak and Cook Inlet sport, drift gillnet fishery near Cordova (Area E).

[f] The gray cells indicate escapements below the lower bound of the biological escapement goal (BEG). The BEG range for the Taku stock is 19,000 to 36,000 large Chinook salmon.

Appendix B4.–Harvest estimates for the Stikine stock of Chinook salmon in various fisheries, areas, and time periods in Southeast Alaska (SEAK), anticipated run years 2014–2023. Estimates of total escapement, harvest and run, and associated harvest rates are also shown.

Fishery	Anticipated run year										Average
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
	Harvest[a]										
Winter troll[b]		354	235	356		71			442	313	177
Spring troll[b]	956	747	149	227			208		89	65	244
Summer R1 troll[c]			86			129		147	105		47
Summer R2 troll[c]								433	689	572	169
Total troll	956	1,101	470	583		200	208	580	1,325	950	637
Total sport[d]	697	988	827	342	12	2	93	88	299		335
Total net	1,355	597	1,153	174	27	204	305	331	103	269	452
Outside SEAK[e]	112	95	560	719	56	917					246
Terminal District 108	1,622	1,500	1,707	207	39	133	161	123	62	71	563
Non-terminal	1,498	1,281	1,302	1,611	56	1,190	445	876	1,665	1,148	1,107
U.S. total	3,120	2,781	3,009	1,818	95	1,323	606	999	1,727	1,219	1,670
Canada total	3,526	4,258	3,235	603	165	333	389	182	269	69	1,303
Total harvest	6,646	7,039	6,244	2,421	260	1,656	995	1,181	1,996	1,288	2,973
Total escapement[f]	24,374	21,597	10,554	7,335	8,603	13,817	9,753	8,376	9,090	12,795	12,629
Total run	31,020	28,636	16,798	9,756	8,863	15,473	10,748	9,557	11,086	14,083	15,602
	Harvest rate										
Winter troll[b]		1.2%	1.4%	3.6%		0.5%			4.0%	2.2%	1.1%
Spring troll[b]	3.1%	2.6%	0.9%	2.3%			1.9%		0.8%	0.5%	1.6%
Summer R1 troll[c]			0.5%			0.8%		1.5%	0.9%		0.3%
Summer R2 troll[c]								4.5%	6.2%	4.1%	1.1%
Total troll	3.1%	3.8%	2.8%	6.0%		1.3%	1.9%	6.1%	12.0%	6.7%	4.1%
Total sport[d]	2.2%	3.5%	4.9%	3.5%	0.1%	0.0%	0.9%	0.9%	2.7%		2.1%
Total net	4.4%	2.1%	6.9%	1.8%	0.3%	1.3%	2.8%	3.5%	0.9%	1.9%	2.9%
Outside SEAK[e]	0.4%	0.3%	3.3%	7.4%	0.6%	5.9%					1.6%
Terminal District 108	5.2%	5.2%	10.2%	2.1%	0.4%	0.9%	1.5%	1.3%	0.6%	0.5%	3.6%
Non-terminal	4.8%	4.5%	7.8%	16.5%	0.6%	7.7%	4.1%	9.2%	15.0%	8.2%	7.1%
U.S. total	10.1%	9.7%	17.9%	18.6%	1.1%	8.6%	5.6%	10.5%	15.6%	8.7%	10.7%
Canada total	11.4%	14.9%	19.3%	6.2%	1.9%	2.2%	3.6%	1.9%	2.4%	0.5%	8.4%
Total harvest rate	21.4%	24.6%	37.2%	24.8%	2.9%	10.7%	9.3%	12.4%	18.0%	9.1%	19.1%

Note: Anticipated run year = August 1–July 31.

[a] Harvests are germane to age-4 fish and older and are coded wire tag-based.

[b] Winter troll occurs from October of the prior year through April of the current year and spring troll occurs May through June of the current year.

[c] Troll Summer R1 occurs in July of the current year; Troll Summer R2 occurs from August through September of the prior year.

[d] Stikine Chinook are inriver by mid-July and sport harvests occur primarily mid-April through June.

[e] Includes fish harvested in U.S. fisheries outside of SEAK such as the high seas trawl, Kodiak and Cook Inlet sport, drift gillnet fishery near Cordova (Area E).

[f] The gray cells indicate escapements below the lower bound of the biological escapement goal (BEG). The BEG range for the Stikine stock is 14,000 to 28,000 large Chinook salmon.

Appendix B5.–Harvest estimates for the Unuk stock of Chinook salmon in various fisheries, areas, and time periods in Southeast Alaska (SEAK), anticipated run years 2014–2023. Estimates of total escapement, harvest and run, and associated harvest rates are also shown.

Fishery	Anticipated run year 2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Average
					Harvest[a]						
Winter troll[b]	137	92	206	191	14	21	10	44	44	78	84
Spring troll[b]	586	1,257	403	163	74	209	40	63	81	136	301
Summer R1 troll[c]	120	334	53		125	42	59	34		13	78
Summer R2 troll[c]		262		89		36		54	23	211	68
Troll total	843	1,945	662	444	214	308	109	195	148	438	531
Early sport[d]	182	299	179		63	154	214	105	143	346	169
Late sport[d]											
Sport total	182	299	179		63	154	214	105	143	346	169
Net total	398	1,298	443	68	579	200	241	241	227	328	402
Outside SEAK[e]		90	85	12			33		157		38
U.S. total	1,423	3,632	1,369	524	856	662	597	540	675	1,112	1,139
Canada total			102	20		293		37	56		51
Total harvest	1,423	3,632	1,471	544	856	955	597	577	731	1,112	1,190
Total escapement[f]	1,691	2,623	1,463	1,203	1,971	3,115	1,135	2,666	1,304	2,072	1,924
Total run	3,114	6,255	2,934	1,747	2,827	4,070	1,732	3,244	2,035	3,184	3,114
					Harvest rate						
Winter troll[b]	4.4%	1.5%	7.0%	10.9%	0.5%	0.5%	0.6%	1.4%	2.2%	2.4%	2.7%
Spring troll[b]	18.8%	20.1%	13.7%	9.3%	2.6%	5.1%	2.3%	1.9%	4.0%	4.3%	9.7%
Summer R1 troll[c]	3.9%	5.3%	1.8%		4.4%	1.0%	3.4%	1.0%		0.4%	2.5%
Summer R2 troll[c]		4.2%		5.1%		0.9%		1.7%	1.1%	6.6%	2.2%
Troll total	27.1%	31.1%	22.6%	25.4%	7.6%	7.6%	6.3%	6.0%	7.3%	13.8%	17.0%
Early sport[d]	5.8%	4.8%	6.1%		2.2%	3.8%	12.4%	3.2%	7.0%	10.9%	5.4%
Late sport[d]											
Sport total	5.8%	4.8%	6.1%		2.2%	3.8%	12.4%	3.2%	7.0%	10.9%	5.4%
Net total	12.8%	20.8%	15.1%	3.9%	20.5%	4.9%	13.9%	7.4%	11.2%	10.3%	12.9%
Outside SEAK[e]		1.4%	2.9%	0.7%			1.9%		7.7%		1.2%
U.S. total	45.7%	58.1%	46.7%	30.0%	30.3%	16.3%	34.5%	16.6%	33.2%	34.9%	36.6%
Canada total			3.5%	1.1%		7.2%		1.1%	2.8%		1.6%
Total harvest rate	45.7%	58.1%	50.1%	31.1%	30.3%	23.5%	34.5%	17.8%	35.9%	34.9%	38.2%

Note: Anticipated run year = August 1–July 31.

[a] Harvests are germane to age-4 fish and older and are coded wire tag-based.

[b] Winter troll occurs from October of the prior year through April of the current year and spring troll occurs May through June of the current year.

[c] Troll Summer R1 occurs in July of the current year; Troll Summer R2 occurs from August through September of the prior year.

[d] The early sport occurs April through July of the current year; the late sport occurs in August of the prior year.

[e] Includes fish harvested in U.S. fisheries outside of SEAK such as the high seas trawl, Kodiak and Cook Inlet sport, drift gillnet fishery near Cordova (Area E).

[f] The gray cells indicate escapements below the lower bound of the biological escapement goal (BEG). The BEG range for the Unuk stock is 1,800 to 3,800 large Chinook salmon.