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Options for Amounts Reasonably Necessary for Subsistence Uses of Deer: Game Management Unit 1A

by

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October 2014

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

Symbols and Abbreviations

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Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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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ABSTRACT

Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) occur throughout Southeast Alaska and are an important game species for area residents. This report details options for the Alaska Board of Game's consideration during deliberations on proposals during its January 2015 Southeast Region meeting. In 2013 the Alaska Board of Game (board) deferred deliberations on revising the amount reasonably necessary for subsistence uses (ANS) in Game Management Unit (GMU) 1A for Sitka black-tailed deer until the next Southeast Alaska meeting, which will be held in Juneau in January 2015. This report provides information on the history of the customary and traditional (C&T) use finding for deer in Southeast Alaska and the establishment of the Ketchikan Nonsubsistence Use Area, which is also located within GMU 1A. The report then provides options for revising the ANS based on the history of the C&T finding and current harvest data.

Key words: Sitka black-tailed deer, Ketchikan, Game Management Unit 1A, Southeast Alaska deer

1. INTRODUCTION

At its 2013 meeting in Sitka, the Alaska Board of Game (board) considered Proposal 178A to adopt an intensive management plan for Game Management Unit (GMU) 1A. At that time it came to the board's attention that the amount reasonably necessary for subsistence uses (ANS) for GMU 1A for Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) was for the deer population in the entirety of GMU 1A, which includes Revillagigedo Island, Gravina Island, and other areas within the Ketchikan Nonsubsistence Use Area (Figure 1). The board requested information from the Alaska Department of Fish and Game (department) to address this issue. In March 2013, at a Board of Game Region II meeting in Kenai, the department reviewed options for modifying the ANS with the board. The board was given 4 ANS options to choose from and a fifth option to take no action. The board chose to take no action and table the ANS revision until the next Southeast Alaska meeting. On-the-record comments by the board stated that choosing the fifth option would be in the best interest of the public so that residents would have time to make comments prior to the meeting or at a meeting that took place in Southeast Alaska.

This report is a follow-up to a report presented to the board in March 2013 (Sill and Holen 2013). The report includes 1 more year of harvest data (study year 2012) and extends the time sequence to address 1997–2012 instead of 1999–2011. During the nearly 2 years between reports, the department has spent significant time and resources cleaning the data in the Southeast deer database and adding the most recent data. It is expected that this report gives a more accurate picture of deer harvests in Southeast Alaska for GMU 1A.

This report details options for revising the ANS for deer in GMU 1A. Under AS 16.05.258 (a), the board is tasked with identifying game populations, or portions of populations, outside of nonsubsistence areas that "are customarily and traditionally taken or used for subsistence" (a "C&T" finding). If a portion of these populations can be harvested consistent with sustained yield principles, "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 uses, or an "ANS finding."

In November 1992, the board reaffirmed that deer populations in GMU 1A (as well as GMUs 1B, 1C, 1D, 2, 3, 4, and 5) are customarily and traditionally taken for subsistence. The finding was reviewed to ensure that the C&T finding was in compliance with the new 1992 state subsistence law, which included new provisions to establish nonsubsistence areas (discussed below), as well as a new provision requiring ANS findings. At the same meeting, the board made an ANS finding of 225–250 deer within GMU 1A.[1]

NONSUBSISTENCE USE AREAS

At a meeting held in November 1992, the Ketchikan Nonsubsistence Area, which encompasses part of GMU 1A, was created by the Joint Board of Fisheries and Game, under authority of AS 16.05.258 (c) (Figure 1). A nonsubsistence use area is an area or community where dependence upon subsistence is not a principal characteristic of the economy, culture, and way of life of the area or community (5 AAC 99.016). The Ketchikan Nonsubsistence Area, which is described in regulation at 5 AAC 99.015 (a)(1), was designated after the positive C&T finding, as mentioned above; therefore, the C&T finding and the ANS determination do not apply to stocks or populations that occur within the nonsubsistence use area. In other words, the C&T finding and ANS apply only to deer within that portion of GMU 1A that is outside of the nonsubsistence use area. Of note is that the nonsubsistence use area consists mainly of island environments, which are generally considered habitats where deer are more abundant, whereas the area

1. It is uncertain if the harvest data upon which this ANS range was based pertained to the entire subunit or just the portion outside the nonsubsistence area. Review of the record of the November 1992 Board of Game meeting would be necessary for clarification.

outside of the nonsubsistence use area is composed largely of mainland habitat, in which deer are generally less abundant (see Figure 1).

State regulations concerning deer hunting in GMU 1A do not differentiate between the nonsubsistence use area and the area outside the nonsubsistence use area. Deer hunting regulations in 2014–2015 in GMU 1A specify a season of August 1–November 30, with a limit of 2 bucks for the area of Cleveland Peninsula south of the divide between Yes Bay and Santa Anna Inlet, and 4 bucks for the remainder of GMU 1A. A harvest ticket is required, and in GMUs 1–6 deer harvest tickets must be used in sequential order and hunters must carry unused tickets while hunting.

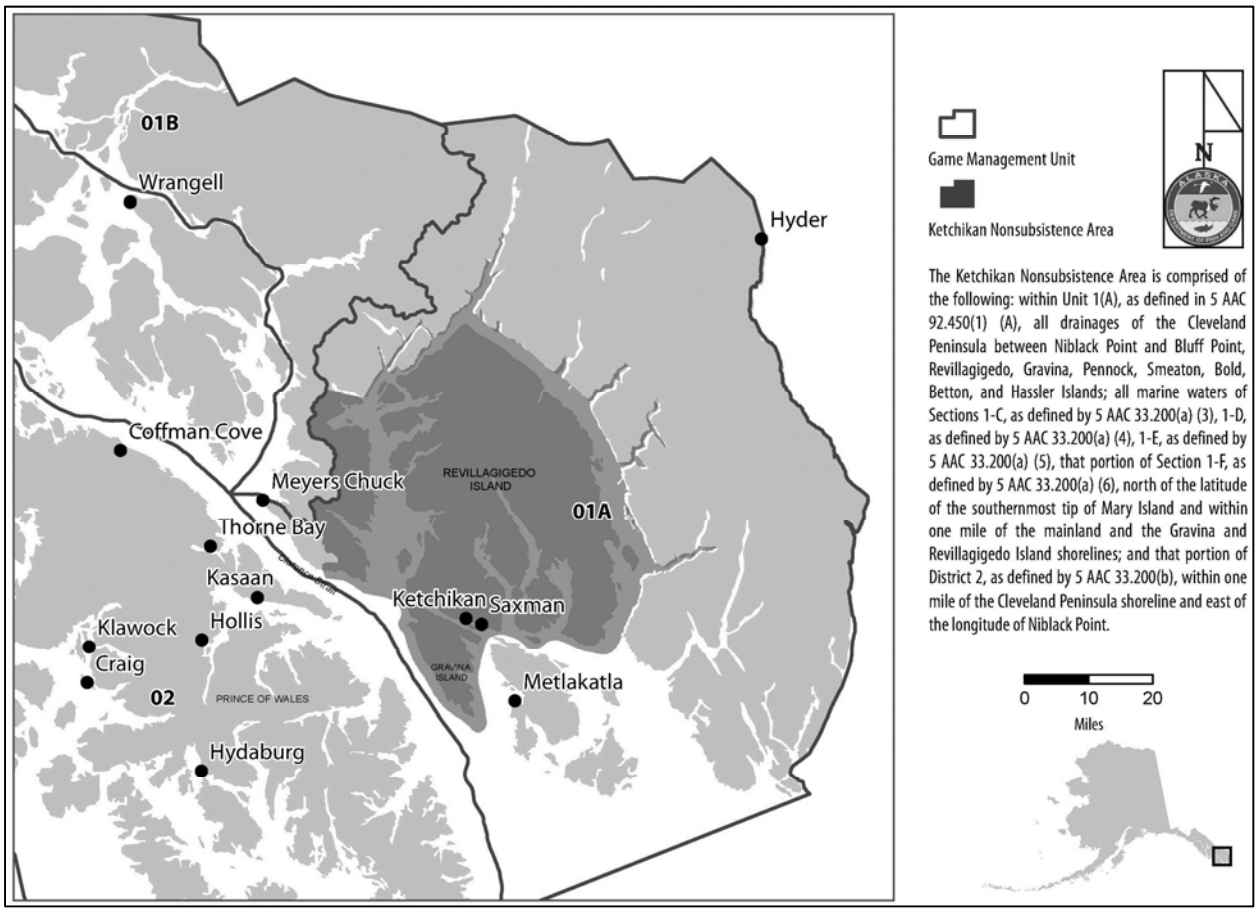

Figure 1.–Ketchikan Nonsubsistence Use Area, GMU 1A.

HARVEST ASSESSMENT OF DEER IN SOUTHEAST ALASKA

Sitka black-tailed deer occur throughout GMU 1A, although mainland densities are consistently lower than those on offshore islands. Weather conditions and population levels are major influences on deer harvest levels. A management goal for the entirety of GMU 1A has been set at a harvest of 700 deer. Population information for deer in the GMU is collected from spring pellet-group surveys, spring mortality surveys, field observations, and, to a lesser extent, hunters' verbal reports. Prior to 2010, the annual harvest was estimated via annual hunter questionnaires mailed to a random sample of hunters who had been issued deer harvest tickets. Beginning in 2010, harvest tickets and associated reporting became required. Total harvest in the unit is estimated based upon the reported harvest in state and federal hunts, as well as estimated illegal and unreported harvests. Table 1 shows the annual harvest of deer in GMU 1A, by GMU residency of hunters, for Southeast Alaska for 1997–2012. This table includes the harvest of

deer in all of GMU 1A to provide a baseline by which to understand the total harvest in the GMU. The years 1997–2012 represent the years available from the updated harvest database. As shown in the table, most of the harvest is by residents of GMU 1A. Figure 2 presents the annual harvest of deer in all of GMU 1A by all hunters from 1997–2012.

Table 2 shows the specific residency of GMU 1A hunters from 1997–2012. As can be seen in the table, most harvests were by Southeast Alaska residents. Recent harvest assessment data show a decline in deer harvests in GMU 1A since 2008 (Table 1; Figure 2).

Table 1.–Annual estimated harvest of deer in GMU 1A by residency of hunters by GMU in Southeast Alaska and residency of hunters in other areas, 1997–2012.

	Harvest by GMU of residency						Other	Outside	Residency	**Grand**
Regulatory year	GMU 1A	GMU 1C	GMU 2	GMU 3	GMU 4	*Subtotal*	Alaska	Alaska	unknown	**total**
1997	514					*514*	0	14		**528**
1998	499	0				*499*	10	0		**509**
1999	225	10	0	12		*247*	21	0		**268**
2000	261					*261*	0			**261**
2001	334	0		29		*363*				**363**
2002	244					*244*	0			**244**
2003	187		0	0		*187*	0			**187**
2004	318	14		0		*332*	15			**347**
2005	245	3	0	4	8	*260*	14	5		**279**
2006	387	25		20	4	*436*	15	10	0	**461**
2007	281	0	17	0	0	*298*	2	6		**306**
2008	121	14	10	0	0	*145*	9	0		**154**
2009	190	0	9	1	6	*206*	6	9	0	**221**
2010	121	5	36	0	15	*177*	1	13	0	**191**
2011	167	1		3	0	*171*	2	11	2	**186**
2012	192	4	4	7	9	*216*	4	14	3	**237**

Source Alaska Department of Fish and Game, Division of Wildlife Conservation harvest ticket database 2014.

Note Blank cells indicate no hunt or harvest.

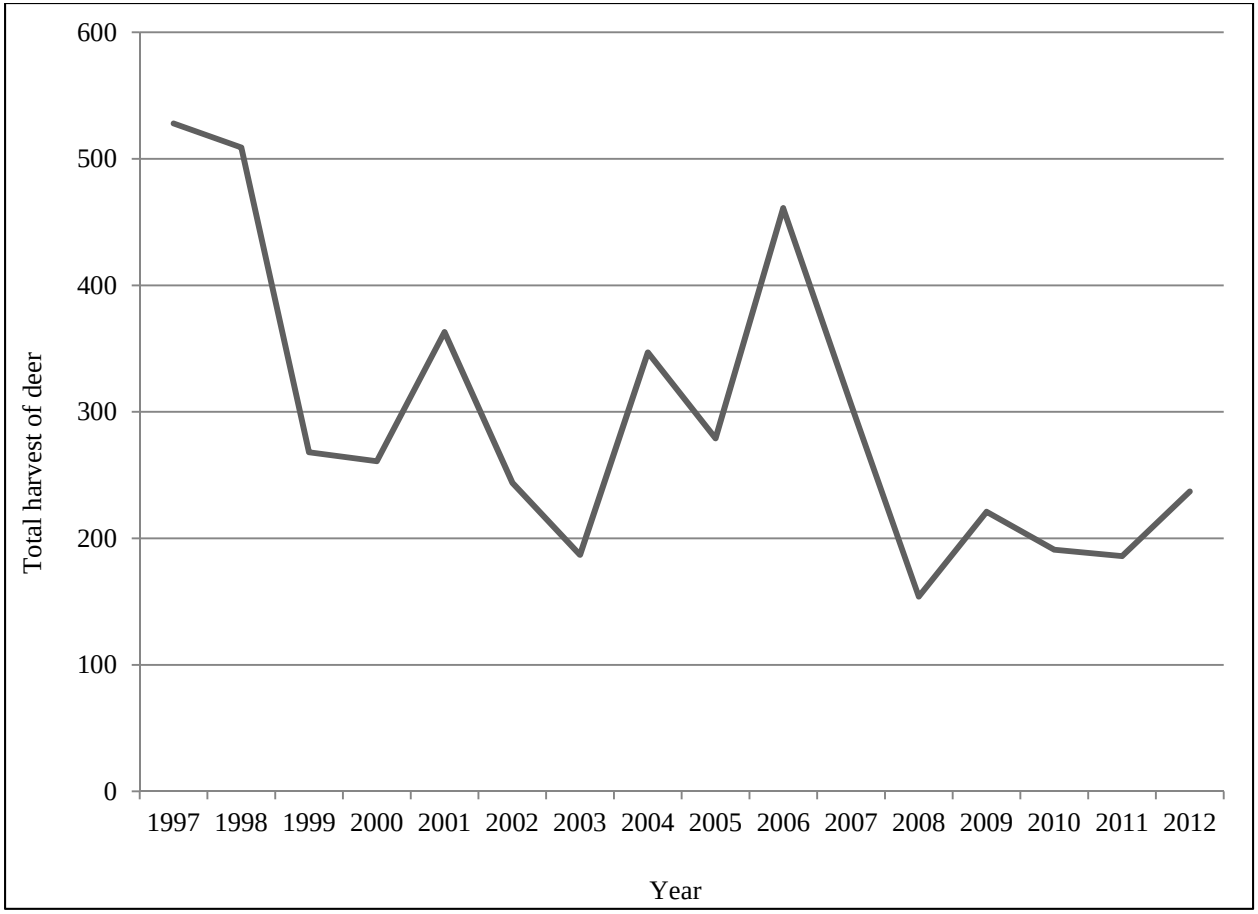

Figure 2.–Annual harvest of deer in GMU 1A, all hunters, 1997–2012.

Table 2.–Harvest of deer in GMU 1A, by community of hunter residence, 1997–2012.

Community of residence	Regulatory year															
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Coffman Cove														2		
Cordova																1
Craig												10	3	22		2
Gustavus															1	
Hollis												0		5		
Hoonah																2
Hydaburg																2
Juneau			10					14	3	25		14		5		4
Kake					24											
Ketchikan	480	477	186	205	297	216	182	310	202	366	263	121	186	122	152	182
Klawock											17		2			0
Metlakatla	18	22	25	56	36	27	5	8	42	22	19		3			6
Meyers Chuck																3
Naukati Bay													1			
Neets Bay	16		14			3										2
Petersburg					4				1	16					1	7
Port Protection														3		
Sitka									8				6	15		1
Tenakee Springs										4						5
Thorne Bay													1	5		
Ward Cove															15	0
Wrangell			12						3	4			1		2	0
Southeast Alaska subtotal	*514*	*499*	*247*	*261*	*361*	*246*	*187*	*332*	*259*	*437*	*299*	*145*	*203*	*179*	*171*	*217*
Other Alaska	0	10	21	0	0	0	0	15	14	15	2	8	6	1	2	3
Alaska subtotal	*514*	*519*	*289*	*261*	*361*	*246*	*187*	*362*	*287*	*467*	*303*	*161*	*215*	*181*	*175*	*220*
Residency unknown															2	2
Outside Alaska	15								5	10	6		8	13	11	13
Grand total	**529**	**509**	**268**	**261**	**361**	**246**	**187**	**347**	**278**	**462**	**307**	**153**	**217**	**193**	**186**	**235**

Source Alaska Department of Fish and Game, Division of Wildlife Conservation harvest ticket database 2014.

Note Blank cells indicate no harvest.

2. ANS OPTIONS

Following are options for the board to consider should it choose to update the ANS finding in GMU 1A and adopt new ANS ranges in regulation. There are a few considerations the board may want to take into account when reviewing ANS options. The 1992 C&T finding reported residency information from all Southeast Alaska residents who harvested deer in GMU 1A. The communities that were included in the harvest assessment in 1992 were Coffman Cove, Craig, Hoonah, Juneau–Douglas, Ketchikan, Klawock, Loring, Margarita Bay, Metlakatla, Meyers Chuck, Neets Bay, Petersburg, Point Baker, Reville (Revillagigedo Island), Saxman, Shoal Cove, Sitka, Thorne Bay, Wrangell, and Yes Bay. Table 3 shows the harvest estimates from 1997–2012, by residency, for GMU 1A outside the Ketchikan Nonsubsistence Use Area (or within the "subsistence" area).

Options provided below only take into account the harvest of deer in GMU 1A outside the nonsubsistence area; also, options take into consideration harvests by all Alaska residents.

As shown in Figure 1, the majority of the GMU 1A area outside the nonsubsistence use area would be considered "mainland." As discussed above, mainland areas tend to have lower deer population densities than islands. In Southeast Alaska, GMUs 1B and 1C are primarily mainland systems. For comparison, the board found that the ANSs for deer in those 2 areas were 40–50 deer in GMU 1B and 30–40 deer in GMU 1C.

Figure 3 shows the total annual estimated harvest of deer from 1997–2012 in GMU 1A outside the nonsubsistence use area (or within the "subsistence" area), by residency of hunters. This, and Table 3, is the complete updated dataset that could be used for determining the ANS.

Deer populations in Southeast Alaska are subject to conditions that can impact their overall numbers and availability from year to year based on winter survival rates. The options that are presented to the board use all available harvest data or harvest data from the last 5 years. For the past few years, southern Southeast Alaska has experienced harsh winters, which may have impacted deer populations and resource availability to hunters. As can be seen in Table 3, the majority of harvests outside the nonsubsistence use area during 1997–2012 were by residents of Southeast Alaska; there were no reported harvests by nonlocal Alaska residents. There were harvests of deer by nonresidents in 2010 and 2012.

Table 3.–Harvests of deer outside the Ketchikan Nonsubsistence Use Area portion of GMU 1A, by residency, 1997–2012.

	Deer harvests by hunters residing in Southeast Alaska							Other	**Alaska**	Outside	**Grand**
Year	GMU 1A	GMU 1C	GMU 2	GMU 3	GMU 4	GMU 5	*Subtotal*	Alaska	**subtotal**	Alaska	**total**
1997	21						*21*		**21**		**21**
1998	19						*19*		**19**		**19**
1999	19						*19*		**19**		**19**
2000	37						*37*		**37**		**37**
2001	10						*10*		**10**		**10**
2002	7						*7*		**7**		**7**
2003	6						*6*		**6**		**6**
2004											
2005				4			*4*		**4**		**4**
2006	9	25		20	4		*58*		**58**		**58**
2007	25		16				*41*		**41**		**41**
2008			6				*6*		**6**		**6**
2009	6		5				*11*		**11**		**11**
2010	4	5	30		3		*42*		**42**	5	**47**
2011	4			2			*6*		**6**		**6**
2012	2		2	7	5		*16*		**16**	4	**20**

Source Alaska Department of Fish and Game, Division of Wildlife Conservation harvest ticket database 2014.

Note Blank cells indicate no hunt or harvest.

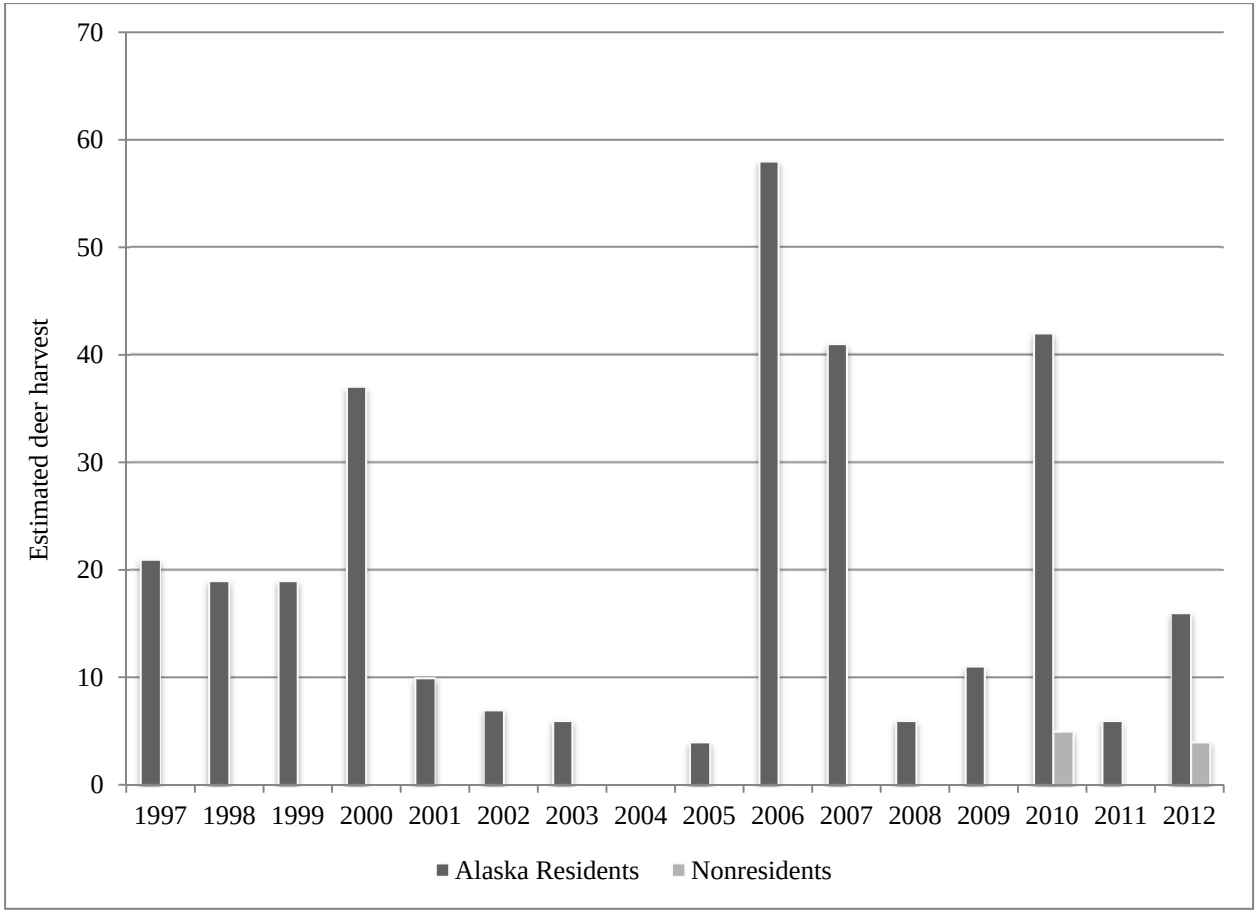

Figure 3.–Harvest of deer in GMU 1A “subsistence” area, by residents and nonresidents, 1997–2012.

OPTIONS 1 AND 2: LOW AND HIGH HARVESTS, AND STANDARD DEVIATION OF HARVESTS, FROM 1997–2012

Table 4 shows the low and high harvest amounts over the time period 1997–2012 and an ANS range option based on these amounts (Option 1). Table 5 shows the standard deviation (SD) from the mean harvest amounts and an ANS range option based on these amounts (Option 2). These options are based on harvests by Southeast Alaska residents because there were no harvests by nonlocal Alaska residents (Table 3; see column "Alaska subtotal").

Option 1

Option 1 is based upon the low and high harvests in years when harvests occurred from 1997–2012 in the area of GMU 1A that is in the "subsistence" area (Table 3). Over this time period, harvests have ranged from a low of 4 to a high of 58. For this option, the ANS range can be rounded to 5–60 deer.

Table 4.–Option 1: range based on low and high harvests by all Alaska residents from 1997–2012.

Harvest		**ANS range option (rounded)**	
Low	High	**Low**	**High**
4	58	**5**	**60**

Option 2

Since low and high harvests may be extremes within a time series (there may have been unusual circumstances that increased or decreased harvest levels), calculating a standard deviation from the mean, or average harvest, may provide a more statistically accurate picture of harvest trends. Option 2 is based upon generation of a standard deviation of the average annual estimated harvest of deer in the "subsistence" area of GMU 1A between the years of 1997–2012, which is 20 deer, and then adding and subtracting the standard deviation. This approach produces an option of 4–36 deer, which can be rounded to 5–35 deer.

Table 5.–Option 2: range based on mean and standard deviation of harvests by all Alaska residents from 1997–2012.

Range of harvest					Mean ± SD			**ANS range option (rounded)**	
Low	High	Mean	SD	*Bounded by*	Low	High	*Equals*	**Low**	**High**
4	58	20	16		4	36		**5**	**35**

OPTION 3: LOW AND HIGH HARVESTS FROM 2008–2012

Option 3 is based upon the low and high harvests during the most recent 5-year period (2008–2012) in that area of GMU 1A that is outside the nonsubsistence use area. During this period there was a low estimated harvest of 6 deer and a high of 42 deer harvested by Alaska residents. The ANS range for this option can be rounded to 5–40 deer (Table 6).

Table 6.–Option 3: range based on low and high harvests by all Alaska residents from 2008–2012.

Harvest		**ANS range option (rounded)**	
Low	High	**Low**	**High**
6	42	**5**	**40**

OPTION 4: STANDARD DEVIATION FROM HARVESTS 2008–2012

Option 4 is based upon the average harvest of deer in the area of GMU 1A outside the nonsubsistence use area from 2008–2012, plus or minus the standard deviation. The mean annual harvest was 16 deer with a standard deviation of 13 deer. The ANS range can be rounded to 5–30 deer for Option 4 (Table 7).

Table 7.–Option 4: range based on mean and standard deviation of harvests by all Alaska residents from 2008–2012.

Range of harvest					Mean ± SD			**ANS range option (rounded)**	
Low	High	Mean	SD	*Bounded by*	Low	High	*Equals*	**Low**	**High**
6	42	16	13		3	30		**5**	**30**

OPTION 5: NO CHANGE

Option 5 is to adopt no changes to the ANS range for deer in GMU 1A, which is currently 225–250 deer.

REFERENCES CITED

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2013. *Options for amounts reasonably necessary for subsistence uses of deer: Game Management Unit 1A.* Alaska Department of Fish and Game Division of Subsistence, Special Publication No. BOG 2013-01: Anchorage. http://www.adfg.alaska.gov/specialpubs/SP2_SP2013-001.pdf