

Special Publication No. BOF 2014-06

**Customary and Traditional Uses of Salmon and
Options for Revising Amounts Reasonably Necessary
for Subsistence Uses of Salmon in Districts 12 and 14,
Southeast Alaska**

prepared by

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December 2014

Alaska Department of Fish and Game

Division of Subsistence



Symbols and Abbreviations

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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

<i>all commonly-accepted abbreviations</i>	
<i>e.g., Mr., Mrs., AM, PM, etc.</i>	
<i>all commonly-accepted professional titles e.g., Dr., Ph.D., R.N., etc.</i>	
Alaska Administrative Code	AAC
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)

Measures (fisheries)

fork length	FL
mid-eye-to-fork	MEF
mid-eye-to-tail-fork	METF
standard length	SL
total length	TL

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 ₀
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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**CUSTOMARY AND TRADITIONAL USES OF SALMON AND OPTIONS
FOR REVISING AMOUNTS REASONABLY NECESSARY FOR
SUBSISTENCE USES OF SALMON IN DISTRICTS 12 AND 14,
SOUTHEAST ALASKA**

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December 2014

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Special Publications are available through the Alaska State Library and on the Internet: <http://www.subsistence.adfg.state.ak.us>. This publication has undergone editorial and professional review.

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ERRATA

The original publication of BOF 2014-06, *Customary and Traditional Uses of Salmon and Options for Revising Amounts Reasonably Necessary for Subsistence Uses of Salmon in Districts 12 and 14, Southeast Alaska*, contained errors to tables and corresponding text that have been corrected in this version.

Table 2 on page 7 and Table 4 on page 12 were edited to display their footnotes properly.

Table 6 on page 18 and Table 7 on pages 18–19 were edited to properly label communities and to correct the corresponding harvest data and sources for that data.

Text on page 17 was edited to correctly reflect the revisions to tables 6 and 7:

The community of Angoon had an estimated harvest of 2,827 salmon and Tenakee Springs an estimated 1,405 salmon for a total of 4,232 salmon.

now reads:

The community of Angoon had an estimated harvest of 2,827 salmon and Tenakee Springs an estimated 1,404 salmon for a total of 4,231 salmon.

Also:

Game Creek CDP had the highest estimated harvest: 9,429 salmon out of a total of 14,926 salmon harvested by all communities combined.

now reads:

Hoonah had the highest estimated harvest: 9,428 salmon out of a total of 14,926 salmon harvested by all communities combined.

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ABSTRACT

This report provides background information for the Alaska Board of Fisheries' consideration of 2 proposals for the Southeast and Yakutat Finfish meeting to be held in Sitka, Alaska, in February and March 2015. The 2 proposals ask the Alaska Board of Fisheries (board) to modify findings regarding the amount of Pacific salmon (*Oncorhynchus*) reasonably necessary to provide for subsistence uses in the Southeastern Alaska Management Area (5 AAC 01.716 (c)). Proposal 146, which was submitted by the Alaska Department of Fish and Game, asks the board to consider revising the amounts reasonably necessary for subsistence for salmon for Southeast Alaska fishing districts 12 and 14. Proposal 147, submitted by the federal Southeast Alaska Subsistence Regional Advisory Council, asks the board to reconsider amounts reasonably necessary for subsistence for salmon in the Angoon area. Currently both fisheries are part of a larger finding for amounts reasonably necessary for subsistence uses for districts 11, 12, 14, and 16. The requests for modified findings were submitted because District 11 is in a nonsubsistence area and District 16 has no customary and traditional use finding.

Key words: Southeast Alaska, salmon, District 12, District 14, Angoon, Hoonah

1. INTRODUCTION

This report provides background information for the Alaska Board of Fisheries' consideration of 2 proposals accepted to the February and March 2015 Southeast and Yakutat Finfish meeting in Sitka, Alaska. Proposal 146, which was submitted by the Alaska Department of Fish and Game (department), asks the Alaska Board of Fisheries (board) to consider revising the amounts reasonably necessary for subsistence uses for salmon for districts 12 and 14 (5 AAC 01.716 (c)). Proposal 147, submitted by the federal Southeast Alaska Subsistence Regional Advisory Council, asks the board to reconsider amounts reasonably necessary for subsistence uses for salmon in the Angoon area. The proposals pertain to the following requirements of AS 16.05.258:

- a. Except in nonsubsistence areas, the Board of Fisheries and the Board of Game shall identify the fish stocks and game populations, or portions of stocks or populations, that are customarily and traditionally taken or used for subsistence. The commissioner [of the Alaska Department of Fish and Game] shall provide recommendations to the boards concerning the stock and population identifications. The boards shall make identifications required under this subsection after receipt of the commissioner's recommendations.
- b. The appropriate board shall determine whether a portion of a fish stock or game population identified under (a) of this section can be harvested consistent with sustained yield. If a portion of a stock or population can be harvested consistent with sustained yield, the board shall determine the amount of the harvestable portion that is reasonably necessary for subsistence uses

Findings made under (a) are called "customary and traditional use findings" or "C&T findings." This document does not seek to revise the C&T finding for salmon in Southeast Alaska. Findings under (b) are called "amounts reasonably necessary for subsistence uses findings" or "ANS findings." ANS findings are one way the board measures whether reasonable opportunity for subsistence uses of a particular stock or population is being provided in regulation. "Reasonable opportunity" is defined as "an opportunity, as determined by the appropriate board, that allows a subsistence user to participate in a subsistence hunt or fishery that provides a normally diligent participant with a reasonable expectation of success of taking of fish or game" (AS 16.05.258 (f)). The board may consider public input and members' own expertise, among other factors, when deliberating on ANS options.

This report presents ANS options for the board to consider if it chooses to modify the ANS for salmon in the Juneau Management Area, which is composed of districts 11, 12, 14, and 16.

Table 1 lists the current C&T and ANS findings for salmon for the Southeastern Alaska and Yakutat areas. In Southeastern Alaska, the board has set ANS ranges by management area (as shown in Table 1). There is a permit required for subsistence and personal use salmon harvests in the Southeastern Alaska Area, and the permit areas are the same as the management areas.

The board established these ANS ranges at its January 2006 meeting in Ketchikan. Each range was defined by the lowest and highest annual estimated subsistence harvest of salmon within the management/permit area from 1996 through 2003. Appendix A is the ANS worksheet the board used to make its determinations. The action in 2006 replaced a 1993 board administrative ANS finding, not adopted in regulation, of 21,000–34,000 salmon for all Southeast Alaska. At the January 2006 meeting, the 1993 finding was considered low because it was based on harvests reported from permit returns rather than harvests expanded to account for non-returned permits. The large geographic scale of the 1993 finding was also considered not useful for assessing reasonable opportunity for subsistence uses of small, local sockeye salmon (*O. nerka*) runs (Appendix A).

The most recent request to change the ANS came in 2009 through a proposal (Proposal 236) submitted by Kootznoowoo, Inc., that asked the board to "detail the minimum numbers of salmon that are reasonably

necessary for subsistence uses by species and location” (Fall et al. 2009; Naves et al. 2010). The board chose option #2, which was to take no regulatory action on this request and directed the department and the public to work together to develop more precise ANS findings for salmon.

Figure 1 shows the current areas having C&T findings for salmon in the Juneau Management Area as described in 5 AAC 01.716. There is no C&T finding for salmon in districts 11 and 16 although they are included in the ANS (5 AAC 01.716 (c) (4)). District 11 is within the Juneau Nonsubsistence Area.

Districts 12 and 14 encompass distinctive fisheries and residents of some communities have brought forward issues with having reasonable opportunity for harvesting salmon. Proposal 146 provides the board with an opportunity to create more refined ANS findings for districts 12 and 14. The proposal also asks the board to consider removing districts 11 and 16 from the ANS since they are either within the Juneau Nonsubsistence Area (District 11) or there is no C&T finding for the area (District 16). An ANS finding that reflects customary and traditional uses of particular stocks within districts 12 and 14 may be a more useful tool for the board when evaluating whether the regulations provide a reasonable opportunity for subsistence in those 2 districts. Proposal 147 requests the board to reconsider amounts reasonably necessary for subsistence uses for salmon in the Angoon area based on the best available information provided by the department.

Table 1.–Findings of customary and traditional use and amounts reasonably necessary for subsistence uses for salmon, Southeastern Alaska and Yakutat management areas.

Management area	Permit area	Stock with positive customary and traditional use (C&T) finding	Amount reasonably necessary for subsistence use (ANS) finding	Regulation
Southeastern Alaska Area				
	Ketchikan	Salmon, districts 1–4	9,068–17,503 salmon	5 AAC 01.716 (c) (1)
	Petersburg	Salmon, districts 5–8, District 10, and Section 9-B	4,120–7,345 salmon	5 AAC 01.716 (c) (2)
	Sitka	Salmon, Section 9-A and District 13	10,487–20,225 salmon	5 AAC 01.716 (c) (3)
	Juneau	Salmon, districts 11, 12, 14, and 16	4,178–10,133 salmon	5 AAC 01.716 (c) (4)
	Haines	Salmon, District 15	7,174–10,414 salmon	5 AAC 01.716 (c) (5)
Yakutat Area				
		Salmon	5,800–7,832 salmon	5 AAC 01.666 (b)

Source Fall et al. (2009).

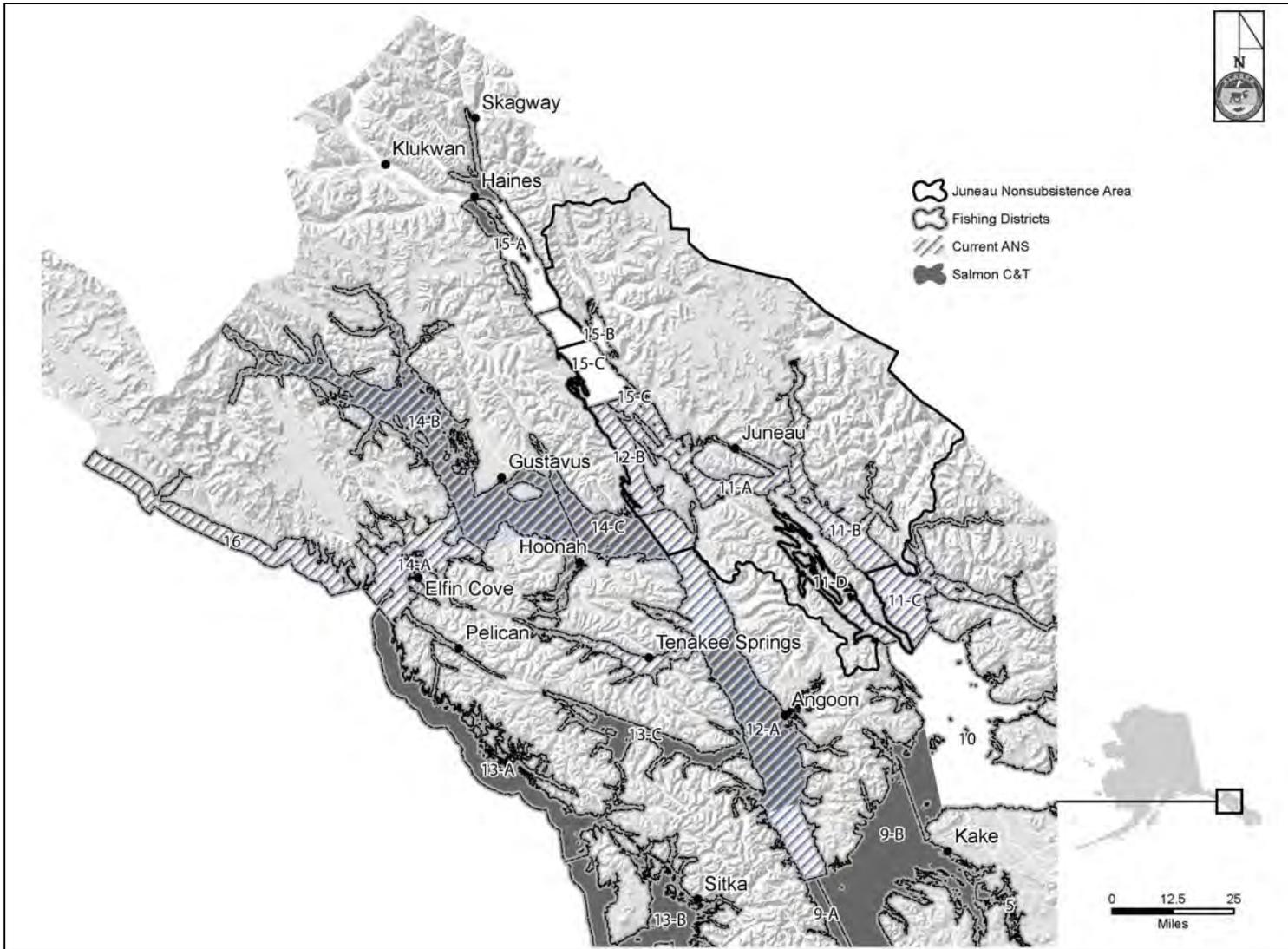


Figure 1.—Map of Southeast Alaska fishing districts, areas having C&T findings for salmon, and areas having an ANS determination.

2. DATA SOURCES AND ANALYSIS

This report includes data on subsistence salmon harvests in Southeast Alaska fishing districts 12 and 14 from data obtained through household surveys conducted by the department and through the subsistence salmon fishing permit program. The household survey data are managed by the Information Management section of the Division of Subsistence. The annual permit data are stored in the Integrated Fisheries Database (IFDB) maintained by the department's Division of Commercial Fisheries Region I office located in Douglas; these data were acquired by the Division of Subsistence to be included in the Alaska Subsistence Fisheries Database (ASFDB¹), from which an annual statewide subsistence salmon report is published. Permit data included in this report's analysis include the years 1999–2012, which are the most recent years for which data are available in the ASFDB (tables 2–5).

Harvest estimates presented in tables 6 and 7 are based on single-year household surveys by the Division of Subsistence. Salmon harvests reported in household surveys were expanded to account for unsurveyed households in each community. Respondents reported harvesting salmon for home use under subsistence, personal use, and sport fishing regulations. The most recent available harvest data based on household surveys for communities in districts 12 and 14 are from the following:

- 1987 survey in District 12 for Tenakee Springs and District 14 for Elfin Cove (pop. 20 in 2012), Gustavus (pop. 489 in 2012), and Pelican (pop. 82 in 2012) (Community Subsistence Information System[CSIS²]);
- 1996 survey in District 14 for Game Creek census designated place (CDP) (pop. 19 in 2012) and Whitestone Logging Camp (pop. 0 in 2012) (CSIS); and
- 2012 survey in District 12 for Angoon (pop. 456 in 2012) and District 14 for Hoonah (pop. 777 in 2012) (AFSDB).³

During each survey effort, the Division of Subsistence also collected data to develop a population estimate of Alaska residents living in that community, which was then used to estimate a per capita salmon harvest for each community for the year it was surveyed (Sill et al. *In prep*). To calculate the 2012 harvest estimates for all the communities presented in this report, each community's survey per capita value for Alaska residents was multiplied by the American Community Survey's 2012 5-year population average estimate; using this method provides a population-adjusted harvest estimate for 2012 for all the communities in districts 12 and 14 (Sill et al. *In prep*).

Map data are also available for the communities of Hoonah and Angoon that show the areas where community respondents harvested salmon in 2012; a survey of Hoonah for study year 2013 also provided map data of harvest areas.

1. David A. Caylor and Louis A. Brown. 2006. ASFDB. Alaska Department of Fish and Game Division of Subsistence, Juneau.

2. ADF&G Division of Subsistence, Community Subsistence Information System (CSIS): <http://www.subsistence.adfg.state.ak.us/CSIS/>.

3. Sill, L.A., R. A. Grant, M. A. Marchioni, and D. Koster. *In prep*. "The Harvest and Use of Wild Resources in Haines, Hoonah, Angoon, Whale Pass, and Hydaburg, Alaska, 2012." Juneau: Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 399. Hereinafter cited as (Sill et al. *In prep*).

3. SUBSISTENCE SALMON FISHERIES IN SOUTHEAST ALASKA

TRADITIONAL TLINGIT AND HAIDA SUBSISTENCE SALMON FISHERIES

Salmon were, and continue to be, a key subsistence resource for the indigenous Tlingit and Haida of Southeast Alaska (Blackman 1990:244; Fall et al. 2009; de Laguna 1990:210). Among the Tlingit, salmon fishing took place from late spring to early autumn at fish camps. Most salmon were harvested in rectangular wooden traps set in salmon streams. Other gear included spears, harpoons, and gaff hooks (de Laguna 1990:210–211). Rights to fish at certain locations were held by matrilineal clans (Goldschmidt and Haas 1998:7–17). A fundamental unit of Tlingit social organization is the *kwaan*, consisting of all individuals living within the boundaries of the lands and waters controlled by the clans residing in a particular winter village. Traditional Tlingit territory included approximately 18 *kwaans*, many of which continue to be associated with contemporary Southeast Alaska communities and the areas they use for subsistence hunting, fishing, and gathering (Fall et al. 2009; Thornton and Sealaska Heritage Institute 2008:44–46). Two of these *kwaans* include the *Xunaa* (Hoonah) *Kwaan*, which controlled the area today circumscribed by District 14, and the *Xulsnoowu* (Angoon) *Kwaan*, which today includes much of District 12.⁴

SUBSISTENCE AND PERSONAL USE SALMON FISHING REGULATIONS

The Division of Commercial Fisheries is responsible for managing subsistence and personal use salmon fisheries in Southeast Alaska. Therefore, the geographic areas managed as districts and sections used for subsistence and personal use management follow those established for commercial fisheries.

The Southeastern Alaska Area includes all waters between a line projecting southwest from the westernmost tip of Cape Fairweather and Dixon Entrance (5 AAC 01.700). The Yakutat Area includes all waters of Alaska between the longitude of Cape Suckling and the longitude of Cape Fairweather (5 AAC 01.650). For management and administrative purposes, the Southeast Alaska/Yakutat Region is divided into 6 management areas. From south to north, they are Ketchikan (districts 1, 2, 3, and 4), Petersburg/Wrangell (districts 5, 6, 7, 8 and 10 and Section 9B), Sitka (Section 9A and District 13), Juneau (districts 11 and 12—except subdistricts 12-11, 12-14, and part of 12-12, 14, and 16), Haines (District 15), and Yakutat (districts 81, 82, 83, 85, 86, 91, and 92). The Southeast Alaska/Yakutat Region includes 2 nonsubsistence areas: the Ketchikan Nonsubsistence Area (5 AAC 99.015 (1)) and the Juneau Nonsubsistence Area (5 AAC 99.015 (2)). The board may not permit subsistence fishing in nonsubsistence areas: in these areas, harvest opportunities are provided through personal use or sport fishing regulations.

Subsistence and personal use fisheries in Southeast Alaska are managed under a permit program that includes an annual harvest assessment component. Permit conditions referring to open dates, salmon species, water bodies, legal gear types, and possession and annual limits are specific to each management area and may change between years to respond to management and conservation strategies. Specific conditions of personal use fisheries differ from subsistence fisheries conditions mainly in regard to gear type, location, and harvest limits.

Permits are available at area department offices and in some additional communities where the department has delegated authority to issue permits on its behalf. Only 1 permit is allowed per household. Permits identify the permit holder, his/her contact information, and other household members authorized to fish the permit. At the end of each fishing season, permit holders are required to return the permit with

4. Alaska Native Knowledge Network. 2006. "Tlingit Tribes, Clans, and Clan Houses," University of Alaska Fairbanks. Accessed August 2014. <http://ankn.uaf.edu/ANCR/Southeast/TlingitMap/>

a completed harvest report by mail or telephone to the department. Information on harvest reports includes date and location of harvest (water body), gear used, species of salmon harvested, and amount of fish harvested. The department is able to differentiate harvests on the subsistence and personal use permit because fishermen record their harvest locations on their permit.

Residents of the Juneau Management Area (districts 11, 12, 14, and 16) also harvest salmon under sport fishing regulations and retain salmon from commercial fisheries for home use (Sill et al. *In prep*). Sport harvest data are collected annually through the Alaska Statewide Sport Fishing survey. In addition, creel surveys of marine sport fisheries are conducted in Juneau, Gustavus, and Elfin Cove for additional sport fish data. The other communities within districts 12 and 14 do not have on-the-ground creel survey data. The results of the statewide survey are provided in published reports and through an online database; both are available on the department website. Commercial removals (homepack) of salmon are reported on fish tickets at the time of delivery to the processor. The data collected on fish retained from a commercial harvest is recorded in the IFDB and includes location of harvest by department statistical area.

ESTIMATED SUBSISTENCE SALMON HARVESTS BASED ON PERMIT DATA

Table 2 reports estimated subsistence harvests of salmon by species in District 12 from the years 1999–2012. There are no nonsubsistence areas within District 12 and no personal use restrictions on the salmon fishery in regulation for District 12 (5 AAC 77.682); therefore, the department attributes harvests to the subsistence fishery. There are no reported harvests under a federal permit in this district. During this 14-year period, total annual subsistence harvests ranged between 317 salmon in 2007 to 3,280 salmon in 2000, with a recent 5-year average of 1,426 salmon, 10-year average of 1,245 salmon, and historical average of 1,615 salmon (Table 2; Figure 2). The largest portion of the 14-year average harvest was sockeye salmon (84%), followed by coho salmon (*O. kisutch*) (10%), pink salmon (*O. gorbuscha*) (4%), chum salmon (*O. keta*) (2%), and king salmon (*O. tshawytscha*) (less than 1%) (Figure 3). Harvests in Table 2 are estimates from reported harvests that have been expanded to account for nonreturned permits. From 2000 to 2012 the number of permits returned averaged 51 and the average number issued was 73.

Table 3 compares the number of permits issued, fished, and the subsistence harvest estimates for local communities in District 12, which includes Angoon and Tenakee Springs, with the same information for Alaska residents who reside outside District 12 for 2005 to 2012 (the years for which this specific information is available). Figure 4 illustrates that most of the harvest of subsistence salmon in District 12 is by local community members.

In District 14 there are no nonsubsistence areas and no personal use restrictions on the salmon fishery in regulation (5 AAC 77.682); therefore, the department attributes harvests to the subsistence fishery. For District 14 during the same 14-year period, total annual subsistence harvests ranged from 315 salmon in 2007 to 3,939 salmon in 2003 (Table 4). The recent 5-year average harvest was 1,067 salmon, the 10-year average harvest was 1,115 salmon, and the historical average harvest was 1,130 salmon (Table 4; Figure 5). The largest portion of the 14-year average was sockeye salmon (41%), chum salmon (38%), pink salmon (16%), coho salmon (5%), and king salmon (less than 1%) (Figure 6). From 2000 to 2012 the number of permits returned averaged 34 and the number issued averaged 48.

Table 5 compares the number of permits issued, fished, and the subsistence harvest estimates for local communities in District 14, which includes Hoonah, Gustavus, and Elfin Cove, with the same information for Alaska residents who reside outside District 14 for 2005 to 2012 (the years for which this specific information is available). Figure 7 illustrates that most of the harvest of salmon in District 14 is by local community members.

Table 2.—Historical subsistence salmon harvests estimated from permit returns for all Alaska residents, District 12, Southeast Alaska Region, 1999–2012.

Year	Permits fished		Estimated salmon harvest					Total
	Reported	Estimated	King	Sockeye	Coho	Chum	Pink	
1999	ND	ND	0	2,144	274	118	93	2,629
2000	79	122	0	2,711	286	107	176	3,280
2001	71	119	0	2,425	413	86	83	3,007
2002	44	67	0	1,090	63	31	63	1,246
2003	49	87	0	1,975	184	0	3	2,162
2004	50	59	0	924	135	10	69	1,137
2005	19	42	0	533	34	0	0	567
2006	35	65	0	1,112	0	0	20	1,131
2007	8	23	0	260	0	0	56	316
2008	65	69	0	969	124	17	1	1,111
2009	63	75	0	966	216	17	11	1,210
2010	62	73	0	1,517	276	16	136	1,945
2011	69	83	10	1,110	243	14	105	1,482
2012	50	63	0	1,161	59	0	165	1,385
5-year average (2008–2012)	62	73	2	1,145	184	13	84	1,426
10-year average (2003–2012)	47	64	1	1,053	127	7	57	1,245
Historical average (1999–2012) ^a	51	73	1	1,350	165	30	70	1,616

Source ADF&G Division of Subsistence, Alaska Subsistence Fisheries Database (ASFDB).

Note ND = no data available.

a. Historical average for permits fished includes 2000–2012 since there are no data for 1999.

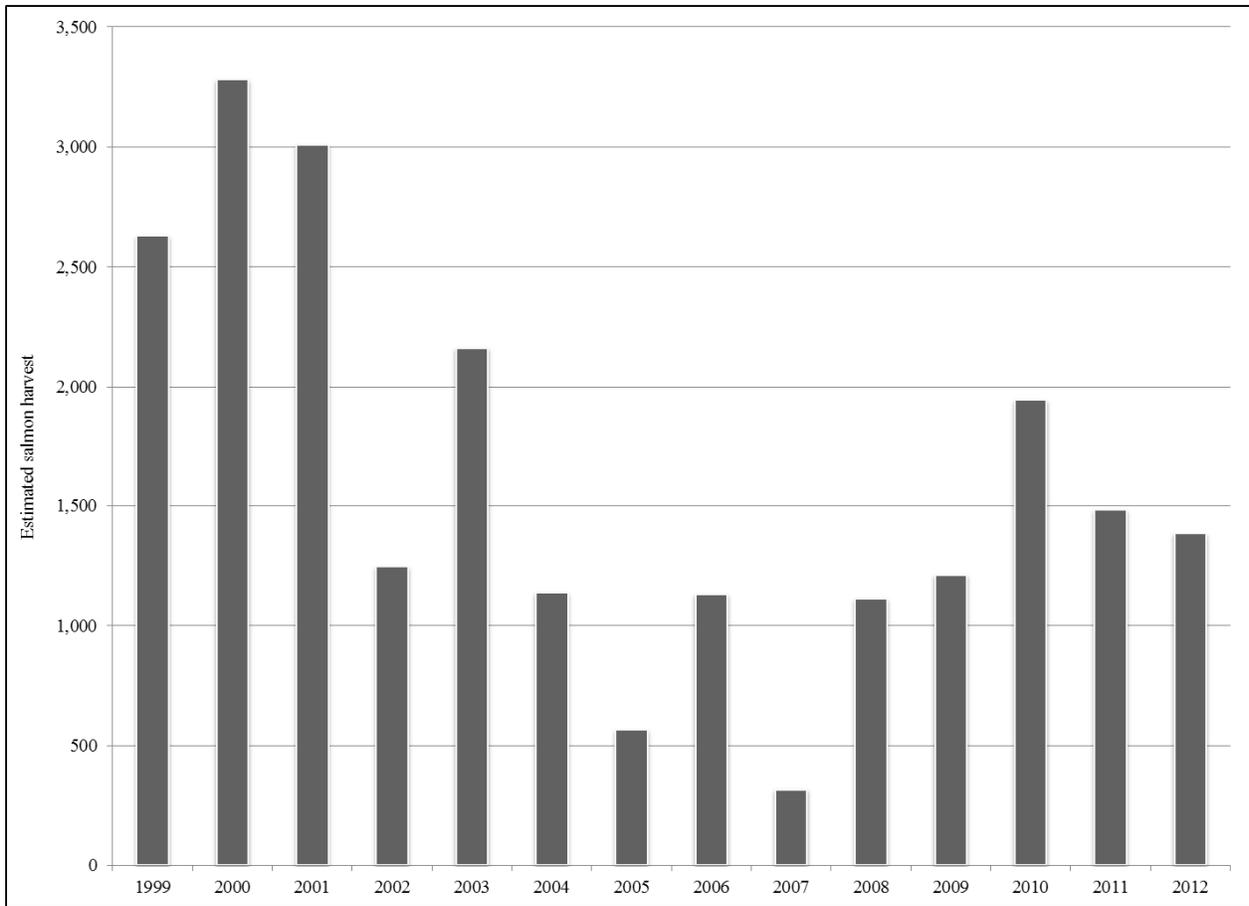


Figure 2.—Historical total subsistence salmon harvests (all species) estimated from permit returns, District 12, 1999–2012.

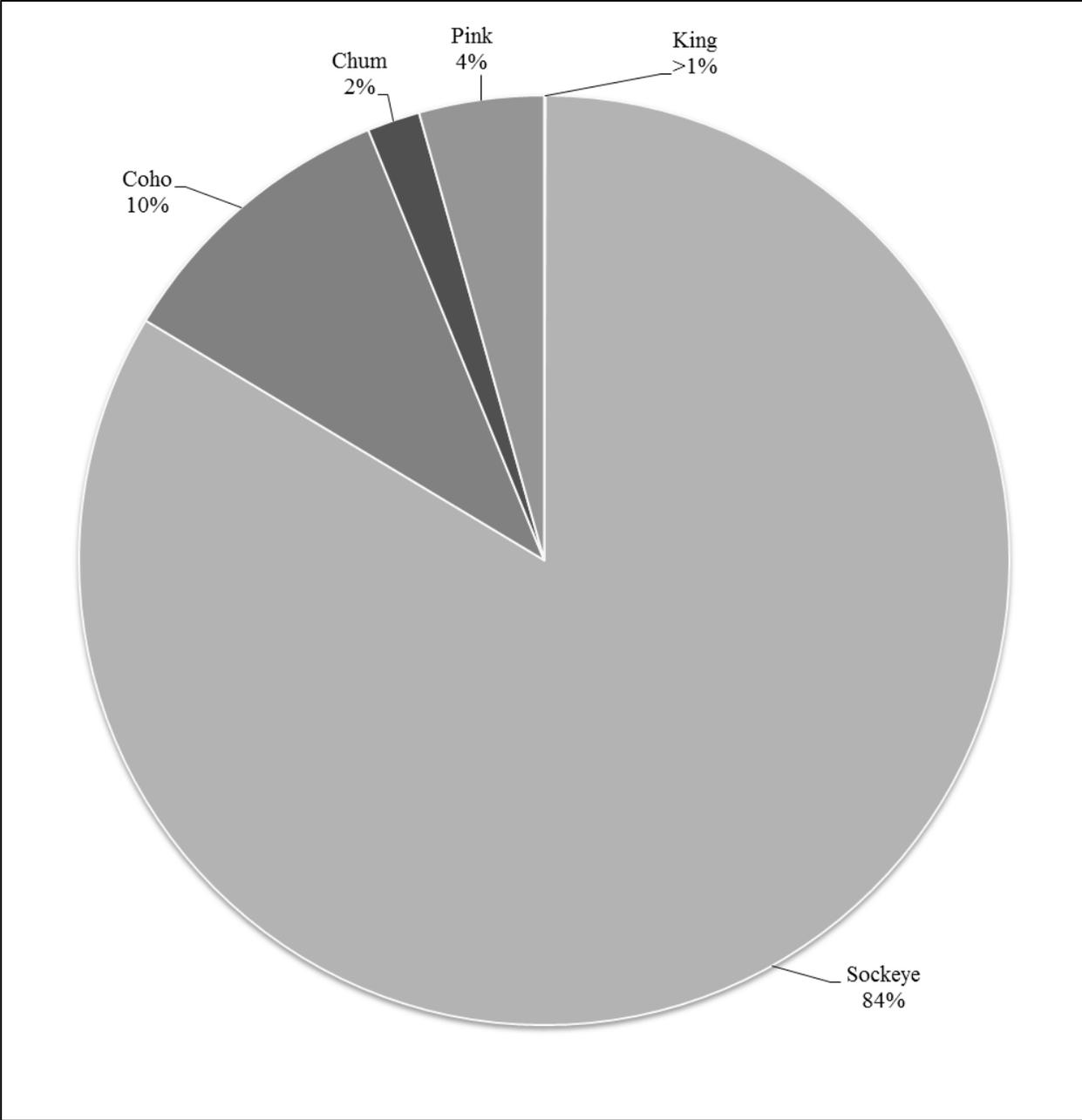


Figure 3.—Average composition of subsistence salmon harvests estimated from permit returns, District 12, 1999–2012.

Table 3.—Historical subsistence salmon harvests, local and non-local communities, District 12, Southeast Alaska Region, 2005–2012.

Year	Permits fished		Estimated salmon harvest					Total
	Reported	Estimated	King	Sockeye	Coho	Chum	Pink	
Local communities ^a								
2005	11	31	0	360	34	0	0	394
2006	20	44	0	921	0	0	20	940
2007	2	11	0	90	0	0	56	146
2008	41	42	0	634	124	16	0	774
2009	47	56	0	833	84	0	6	922
2010	42	48	0	1,180	176	10	92	1,457
2011	49	60	10	899	195	14	10	1,127
2012	44	56	0	1,019	51	0	0	1,070
Non-local communities								
2005	8	11	0	173	0	0	0	173
2006	15	21	0	191	0	0	0	191
2007	6	11	0	171	0	0	0	171
2008	24	26	0	335	0	1	1	337
2009	16	18	0	134	132	17	5	288
2010	20	26	0	338	100	5	44	487
2011	20	23	0	211	49	0	95	355
2012	6	7	0	141	8	0	165	315

Source ADF&G Division of Subsistence.

a. Local communities are Angoon and Tenakee Springs.

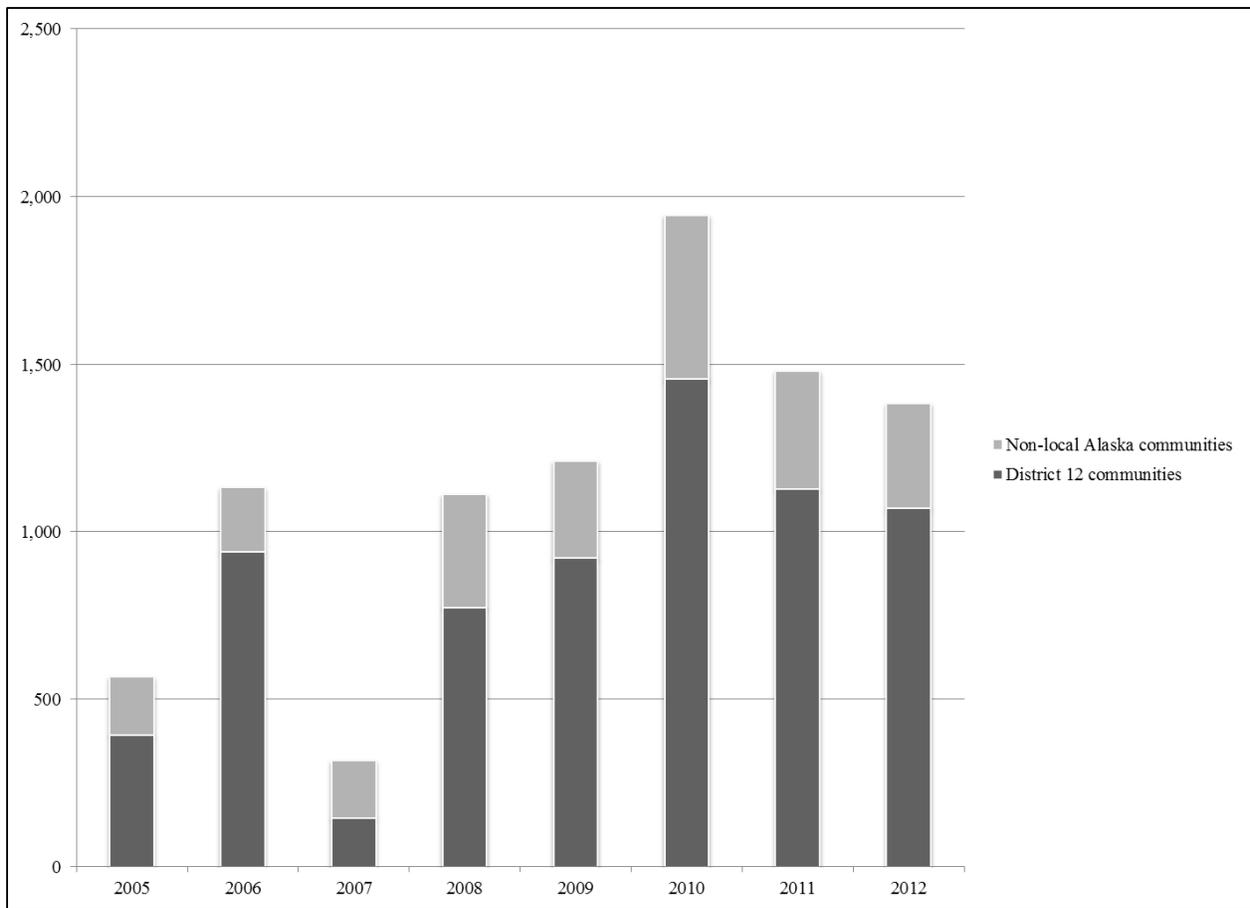


Figure 4.—Historical subsistence salmon harvests by residents of District 12 and non-local Alaska residents, District 12, Southeast Alaska Region, 2005–2012.

Table 4.—Historical subsistence salmon harvests estimated from permit returns for all Alaska residents, District 14, Southeast Alaska Region, 1999–2012.

Year	Permits fished		Estimated salmon harvest					Total
	Reported	Estimated	King	Sockeye	Coho	Chum	Pink	
1999	ND	ND	0	83	30	123	1,779	2,015
2000	35	53	0	406	19	203	34	662
2001	21	30	0	367	118	986	58	1,530
2002	15	27	0	115	4	191	159	468
2003	10	39	0	387	121	3,431	0	3,939
2004	29	45	0	500	11	46	124	681
2005	17	32	0	421	0	25	51	497
2006	28	47	0	274	3	22	84	383
2007	21	31	0	253	28	34	0	315
2008	68	75	0	717	142	33	7	900
2009	62	74	0	989	42	760	43	1,834
2010	28	37	2	464	86	2	6	560
2011	41	46	0	554	130	1	85	771
2012	72	84	0	969	62	97	142	1,270
5-year average (2008–2012)	54	63	0	739	92	179	57	1,067
10-year average (2003–2012)	38	51	0	553	62	445	54	1,115
Historical average (1999–2012) ^a	34	48	0	464	57	425	184	1,130

Source ADF&G Division of Subsistence, Alaska Subsistence Fisheries Database (ASFDB).

Note ND = no data available.

a. Historical average for permits fished includes 2000–2012 since there are no data for 1999.

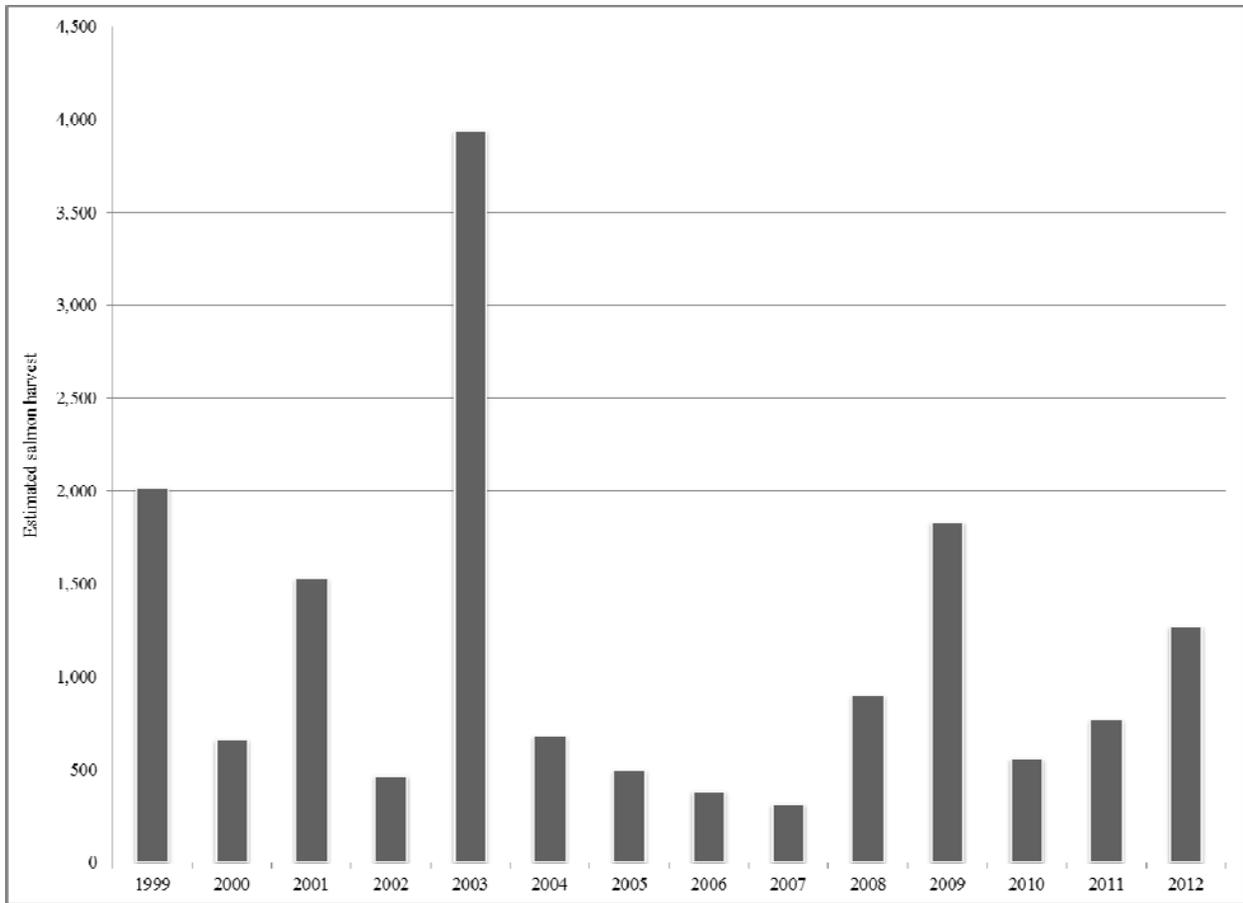


Figure 5.—Historical total subsistence salmon harvests (all species) estimated from permit returns, District 14, 1999–2012.

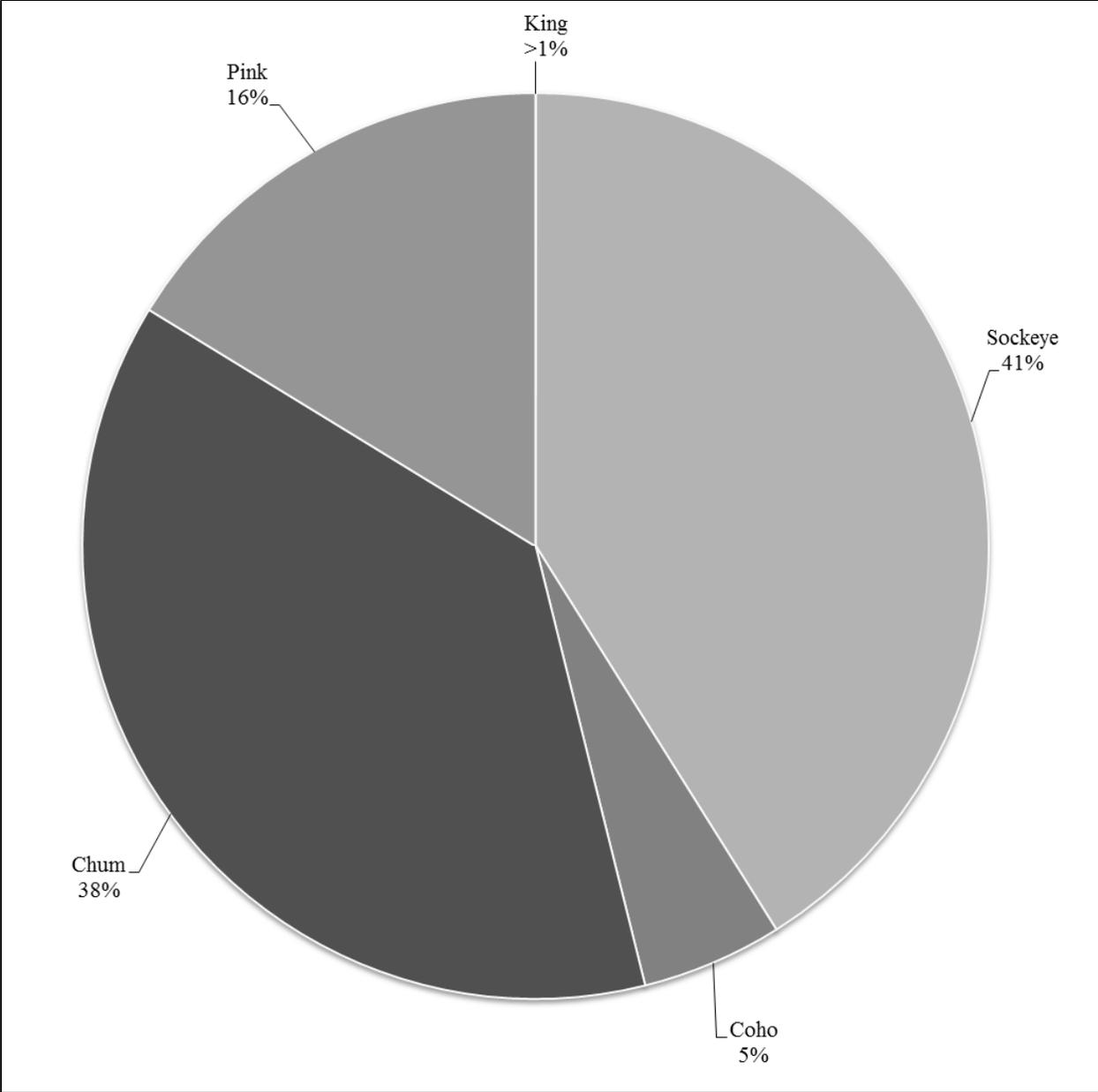


Figure 6.—Average composition of subsistence salmon harvests estimated from permit returns, District 14, 1999–2012.

Table 5.—Historical subsistence salmon harvests, local and non-local communities, District 14, Southeast Alaska Region, 2005–2012.

Year	Permits fished		Estimated salmon harvest					Total
	Reported	Estimated	King	Sockeye	Coho	Chum	Pink	
Local communities ^a								
2005	8	20	0	277	0	25	44	346
2006	12	24	0	97	3	12	84	196
2007	14	17	0	131	0	34	0	165
2008	35	40	0	346	114	21	2	483
2009	42	52	0	770	27	760	32	1,588
2010	16	24	2	318	71	2	6	399
2011	21	24	0	336	48	1	85	471
2012	35	44	0	626	28	95	138	887
Non-local communities								
2005	9	13	0	144	0	0	7	151
2006	16	23	0	177	0	10	0	188
2007	7	13	0	121	28	0	0	150
2008	33	35	0	371	29	13	5	417
2009	20	21	0	220	15	0	12	246
2010	12	13	0	146	15	0	0	161
2011	20	22	0	218	82	0	0	300
2012	37	39	0	343	34	2	4	383

Source ADF&G Division of Subsistence.

a. Local communities are Hoonah, Gustavus, and Elfin Cove.

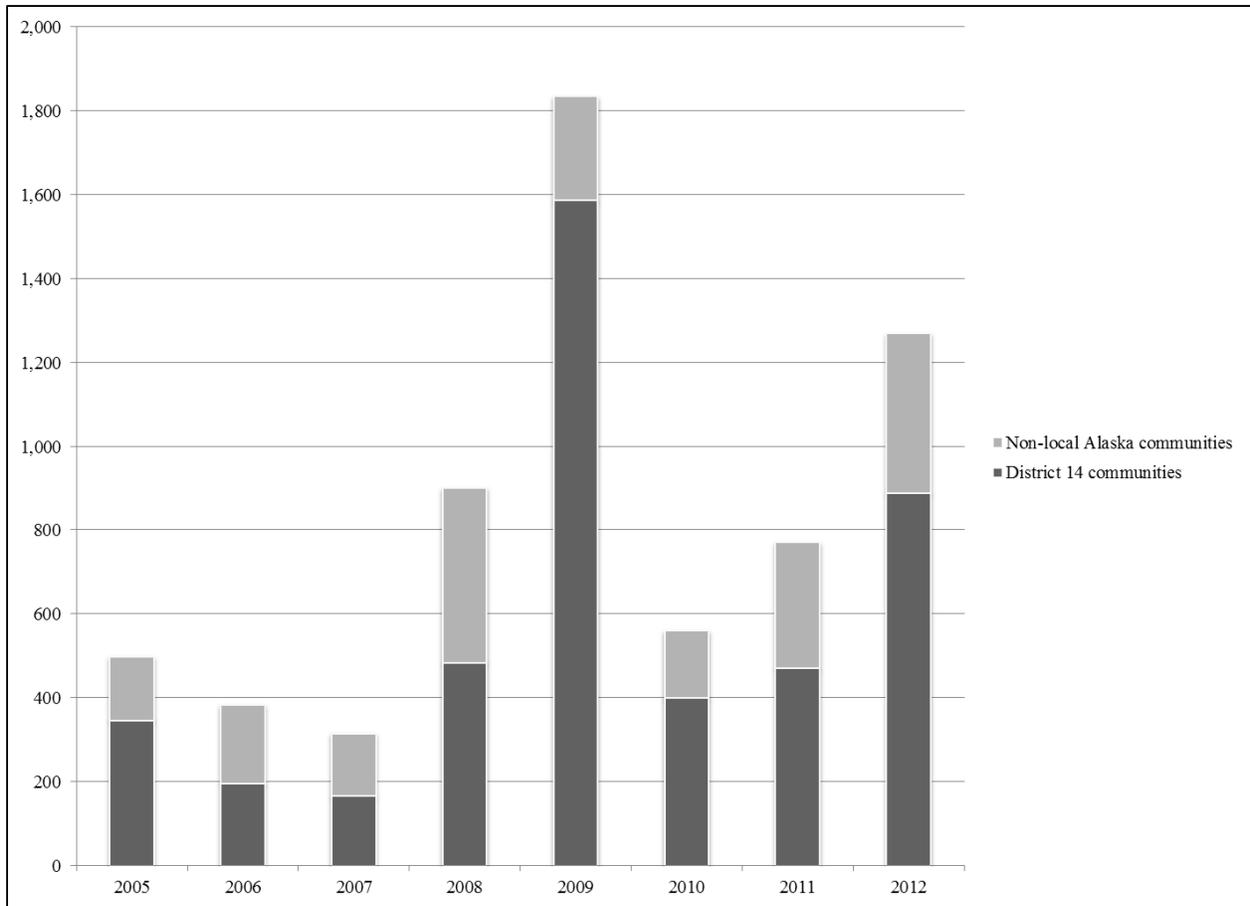


Figure 7.—Historical subsistence salmon harvests by residents of District 14 and non-local Alaska residents, District 14, Southeast Alaska Region, 2005–2012.

ESTIMATED HARVESTS OF SALMON BASED ON HOUSEHOLD HARVEST SURVEY DATA

Harvest estimates can also be discerned from household surveys administered in a community. In 2013, the department administered a comprehensive harvest assessment survey in the communities of Angoon and Hoonah for the 2012 study year. Since the department did not administer a survey in other communities in these 2 districts for study year 2012, harvest estimates in tables 6 and 7 for 2012 are derived from earlier surveys that the department conducted in the communities (1987 for Tenakee Springs, Elfin Cove, Gustavus, and Pelican, and 1996 for Game Creek CDP and Whitestone Logging Camp, which are near Hoonah). As described previously, the 2012 estimates were calculated based on the previous study years' per capita fish harvests being multiplied by a 5-year average of the populations as estimated by the American Community Survey. Districts 12 and 14 have positive C&T findings for salmon (Figure 1). Residents of these communities use a variety of methods for harvesting salmon for home uses—including rod and reel and gillnets, and retaining salmon caught in commercial fisheries—under sport, subsistence, and commercial fishing regulations.

Table 6 shows the 2012 estimated harvests of salmon for home uses harvested by all noncommercial fisheries in District 12. The community of Angoon had an estimated harvest of 2,827 salmon and Tenakee Springs an estimated 1,404 salmon for a total of 4,231 salmon. In comparison, the historical average for District 12 based on permit returns is 1,616 salmon, which only includes harvests by net in the subsistence fishery (Table 2). Harvesters in District 12, as well as in District 14, harvest with nets in the subsistence fishery, as well as with rod and reel while sport fishing from a boat that is underway (trolling in the sport fishery⁵) and from shore.

Table 7 shows the 2012 estimated harvests of salmon for home uses harvested with by all noncommercial fisheries in District 14. Hoonah had the highest estimated harvest: 9,429 salmon out of a total of 14,928 salmon harvested by all communities combined. In comparison, the historical average estimate for District 14 based on permit returns is 1,130 salmon, which only includes harvests by net in the subsistence fishery (Table 4).

5. Respondents were very clear that trolling in the sport fishery is different than other sport fishing, which they distinguished as fishing from a stationary boat or at a stationary location from shore. Trolling is a common commercial activity in many Southeast Alaska communities, or, for some communities, was common in the past. Respondents related that residents who currently troll in the commercial fishery (or who used to troll in the commercial fishery) troll in the sport fishery to harvest fish for home use. The data are characterized in this manner because they are reflective of harvesting activity as categorized by Southeast Alaska survey respondents.

Table 6.—Estimated harvests of salmon for home uses (all fisheries), from surveys, District 12 communities.

Species by fishery	Estimated harvests of salmon by species ^d		
	Angoon ^a	Tenakee Springs ^b	Total
<i>King salmon</i>	414	130	544
King salmon [CF retention]	0	96	96
King salmon [sport fishery]	414	34	448
King salmon [subsistence]	0	0	0
<i>Sockeye salmon</i>	1,087	121	1,208
Sockeye salmon [CF retention]	0	9	9
Sockeye salmon [sport fishery]	45	0	45
Sockeye salmon [subsistence fishery]	1,042	112	1,154
<i>Coho salmon</i>	1,054	259	1,313
Coho salmon [CF retention]	0	82	82
Coho salmon [sport fishery]	998	176	1,174
Coho salmon [subsistence fishery]	56	1	57
<i>Chum salmon</i>	80	85	165
Chum salmon [CF retention]	0	4	4
Chum salmon [sport fishery]	57	39	96
Chum salmon [subsistence fishery]	23	42	65
<i>Pink salmon</i>	192	809	1,001
Pink salmon [CF retention]	0	0	0
Pink salmon [sport fishery]	85	809	894
Pink salmon [subsistence fishery]	107	0	107
Total salmon^c	2,827	1,404	4,231
Total salmon [CF retention]	0	191	191
Total salmon [sport fishery]	1,599	1,058	2,657
Total salmon [subsistence fishery]	1,228	155	1,383

a. Estimated from 2012 household surveys conducted by ADF&G Division of Subsistence.

b. Estimated from 1987 household surveys conducted by ADF&G Division of Subsistence.

c. Estimates based upon the best available household survey data for each community, and adjusted based upon 2012 5-year average American Community Survey (ACS) population estimates.

d. Estimated using 5-year (2008–2012) average population estimate from the ACS.

Table 7.—Estimated harvests of salmon for home uses (all methods/fisheries), from surveys, District 14 communities.

Species by fishery	Estimated harvests of salmon by species ^d						Total
	Elfin Cove ^a	Hoonah ^b	Gustavus ^a	Pelican ^a	Game Creek CDP ^c	Whitestone Logging Camp ^c	
<i>King salmon</i>	111	1,243	611	200	1	20	2,186
King salmon [CF retention]	87	237	30	74	1	0	429
King salmon [sport fishery]	23	1,004	537	126	0	20	1,710
King salmon [subsistence fishery]	0	2	44	0	0	0	46
<i>Sockeye salmon</i>	36	3,405	362	102	93	18	4,016
Sockeye salmon [CF retention]	18	1,208	30	24	2	0	1,282
Sockeye salmon [sport fishery]	18	210	242	34	0	10	514
Sockeye salmon [subsistence fishery]	0	1,987	87	44	91	8	2,217
<i>Coho salmon</i>	37	3,307	1,735	153	41	184	5,457
Coho salmon [CF retention]	24	979	127	31	0	0	1,161
Coho salmon [sport fishery]	14	1,961	1,503	118	34	184	3,814
Coho salmon [subsistence fishery]	0	367	107	4	7	0	485
<i>Chum salmon</i>	6	685	245	22	0	1	959
Chum salmon [CF retention]	3	380	23	5	0	0	411
Chum salmon [sport fishery]	3	252	218	4	0	1	478
Chum salmon [subsistence fishery]	0	53	3	13	0	0	69

-continued-

Table 7.–Page 2 of 2.

Species by fishery	Estimated harvests of salmon by species ^d						Total
	Elfin Cove ^a	Hoonah ^b	Gustavus ^a	Pelican ^a	Game Creek CDP ^c	Whitestone Logging Camp ^c	
<i>Pink salmon</i>	36	789	1,111	313	51	10	2,310
Pink salmon [CF retention]	16	161	23	192	0	0	392
Pink salmon [sport fishery]	21	492	1,067	95	51	10	1,736
Pink salmon [subsistence fishery]	0	136	20	26	0	0	182
Total salmon^e	226	9,429	4,064	790	186	233	14,928
Total salmon [CF retention]	148	2,965	233	326	3	0	3,675
Total salmon [sport fishery]	79	3,919	3,567	377	85	225	8,252
Total salmon [subsistence fishery]	0	2,545	261	87	98	8	2,999

a. Estimated from 1987 household surveys conducted by ADF&G Division of Subsistence.

b. Estimated from 2012 household surveys conducted by ADF&G Division of Subsistence.

c. Estimated from 1996 household surveys conducted by ADF&G Division of Subsistence.

d. Estimated using 5-year (2008–2012) average population estimate from the American Community Survey (ACS).

e. Estimates based upon the best available household survey data for each community, and adjusted based upon 2012 5-year average ACS population estimates.

HARVEST LOCATIONS

Harvest location data in this report come from 2 sources: 1) from comprehensive harvest surveys in the communities of Angoon and Hoonah, which documented harvest of wild resources during the 2012 calendar year, and 2) a query of the IFDB, which shows the locations of reported salmon harvests on state-issued subsistence salmon permits. Additionally, harvest surveys for salmon and marine invertebrates occurred in Hoonah for the 2013 study year. The 2013 study initially included Angoon but the Angoon Tribal Council chose not to approve the survey.

Map data support the assessment shown above that many residents are meeting their harvesting goals in the subsistence and sport fisheries. Figure 8 shows harvests using point data (circles with fish), which indicate seine net or rod and reel harvest methods, and also lines, which show locations for trolling for salmon for the community of Angoon in 2012. As shown in Table 6, Angoon makes up most of the harvest for District 12 communities. Most of the harvest is by subsistence seine net at the mouth of Kanalku River, and trolling for salmon occurred in the immediate vicinity of Angoon inside Kootznahoo Inlet and surrounding waters in Chatham Strait.

For District 14 there are 2 years of map harvest data for the community of Hoonah⁶. One of the main harvesting areas for Hoonah residents is Hoktaheen, at the very edge of District 14 (Figure 9). In addition, residents of Hoonah traveled farther south into District 13-A to troll for salmon as well as to harvest from a few rod and reel locations in 12-A. The board has already made an ANS finding for salmon in District 13-A as part of the District 9A and 13 finding for the Sitka Management Area (Table 1). However, as shown in Figure 11, most harvesting activity for salmon occurred in District 14 in the sport fishery, including trolling. A similar pattern is shown in 2013 with almost all salmon fishing activity occurring in District 14 (Figure 10).

Table 8 shows the top locations where residents of District 12 fish based on subsistence salmon permit returns. As shown in the table these include locations within District 12, including Favorite Creek, Hasselborg River, Kanalku Bay, and Kook Lake Outlet.

Table 9 shows the top locations where residents of District 14 fish based on subsistence salmon permit returns. These include Excursion River, Game Creek, Neva Creek, Surge Bay, and Hoktaheen Cove, which is located on the edge of District 14.

6. The study design for the project included a harvest survey for salmon in both Angoon and Hoonah. However, upon consultation with the community, the Angoon Community Association declined to participate in the survey.

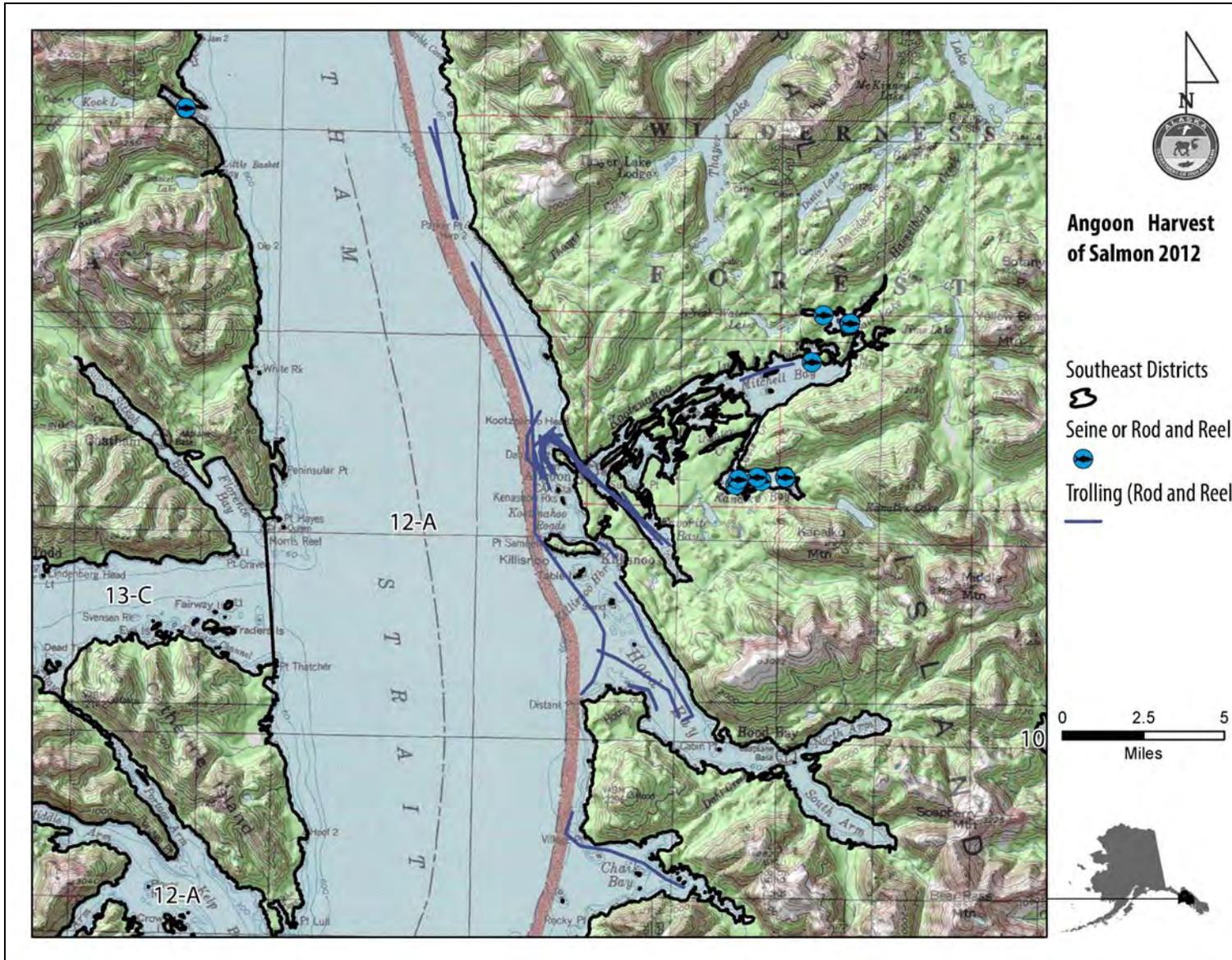


Figure 8.—Salmon harvest locations, Angoon, 2012.

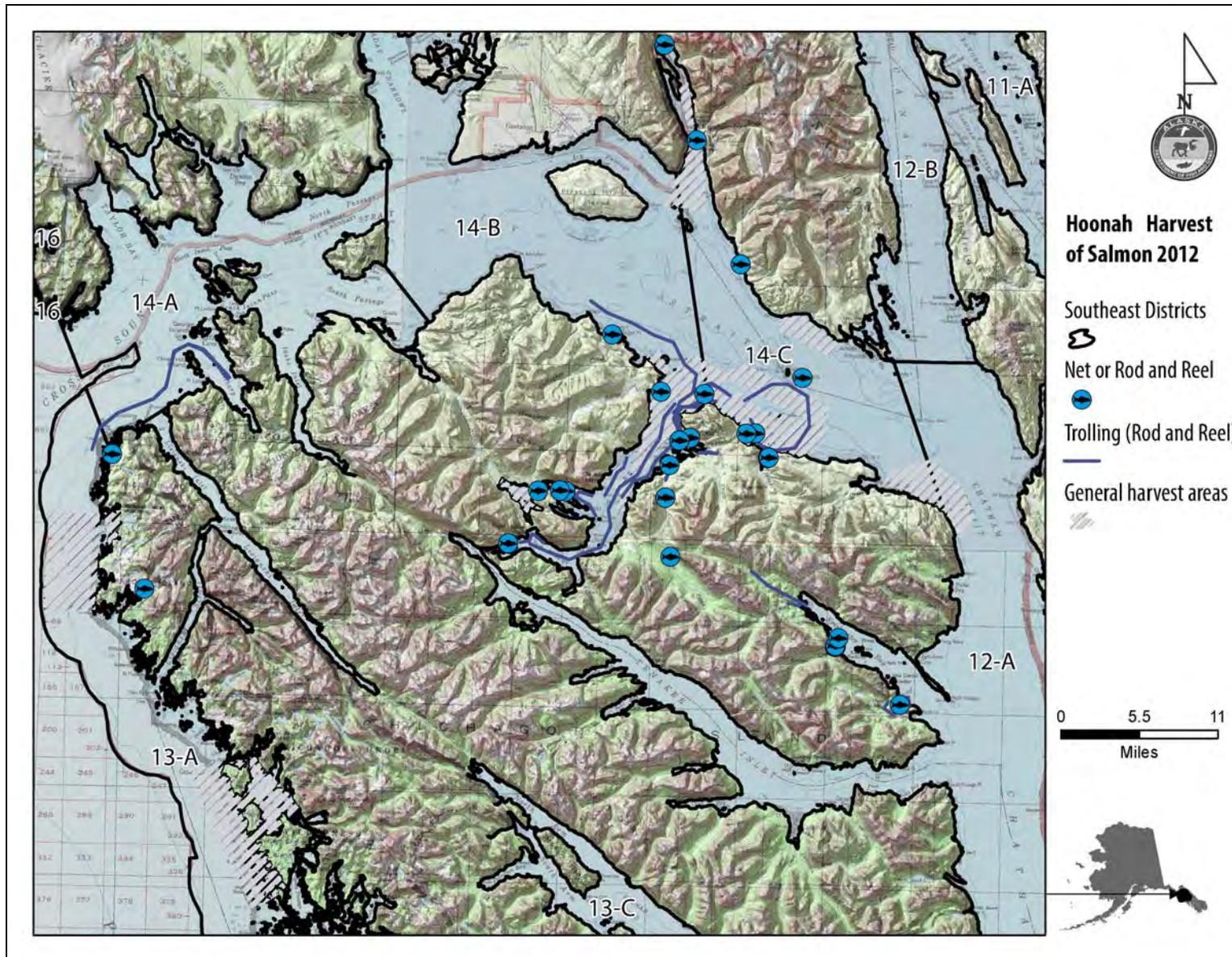


Figure 9.—Salmon harvest locations, Hoonah, 2012.

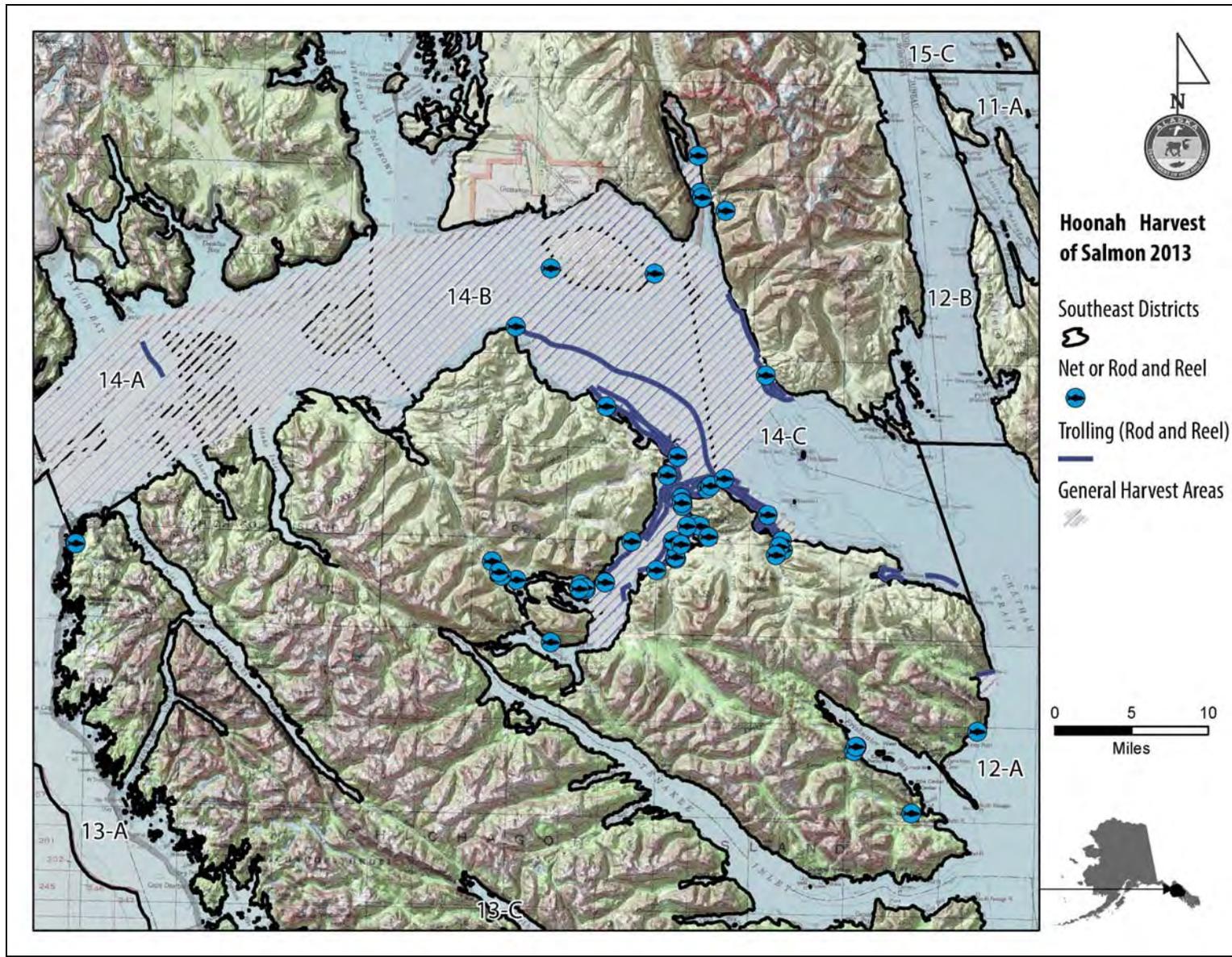


Figure 10.—Salmon harvest locations, Hoonah, 2013.

Table 8.–Salmon harvests by location, subsistence permits, District 12 communities, 1989–2013.

Year	Favorite Creek	Hasselborg River	Kanalku Bay	Kook Lake Outlet	Other streams	Total
1989		100	392	185	90	767
1990	50	110	772	200	161	1,293
1991	99	165	421	89	165	939
1992	50	160	548	223		981
1993		425	877	33	25	1,360
1994	55	222	1,108	143	189	1,717
1995	100	255	892	101	10	1,358
1996	35	378	1,293	120	248	2,074
1997	50	480	1,458	52	242	2,282
1998	100	394	1,497	80	25	2,096
1999		151	1,700	15	80	1,946
2000	50	131	1,369	10	0	1,560
2001	70	108	978	135	286	1,577
2002	20	110	14	553	182	879
2003	35	90	65	746	604	1,540
2004		60	40	488	1,163	1,751
2005		24	28	64	182	298
2006		20		356	311	687
2007		5	5	26	130	166
2008		15	531	26	200	772
2009		60	635	75	302	1,072
2010		298	667	356	307	1,628
2011	20	55	404	386	347	1,212
2012		65	470	60	513	1,108
2013		138	479	85	246	948
Average, all years	56	161	693	184	250	1,280

Source IFDB, accessed 2014.

Table 9.–Salmon harvests by location, subsistence permits, District 14 communities, 1989–2013.

Year	Excursion River	Game Creek	Hoktaheen Cove	Neva Creek	Surge Bay	Other streams	Total
1989	964	77	265		169	452	1,927
1990	1,375	21	30	25		1,044	2,495
1991	197	73	193	30	75	403	971
1992	240	260	292	322		310	1,424
1993		98	302	100	50	293	843
1994	920	211	636	80	50	408	2,305
1995	60	170	731	50		274	1,285
1996		22	891	908	12	230	2,063
1997		2	1,661	1,192		234	3,089
1998	1,400	32	927	5	31	244	2,639
1999	1,500	36	626	30	45	534	2,771
2000		14	503	137	78	349	1,081
2001	624	4	572	178	118	400	1,896
2002		23	721	25	80	316	1,165
2003	750		661	98	45	156	1,710
2004		47	1,447	262	425	397	2,578
2005			501	201	66	281	1,049
2006		0	200	46	35	141	422
2007	76	68	205	168	2	91	610
2008		15	141	338	12	188	694
2009	550		704	623	73	300	2,250
2010		21	381	221	291	308	1,222
2011			654	351	180	268	1,453
2012		31	500	522	102	382	1,537
2013		7	472	218	44	250	991
Average, all years	721	59	569	255	94	330	1,619

Source IFDB, accessed 2014.

4. ANS OPTIONS FOR SALMON STOCKS IN DISTRICTS 12 AND 14

The ANS for salmon, all species combined, in districts 11, 12, 14, and 16 combined is 4,178–10,133 salmon and only districts 12 and 14 have salmon stocks with a positive C&T finding. Proposal 146 provides the board with an opportunity to create 2 separate ANS findings for stocks with a positive C&T finding in districts 12 and 14. Proposal 147 asks the board to make an ANS finding for the salmon stocks in the Angoon area (District 12). Harvest estimates for the 2 districts from subsistence salmon permit returns are available in tables 2 and 4 and from household surveys in tables 6 and 7. Tables 2 and 4 include the harvest of salmon by all Alaska residents who participate in the subsistence fishery in each district. A few items the board may wish to consider when addressing these ANS findings include: the current ANS is based only on subsistence permit returns, whereas residents of both districts rely on a variety of methods and fisheries to meet their harvesting goals. In addition, residents rely on harvesting from a variety of areas, as shown in figures 10–12. In District 12, most harvests are localized in the district, whereas in District 14 there is harvest activity occurring in a small portion of District 12. One consideration to keep in mind for District 14 is that Hoktaheen Cove is an important historical location for residents of Hoonah for subsistence fishing (Sill et al. *In prep*). As noted in Table 9, the average yearly subsistence harvest at Hoktaheen Cove over time by District 14 residents is 569 salmon. Residents invest a significant amount of time and fuel in reaching this location. Observations made by department researchers have found that Hoktaheen Cove is difficult to access due to distance, weather, risks associated with open ocean travel in skiffs, and expense of fuel. Residents must also consider whether there will be salmon schooling in Hoktaheen Cove to harvest once the trip to the location is made. If the water in Hoktaheen River is high, salmon will move directly into the river from the ocean and fishermen will not catch fish. Residents do not know whether the opportunity will be good until they are onsite, which takes several hours to reach from Hoonah. Although attempts are made, the trip may end with no fish harvested, as observed by department research staff. One item to consider is that residents of Hoonah use a variety of methods (sport, subsistence, and commercial removals) to meet their harvesting goals.

OPTION A: 5-YEAR LOW AND HIGH HARVEST

Option A would be to base the revised ANS on the most recent 5-year (2008–2012) lowest and highest harvest based on subsistence salmon permit returns. For District 12 the lowest harvest was 1,111 salmon while the highest harvest was 1,944 salmon (Table 2). This could be rounded to 1,100–1,900 salmon (Table 10). For District 14 the lowest harvest was 771 while the highest harvest was 1,834 salmon (Table 4). This could be rounded to 800 to 1,800 salmon (Table 10).

Table 10.–Option A: revise the ANS based on recent 5-year lowest and highest salmon harvest.

	Low	High	Rounded	
			Low	High
District 12	1,111	1,944	1,100	1,900
District 14	771	1,834	800	1,800

OPTION B: 5-YEAR STANDARD DEVIATION

Option B would be to base the revised ANS on the 5-year (2008–2012) average harvest of all salmon species combined, as estimated from permit returns, plus or minus the standard deviation for those years. Since low and high harvests may be extreme within a time series (there may have been unusual

circumstances that increased or decreased harvest levels), calculating a standard deviation from the mean, or average, harvest may provide a more statistically accurate picture of harvest trends.

For District 12, Option B is based upon generation of a standard deviation of the average annual estimate of salmon harvest from 2008–2012, which is 1,426 salmon (Table 2), and then adding and subtracting the standard deviation (290). This approach produces an option of 1,136–1,716 salmon, which can be rounded to 1,100–1,700 salmon (Table 11).

For District 14, Option B is based upon generation of a standard deviation of the average annual estimate of salmon harvest from subsistence permits in 2008–2012, which is 1,067 salmon, all species combined (Table 4), and then adding and subtracting the standard deviation (448). This approach produces an option of 619–1,515 salmon, which can be rounded to 600–1,500 salmon (Table 11).

Table 11.–Option B: revise ANS based on 5-year average (2008–2012) subsistence permit returns, with standard deviation.

District	Average harvest, all salmon species combined	Standard deviation	± Standard deviation		ANS option, rounded, all salmon species combined	
			Low	High	Low	High
District 12	1,426	290	1,136	1,716	1,100	1,700
District 14	1,067	448	619	1,515	600	1,500

OPTION C: 10-YEAR LOW AND HIGH HARVEST

Option C would be to base the revised ANS on the most recent 10-year (2003–2012) lowest and highest harvest based on subsistence salmon permit returns. For District 12 the lowest harvest was 317 salmon while the highest harvest was 2,162 salmon (Table 2). This could be rounded to 300–2,200 salmon (Table 12). For District 14 the lowest harvest was 315 while the highest harvest was 3,939 salmon (Table 4). This could be rounded to 300 to 3,900 salmon (Table 12).

Table 12.–Option C: revise the ANS based on recent 10-year lowest and highest salmon harvest.

	Low	High	Rounded	
			Low	High
District 12	317	2,162	300	2,200
District 14	315	3,939	300	3,900

OPTION D: 10-YEAR STANDARD DEVIATION

Option D would be to base the revised ANS on the 10-year (2003–2012) average harvest of all salmon species combined, as estimated from permit returns, plus or minus the standard deviation for those years. For District 12, Option D is based upon generation of a standard deviation of the average annual estimate of salmon harvest from 2003–2012, which is 1,245 salmon (Table 2), and then adding and subtracting the standard deviation (526). This approach produces an option of 719–1,771 salmon, which can be rounded to 700–1,800 salmon (Table 13).

For District 14, Option D is based upon generation of a standard deviation of the average annual estimate of salmon harvest from subsistence permits in 2003–2012, which is 1,115 salmon, all species combined (Table 4), and then adding and subtracting the standard deviation (1,036). This approach produces an option of 79–2,151 salmon, which can be rounded to 100–2,200 salmon (Table 13).

Table 13.–Option D: revise ANS based on 10-year average (2003–2012) subsistence permit returns, with standard deviation.

District	Average harvest, all salmon species combined	Standard deviation	± Standard deviation		ANS option, rounded, all salmon species combined	
			Low	High	Low	High
District 12	1,245	526	719	1,771	700	1,800
District 14	1,115	1,036	79	2,151	100	2,200

OPTION E: HISTORICAL LOW AND HIGH HARVEST

Option E would be to base the revised ANS on the historical lowest and highest harvest based on subsistence salmon permit returns. For District 12 the lowest harvest was 317 salmon while the highest harvest was 3,280 salmon (Table 2). This could be rounded to 300–3,300 salmon (Table 14). For District 14 the lowest harvest was 315 while the highest harvest was 3,939 salmon (Table 4). This could be rounded to 300 to 3,900 salmon (Table 14).

Table 14.–Option E: revise the ANS based on recent 10-year lowest and highest salmon harvest.

	Low	High	Rounded	
			Low	High
District 12	317	3,280	300	3,300
District 14	315	3,939	300	3,900

OPTION F: HISTORICAL STANDARD DEVIATION

Option F would be to base the revised ANS on the historical (1999–2012) average harvest of all salmon species combined, as estimated from permit returns, plus or minus the standard deviation for those years. For District 12, Option F is based upon generation of a standard deviation of the average annual estimate of salmon harvest from 1999–2012, which is 1,616 salmon (Table 2), and then adding and subtracting the standard deviation (846). This approach produces an option of 769–2,461 salmon, which can be rounded to 800–2,500 salmon (Table 15).

For District 14, Option F is based upon generation of a standard deviation of the average annual estimate of salmon harvest from subsistence permits from 1999–2012, which is 1,130 salmon, and then adding and subtracting the standard deviation (939). This approach produces an option of 191–2,069 salmon (Table 4), which can be rounded to 200–2,000 salmon (Table 15).

Table 15.–Option F: revise ANS based on historical average (1999–2012), subsistence permit returns, with standard deviation.

District	Average harvest, all salmon species combined	Standard deviation	± Standard deviation		ANS option, rounded, all salmon species combined	
			Low	High	Low	High
District 12	1,616	846	769	2,461	800	2,500
District 14	1,130	939	191	2,069	200	2,000

OPTION G: NO ACTION

Option G is take no action.

REFERENCES CITED

- Blackman, M.B.
1990. "Haida: traditional culture" [in] W. Suttles and W.C. Sturtevant, editors *Handbook of North American Indians*, 7: Northwest Coast. Smithsonian Institution Press: Washington, D.C.
- Fall, J.A., M. Turek, and L. Naves
2009. *Overview of amounts reasonably necessary for subsistence uses of salmon in Southeast Alaska*. Alaska Department of Fish and Game Division of Subsistence, Special Publication No. BOF 2009-03: Anchorage. http://www.adfg.alaska.gov/specialpubs/SP2_SP2009-003.pdf
- Goldschmidt, W. and T.H. Haas
1998. *Haa aaní = Our land: Tlingit and Haida land rights and use*. University of Washington Press; Sealaska Heritage Foundation: Seattle : Juneau.
- De Laguna, F.
1990. "Tlingit" [in] W. Suttles and W.C. Sturtevant, editors *Handbook of North American Indians*, 7: Northwest Coast. Smithsonian Institution Press: Washington, D.C.
- Naves, L.C., M.F. Turek, and W.E. Simeone
2010. *Subsistence–personal use salmon harvest, Southeast–Yakutat Management Region, 1996–2006*. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 350: Anchorage.
- Thornton, T.F. and Sealaska Heritage Institute
2008. *Being and place among the Tlingit*, Culture, place, and nature. University of Washington Press; In association with Sealaska Heritage Institute: Seattle: Juneau [Alaska].

**APPENDIX A—AMOUNTS REASONABLY NECESSARY
FOR SUBSISTENCE USES WORKSHEET,
SOUTHEASTERN ALASKA AND YAKUTAT
MANAGEMENT AREAS, 2006**

PROPOSAL 118
Amounts Necessary for Subsistence Uses of Salmon
in Southeastern Alaska and Yakutat Management Areas
Report to the Alaska Board of Fisheries
Ketchikan, Alaska

Mike Turek, Division of Subsistence
Alaska Department of Fish and Game
January 2006

Introduction

The following report provides background information for **Proposal 118 – 5AAC 01.716. Customary and traditional subsistence uses of fish stocks and amounts necessary for subsistence uses**. This proposal requests a review and update of the amount reasonably necessary for subsistence use (ANS) of salmon in the Southeastern Alaska and Yakutat Management Areas.

Whenever there is a harvestable surplus on fish stocks subject to customary and traditional uses as determined by the Board, the subsistence statute also requires the Board to determine the amount reasonably necessary for subsistence uses (ANS) (AS 16.05.258). In making ANS findings, the Board considers information about subsistence harvest and use patterns from the department and the public and may periodically reconsider and update these findings or address public proposals to change them.

Current Regulations

In 1989, the Alaska Board of Fisheries made Customary and Traditional (C&T) determinations covering all of Southeast Alaska communities for all fisheries. At its spring, 1993, meeting the Board of Fisheries completed its work reauthorizing subsistence regulations for Southeast Alaska. In 1993 the Alaska Board of Fisheries established administrative ANS findings (not in regulations) for all salmon in the Southeastern and Yakutat areas. Subsistence harvest data collected over the past decade were considered in setting these amounts or ranges. For the Southeastern Area the board established an ANS range of 21,000 – 34,000 salmon and in the Yakutat Area a range of 1,200-3,000 salmon. These findings were based on subsistence permit data, which are considered low due to under- and non-reported harvests. Because these findings were for such large geographic areas (Yakutat and Southeastern Management areas), they have not been useful when examining harvest rates on small, local sockeye runs.

Background

All C&T findings based on residency were repealed in spring 1993 because of constitutional compliance requirements. The Board has since delineated geographic areas where subsistence uses may be permitted, so that uses are not based on residency.

Southeastern Alaska subsistence salmon fisheries primarily occur in terminal areas near, or, in some cases within, dozens of specific drainages throughout the region. Sockeye salmon are the predominant target species, but there are also harvests of other salmon species that vary in magnitude by area.

The Southeastern/Yakutat Region includes all waters of Alaska between the latitude of Cape Muzon at the southern tip of Prince of Wales Island at Dixon Entrance to Cape Suckling on the Gulf of Alaska. The Alaska Joint Board of Fisheries and Game identified two nonsubsistence areas in Southeastern Alaska: (1) the Ketchikan Nonsubsistence Area and (2) the Juneau Nonsubsistence Area (5 AAC 99.015). Subsistence fisheries may not be authorized in nonsubsistence areas.

Fishing Permits and Reporting Requirements

Depending upon the fishing district and section, non-commercial, non-recreational salmon fishing in Southeast Alaska occurs under either subsistence or personal use regulations. Subsistence and personal use fisheries have annual harvest assessment programs based on a permit reporting system. Except the Yakutat Area, specific waters have been identified where subsistence or personal use fishing is permitted, with daily or annual limits, seasons, and gear type allowed. Since 1990, any Alaska resident may harvest under the terms of a subsistence permit, except in a nonsubsistence area.

The Division of Commercial Fisheries is responsible for administering the subsistence/personal use salmon fisheries in Southeast Alaska. Area management biologists issue permits identifying open fishing locations, species, daily (and in some cases annual) possession limits, seasons, and gear. Area management biologists may use their discretion in changing permit conditions, including issuing emergency closures. Area management offices require that catch calendars on the permit be returned by mail or phone at the end of each season, and the information on the calendars is entered into *Alexander: The Integrated Fisheries Database for Southeastern Alaska and Yakutat*. The database includes the names and addresses of all those applying for subsistence and personal use permits, along with their catch record. Permits specify that a permit will not be issued to anyone who has failed to return a permit issued for the previous year. Generally, area management offices will accept a reported catch for the previous year at the time a person is applying for a current year permit.

Harvest Estimates

Much of the existing subsistence salmon harvest estimates and the current ANS findings are based on subsistence fishing permits. Permit data are collected yearly by stream or river system. As mentioned above, the estimates tend to be low due to under- and non-reported harvest. Household harvest survey data provides a more accurate estimate of the amount of salmon caught for personal consumption. However, household harvest survey data are not collected on a yearly basis and most of the data were not collected by stream or river system. Department analysts have developed a system using subsistence permit data expanded to non-reported permits to provide information on possible ranges for new ANS findings for salmon harvested under subsistence regulations.

Possible ANS Ranges

Possible ANS ranges (Table 1), based on additional harvest analyses, are presented for the six fisheries permit areas: Yakutat, Haines, Juneau, Sitka, Petersburg, and Ketchikan. The possible ANS ranges are based on subsistence salmon fisheries permit data and the estimated salmon harvests from 1996-2003 shown in Table 1. These estimates are 40 to 50 percent greater than the earlier figures, which simply represented reports rather than harvest estimates. These harvest estimates are considered to more closely approximate harvests for subsistence use in the permit areas, not expanded. Harvests for 2004 and 2005 seasons have not been estimated and are not included.

Table 1. Estimated Southeastern Alaska and Yakutat Management Areas, Subsistence Salmon Harvests 1996-2003

	Estimated Harvests, All Salmon 1996-2003										1993 Admin.		
	1996	1997	1998	1999	2000	2001	2002	2003	1996-2003 Average	min	max	ANS Range	Possible ANS Range
Yakutat Permit Area	6,385	5,800	6,624	6,036	6,869	7,832	7,629	6,872	6,756	5,800	7,832	1,200 to 3,000	5,800 to 7,832
Southeastern Alaska												21,000-34,0000	
Haines Permit Area	10,414	8,474	8,213	8,051	7,174	8,140	8,394	9,493	8,544	7,174	10,414		7,174 to 10,414
Juneau Permit Area	9,790	8,348	8,650	7,605	5,045	6,265	4,178	10,133	7,502	4,178	10,133		4,178 to 10,133
Angoon Area	5,345	3,841	4,154	3,295	3,219	3,549	1,532	3,240	3,522	1,532	5,345		1,532 to 5,345
Hoonah Area	4,445	4,506	4,496	4,311	1,826	2,716	2,646	6,893	3,980	1,826	6,893		1,826 to 6,893
Sitka Permit Area	20,108	10,487	16,876	15,604	12,933	15,278	20,225	19,382	16,362	10,487	20,225		10,487 to 20,225
Petersburg Permit Area	5,841	4,583	5,506	5,325	4,120	4,798	5,905	7,345	5,428	4,120	7,345		4,120 to 7,345
Petersburg Area	942	914	1,129	1,165	1,061	1,614	1,725	2,558	1,389	914	2,558		914 to 2,558
Wrangell Area	1,289	659	875	1,146	924	753	1,507	668	978	659	1,507		659 to 1,507
Kake Area	3,610	3,010	3,501	3,014	2,134	2,431	2,672	4,118	3,081	2,134	4,118		2,134 to 4,118
Ketchikan Permit Area	17,503	14,469	11,641	12,014	10,684	11,473	9,068	11,773	12,328	9,068	17,503		9,068 to 17,503
Kasaan Area	3,944	3,381	2,448	2,343	2,429	3,134	1,526	2,161	2,671	1,526	3,944		1,526 to 3,944
Craig/Klawock/ Hydaburg Area	13,559	11,088	9,193	9,671	8,255	8,339	7,542	9,612	9,657	7,542	13,559		7,542 to 13,559
Totals	70,041	52,162	57,510	54,635	46,824	53,787	55,399	64,998	56,919	46,824	70,041	22,200-37,000	46,824 to 70,041

Source: Alaska Subsistence Fisheries Database. Version 3.4 for Microsoft Access. Alaska Department of Fish and Game, Division of Subsistence.

1. Source of permit data: Alaska Department of Fish and Game, Commercial Fisheries Division, Alexander: The Integrated Fisheries Database for Southeast Alaska and Yakutat.
2. Description of method for harvest estimates see: Alaska Subsistence Fisheries 2003 Annual Report, Alaska Department of Fish and Game, Division of Subsistence, Juneau, Alaska, December 2004.