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Options for Amounts Reasonably Necessary for Subsistence Uses of Crab in the Cook Inlet and Kodiak Areas

by

Lauren A. Sill

February 2020

Alaska Department of Fish and Game **Division of Subsistence**

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the reports by the Division of Subsistence. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

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

all commonly-accepted abbreviations e.g., Mr., Mrs., AM, PM, etc.	
all commonly-accepted professional titles e.g., Dr., Ph.D., R.N., etc.	
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
mideye-to-fork	MEF
mideye-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_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

SPECIAL PUBLICATION NO. BOF 2020-07

OPTIONS FOR AMOUNTS REASONABLY NECESSARY FOR SUBSISTENCE USES OF CRAB IN THE COOK INLET AND KODIAK AREAS

by

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BACKGROUND

This report has been prepared for the Alaska Board of Fisheries (board) for reference when considering proposals 246 and 256, with implications for subsistence fisheries during its March 2020 meeting. Proposal 246 asks the board to consider adopting amounts reasonably necessary for subsistence for crab in the Cook Inlet Area, outside the Anchorage-Matsu-Kenai Nonsubsistence Area. Proposal 246 references "crab;" however, due to a lack of harvest data for king or Dungeness crab, this report will focus on Tanner crab in Cook Inlet. Proposal 256 asks the board to consider adopting amounts reasonably necessary for subsistence for king crab in the Kodiak Area.

Under AS 15.05.258(a), the board is charged with identifying fish stocks, or portions of stocks, that "are customarily taken or used for subsistence" (a customary and traditional (C&T) use finding). The board has made positive C&T findings for shellfish in both the Cook Inlet Area and for king crab in the Kodiak Area (see 5 AAC 02.311 and 5 AAC 02.466, respectively, see Appendix A and C). If a portion of these stocks can be harvested consistent with sustained yield, the board "shall determine the amount of the harvestable portion that is reasonably necessary for subsistence uses" (AS 16.05.258(b)). This is called the amount reasonably necessary for subsistence, or an "ANS finding," which provides a measure for the board to determine if regulations provide a reasonable opportunity for subsistence uses of that stock or population. "Reasonable opportunity" is defined in statute 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 department recommends that the board make ANS findings as soon as is reasonably possible after determining positive C&T uses. Timing of an ANS finding often depends on availability of reliable and complete harvest and use data that reflect customary and traditional use patterns and harvest levels.

COOK INLET AREA

The Cook Inlet Area has as its eastern boundary the longitude of Cape Fairfield and as its southern boundary the latitude of Cape Douglas (5 AAC 02.300). The Joint Boards of Fisheries and Game have designated a nonsubsistence area in a portion of the Cook Inlet Area: the Anchorage-Matsu-Kenai Nonsubsistence area, described in 5 AAC 99.015(a)(3) (see Figure 1). Within the nonsubsistence area, dependence on subsistence is not a principal characteristic of the economy, culture, and way of life of the area and no subsistence fisheries may be authorized.

Areas outside the nonsubsistence area include coastal portions of the Southern, Barren Islands and Outer districts of Lower Cook Inlet, including Jakalof and Kasitsna bays in what is considered Kachemak Bay. There are three communities on the lower Kenai Peninsula outside the Anchorage-Matsu-Kenai Nonsubsistence Area (Figure 1): Nanwalek (formerly English Bay), Port Graham, and Seldovia. In 2018, Department of Commerce, Community, Economic Development (DCCED) population estimates for these communities were 291 residents in Nanwalek, 179 residents in Port Graham, and 401 residents in Seldovia (city and census designated place combined). Based on department household subsistence surveys in 2014, the Alaska Native population in these communities ranged from 95% in Nanwalek, to 90% in Port Graham, to 23% in Seldovia.

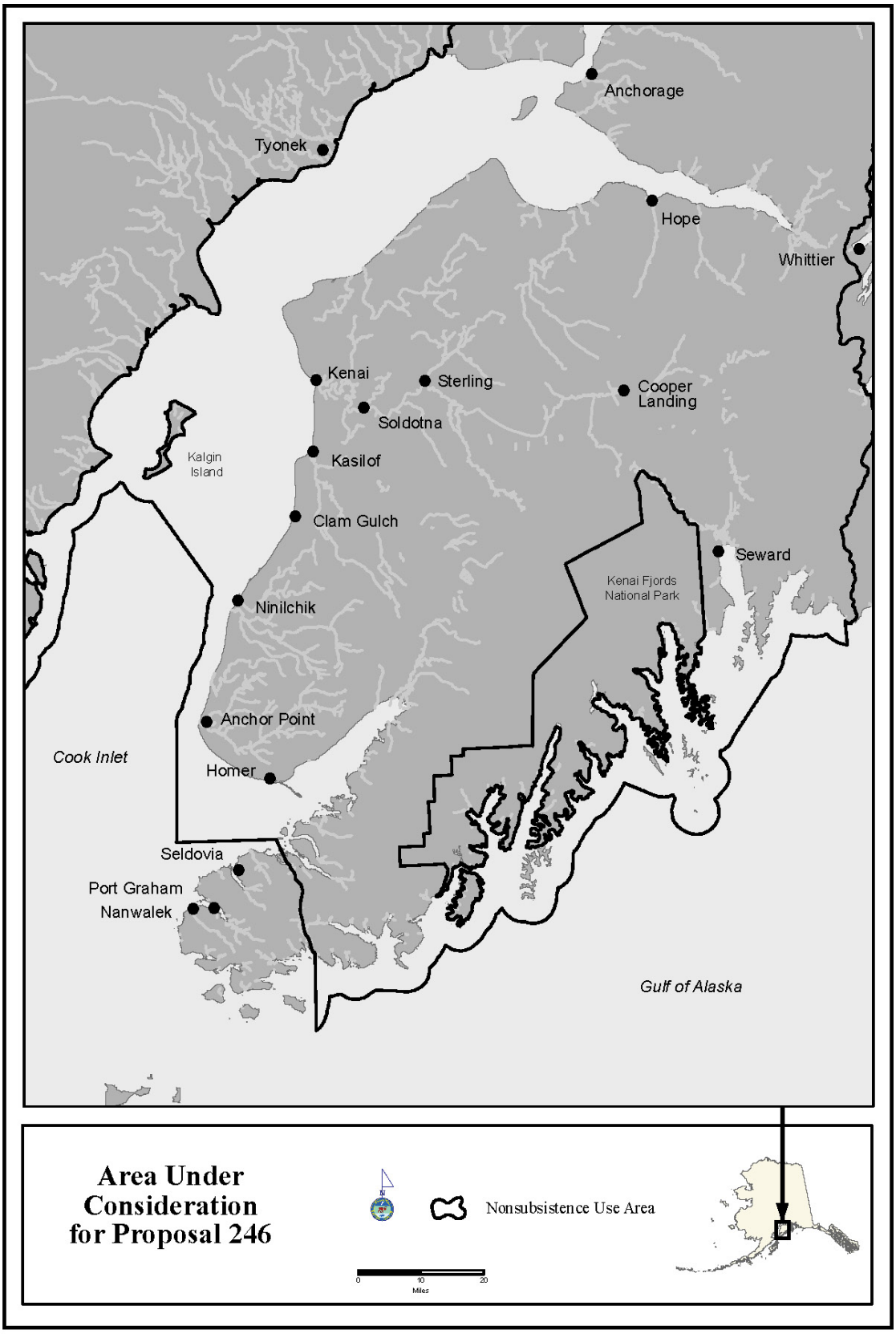

Figure 1.–Map of Cook Inlet showing the boundary of the nonsubsistence use area.

HISTORY OF C&T AND ANS FINDINGS ON SHELLFISH STOCKS IN COOK INLET

In 1982, the Board of Fisheries adopted regulations allowing the subsistence harvesting of clams in the Port Graham Subdistrict. At the same time, the board repealed all other subsistence shellfish regulations pertaining to the Lower Cook Inlet Area. Written findings explaining this decision were not made. In November 1992/January 1993, as part of the board's consistency review of fishing regulations following passage of revisions to the state subsistence statute in 1992, the board affirmed positive C&T uses for clams in the Port Graham Subdistrict.

In 2007, Proposal 392 was brought before the board seeking to modify the positive C&T finding for clams. The board found positive C&T uses for all shellfish outside of the nonsubsistence area and determined an ANS for hardshell clams, and shellfish other than hardshell clams, crab, and shrimp (5 AAC 02.311(b)).

CURRENT SUBSISTENCE CRAB FISHING REGULATIONS FOR THE COOK INLET AREA

Due to a lack of harvestable surplus, there are no fisheries, including for subsistence uses, authorized for Dungeness crab or king crab in the Cook Inlet Area. Noncommercial fishing (i.e., fishing under sport, personal use, or subsistence regulations) has been closed in the Cook Inlet Area for king crab since 1985 and for Dungeness crab since 1998. Therefore, this report and the ANS options that follow will focus on the Tanner crab fishery. Noncommercial Tanner crab fisheries have been authorized since at least 1981; however, these fisheries have not been opened every year. Following are the current regulations for the Tanner crab subsistence fishery in the Cook Inlet Area outside the nonsubsistence area described in 5 AAC 00.015(a)(3).

Season

Tanner crab may be taken for subsistence purposes only from July 15 through March 15, with two exceptions: In a portion of Kachemak Bay, male Tanner crab may be taken only from September 1 through December 31 and from January 15 (or the beginning of the commercial Tanner crab season, whichever is later) through March 15. Additionally, when the subsistence Tanner crab fishery is closed in the Kamishak or Barren Islands districts, the subsistence Tanner crab fishery is also closed in the Eastern, Outer, and Central districts. (5 AAC 02.325 (a)(1)).

Gear

In the Cook Inlet Area, Tanner crab may be taken with pots, ring nets, dip nets, diving gear, hooked or hookless hand lines, and by hand (5 AAC 02.307(1)). There are several specifications for a pot used to take Tanner crab: it must have a minimum of two escape rings that are at least four and three-eighths inches inside diameter, and it may not have any portion of the line attaching the pot to a buoy floating on the surface of the water at any time, except for that portion of the line connecting the main buoy to any auxiliary buoy or buoys (5 AAC 02.307(2)). No more than two pots per person with a maximum of two pots per vessel may be used to take Tanner crab, except that in the waters of the Outer and Eastern districts between the longitude of Gore Point (150° 57.85' W. long.) and the longitude of Cape Fairfield (148° 50.25' W. long.), no more than two pots per person with a maximum of six pots per vessel may be used to take Tanner crab (5 AAC 02.307(3)).

Permit

A subsistence crab fishing permit is required, and catch information must be recorded on the permit before concealing the Tanner crab from plain view or removing the Tanner crab from the fishing site (5 AAC 02.325(a)(2)) (See Appendix B for an example of the permit).

Bag and Possession Limits

The daily bag and possession limit is five male Tanner crab (5 AAC 02.325(a)(3)). Only male Tanner crab four and one-half inches or greater in width of shell may be taken or possessed (5 AAC 02.325(a)(4)).

Special Provisions

If the provisions of 5 AAC 35.408(d) (i.e., there is an absence of trawl survey data or specific Tanner crab abundance estimates) apply, then male Tanner crab may be taken only from October 1 through the last day of February with a bag and possession limit of three male Tanner crab. In this scenario, no more than one pot per person with a maximum of one pot per vessel may be used to take Tanner crab (5 AAC 02.325(b)).

LOWER COOK INLET TANNER CRAB HARVEST DATA

Data relevant to the subsistence harvest of Tanner crab in the lower Cook Inlet area are available through department household harvest surveys and a permit program. Household harvest surveys are conducted periodically and usually collect harvest data for an entire study year. Table 1 presents estimated harvest and use data for Tanner crab by residents of Nanwalek, Port Graham, and Seldovia for available study years. ADF&G has issued noncommercial fishery permits annually since 1996. Prior to 2008, permits were valid for an entire calendar year; beginning in 2008 permits were issued based on seasons and may have spanned calendar years. Beginning with the 2017/2018 fishery, permits for the subsistence fishery were offered separately from the permit for other noncommercial uses, basically reflecting whether the harvest activity took place within or outside of the nonsubsistence area. Table 2 provides estimated subsistence Tanner crab harvests for 2017/2018 and 2018/2019 based on returned subsistence permits. The community of residence from returned subsistence Tanner crab permits is detailed in Table 3; the majority of returned permits in both fishery seasons were from the Kenai Peninsula Borough, in particular Homer.

Table 1.–Estimated harvest and uses of Tanner crab, Port Graham, Nanwalek, and Seldovia, 1987, 1989–1993, 1997, 2003, and 2014.

		Percent of households					Estimated harvest		
Year	Community	Using	Attempting harvest	Harvesting	Giving	Receiving	Individual	Total pounds	Pounds per capita
1987	Port Graham	35%	4%	4%	7%	33%	40.0	64.0	0.4
	Nanwalek	12%	0%	0%	0%	12%	0.0	0.0	0.0
1989	Port Graham	0%	0%	0%	0%	0%	0.0	0.0	0.0
	Nanwalek	3%	0%	0%	3%	3%	0.0	0.0	0.0
1990	Port Graham	0%	0%	0%	0%	0%	0.0	0.0	0.0
	Nanwalek	6%	0%	0%	0%	6%	0.0	0.0	0.0
1991	Seldovia	62%	17%	15%	18%	52%	1515.0	2425.0	7.1
	Port Graham	14%	2%	2%	2%	12%	4.0	6.0	0.0
	Nanwalek	0%	0%	0%	0%	0%	0.0	0.0	0.0
1992	Seldovia	62%	12%	12%	20%	54%	670.0	1072.0	2.9
	Port Graham	8%	0%	0%	2%	8%	0.0	0.0	0.0
	Nanwalek	19%	0%	0%	3%	19%	0.0	0.0	0.0
1993	Seldovia	52%	15%	15%	26%	43%	1033.0	1653.0	3.8
	Port Graham	16%	0%	0%	6%	16%	0.0	0.0	0.0
	Nanwalek	0%	0%	0%	0%	0%	0.0	0.0	0.0
1997	Port Graham	5%	0%	0%	0%	5%	0.0	0.0	0.0
	Nanwalek	0%	0%	0%	0%	0%	0.0	0.0	0.0
2003	Port Graham	9%	0%	0%	4%	9%	0.0	0.0	0.0
	Nanwalek	0%	0%	0%	0%	0%	0.0	0.0	0.0
2014	Seldovia	12%	2%	2%	4%	11%	7.0	10.7	0.0
	Port Graham	0%	0%	0%	0%	0%	0.0	0.0	0.0
	Nanwalek	0%	0%	0%	0%	0%	0.0	0.0	0.0

Source ADF&G Division of Subsistence, Community Subsistence Information System (CSIS): http://www.adfg.alaska.gov/sb/CSIS/ (Accessed November 2019).

Note Harvests in this table include noncommercial harvests (subsistence, sport, or personal use) as well as retention from commercial fisheries for personal use. Residents of Seldovia and Port Graham removed Tanner crab from commercial catches during these study years. In 1987, 88% of the harvest by weight in Port Graham originated from commercial retention. The proportion of the overall harvest provided by commercial retention by Seldovia residents in 1991, 1992, and 1993 ranged from 28% to 62%.

Table 2.–Historical subsistence Tanner crab harvests, Cook Inlet and North Gulf Coast Area, 2017–2019.

	Number of permits			
Year	Issued	Returned	Percentage of permits returned	Estimated Harvest amount, individual Tanner crab
2017/2018	148	143	97%	369
2018/2019	193	152	79%	273

Table 3. Subsistence Tanner crab permits, by community of residence, 2017–2019.

Community	Number of permits issued in 2017/2018 season	Number of permits issued in 2018/2019 season
Kenai Peninsula Borough		
Anchor Point	2	11
Clam Gulch	1	1
Fritz Creek	2	4
Halibut Cove	0	1
Homer	89	80
Kasilof	1	5
Kenai	11	15
Nikiski	0	1
Nikolaevsk	1	0
Ninilchik	7	3
Port Graham	1	1
Seldovia	5	5
Soldotna	11	16
Sterling	0	3
Subtotal, Kenai Peninsula Borough	**131**	**146**
Other Alaska		
Anchorage	10	21
Eagle River	2	1
Elfin Cove	0	2
Fairbanks	1	2
Girdwood	1	1
Juneau	1	0
Kodiak	0	1
Talkeetna	0	1
Valdez	0	1
Wasilla	2	5
Subtotal, other Alaska	**17**	**35**
Total	**148**	**181**

ANS OPTIONS, COOK INLET AREA CRAB

Following are options for the board to consider should it choose to adopt ANS ranges for crab in the Cook Inlet Area outside the nonsubsistence area in regulation during its March 2020 meeting. Data concerning subsistence uses of king and Dungeness crab are lacking because subsistence fisheries for these crab species have been closed in Cook Inlet since 1985 and 1998, respectively. The department submitted and supports reviewing the ANS options for Tanner crab due to the lack of an ANS finding for this stock, so that the board has one objective measure in its toolbox to assess if reasonable opportunity for success in harvesting Tanner crab for subsistence uses is provided by the regulations.

The options are based on household harvest surveys conducted by the Division of Subsistence between 1982 and 2014 plus data from two years of permit returns in the subsistence Tanner crab fishery (2017/2018 and 2018/2019). The tables provide ANS options based on: 1) the low and high harvest point estimates from all household harvest surveys in the three Lower Cook Inlet communities (Nanwalek, Port Graham, and Seldovia) conducted between 1987 and 2014; 2) the sum of the averages of the low and high annual harvest estimates based on household surveys in the three Lower Cook Inlet communities from 1987–2014; and 3) the mean harvest from the two seasons of subsistence permit data plus or minus 25%. It should be noted that residents of the three communities may have harvested Tanner crab from within the nonsubsistence area during study years. Additionally, the permit harvest data are expanded to account for nonreturned permits but do not account for people who are harvesting crab without permits.

OPTION A: 10–1,600 TANNER CRAB

This option is based on the low and high harvest point estimates from household harvest surveys in Seldovia, Nanwalek, and Port Graham 1987–2014

	Harvest (ind)		ANS range option (rounded)	
	Low	High	Low	High
Seldovia[a]	7	1,515		
Port Graham	4	40		
Nanwalek	0	0		
Total	**11**	**1,555**	**10**	**1,600**

a. Some unknown portion of Seldovia's harvest may have come from within the nonsubsistence area.

OPTION B: 275–1,400 TANNER CRAB

This option is based on the sum of the averages of the low and high annual harvest estimates from household surveys as determined by confidence intervals, 1987–2014

	Harvest (ind)	
	Low estimate	High estimate
Seldovia, average[a]	270	1,346
Port Graham, average	2	9
Nanwalek, average	0	0
Total	**272**	**1,355**
ANS option (rounded)	275	1,400

a. Some unknown portion of Seldovia's harvest may have come from within the nonsubsistence area.

OPTION C: 230–400 TANNER CRAB

This option is based on the mean harvest ± 25% estimated through the subsistence Tanner crab fishery permits, 2017/18 and 2018/2019.

Estimated mean harvest amount, 2017–2019 (ind)	Mean ± 25%		ANS Range	
	Low	High	Low	High
312	233.63	389.38	230	400

OPTION D: TAKE NO ACTION

Option D is to maintain status quo by not adopting an ANS range for Tanner crab at this time. Data on subsistence harvests of Tanner crab in Lower Cook Inlet will continue to be collected on an annual basis for residents of all Alaska communities through the permit program and may provide a more robust dataset upon which to base an ANS finding than the two years of data presently available.

KODIAK AREA

The Kodiak Area is described in 5 AAC 02.400 (Figure 2). Within the Kodiak Area is the Kodiak Island Borough which includes 11 incorporated places and census designated places (CDPs), and a "balance" that is mostly along the Kodiak Island's road system and is connected to the incorporated city of Kodiak, the U.S. Coast Guard base, and the airport (Fall 2013:111). Six predominantly Alaska Native communities that do not have access to the road system include Akhiok, Old Harbor, Ouzinkie, Larsen Bay, Karluk, and Port Lions; the Old Believer community of Aleneva is also off the road system. The DCCED population estimate for the entire Kodiak Island Borough for 2018 was 13,136 people. There are no nonsubsistence areas in the Kodiak Area.

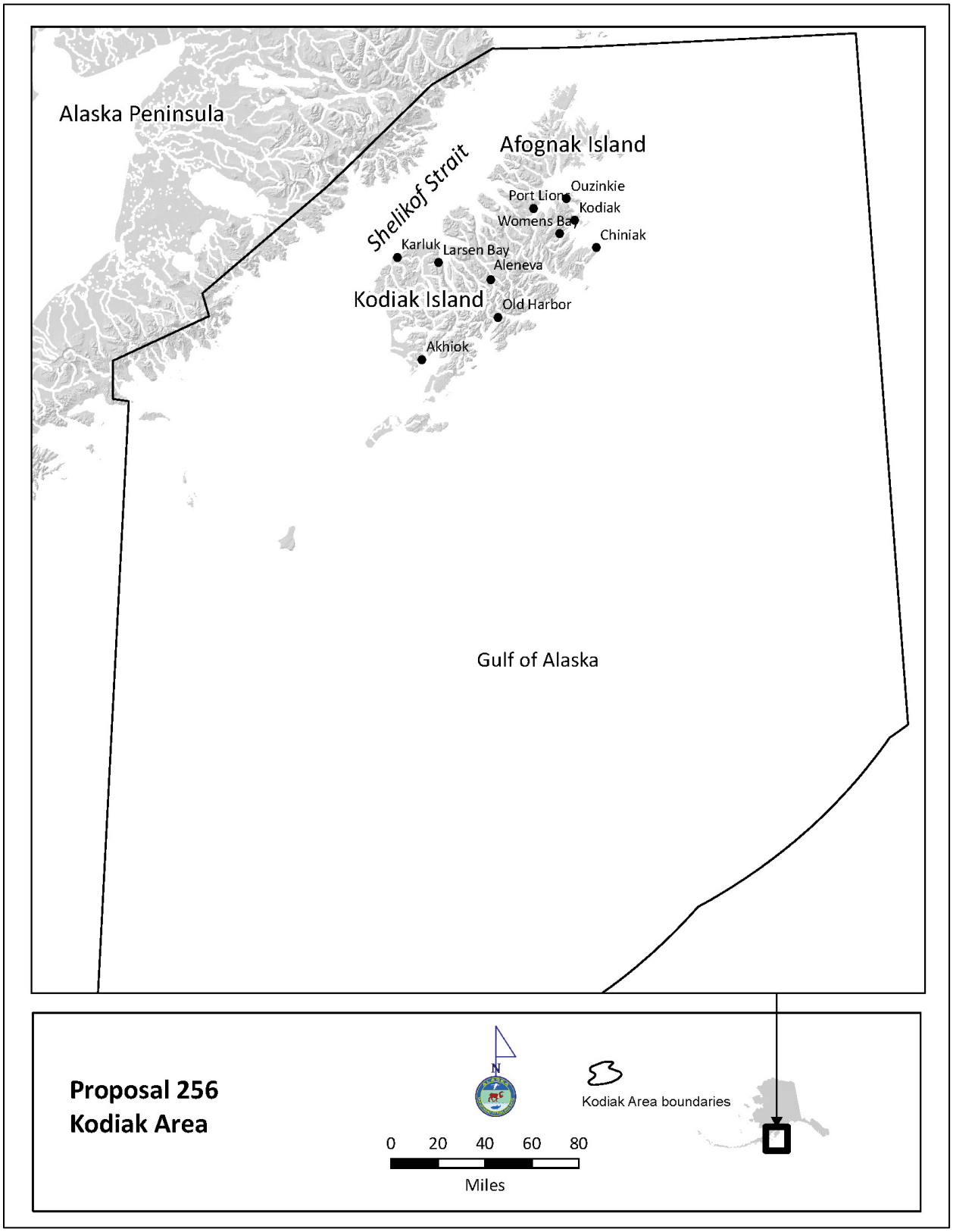

Figure 2.–Map of Kodiak Area.

HISTORY OF C&T AND ANS FINDINGS ON SHELLFISH STOCKS IN KODIAK

In 1988, the board determined that there are customary and traditional uses of king crab in the Kodiak Area—except the Semidi Island Overlap Section, the North Mainland Section, and the South Mainland Section. No finding was made in those three sections.

In 1993, the board reviewed available harvest and subsistence use information, as summarized in an "eight criteria worksheet" prepared by the department (see Appendix C), and reconfirmed the positive C&T use finding for king crab (5 AAC 02.466 (a)).

In 2015, the board found positive C&T findings for Tanner crab, Dungeness crab, and miscellaneous shellfish and determined ANS ranges for these species (5 AAC 02.466). At the same time, the board extended the positive C&T finding for king crab to the entire Kodiak Area. An ANS for king crab was not determined at that meeting.

CURRENT SUBSISTENCE KING CRAB FISHING REGULATIONS FOR THE KODIAK AREA

Following are the current regulations for the king crab subsistence fisheries in the Kodiak Area.

Season

King crab may be taken for subsistence purposes only from June 1 through January 31, except in waters 25 fathoms or more in depth during the 14 days immediately before the opening of a commercial king or Tanner crab fishing season in that location (5 AAC 02.420(a)(4)).

Gear

Although technically king crab may be taken by a wide variety of gear under 5 AAC 02.010, harvesters are only documented as using pots. No more than one pot per person or per vessel may be used to take subsistence king crab (5 AAC 02.420(a)(3)). Requirements specifying what a "king crab pot" is, including dimensions and opening sizes are found in 5 AAC 02.420(b). In addition to requirements specified in 5 AAC 02.010(e), a king crab pot must have "king crab" legibly inscribed on the keg or buoy attached to the pot (5 AAC 02.420(a)(3)). Escapement mechanisms are also required (5 AAC 02.010(f)). In addition, all king crab pots used for subsistence fishing and left unattended in salt water longer than a two-week period shall have all bait and bait containers removed and all doors secured fully open (5 AAC 02.420(a)(2)).

Permit

A subsistence crab fishing permit is required (5 AAC 02.405) (see Appendix D).

Bag and Possession Limits

The annual limit is three male king crab per household (5 AAC 02.420(a)(1)). Only male king crab seven inches or greater in width of shell may be taken or possessed (5 AAC 02.420(a)(5)). The three-crab-per-household limit has been in effect since 1996.

SUBSISTENCE KING CRAB HARVEST DATA

Data relevant to the subsistence harvest of king crab in the Kodiak Area are available through department household harvest surveys and a permit program. Household harvest surveys are conducted periodically and usually collect harvest data for an entire study year. Table 4 presents estimated harvest and use data for king crab by residents of Kodiak Island for available study years. Reported harvests of king crab from annual subsistence permits since 1995 are presented in Table 5 and Figure 3. The department mails permits to all permit holders from the previous year. Each year, large numbers of permits are returned by the U.S. Postal Service as "undeliverable." No record is maintained regarding the number of "undeliverable" permits. Therefore, it is not known how many permits are issued each year, so expanded estimates of harvest

to account for nonreturned permits are not available. Retention of king crab from commercial harvests for personal use has provided a significant amount of a community's king crab in some years. Table 6 gives the amount of king crab harvested through commercial retention and noncommercial methods, as well as the percentage of harvest from commercial retention for each study year, as estimated through household surveys.

Table 4.–Estimated harvest and use of king crab, Kodiak Island communities, household surveys 1982, 1986, 1989–1993, 1997, and 2003.

		Percentage of households					Estimated harvest		
Year	Community	Using	Attempting harvest	Harvesting	Giving away	Receiving	Individual	Total pounds	Pounds per capita
1982	Akhiok	95.2		90.5			499.1	1,148.00	11.2
	Chiniak	94.1		70.6			2,698.30	6,206.00	10.1
	Karluk	80		20			35.2	81	0.8
	Kodiak City	87.1		31.6			17,997.00	41,393.00	5
	Larsen Bay	78.1		28.1			259.1	596	3.5
	Old Harbor	72.7		61			858.3	1,974.00	5.6
	Ouzinkie	90.6		50			1,820.00	4,186.00	18.2
	Port Lions	98.2		56.4			1,773.50	4,079.00	14.1
1986	Akhiok	50	25	25	33.3	25	70.9	163	1.3
	Karluk	10.5	5.3	5.3	0	5.3	28.3	65	0.6
	Larsen Bay	29.7	13.5	13.5	0	21.6	40.9	94	0.6
	Old Harbor	18.2	6.8	6.8	6.8	11.4	124.3	286	0.8
	Ouzinkie	38.2	29.4	26.5	14.7	26.5	315.7	726	3.7
	Port Lions	87.7	41.5	40	26.2	64.6	1,230.90	2,831.00	9.6
1989	Akhiok	90	40	30	40	80	279.6	643	11.5
	Karluk	7.1	0	0	0	7.1	0	0	0
	Larsen Bay	35.3	11.8	11.8	11.8	23.5	60.9	140	1.1
	Old Harbor	45.8	14.6	14.6	10.4	41.7	83.9	193	0.7
	Ouzinkie	22.9	5.7	5.7	0	20	65.2	150	0.7
	Port Lions	72.2	22.2	22.2	13.9	61.1	199.1	458	2.3
1990	Karluk	5.9	0	0	5.9	5.9	0	0	0
	Larsen Bay	51.4	17.1	17.1	11.4	40	136.1	313	2.2
	Ouzinkie	17	3.8	3.8	3.8	15.1	67	154	0.8
1991	Karluk	0	0	0	0	0	0	0	0
	Kodiak City	56	17	15	19	49	3,470.00	7,981.00	1.4
	Kodiak Coast Guard Station	32.3	12.9	12.9	6.5	19.4	201.7	464	0.8
	Kodiak Road	56.6	18.4	14.5	18.4	52.6	2,944.80	6,773.00	1.7
	Larsen Bay	28.9	7.9	7.9	5.3	21.1	53	122	0.8
	Old Harbor	40.5	14.3	11.9	7.1	35.7	114.8	264	1.2
	Ouzinkie	25	6.3	3.1	0	21.9	8.7	20	0.1
1992	Akhiok	66.7	29.2	25	16.7	58.3	65.7	151	1.9
	Kodiak City	60	17	13	25	53	5,653.00	13,002.00	2.7
	Larsen Bay	35.1	24.3	24.3	10.8	16.2	156.5	360	2.6
	Ouzinkie	32.7	5.8	3.8	9.6	30.8	9.1	21	0.1
1993	Kodiak City	50.5	17.1	14.3	19	43.8	4,646.50	10,687.00	1.8
	Larsen Bay	45	25	22.5	15	30	193.5	445	3.4
	Ouzinkie	39.3	6.6	4.9	11.5	37.7	16.1	37	0.2
	Port Lions	26.7	6.7	4.4	0	24.4	92.6	213	0.9
1997	Larsen Bay	19.2	7.7	7.7	3.8	15.4	9.6	22	0.2
	Old Harbor	51.2	20.9	20.9	25.6	32.6	174.3	401	1.4
	Ouzinkie	14.9	2.1	2.1	4.3	12.8	2.6	6	0
2003	Akhiok	72.7	45.5	36.4	9.1	36.4	70.9	163	2.3
	Larsen Bay	8	8	8	0	0	6.1	14	0.2
	Old Harbor	44.2	15.4	15.4	5.8	32.7	45.2	104	0.5
	Port Lions	31.5	5.6	1.9	5.6	27.8	3.9	9	0

Source ADF&G Division of Subsistence, Community Subsistence Information System (CSIS): http://www.adfg.alaska.gov/sb/CSIS/ (Accessed December 2014).

Note Empty cells indicate that data were not collected.

Table 5.–Historical subsistence king crab harvests, Kodiak Management Area, permits 1995–2018.

Year	Number of permits		Harvest amount, individual King crab
	Issued	Returned	
1995	1,935	1,191	2,603
1996[a]	1,556	1,297	513
1997	2,081	1,572	292
1998	1,816	543	217
1999	ND	182	177
2000	ND	242	215
2001	ND	497	323
2002	ND	362	305
2003	ND	406	322
2004	ND	437	459
2005	ND	424	440
2006	ND	383	394
2007	ND	304	298
2008	ND	281	360
2009	ND	330	406
2010	ND	410	339
2011	ND	390	264
2012	ND	257	220
2013	ND	255	199
2014	ND	227	181
2015	ND	204	215
2016	ND	182	210
2017	ND	214	201
2018	ND	219	236
5-year average (2014–2018)	ND	209	209
10-year average (2009–2018)	ND	269	247
Historical average (1995–2018)	ND	450	391

Source ADF&G Division of Commercial Fisheries, 2019

a. Regulations limiting the subsistence harvest of king crab to three per household per year went into effect in 1996.

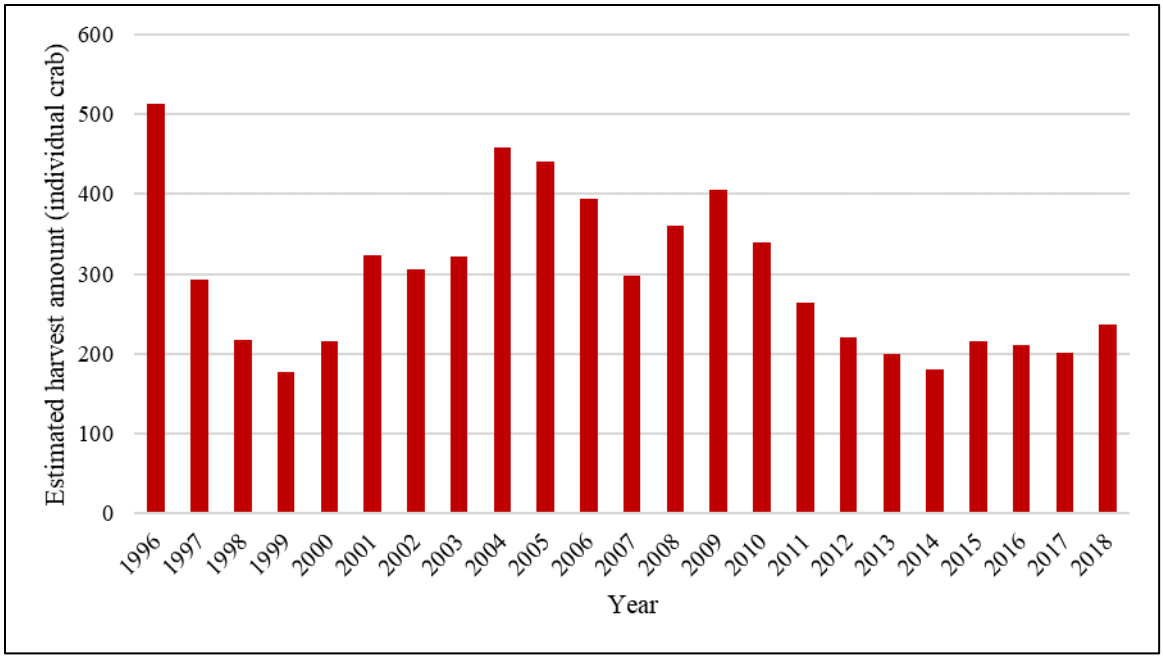

Figure 3.–Historical subsistence king crab harvests based on returned permits, Kodiak Management Area, 1996–2018.

Table 6. Comparison of estimated harvests of king crab through noncommercial methods and retention from commercial harvests, Kodiak Island communities, household harvest surveys, 1986, 1989–1993, 1997, and 2003.

		Estimated number of king crab						Percentage of king crab	
Year	Community	Retained from commercial harvests	95% CI (±%)	Non-commercial gear	95% CI (±%)	Total harvest	95% CI (±%)	Retained from commercial harvests	Non-commercial gear
1986	Akhiok	0		71	0.84	71	0.84	0%	100%
	Karluk	28	1.07	0		28	1.07	100%	0%
	Larsen Bay	14	1.07	27	0.62	41	0.53	34%	66%
	Old Harbor	0		124	1.07	124	1.07	0%	100%
	Ouzinkie	36	1.33	279	0.56	315	0.51	11%	89%
	Port Lions	69	0.73	1,162	0.29	1,231	0.28	6%	94%
1989	Akhiok	0		280	0.86	280	0.86	0%	100%
	Karluk	0		0		0			
	Larsen Bay	3	0.66	57	0.47	61	0.44	5%	95%
	Old Harbor	0		84	0.54	84	0.54	0%	100%
	Ouzinkie	0		65	1.18	65	1.18	0%	100%
	Port Lions	19	0.68	181	0.96	199	0.89	10%	91%
1990	Karluk	0		0		0			
	Larsen Bay	7	0.57	129	0.61	136	0.61	5%	95%
	Ouzinkie	0		67	0.44	67	0.44	0%	100%
1991	Karluk	0		0		0			
	Kodiak City	298	1.1	3,172	0.74	3,470	0.68	9%	91%
	Kodiak Roac	756	1.67	2,189	0.8	2,945	0.74	26%	74%
	Kodiak Stati	0		202	1.22	202	1.22	0%	100%
	Larsen Bay	2	1	53	0.41	53	0.41	4%	96%
	Old Harbor	0		113	0.74	115	0.73	0%	100%
	Ouzinkie	0		9	1.22	9	1.22	0%	100%
1992	Akhiok	0		66	0	66	0	0%	100%
	Kodiak City	2,761	1.4	2,892	0.75	5,653	0.85	49%	51%
	Larsen Bay	15	0.6	142	0.26	157	0.26	10%	90%
	Ouzinkie	0		9	0.44	9	0.44	0%	100%
1993	Kodiak City	1,465	1.31	3,181	0.69	4,646	0.69	32%	68%
	Larsen Bay	0		194	0.32	194	0.32	0%	100%
	Ouzinkie	1	1	15	0.53	16	0.5	6%	94%
	Port Lions	89	1.29	4	1.25	92	1.25	96%	4%
1997	Larsen Bay	0		9	0.86	9	0.86	0%	100%
	Old Harbor	41	0.88	133	0.52	174	0.55	24%	76%
	Ouzinkie	0		3	0.99	3	0.99	0%	100%
2003	Akhiok	0		71	0.88	71	0.88	0%	100%
	Larsen Bay	0		6	0.64	6	0.64	0%	100%
	Old Harbor	23	1.06	22	0.47	45	0.58	52%	48%
	Ouzinkie	0		0		0			
	Port Lions	0		4	0.98	4	0.98	0%	100%

Source ADF&G Division of Subsistence, Community Subsistence Information System (CSIS): http://www.adfg.alaska.gov/sb/CSIS/ (Accessed January 2020).
Note Empty cells indicate that data were not collected.

ANS OPTIONS, KODIAK AREA KING CRAB

Following are options for the board to consider should it choose to adopt ANS ranges for king crab in the Kodiak Area in regulation during its March 2020 meeting. The department submitted and supports reviewing the ANS options so that the board has one objective measure in its toolbox to assess if reasonable opportunity for success in harvesting king crab for subsistence uses is provided by the regulations.

The options are based on the department's subsistence permit harvest data from 1996–2018. Permit harvest data are available from 1995 (Table 5) but have been left out of the following discussion because the three crab per year limit only came into effect in 1996. Permit data should be considered minimum harvest estimates because they are not expanded to account for nonreturned permits or for people who are harvesting crab without a permit. Although household harvest data for king crab have been collected in Kodiak area communities, the most recent data available are over 15 years old, and for Kodiak City, the largest community on the island, data are over 25 years old. The following tables provide ANS options based on: 1) the low and high harvests for the period for which permit data are available (1996–2018) under the current set of regulations; 2) the mean harvest and standard deviation from permit returns 1996–2018; 3) the low and high harvests for the most recent 10-year range for which data are available (2009–2018); and 4) mean harvest and standard deviation from permit returns for the most recent 10-year period (2009–2018). A note about standard deviations: 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 assessment of harvest trends. Also note that since 1996, subsistence king crab harvests in the Kodiak Management Area have been limited to three crab per household per year due to conservation concerns. If the harvestable surplus rebounds and the annual limit was increased or eliminated, subsistence harvests could increase to resemble pre-1996 levels, and the board may wish to revisit the ANS at that time if it chooses to adopt an ANS in 2020 based on available permit data.

The options presented below are in individual king crab.

OPTION A: 175–525 KING CRAB

This option is based on low and high harvests from permit returns 1996–2018

Harvest (ind)		ANS range option (rounded)	
Low	High	Low	High
177	513	175	525

OPTION B: 200–400 KING CRAB

This option is based on mean harvest and standard deviation from permit returns, 1996–2018

Range of harvest (ind)					Mean ± SD			ANS range option (rounded)	
Low	High	Mean	SD	*Bounded by*	Low	High	*Equals*	Low	High
177	513	295	97		198	392		200	400

OPTION C: 175–400 KING CRAB

This option is based on low and high harvests from permit returns, 2009–2018

Harvest (ind)		ANS range option (rounded)	
Low	High	Low	High
181	406	175	400

OPTION D: 175–325 KING CRAB

This option is based on mean and standard deviation, 2009–2018

Range of harvest (ind)					Mean ± SD			ANS range option (rounded)	
Low	High	Mean	SD	*Bounded by*	Low	High	*Equals*	Low	High
181	406	247	72		176	319		175	325

OPTION E: TAKE NO ACTION

Option E is to maintain status quo by not adopting an ANS range at this time. If the population of king crab recovers and harvest restrictions are eliminated or relaxed, at that time the department's permit data will better provide information on actual subsistence harvests that reflect customary and traditional use levels.

REFERENCES CITED

Fall, J.A.

2013 *Report on proposed changes to nonsubsistence areas*. Alaska Department of Fish and Game Division of Subsistence, Technical Paper No. 386: Anchorage. http://www.adfg.alaska.gov/techpap/TP386.pdf

APPENDIX A: 1993 CUSTOMARY AND TRADITIONAL USE WORKSHEET, CRAB, LOWER COOK INLET

CUSTOMARY AND TRADITIONAL USE WORKSHEET II-11

CRAB -- LOWER COOK INLET
Southern District; Outer District

Prepared by the Division of Subsistence
Alaska Department of Fish and Game

November 1992; minor revisions January 1993

Criterion 1. A long-term consistent pattern of use and reliance on the fish stock or game population that has been established over a reasonable period of time, excluding interruption by circumstances beyond the user's control, such as unavailability of the fish or game caused by migratory patterns.

Information from elder residents of Port Graham and English Bay indicates that crabs are part of a large group of bottom-dwelling animals called *uyangtaaq* (Stanek 1985:157-158). These resources are usually found in shallow waters of bays and intertidal areas. Crab harvests have been documented for lower Cook Inlet communities (Tables 1-3, Fig. 1). In Port Graham and English Bay, residents reported that crab numbers, particularly dungeness, in the area had declined greatly since the time commercial crabbing began in the 1960s. By the 1980s, population declines led to closures of all Cook Inlet commercial crab fisheries. Crab were harvested at relatively low levels for home use in the early 1980s, but an even more severe decline in harvest has taken place since then, and may also be attributable in part to an abundance of sea otters competing with people for crab. Also, subsistence fishing have not been authorized since the early 1980s.

Criterion 2. A use pattern recurring in specific seasons of each year.

Crab were usually taken whenever they were present in accessible areas. With the use of pots, harvest capability probably increased. In recent years, harvests have generally occurred within the limited periods allowed by regulations. Like some other shellfish, extreme low tides make crab more accessible for hand picking or other means of harvest. Seldovia residents typically fish for crab between May and August.

Criterion 3. A use pattern consisting of methods and means of harvest which are characterized by efficiency and economy of effort and cost.

In lower Cook Inlet communities, crab were traditionally harvested with spears and by hand in shallow water (Stanek 1985:158). In deeper water, crab may have been taken incidentally on hooks set for bottomfish. In more recent times several pots are placed in favorite harvest locations. The pots are attended by their owners, or permission is given to others to take what they need. Quantities of crab are often distributed around the community to whoever wants some. Occasionally, commercial fishermen remove crab from their catch for their personal use and to distribute to others in the communities (Stanek field notes).

Criterion 4. The area in which the noncommercial long-term and consistent pattern of taking, use, and reliance upon the fish stock or game population has been established.

Crab harvest by Port Graham and English Bay, for the most part, takes place within the areas described for the taking of other shellfish (see maps in Stanek 1985). Occasionally, as with other shellfish, other areas used include Tutka Bay, Sadie Cove, Port Chatham, Chugach, Rocky and Windy Bays, and Port Dick.

Harvest areas for Seldovia have not been recorded on maps by the Division of Subsistence. Seldovia residents commonly use Seldovia Bay as their source of dungeness crab.

Criterion 5. The means of handling, preparing, preserving, and storing fish or game which has been traditionally used by past generations, but not excluding recent technological advances where appropriate.

Most commonly, crab are prepared for eating by boiling in water, but on occasion they may be roasted on open fires. Most crab are eaten shortly after harvest, unless very large numbers are taken, in which case they may be frozen.

Criterion 6. A use pattern which includes the handing down of knowledge of fishing or hunting skills, values, and lore from generation to generation.

Crab, like other shellfish species, are part a complex of resource harvest and sharing activities in which older, experienced harvesters teach children and young adults the skills of obtaining food from the ocean, and the ability to provide for themselves.

Criterion 7. 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.

Crab are typically harvested by relatively few individuals in the communities, but are widely used through sharing networks. Table 1 illustrates the extensive sharing in English Bay where, in 1987, 3.0 percent of the households harvested crab and 51.5 percent used crab. Similar patterns occur in Port Graham (Table 2). Available data for Seldovia (Reed (1985:160-161) reported three crab species used by 91.0 percent of the households, but harvest by 20.0 percent. A similar pattern was found in 1992 when Division of Subsistence researchers also interviewed commercial crabbers who remove quantities of crab from their harvests and distribute them throughout Seldovia (Table 3).

Criterion 8. A pattern that includes taking, use, and reliance for subsistence purposes upon a wide variety of the fish and game resources and that provides substantial economic, cultural, social, and nutritional elements of the subsistence way of life.

Overall subsistence harvests in these communities are relatively large, ranging from about 200 to 300 pounds per person per year. English Bay, an average of 25 different resources were used in 1987, while in Port Graham an average of 21 different resources were recorded. These are some of the highest levels recorded in the state (Fall 1992:51-62). For Seldovia, there was a total of 32 different categories of resources reported used during 1982 (Reed 1985:151). The average household used 13.7 kinds of wild foods in 1991/92.

References cited:

Alaska Department of Fish and Game
1992 Seldovia Household Survey. Division of Subsistence, Data Files. Anchorage.

Reed, Carolyn E.
1985 The Role of Wild Resource Use in Communities of the Central Kenai Peninsula and Kachemak Bay Alaska. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 106. Juneau.

Fall, James A., Dan J. Foster, and Ronald T. Stanek
1984 The Uses of Fish and Wildlife Resources in Tyonek, Alaska. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 105. Juneau.

Fall, James A. editor
1992 Subsistence Harvests and Uses in Seven Gulf of Alaska Communities in the Second Year Following the *Exxon Valdez* Oil Spill. Alaska Department of Fish and Game, Division of Subsistence. Prepared for the U.S. Department of the Interior, Fish and Wildlife Service. Anchorage.

Scott, Cheryl L., Amy W. Paige, and Louis Brown
1992 Community Profile Database Catalog. Volume 2. Juneau: Alaska Department of Fish and Game, Division of Subsistence.

Stanek, Ronald T., James A. Fall, and Dan J. Foster
1982 Subsistence Shellfish Use in Three Cook Inlet Villages, 1981: A Preliminary Report. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 34. Juneau.

Stanek, Ronald T.
1985 Patterns of Wild Resource Use in English Bay and Port Graham, Alaska. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 104. Juneau.

Table 1. Subsistence Crab Harvests, English Bay

Total Resource	Year	Lbs. per Used	Percentage of Households: Attempted	Harvested	Gave	Received	Harvested	Person
King crab	1982	--	--	--	--	--	13 Ind.	--
	1987[a]	3.0	0	0	0	3.0	0	0
	1989[b]	0	0	0	0	0	0	0
	1990[c]	0	0	0	0	0	0	0
	1991[d]	0	0	0	0	0	0	0
Tanner crab	1982	--	--	--	--	--	*	--
	1987[a]	12.1	0	0	0	12.1	0	0
	1989[b]	3.0	0	0	3.0	3.0	0	0
	1990[c]	5.7	0	0	0	5.7	0	0
	1991[d]	0	0	0	0	0	0	0
Dungeness crab	1982	--	--	--	--	--	196 Ind.	--
	1987[a]	51.5	0	0	3.0	51.5	0	0
	1989[b]	6.1	3.0	3.0	0	3.0	25 Ind.	0.1
	1990[c]	11.4	2.9	2.9	0	11.4	6 Ind.	0.02
	1991[d]	6.9	0	0	0	6.9	0	0

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Community Profile Database Catalog, 1992.

* Combined with King crab for 1982

a N = 33 Households

b N = 33 Households

c N = 35 Households

d N = 29 Households

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Table 2. Subsistence Crab Harvests, Port Graham

Total Resource	Year	Lbs. per Person Used	Percentage of Households: Attempted	Harvested	Gave	Received	Harvested
King crab	1982	--	--	--	--	--	--
	1987[a]	5.6	0	0	0	5.6	0
	1989[b]	0	0	0	0	0	0
	1990[c]	0	0	0	0	0	0
	1991[d]	0	0	0	0	0	0
Tanner crab	1982	--	--	--	--	--	38 Ind.
	1987[a]	35.2	3.7	3.7	7.4	33.3	40 Ind.
	1989[b]	0	0	0	0	0	0
	1990[c]	0	0	0	0	0	0
	1991[d]	14.3	2.0	2.0	2.0	12.2	4 Ind.
Dungeness crab	1982	--	--	--	--	--	339 Ind.
	1987[a]	50.0	7.4	5.6	7.4	46.3	55 Ind.
	1989[b]	0	0	0	0	0	0
	1990[c]	2.2	0	0	0	2.2	0
	1991[d]	20.4	16.3	16.3	14.3	4.1	117 Ind.

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Community Profile Database Catalog, 1992.

a N = 54 Households
b N = 48 Households
c N = 46 Households
d N = 49 Households

Table 3. Subsistence Crab Harvests, Seldovia

Total Resource	Year	Lbs. per Used	Percentage of Households: Attempted	Harvested	Gave	Received	Harvested	Person
Crab*	1982[a]	91.4	--	20.0	--	--	1,022 Lbs.	1.7
King	1991[b]	13.6	6.1	3.0	6.1	12.1	44 Ind.	0.3
Tanner	1991[b]	62.1	19.7	15.2	18.2	51.	51,515 Ind.	7.1
Dungeness	1991[b]	21.2	4.5	4.5	4.5	19.7	40 Ind.	0.1
All Crab	1991[b]	66.7	22.7	18.2	21.2	54.	51,600 Ind.	7.5

SOURCES: Alaska Department of Fish and Game, Division of Subsistence, Community Profile Database Catalog, 1992; Alaska Department of Fish and Game, Division of Subsistence, Household Survey, 1992.

* All species were combined in 1982

a N = 35 Households

b N = 66 Households

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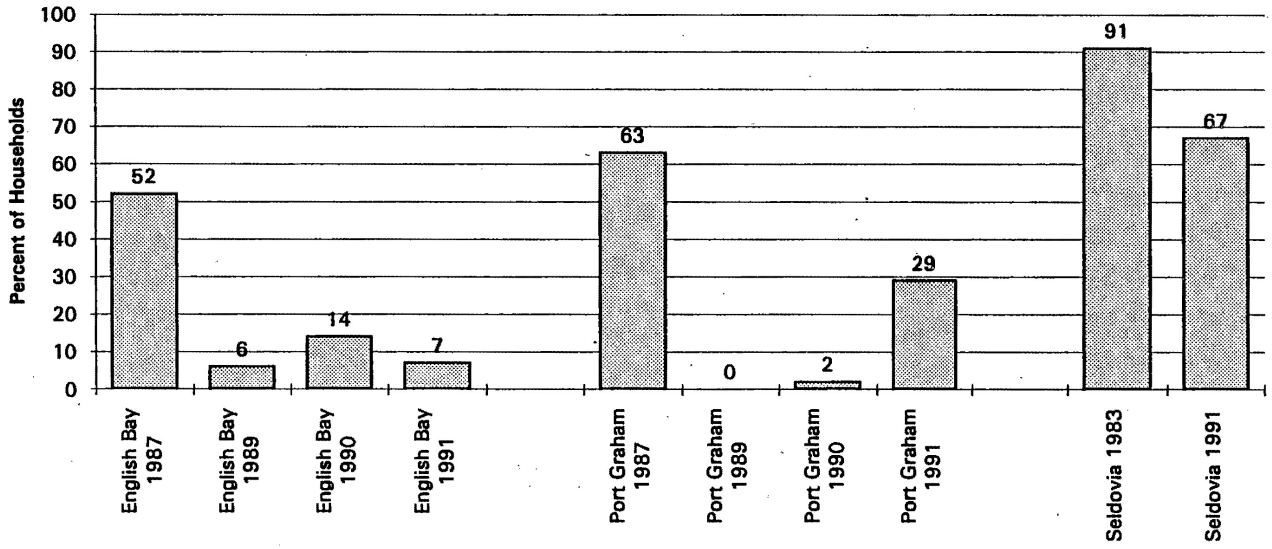
Figure 1. Percentage of Sampled Households Using Crab, Cook Inlet Communities



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APPENDIX B: LOWER COOK INLET SUBSISTENCE TANNER CRAB PERMIT

This permit is valid through February 28th, 2020

Permit Number

Alaska Department of Fish and Game
2019 - 2020 Cook Inlet and North Gulf Coast Subsistence Tanner Crab Permit

☐ Alaska Resident

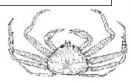
Last Name | First Name | M.I. | Sport Fishing License #

Mailing Address

(Required for Sport, Personal Use, or Proxy Fishing)

City | State | Zip Code | Phone Number | Driver's License # | State

E-Mail Address



Names of other household members authorized to fish this permit:

This subsistence permit is valid October 1, 2019 through February 28, 2020.

1) This permit **must be in your possession** while taking or transporting sport caught Tanner crab.
2) Prior to leaving the fishing site or concealing the crab from view, harvest information must be **immediately recorded** in ink on the permit.
3) Once a bag limit is removed from a pot, that pot may not be returned to the water containing any live crab.
4) Daily bag and possession limit is 5 legal male crab (4 ½ inches or greater in carapace width).
5) Individuals who receive both a subsistence and sport permit are reminded that having both permits does not allow for double the pot limit and bag and possession limits and only 5 legal crab may be retained per day.
6) Maximum of two pots may be operated per vessel and permit holders are allowed to operate only two pots.
7) The permit holder is responsible for reporting online by **March 15, 2020** even if the permit holder did not fish. Failure to report is a violation, and the permit holder **WILL NOT** be eligible to receive a permit the next following season.

You Must Report Online by March 31, 2020

Scan the QR code or visit us at:

www.adfg.alaska.gov/sf/PU/

Permit Holder Signature | **Date**

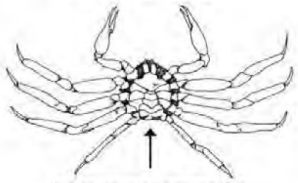
Did you go fishing for Tanner crab with this permit in 2019-2020? ◯ YES ◯ NO

Tanner Crab Harvest Log

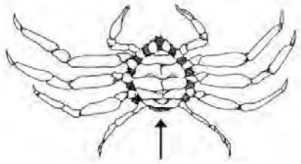
Number of lost crab pots:

	Date Pot Pulled (MM/DD)	Area Code (See Area Map)	Legal Crab Harvested		Date Pot Pulled (MM/DD)	Area Code (See Area Map)	Legal Crab Harvested
1.				12.			
2.				13.			
3.				14.			
4.				15.			
5.				16.			
6.				17.			
7.				18.			
8.				19.			
9.				20.			
10.				21.			
11.				22.			

Tanner crab

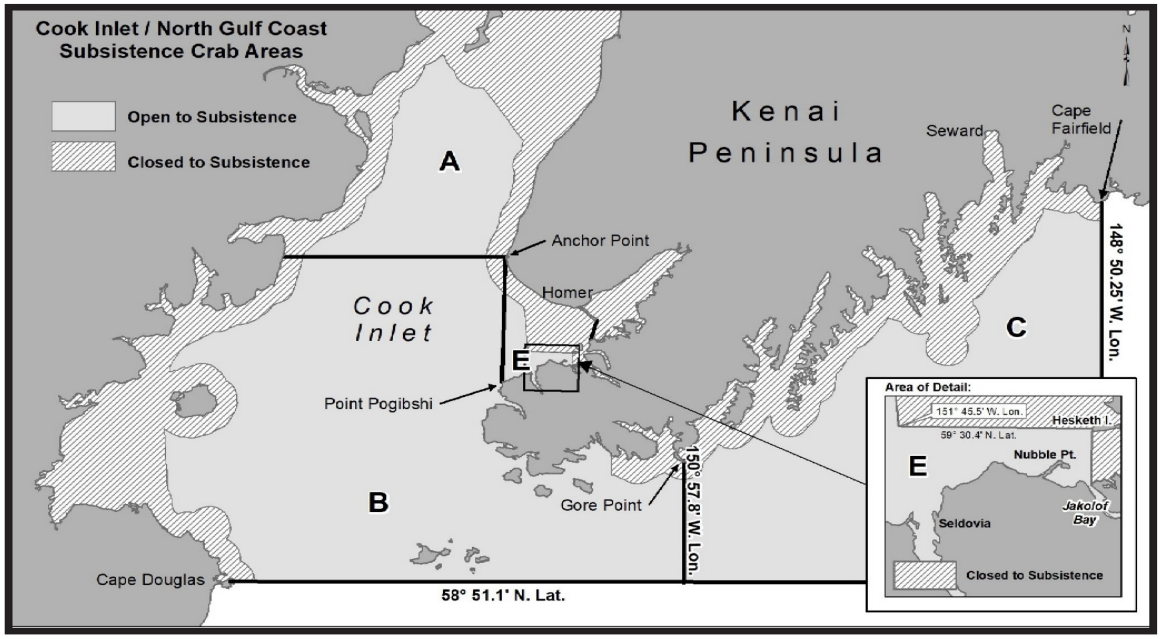


Male—narrow abdominal flap



Female—wide abdominal flap covers most of underside (females usually smaller than 4½")
NO HARVEST ALLOWED

Width measurement is the straight-line distance across the carapace, including spines.



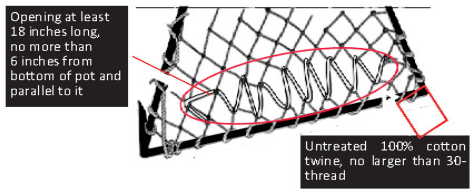
Escape Rings: Each pot used to take Tanner crab must have a minimum of two escape rings on opposite sides of the pot measuring no less than 4 ⅜ inches in diameter.

Escape Mechanism: A biodegradable escape mechanism as defined in 5 AAC 39.145 is required for crab and shrimp pots. Required escape mechanisms vary by pot construction and are divided into two categories: non-rigid mesh pots and rigid mesh pots.

Non-rigid mesh pots: Pot sidewalls, which may include the tunnel sidewalls, must contain an opening that is laced, sewn, or secured together by a single length of untreated, 100% cotton twine, no larger than 30-thread count. The cotton twine may be knotted at each end only. The opening must be within six inches of the bottom of the pot and must be parallel with it. The cotton twine may not be tied or looped around the web bars. The opening must be a minimum of 18 inches long.

Rigid mesh pots: Must have at least one rectangular opening in a sidewall of the pot, which may include a side of the tunnel. The lower long edge of the opening must be parallel to and within six inches of the bottom of the pot. The opening may be covered with a single panel secured to the pot with no more than four single loops of untreated, 100% cotton twine, no larger than 30-thread; each single loop of cotton twine may not be laced along the opening. The panel must be attached to the pot in a manner that when the cotton twine degrades, the panel will drop away from the pot exposing the opening completely. The panel must be equal to or exceeding 12 inches x 8 inches.

Example diagram for non-rigid mesh pot



Buoy Marking:
A buoy must be attached to each pot operated and marked with the following information:

- The name (first initial and last name) and address of each permit holder fishing the pot
- The vessel name or Department of Motor Vehicles registration number (AK number) that is used to operate the pot

Subsistence Area Codes

- **A** *Cook Inlet (North of Anchor Point)*
- **B** *Lower Cook Inlet*
- **C** *North Gulf Coast*
- **E** *Kachemak Bay West of Homer Spit and Anicom Point*

Gear Requirements

- A maximum of **2 pots** per person/**2 pots** per vessel
- Permit holders are allowed to operate two pots at a time.

APPENDIX C: 1993 CUSTOMARY AND TRADITIONAL USE WORKSHEET, MARINE INVERTEBRATES, KODIAK MANAGEMENT AREA

CUSTOMARY AND TRADITIONAL USE WORKSHEET 11-9

MARINE INVERTEBRATES: KODIAK MANAGEMENT AREA

Prepared by the Division of Subsistence
Alaska Department of Fish and Game

January 1993

Note: Other than king crab, the Board of Fisheries has made no customary and traditional use determinations for marine invertebrates in the Kodiak Management Area. In 1988, the Board determined that king crab in the Kodiak Management area, except the Semidi Island Section, the North Mainland Section, and the South Mainland Section, supported customary and traditional uses of king crab. No finding was made for the three previously named sections.

Criterion 1. A long-term consistent pattern of use and reliance on the fish stock or game population that has been established over a reasonable periods of time, excluding interruption by circumstances beyond the user's control, such as unavailability of the fish or game caused by migratory patterns.

Marine invertebrates have long played an important role in the wild resource harvests of communities of the Kodiak Area. Regarding prehistoric and early historic uses, Clark (1984:190) noted that:

> Shellfish (sea urchins, periwinkles, clams, blue mussels, chitons, etc) were consumed in large quantities, judging from shell midden deposits at late prehistoric and early historic settlement sites. Shellfish exploitation often is interpreted as primarily an activity of the late winter season of scarcity, but circumstantial evidence of clam shells at inland summer salmon fishing sites suggests that there also was an epicurean interest in shellfish.

The importance of all types of shellfish, including crab, in subsistence harvests of Kodiak Island residents in early contact times, was noted by Gavriil Davydov, an officer in the Russian navy, who wrote in 1810/12 (Davydov 1977:174; describing the period 1802/07):

> There is almost nothing which the [Kodiak] islands do not eat. There is hardly a shellfish or crab or shiny sea worm, and virtually no growing plant, which the would not use in their food.

Davydov {1977: 175) further noted that the Kodiak islanders "eat whatever food the sea provides them with," and that they ate shellfish "raw or warmed a little over a fire." He also wrote that, "The islanders are at all times, even times of plenty, great lovers of shellfish."

In 1990, the population of the Kodiak Island Borough was 13,309; of this, 92 percent lived along the road system and most of the remainder in six predominantly Alaska Native villages (Table 1). Subsistence uses of various marine invertebrates remain important in all these communities. As shown in Table 2 and Figure 1, the vast majority of households interviewed during Division of Subsistence surveys reported using marine invertebrates. Harvest quantities vary by community and by year; they generally have ranged between 10 and 50 pounds useable weight per person annually (Table 2, Figure 2).

Table 3 provides a list of marine invertebrates used in five study communities in the Kodiak Island Borough in 1991. Resources used by the most households included clams (mostly butter clams and littleneck clams), dungeness, king, and tanner crab, chitons ("bidarkies"), octopus, and sea urchins. As shown in Table 4, in 1991 clams made up the largest percentage of the total marine invertebrate harvest in four of the

five study communities. The exception was the Kodiak road system area, where crab ranked first and clams were second.

Table 5 provides information from Division of Subsistence household surveys regarding uses of crab. Except for Karluk, the majority of households in all communities reported using crab during the study years. All three kinds (dungeness, king, and tanner) are used in each community. King crab generally rank first in the number of pounds harvested, followed by tanner, and then dungeness (Tables 6, 7, and 8; see also Tables 3 and 4 for recent data for 1991).

Harvest data from shellfish permits issued by the Department of Fish and Game are available from the Division of Commercial Fisheries. While it is likely that since the permit requirement was adopted in the mid 1980s, most residents of the Kodiak road system who fish for crab have obtained and returned permits, permit returns from other communities and returns for shellfish other than crab are generally low.

Criterion 2. A use pattern recurring in specific seasons of each year.

Harvests of marine invertebrates occur year-round (Schroeder et al. 1987:474-479). In the past, king crab harvests likely occurred in the spring when they were available near shore. Current subsistence regulations provide a June 1 - January 31 season for king crab.

Criterion 3. A use pattern consisting of methods and means of harvest which are characterized by efficiency and economy of effort and cost.

Marine invertebrates are obtained for home use either by removal from commercial catches or by subsistence methods. Table 9 summarizes data regarding the percentage of the total marine invertebrate harvest by each general category (commercial removal or subsistence methods). The vast majority of this harvest (at least 80 percent and usually 90 percent or more) takes place using subsistence methods.

Table 10 summarizes data regarding the harvest of crab for home use either through removal from commercial catches or subsistence methods. Compared to marine invertebrates overall, a larger percentage of the crab harvest is removed from commercial catches. In most years in most communities, however, 50 percent or more of the crab are harvested under subsistence regulations.

A variety of methods is used to harvest marine invertebrates. Clams and cockles are harvested with shovels or rakes. Pots are set for crab. Some people use dip nets for crab at low tides. Ring nets and baited hooks on lines (rare today but perhaps more common in the past) are sometimes used for crab as well. In the past, spears were used for crab. Mussels, chitons, snails, and sea urchins are picked by hand or pried off rocks with knives. Octopus are extracted from dens with the use of laundry bleach and rubber hoses.

Criterion 4. The area in which the noncommercial long-term and consistent pattern of taking, use, and reliance upon the fish stock or game population has been established.

Most of the Kodiak Management Area is used by residents of the Kodiak Island Borough for harvesting marine invertebrates. Effort is probably concentrated near each community (Wright et al. 1985: Map --) . Kodiak road system area residents mostly use the areas accessible along the road system for marine invertebrate harvests (Schroeder et al. 1987:472).

Several beaches along the Alaska Peninsula within the Kodiak Shellfish Management Area are used for subsistence harvesting of clams, and probably other marine invertebrates as well. These include Kashvik Bay, Alinchak Bay, and Wide Bay (Wright et al. 1985:Map 7). Residents of several communities of the

Bristol Bay side of the Alaska Peninsula, including the Bristol Bay Borough, Egegik, and Pilot Point, use planes to access these areas for clam harvests. These areas may also be used for subsistence clam harvesting while people are in these areas engaged in commercial fishing. There are no permanent communities along this stretch of the Alaska Peninsula coast.

Criterion 5. The means of handling, preparing, preserving, and storing fish or game which has been traditionally used by past generations, but not excluding recent technological advances where appropriate.

It is likely that most harvests of marine invertebrates are eaten fresh. Crab may be frozen for later use.

Criterion 6. A use pattern which includes the handing down of knowledge of fishing or hunting skills, values, and lore from generation to generation.

Subsistence activities in Kodiak Island communit ies, including collecting marine invertebrates, are often family activities. It is common for extended family groups to cooperate in these harvest activities. Many Alaska Native families avoid eating clams in the "non-r" months for fear of PSP.

Criterion 7. 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.

As shown in Table 2, giving and receiving marine invertebrates is very common throughout the Kodiak Island Borough, and take place within the wider sphere of noncommercial exchange of wild foods. Exchanges take place between households within the same community as well as between communities . It should be noted, for example, the Karluk generally has a low harvest of marine invertebrates but a high percentage of households that use marine invertebrates. This is due to reciprocity with Larsen Bay, which receives much of its salmon from Karluk. These two communities are interrelated and interdependent.

Criterion 8. A pattern that includes taking, use, and reliance for subsistence purposes upon a wide variety of the fish and game resources and that provides substantial economic, cultural, social, and nutritional elements of the subsistence way of life.

As shown in Table 11, harvests of wild resources for home use are relatively large and diverse in all Kodiak Management Area communities. Harvests as measured in useable pounds were 147 pounds per person in the Kodiak City area in 1982/83 and about 140 pounds per person in 1991. Subsistence harvests in the six smaller communities have generally ranged from about 300 to 400 pounds per person per year (except in 1989, the year of the *Exxon Valdez* oil spill, when subsistence harvests dropped substant ially in most communities). Harvests of marine invertebrates generally make up between about -- to -- percent of each community's take of wild resources for home use. Noncommercial harvests are also diverse, with the average household in Kodiak Island Borough communities using between 10 and 20 kinds of wild foods per year (Table 11). In addition to marine invertebrates, other kinds of resources used for subsistence purposes include salmon, other finfish, deer, birds, and wild plants. Marine mammals remain important in some of the smaller communities

References cited:

Clark, Donald W.
1984 Pacific Eskimo: Historical Ethnography. *In* Handbook of North American Indians, Volume 5: Arctic. David Damas, editor, pp. 185-197. Washington: Smithsonian Institution.

Davydov, Gavriil Ivanovich
1977 [1810-12] Two Voyages to Russian America. 1802 - 1807. Translated by Colin Bearne. Materials tor the Study of Alaska History, No. 10. Kingston, Ontario: The Limestone Press.

Schroeder, Robert, David B. Andersen, Rob Bosworth, Judith Morris, and John Wright
1987 Subsistence in Alaska: Arctic, Interior, Southcentral, Southwest, and Western Regional Summaries. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 150. Juneau.

Scott, Cheryl, Amy Paige, Louis Brown, and Gretchen Jennings
1992 Community Profile Database Catalog. Alaska Department of Fish and Game, Division of Subsistence. Juneau.

Wright, John, Judith Morris, and Robert Schroeder
1985 Bristol Bay Regional Subsistence Profile. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 114. Juneau.

TABLE 1. POPULATION OF THE KODIAK ISLAND BOROUGH, 1990

Community	Population	Number of Households
Akhiok	77	19
Chiniak	69	23
Karluk	71	18
Kodiak	6,365	2,051
Kodiak Station	2,025	414
Larsen Bay	147	44
Old Harbor	284	87
Ouzinkie	209	68
Port Lions	222	73
Women's Bay	620	220
Balance	3,220	1,485
Total	13,309	4,083

Source: Alaska Department of Labor 1991

Table 2

HARVEST SUMMARY FROM DIVISION OF SUBSISTENCE HOUSEHOLD SURVEYS
RESOURCE: MARINE INVERTEBRATES

GMU	Community	Year	Percentage of Households					Estimated Number Harvested	Estimated Pounds Harvested	Pounds Harvested	
			Used	Attempt	Harvested	Received	Gaveaway			Household	Percapita
08											
	Akhiok	82	100.		100.			4536	4536	168.0	44.1
	Akhiok	86	75.	58.3	58.3	25.	41.7	1219	1219	35.8	10.0
	Akhiok	89	100.	100.	100.	100.	100.	2488	2488	191.4	44.5
	Chiniak	82	100.		100.			15075	15076	96.6	24.5
	Karluk	82	90.		70.			1321	1321	50.8	12.8
	Karluk	86	84.2	63.2	63.2	47.4	10.5	1351	1351	50.0	12.5
	Karluk	89	85.7	78.6	78.6	50.	71.4	379	379	22.2	5.1
	Karluk	90	82.4	82.4	82.4	52.9	58.8	1063	1063	55.9	12.6
	Kodiak City	82	95.5		69.			135583	135577	54.5	16.2
	Larsen Bay	82	87.5		81.3			6384	6384	148.4	35.7
	Larsen Bay	86	89.2	64.9	59.5	70.3	48.6	4096	4097	78.7	24.0
	Larsen Bay	89	97.1	79.4	79.4	76.5	52.9	4527	4527	116.0	34.3
	Larsen Bay	90	100.	80.	80.	88.6	71.4	7965	7965	199.1	54.4
	Old Harbor	82	98.7		98.7			10541	10541	112.1	29.5
	Old Harbor	86	88.6	84.1	84.1	61.4	47.7	8830	8830	74.2	23.3
	Old Harbor	89	95.8	83.3	83.3	79.2	64.6	7457	7457	80.1	26.7
	Ouzinkie	82	100.		93.8			11834	11834	169.0	50.5
	Ouzinkie	86	76.5	61.8	61.8	52.9	26.5	5505	5505	88.7	28.2
	Ouzinkie	89	62.9	48.6	48.6	45.7	40.	1693	1693	24.5	7.7
	Ouzinkie	90	94.3	75.5	75.5	62.3	43.4	2823	2823	47.8	13.9
	Port Lions	82	100.		92.7			10358	10358	116.3	35.7
	Port Lions	86	96.9	84.6	81.5	72.3	53.8	9599	9599	106.6	32.4
	Port Lions	89	91.7	83.3	83.3	75.	41.7	3161	3161	47.1	16.1

TABLE 3. PERCENTAGE OF SAMPLED HOUSEHOLDS USING MARINE INVERTEBRATES, KODIAK ISLAND BOROUGH COMMUNITIES, 1991/92

		Percentage of Sampled Households Using Resource:			
Resource	Karluk	Kodiak	Larsen Bay	Old Harbor	Ouzinkie
Clams	69.2	35.3	89.5	88.1	93.8
Butter Clams	69.2	28.4	84.2	85.7	90.6
Razor Clams	0.0	7.9	5.3	28.6	0.0
Littleneck Clams	38.5	5.9	52.6	23.8	18.8
Pinkneck Clams	0.0	0.5	2.6	0.0	0.0
Unknown Clams	0.0	5.1	5.3	0.0	3.1
Crabs	15.4	76.4	84.2	83.3	65.6
Dungeness Crab	7.7	57.3	42.1	52.4	31.3
King Crab	0.0	56.0	28.9	40.5	25.0
Tanner Crab	7.7	51.3	68.4	76.2	53.1
Unknown Crab	0.0	0.5	2.6	0.0	0.0
Cockles	0.0	3.3	5.3	21.4	25.0
Geoducks	7.7	0.6	7.9	4.8	6.3
Scallops	7.7	9.2	0.0	7.1	0.0
Mussels	38.5	4.1	10.5	9.5	3.1
Chitons	61.5	6.6	55.3	57.1	71.9
Octopus	61.5	17.6	76.3	47.6	25.0
Sea Cucumber	0.0	0.0	7.9	7.1	0.0
Sea Urchin	23.1	6.6	50.0	61.9	25.0
Shrimp	0.0	7.6	0.0	4.8	3.1
Snails	0.0	1.3	2.6	4.8	0.0
Limpets	0.0	2.0	5.3	4.8	0.0
Squid	0.0	2.2	0.0	0.0	0.0
ANY MARINE INVERETEBRATE	84.6	80.9	97.4	97.6	96.9

Kodiak includes the road system area.

Source: Alaska Department of Fish and Game, Division of Subsistence Household Survey, 1992

TABLE 4. HARVESTS OF MARINE INVERTEBRATES, POUNDS USABLE WEIGHT PER PERSON, KODIAK ISLAND BOROUGH COMMUNITIES, 1991/92

	Pounds Usable Weight per Person:				
Resource	Karluk	Kodiak	Larsen Bay	Old Harbor	Ouzinkie
Clams	2.0	3.6	28.7	20.2	6.4
Butter Clams	1.6	2.8	22.4	18.0	5.6
Razor Clams	0.0	0.2	0.1	1.1	0.0
Littleneck Clams	0.4	0.4	5.3	1.1	0.4
Pinkneck Clams	0.0	0.0	0.1	0.0	0.0
Unknown Clams	0.0	0.1	0.9	0.0	0.5
Crabs	0.0	6.3	12.4	7.0	1.7
Dungeness Crab	0.0	1.3	0.6	1.5	0.1
King Crab	0.0	1.5	0.8	1.2	0.1
Tanner Crab	0.0	3.5	11.1	4.3	1.5
Unknown Crab	0.0	0.0	0.0	0.0	0.0
Cockles	0.0	0.1	0.1	1.4	1.2
Geoducks	0.2	<0.1	0.1	1.0	0.2
Scallops	0.0	0.1	0.0	0.0	0.0
Mussels	0.5	0.1	0.1	0.2	0.0
Chitons	1.5	0.1	2.8	3.1	2.5
Octopus	0.1	0.5	7.1	1.3	0.7
Sea Cucumber	0.0	0.0	0.1	0.4	0.0
Sea Urchin	0.1	<0.1	0.7	0.9	0.1
Shrimp	0.0	0.2	0.0	0.7	<0.1
Snails	0.0	<0.1	0.0	<0.1	0.0
Limpets	0.0	<0.1	<0.1	0.1	0.0
Squid	0.0	0.9	0.0	0.0	0.0
ALL MARINE INVERETEBRATES	4.3	11.8	52.2	36.1	12.7

Kodiak includes the road system area. SuNeys were not conducted in Akhiok or Port Lions.

Source: Alaska Department of Fish and Game, Division of Subsistence Household SuNey, 1992

Table 5

HARVEST SUMMARY FROM DIVISION OF SUBSISTENCE HOUSEHOLD SURVEYS
RESOURCE: Crabs

GMU	Community	Year	Percentage of Households					Estimated Number Harvested	Estimated Pounds Harvested	Pounds Harvested	
			Used	Attempt	Harvested	Received	Gaveaway			Household	Percapita
08											
	Akhiok	82	95.2		90.5			585	1274	47.1	12.3
	Akhiok	86	50.	25.	25.	25.	33.3	71	163	4.7	1.3
	Akhiok	89	90.	40.	30.	90.	40.	295	654	50.2	11.7
	Chiniak	82	94.1	70.6	76.5			4028	7706	49.4	12.5
	Karluk	82	85.		25.			120	169	6.5	1.6
	Karluk	86	10.5	5.3	5.3	10.5	0.	171	165	6.1	1.5
	Karluk	89	21.4	7.1	7.1	14.3	21.4	49	78	4.5	1.0
	Karluk	90	17.6	5.9	5.9	17.6	17.6	34	24	1.2	0.2
	Kodiak City	82	91.6	37.4	34.2			36923	64559	25.9	7.7
	Larsen Bay	82	78.1		31.3			701	1037	24.1	5.8
	Larsen Bay	86	62.2	29.7	24.3	51.4	10.8	869	1093	21.0	6.4
	Larsen Bay	89	61.8	20.6	20.6	50.	23.5	689	1057	27.1	8.0
	Larsen Bay	90	88.6	31.4	31.4	77.1	25.7	870	1376	34.4	9.4
	Old Harbor	82	77.6		64.5			1615	2781	29.5	7.8
	Old Harbor	86	45.5	22.7	22.7	34.1	15.9	1301	1779	14.9	4.7
	Old Harbor	89	66.7	35.4	35.4	58.3	25.	907	1176	12.6	4.2
	Ouzinkie	82	93.8		53.1			2542	4896	69.9	20.9
	Ouzinkie	86	61.8	38.2	38.2	44.1	14.7	1089	1494	24.0	7.6
	Ouzinkie	89	34.3	8.6	8.6	31.4	14.3	515	580	8.4	2.6
	Ouzinkie	90	52.8	17.	17.	41.5	15.1	480	705	11.9	3.4
	Port Lions	82	100.		63.6			3299	5645	63.4	19.4
	Port Lions	86	92.3	50.8	44.6	67.7	33.8	2178	3899	43.3	13.1
	Port Lions	89	77.8	33.3	33.3	66.7	16.7	861	1249	18.6	6.3

Table 6

HARVEST SUMMARY FROM DIVISION OF SUBSISTENCE HOUSEHOLD SURVEYS
RESOURCE: King Crab

GMU	Community	Year	Percentage of Households					Estimated Number Harvested	Estimated Pounds Harvested	Pounds Harvested	
			Used	Attempt	Harvested	Received	Gaveaway			Household	Percapita
08											
	Akhiok	82	95.2		90.5			499	1148	42.5	11.1
	Akhiok	86	50.	25.	25.	25.	33.3	71	163	4.7	1.3
	Akhiok	89	90.	40.	30.	80.	40.	280	643	49.4	11.5
	Chiniak	82	94.1		70.6			2698	6206	39.7	10.0
	Karluk	82	80.		20.			35	81	3.1	0.7
	Karluk	86	5.3	5.3	5.3	5.3	0.	28	65	2.4	0.6
	Karluk	89	7.1	0.	0.	7.1	0.	0	0	0.0	0.0
	Karluk	90	5.9	0.	0.	5.9	5.9	0	0	0.0	0.0
	Kodiak City	82	87.1		31.6			17997	41383	16.6	4.9
	Larsen Bay	82	78.1		28.1			259	596	13.8	3.3
	Larsen Bay	86	27.	16.2	13.5	21.6	0.	41	94	1.8	0.5
	Larsen Bay	89	35.3	11.8	11.8	23.5	11.8	61	140	3.5	1.0
	Larsen Bay	90	51.4	17.1	17.1	40.	11.4	136	313	7.8	2.1
	Old Harbor	82	73.7		61.8			870	2000	21.2	5.6
	Old Harbor	86	20.5	6.8	6.8	11.4	6.8	124	286	2.4	0.7
	Old Harbor	89	45.8	14.6	14.6	41.7	10.4	84	193	2.0	0.6
	Ouzinkie	82	90.6		50.			1820	4186	59.8	17.8
	Ouzinkie	86	35.3	29.4	26.5	26.5	14.7	315	725	11.7	3.7
	Ouzinkie	89	22.9	5.7	5.7	20.	0.	65	150	2.1	0.6
	Ouzinkie	90	17.	3.8	3.8	15.1	3.8	67	153	2.6	0.7
	Port Lions	82	98.2		56.4			1774	4079	45.8	14.0
	Port Lions	86	89.2	44.6	40.	64.6	26.2	1228	2825	31.3	9.5
	Port Lions	89	72.2	22.2	22.2	61.1	13.9	199	458	6.8	2.3

Table 7

HARVEST SUMMARY FROM DIVISION OF SUBSISTENCE HOUSEHOLD SURVEYS
RESOURCE: Dungeness Crab

GMU	Community	Year	Percentage of Households					Estimated Number Harvested	Estimated Pounds Harvested	Pounds Harvested	
			Used	Attempt	Harvested	Received	Gaveaway			Household	Percapita
08											
	Akhiok	82	14.3		9.5			13	9	0.3	0.0
	Akhiok	86	0.	0.	0.	0.	0.	0	0	0.0	0.0
	Akhiok	89	20.	10.	10.	10.	10.	16	11	0.8	0.2
	Chiniak	82	52.9		29.4			697	488	3.1	0.7
	Karluk	82	35.		5.			52	36	1.4	0.3
	Karluk	86	0.	5.3	5.3	0.	0.	142	99	3.6	0.9
	Karluk	89	14.3	0.	0.	14.3	14.3	0	0	0.0	0.0
	Karluk	90	17.6	5.9	5.9	17.6	17.6	34	24	1.2	0.2
	Kodiak City	82	61.3		16.8			7901	5539	2.2	0.6
	Larsen Bay	82	53.1		25.			297	208	4.8	1.1
	Larsen Bay	86	40.5	16.2	13.5	32.4	8.1	361	253	4.8	1.4
	Larsen Bay	89	41.2	14.7	14.7	29.4	11.8	99	69	1.7	0.5
	Larsen Bay	90	57.1	17.1	17.1	51.4	8.6	123	86	2.1	0.5
	Old Harbor	82	40.8		32.9			459	321	3.4	0.9
	Old Harbor	86	18.2	9.1	9.1	9.1	6.8	433	303	2.5	0.8
	Old Harbor	89	41.7	20.8	20.8	31.3	12.5	372	260	2.8	0.9
	Ouzinkie	82	65.6		34.4			494	346	4.9	1.4
	Ouzinkie	86	47.1	35.3	35.3	29.4	11.8	522	365	5.8	1.8
	Ouzinkie	89	20.	8.6	8.6	14.3	11.4	321	225	3.2	1.0
	Ouzinkie	90	34.	9.4	9.4	26.4	5.7	121	85	1.4	0.4
	Port Lions	82	54.5		38.2			973	681	7.6	2.3
	Port Lions	86	30.8	23.1	18.5	16.9	12.3	496	347	3.8	1.1
	Port Lions	89	27.8	8.3	8.3	19.4	2.8	298	208	3.1	1.0

Table 8

HARVEST SUMMARY FROM DIVISION OF SUBSISTENCE HOUSEHOLD SURVEYS
RESOURCE: Tanner Crab

GMU	Community	Year	Percentage of Households					Estimated Number Harvested	Estimated Pounds Harvested	Pounds Harvested	
			Used	Attempt	Harvested	Received	Gaveaway			Household	Percapita
08											
	Akhiok	82	23.8		23.8			73	117	4.3	1.1
	Akhiok	86	0.	0.	0.	0.	0.	0	0	0.0	0.0
	Akhiok	89	20.	0.	0.	20.	0.	0	0	0.0	0.0
	Chiniak	82	41.2		35.3			633	1012	6.4	1.6
	Karluk	82	30.		10.			33	52	2.0	0.5
	Karluk	86	5.3	0.	0.	5.3	0.	0	0	0.0	0.0
	Karluk	89	14.3	7.1	7.1	7.1	14.3	49	78	4.5	1.0
	Karluk	90	0.	0.	0.	0.	0.	0	0	0.0	0.0
	Kodiak City	82	51.		15.5			11026	17636	7.1	2.1
	Larsen Bay	82	46.9		15.6			145	232	5.4	1.3
	Larsen Bay	86	51.4	24.3	18.9	40.5	8.1	467	747	14.3	4.3
	Larsen Bay	89	52.9	20.6	20.6	38.2	20.6	530	848	21.7	6.4
	Larsen Bay	90	77.1	20.	20.	65.7	20.	611	977	24.4	6.6
	Old Harbor	82	32.9		22.4			287	459	4.8	1.2
	Old Harbor	86	34.1	13.6	13.6	29.5	4.5	744	1190	10.0	3.1
	Old Harbor	89	52.1	27.1	27.1	33.3	14.6	451	723	7.7	2.5
	Ouzinkie	82	68.8		31.3			228	364	5.2	1.5
	Ouzinkie	86	38.2	26.5	20.6	32.4	11.8	252	402	6.4	2.0
	Ouzinkie	89	17.1	5.7	5.7	14.3	14.3	128	205	2.9	0.9
	Ouzinkie	90	39.6	13.2	13.2	28.3	15.1	292	467	7.9	2.3
	Port Lions	82	54.5		32.7			553	886	9.9	3.0
	Port Lions	86	40.	36.9	24.6	24.6	12.3	454	726	8.0	2.4
	Port Lions	89	38.9	19.4	19.4	22.2	5.6	364	582	8.6	2.9

TABLE 9. PERCENTAGE OF HARVEST OF MARINE INVERTEBRATES HARVESTED FOR HOME USE TAKEN FROM COMMERCIAL CATCHES AND HARVESTED WITH SUBSISTENCE METHODS, KODIAK ISLAND BOROUGH COMMUNITIES

	Percentage of Total Harvest (Pounds) Obtained by:	
Community	Commercial Removal	Subsistence Methods
Study Year 1989		
Akhiok	0.0	100.0
Karluk	10.3	89.7
Larsen Bay	7.9	92.1
Old Harbor	4.7	95.3
Ouzinkie	6.5	93.5
Port Lions	7.6	92.4
Study Year 1990		
Karluk	19.5	80.5
Larsen Bay	11.7	88.3
Ouzinkie	6.4	93.6
Study Year 1991		
Karluk	0.0	100.0
Kodiak	17.7	82.3
Larsen Bay	1.3	98.7
Old Harbor	9 9	90.1
Ouzinkie	8.8	91.2

Source: Scott et al. 1992

TABLE 10. PERCENTAGE OF HARVEST OF CRAB HARVESTED FOR HOME USE TAKEN FROM COMMERCIAL CATCHES AND HARVESTED WITH SUBSISTENCE METHODS, KODIAK ISLAND BOROUGH COMMUNITIES

	Percentage of Total Harvest (Pounds) Obtained by:	
Community	Commercial Removal	Subsistence Methods
Study Year 1989		
Akhiok	0.0	100.0
Karluk	49.0	51.0
Larsen Bay	28.9	71.1
Old Harbor	29.3	70.7
Ouzinkie	19.0	81.0
Port Lions	14.3	85.7
Study Year 1990		
Karluk	100.0	0.0
Larsen Bay	65.B	34.2
Ouzinkie	21.7	78.3
Study Year 1991		
Karluk	No harvest	
Kodiak	13.6	86.4
Larsen Bay	4.2	95.8
Old Harbor	39 5	60.5
Ouzinkie	29.8	70.2

TABLE 11. PER CAPITA HARVESTS OF WILD RESOURCES AND AVERAGE NUMBER OF RESOURCES USED, COMMUNITIES OF THE KODIAK ISLAND BOROUGH

Community	Year	Total Pounds Per Person	Average Number Of Resources Per Household
Akhiok	1982/83	519.5	15.5
Akhiok	1986	162.4	NA
Akhiok	1989*	297.7	20.0
Chiniak	1982/83	217.2	13.9
Karluk	1982/83	863.2	19.1
Karluk	1986	385.2	13.7**
Karluk	1989*	250.5	13.2
Karluk	1991/90	396.2	15.9
Karluk	1991/92	262.2	15.5
Kodiak	1982/83	147.2	11.9
Kodiak	1991	139.8	12.1
Larsen Bay	1982/83	403.5	16.3
Larsen Bay	1986	209.0	13.8**
Larsen Bay	1989*	209.9	14.3
Larsen Bay	1990/91	341.8	19.3
Larsen Bay	1991/92	294.6	17.5
Old Harbor	1982/83	491.1	15.4
Old Harbor	1986	423.2	13.7**
Old Harbor	1989*	271.7	15.5
Old Harbor	1991/92	388.1	20.1
Ouzinkie	1983	369.1	17.7
Ouzinkie	1986	402.8	17.0**
Ouzinkie	1989*	88.8	9.4
Ouzinkie	1990/91	205.3	17.4
Ouzinkie	1991/92	209.3	18.8
Port Lions	1982/83	279.8	13.5
Port Lions	1986	333.1	NA
Port Lions	1989*	146.4	11.5

* Year of the Exxon Valdez oil spill, which severely disrupted subsistence harvests of some households

** Fewer resource categories were used to collect the 1986 data; therefore, this average is not immediately comparable with the others.

Sources: Scott et al. 1992; Files, ADF&G, Division of Subsistence, Anchorage

Figure 1. Percent of Sampled Households Using Marine Invertebrates, Kodiak Island Borough Communities

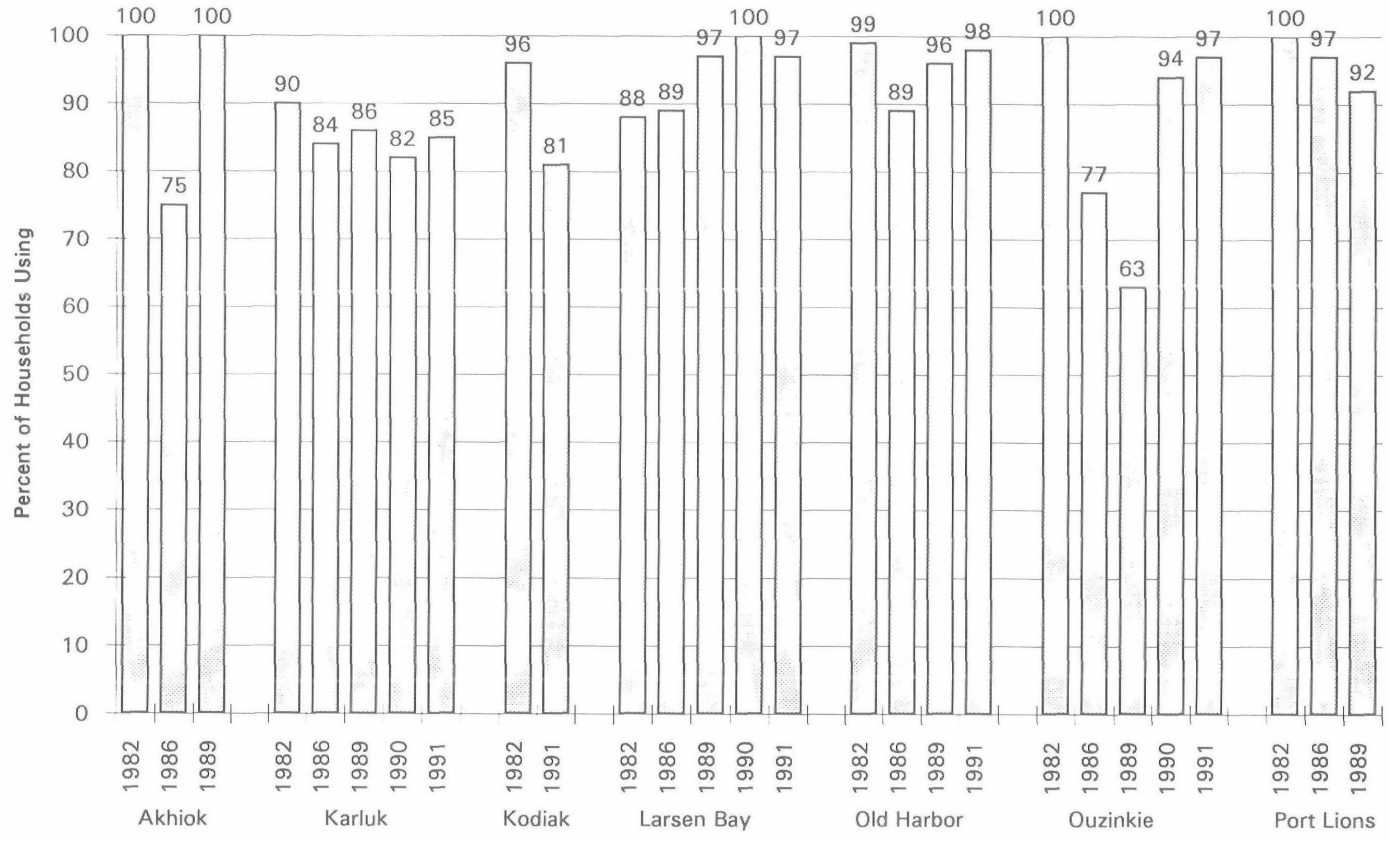


Figure 2. Harvests of Marine Invertebrates in Pounds per Person, Kodiak Island Borough Communities

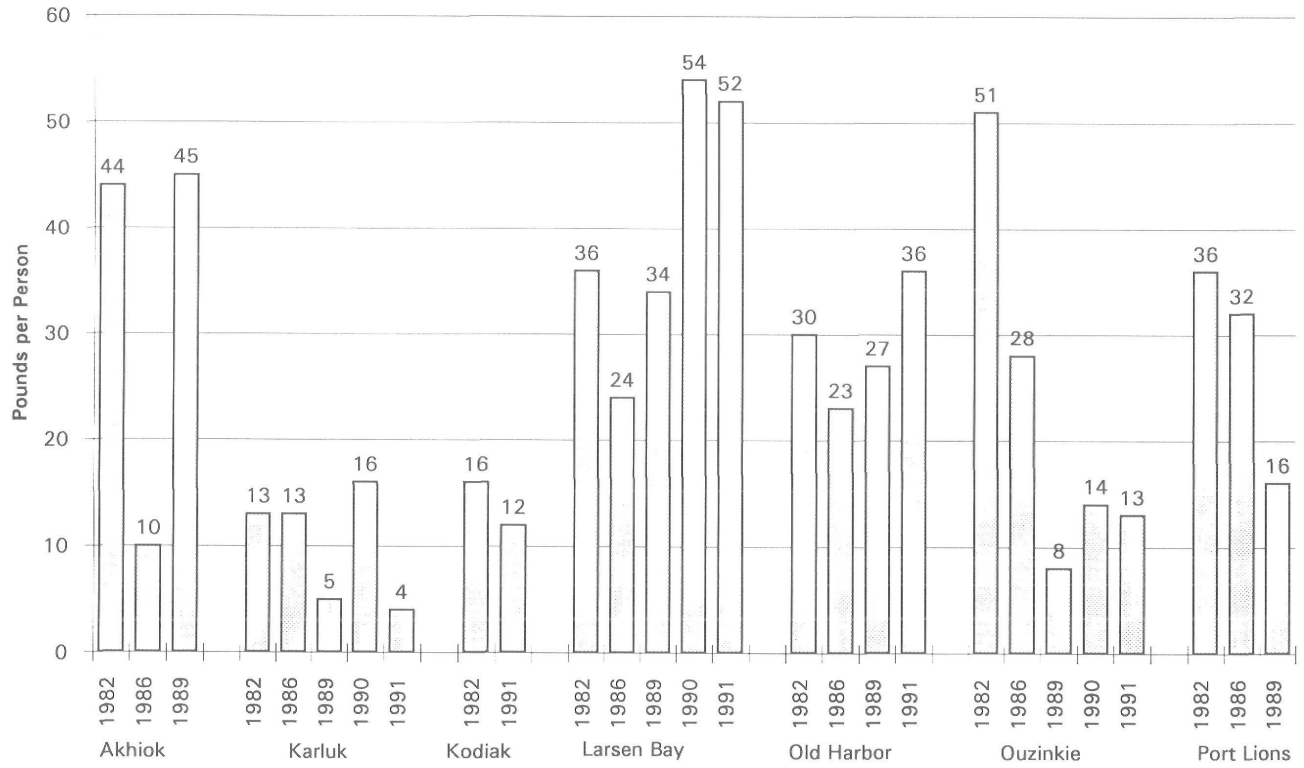


Figure 3. Percent of Sampled Households Using Crab, Kodiak Island Borough Communities

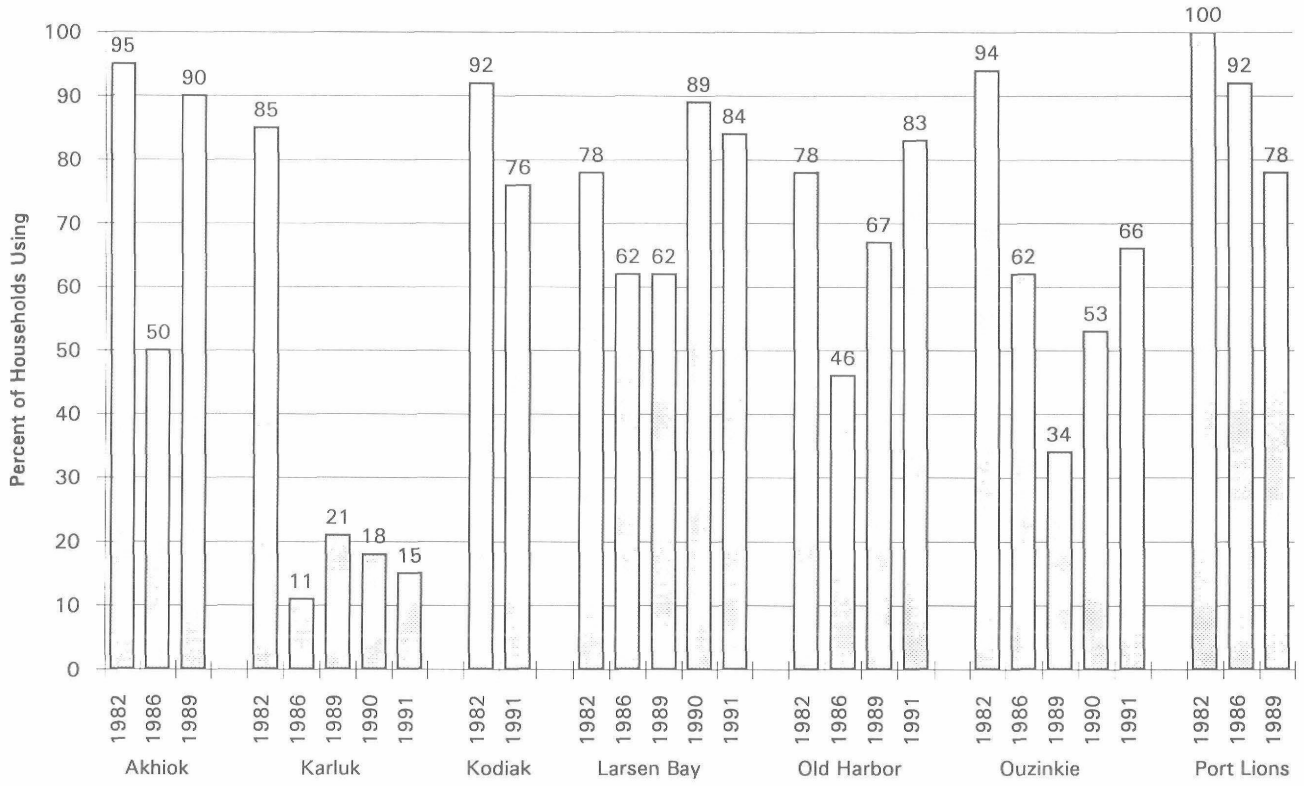
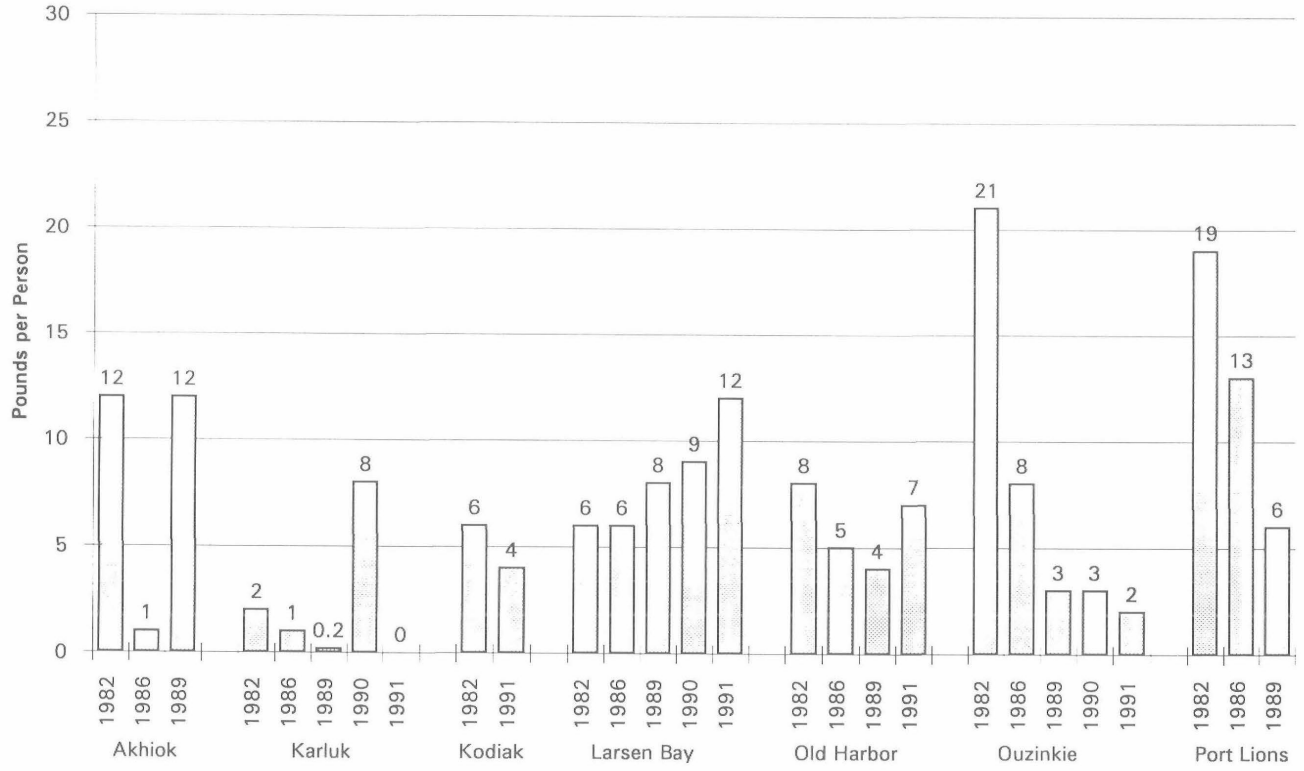


Figure 4. Harvests of Crab in Pounds per Person, Kodiak Island Borough Communities



APPENDIX D: KODIAK SALMON/HERRING/CRAB SUBSISTENCE PERMIT

KODIAK SALMON/HERRING/CRAB/ SUBSISTENCE PERMIT

PERMIT EXPIRES DECEMBER 31, _____

PERMIT #_____

NAME_____

ADDRESS_____

I hereby certify that I am an Alaskan resident, and any salmon, herring or crab, taken will be used for subsistence purposes only.

PERMITTEE SIGNATURE **DATE**

Additional members of same household to be included on permit (Residents Only).

Limit of 25 salmon per family member listed in area defined in regulation 5AAC01.530 (b)(1). Remainder of Kodiak Area not described in 5AAC01.530 (b)(1) of this subsection, there is n annual limit.

Total number of salmon allowed on this permit_____

SUBSISTENCE SALMON HARVEST REPORT

NUMBER OF SALMON BY SPECIES

DATE	SPECIFIC LOCATION	SOCKEYE	CHINOOK	COHO	PINK	CHUM

⇒ **ALL PERSONS MUST HAVE A VALID SUBSISTENCE PERMIT IN POSSESSION WHILE TAKING OR ATTEMPTING TO TAKE SUBSISTENCE SALMON, HERRING, OR CRAB.**

⇒ **COMPLETE THE SUBSISTENCE HARVEST REPORTS IMMEDIATELY UPON LANDING SALMON, HERRING, OR CRAB. UNSUCCESSFUL TRIPS SHOULD ALSO BE RECORDED.**

⇒ **LAWFUL SALMON GEAR: GILLNET (MAXIMUM LENGTH 50 FATHOMS) AND SEINE. COMMERCIAL PURSE SEINES MAY BE USED FOR SUBSISTENCE FISHING ONLY BEFORE JUNE 1 AND AFTER SEPTEMBER 15. SALMON SEINE VESSELS MAY NOT BE USED 24 HOURS BEFORE, DURING, OR 24 HOURS AFTER ANY COMMERCIAL FISHING PERIOD.**

REFER TO THE CURRENT SUBSISTENCE REGULATION BOOK FOR COMPLETE REGULATIONS

RETURN PERMIT TO: ADF&G, 351 RESEARCH COURT, KODIAK, AK 99615 BY JANUARY 31,_____

DEPARTMENT REPRESENTATIVE **DATE**

(SEE OPPOSITE SIDE FOR SUBSISTENCE CRAB AND HERRING REPORT)

SUBSISTENCE CRAB HARVEST REPORT

RECORD DATE AND SPECIFIC LOCATION ON THE SAME DAY OF CAPTURE

		NUMBER OF CRAB BY SPECIES	
DATE	**SPECIFIC LOCATION**	**TANNER**	**DUNGENESS**

ANNUAL KING CRAB HOUSEHOLD LIMIT = 3

CRAB NO:	DATE	SPECIFIC LOCATION
1		
2		
3		

NO MORE THAN ONE KING CRAB POT MAY BE USED PER PERSON OR PER VESSEL TO TAKE KING CRAB; SEE 5 AAC 02.420 FOR KING CRAB POT DEFINITION.

Each household member must be present while fishing for crabs in order to retain the possession limit of that specie of crab. Be sure each household member's name is listed on the permit.

INDIVIDUAL POSSESSION LIMITS	**SEASON**
12 male Tanner crab 5-1/2 inches carapace width	**OPEN ALL YEAR**
12 male Dungeness crab 6-1/2 inches carapace width	**OPEN ALL YEAR**
3 male King crab 7 inches carapace width (**Per household per year**.)	**OPEN JUNE 1 - JANUARY 31**

SUBSISTENCE HERRING HARVEST REPORT

DATE	POUNDS	SPECIFIC LOCATION

HARVEST LIMIT	**SEASON**
500 POUNDS	**JAN. 1 – DEC. 31**

Taking of herring for the purpose of commercial bait is not allowed with this permit.
Lawful Herring Gear: Gillnet, maximum length 25 fathoms.
This permit is not valid for any individual participating in the Kodiak Sac Roe Herring fishery from April 15 – June 30.

PLEASE REFER TO SUBSISTENCE REGULATIONS FOR HARVEST METHODS, SPECIAL REGULATIONS AND STATEWIDE GENERAL RESTRICTIONS.

(SEE OPPOSITE SIDE FOR SUBSISTENCE SALMON REPORT)