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Customary and Traditional Use Worksheet: Black Bears Unit 15C (portion)

Prepared by

Alaska Department of Fish and Game, Division of Subsistence

for the Southcentral Alaska Board of Game meeting, March 2019

March 2019

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

Symbols and Abbreviations

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Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

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CUSTOMARY AND TRADITIONAL USE WORKSHEET: BLACK BEARS UNIT 15C (PORTION)

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INTRODUCTION

Proposal 85 would reduce the bag limit for black bears in Game Management Unit (GMU) 15. A portion of GMU 15C is outside the Anchorage-Matsu-Kenai Nonsubsistence Area [described at 5 AAC 99.015(3); Figure 1]. Alaska statute 16.05.258(a) *Subsistence use and allocation of fish and game* requires that the Alaska Board of Game (board) identify game populations or portions of populations outside nonsubsistence areas that are customarily and traditionally taken or used for subsistence. The board applies the Joint Board's criteria at 5 AAC 99.010 *Boards of fisheries and game subsistence procedures* (generally known as "the eight criteria") when making customary and traditional use ("C&T") determinations. The board has not made a C&T determination for the black bear population in GMU 15C that is outside the nonsubsistence area. This worksheet has been prepared to assist the board in making such a determination. The information in the worksheet can be supplemented by other information provided for the board meeting.

The Division of Subsistence first prepared a customary and traditional use worksheet for black bears in this portion of GMU 15C for the March 1988 meeting of the board. The worksheet was updated in 1990, 1991, 1993 [as Worksheet II (31) in the set of worksheets prepared for the February 1993 board meeting], and 1994. No review of or action on this information occurred at these meetings. The current worksheet is an update of the one prepared in 1994.

Under AS 16.05.258(b), the board is also required to determine the amount of the harvestable portion of game populations with customary and traditional uses that is reasonably necessary for subsistence uses (an "ANS" finding). Appendix A provides options for an ANS finding should the board make a positive C&T determination for this game population.

Presently, there are three year-round communities in the portion of GMU 15C outside the nonsubsistence area: Seldovia [estimated population of 401 in July 2018 for Seldovia city and Seldovia Village Census Designated Place (CDP)], Port Graham (estimated population 179), and Nanwalek (formerly English Bay; estimated population 291). Seldovia was founded in the late 19th century as an Alaska Native village centered around a trading post. It grew in the 20th century with the development of Cook Inlet commercial fisheries (Reed 1985:143–146). According to data collected by the American Community Survey for the period 2012–2016, about 26% of Seldovia's population is of Alaska Native heritage. In the early 1980s, Reed (1985:146–147) noted that Seldovia's population contained a core of long-term resident households; in 1982, about a third of the sampled household heads had lived in Seldovia for more than 20 years. In 2014, the last year for which such data are available, the average length of residency of Seldovia household heads was 25.5 years (Jones and Kostick 2016:107).

Port Graham and Nanwalek are predominately Alaska Native communities, with populations of 91% and 92% Alaska Native, respectively, according to data from the American Community Survey. Most Nanwalek and Port Graham families have lived in the Kachemak Bay area for many generations. The average length of residency of household heads in 2014 was 31.1 years for Nanwalek and 31.5 years for Port Graham (Jones and Kostick 2016).

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.

Prior to Euro-American contact and exploration, the indigenous Dena'ina Athabascan and Alutiiq peoples hunted black bears in the Kachemak Bay area for food and raw materials (Osgood 1937; Stanek 1985). In interviews conducted in 1983, Alutiiq elders from Port Graham and Nanwalek (English Bay) stated that black bears have been used and relied upon in their communities as an important food source for as long as anyone could remember. Black bears were especially an important source of meat during winters when food supplies might run low. The locations of bear dens were noted by hunters in the fall and spring, and returned to during winters to remove the animal when the bear was needed in winter (Stanek 1985:71,74,179).

Regarding uses of black bears in Nanwalek and Port Graham in the 1970s and 1980s, Stanek (1985:181) noted that:

> Bear meat and fat are highly valued by people in both communities, and are thought to be about equal to seal in food value. The meat was usually cooked in roasts and stews, and ribs were highly favored. Bear fat was considered the very best for baking and cooking after it had been rendered into lard.

Black bears, along with moose and mountain goats, are among the few large game animals available near the three communities of this portion of 15C, and of the three, black bears are probably the most common. In the early 1980s, there were about 14 hunters from Nanwalek and Port Graham who regularly hunted black bears, with many others participating more opportunistically. From the spring of 1981 to summer of 1982, the 2 communities took 6 bears in total; in fall 1983, Port Graham hunters harvested 2 black bears and Nanwalek hunters harvested 3. Also in the early 1980s, hunters from these communities reported increasing difficulty in harvesting black bears at Koyuktulik (Dogfish) Bay, a preferred location, due to increasing hunting pressure from nonlocal hunters (Stanek 1985:180).

Table 1 summarizes harvest and use information about black bears for Nanwalek, Port Graham, and Seldovia based upon Division of Subsistence systematic household surveys. (Note that household survey data are only available for a limited number of study years, based largely on funding availability). In Nanwalek, about 50% to 75% of the households used black bears in study years in the late 1980s and early 1990s (excluding 1989, the year of the *Exxon Valdez* oil spill, when subsistence uses were severely disrupted). About 10% to over a third of Nanwalek households hunted black bears. Estimated harvests ranged from 5 to 15 bears, with an average of about 8 bears per year. Virtually all of this harvest occurred in areas outside the nonsubsistence area. The harvest of 15 black bears in 1992/93 was viewed by Nanwalek residents as the largest in many years because of an abundance of bears and strong interest in hunting. In 1997 and 2003, the percentage of Nanwalek households using bears was generally in the same range as in the 1980s and early 1990s, but dropped to 18% in 2014. Nanwalek hunters harvested two black bears in that year. When interviewed for the 2014 study, Nanwalek residents attributed this lower harvest to competition with nonlocal hunters and declining bear populations. They reported that

nonlocal hunters often hunt on Alaska Native corporation lands and that the community has no means to prevent this trespass. They have also observed growing numbers of nonlocal residents hunting bears from boats along Cook Inlet and Kachemak Bay. As a result, Nanwalek residents asserted, local black bear populations have declined drastically. One respondent said, "Bears are in trouble. They have been overharvested. We got all them guides coming from across the bay that have been doing a lot of hunting" (Jones and Kostick 2016:296).

In Port Graham, a third or more of the households used black bears in three study years in the early 1990s (Table 1). About 10% to 20% of Port Graham households hunted bears. Harvests ranged from 1 to 7 animals in the 5 study years in the 1990s, with an annual average of 3 bears. As in Nanwalek, virtually all black bear hunting by Port Graham residents occurs outside the nonsubsistence area. Also as in Nanwalek, harvests and uses of black bears were lower in the 2014 study year than most previous study years, with 9.8% of households using black bears and a harvest of one bear. Many Port Graham residents who were surveyed for 2014 commented that they were noticing a decline in the local black bear populations. Some community members expressed concerns about the number of guided hunters arriving near the community to hunt for black bears and mountain goats (Jones and Kostick 2016:403).

In 3 study years in the early 1990s (1991, 1992, and 1993), between 11% and 20% of a sample of households in Seldovia reported using black bears. About 5% to 9% of Seldovia households hunted bears; about 10 animals were taken in 1991 and 1992, but none by any interviewed households in 1993 (Table 1). Some of this harvest probably took place within the nonsubsistence area and some outside of this area. In 2014, 21% of Seldovia households used black bears and about 7% hunted black bears. The estimated harvest was three bears. When interviewed for the 2014 study, several Seldovia residents reported that the local black bear population was in decline (Jones and Kostick 2016:196).

Between 1973/74 and 1992/93, a total of 243 black bears that had been killed in this portion of GMU 15C were brought to ADF&G for sealing. This is an annual average of 12.15 bears, with a range of 3 in 1979/80 to 36 in 1992/93. Of these, 129 bears were harvested by residents of GMU 15C (53.1%), 89 (36.6%) were taken by other Alaska residents, 23 (8.2%) were taken by non-Alaska residents, and 2 (0.8%) were killed by hunters with unknown addresses. A total of 33 black bears were sealed by hunters from Seldovia over this 20-year period. When interviewed in the 1980s, hunters from Port Graham and Nanwalek recalled sending some black bear skulls and hides to Homer for sealing in the past, although department records in Anchorage have no record of any black bears sealed by residents of either community during this 20-year time period[1].

There are several reasons why hunters from Nanwalek and Port Graham have generally not had black bear skulls and hides sealed in the past. Hides are rarely used in these communities and are often left in the field to facilitate transport of the edible parts of the bear back to the communities. In the 1970s, 1980s, and 1990s, sealing required that the skull and hide be retrieved and sent to the Homer ADF&G office, an expense of $60 or more (in the 1990s). A perception among hunters was that this sealing (and expense) was required only if they planned to remove the hide from the communities, and not for bears solely taken for food near the communities. Also, traditions that require that the skull be left at the kill site have discouraged some older hunters from retrieving the skull and shipping it to Homer.

1. Black Bear Sealing Records, data provided by Mike McDonald, ADF&G Division of Wildlife Conservation, 2/11/94, Anchorage. Hereinafter cited as ADF&G 1994.

For the 10-year period 2008–2017, a total of 580 black bears taken in the portion of GMU 15C outside the nonsubsistence area were sealed, an average of 58 bears/year (Table 2; Figure 2). Of the total, residents of the three local communities harvested 41 bears [4.1/year; 7% of total (Figure 3)]; other Alaska residents harvested 230 bears (23.0/year; 40% of total); and non-residents harvested 309 bears (30.9/year; 53% of total). Harvests of black bears in this portion of 15C declined sharply in 2012 and 2013 and increased slightly in 2016 and 2017 (Figure 2). Over this 10-year period, black bear harvests in the portion of GMU15C outside the nonsubsistence area accounted for 16% of the total harvest in the subunit. This percentage was higher (between 18% and 22%) from 2008–2012, after which harvests declined throughout the subunit but to a greater degree in the area outside the nonsubsistence area (Table 3).

CRITERION 2: SEASONALITY

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

Presently, there is no closed regulatory season for black bears in GMU 15C. In Nanwalek and Port Graham, black bears are taken when available and needed; however early spring (April and May) as bears emerge from dens, and mid- to late fall, are the preferred times to take bears. Bears that have fed on fish are less desired than those that have grown fat on berries.

Sealing records for the 10-year period 2008–2017 show that of the 580 black bears harvested in this portion of GMU 15C, 192 (33%) were taken in fall and 388 (67%) were taken in spring (Figure 4). In every year except 2010/11, the majority of the harvest occurred in spring.

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, bears were taken with spears and snares (Stanek 1985:71). Presently, bears are taken with firearms.

In Nanwalek and Port Graham, three methods are commonly used for hunting black bears: 1) coastal shorelines are searched by hunters passing in skiffs; 2) hunters travel on foot or ATVs to inland locations of known bear concentrations, and 3) while in the communities and involved in other activities, hunters opportunistically spot bears on hillsides, dumps, berry patches, and along streams. In the winter of 1990, an elder in Port Graham took four younger hunters on a traditional den hunt. The black bear was removed from the den and dispatched with a rifle. This bear was shared widely in the community.

Bear hunting is a specialized activity in these communities. In the 1980s, Division staff learned through ethnographic fieldwork that during spring in Nanwalek and Port Graham, two or three hunts for black bear involving three to six people were organized. These hunts lasted several days and included setting up base camps at places such as the English Bay lakes, Koyoktolik (Dogfish) Bay, Port Chatham, Windy Bay, and Port Dick. These hunting parties again formed in the fall. During these hunts, waterfowl, moose, goats, and marine mammals were taken if encountered (Stanek 1985:179–180). Preferred bears were large, fat, and healthy (e.g., with a good coat). Sows with cubs were not harvested.

An analysis of survey data for study years 1987 through 1992 found that 10 of 37 hunters in Nanwalek, Port Graham, and Seldovia who reported harvesting black bears during household interviews killed more than one bear during the study year. Six of the hunters who harvested more than one bear lived in Nanwalek. Of 53 black bears reported harvested during household surveys in these study years in these three communities, 16 (30.2%) were killed by hunters who had already taken one bear that year. In Nanwalek, about 41% of the black bear harvest was bears killed after the hunters had taken their first bear of the year.

Department black bear sealing records for a 20-year period from 1973/74 through 1992/93 contain 15 cases of hunters harvesting more than one bear in a given regulatory year from the southern portion of GMU 15C, including 13 cases of two sealed bears and two cases of three sealed bears. Three of these cases involved hunters from Seldovia (two taking two bears and one taking three within a regulatory year) (ADF&G 1994).

For the period 2008–2017, there were 23 cases in which a hunter harvested two black bears in this portion of GMU 15C within a regulatory year, ranging from 8 hunters in 2009 to no hunters in 2013 or 2014 (Figure 5). No hunters took three bears. This represents about 9% of the 248 successful hunters over this 10-year period.

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.

Figure 6 illustrates areas used for hunting black bears by residents of Nanwalek and Port Graham from approximately 1970 until the mid-1980s. Figure 7 is an updated map for 2014 for Nanwalek, Port Graham, and Seldovia. Presently, virtually all black bear hunting by these three communities takes place outside the nonsubsistence portion of GMU 15C.

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.

Traditionally, bear meat was smoked, dried, salted, and eaten fresh. Cold weather harvests may have been frozen out-of-doors. Hides were used as mattresses and blankets on beds.

By the 1980s, freezers had become the most common method of storing bear meat. Currently, because there is a high demand for the meat, and the distribution of each bear is among many households, most meat is eaten fresh. Bear fat is rendered into lard and used for baking. There is some use of the claws for crafts.

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.

Stories about bear hunting are part of the active oral traditions in Nanwalek and Port Graham (Stanek 1985:179). Historically, hunters believed that parts of the bear, such as the skull, should be left where the bear was killed, and placed facing the south (cf. Birket-Smith 1953:38). This would assure that more bears would return. Presently, if a more traditional hunter or elder is along on a hunt, this tradition may still be observed. Some active black bear hunters remove the sternum from the bear prior to their return to the community with the carcass. It is said that if this is done, the bear will not be able to harm the hunter. Another tradition states that hunters should not defecate in areas above the timberline inhabited by bears. It is said that a bear that found a hunter's excrement would hunt him and kill him while he slept (Stanek 1985:179). Yet another tradition is that a man whose wife is pregnant should not hunt bears. See also Criterion 3 regarding a traditional den hunt led by a Port Graham elder that took place in 1990.

Today, bear hunting parties from each community are usually made up of family members.

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.

Relatively few hunters from each community hunt bears, and the meat is widely shared. As shown in Table 1, in study years in the 1990s, about 50% to 70% of Nanwalek households received bear meat, as did about a third of Port Graham households and about 15% of sampled households in Seldovia. Because of the high demand for bear meat in Nanwalek and Port Graham, hunters cannot always provide for everyone who wishes to receive some meat. A pattern of distribution is followed in which hunters give bear products to their closest relatives first, with more distant relations receiving products last. Figure 8 provides an example of one average-sized distribution network in Nanwalek. Because in the past more black bears were taken annually by Nanwalek residents, bear products were more commonly passed from hunters in Nanwalek to relatives in Port Graham than vice versa.

Extensive sharing networks also exist in Seldovia. Reed (1985:155) noted that in Seldovia, "sharing local resources with neighbors and kin served to satisfy social obligations."

Updated survey data for 2014 show that in that year, 14% of Nanwalek households, 7% of Port Graham households, and 19% of Seldovia households received gifts of black bear meat.

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.

Table 4 summarizes some characteristics of wild resource uses in Seldovia, Nanwalek, and Port Graham based on comprehensive household surveys. Virtually every household in these communities uses wild foods and participates in harvest activities. Resource uses in these communities are diverse, consisting of a wide range of salmon, other fish, shellfish, marine mammals, birds, land mammals, and wild plants (Jones and Kostick 2016; Reed 1985; Stanek 1985). Resource harvests for home use are also relatively large: in 2014, total harvests averaged 138 lb per person in Seldovia, 218 lb per person in Port Graham, and 253 lb per person in Nanwalek.

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TABLES AND FIGURES

Table 1.–Harvests and uses of black bears in Nanwalek, Port Graham, and Seldovia, Alaska.

		Percentage of Households								
Community	Study year	Use	Hunt	Harvest	Receive	Give away	Estimated harvest (numbers)	Estimated usable pounds harvested	Average pounds harvested per household	Pounds harvested per capita
Nanwalek	1987	51.5%	15.2%	9.1%	45.5%	15.2%	6	352	8.8	2.3
Nanwalek	1989	33.3%	12.1%	9.1%	30.3%	12.1%	5	288	7.0	1.8
Nanwalek	1990	54.3%	8.6%	8.6%	54.3%	14.3%	5	272	6.6	1.5
Nanwalek	1991	75.9%	34.5%	13.8%	69.0%	24.1%	8	492	12.0	3.1
Nanwalek	1992	75.0%	25.0%	15.6%	71.9%	25.0%	15	892	21.8	5.2
Nanwalek	1993	81.8%	42.4%	18.2%	78.8%	33.3%	11	650	17.6	4.6
Nanwalek	1997	65.5%	17.2%	13.8%	62.1%	20.7%	10	608	16.0	3.6
Nanwalek	2003	63.6%	18.2%	18.2%	59.1%	13.6%	5	290	5.7	1.3
Nanwalek	2014	17.9%	5.4%	3.6%	14.3%	5.4%	2	120	2.1	0.5
Port Graham	1987	9.3%	7.4%	1.9%	9.3%	1.9%	1	67	1.1	0.4
Port Graham	1989	2.1%	4.2%	0.0%	2.1%	0.0%	0	0	0.0	0.0
Port Graham	1990	34.8%	10.9%	4.3%	30.4%	10.9%	2	139	2.5	0.9
Port Graham	1991	42.9%	20.4%	10.2%	36.7%	18.4%	7	412	7.1	2.6
Port Graham	1992	33.3%	12.5%	4.2%	33.3%	16.7%	2	140	2.4	0.8
Port Graham	1993	15.7%	2.0%	2.0%	15.7%	5.9%	1	69	1.1	0.4
Port Graham	1997	22.7%	6.8%	4.5%	18.2%	9.1%	3	166	2.6	1.1
Port Graham	2003	23.4%	6.4%	4.3%	21.3%	6.4%	6	321	4.9	2.1
Port Graham	2014	9.8%	2.4%	2.4%	7.3%	7.3%	1	82	1.4	0.6
Seldovia	1982			2.9%			5	320	1.9	0.5
Seldovia	1991	18.2%	9.1%	6.1%	13.6%	3.0%	9	408	3.5	1.2
Seldovia	1992	20.0%	7.7%	4.6%	15.4%	7.7%	11	611	4.5	1.6
Seldovia	1993	10.8%	4.6%	0.0%	10.8%	3.1%	0	0	0.0	0.0
Seldovia	2014	21.1%	7.4%	2.1%	18.9%	1.1%	3	155	1.2	0.6

Source Alaska Department of Fish and Game, Division of Subsistence Community Subsistence Information System http://www.adfg.alaska.gov/sb/CSIS/
Note Blank cells = data not available

Table 2.–Number of black bears sealed from harvests in the portion of GMU 15C outside the nonsubsistence area.

	Number of black bears sealed							
	Nanwalek	Port Graham	Seldovia	All local communities	Other Alaska communities	All Alaska residents	Nonresidents	Total harvest
2008	0	0	5	5	40	45	43	88
2009	0	0	6	6	53	59	48	107
2010	0	0	6	6	40	46	49	95
2011	0	0	2	2	37	39	64	103
2012	1	0	1	2	16	18	26	44
2013	0	0	5	5	1	6	9	15
2014	0	0	1	1	5	6	12	18
2015	3	0	0	3	6	9	13	22
2016	3	1	5	9	15	24	20	44
2017	0	0	2	2	17	19	25	44
Total	**7**	**1**	**33**	**41**	**230**	**271**	**309**	**580**
Annual average	0.7	0.1	3.3	4.1	23	27.1	30.9	58

Source: Alaska Department of Fish and Game, Division of Wildlife Conservation, WINFONET

Table 3.–Harvests of black bears in areas of GMU 15C.

	Number of black bears			Percent of total		Change from previous year		
	Outside nonsubsistence area	Remainder of 15C	total	Outside nonsubsistence area	Remainder of 15C	Outside nonsubsistence area	Remainder of 15C	Total
2008	88	403	491	17.9%	82.1%			
2009	107	380	487	22.0%	78.0%	21.6%	-5.7%	-0.8%
2010	95	430	525	18.1%	81.9%	-11.2%	13.2%	7.8%
2011	103	405	508	20.3%	79.7%	8.4%	-5.8%	-3.2%
2012	44	340	384	11.5%	88.5%	-57.3%	-16.0%	-24.4%
2013	15	201	216	6.9%	93.1%	-65.9%	-40.9%	-43.8%
2014	18	228	246	7.3%	92.7%	20.0%	13.4%	13.9%
2015	22	158	180	12.2%	87.8%	22.2%	-30.7%	-26.8%
2016	44	251	295	14.9%	85.1%	100.0%	58.9%	63.9%
2017	44	255	299	14.7%	85.3%	0.0%	1.6%	1.4%
Total	**580**	**3,051**	**3,631**	**16.0%**	**84.0%**			
10-year average	58	305	363					

Source: Alaska Department of Fish and Game, Division of Wildlife Conservation, WINFONET

Table 4.–Harvests and uses of wild resources, Nanwalek, Port Graham, and Seldovia.

		Percentage of Households							
Community	Study year	Use	Attempt to harvest	Harvest	Receive	Give	Estimated total pounds harvested	Mean pounds harvested per household	Per capita pounds harvested
Nanwalek	1987	97.0%	93.9%	93.9%	93.9%	93.9%	43,130	1,078.3	284.7
Nanwalek	1989	100.0%	100.0%	100.0%	100.0%	93.9%	22,059	538.0	140.9
Nanwalek	1990	100.0%	100.0%	100.0%	100.0%	97.1%	33,336	813.1	181.3
Nanwalek	1991	100.0%	100.0%	100.0%	100.0%	100.0%	41,716	1,017.5	258.8
Nanwalek	1992	100.0%	100.0%	100.0%	100.0%	93.8%	47,547	1,159.7	279.0
Nanwalek	1993	100.0%	100.0%	100.0%	100.0%	97.0%	43,068	1,164.0	304.9
Nanwalek	1997	100.0%	100.0%	100.0%	100.0%	89.7%	42,593	1,120.9	253.9
Nanwalek	2003	100.0%	100.0%	100.0%	100.0%	100.0%	91,155	1,787.3	393.2
Nanwalek	2014	89.3%	85.7%	83.9%	83.9%	71.4%	58,443	1,007.6	253.0
Port Graham	1987	100.0%	100.0%	100.0%	98.1%	81.5%	41,379	656.8	228.8
Port Graham	1989	95.8%	93.8%	93.8%	91.7%	64.6%	19,729	323.4	122.2
Port Graham	1990	100.0%	100.0%	100.0%	97.8%	89.1%	35,047	637.2	214.0
Port Graham	1991	100.0%	95.9%	95.9%	98.0%	87.8%	45,217	779.6	280.9
Port Graham	1992	100.0%	100.0%	100.0%	100.0%	97.9%	45,475	784.1	272.7
Port Graham	1993	100.0%	98.0%	98.0%	100.0%	90.2%	37,069	607.7	212.3
Port Graham	1997	100.0%	97.7%	97.7%	95.5%	86.4%	39,548	627.8	253.4
Port Graham	2003	97.9%	95.7%	95.7%	97.9%	93.6%	72,879	1,121.2	466.3
Port Graham	2014	100.0%	97.6%	97.6%	100.0%	90.2%	32,429	559.1	218.3
Seldovia	1982			94.3%			30,406	176.8	50.7
Seldovia	1991	98.5%	92.4%	92.4%	95.5%	84.8%	70,059	604.0	205.5
Seldovia	1992	98.5%	93.8%	93.8%	95.4%	84.6%	54,451	397.5	145.1
Seldovia	1993	95.4%	95.4%	95.4%	86.2%	78.5%	79,063	516.8	183.6
Seldovia	2014	98.9%	94.7%	93.7%	96.8%	75.8%	38,455	302.8	138.3

Source Alaska Department of Fish and Game, Division of Subsistence Community Subsistence Information System http://www.adfg.alaska.gov/sb/CSIS/

Note Blank calls = no data

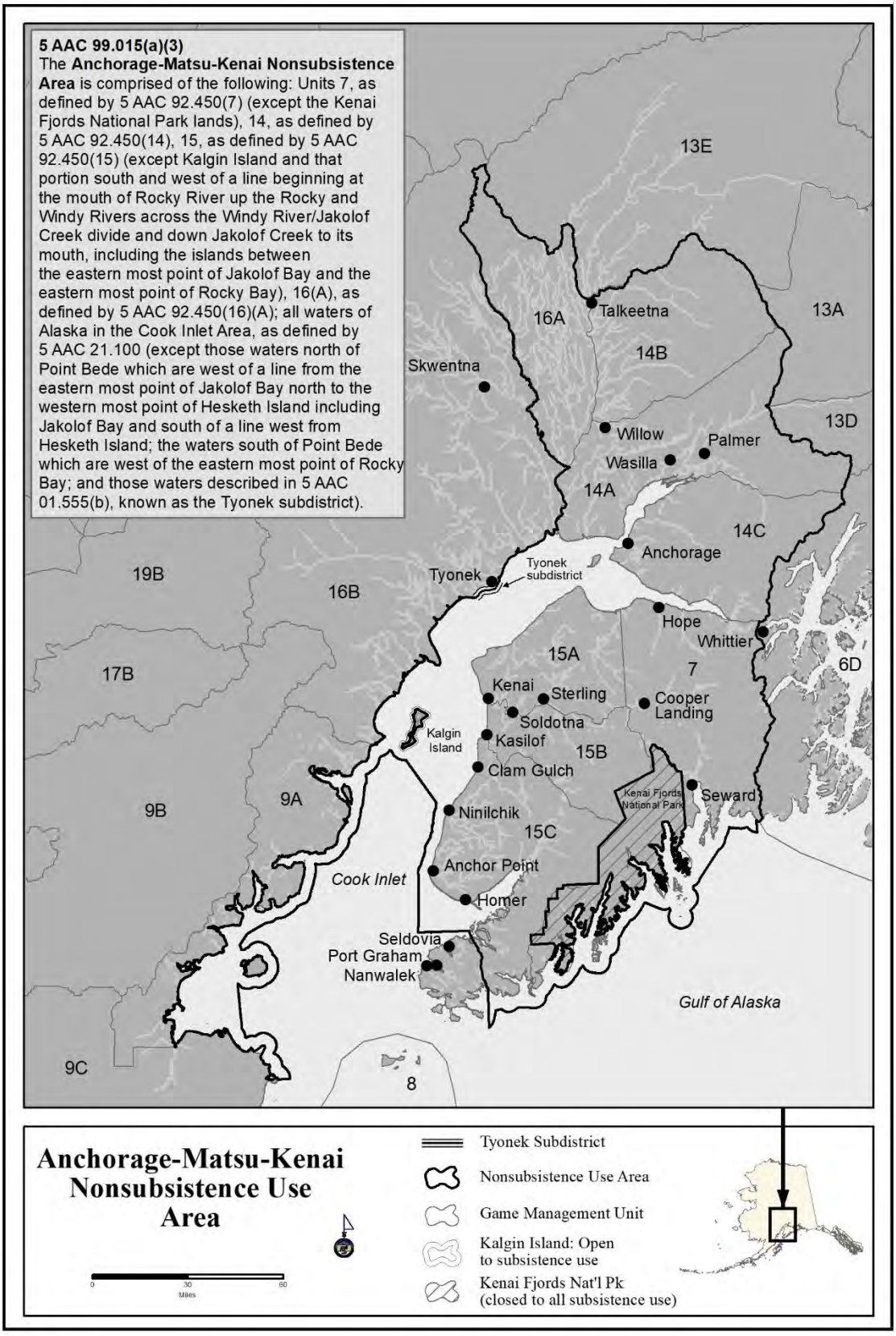

Figure 1.–Anchorage-Matsu-Kenai Nonsubsistence Area

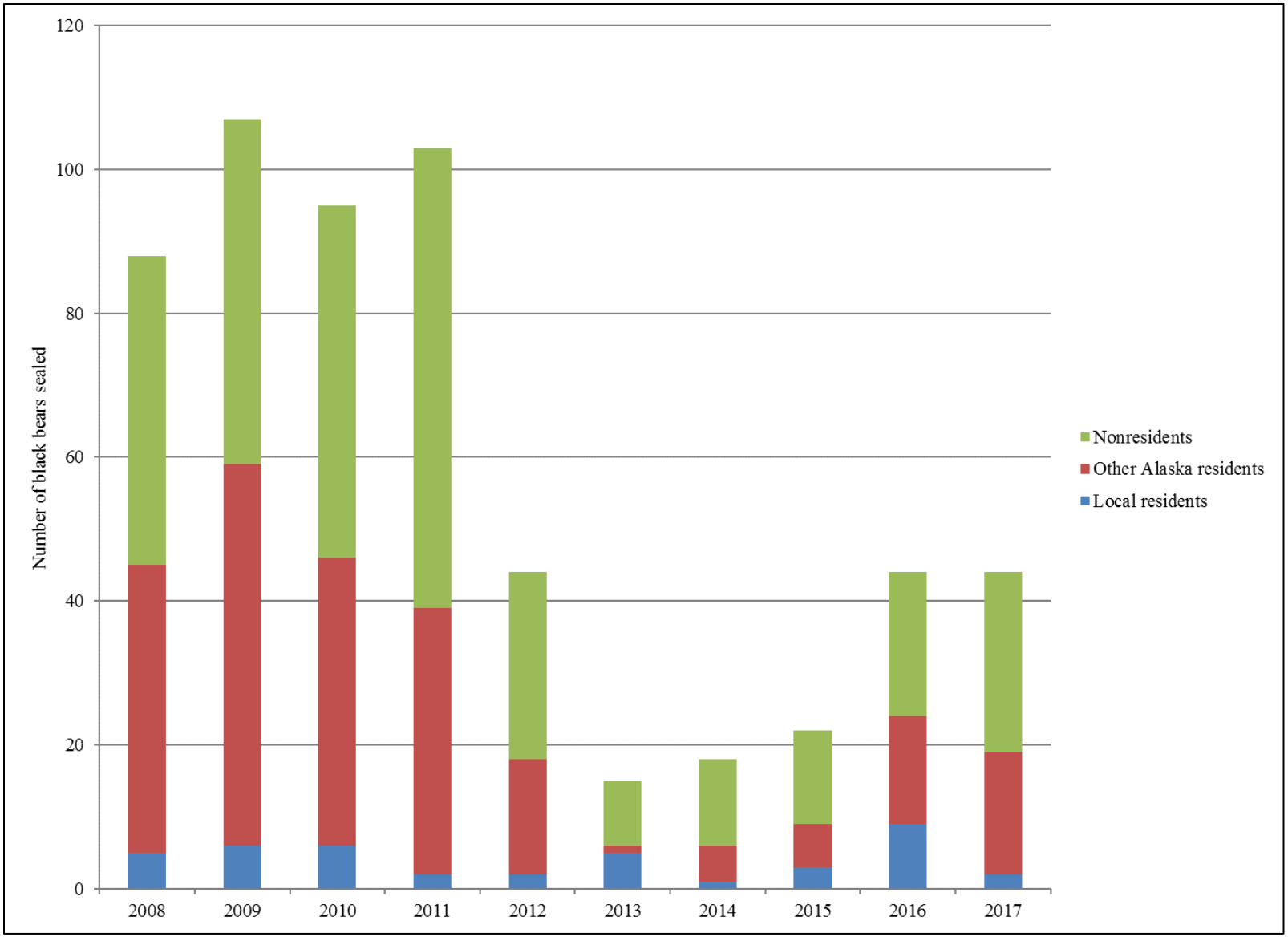

Figure 2.–Number of black bears harvested in the portion of GMU 15C outside the nonsubsistence area, based on sealing records, by area of residence.

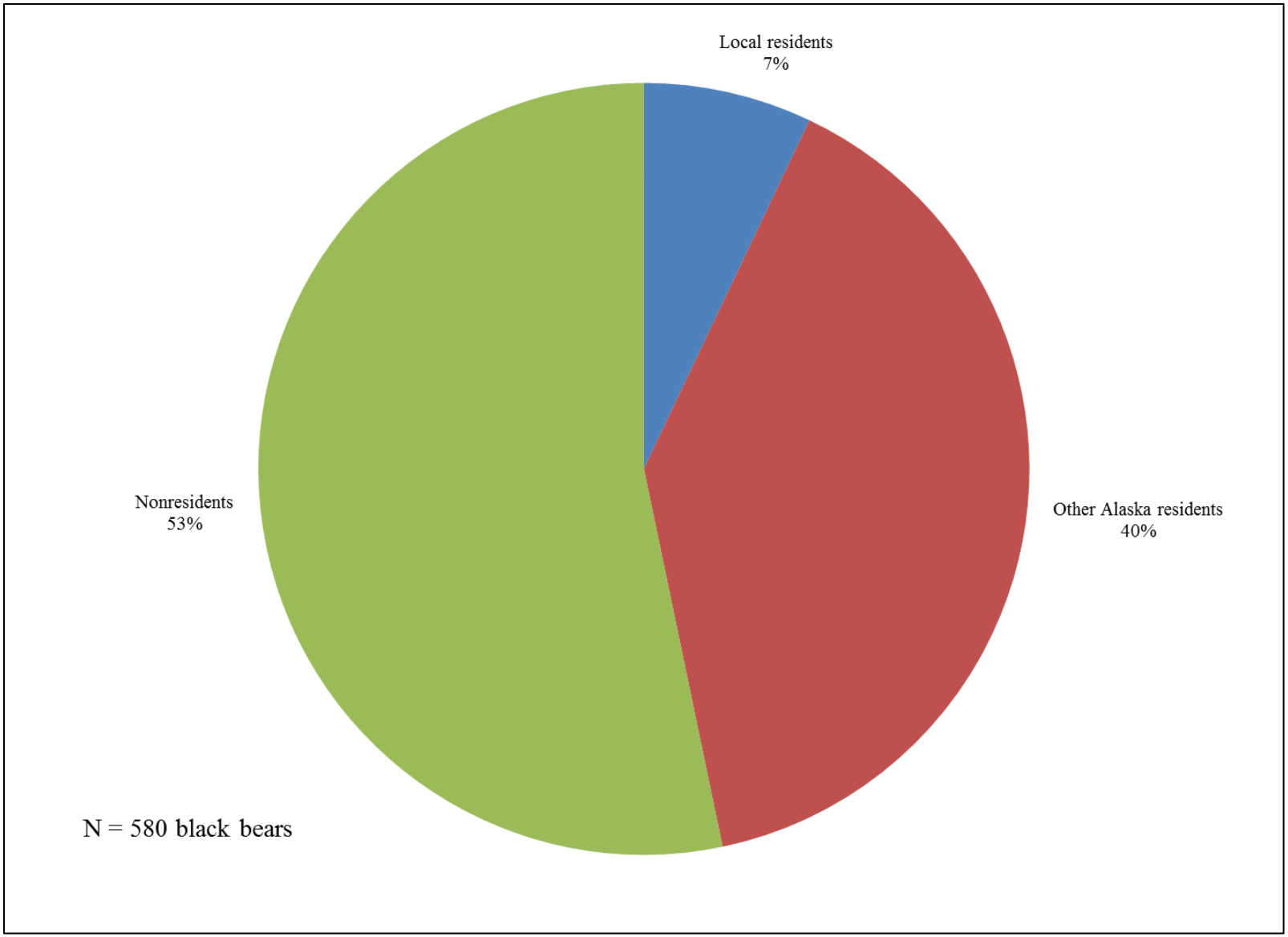

Figure 3.–Area of residence of successful black bear hunts (based on sealing records), that portion of GMU 15C outside the nonsubsistence area, 2008–2017.

Figure 4.–Percentage of black bear harvest taken in fall and spring in that portion of GMU 15C outside the nonsubsistence area, based on sealing records, 2008–2017.

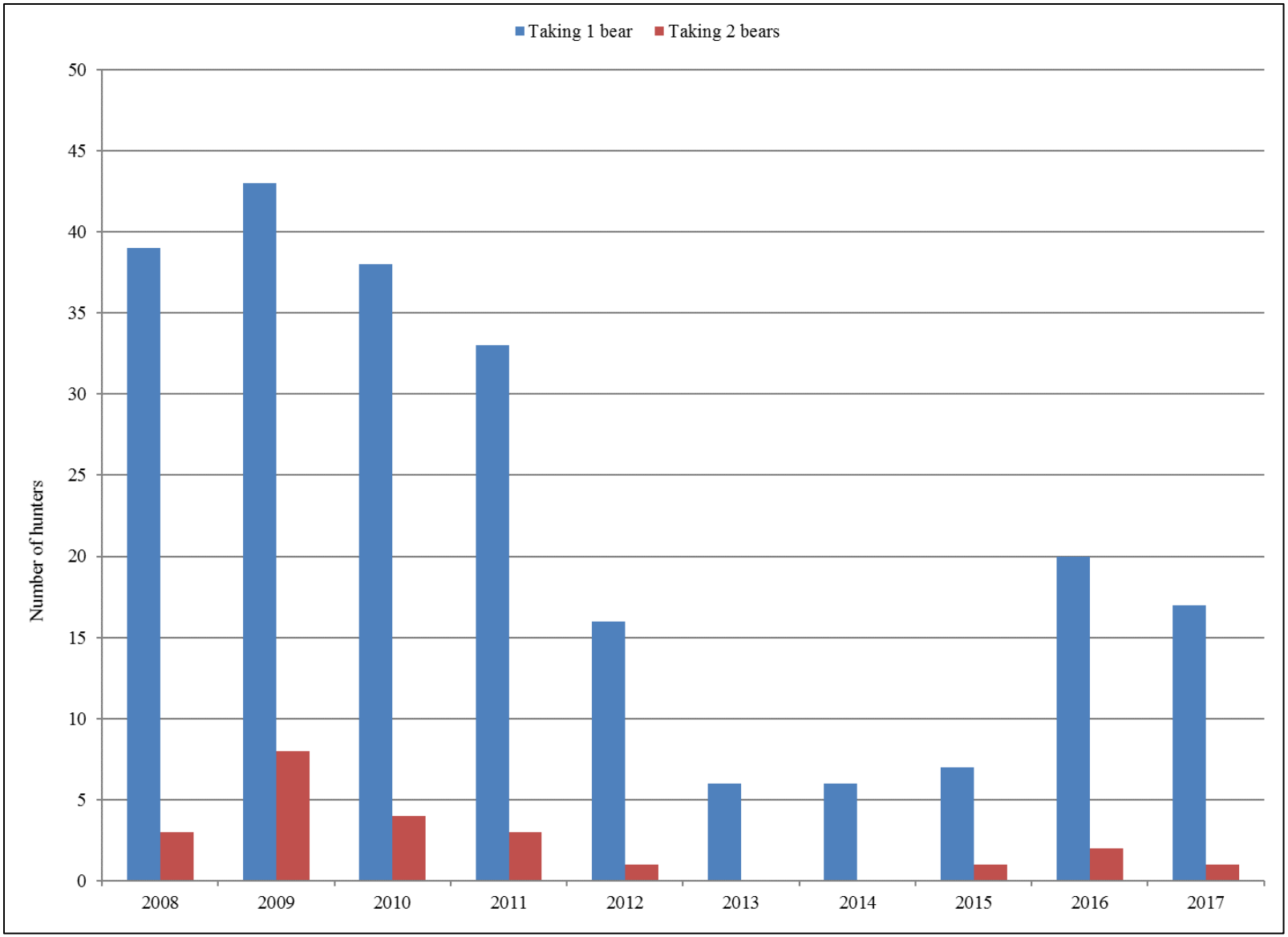

Figure 5.–Number of successful black bear hunters and number of bears taken, Alaska residents only, that portion of GMU 15C outside the nonsubsistence area, 2008–2017.

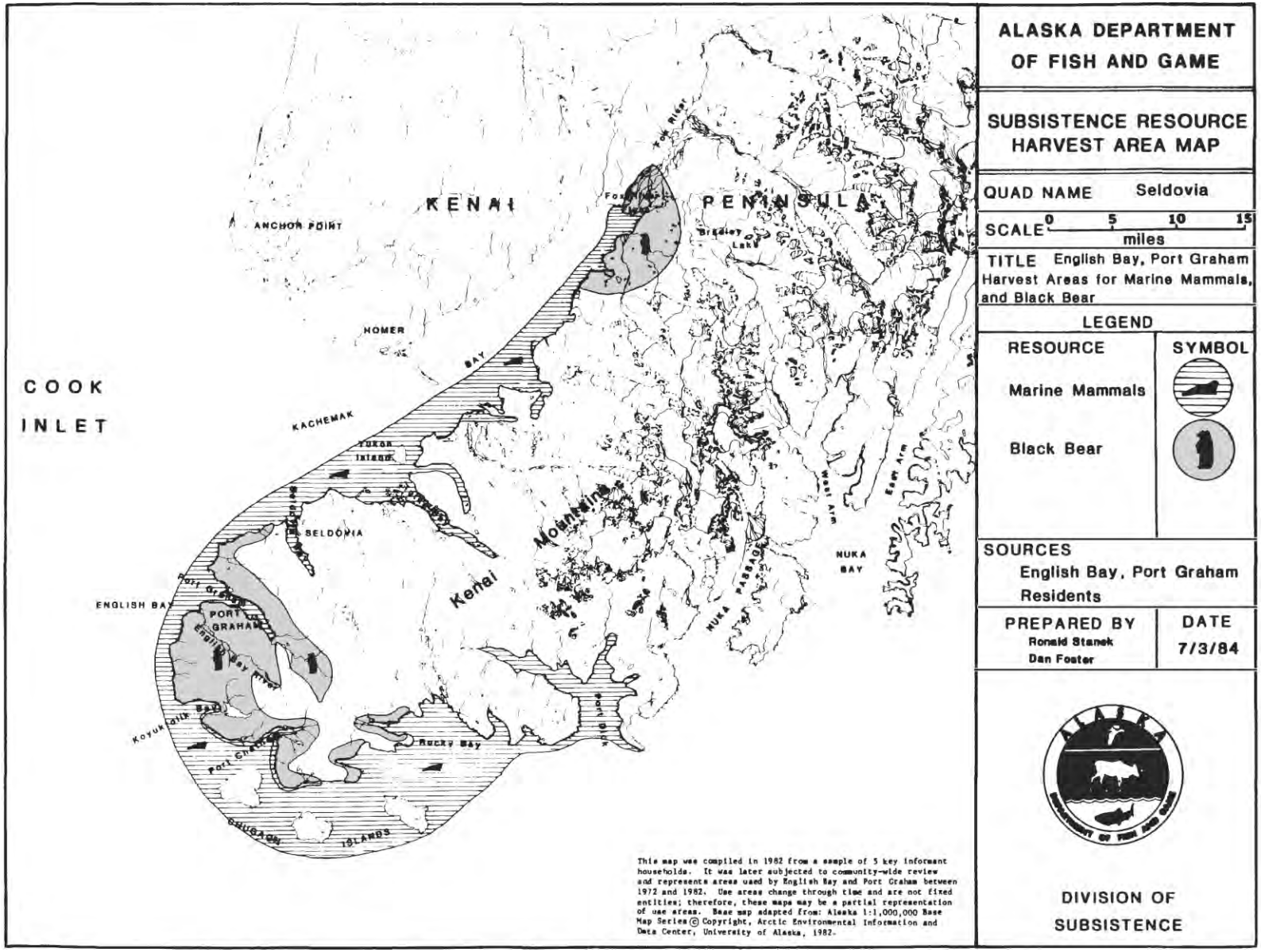

Figure 6.–Historical black bear harvest and use areas, Port Graham and Nanwalek, Alaska, early 1980s (edited for clarity).

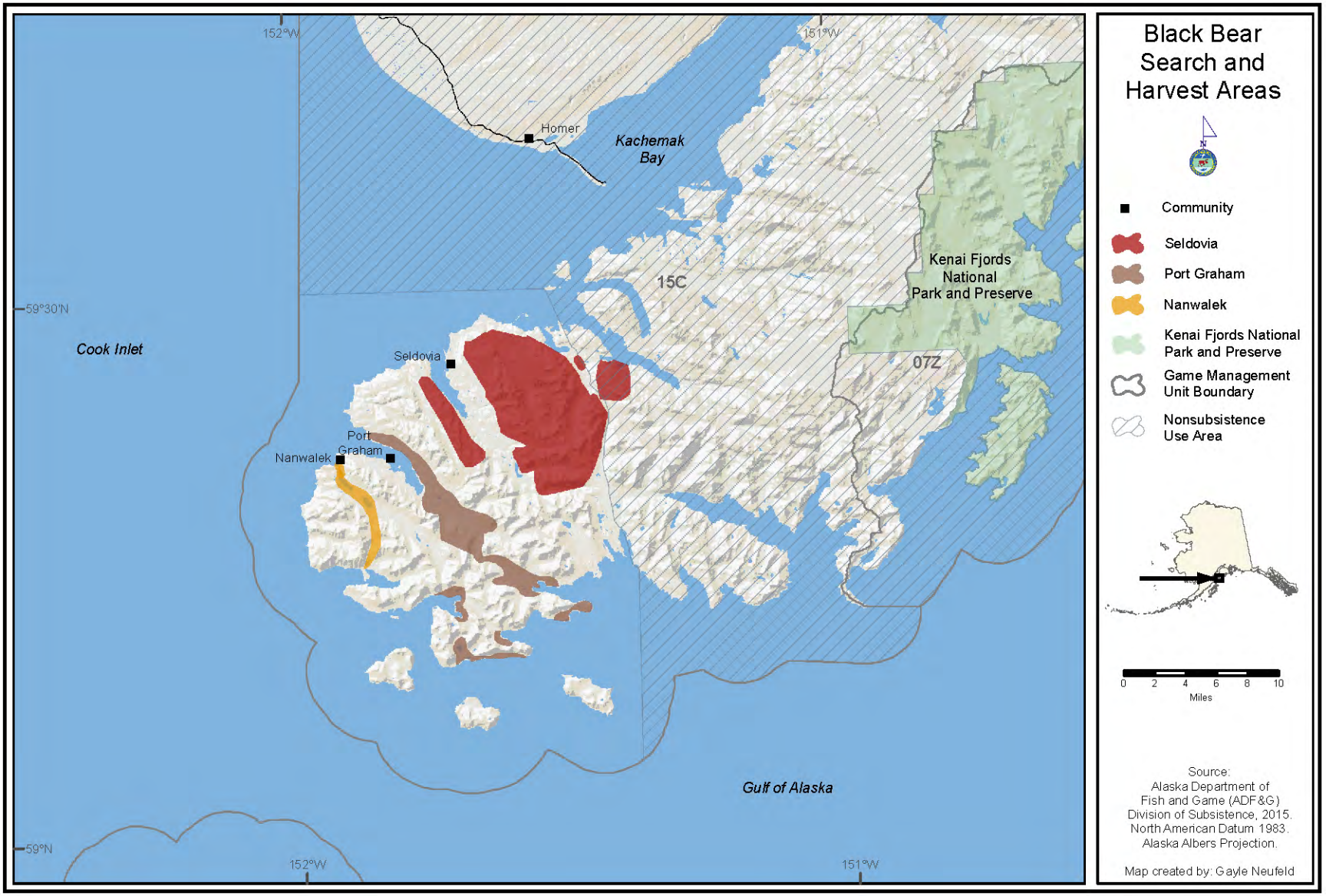

Figure 7.–Black bear search and harvest areas for the communities of Seldovia, Port Graham, and Nanwalek, Alaska, 2014.

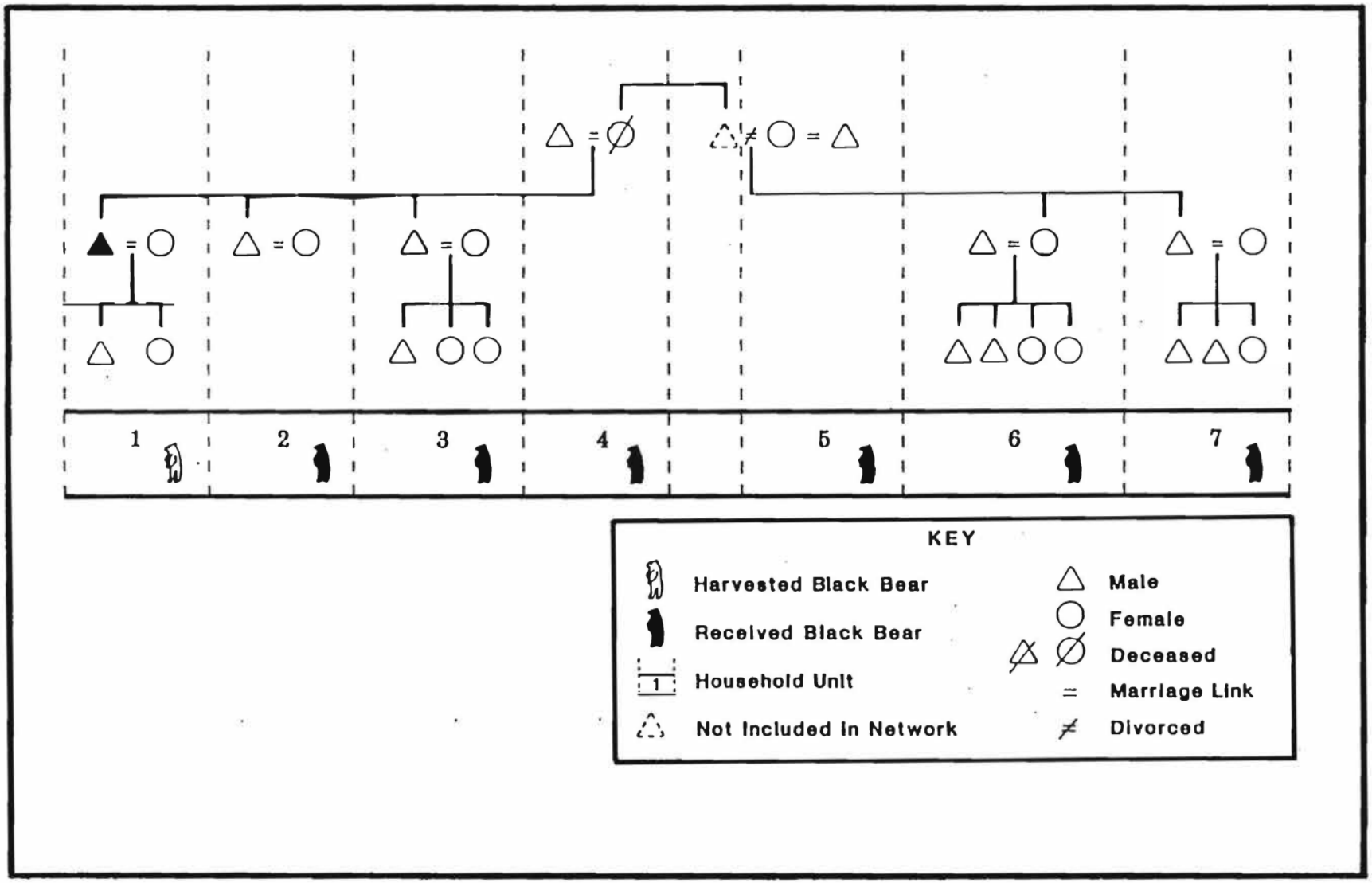

Figure 8.–An example of the distribution of black bear within a kinship network, Nanwalek, Alaska, early 1980s.

APPENDIX A: ANS OPTIONS

Option A

SEALING RECORDS, ALL ALASKANS, RECENT TEN YEARS

See Table 2.

Do not include three years of very low harvests (2013, 2014, 2015)

A1. Point ANS of **36 bears** (mean annual harvest by Alaska residents)

A2. Range ANS of **18–59 bears** (low and high years); could round to **20–60 bears**

Option B

SEALING RECORDS, LOCAL RESIDENTS ONLY, RECENT TEN YEARS

See Table 2.

Do not include three years of very low harvests (2013, 2014, 2015)

B1. Point ANS of **4 bears** (mean annual harvest by Nanwalek, Port Graham, Seldovia)

B2. Range ANS of **2–6 bears** (low and high years)

Option C

HARVEST SURVEYS, LOCAL RESIDENTS

See Table 1.

Do not include 1989 (year of *Exxon Valdez* oil spill); do not include low and high harvest years for each community in means or ranges.

Using survey data for local communities provides a longer time series and takes into account some harvests that likely were not sealed. It also accounts for reports by local residents that harvests in recent years have declined in part due to increasing nonlocal hunting pressure, including nonresident hunting.

C1. Point ANS of **18 bears** (sum of average of: Nanwalek, 8 bears; Port Graham, 3 bears; Seldovia, 7 bears.

C2. Range ANS of **11–26** bears (sum of range for Nanwalek (5 to 11 bears); Port Graham (1 to 6 bears); and Seldovia (5 to 9 bears)

Option D

Combination of harvest ticket data for nonlocal Alaska residents and survey data for local residents

D1. Point ANS of **49 bears** (mean of 31 bears for nonlocal Alaska residents and 18 bears for local residents). Could round to 50 bears.

D2. Range ANS of **26–79 bears**. (Sum of range for nonlocal Alaska residents of 15 to 53 bears and range for local residents of 11–26 bears). Could round to 26–80 bears.