

**Customary and Traditional Use Worksheet:
King and Tanner Crabs in Districts 13 and 14,
Southeast Alaska**

Prepared by

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and

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for the January 2009 Petersburg Board of Fisheries meeting

January 2009

Alaska Department of Fish and Game

Division of Subsistence



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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 USE WORKSHEET:
KING AND TANNER CRABS IN DISTRICTS 13 AND 14,
SOUTHEAST ALASKA**

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INTRODUCTION

This worksheet provides background information on the subsistence uses of king and Tanner crabs in the waters of districts 13 and 14. These waters currently have shellfish customary and traditional use (C&T) findings which exclude king and Tanner crabs (5 AAC 02.108(a)(3)). Under the Alaska subsistence law (AS 16.05.258(a)), the Board of Fisheries is required to identify the fish stocks or portions of stocks that are customarily and traditionally taken or used for subsistence (a “C&T finding”).

King crab is defined in regulation as any or all of the following species: *Paralithodes camtschaticus* (red king crab), *P. platypus* (blue king crab), *Lithodes couesi* (scarlet king crab), and *L. aequispinus* (golden king crab) (5 ACC 39.975 (17)). Tanner crab is defined as any or all of the following species: *Chionoecetes bairdi*, (Tanner crab), *C. opilio* (snow crab), *C. tanneri* (grooved Tanner crab), and *C. angulatus* (triangle Tanner crab) (5 ACC 39.975 (18)). In this worksheet, “Tanner crab” refers to all species of Tanner crab combined, unless otherwise noted, and “king crab” refers to all species of king crab combined, unless otherwise noted.

In the waters of District 13, the C&T finding for shellfish is for Dungeness crabs *Cancer magister*, shrimp *Pandalus* spp, abalone *Haliotis kamtschatkana*, sea cucumbers *Parastichopus* spp, gumboot chitons *Cryptochiton stelleri*, cockles (various spp), and clams (various spp), except geoducks *Panopea abrupta* (5 AAC 02.108(a)(4)). There is also a C&T finding for those waters of Section 13-C that are east of the longitude of Point Elizabeth for all shellfish, except shrimp, king crabs, and Tanner crabs. (5 AAC 02.108(a)(3)(B)). In the waters of District 14, the C&T finding is for shellfish except for shrimp, king crabs, and Tanner crabs in those waters that are east of the longitude of Point Dundas (5 AAC 02.108(a)(3)(A)).

A C&T finding for king crabs in districts 13 and 14 is necessary to address proposals 164, 165, 167, and 168 submitted to the Alaska Board of Fisheries for the consideration during their January 2009 meeting in Petersburg, Alaska. The Board of Fisheries requires this information in order to determine whether there are customary and traditional uses of king and Tanner crabs in this area. It is intended that the information in this worksheet be supplemented by written and oral public testimony, if any, delivered during the Board of Fisheries January 2009 meeting.

The quantitative harvest data presented in this report are estimations based on the results of Alaska Department of Fish and Game (ADF&G) Division of Subsistence (Division) surveys administered to randomly-sampled households in various years and communities. The harvest data presented here have been expanded from the sampled households to generate per capita estimates for all individuals in each community. Survey instruments included questions about “king crabs,” “Tanner crabs,” and “other crabs” in general, and did not differentiate at the species level.

The communities of Angoon, Sitka, and Pelican show a history of using king and Tanner crabs in District 13. Residents of Port Alexander also occasionally use the southern end of District 13. Hoonah, Gustavus and Elfin Cove residents historically have used king and Tanner crabs in District 14.

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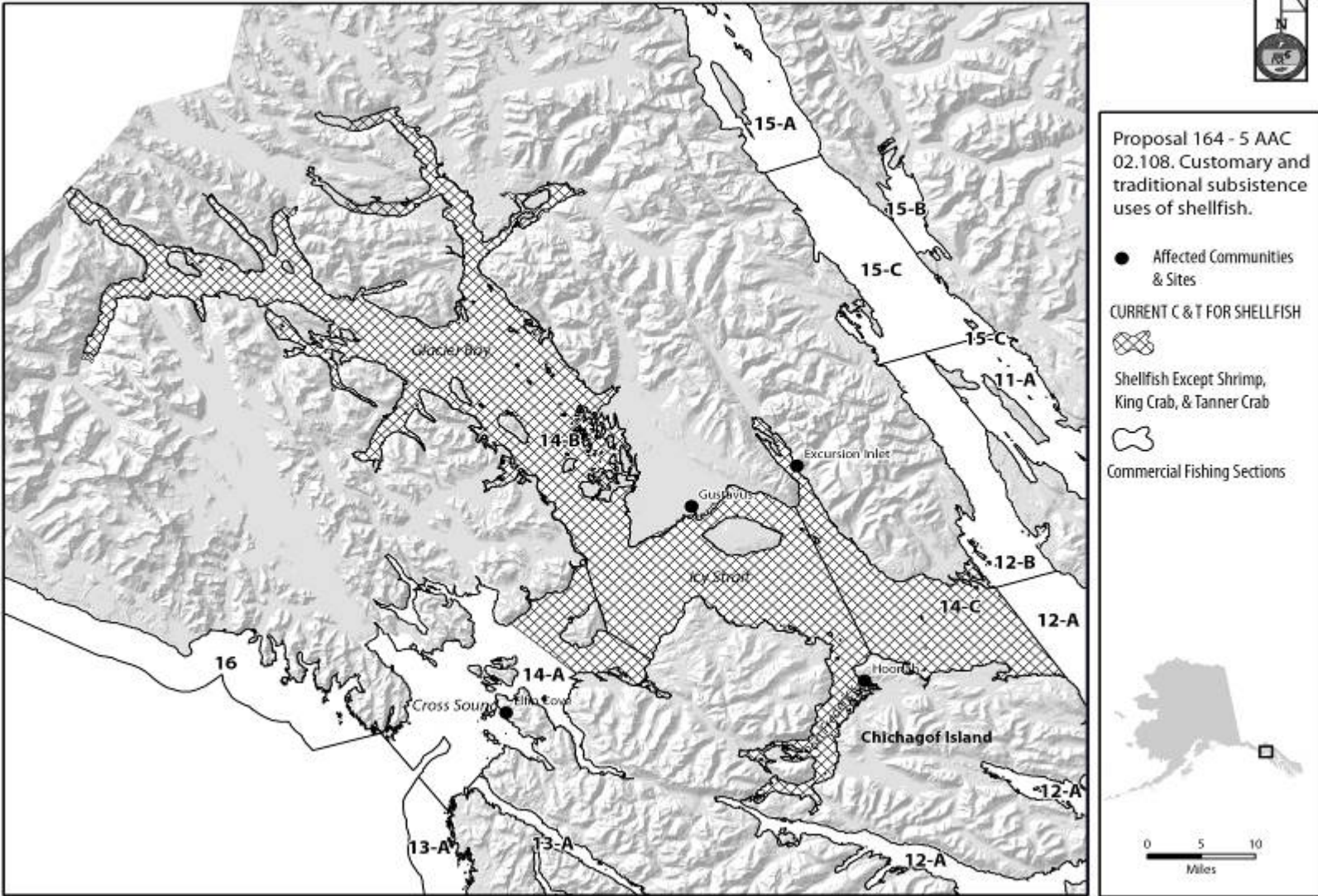


Figure 1.—Areas with current C&T findings for shellfish (except shrimp, king crab and Tanner crab), Districts 13 and 14, Southeast Alaska.

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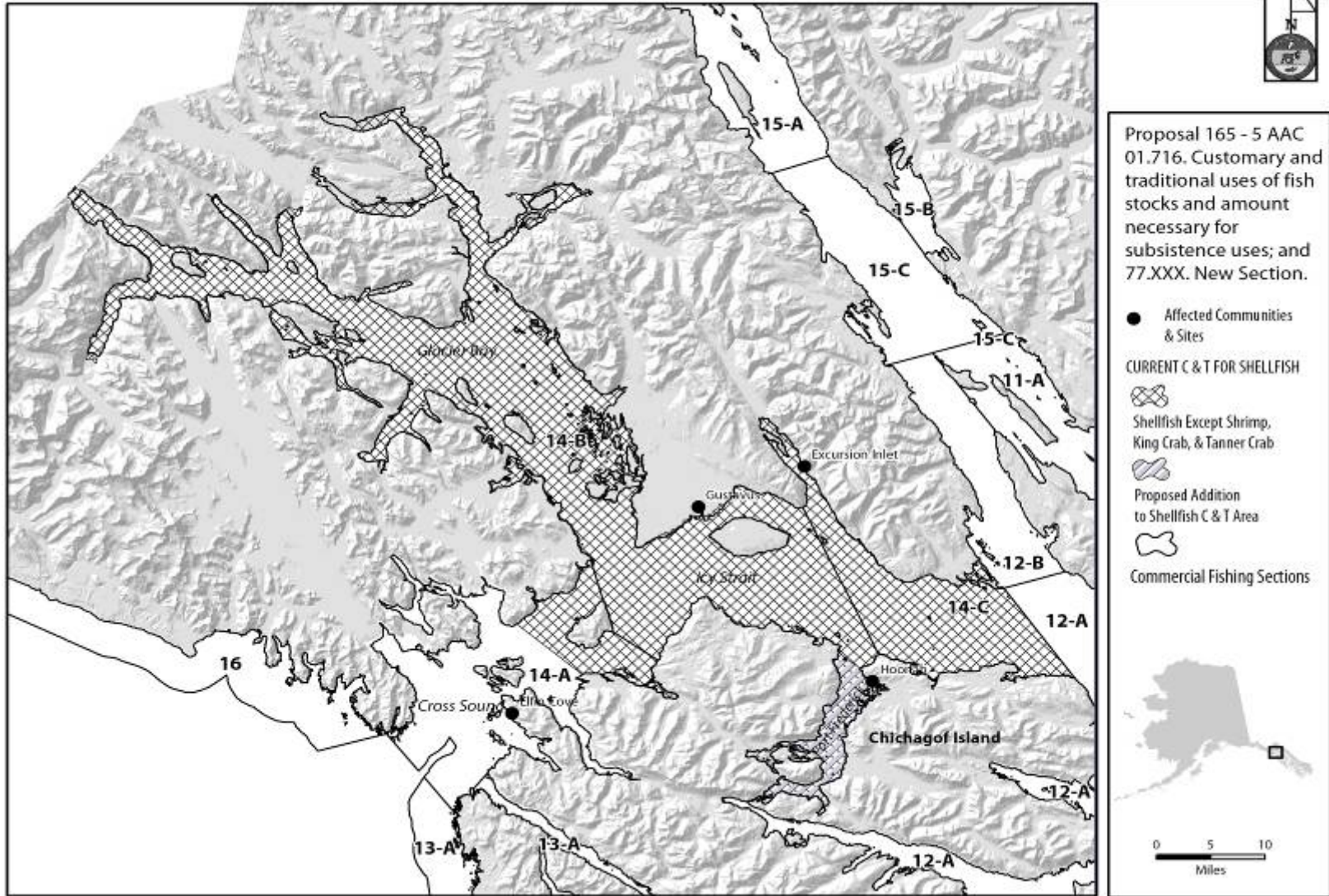


Figure 2.—Proposed addition to C&T finding for shellfish, District 14.

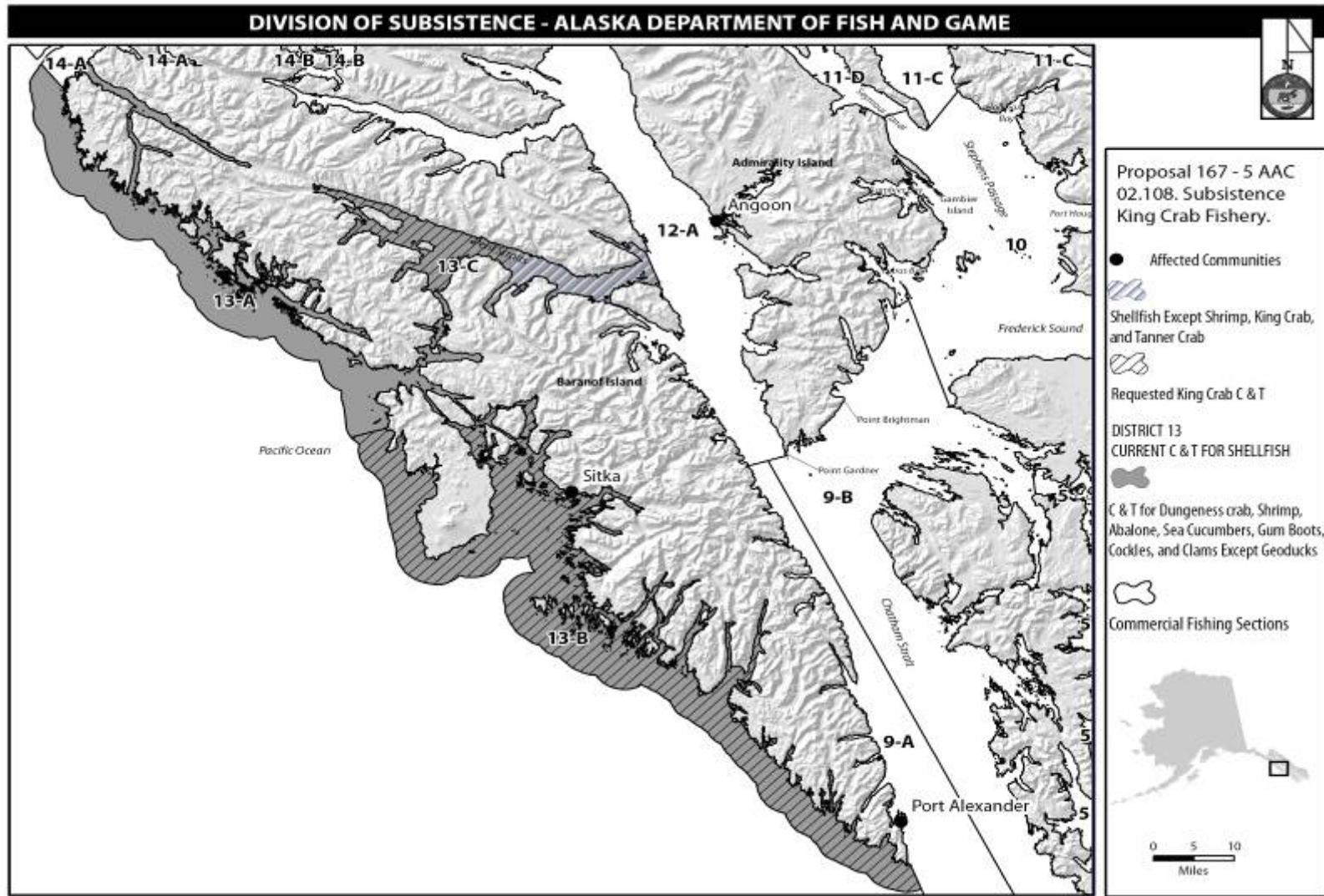


Figure 3.—Current C&T finding for shellfish (except shrimp, king crab, and Tanner crab) and requested addition for king crab, District 13, Southeast Alaska.

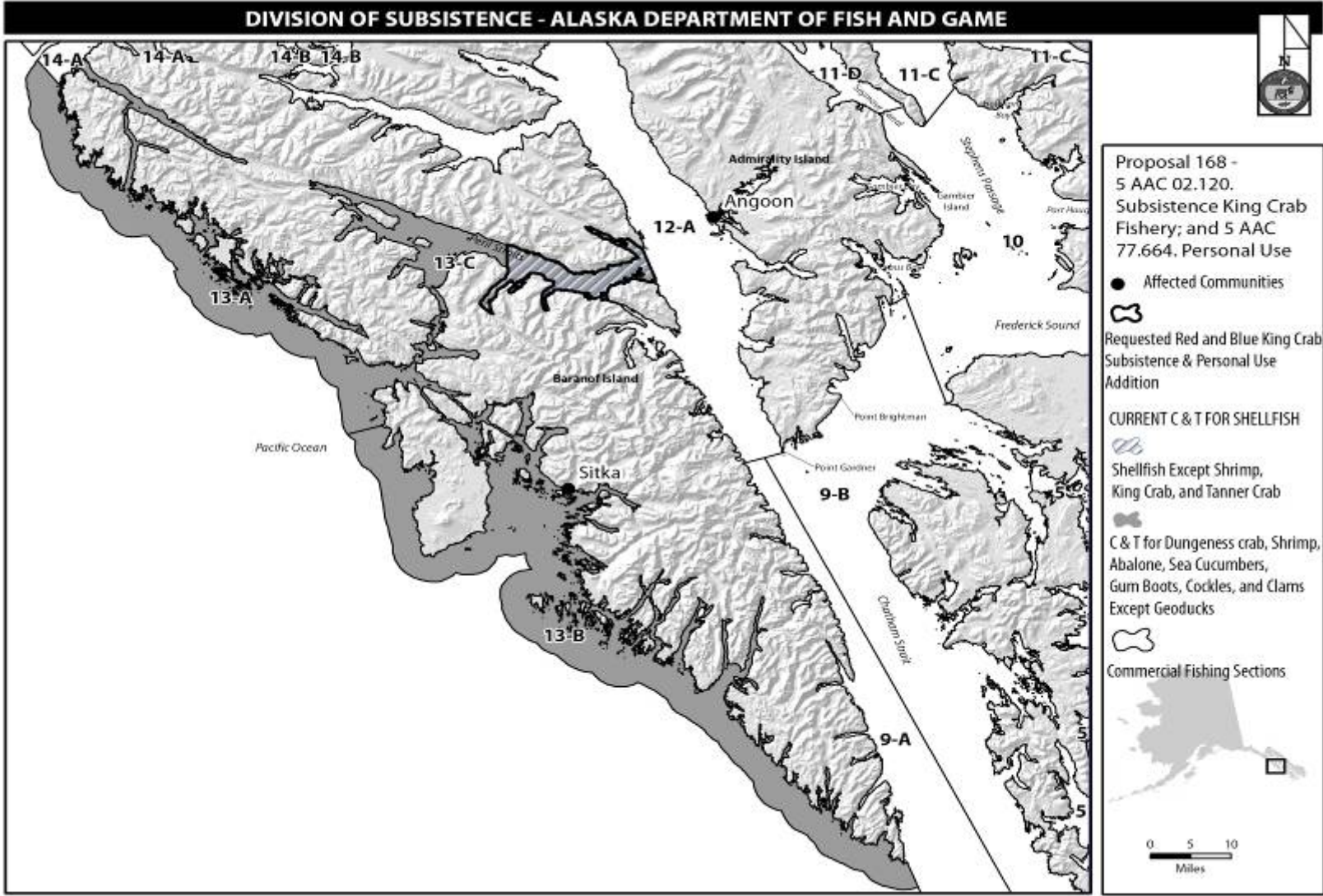


Figure 4.—Requested red and blue king crab subsistence and personal use addition to current C&T finding for shellfish in District 13, Southeast Alaska.

PROPOSAL NUMBERS: 164, 165, 167, and 168

FISHING DISTRICTS: Sections 13A and 13C; District 14

SPECIES/STOCK: King crabs and Tanner crabs

MAIN COMMUNITIES USING THE SPECIES

District 13: Angoon, Sitka, Port Alexander, and Pelican

District 14: Elfin Cove, Gustavus, and Hoonah

THE EIGHT CRITERIA

CRITERION 1: LENGTH AND CONSISTENCY OF USE

A long-term consistent pattern of noncommercial taking, use, and reliance on the fish stock or game population that has been established over a reasonable period of time of not less than one generation, excluding interruption by circumstances beyond the user’s control, such as unavailability of the fish or game caused by migratory patterns.

Archeological evidence suggests that the inhabitants of Southeast Alaska have had a marine-based diet for at least 9,000 years, which is the entire known period of human occupancy (Dixon 2000). Shellfish harvests appear to have increased with the stabilization of sea levels, as evidenced by the appearance of numerous shell middens throughout the region between 4,200 and 3,200 BCE (Ames and Maschner 1999). Reports by anthropologists and travelers in the past century have remarked on residents’ uses of shellfish, including various species of crabs. A traveler visiting Hoonah in the late 1800s was fed large crabs by his Tlingit hosts (Wood 1882). The size of these crabs, the largest having a 6 ft span and an 18 in body, provides early evidence of king crab use by Hoonah Tlingits. Jones ([c1914]:108) wrote about crabs of remarkable size, having seen “crabs that measured fifty-four inches from the tip of one leg to the tip of the other and weighed fifteen pounds each.”

The *Sanyaa Kwáan* (Cape Fox) people had a tribal clan house called the “king crab house” (*X’éix Hít*) (Hope III and Thornton 2000). The Tlingit word for king crab is *x’éix ka s’áaw* in Yakutat (De Laguna 1972), but in Angoon, *s’áaw* is used for Dungeness, king or Tanner crab (Newton and Moss 2005). In Sitka, *x’éix* refers to both king and “spider” crab (one common name for Tanner crab) and *s’áaw* is a Dungeness crab (Robby Littlefield, Sitka Tribe of Alaska, personal communication). De Laguna (1972:404) recorded *ítka tsáwù* as the name for “spider” crab. It means “crab of the halibut deep.”

Historical references, usually absent information at the species level, indicate continued use of crabs in Southeast Alaska throughout the late 19th and early 20th centuries. Several accounts report Southeast Natives’ use of digging sticks or spears to target crabs during low tide (De Laguna 1972; Goldschmidt and Haas 1998; Niblack 1970; Jones [c1914]). In the years proceeding crab pots, “spider” crabs (likely Tanner crabs) or king crabs were caught incidentally on Pacific halibut *Hippoglossus stenolepis* fishing lines (De Laguna 1972; Jacobs M. Jr. and Jacobs M. Sr. 1982; transcripts, Kake key respondent, interviewed by Anne Firman, 4/16/1986). Oral histories taken by Goldschmidt and Haas (1998) in 1946 recorded king crab use by Hoonah Tlingits, who also reported harvesting crabs near the mouth of Glacier Bay. Angoon elder Jimmy

Johnson mentioned that “big crabs” could be harvested from Surprise Harbor (Goldschmidt and Haas 1998:69).

King and Tanner crabs have been commercially harvested since the mid-1900s. Shellfish were removed from commercial catches for home use to varying degrees, a practice which continues to the present (Betts et al. 1994; Smythe 1988:35, 36).

In Pelican, residents primarily target king crabs when fishing noncommercially for crabs, although other crab species are also taken (George et al. 1985). Pelican had the highest percentage of households (71%) utilizing king crabs during all survey years, followed by Elfin Cove (54%) also in 1987, then Hoonah in 1996 (53%) and 1987 (42%). Over one-third of all households utilized king crabs in Gustavus in 1987 (41%), in Sitka in 1996 (38%), in Hoonah in 1985 (37%), and in Port Alexander in 1987 (35%). In both survey years for Angoon, about one-quarter of all households utilized king crabs (25% in 1987 and 24% in 1984).

CRITERION 2: SEASONALITY

A pattern of taking or use recurring in specific seasons of each year.

Historically, shellfish consumption occurred year-round but predominated when Pacific salmon *Oncorhynchus* spp and halibut were less available (Emmons 1991). In the days before pot fishing for crabs, the Tlingits used to harvest crabs in the spring and summer by fishing off the beaches in the shallow waters during low tide. King crabs were also harvested when they moved into shallow water in late winter, where they often stayed until spring. King crabs are listed as an intertidal resource for the Tlingit people in Goldschmidt and Haas (1998).

Pot fishing increased the seasons that king and Tanner crabs could be harvested. In Angoon, king and Tanner crabs were primarily harvested August through January, and occasionally in July and February. King crabs were occasionally harvested in April and May (George and Bosworth 1988). In Hoonah, king and Tanner crabs were harvested year-round (Schroeder and Kookesh 1990). Herman Kitka, Sr. (2000), a Sitka resident, said they gathered crabs during winter.

Seasonal king and Tanner crab harvests were affected by various factors, including species’ annual migrations, the weather, tidal fluctuations, other harvesting activities, and regulations. Crab and shrimp harvests often occurred as a supplemental activity to other recreational boating pursuits or commercial fishing trips.

Current personal use shellfish regulations restrict red and blue king crab harvests to July 1 through March 31; closures also occur by ADF&G emergency order. There are no regulatory seasonal restrictions on Tanner crabs.

CRITERION 3: MEANS AND METHODS OF HARVEST

A pattern of taking or use consisting of methods and means of harvest that are characterized by efficiency and economy of effort and cost.

Historically, crabs were speared or kicked out of the sand or mud at low tide (Jacobs M. Jr. and Jacobs M. Sr. 1982). In some cases, special digging sticks were used for crabs and other shellfish (De Laguna 1972). According to a key respondent from Hoonah, Tlingits traditionally harvested king crabs at low tide by using barbed spears, long poles with a loop, or baited lines with or without treble hooks hung below the bait. Wood (1882) reported that “boy archers” of a Hoonah Tlingit village brought him giant crabs (probably king crabs). King and Tanner crabs were also

incidentally caught in deeper waters; the crabs would either be tangled in the net or fishing line or they would grab a baited hook and be taken to the surface. Occasionally, king and Tanner crabs were incidentally caught on halibut gear (De Laguna 1972; transcripts, Kake key respondent, interviewed by Anne Firman, 4/16/1986).

More recently, king crabs and Tanner crabs are taken with pots, webbed rings, or baited hand lines. Additionally, crabs are removed from commercial catches for home use. Crabs are harvested with pots in the deeper waters of bays and inlets or when they move to shallow water. At these times, pots are set from local docks or in shallow bays to target king and Dungeness crabs (Turek unpublished field notes).

CRITERION 4: GEOGRAPHIC AREAS

The area in which the noncommercial, long-term, and consistent pattern of taking, use, and reliance upon the fish stock and game population has been established.

The 1946 Tlingit testimony recorded in Goldschmidt and Haas (1998) most often provided general information without specific references to crab species or crab harvest locations. Customary and traditional crab harvest sites in districts 13 and 14 included Couverden Island, Swanson Harbor, Bartlett Cove, Glacier Bay, Lisianski Strait, and St. John Baptist Bay. Hoonah residents testified they harvested king crabs from beaches near the mouth of Glacier Bay. Jimmy Johnson from Angoon reported getting “big crabs” from Surprise Harbor on Admiralty Island (Goldschmidt and Haas 1998).

The following information for noncommercial harvesting areas of selected communities is based on Division of Subsistence research, specifically George et al. (1985), which discusses survey results from community management plans developed by the Alaska Department of Natural Resources Alaska Coastal Management Program.¹ Figure 4 from George et al. (1985) shows the 1985 noncommercial harvest sites used by the residents of Sitka, Angoon, Hoonah and Pelican.

King crab harvest sites in District 14 included Port Frederick, and the north and south shores of Icy Strait from Point Augusta to waters past Point Adolphus, including the waters surrounding Lemeisure and Pleasant islands. District 13 king crab harvest sites included Peril Strait, Deadman’s Reach, Nakwasina Passage, Lisianski Inlet, and the outer coast of Chichagof Island from Point Urey to Hogan Island.

¹ <http://www.alaskacoast.state.ak.us>

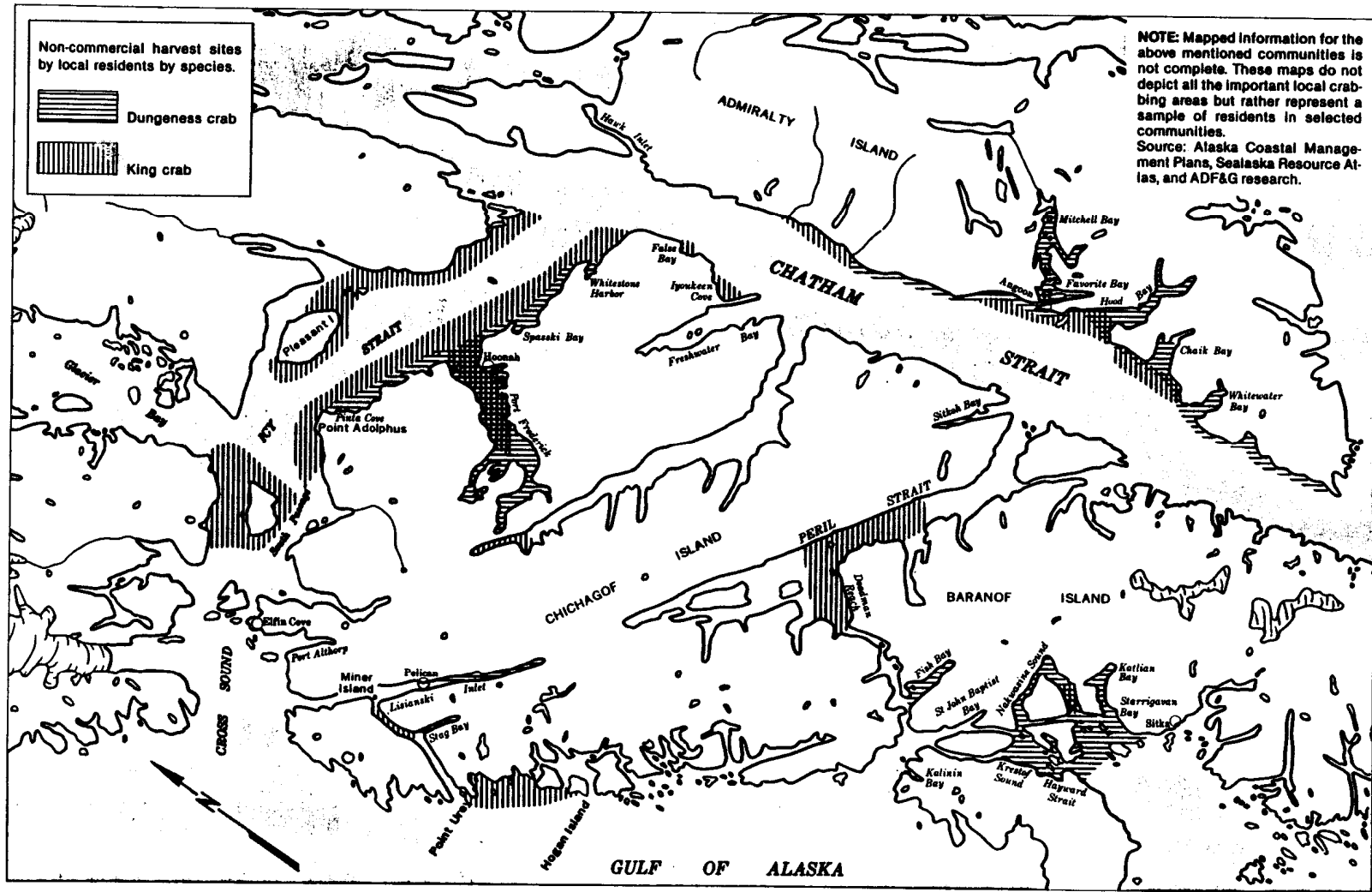


Figure 5.—Noncommercial harvest areas of residents of Sitka, Angoon, Hoonah, and Pelican, 1985.

Source George et al. 1985.

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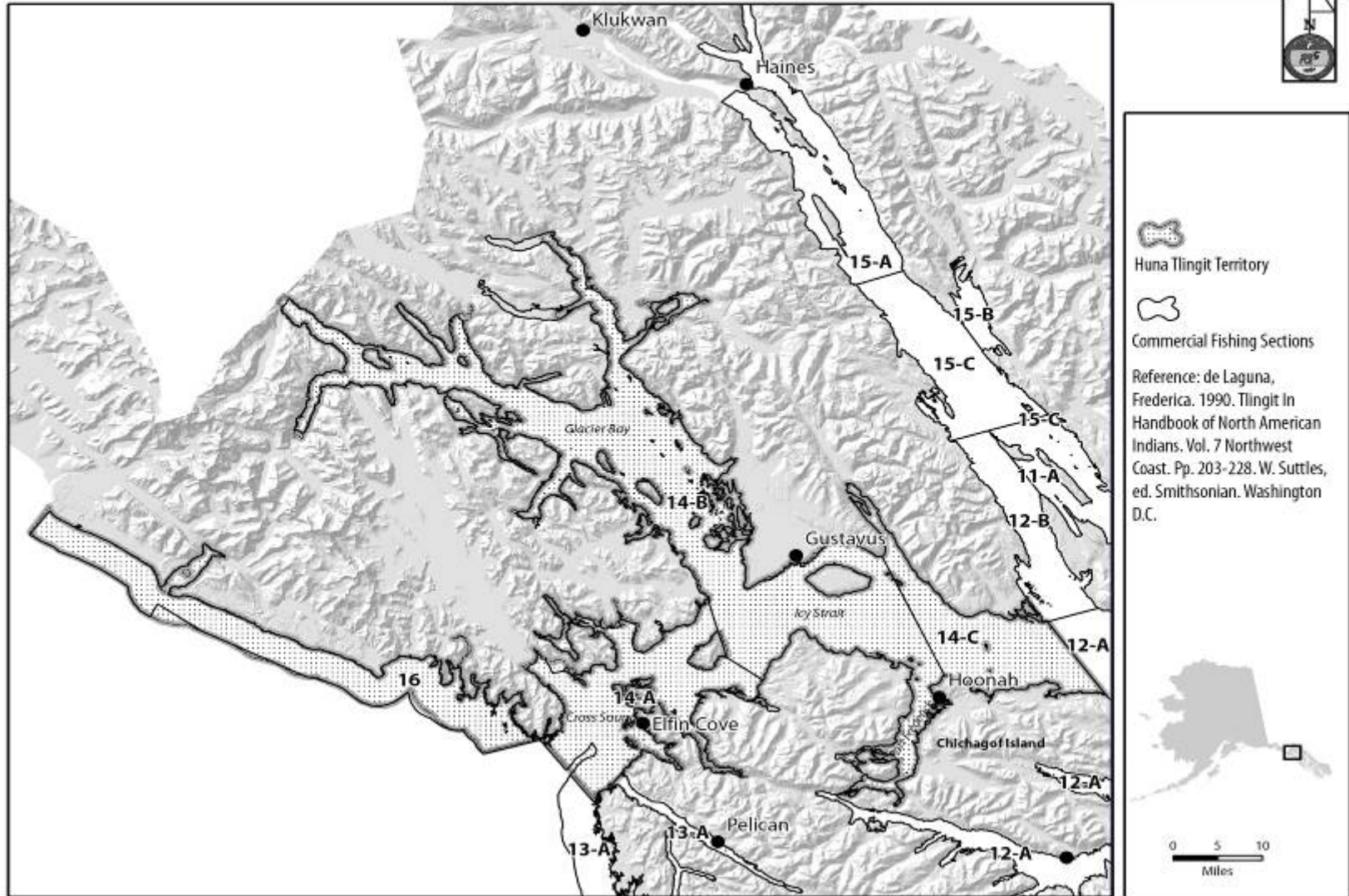


Figure 6.—Traditional Huna Tlingit territory in Southeast Alaska.

Angoon residents harvested king crabs in Peril Straits, Sitkoh Bay, Chaik Bay, Hood Bay, Favorite Bay, and along the northwest coast to Hawk Inlet in Chatham Straits (George et al. 1985:20). Pelican residents harvested king crabs from the southern portion of Miner Island to north of Stag Bay, and along Hogan Island to Point Urey. Hoonah residents primarily fished for king crabs in Spasskii Bay, the waters surrounding Pleasant Island, South Passage, False Bay, Port Frederick, Iyoukeen Bay, Freshwater Bay, and Glacier Bay.

Currently, according to a key respondent from Hoonah, king crab pots are set in Icy Strait and Whitestone Harbor. Sitka residents harvest king crabs in Peril Straits, Deadman's Reach, and Nakwasina Passage. Information concerning king and Tanner crab locations utilized by Elfin Cove residents was not available in documents reviewed for this worksheet.

CRITERION 5: MEANS OF HANDLING, PREPARING, PRESERVING, AND STORING

A means of handling, preparing, preserving, and storing fish or game that has been traditionally used by past generations, but not excluding recent technological advances where appropriate.

Historically, crabs were boiled or roasted and were greatly relished (Emmons 1991:149; Jones [c1914]:108). Generally, there were 2 ways to boil crabs. The crab could first be cleaned and then boiled, or the live crab could be immersed in boiling water and then cleaned after cooking. Crabs were also dried, according to one Hoonah key respondent, but we did not find other detailed information about this traditional preservation method.

CRITERION 6: INTERGENERATIONAL TRANSMISSION OF KNOWLEDGE, SKILLS, VALUES, AND LORE

A pattern of taking or use that includes the handing down of knowledge of fishing or hunting skills, values, and lore from generation to generation.

Southeast Alaska Native families are descended from several generations of Tlingit clans which formerly controlled use rights to particular bays and inlets in the area. While the clans no longer utilize exclusive ownership rights to these areas, knowledge of the habitats, wild resource populations and characteristics, and skills used in the harvest of the resources in each area tends to be greater among elder clan members associated with those areas. Elder residents pass such knowledge on to other community members.

The use of crabs is found in stories told by several generations of Tlingits. In 1885, Krause (1956) recorded a story about Kake Natives who collected crabs and traded them to the "land otter people" who used the crab shells to make dance rattles. According to Tlingit legend, land otter people rescue drowning Indians in the hopes of receiving crab shells and claws. Tanner crabs are also included in stories recorded by Swanton (1909:142). According to Swanton, "spider" (possibly Tanner) crabs were used by the land otter people to make poisonous arrowheads to shoot at enemies. The shells were reported to cause boils and an itchy rash. The "lobster" shells used to make drums for the land otter people were more likely king crab or "spider" crab shells (De Laguna 1972).

Customary and traditional methods of harvest and harvest areas for shellfish have endured throughout the region. Because shellfish are a highly-valued food, residents of the region are greatly aware of seasonal harvest opportunities and efficient harvest methods.

Division of Subsistence survey data indicates that although ethnicity generally influences the use of certain species of shellfish over others in Southeast Alaska, king crabs are universally enjoyed (Turek unpublished field notes). King crabs have spotty distributions in Southeast Alaska, and harvest is difficult without specific location information (transcripts, Kake key respondent, interviewed by Anne Firman, 4/16/1986).

CRITERION 7: DISTRIBUTION AND EXCHANGE

A pattern of taking, use, and reliance where the harvest effort or products of that harvest are distributed or shared, including customary trade, barter, and gift-giving.

Division of Subsistence survey data indicate that crabs are shared among community households (Turek unpublished field notes). Division of Subsistence survey data also indicate intercommunity distribution of king and Tanner crabs. In general, Division researchers have found that wild foods requiring specialized harvest methods, such as crabs, tend to be widely distributed within communities. It is likely that sharing of crabs takes place within networks of relatives and friends, as is common with other subsistence resources.

...if we have extra crab, then you just kind of give it around...because a lot of these people, they don't have the means to go, or they are older, or whatever. (Transcripts, key respondent from Hoonah, interviewed 9/7/2003 by Nancy Ratner)

Traditional values and customs also influence sharing and distribution networks. In one example, a Hoonah man shared crab and other resources with another man who had been given the same ancestral Tlingit name as his father:

He's not really related to me, other than just being from the Snail House tribal-wise, he's named after my dad, so I take him stuff just because he's got my dad's name. [*His Tlingit name is named after your dad?*] Yeah, so I take him stuff; we've brought him in some fish eggs and we'll probably take him some crab today or whatever, if we take dry fish. (Transcripts, key respondent from Hoonah, interviewed 9/7/2003 by Nancy Ratner)

Division researchers have found that in many communities a few harvesting individuals may be responsible for supplying shellfish to many households (Turek unpublished field notes). This appears to be especially true with shrimp and crab resources, which require special equipment for harvest. Harvesting households often have social obligations towards others in the community, especially the Tlingit community. In addition, shellfish are used during community dinners and traditional feasts, as well as gifts to relatives and friends in other communities. King crabs, especially, are a highly-regarded culinary treat (Turek unpublished field notes).

Table 1 shows the relationship between estimated harvest, use, and sharing for king crabs in Pelican, Elfin Cove, Hoonah, Gustavus, Sitka, Port Alexander, and Angoon, based on Division of Subsistence household surveys. The data show that king and Tanner crabs were highly shared between households. In most communities, almost as many households received king crabs from others as used king crabs. In Pelican, for example, 68% of the households received king crabs from another household, almost as many (71%) as used king crabs in 1987. In Elfin Cove, 54% of the households received king crabs and 54% used king crabs in 1987. In Hoonah in 1987, the percentages of households using and receiving king crabs were also similar (42%).

Table 1.—Estimated total harvest, per capita harvest, and use of king crabs, Southeast Alaska communities, selected years 1984-1996.

Location	Year	Estimated harvest king crab (lbs)	Per capita harvest king crab (lbs)	Percentage using king crab	Percentage giving away	Percentage receiving	95% confidence limit for number harvested
Angoon	1984	1,282	2.00	24%	8%	18%	87
Angoon	1987	437	0.84	25%	2%	18%	100
Angoon	1996	176	0.30	4%	1%	3%	147
Elfin Cove	1987	46	0.77	54%	8%	54%	111
Gustavus	1987	128	0.84	41%	2%	33%	45
Hoonah	1985	986	1.10	37%	ND	ND	98
Hoonah	1987	763	1.09	42%	5%	42%	70
Hoonah ^a	1996	10,201	11.45	53%	18%	47%	100
Pelican	1987	246	1.00	71%	8%	68%	ND
Port Alexander	1987	34	0.32	35%	3%	29%	50
Sitka	1987	23,544	2.92	9%	ND	ND	47
Sitka	1996	53,376	6.25	38%	10%	26%	53

Source ADF&G CSIS 2008 (<http://www.subsistence.adfg.state.ak.us/CSIS>).

ND = data for this category not collected in this survey.

a. No reported harvest from commercial fishing.

Tanner crabs are also widely shared among households in relative proportion to the percentage of households utilizing them. Those communities that had a high percentage of households utilizing Tanner crabs, such as Elfin Cove (62%) in 1987 and Pelican (46%) in 1987, also had high percentages of households receiving Tanner crabs (54% in Elfin Cove and 44% in Pelican) (Betts et al. 1994) (Table 2).

Table 2.—Estimated total harvest, per capita harvest, and use of Tanner crabs, Southeast Alaska communities, 1984-1996.

Location	Year	Estimated harvest Tanner crab (lbs)	Per capita harvest Tanner crab (lbs)	Percentage using Tanner crab	Percentage giving away	Percentage receiving	95% confidence limit for number harvested
Angoon	1984	503	1.00	18%	5%	13%	115
Angoon	1987	1,112	2.00	23%	7%	15%	104
Angoon	1996	197	0.34	7%	3%	3%	109
Elfin Cove	1987	169	3.00	62%	15%	54%	79
Gustavus	1987	193	1.00	25%	12%	16%	80
Hoonah	1985	120	0.13	13%	ND	ND	100
Hoonah	1987	2,166	3.00	26%	9%	21%	107
Hoonah	1996	1,092	1.00	29%	9%	18%	82
Pelican	1987	1,952	8.00	46%	11%	44%	ND
Port Alexander	1987	24	0.23	12%	0%	6%	57
Sitka	1987	3,841	0.50	6%	0%	0%	59
Sitka	1996	10,667	1.00	15%	7%	6%	75

Source ADF&G CSIS 2008 (<http://www.subsistence.adfg.state.ak.us/CSIS>).

ND = data for this category not collected in this survey.

CRITERION 8: DIVERSITY OF RESOURCES IN AN AREA; ECONOMIC, CULTURAL, SOCIAL, AND NUTRITIONAL ELEMENTS

A pattern that includes taking, use, and reliance for subsistence purposes upon a wide variety of fish and game resources and that provides substantial economic, cultural, social, and nutritional elements of the subsistence way of life.

The crab resource continues to be part of a wide range of resources used in Southeast Alaska communities, including various finfishes, specifically Chinook *O. tshawytscha*, sockeye *O. nerka*, coho *O. kisutch*, chum *O. keta*, and pink *O. gorbuscha* salmon, Pacific herring *Clupea pallasii*, Dolly Varden *Salvelinus malma*, Pacific cod *Gadus macrocephalus*; marine mammals such as harbor seals *Phoca vitulina*; land mammals such as Sitka black-tailed deer *Odocoileus hemionus sitkensis*; and shellfish.

Oral history established diverse uses of marine and land resources by the Tlingit in Hoonah, Sitka, and Angoon (Goldschmidt and Haas 1998). Household surveys conducted by the Division of Subsistence show continued uses of diverse resources by rural communities in the area of concern. Tables 2 through 7 indicate the top 10 or 11 resources, ranked by the percentage of all community households using them. Note that on survey instruments, “cod” was used to refer to either Pacific cod, Pacific tomcod *Microgadus tomcod*, walleye pollock *Theragra chalcogramma*, or “unknown” cod.

The halibut, deer, and salmon resources are ranked in the top 10 resources used in all communities. King crabs are ranked among the top 10 resources used in Sitka in 1996 and in Pelican in 1987, although halibut, Chinook salmon and deer topped the rankings for both communities. King crabs were the eleventh most-utilized resource used by Gustavus households, with wood, halibut, and Dungeness crab ranked as the top 3 resources.

Table 3.—Top 10 resources used by the most Sitka households, 1996.

Rank	Resource	Percentage of households using
1.	Halibut	80.8%
2.	Chinook salmon	78.6%
3.	Deer	61.9%
4.	Sockeye salmon	55.8%
5.	Dungeness crab	53.4%
6.	Coho salmon	52.2%
7.	Rockfish	44.7%
8.	Shrimp	43.6%
9.	King crab	38.5%
10.	Pacific herring	36.6%

Source Paige 2002.

Table 4.—Top 10 resources used by the most Pelican households, 1987.

Rank	Resource	Percentage of households using
1.	Halibut	97.2%
2.	Chinook salmon	90.9%
3.	Deer	90.5%
4.	Dungeness crab	88.9%
5.	Rockfish	87.7%
6.	Berries	79.8%
7.	Clams	76.6%
8.	Coho salmon	76.5%
9.	King crab	70.6%
10.	Cod	67.9%

Source Paige 2002.

Table 5.—Top 11 resources used by the most Gustavus households, 1987.

Rank	Resource	Percentage of households using
1.	Wood	91.8%
2.	Halibut	90.0%
3.	Dungeness crab	90.0%
4.	Berries	88.2%
5.	Coho salmon	70.0%
6.	Deer	70.0%
7.	Chinook salmon	64.6%
8.	Dolly Varden	52.7%
9.	Pink salmon	44.6%
10.	Cod	40.9%
11.	King crab	40.9%

Source Paige 2002.

Table 6.–Top 10 resources used by the most Angoon households, 1996.

Rank	Resources	Percentage of households using
1.	Deer	74.3%
2.	Halibut	71.6%
3.	Sockeye salmon	67.6%
4.	Clams	64.9%
5.	Gumboot chitons	58.1%
6.	Chinook salmon	56.8%
7.	Coho salmon	55.4%
8.	“Black” seaweed	48.6%
9.	Dungeness crab	45.9%
10.	Herring spawn on hemlock branches	35.1%

Source Paige 2002.

Table 7.–Top 10 resources used by the most Hoonah households, 1996.

Rank	Resource	Percentage of households using
1.	Halibut	75.3%
2.	Deer	74.0%
3.	Chinook salmon	72.7%
4.	Coho salmon	68.8%
5.	Sockeye salmon	64.9%
6.	Clams	62.3%
7.	Dungeness crab	61.0%
8.	“Black” seaweed	59.7%
9.	Harbor seal	55.8%
10.	Chum salmon	50.6%

Source Paige 2002.

Table 8.–Top 10 resources used by the most Port Alexander households, 1987.

Rank	Resources	Percentage of households using
1.	Deer	94.0%
2.	Chinook salmon	91.6%
3.	Halibut	91.3%
4.	Berries	85.8%
5.	Wood	79.5%
6.	Clams	74.1%
7.	Rockfish	71.4%
8.	Coho salmon	64.5%
9.	Seaweed/kelp	59.3%
10.	Cod	59.0%

Source Paige 2002.

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