Species Management Report ADF&G/DWC/SMR-2015-3

Deer Management Report of Survey-Inventory Activities, 1 July 2012–30 June 2014

Patricia Harper and Laura A. McCarthy, editors

2015

Alaska Department of Fish and Game Division of Wildlife Conservation

Species Management Report ADF&G/DWC/SMR-2015-3

Deer Management Report of Survey-Inventory Activities, 1 July 2012–30 June 2014

Alaska Department of Fish and Game
Division of Wildlife Conservation
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Juneau, AK 99811-5526

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Species management reports provide information about species that are hunted or trapped and management actions, goals, and recommendations for those species. Detailed information is prepared for each species every two or three years, depending on the species, by the area management biologists for game management units in their areas. Reports are not produced for species that are not managed for hunting or trapping or for areas where there is no current or anticipated activity. The individual unit reports are compiled in this statewide report. Unit reports are reviewed and approved for publication by regional management coordinators. Any information taken from this report should be cited with credit given to authors and the Alaska Department of Fish and Game. Authors are identified at the end of each unit section.

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Individual 2015 deer unit reports were processed and posted as they were completed during 2015–2017. Although this compilation of unit reports was produced in 2017 it is cited as a 2015 set of reports to avoid confusion.

Cover Photo: A Sitka black-tailed deer on the beach in fall. ©2007 ADF&G. Photo by Phil Mooney.

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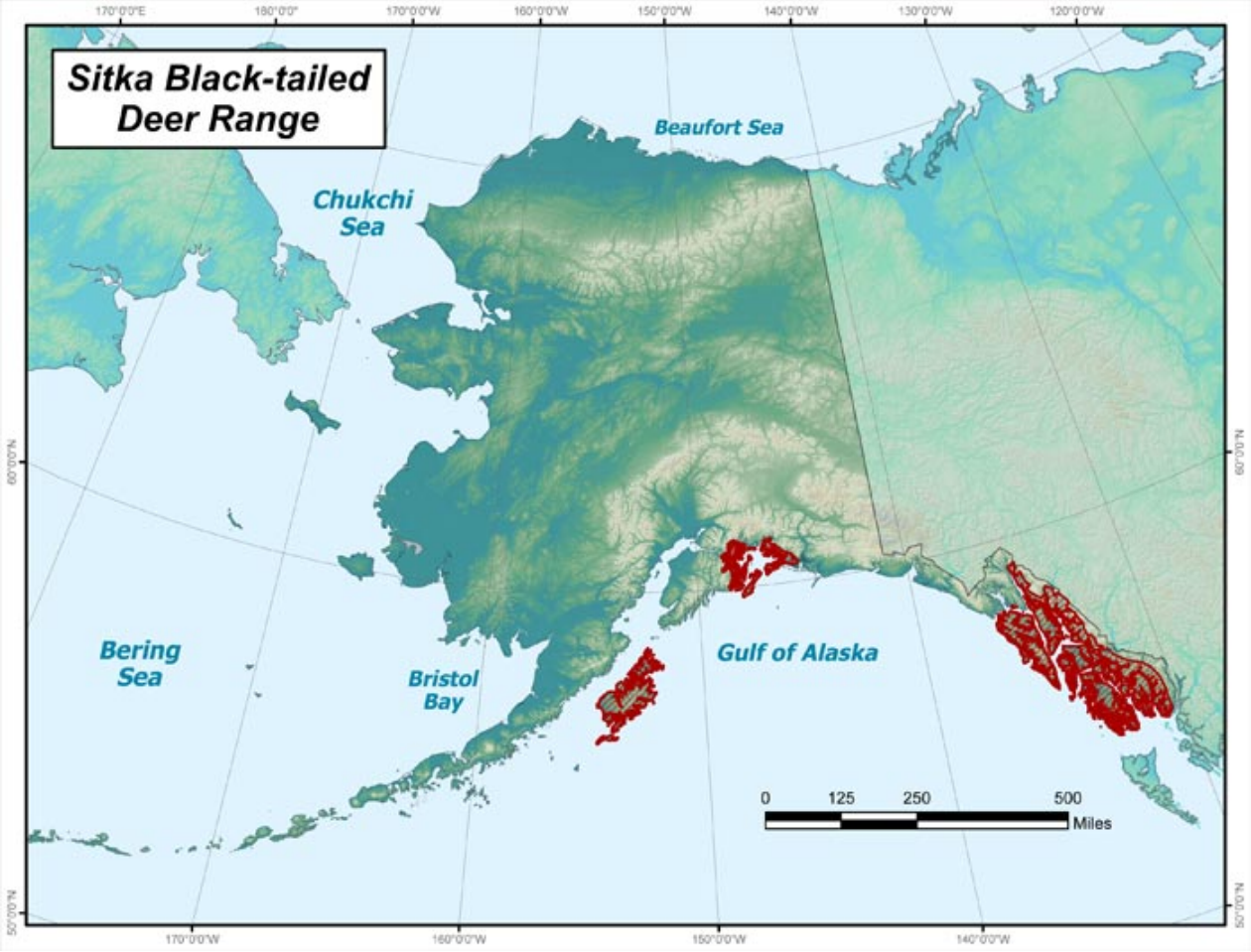
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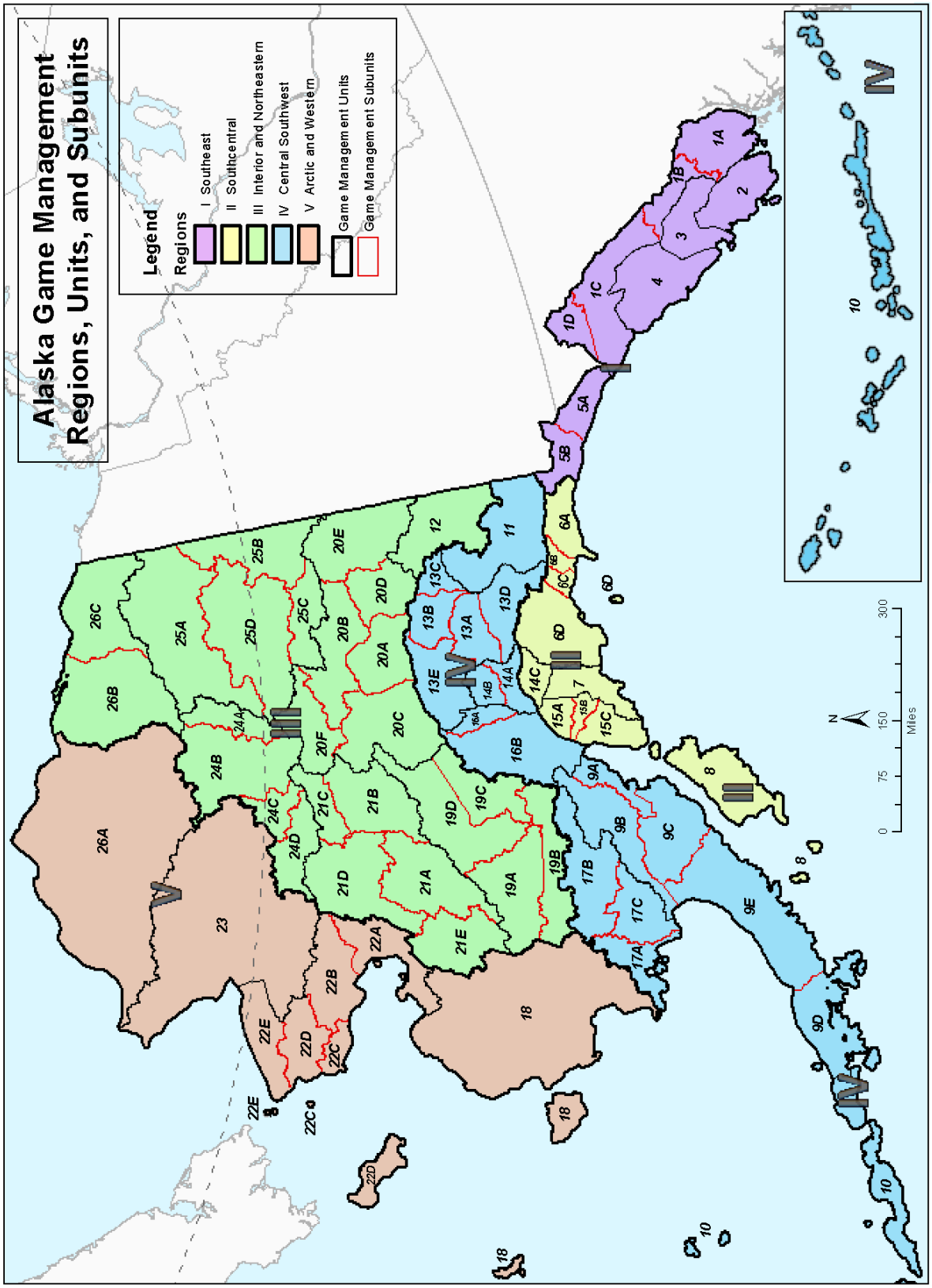
Alaska Game Management
Regions, Units, and Subunits
Legend
Regions
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CHAPTER 1: DEER MANAGEMENT REPORT

From: 1 July 2012
To: 30 June 2014

LOCATION

GAME MANAGEMENT UNIT: 1A (5,300 mi^2)

GEOGRAPHIC DESCRIPTION: Unit 1 south of Lemesurier Point, including all drainages into Behm Canal and excluding all drainages into Ernest Sound

BACKGROUND

Sitka black-tailed deer live throughout Unit 1A, although mainland densities are consistently lower than those on maritime-influenced offshore islands. Deer populations tend to fluctuate in response to winter weather and wolf and bear predation. Widespread clearcut logging from the 1970s through the 1990s has eliminated much important deer winter habitat, old-growth forest below 800 feet elevation, making deer more vulnerable to severe winters. Deer numbers are currently at low levels throughout Unit 1A.

Weather conditions and population levels influence deer harvests. Unit 1A harvests have ranged widely during the past 20 years from a high of 914 during 1995 to a low of 75 in 2008. Hunting was open each year in Unit 1A from August through December until 2011 when the deer season was shortened to end November 30. Limited hunting of antlerless deer in Unit 1A was allowed before 1978, but since then only bucks have been legal under both state and federal regulations. As clearcut logging continues to reduce old-growth habitat in portions of the unit, many previously logged stands no longer support deer, and local deer populations are expected to further decline. Population models predict declines in deer carrying capacity of 50–60% by the end of the logging rotation in 2054 (USFS 1989).

MANAGEMENT DIRECTION

MANAGEMENT GOALS

Deer are highly valued by hunters in the Ketchikan area, and under 5 AAC 92.108 the Board of Game established population and annual hunter harvest goals for Unit 1A of 15,000 deer and 700 deer, respectively. We are currently evaluating the viability of those goals relative to declining habitat conditions. Region I staff also developed a feasibility assessment (ADF&G 2012a) and operational plan (ADF&G 2013) for implementing wolf control and other measures under the intensive management law, to potentially increase deer numbers in a portion of Unit 1A.

MANAGEMENT OBJECTIVES

- Maintain populations in excess of 45 deer per mi^2 of winter range, as determined by mean densities of 1.4 pellet groups per plot (Kirchhoff 1990).

METHODS

We collected population information from spring pellet-group surveys, field observations, and to a lesser degree from hunters' anecdotal reports. Deer pellet transects are measured each spring in a sample of Value Comparison Units (VCU) to look at long-term deer trends across Southeast Alaska.

During RY10 we gathered harvest data from an annual hunter questionnaire that we mailed to a random sample of hunters who were issued deer harvest tickets (ADF&G 2012b). DWC mailed harvest questionnaires to approximately 33% of all Region I deer harvest ticket holders. Using the answers on the surveys returned to us, we expanded the results statistically to estimate hunting results of all deer harvest ticket holders. The deer harvest survey has been conducted since the early 1980s to estimate deer harvest. However at the fall 2010 Board meeting the department submitted a proposal to change our harvest assessment methodology from the survey format to an individual hunter harvest ticket report. The proposal passed and the change was implemented in July of 2011. Currently, a hunt report is attached to all deer harvest tickets, and all hunters are required to submit the information using either our online report system or using the attached prepaid postage report form. Our harvest data for RY11 is based on the harvest ticket report and statistically expanded to all hunters similar to the mail survey.

RESULTS AND DISCUSSION

MORTALITY

Harvest

Season and Bag Limit	Resident and Nonresident Hunters	
Unit 1A	1 August–30 November	4 bucks
Unit 1A Cleveland Peninsula	1 August–30 November	2 bucks

Board of Game Actions and Emergency Orders. During the November 2010 BOG meeting the closing date for the 1A deer hunting season was changed from 31 December to 30 November. During the same meeting, the board also adopted a department proposal to add a statewide harvest report portion to the general season deer harvest ticket. Hunters are now required to use the harvest prepaid postage ticket report form to report their hunting effort to the department or they can report online.

At its spring 2013 meeting, the Alaska BOG heard a report on the department's feasibility assessment (ADF&G 2012a) and plans for intensive management activities on Gravina Island. The board then directed the department to prepare an operational plan (ADF&G 2013) and to develop and submit a regulatory proposal for intensive management activities. The department is currently evaluating habitat capability for deer in a portion of Unit 1A before submitting an intensive management activity proposal at the next Southeast BOG meeting.

Hunter Harvest. The harvest survey in RY12 and the harvest ticket report in RY13 indicate an estimated harvest of 236 and 265 deer respectively. This is slightly higher than the previous 5-year average (RY07–RY11) of 153 deer. The average time it took hunters during this report period to harvest a deer (8.4 days) was lower than the previous 5-year average of 10.3 days per

harvested deer. The estimated number of successful hunters increased during this report period from an average 137 during RY10–RY11 to an average of 168 successful hunters during this report period (Table 1). This continues a higher successful hunter trend from the low average of 72 successful hunters during the period RY07–RY09.

The number of people hunting and number of deer harvested on Gravina Island near Ketchikan remained low compared to historical figures. During RY12, 93 hunters reported a harvest of 15 deer, and in RY13, 90 hunters who spent time on the ground reported taking 13 deer. Although low, those figures are higher than RY07 when only 9 deer were reported taken. However, hunter harvest remains well below the past 5-year average of 31 bucks (RY06–RY11). Gravina Island is located near Ketchikan and is accessible by boat or road vehicle, but it appears many local hunters opt to spend their hunting effort in areas with higher deer densities such as those on nearby Prince of Wales Island. During the RY12 and RY13 seasons a total of 182 and 211 male deer were reportedly harvested by hunters on Revilla Island, respectively. Those figures are close to the past 5-year average of 222 bucks (RY06–RY11) (Table 2).

Based on hunt reports, we estimated 8 and 5 deer were harvested during RY12 and RY13 respectively on the Cleveland (Table 2). The chronic low deer numbers on the Cleveland are likely due to the combination of poor habitat quality, a series of harsh winters, and wolf and black bear predation. We continue to monitor the Cleveland deer population and are developing methods to measure winter habitat vegetation quality and quantity of forage available to determine if Intensive Management tools may be effective to enhance deer numbers in this portion of Southeast Alaska.

In addition to reported harvest data we assume there are illegal and unreported kills. Total harvest in the unit is estimated by combining the reported harvest from mail out surveys and harvest ticket reports with estimated illegal and unreported kills. We estimate, based on local law enforcement citations, recent staff observations, and comments from local hunters, that the unreported and illegal take for Unit 1A equals approximately half of the reported legal harvest (Table 3).

Other Mortality

During this reporting period the number of road-killed deer in the Ketchikan area was higher than the long-term range of 10-15 deer killed per year by vehicles. That could indicate more deer are living near roads or an increase in vehicle traffic near Ketchikan.

Residency and Success. Over 90% of Unit 1A hunters are local residents living within the unit. During the 2 years of this report period, 128 and 145 local hunters were successful for an average success rate of 30% during RY12 and 31% in RY13. This is similar the previous 5-year average success rate (RY07–RY11) for local hunters of 32% (Table 4). On average during the previous 5 years, approximately 19 nonlocal resident hunters have been successful harvesting deer in this area each season with 44% hunters being successful. Nonresident hunters had an average of 24% success during the past 2 years. Most nonresident deer hunters hire registered guides and pursue deer as part of a multi-species big game package hunt, which increases their chances of taking a deer (Table 4).

HABITAT

Assessment

Past and current clearcut logging has altered much deer habitat in Unit 1A. The most serious effects are in higher volume stands below 800 feet elevation, which are critical habitat for deer during winters with heavy snowfall (McNay and Voller 1995). Although young clearcuts can provide considerable forage for deer during snow-free times of year, at 25-30 years following a cut, regenerating trees begin to shade out shrubs and forbs that are important forage species. Closed canopy second-growth forest has low habitat value for deer.

Based on field observations we believe Unit 1A deer populations are currently low and coincide with predictions of the Interagency Habitat Capability Model for deer. Recent timber sales by the Alaska Mental Health Trust Authority and the State of Alaska on Gravina Island, and Forest Service timber sales on Revilla Island will further reduce carrying capacity for deer in these previously popular Unit 1A hunting areas.

The ongoing decline in deer numbers in Unit 1A is likely to continue as the remaining 15–30 year old clearcuts regenerate into closed canopy second-growth forest and available winter range is reduced. As a result, we anticipate hunter success in Unit 1A will also continue to decline. The Tongass Land Management Plan predicts by 2054 few areas within roaded and logged portions of Unit 1A will support enough deer to meet projected hunter demand (USFS 1989). In fact, at the time of this report, Unit 1A deer numbers no longer meet local hunter demand, nor do they meet established Intensive Management deer harvest objectives.

Pellet Survey Trends

We interpret pellet-group transect data cautiously because this type of survey is designed to indicate long-term trends in deer abundance, rather than year to year changes in deer numbers or to estimate deer densities. In most cases we sample 3 transects in unaltered forested habitat within U. S. Forest Service Value Comparison Units (VCU). VCUs correspond to watersheds. We count pellet groups beginning at a marked tree at the beach and survey a transect along a designated compass heading until reaching 1,500 feet elevation, >50% snow cover, or a maximum of 125 20-meter segments. Each 20 meter segment represents a "plot". Each pellet group within a half meter either side of a 20 meter chain pulled along the transect is counted, and totals for each plot are recorded.

For this reporting period we surveyed south Gravina Island (VCU 765) near Dall Head during spring of 2012 (0.53 PG/plot) and spring 2013 (0.44 PG/plot). In 2011 we found 0.43 PG/plot, indicating the population in that area is stable. We also conducted deer pellet surveys on north Gravina Island (VCU 999). In 2013 we found 0.32 pellet groups/plot, which was similar to survey findings in 2010 (0.33 PG/plot) (McCoy 2010 and 2013). Recent logging activity in VCU 999 has fragmented habitat requiring that we establish new transects for future pellet group surveys in this watershed.

An ADF&G supported graduate student project recently developed and tested a deer fecal pellet-based deer abundance monitoring technique. Biologists used path sampling and DNA extracted from fresh deer fecal pellets to generate a modified mark–recapture (MR) estimate of deer abundance in several Southeast Alaska watersheds. Path sampling can be used alone to increase

pellet group encounter rates and improve estimates of deer abundance using pellet group counts, or it can be used as a sampling method for the more expensive but precise DNA-based MR estimate. We hope these new tools will enable managers to more accurately estimate the abundance and trend of deer populations in densely vegetated habitats like those found in Southeast Alaska. Limitations of the DNA-based MR technique include the high cost to obtain and analyze the samples. We also do not know whether this method can be used in an area with low deer densities (Brinkman et al. 2011) and consequently low pellet encounter rates.

During spring 2013 we compared pellet encounter rates of the path sampling technique to our traditional compass bearing pellet transects in one VCU near Ketchikan. At Dall Head on the south end of Gravina Island the path sampling method yielded 0.83 PG/plot, whereas traditional transects in the same area yielded only 0.44 PG/plot. Preliminary results from this pilot work during 2013 in the Bostwick Bay watershed resulted in 0.78 PG/plot although we did not have parallel traditional transects established in that area to compare the new method results.

Path sampling appears to be a more efficient way of locating pellet groups than compass bearing transects, but using it would make future pellet group data difficult to compare to previous data. The DNA-based MR technique for estimating deer abundance has relatively high personnel and lab costs and applying findings from a small study area to a broader landscape requires assuming deer occur at a uniform density. More analysis is required to determine if it can be a viable way to estimate abundance or trend of a population.

CONCLUSIONS AND RECOMMENDATIONS

During this report period the deer harvest in Unit 1A was higher than the previous 5-year average for the subunit but remained about one third of the 700 deer per year harvest objective. The number of hunters pursuing deer in Unit 1A and hunter effort also exceeded the past 5-year average. However, hunter effort and harvest have declined in two historically popular areas.

Harvests from the Cleveland Peninsula near Ketchikan historically averaged over 100 deer per year in the early to mid-1990s with a high of 208 in RY94, but dropped to zero during RY02 and RY03. Deer numbers in this area remain low with an average of 6 deer taken per year during the current report period. We believe the combined effects of logging and several deep-snow winters during the last 10 years are primarily responsible for the decline of this population.

Another area of concern is Gravina Island which traditionally produced a high proportion of Unit 1A deer. However, since RY01 harvests on Gravina have dropped dramatically, and during this report period we estimated only 15 and 13 deer, respectively, were legally harvested from this 100 square mile island adjacent to Ketchikan. We will continue to monitor this population using traditional pellet group surveys and also evaluate new techniques such as the DNA capture-recapture technique. Although logging has reduced important winter habitat, in the absence of harsh winters we believe this population has the potential to grow and produce higher deer harvests.

South Revilla Island continues to produce most of the annual Unit 1A deer harvest. Easy access from Ketchikan makes this area a popular hunting destination. During this report period deer harvest from Revilla averaged 197 deer per year and was similar to the average annual harvest of 206 deer from RY04–RY11.

Unit wide we anticipate that effects of past and ongoing logging in Unit 1A will continue to reduce carrying capacity and winter habitat for deer, and that over the long term deer abundance and consequently hunter harvest will decline. If that happens, Ketchikan hunters will likely shift their effort to nearby Unit 2.

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While this unit report was actually published in 2016, it is part of the set of 2015 unit species management reports, so we suggest citing the report as a 2015 report to maintain its relationship to the other 2015 unit reports

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Table 1. Unit 1A reported deer harvest data, regulatory years 2004 through 2013.

Regulatory year	No. Hunters expanded[b]	No. successful hunters expanded[b]	Percent successful	Hunter days expanded	Average days per hunter	Deer[a] harvested	Average deer per hunter	Average hunter days per deer
2004	546	194	36	2,222	4.1	347	0.6	6.4
2005	258	106	41	1,257	4.9	132	0.5	9.5
2006	340	191	56	1,105	3.3	374	1.1	3.0
2007	241	90	37	1,187	4.9	186	0.8	6.4
2008	250	56	22	1,836	7.3	75	0.3	24.5
2009	283	70	25	844	3.0	138	0.5	6.1
2010	404	140	35	1,622	4.0	189	0.5	8.4
2011	360	133	37	1,074	3.0	176	0.5	6.1
2012	520	162	31	1,888	3.6	236	0.5	8.0
2013	576	173	30	2,334	4.1	265	0.5	8.8
$\bar{x}$	378	132	35	1,537	4.2	212	0.6	8.7

[a] Includes illegal does that were reported killed.

[b] Expanded means harvest totals are estimated for the region based on a sample of approximately 33% of hunters from each community. For each community, expansion factors used to estimate totals from mean responses are calculated as the total number of harvest tickets issued to residents of that community divided by the number of returned questionnaires for that community.

Table 2. Unit 1A deer harvest from major hunt areas, regulatory years 2004 through 2013.

	Regulatory Year	No. hunters expanded[a]	No. successful hunters expanded[a]	Percent successful	Hunter days expanded[a]	Average days per hunter	Average deer per hunter	Deer killed
Gravina Island	2004	140	51	36	478	3.4	0.6	83
	2005	159	45	28	468	2.9	0.3	54
	2006	113	27	24	301	2.7	0.5	57
	2007	107	9	8	377	3.5	0.1	9
	2008	116	14	12	389	3.4	0.2	20
	2009	83	25	30	209	2.5	0.4	31
	2010	89	17	19	309	3.5	0.3	25
	2011	73	15	21	209	2.9	0.2	15
	2012	93	13	14	217	2.3	0.2	15
	2013	90	13	14	246	2.7	0.1	13
	$\bar{x}$	106	23	21	320	3.0	0.3	32
Revilla Island	2004	418	149	36	1,599	3.8	0.6	232
	2005	324	140	43	1,210	3.7	0.6	195
	2006	335	185	55	1,106	3.3	1.0	323
	2007	298	129	43	1,193	4.0	0.8	251
	2008	279	85	30	1,875	6.7	0.4	125
	2009	345	103	30	1,156	3.4	0.5	172
	2010	243	69	28	858	3.5	0.4	98
	2011	257	102	40	721	2.8	0.5	141
	2012	393	125	32	1406	3.6	0.5	182
	2013	403	136	34	1695	4.2	0.5	211
	$\bar{x}$	329	122	37	1282	4.0	0.6	193

	Regulatory Year	No. hunters expanded[a]	No. successful hunters expanded[a]	Percent successful	Hunter days expanded[a]	Average days per hunter	Average deer per hunter	Deer killed
Cleveland Peninsula	2004	58	16	28	100	1.7	0.6	32
	2005	46	17	37	264	5.7	0.6	26
	2006	21	3	14	24	1.1	0.2	4
	2007	37	0	0	80	2.2	0	0
	2008	26	1	4	50	1.9	0	0
	2009	31	5	16	81	2.6	0.2	5
	2010	33	21	64	102	3.1	0.8	25
	2011	14	6	43	53	3.8	0.5	7
	2012	17	6	35	112	14.0	0.5	8
	2013	18	3	17	94	18.8	0.3	5
	$\bar{x}$	30	8	26	96	5.5	0.4	11

[a] Expanded means harvest totals are estimated for the region based on a sample of approximately 33% of hunters from each community. For each community, expansion factors used to estimate totals from mean responses are calculated as the total number of harvest tickets issued to residents of that community divided by the number of returned questionnaires for that community.

Table 3. Unit 1A reported and estimated deer harvest/mortality, regulatory years 2004 through 2013.

Regulatory year	Reported harvest			Unreported & illegal harvest[a]	Estimated total harvest	Estimated No. road kills
	Male	Female	Total			
2004	342	5	347	174	521	1–5
2005	271	8	279	140	419	1–5
2006	461	0	461	231	692	1–5
2007	305	1	306	153	459	1–5
2008	149	5	154	77	231	1–5
2009	216	5	221	111	332	1–5
2010	189	3	154	77	231	1–5
2011	170	6	221	111	332	1–5
2012	236	0	236	118	354	10–15
2013	264	2	266	133	399	10–15
$\bar{x}$	260	4	265	140	405	3–7

[a] Unreported and illegal harvest is estimated at 50% of reported harvest

Table 4. Unit 1A deer hunter residency and success, regulatory years 2004 through 2013.

Regulatory year	Successful				Unsuccessful			
	Local resident[a]	Nonlocal resident	Nonresident	Total	Local resident[a]	Nonlocal resident	Nonresident	Total
2004	179	16	0	194	346	5	0	351
2005	170	23	5	198	225	19	25	269
2006	206	46	10	262	193	17	4	214
2007	139	8	6	153	216	31	10	257
2008	88	18	0	106	233	50	0	283
2009	99	22	24	145	246	26	15	287
2010	88	38	13	139	240	2	10	252
2011	115	7	9	131	197	15	7	219
2012	128	20	12	160	302	24	27	353
2013	145	22	5	172	317	48	25	390
$\bar{x}$	136	22	8	166	252	24	12	288

[a] Local resident includes all hunters living in Unit 1A.

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CHAPTER 2: DEER MANAGEMENT REPORT

From: 1 July 2012
To: 30 June 2014

LOCATION

GAME MANAGEMENT UNIT: 1B (3,000 mi^2)

GEOGRAPHIC DESCRIPTION: Southeast Alaska mainland from Cape Fanshaw to Lemesurier Point

BACKGROUND

Except for isolated pockets, Sitka black-tailed deer inhabit the Unit 1B mainland in low densities. Deer numbers have fluctuated over time with high and low population extremes. Severe winter weather has caused most population declines, and illegal hunting and predation by wolves and bears have extended the length of the declines. Clearcut logging has and will continue to further reduce deer carrying capacity in some areas.

A substantial population decline occurred as a result of a series of severe winters in the late 1960s and early 1970s. The population declines led to restrictive regulations and bag limits in 1973. Unit 1B remained open, with a 1 antlered-deer limit from 1973 to 1980 and a 2 antlered-deer limit from 1981 to the present. However, another deep-snow winter during 2006–2007 further reduced already low populations.

Most of Unit 1B is federal land managed by the U.S. Forest Service (USFS). There are no large communities in Unit 1B, although private in-holdings and small settlements exist at Point Agassiz, Farm Island, and Meyer's Chuck. The subunit is accessible only by boat or airplane although some local logging roads exist for onsite access. Although the communities of Petersburg and Wrangell are located only a short distance west of Unit 1B, much of the hunting effort by individuals in these communities is focused on the Unit 3 islands to the west of the mainland. The deer season in most of neighboring Unit 3 closes a month earlier than Unit 1B, after which time some Petersburg residents shift their deer hunting efforts to the mainland where the season remains open until December 31. From 2002 through 2011, the estimated Unit 1B deer harvest ranged from a low of 34 to a high of 121, and the estimated number of hunters varied from 66 to 157 (Tables 1 and 2).

MANAGEMENT DIRECTION

MANAGEMENT GOALS

The management goal for Unit 1B deer is to maintain healthy, productive populations, sufficiently abundant and resilient to harsh winters to ensure good hunting opportunities and success. The population objective for deer in Unit 1B is from 6,400 to 10,200 deer.

MANAGEMENT OBJECTIVES

- Maintain winter range (<1,500 foot elevation) that is capable of supporting 32 deer/mi^2 (average 1.0 pellet group/20 m^2 plot).
- Monitor long-term trends in deer abundance using pellet-group surveys.
- Monitor deer harvest using harvest ticket reports.

METHODS

Prior to RY11, we estimated Unit 1B harvest data from a regional questionnaire, mailed to a random sample of 33% of deer harvest ticket holders. However, during this reporting period deer harvest data were collected from mandatory hunt report cards issued in conjunction with deer harvest tickets. Relative winter deer densities are periodically measured with spring pellet-group transects in selected areas (ADF&G 2012). All data listed in this report is tallied within regulatory years (RY) (i.e., RY11=1 July 2011–30 June 2012).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Unit 1B pellet-group surveys are currently inadequate to determine deer population trends (Table 3). In spring 2002, the most recent year that pellet-group counts were conducted in the unit, one value comparison unit (VCU) at Horn Cliffs had a pellet-group density of .67 pellet-groups/plot, which was nearly identical to the .60 recorded the previous time the area was surveyed in 1998. In recent years emphasis has been placed on conducting deer pellet counts and monitoring the deer population in neighboring Unit 3 where hunting pressure is much higher and where Department and hunter observations indicate deer populations have remained stagnant at low levels since 2007. As a consequence, we did not conduct pellet-group surveys in Unit 1B during the current report period.

MORTALITY

Harvest

Season and Bag Limit	Resident and Nonresident Hunters
Unit 1B	1 August–31 December 2 bucks

Board of Game Actions and Emergency Orders. The Board of Game (BOG) took no actions and we issued no emergency orders regarding deer hunting in Unit 1B during the report period.

Hunter Harvest. The estimated Unit 1B harvest (including illegal harvest) increased slightly from 87 deer in RY12 to 92 deer in RY13. Both years of this report period remained above the preceding 10-year average (RY02─RY11) of 71 deer per year. During the report period deer harvest was reported in 5 Wildlife Analysis Areas (WAAs), including WAA 1603 (Thomas Bay), WAA 1605 (Muddy River/Patterson Glacier), WAA 1706 (Horn Cliffs/LeConte Bay), WAA 1707 (North Arm of the Stikine River Drainage), and WAA 1817 (Vixen Inlet, Union Bay). The greatest percentages of the unit-wide harvest were taken in WAA 1603 (54%), WAA 1605 (35%), and WAA 1706 (17%).

Hunter Residency and Success. Based on estimates derived from harvest ticket hunt report cards, 13 nonresidents hunted deer in Unit 1B during RY12 and 9 were successful (Table 2). In RY13, an estimated 29 nonresidents hunted deer in the unit and 8 were successful. Deer populations are higher and seasons and bag limits more liberal in Unit 2 and Unit 4. Therefore, those areas attract more nonlocal hunters. Nonetheless, some nonlocal residents, and guided nonresidents in particular, hunt deer incidentally while mountain goat hunting in Unit 1B.

During the report period, the number of hunters increased from 138 in RY12, to 159 in RY13, both well above the preceding 10 year average (RY02─RY11) of 106 hunters per year. The hunter success rate of 48% in RY12 and 38% in RY13, were slightly above and below, respectively, the preceding 10-year average (RY02─RY11) of 46%.

Harvest Chronology. Generally, most harvest in the unit takes place during November, October, and August, in descending order, and such was case during RY12. However, during RY13 most of the harvest occurred in November, but more deer were harvested during August than during October (Table 4).

Transport Methods. Most Unit 1B deer hunters generally reported traveling to their hunting areas by boat (Table 5). In RY12 83% of hunters reported using boats to access their hunt area, 9% used 3- or 4-wheelers, and 3% accessed their hunting area on foot. In RY13 84% of hunters reported using boats to access their hunting area, 6% accessed their hunting area on foot, and 4% used 3- or 4-wheelers. Logging roads provide some all-terrain vehicle (ATV) and highway vehicle access in a few isolated portions of the unit.

Other Mortality

In addition to mortality resulting from legal hunting, other sources of deer mortality include severe winter weather, predation by wolves and bears, poaching, injury and accidents, and starvation or natural causes.

CONCLUSIONS AND RECOMMENDATIONS

Unit 1B deer populations exist in isolated pockets and have patchy distribution. The unit has relatively low deer density overall (due to typically high snow accumulation) and is largely inaccessible. Unit-wide, deer densities vary from moderate in some isolated areas to extremely low in others. Overall, deer populations seem stable with localized variations.

Winter weather, predation, and removal of winter habitat through clearcut logging have the greatest effects on deer population dynamics. Clearcut logging and second-growth stands entering stem exclusion have and will continue to reduce deer carrying capacity in the unit. With recent declines in the deer population and harvest in the northern Unit 3, many residents of Petersburg have begun to shift hunting effort to the adjacent Unit 1B mainland. At this time there are no indications that hunting seasons or bag limits should be further restricted.

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Lowell, R.E. 2015. Unit 1B deer. Chapter 2 pages 2–1 through 2–9 [*In*] P. Harper, editor. Deer management report of survey and inventory activities 1 July 2012–30 June 2014. Alaska Department of Fish and Game, Species Management Report ADF&G/DWC/SMR-2015-3, Juneau.

While this unit report was actually published in 2016, it is part of the set of 2015 unit species management reports, so we suggest citing the report as a 2015 report to maintain its relationship to the other 2015 unit reports.

Table 1. Unit 1B deer harvest, regulatory years 2002–2013.

Regulatory	Estimated legal harvest						Estimated illegal harvest					
year	M	(%)	F	(%)	Unk	Total	M	(%)	F	(%)	Unk	Total
2002[a]	34	(100)				34						34
2003[a]	82	(100)				82						82
2004[a]	38	(100)				38						38
2005[a]	58	(100)				58						58
2006[a]	114	(100)				114						114
2007[a]	43	(100)				43						43
2008[a]	34	(100)				34						34
2009[a]	105	(100)				105			16	(100)		121
2010[a]	103	(100)				103						103
2011[b]	83	(100)				83						83
2012[b]	87	(100)				87						87
2013[b]	89	(100)				89			3	(100)		92

[a] Data from mail out survey.
[b] Data from mandatory harvest ticket reports.

Table 2. Unit 1B deer hunter residency and success, regulatory years 2002–2013.

	Successful					Unsuccessful					
Regulatory year	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Total hunters
2002	30	0	0	30	(33)	52	0	9	61	(67)	91
2003	45	0	0	45	(42)	46	15	0	61	(58)	106
2004	34	0	0	34	(49)	26	10	0	36	(51)	70
2005	47	0	5	52	(43)	48	7	14	69	(57)	121
2006	62	10	5	77	(65)	23	5	13	41	(35)	118
2007	24	3	0	27	(41)	24	6	9	39	(59)	66
2008	19	0	0	19	(25)	57	0	0	57	(75)	76
2009	61	6	6	73	(51)	53	6	6	71	(49)	144
2010	54	7	13	74	(50)	61	0	14	75	(50)	157[b]
2011	57	0	7	64	(56)	36	7	8	51	(44)	115
2012	56	1	9	66	(48)	58	9	4	71	(52)	138[c]
2013	52	0	8	60	(38)	66	9	21	96	(62)	159[d]

[a] Residents of Units 1B, 3, Meyers Chuck, Point Baker, and Port Protection.

[b] Categories do not equal number of hunters because the residency status for 8 hunters was unknown.

[c] Categories do not equal number of hunters because residency status of 1 hunter was unknown.

[d] Categories do not equal number of hunters because residency status of 3 hunters was unknown.

Table 3. Unit 1B deer population trends as indicated by pellet-group surveys, regulatory years 1991 through 2002.

Area	Regulatory year	Mean pellet-groups/plot	Number of plots	95% CI
Frosty Bay (VCU 524)	1991	.70	266	0.55–0.86
Muddy River (VCU 489)	1996	1.53	348	1.26–1.80
Horn Cliffs (VCU 490)	1998	.60	250	0.47–0.74
Madan (VCU 504)	2000	.23	244	0.14–0.31
Harding (VCU 511)	2000	.02	207	0.00–0.05
Horn Cliffs (VCU 490)	2002	.67	290	0.53–0.81

Table 4. Unit 1B deer harvest chronology by month and percent, regulatory years 2002–2013.

Regulatory		Harvest periods							Number of
year	Aug	Sep	Oct	Nov	Dec	Jan	Mar	Unk	deer[a]
2002	12	12	24	52	0	0	0	0	33
2003	20	15	27	38	0	0	0	0	82
2004	33	0	33	34	0	0	0	0	39
2005	43	16	19	22	0	0	0	0	58
2006	14	13	20	42	11	0	0	0	114
2007	56	9	0	28	0	0	0	7	43
2008	0	0	34	66	0	0	0	0	29
2009	17	3	3	64	7	0	0	7	121
2010	5	14	28	38	12	3	0	1	104
2011	19	7	20	45	6	0	0	2	83
2012	14	8	25	52	2	0	0	0	93
2013	23	3	14	43	16	1	0	0	88

[a] May not equal harvest table due to rounding or incomplete reporting.

Table 5. Unit 1B deer hunter effort, percent by transport method, regulatory year's 2002–2013[a].

Regulatory year	Percent of effort							Number of trips
	Airplane	Boat	3- or 4-wheeler	Foot	ORV	Highway vehicle	Horse / Dog Team	Not specified	
2002		91				4		4	NA
2003		84	8	9					NA
2004		95	5						74
2005		97				3			129
2006	3	93						3	118
2007	8	77	6	9					66
2008		100							34
2009		93				3		3	121
2010		83	1	3	1	10		2	160
2011	1	84	3	6		4	1	2	114
2012	1	83	9	3		2		2	138
2013	1	84	4	6		1		4	159

[a] The hunter survey reports transport as total number of hunting trips by method.

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CHAPTER 3: DEER MANAGEMENT REPORT

From: 1 July 2012
To: 30 June 2014

LOCATION

GAME MANAGEMENT UNIT: 1C (7,600 mi^2)

GEOGRAPHIC DESCRIPTION: Southeast Alaska mainland and the islands of Lynn Canal and Stephens Passage lying between Cape Fanshaw and the latitude of Eldred Rock, including Sullivan Island and the drainages of Berners Bay

BACKGROUND

Deer have inhabited northern Southeast Alaska since their migration from southern refugia following the Pleistocene epoch (Klein 1965). Deep snow keeps the number of deer on the mainland lower than that on adjacent islands. A 1963 population estimate suggested about 200,000 deer inhabited Southeast Alaska (Merriam 1963). The regionwide 1962 harvest was about 10,500 deer. Severe winters in 1969 and 1971 resulted in high overwinter mortality and reduced deer numbers across the region (Olson 1979). Hunter surveys began in 1970 and continued annually through 2010. Those surveys evolved from telephone contacts of a few hunters to a mail-out survey of a random list of hunters beginning in 1980. In 2011 the department switched from a mail-out survey to a harvest ticket report that all hunters are required to turn in. Pellet-group counts (Kirchhoff and Pitcher 1988) began in Unit 1C in 1984 and have been conducted on Douglas, Lincoln, and Shelter islands on a nearly annual basis, but rarely in mainland locations.

Winter severity, primarily deep and persistent snow, appears to limit deer populations in Unit 1C. Deer densities were relatively high throughout the early to mid-1990s but declined substantially following the severe winter of 1998–1999. With very mild winters from 2000 through 2005, deer populations across the region rebounded again to high densities. However, winter 2006–2007 was severe with record snowfall recorded in Juneau (Fig. 1). Substantial snow accumulated during November 2006 driving deer to beaches where they were vulnerable to hunters; consequently a substantial increase in harvest was reported in 2006. In addition, during March the Southeast panhandle received snow day after day throughout the month, and by early April, snow was at extreme levels throughout this area. The snowpack restricted deer movements and led to a substantial deer die off across the region including Unit 1C. The severity of winter 2006–2007 and associated deer mortality spurred the department to implement a doe closure in both Units 1C and 4 during December 2007 to protect female deer from further harvest.

Larger islands including Douglas, Shelter, and Lincoln Islands support the highest number of deer in Unit 1C. Less snow accumulates on islands than on the mainland of Unit 1C, and of these islands only Douglas Island has been documented to support substantial numbers of black bears

and recently wolves. Since about 2000 there were sporadic reports of wolves on Douglas Island, but only in recent years have wolves been officially documented. Wolves are known to occur in mainland areas of Unit 1C but are rarely seen, and they likely contribute to maintaining low densities of deer in these areas.

MANAGEMENT DIRECTION

MANAGEMENT GOAL

As established by the Alaska Board of Game during its fall 2000 meeting, in response to the intensive management of game law [AS 16.05.255 (i) (4)], the Unit 1C management goal is to manage the deer population to achieve and maintain a population of 6,200 deer while supporting an annual harvest of 456 deer.

MANAGEMENT OBJECTIVES

- Maintain population densities on Douglas, Lincoln, and Shelter Islands at high levels as reflected by a mean pellet density of 2.0 pellet groups per plot.
- Monitor the deer harvest through general season harvest ticket reports.
- Participate in annual deer-pellet surveys.

METHODS

Historically, the department sent deer harvest surveys to a randomly selected group of hunters (approx. 33%) to collect deer harvest data. The survey was designed to collect information on hunter effort, hunt location, hunt timing, number of days hunted, transportation used, and the number of deer harvested. Survey results for hunter effort, success, and kill location were expanded to estimate results for all harvest ticket holders. This survey was implemented through regulatory year (RY) 2010 (a regulatory year begins 1 July and ends 30 June, e.g., RY10 = 1 July 2010–30 June 2011). However at the fall 2010 board meeting in Southeast Alaska the department submitted a proposal to change our harvest assessment methodology from the survey format to a harvest ticket report. The proposal passed, and the change was implemented in July 2011. The report is attached to harvest tickets, and all hunters are required to submit reports. Our harvest data for RY12 and RY13 is based on the harvest ticket report. One problem encountered since the implementation of the harvest ticket is that the department has encouraged hunters to report their hunting effort and harvest "online." The online system has caused confusion or did not work properly, and some hunters got frustrated with the reporting process and simply gave up. We do not know how this affected the data on hunting effort and harvest for RY12, however the department has spent a significant amount of time improving the online system leading up to RY13.

Since 1984, Unit 1C pellet-group surveys have been conducted to gauge deer population trends. Pellet transects were conducted on Douglas and Shelter Islands in Unit 1C during the report period (Table 1). Data in this report were compiled by regulatory year, with the current report period pertaining to RY12 and RY13.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

No population estimates are available for Unit 1C deer, but we monitor general population trends using deer pellet data (McCoy, 2011) and harvest report data. North Douglas Island pellet-group densities increased in RY12, however decreased significantly in RY13 (Table 1). Inner Point is located on the southwest side of Douglas Island and RY12 resulted in the highest mean count of 2.41 pellet groups per plot since 1991. Mean pellet group counts also decreased at Inner Point in RY13.

Shelter Island pellet surveys were conducted in RY12 but not in RY13. The 2012 survey resulted in a mean count of 2.14 pellet groups per plot, which is the second highest count for the area (Table 1) and significantly higher than either RY08 or RY09. The Shelter Island transects have not been done annually like Douglas Island. Mean pellet density for the past 10 years when surveys have been conducted (RY96–RY10) is 1.55 pellet groups per plot.

We do not think the decline in pellet group densities from RY12 to RY13 reflect an actual decline in the population. The winter 2012–2013 had near normal snowfall and deep snow accumulated at higher elevations. As snow accumulates at higher elevations, deer move downhill resulting in an increase in the overwinter density of deer and pellet groups at lower elevations. Total snowfall for winter 2013–2014 was also near normal, but persistent warm periods resulted in lower than normal accumulations at higher elevations, and we believe deer were not forced to use lower elevation habitat. Deer pellet transects end at 1,500 feet elevation. It is possible that a significant number of deer wintered above that elevation, so their pellets were not captured by the survey and deer abundance based on pellet groups appeared to decline.

MORTALITY

Harvest

Seasons and Bag Limits.

Area	Season	Resident and nonresident hunters
Unit 1C		
Douglas, Lincoln, Shelter, and Sullivan Islands	1 August–31 December	4 deer; antlerless deer may be taken only from 15 September–31 December
Unit 1C Remainder	1 August–31 December	2 antlered deer

Alaska Board of Game Actions and Emergency Orders. A proposal submitted during the 2013 Board of Game meeting to increase the deer bag limit on the mainland failed due to the depressed number of deer currently available in those locations. No emergency orders were issued for deer in Unit 1C during the report period.

Harvest by Hunters. Based on data gathered from deer harvest ticket report cards, hunters in Unit 1C killed 368 deer in RY12 and 413 in RY11 (Table 2), with bucks composing 69% and

56% of the annual harvest respectively. The majority of the Unit 1C deer harvest came from Douglas Island during the report period; 270 deer in RY12, and 257 deer in RY13. Due to its proximity to Juneau, accessibility by road, and higher density of deer, Douglas Island historically has produced the highest deer harvest in Unit 1C.

The deer harvest on Shelter and adjacent Lincoln Island decreased slightly in RY12, however increased significantly in RY13. In RY12, 34 deer were harvested on Shelter-Lincoln Islands; and in RY13, 80 deer were taken. The RY13 harvest is higher than it has been in recent years and is approaching a harvest level similar to those prior to the severe winter of 2006–2007 (Fig. 1). The increased harvest combined with higher pellet group density suggest deer numbers continue to rebound on the islands. Shelter and Lincoln Islands receive less hunting pressure than Douglas Island.

The deer harvest on Sullivan Island decreased, with 21 deer reported taken in RY12, and 18 deer taken in RY13. Currently, the geographic unit used to monitor deer harvest in this area includes a portion of the Unit 1C mainland along the Sullivan River. Although it is possible that a few deer were taken from the mainland we are confident that the majority, if not all, deer harvested in this area were taken on Sullivan Island.

Other less hunted areas, such as the mainland near Juneau, the Chilkat Range, Holkum Bay, and Cape Fanshaw, represent a small percentage of the Unit 1C deer harvest. No data are available concerning the deer population in these mainland areas, but low harvest and a significant number of days afield required to harvest a mainland deer suggest low numbers.

Hunter Residency and Success. During both years of the report period most hunters (85%) were Unit 1C residents; nonlocal residents composed the majority of the remaining hunters. Thirteen nonresident hunters reported effort in Unit 1C during RY12; 3 were successful. In RY13, 35 nonresidents reported hunting in Unit 1C and 2 were successful (Table 3). Hunter success rates decreased from an average of 31% during RY02–11 to 27% in RY12 and 28% in RY13 (Table 3). Unitwide, hunters spent an average of 8.9 days hunting per deer taken in RY12 and 8.3 days per deer in RY13 (Table 4). The average deer per hunter was 0.4 in both RY12 and RY13 (Table 4). On Douglas Island hunters averaged 9.6 days to take a deer in both RY12 and RY13, taking 0.4 and 0.3 deer per hunter in RY12 and RY13, respectively. On Shelter Island, hunters spent 3.5 days on average to take a deer in RY12; and in RY13, spent an average of 4.1 days to take a deer. Shelter Island hunters averaged 0.5 deer per hunter in RY12 and 0.7 deer per hunter in RY13. On Sullivan Island, hunter success was relatively high with 0.8 deer per hunter in RY12, and 0.6 deer per hunter in RY11. Hunters spent 2.5 days hunting per deer in RY12, and 4.6 days per deer in RY13.

Transport Methods. As in the past, most hunters used highway vehicles or boats to access hunting areas, with foot access being the third most popular method. During this report period 47% of hunters used highway vehicles for access, 27% used boats, 21% accessed hunting areas by walking, and approximately 5% used an airplane, off-road vehicle, or other modes of transportation. Hunters most commonly used highway vehicle and foot access while hunting the east and north sides of Douglas Island; boats were used for hunting on west Douglas, Shelter, Lincoln, and Sullivan Islands. As previously noted, Douglas Island accounted for the majority of the Unit 1C deer harvest; many of the Douglas Island hunting areas are accessible by road.

Although the majority of hunters used highway vehicles to access hunting areas and enjoyed good success during the report period, the number of deer harvested by boat-based hunters was higher (0.6 deer per hunter) and the number of days per deer (4.2 days per deer) was lower than hunters using highway vehicles (0.4 and 10, respectively) to access hunting areas.

Other Mortality

During both years of the report period an estimated 7–10 deer annually were reported to have been struck by vehicles and killed on Juneau roads. This estimate is low because not all vehicle-deer collisions are reported to the department. During spring, deer congregate on highway shoulders to eat emerging grass. We issue public service announcements annually to remind motorists to be aware of deer and other wildlife along roads.

CONCLUSIONS AND RECOMMENDATIONS

Douglas and Shelter Islands were the only pellet group transects surveyed during this report period. Finding staff available to conduct the surveys was difficult, and we determined surveying Sullivan Island was a high priority for the next report period. Transects were not conducted on Lincoln Island, or in mainland areas of Unit 1C during the report period. Only one transect (Inner Point) met the management objective of 2.0 pellet groups per plot during the report period. Overall, pellet group densities increased in Unit 1C in 2012 and decreased in 2013. We speculate that the decrease in pellet group densities in 2013 is related to limited snowfall not concentrating deer in normal wintering areas (Fig. 1). Harvest by hunters suggests that deer numbers have remained stable during the report period.

The harvest management objective of 456 deer was not met in either RY12 or RY13. During those years, relatively mild winters and below average snowfall likely allowed deer to remain at higher elevations where they were less accessible to hunters. In years when deep snow accumulates at higher elevations during hunting season deer concentrate at lower elevations, which can result in higher harvest. Still, the current harvest objective has only been met during 7 of the past 24 years, indicating it may be unrealistically high. Deer populations in Unit 1C are largely driven by winter severity. There are no workable options for improving habitat, predator numbers in areas where most people hunt are low, and under the current harvest strategy populations recover in a few years following a severe winter. Considering that hunter effort and success remain within historical ranges and that we have no workable options for increasing deer abundance in this unit, we should consider reducing the harvest objective to a level that can be met during more years. Based on historical data, an annual harvest objective for Unit 1C in the range of 350–375 deer would be achieved in 55–65% of years.

We should also consider conducting more frequent pellet group transects in mainland areas because we believe an increasing number of hunters are interested in hunting there. Based on observations and anecdotal information, mainland deer numbers near Juneau appear to be stable, but will likely remain at low densities due to snowfall and the presence of predators such as wolves and coyotes. The natural ability of deer to rebound quickly in areas without significant predator populations, such as islands in Unit 1C, should aid the growth of the deer population. Opportunities to harvest Sitka black-tailed deer will likely improve in the coming years if winters remain mild.

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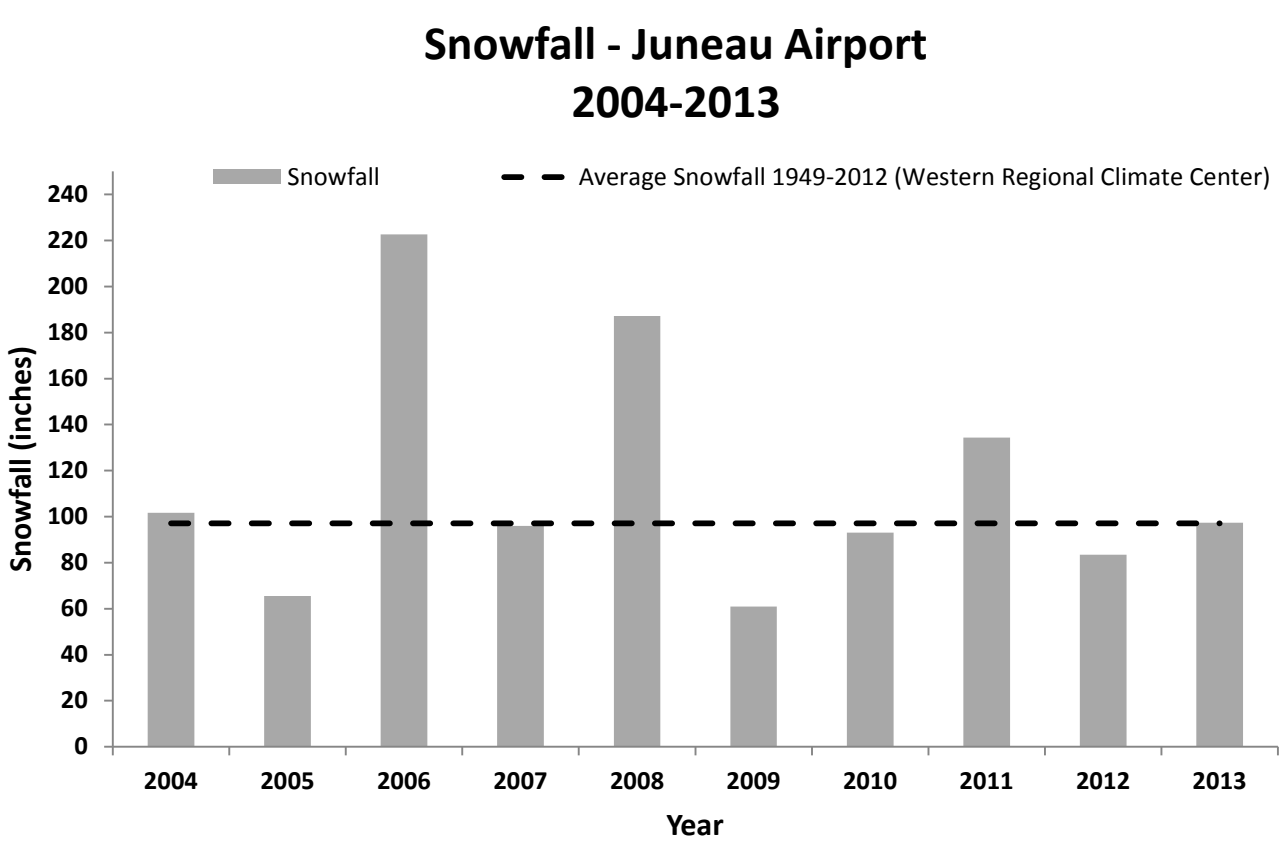

Figure 1. Annual winter snowfall measured at the Juneau airport, Southeast Alaska, 2004–2013. The average snowfall is depicted as a dashed line. (Data: Weather Forecast Office, Juneau).

Table 1. Unit 1C deer population trends as indicated by pellet-group surveys, Southeast Alaska, regulatory years[a] 1986–2013.

Area	Regulatory year	Groups/Plot	Mean pellet of plots	Number 95% CI
Kensington (VCU[b] 20)	1993	0.00	180	
Portland Island (VCU 27)	1986	0.99	381	0.87–1.12
North Douglas (VCU 35)	1993	0.91	315	0.74–1.09
	1994	0.86	306	0.70–1.02
	1995	0.97	323	0.81–1.12
	1996	1.43	323	1.24–1.62
	1997	1.55	321	1.32–1.77
	1998	1.03	273	0.86–1.19
	1999	0.88	282	0.71–1.04
	2000	1.01	335	0.85–1.17
	2001	0.68	200	0.50–0.85
	2002	0.93	267	0.77–1.09
	2003	1.52	288	1.28–1.76
	2004	2.08	151	1.61–2.54
	2005	2.02	263	1.74–2.29
	2006	2.28	165	1.83–2.73
	2007	2.84	316	2.49–3.19
	2008	1.85	220	1.57–2.14
	2009	1.07	312	0.89–1.24
	2010	1.53	328	1.30–1.75
	2011	1.21	253	1.02–2.70
	2012	1.56	306	1.38–1.75
	2013	0.83	242	0.69–0.97
Inner Point (VCU 36)	1991	2.05	204	1.75–2.36
	1994	1.41	254	1.21–1.60
	1995	1.68	240	1.45–1.91
	1996	2.36	252	2.08–2.64
	1997	0.84	280	0.69–0.98
	1998	1.06	239	0.87–1.25
	1999	1.09	280	0.90–1.28
	2001	0.82	198	0.64–1.00
	2002	0.76	272	0.60–0.92
	2003	0.88	242	0.68–1.08
	2005	2.33	147	1.93–2.72
	2006	2.10	182	1.70–2.50
	2007	1.59	232	1.32–1.85
	2008	1.44	268	1.20–1.68
	2009	1.52	263	1.30–1.74
	2010	2.12	267	1.29–1.74

Area	Regulatory year	Groups/Plot	Mean pellet of plots	Number 95% CI
	2012	2.41	250	2.12–2.70
	2013	1.55	267	1.37–1.73
Rhine Creek (VCU 38)	1996	0.31	108	0.14–0.47
Harbor Island (VCU 65)	1986	1.28	200	1.00–1.56
Couverden (VCU 117)	1992	0.35	350	0.27–0.44
Shelter Island (VCU 124)	1988	1.42	300	1.23–1.62
	1989	1.60	300	1.37–1.82
	1992	2.00	250	1.73–2.26
	1994	1.38	297	1.20–1.56
	1996	2.51	312	2.23–2.78
	1998	1.63	290	1.42–1.85
	2000	2.07	231	1.79–2.36
	2002	1.41	300	1.19–1.63
	2004	1.86	200	1.59–2.13
	2006	1.10	321	0.97–1.41
	2007	1.05	321	0.90–1.21
	2008	0.71	250	0.57–0.84
	2009	1.27	325	1.10–1.44
	2010	1.86	333	1.66–2.07
	2012	2.14	294	1.89–2.39
Lincoln Island (VCU 124)	1997	1.57	207	1.27–1.77
	2006	0.84	213	0.62–1.06
Sullivan Island (VCU 94)	1989	1.40	250	1.17–1.62
	1998	0.64	66	0.35–0.93
	2011	1.47	206	1.24–3.13

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 1986 = 1 July 1986–30 June 1987.
[b] VCU = Value comparison units.

Table 2. Unit 1C annual deer harvest[a], Southeast Alaska, regulatory years[b] 1997–2013.

Regulatory year	Males	Females	Estimated total
1997	342	96	438
1998	272	116	388
1999	196	139	335
2000	172	69	241
2001	274	71	345
2002	217	141	358
2003	322	137	459
2004	240	68	308
2005	281	122	403
2006	393	284	677
2007	148	30	178
2008	209	127	336
2009	217	96	313
2010	345	163	508
2011	271	116	387
2012	255	113	368
2013	230	183	413

[a] Data from expanded results of hunter surveys.
[b] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 1997 = 1 July 1997–30 June 1998.

Table 3. Unit 1C deer hunter residency and success, Southeast Alaska, regulatory years[a] 1990–2013.

	Successful						Unsuccessful						
Regulatory year	Local[b] resident	Nonlocal resident	Nonresident	Unk	Total	(%)	Local[b] resident	Nonlocal resident	Nonresident	Unk	Total	(%)	Total hunters
1990	291	32	2	0	325	(34)	564	56	3	0	623	(66)	948
1991	209	21	0	0	230	(28)	551	42	4	0	597	(72)	827
1992	321	15	6	0	342	(36)	550	63	5	0	618	(64)	960
1993	295	8	0	0	303	(34)	549	50	2	0	601	(66)	904
1994	359	4	2	0	365	(36)	574	67	11	0	652	(64)	1,017
1995	210	0	0	0	210	(21)	670	92	18	0	780	(79)	990
1996	247	10	0	0	257	n/a	–[c]	–[c]	–[c]	–[c]	–[c]	–[c]	–[c]
1997	241	4	0	0	245	(28)	573	33	9	0	615	(72)	860
1998	217	6	0	0	223	(23)	672	46	8	0	726	(77)	949
1999	201	26	0	0	227	(27)	576	49	0	0	625	(73)	852
2000	176	4	5	0	185	(23)	593	20	6	0	619	(77)	804
2001	240	15	0	0	255	(29)	555	61	10	0	626	(71)	881
2002	218	9	0	0	227	(29)	526	41	0	0	567	(71)	794
2003	293	14	0	0	307	(34)	541	49	0	0	590	(66)	897
2004	224	23	0	0	247	(30)	544	44	0	0	588	(70)	835
2005	237	24	5	0	266	(28)	626	48	14	0	688	(72)	954
2006	387	37	10	6	440	(47)	437	48	11	0	496	(53)	936
2007	116	13	5	0	134	(19)	520	42	10	0	572	(81)	706
2008	203	21	0	0	224	(26)	572	55	0	0	627	(74)	851
2009	197	15	0	0	212	(27)	520	52	13	0	585	(73)	797
2010	281	32	0	0	313	(35)	520	46	13	8	587	(65)	900
2011	247	27	2	5	281	(34)	455	42	27	14	538	(66)	819
2012	217	33	3	4	257	(27)	608	68	10	9	695	(73)	952
2013	235	37	2	4	278	(28)	597	80	33	11	721	(72)	999

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 1990 = 1 July 1990–30 June 1991.
[b] Local means the hunter is a resident of Unit 1C.
[c] Data for unsuccessful hunters not available due to changes in survey.

Table 4. Unit 1C hunter effort and success (by number), Southeast Alaska, regulatory years[a] 1990–2013.

Regulatory year	Hunters	Days hunted	Deer killed	Deer/hunter	Days/deer
1990	948	3,262	499	0.5	6.5
1991	827	2,993	417	0.5	7.2
1992	959	3,202	511	0.5	6.3
1993	904	2,950	579	0.6	5.1
1994	1,017	4,151	659	0.6	6.3
1995	990	3,968	311	0.3	12.8
1996	257	_[b]	_[b]	_[b]	_[b]
1997	861	3,819	438	0.5	8.7
1998	950	3,396	388	0.4	8.7
1999	851	2,327	335	0.4	7.0
2000	803	2,312	241	0.3	9.6
2001	881	2,764	345	0.4	8.0
2002	795	2,563	358	0.5	7.2
2003	897	2,925	459	0.5	6.4
2004	835	3,115	307	0.4	10.1
2005	954	3,577	404	0.4	8.9
2006	937	3,188	676	0.7	4.7
2007	706	2,778	178	0.3	15.6
2008	853	3,580	336	0.4	10.7
2009	797	2,704	313	0.4	8.6
2010	901	3,341	508	0.6	6.6
2011	820	2,284	388	0.5	5.9
2012	952	3,282	368	0.4	8.9
2013	998	3,436	413	0.4	8.3

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 1990 = 1 July 1990–30 June 1991.
[b] Data not available due to changes in survey.

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CHAPTER 4: DEER MANAGEMENT REPORT

From: 1 July 2012
To: 30 June 2014

LOCATION

GAME MANAGEMENT UNIT: Unit 2 (3,600 mi^2)

GEOGRAPHIC DESCRIPTION: Prince of Wales (POW) Island and adjacent islands south of Sumner Strait and west of Kashevarof Passage and Clarence Strait

BACKGROUND

Sitka black-tailed deer are found throughout Unit 2, both on Prince of Wales Island (POW) and the smaller associated islands. Deer populations fluctuate, primarily in response to severe winter weather, unfavorable changes in habitat resulting from clearcut logging, and predation by wolves and black bears. Deer abundance appears to be stable or slowly increasing, likely in response to mild winters during this reporting period in conjunction with low wolf and bear numbers. Managers continue to monitor range conditions for signs of over-abundance, but for now deer populations in Unit 2 appear healthy compared to other adjacent areas such as Units 1A and 3 where deer numbers are low.

Sitka black-tailed deer are highly valued for both their meat and their trophy value on POW. POW has a reputation for producing large-bodied and large-antlered bucks with a number of bucks qualify for the Boone and Crockett and Pope and Young record books each year. Winter severity, weather conditions during hunting season, and deer population levels are the main regulators of deer harvests. The annual harvest in Unit 2 this reporting period averaged 3,696 compared to 2,926 for the previous 10-year period (RY02–RY11; Table 1).

Hunting does is currently allowed under federal regulations however the practice remains controversial. In 1995, despite state opposition, the Federal Subsistence Board implemented a 2.5-month-long antlerless deer season in Unit 2. The federal antlerless deer season remains in effect, running from October 15 through December 31, and allows hunters who qualify to participate in federal subsistence hunts to harvest 1 female deer as part of their 5-deer bag limit. A 3-week state antlerless season was initiated in Unit 2 during regulatory year (RY) 1987, but was discontinued a year later due to public opposition. The bag limit remains 4 bucks for individuals hunting under state regulations.

The current population of Unit 2 is about 3,600 people, down from nearly 6,000 at the turn of the century. The population peaked in the 1960s and 1970s and declined along with the decline of the old-growth logging industry. The City of Craig is the largest community in Unit 2, with

approximately 1,100 residents, followed by the communities of Klawock and Thorne Bay. Despite the recent decline in the human population, demand for deer hunting opportunity in Unit 2 remains strong. In addition to local residents, Unit 2 is also a popular deer hunting area for residents of other Southeast Alaska communities, particularly Ketchikan, and nonresident hunters.

Clearcut logging has been widespread in Unit 2 since the late 1950s. Counting National Forest, state, and private land, over 300,000 acres of old growth forest have been logged, and over 5,000 miles of roads have been built. Logging and road-building are ongoing, albeit at lower levels than in the past. Road building has greatly increased hunter access, and logging has focused on productive old-growth forest below 800 feet elevation, which is critical habitat for deer during winters with significant snow. Further, 25–35 years after being clearcut, regenerating stands of trees form dense even-aged canopies which block most light and shade-out forbs and shrubs that deer depend on as forage. To date thinning schemes have shown little potential to improve value of regenerating stands for deer. Consequently, it appears that much formerly productive deer habitat in Unit 2 will remain unproductive for many decades and the population will remain vulnerable to die-offs during winters with deep snow.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

Action by the Board of Game in fall 2000 established a Unit 2 Intensive Management (IM) population objective of 71,000 deer and a harvest objective of 2,700 deer. This action was based on the board identifying the Unit 2 population as important for satisfying high levels of human consumptive use.

MANAGEMENT OBJECTIVES

- Maintain populations in excess of 45 deer per mi^2 of winter range, as determined by mean pellet-group densities of 1.4 pellet groups per plot (Kirchhoff 1990).

METHODS

We collected population information from anecdotal reports provided by hunters and from field observations. We were unable to conduct spring pellet-group surveys and spring mortality transects during the reporting period because regional priorities shifted to more focused data collection in Units 1A and 3 associated with intensive management activities. We intend to conduct spring pellet counts again beginning in 2015. A new technique for estimating deer abundance developed on POW by Todd Brinkman, PhD identifies individual deer using fecal DNA and uses a DNA-based mark-recapture technique to measure abundance within specific study sites, usually a watershed (Brinkman 2009). Although the technique appears promising, questions remain about applying the study area findings to a larger landscape.

From 1980 (except 1981) through 2010 we collected deer harvest information using a region-wide questionnaire mailed to a random sample of 33% of deer harvest ticket holders (ADF&G 2012). Information provided by respondents was expanded to estimate total harvest for the unit. To address questions surrounding allocation of deer harvest among residents of Unit 2, other Alaska residents, and nonresident hunters, from 2005 through 2010 Unit 2 deer hunters were required to obtain and complete a deer harvest report form specific to the unit. Those hunters

were removed from the region-wide mail-out survey. Beginning in fall 2011, we began collecting harvest information using a statewide deer harvest ticket report, similar to that used for species such as black bear, moose, caribou and sheep. Those data are also expanded to account for harvest ticket holders who did not respond. A preliminary analysis found that the deer hunter questionnaire and new harvest ticket reports produced comparable results.

Please note that there may be discrepancies between data in this report and management reports from previous reporting periods. DWC deleted many records and reloaded data from 1997-2010 in the WinfoNet database as a result of questionable records found in the database. In most cases, these data differences are minimal and the current data is the best available.

RESULTS AND DISCUSSION

MORTALITY

Harvest

Season and Bag Limit	Resident and Nonresident Hunters	
Unit 2	1 August–31 December	4 bucks
	Federally Qualified Subsistence Hunters	
	24 July–31 December	5 deer, however, no more than one may be an antlerless deer.

Board of Game Actions and Emergency Orders. The Board of Game took no actions affecting Unit 2 deer hunting, and no emergency orders were issued during the report period.

Hunter Harvest. Deer harvest in Unit 2 during the reporting period was estimated at 3,690 (RY12) and 3,702 (RY13) deer, both well above the IM harvest objective of 2,700 and the 10-year average annual harvest (RY02–RY11) of 2,926. The number of deer harvested per hunter was 1.5 in both RY12 and RY13, identical to the 10-year average (RY02–RY11 of 1.5 deer per hunter. The average of 3.5 and 3.4 hunter days per deer during RY12 and RY13, respectively, was similar to the 10-year average (RY02–RY11) of 3.5 days per deer. Overall hunter success rates in RY12 and RY13 were also very high at 73% each year, and slightly higher than the 10-year average (RY02–RY11) of 71% success (Table 1). Harvest during RY12 and RY13 on POW itself was 3,144 and 3,143 deer, respectively, above the 10-year average (RY02–RY11) of 2,655 (Table 2). This harvest data is consistent with anecdotal and field observations in Unit 2, which all suggest that deer in Unit 2 are stable to increasing and relatively abundant.

Hunter Residency and Success. Ketchikan hunters' share of the Unit 2 harvest during the report period was 30%, similar to the 10-year average (RY02–RY11) of 29% (Table 3). An estimated 48% of the hunters harvesting deer in Unit 2 during this report period were residents of POW. Residents of POW had a higher success rate than other hunters, with residents enjoying an average success rate of 82% during the report period (Table 4). Higher than average numbers of nonresidents hunted deer in Unit 2 during this report period. Nonresident hunters numbered 198 and 212 during RY12 and RY13, respectively. The 10-year average (RY02–RY11) is 142 per year. The nonresident success rate during the report period was 56%, slightly higher than the 10-year average (RY02–RY11) of 50%. This indicates a robust deer population and perhaps an increase in guided hunting activity (Table 4). As black bear hunting opportunities diminish on

POW many lodges, outfitters and guides may be shifting focus to deer hunting. Over the past 5 years the ADF&G office in Craig has noted an increase in nonresident inquiries about deer hunting in Unit 2, particularly from hunters interested in taking a Sitka black-tailed deer as part of their North American "deer slam." Recent harsh winters on Kodiak Island in Unit 8 caused significant declines in that deer population. Some increase in nonresident hunters on POW may be a result of nonresidents who normally hunt Kodiak shifting effort to POW. As Kodiak deer rebound, managers expect nonresident focus to shift back to that unit.

The average annual reported doe harvest over the past 10 seasons (RY02–RY11) has been 108, or approximately 3.7% of the overall reported harvest. During the RY12 season, 109 does were reported harvested under federal subsistence permits in Unit 2. During RY13, hunters reported the harvest of 91 does (Table 5). With populations nearing carrying capacity in potions of Unit 2, a limited doe harvest is warranted. However, anecdotal evidence and testimony from local residents suggests that the doe harvest by federal subsistence hunters is likely substantially under-reported.

Despite abundant deer, historically high harvests, and liberal seasons and bag limits, hunters from rural communities continue to complain about their inability to meet their subsistence needs. In some cases data from hunter reports substantiate those concerns. Among rural residents there is a perception of increased hunting pressure. The number of hunters for this reporting period (2,468 and 2,459 in RY12 and RY13, respectively), are the highest in the last 10 years (RY02–RY11), and 22% higher than the 10-year average (Table 1). The recently enacted Access Travel Management Plan (ATM) by the USFS will close 150 miles of existing logging roads to highway vehicles and convert an additional 222 miles from highway vehicle use to OHV use only (USDA 2009)**.** Road closures may direct the same number of hunters into smaller areas, affirming the perception of increasingly crowded hunting conditions. In addition, as clear-cuts regenerate, deer become less visible, fueling speculation that fewer deer are available for harvest. State and federal managers will continue to struggle with balancing ADF&G's mission of wildlife conservation with the Federal Subsistence Board's mission to provide subsistence resources for rural residents under the Alaska National Interest Lands Conservation Act.

Harvest Chronology. Most Unit 2 deer are harvested during August, October and November. From 2004 through 2013, August and October harvests were roughly equal accounting for 16% and 17% of the harvest, respectively. August harvest levels were traditionally much higher but beginning in 2003 significant changes were implemented to federal deer hunting regulations that restricted non-federally qualifying hunters from participating during the first 2 weeks of August. Federally qualified hunters are also taking advantage of the late July opening day for the season. For hunters not qualified to hunt under federal regulations, November, which coincides with the rut, is now by far the most popular period to hunt deer and accounts for roughly 42% of the total harvest (Table 6).

Transport Methods. With the extensive road system in Unit 2, highway vehicles typically represent the primary method of access for deer hunters. During this reporting period 62% of hunters accessed opportunity using highway vehicles, whereas only about 27% of deer hunters used boats. Those proportions compare to 66% and 24% respectively for the 10-year average (RY02 – RY11) (Table 7).

Other Mortality

We believe that Unit 2 has one of the highest illegal and unreported harvest rates in the region, estimated to be equal to the legal harvest (Table 5). That estimate is based on anecdotal reports, interviews with law enforcement personnel, and fates of radio-collared deer. If that estimate is correct, over 4% of the estimated 75,000 deer in Unit 2 may be illegally harvested each year. This high illegal take is likely due in large part to the extensive and remote road system and few law enforcement personnel patrolling the unit.

Flynn and Suring (1989) reported that actual mortality from legal hunting could be 38% greater than the estimated harvest because of unknown or unreported crippling loss. Field observations and voluntary reports of wounding loss suggest that this estimate might be conservative.

Historically and prior to extensive road paving on the island, deer/vehicle collisions were rare (10–25 deer/year) and were not considered a significant source of mortality. However, the collision risk increased with completion in 2003 of extensive new POW highway paving projects, which now extend from Craig to Coffman Cove and east to Thorne Bay. Construction and paving of the main 30 road to Coffman Cove was completed in 2008. Construction is currently underway to extend the paved surface of Road 20 to Whale Pass. Higher vehicle speeds, as well as an attractive food source created by planting grass for erosion control near the roads will likely cause more deer/vehicle collisions, prompting managers to raise estimates to 30-50 deer per year beginning in 2004.

HABITAT

Assessment

Although timber harvest peaked in the 1980's and early 1990's, occasional large sales continue. The recent Logjam Timber sale, involving 73 million board feet of timber, resulted in clear-cut logging of approximately 3,400 acres of old-growth forest. Another highly controversial sale called the Big Thorne was scheduled to begin in April 2015. The record of decision (ROD) for this sale was signed in June 2013 but was delayed by the regional forester pending review of wolf habitat concerns and also delayed by lawsuits from several conservation organizations. A federal judge upheld the ROD in March 2015, although defendants in the case have appealed the decision and requested an injunction. This sale will authorize an additional 149 million board feet of timber and approximately 6,200 acres old growth forest to be clearcut, making it the largest timber sale on the Tongass National Forest in decades. Many of the old growth stands slated for harvest are among the last remaining stands of high quality deer winter habitat and travel corridors within their respective drainages within the central part of POW. In addition, the Sealaska Lands Bill passed Congress in December 2014. That bill transfers 70,000 acres or approximately 110 square miles of old-growth forest from the Tongass National Forest to the Sealaska Corporation. Most of that land is within Unit 2 and will be subject to clearcut logging. Sizeable units on State of Alaska and Alaska Mental Health Trust lands in the Control Junction and Coffman Cove areas are currently being logged, further contributing to the loss of high quality deer habitat.

Although early seral stages of clear-cuts provide abundant deer forage during snow free periods, within 20 to 30 years the regenerating second-growth forest reaches the stem exclusion stage where the canopy closes and shades out understory plants important for deer forage. Road

construction associated with logging activities continually increases access to deer and other wildlife habitat. As clearcut logging continues to remove old-growth forest habitat in Unit 2, deer populations are expected to decline. In a study of the relationship between habitat and predation of Columbian black-tailed deer on Vancouver Island, British Columbia, McNay and Voller (1995) found that logging and associated road construction fragments deer winter range and concentrates predation on resident deer. They concluded that large blocks of intact old-growth forest at low elevations are essential to sustaining healthy deer populations.

Old-growth forest retains important winter forage and intercepts snowfall making that forage more available to deer during periods of deep snow. Population models estimate declines in carrying capacity for deer of 50–60% by the end of the U. S. Forest Service planned logging rotation in 2054. By then we expect few areas within road accessible and logged portions of Unit 2 will meet projected hunter demand for deer (USFS 1989). The USFS is investigating thinning and other ways of creating openings in the canopy of second-growth forest, but any benefits to deer may be short-lived and will not provide winter habitat (Farmer et. al. 2006). Long-term consequences of habitat loss are likely to include reductions in deer hunting opportunity and an inability to provide for subsistence needs.

CONCLUSIONS AND RECOMMENDATIONS

According to estimates based on harvest ticket reports, the Unit 2 harvest objective of 2,700 deer per year was exceeded during both years of this reporting period. In fact, anecdotal accounts from hunters and public testimony during a multi-agency Unit 2 deer planning effort in 2005 (Unit 2 Deer Planning Subcommittee 2005) suggested that we probably continue to significantly underestimate the total number of deer harvested because illegal and unreported harvest appear to be substantial. If that is the case, actual harvest may be more than double the harvest objective.

The reported harvest along with average deer per hunter and the average hunter days per deer during the past 2 years indicate good recruitment and stable to increasing deer numbers in Unit 2. Both the total number of hunters and the number of successful hunters increased during the reporting period, and despite increased hunting pressure success rates remain high. However, managers are concerned that in some drainages the population may be near carrying capacity, and that a severe winter could result in a substantial die-off.

We should better inform the public regarding the effects of logging on deer populations, so that they are aware of tradeoffs between timber harvest and wildlife. We anticipate that logging related reductions in important winter habitat will reduce deer carrying capacity for decades to come. The long term consequences of habitat loss include loss of hunting opportunity and the inability to provide for subsistence needs of rural residents (Wood 1990, Larsen 1993).

Effects of climate change on deer and deer habitat remain unknown. Anticipated declines in deer carrying capacity coupled with steady or increasing demand for deer will require that we closely monitor Unit 2 deer populations and develop management strategies to adapt to changing conditions.

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While this unit report was actually published in 2016, it is part of the set of 2015 unit species management reports, so we suggest citing the report as a 2015 report to maintain its relationship to the other 2015 unit reports.

Product names used in this publication are included for completeness but do not constitute product endorsement.

Table 1. Unit 2 deer harvest data, regulatory years 2002 through 2013.

Regulatory year	No. hunters	No. successful hunters	Percent successful	Total hunter days	Average hunter days	Total deer[a]	Average deer per hunter	Average hunter days per deer
2002[b]	1,850	1,122	61	10,426	5.6	1,805	1.2	4.8
2003[b]	1,390	887	64	8,014	5.8	2,176	1.3	4.4
2004[b]	1,410	1,038	74	6,819	4.8	2,184	1.5	3.1
2005[b]	1,824	1,322	72	9,194	5.0	2,744	1.5	3.4
2006[b]	2,072	1,548	75	10,102	4.9	3,326	1.6	3.0
2007[b]	2,005	1,385	69	10,521	5.2	2,854	1.4	3.7
2008[b]	2,114	1,511	71	11,122	5.3	3,319	1.6	3.4
2009[b]	2,108	1,567	74	11,681	5.5	3,340	1.6	3.5
2010[b]	2,250	1,682	75	11,823	5.3	3,626	1.6	3.3
2011[c]	2,229	1,680	75	13,271	6.0	3,882	1.7	3.4
2012[c]	2,468	1,795	73	12,972	5.3	3,690	1.5	3.5
2013[c]	2,459	1,800	73	12,663	5.2	3,702	1.5	3.4
Average	1,925	1,374	71	10,297	5.3	2,926	1.5	3.5

[a] Includes the reported harvest of does.

[b] Estimates calculated from hunter questionnaires sent to about 30% of deer harvest ticket holders.

[c] Estimates calculated from mandatory hunt reports distributed with deer harvest tickets.

Table 2. Expanded Unit 2 deer harvest from Prince of Wales Island only, regulatory years 2002 through 2013.

	Regulatory Year	Nr hunters expanded[a]	Nr successful hunters expanded[a]	Percent successful	Hunter days expanded[a]	Average days per hunter	Average deer per hunter	Deer killed
POW Island	2002[b]	1,761	1061	60	10,120	5.7	1.2	2,053
	2003[b]	1,311	828	63	7,608	5.8	1.3	1,650
	2004[b]	1,335	973	73	6,396	4.8	1.5	2,018
	2005[b]	1,726	1,234	71	8,676	5.0	1.5	2,540
	2006[b]	1,960	1,451	74	9,589	4.9	1.6	3,097
	2007[b]	1,910	1,312	69	10,044	5.3	1.4	2,645
	2008[b]	1,983	1,399	71	10,310	5.2	1.5	2,959
	2009[b]	1,958	1,441	74	10,706	5.5	1.5	2,987
	2010[b]	2,125	1,578	74	11,035	5.2	1.5	3,229
	2011[c]	2,056	1,559	76	11,983	5.9	1.6	3,373
	2012[c]	2,258	1,607	71	11,744	5.2	1.4	3,144
	2013[c]	2,217	1,605	72	11,287	5.1	1.4	3,143
	Average	1,813	1,284	71	9,647	5.3	1.5	2,655

[a] Expanded numbers are derived from a multiplier applied to survey results to yield totals for the area.

[b] Estimates calculated from hunter questionnaire sent to about 30% of deer harvest ticket holders.

[c] Estimates calculated from mandatory hunt reports distributed with deer harvest tickets.

Table 3. Expanded Unit 1A (Ketchikan) hunters deer hunting effort and harvest in Unit 2, regulatory years 2002 through 2013[a].

Regulatory year	Residents of Unit 1A		Total 1A Resident Hunters	Total Hunters Unit 2	Deer Harvested by 1A Res.	Total Deer Harvested Unit 2
	Successful Hunters	Unsuccessful Hunters				
2002[b]	417	316	733	1,850	766	1,805
2003[b]	321	226	547	1,390	593	2,176
2004[b]	425	182	607	1,410	900	2,184
2005[b]	373	143	516	1,824	701	2,744
2006[b]	387	196	583	2,072	767	3,326
2007[b]	370	201	571	2,005	743	2,854
2008[b]	456	201	657	2,114	944	3,319
2009[b]	443	191	634	2,108	848	3,340
2010[b]	484	196	680	2,250	1,023	3,626
2011[c]	479	205	684	2,229	1,137	3,882
2012[c]	571	215	786	2,468	1,187	3,690
2013[c]	502	207	709	2,459	1,000	3,702
Average	416	206	621	1,925	842	2,926

[a] Expanded numbers are derived from a multiplier applied to survey results to yield totals for the area.

[b] Estimates calculated from hunter questionnaire sent to about 30% of deer harvest ticket holders.

[c] Estimates calculated from mandatory hunt reports distributed with deer harvest tickets.

Table 4. Unit 2 hunter residency and success, regulatory years 2002 through 2013[a].

Regulatory year	Successful				Unsuccessful			
	Unit 2 resident[b]	Nonlocal resident	Nonresident	Total	Unit 2 resident[b]	Nonlocal resident	Nonresident	Total
2002[c]	548	574	0	1,122	301	427	0	728
2003[c]	475	412	0	887	172	331	0	503
2004[c]	475	563	0	1,038	126	246	0	372
2005[c]	742	491	89	1,322	176	217	107	500
2006[c]	756	723	65	1,544	147	277	83	507
2007[c]	721	590	75	1,386	165	303	151	619
2008[c]	719	693	100	1,512	189	302	111	602
2009[c]	745	657	139	1,541	149	291	88	528
2010[c]	789	724	136	1,649	161	308	88	557
2011[d]	799	770	102	1,671	122	339	86	547
2012[d]	812	858	111	1,781	186	392	87	665
2013[d]	804	849	119	1,772	195	363	93	651
Average	677	620	71	1,367	171	304	71	546

[a] Table does not include hunters with unknown residency.

[b] Local residents include Alaskan residents living within Unit 2 boundaries.

[c] Estimates calculated from hunter questionnaire sent to about 30% of deer harvest ticket holders.

[d] Estimates calculated from mandatory hunt reports distributed with deer harvest tickets.

Table 5. Unit 2 reported and estimated deer harvest/mortality, regulatory years 2002 through 2013.

Regulatory year	Reported harvest			Unreported & illegal harvest[a]	Estimated total harvest	Estimated no. road kills
	Male	Female	Total			
2002[b]	1,736	69	1,805	1,805	3,610	30-50
2003[b]	2,085	91	2,176	2,176	4,352	30-50
2004[b]	2,090	94	2,184	2,184	4,368	30–50
2005[b]	2,630	114	2,744	2,744	5,488	30–50
2006[b]	3,215	111	3,326	3,326	6,652	30–50
2007[b]	2,756	98	2,854	2,854	5,708	30–50
2008[b]	3,193	126	3,319	3,319	6,638	30–50
2009[b]	3,187	153	3,340	3,340	6,680	30–50
2010[b]	3,525	101	3,626	3,626	7,252	30–50
2011[c]	3,762	120	3,882	3,882	7,764	30–50
2012[c]	3,581	109	3,690	3,690	7,380	30–50
2013[c]	3,611	91	3,702	3,702	7,404	30–50
Average	2,818	108	2,926	2,926	5,851	30–50

[a] Unreported and illegal harvest estimated at 100% of reported harvest.

[b] Estimates calculated from hunter questionnaire sent to about 30% of deer harvest ticket holders.

[c] Estimates calculated from mandatory hunt reports distributed with deer harvest tickets.

Table 6. Unit 2 deer harvest chronology, regulatory years 2002 through 2013.

	Month of kill						
Regulatory year	July[a]	Aug	Sep	Oct	Nov	Dec	Unk/ other
2002[b]	0	605	276	401	672	79	149
2003[b]	78	284	287	357	567	49	182
2004[b]	68	310	240	481	811	61	213
2005[b]	210	504	399	503	897	76	154
2006[b]	189	501	460	538	1,329	153	158
2007[b]	128	428	300	450	1,218	121	210
2008[b]	116	494	362	522	1,525	167	132
2009[b]	122	488	263	510	1,658	183	117
2010[b]	156	471	281	594	1,669	178	278
2011[c]	220	619	290	598	1,918	197	41
2012[c]	142	460	306	557	1,879	315	32
2013[c]	167	485	282	461	2,100	174	34
Average	143[d]	470	316	495	1226	126	163

[a] Federal subsistence deer hunting season opens July 24.

[b] Estimates calculated from hunter questionnaire sent to about 30% of deer harvest ticket holders.

[c] Estimates calculated from mandatory hunt reports distributed with deer harvest tickets.

[d] Average does not include RY02 when there was no July season.

Table 7. Unit 2 hunter transport method, regulatory years 2002 through 2013.

Regulatory year	Method of transportation[a]					
	Airplane	Boat	Foot	Highway vehicle[b]	Other	Unk
2002[c]	34	345	38	1,077	0	69
2003[c]	75	426	41	1,469	0	28
2004[c]	32	330	33	1,113	0	31
2005[c]	80	391	41	1,432	0	56
2006[c]	81	526	56	1,569	0	35
2007[c]	93	480	43	1,502	0	32
2008[c]	84	794	73	1,306	1	87
2009[c]	69	623	57	1,479	0	76
2010[c]	54	562	71	1,668	0	145
2011[d]	76	637	215	1,478	12	112
2012[d]	101	716	195	1,605	9	80
2013[d]	90	720	60	1,737	7	88
Average	68	511	67	1409	3	67

[a] Numbers of successful and unsuccessful hunter trips.

[b] Includes cars, trucks, and off-road vehicles (3- and 4-wheelers).

[c] Estimates calculated from hunter questionnaire sent to about 30% of deer harvest ticket holders.

[d] Estimates calculated from mandatory hunt reports distributed with deer harvest tickets.

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CHAPTER 5: DEER MANAGEMENT REPORT

From: 1 July 2012
To: 30 June 2014

LOCATION

GAME MANAGEMENT UNIT: 3 (3,000 mi^2)

GEOGRAPHIC DESCRIPTION: Islands of the Petersburg, Kake, and Wrangell area, including Mitkof, Wrangell, Zarembo, Etolin, Kupreanof, Kuiu and adjacent smaller islands in central Southeast Alaska

BACKGROUND

Sitka black-tailed deer inhabit most Unit 3 islands. Deer populations on these islands have historically fluctuated with high and low extremes; clearcut logging has and will continue to reduce winter carrying capacity in some areas. Population declines result from severe winter weather and may be exacerbated by reduced habitat capability as a result of logging, predation by wolves and bears, and illegal hunting.

During the late 1960s and early 1970s, deer in Unit 3 experienced a series of severe winters that resulted in a significant population decline and led to restrictive regulations and bag limits in 1973. Unit 3 was closed to deer hunting from 1975 through 1979. The area south of Sumner Strait had a limit of 1 antlered deer from 1980 to 1987. The Alaska Board of Game (board) increased this limit to 2 antlered deer in 1988. In 1991 a registration permit hunt with a 15–31 October season and a 1 antlered deer bag limit was opened on parts of Mitkof, Kupreanof, Woewodski, and Butterworth islands, where the deer season had been closed since 1975. The registration permit was replaced with a harvest ticket requirement in 1995.

Beginning with the 1993 hunt, the only part of Unit 3 closed to deer hunting was the area within the Petersburg and Kupreanof city limits. The board abolished that prohibition in fall 2000. At the fall 2002 meeting, the Board of Game extended the season length and increased the bag limit for deer on the Lindenberg Peninsula, aligning the deer regulations on all of Kupreanof Island with the majority of Unit 3. In another action, the board established the Petersburg Management Area, an archery-only hunt area within the Petersburg city limits, and extended the archery-only deer season in this area by an additional 2 weeks. At its fall 2004 meeting, the Board of Game adopted a region-wide regulation requiring that deer hunters use harvest tickets in sequential order and carry any unused tickets with them while hunting.

Most of Unit 3 is federal land managed by the U.S. Forest Service (USFS). This area has experienced a significant amount of logging activity over the years. Initial access to most hunting

areas is by water. However, in many areas, once hunters arrive, extensive networks of logging roads are used for additional access to hunting areas. The communities of Petersburg, Wrangell and Kake are located in the unit and some hunters use local road systems to access hunting areas.

Seasons and bag limits for deer on Mitkof Island and Unit 3 in general are more restrictive compared to other island-dominated management units in the region. Between RY94 and RY11, the estimated Unit 3 deer harvest ranged from a low of 333 to a high of 1,119, and the number of hunters varied from 556 to 1,220. In RY05, the estimated unit wide harvest began decreasing, a trend that continued until reaching a low of 333 deer in RY08. During the past 3 seasons, the harvest has decreased somewhat, and the mean harvest during this report period of 506 deer is still about 125 deer below the previous 10 year mean (RY02–RY11) (Table 1).

MANAGEMENT DIRECTION

MANAGEMENT GOALS

As established by the board during its fall 2000 meeting in response to the intensive management of game law [AS 16.05.255 (i)(4)], the management goal is to manage the Unit 3 deer population to achieve and maintain a population of 15,000 deer while maintaining an annual harvest of 900 deer.

MANAGEMENT OBJECTIVES

- Maintain winter range (<1,500 foot elevation) that is capable of supporting 32 deer/mi^2 (average 1.0 pellet group/20 m^2 plot).
- Monitor long-term trends in deer abundance using pellet-group surveys.
- Monitor deer harvest using mandatory harvest ticket reports.

METHODS

From 1980 to 2010 (with the exception of 1981), we estimated Unit 3 harvest data using a regional questionnaire, mailed to a random sample of 33% of deer harvest ticket holders (ADF&G 2012a). Survey results for hunter effort, success, and kill location were then expanded to estimate results for all harvest ticket holders. Beginning fall 2011, the mail out questionnaire was replaced by mandatory hunt report cards issued in conjunction with deer harvest tickets. A preliminary analysis indicated these methods produce comparable results. We monitored long-term deer abundance using spring pellet-group transects in selected areas. All data listed in this report is tallied within regulatory years (RY; e.g., RY11 = 1 July 2011–30 June 2012).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Snow cover in the Petersburg area was well above average during the winters of 2006–2007, 2007–2008, and 2008–2009, including record breaking snowfall in 2006–2007 (NOAA 2010). Severe winter weather, reductions in deer winter range due to logging, and predation by wolves

and black bears are believed to be the primary factors contributing to the observed decline in the Unit 3 deer population and hunter harvest. Because winter severity can influence the results of pellet-group surveys, inferences about population trends based on year-to-year variations in observed pellet-group densities must be made with caution. Nonetheless, we believe the recent declines in pellet-group densities and the decline in the estimated unit-wide harvest reflect actual declines in the unit's deer population.

Of 3 areas where pellet-group surveys were conducted in spring 2011 and 2012, 1 increased, 1 decreased, and 1 remained unchanged. Slight variations in pellet-group densities can be expected even when populations are stable because annual weather variations can affect how long pellet groups persist through a winter, and influence deer use of transects surveyed. Due to growing concern about the decline in the deer population and harvest in the vicinity of Petersburg, during the report period the department focused pellet group surveys on portions of Mitkof Island and the Lindenberg Peninsula of Kupreanof Island.

In spring 2013, pellet-group counts were conducted in 4 VCUs on 2 islands in Unit 3. Castle River pellet-group counts were 0.15 pellet-groups/plot in spring 2013, which was nearly identical to 0.12 in spring 2008. East Duncan pellet-group counts declined slightly from 0.60 pellet-groups/plot in spring 2012, to 0.56 in spring 2013. Portage Bay pellet-group counts declined from 0.63 pellet-groups/plot in spring 2012, to 0.24 in spring 2013. Woewodski (South Mitkof Island) pellet-group counts continued a decreasing trend that began in 2007, down from 0.74 pellet-groups/plot in spring 2012 to 0.64 in spring of 2013. This represents the second lowest count since pellet-group counts were initiated in that area in 1984 (Table 2).

In spring of 2014, pellet-group counts were conducted in 2 VCUs on 2 islands in Unit 3. East Duncan pellet-group counts declined slightly from 0.56 pellet-groups/plot in spring 2013, to 0.47 in spring 2014. Woewodski (South Mitkof Island) pellet-group counts increased slightly from 0.64 pellet-groups/plot in spring 2013, 0.76 in spring of 2014 (Table 2).

MORTALITY

Harvest

Season and Bag Limit	Resident and Nonresident Hunters
Unit 3, Mitkof Island, the Petersburg Management Area	15 October–15 December 2 bucks
Unit 3, remainder of Mitkof Island, Woewodski and Butterworth islands	15 October–31 October 1 buck
Remainder of Unit 3	1 August–30 November 2 bucks
Beginning in RY2013.	
Unit 3, that portion of Kupreanof Island on the Lindenberg Peninsula east of Portage Bay-Duncan Canal portage	Resident season 15 October–31 October 1 buck (Nonresidents: No open season)

Board of Game Actions and Emergency Orders. At the January 2013 BOG meeting, the board adopted a department proposal to reduce the resident deer hunting season by 10 weeks (October 15–October 31), reduce the bag limit from 2 bucks to 1 buck, and close the nonresident deer hunting season on that portion of Kupreanof Island on Lindenberg Peninsula east of the Portage Bay-Duncan Canal portage. This action returned the resident deer season and bag limit on Lindenberg Peninsula to those previously in place from 1993–2002, and realigned the deer season and bag limit on the Lindenberg Peninsula with those of Mitkof, Woewodski, and Butterworth islands.

In fall 2010 it was brought to the Board of Game's attention that the Unit 3 deer harvest was well below the Intensive Management (IM) objective of 900 deer per year and that although we have no way to estimate the unit-wide deer population, it also appeared to be below the IM objective of 15,000 deer. In response to the board's fall 2010 request, in early 2011 the department began investigating potential IM actions that might be undertaken to reverse the decline in the Unit 3 deer population and hunter harvest. In early 2012 the department prepared a "Feasibility Assessment for Increasing Sustainable Harvest of Sitka-Black-Tailed Deer in a Portion of Game Management Unit 3" (ADF&G 2012b) and submitted it for board consideration in November 2012. The IM feasibility analysis was received favorably by the board, which requested the department to proceed with development of an operational plan for IM action in Unit 3 and to submit a regulatory proposal for IM action for board consideration at its March 2013 meeting.

In February 2013 the department prepared an "Operational Plan for the Intensive Management of Sitka Black-tailed Deer in a Portion of Game Management Unit 3" (ADF&G 2013). The following month, the IM operational plan was submitted for board consideration, along with a regulatory proposal (179A) requesting authorization for the department to hire 1 or 2 experienced trappers to intensively trap wolves within a 1,680 km^2 treatment area within Unit 3. The IM Operational Plan was well received by the board, which adopted Proposal 179A authorizing the department to take actions to reduce the wolf population in the intensive management area.

During this report period the department did not implement wolf control efforts and instead focused on developing techniques to more accurately measure changes in deer and wolf abundance resulting from wolf control measures and to assess habitat condition. Coincidentally and without direct support from the department, Petersburg-based wolf trappers have targeted wolves in the IM area, taking a total of 38 wolves during this report period. We believe that harvest has significantly reduced the number of wolves in the IM area and may be largely achieving the department's wolf reduction goal.

We issued no emergency orders regarding deer hunting in Unit 3 during the report period.

Hunter Harvest. In RY12 the unit-wide harvest increased to 536 deer, up slightly from 514 deer in RY11 (Table 1). In RY13, the unit-wide harvest decreased to 476. Deer harvest was reported in 18 Wildlife Analysis Areas (WAAs) during the report period, with the greatest percentage of the unit-wide harvest coming from WAA 1905 (Zarembo Island), WAA 1903 (Wrangell Island), and WAA 1901 (northern Etolin Island) providing 38%, 18% and 15%, respectively, of the unit-wide harvest.

Hunter Residency and Success. Few nonresidents hunt deer in Unit 3, and most hunters are local residents (Table 3). Nonresidents were just 5% of all Unit 3 deer hunters in RY12 and RY13. Deer populations are greater and seasons and bag limits more liberal in other nearby units, attracting most nonlocal hunters to those areas. During the report period, the estimated number of hunters increased somewhat and was slightly higher than the preceding 10-year average (RY02 - RY11) of 781. The total number of hunters increased from 693 in RY11 to 818 in RY12. In RY13, the total number of hunters declined slightly to 808. The hunter success rate decreased from 51% in RY10 and 52% in RY11 to 45% and 42% in RY12 and RY13, respectively.

Harvest Chronology. Table 4 shows the historical Unit 3 deer harvest percentage by month. Since 2002, the highest percentage of the unit-wide deer harvest has typically occurred during November, followed in descending order by October, August, and September. Such was the case during the current report period. The Unit 3 deer season is closed during the months of December and January, so the reported level of harvest during those months represents either illegal harvest, misreporting on the part of hunters, or is possibly an artifact of the expansion factor used to derive monthly harvest estimates.

Transport Methods. In RY12, most hunters reported using boats, highway vehicles, and 3- or 4-wheelers in descending order, to access their hunting areas. In RY13 hunters reported using highway vehicles, boats, and 3- or 4-wheelers in descending order, to access their hunting areas (Table 5).

Other Mortality

In addition to mortality resulting from legal hunting, other sources of deer mortality include predation by wolves and bears, poaching, deer-vehicle collisions, injury and accidents, and starvation or other natural causes. We have no estimates of nonhunting mortality during the report period.

CONCLUSIONS AND RECOMMENDATIONS

The IM harvest objective of 900 deer per year in Unit 3 was established by the board in fall 2000 based on the average annual harvest during the period RY94–RY98 plus 10 percent. That objective was last achieved in RY04 when an estimated 921 deer were taken and has only been achieved during 2 of the last 12 years. Field observations indicate that throughout Unit 3 deer currently exist at levels well below carrying capacity.

We believe declines in pellet-group densities and estimated unit-wide harvest since RY04 reflect an actual decline in the GMU 3 deer population. Several deep-snow winters including the record-setting snowfall of winter 2006–07 were likely causes of the decline, but reasons for the slow recovery are less clear. We suspect the primary factor limiting growth of the deer population was predation by wolves and bears. We also believe hunter harvest exerted less influence because there was a one or two buck bag limit and unit-wide harvest has been relatively modest. Less clear are the effects of unfavorable long-term changes in habitat conditions resulting from decades of clearcut logging, and potential competition from recently established and expanding moose populations. Research on forage availability, abundance and food habits of predators, and effects of a sympatric moose population on deer is needed to evaluate future management direction.

In addition to ongoing clearcut logging, which removes productive old growth forest that provides important winter habitat for deer, since the 1990s there have been two other changes to the unit's capacity to support deer. The amount of forage (forbs and shrubs) available to deer year round continues to decline as young clearcuts mature into closed canopy second-growth forest, and the distribution and abundance of moose has increased throughout the Unit 3 islands. The first unit-wide moose hunting season in Unit 3 opened in 1993 with a harvest of 13 bulls. Even with antler restrictions, by RY13 the harvest had grown to 55 bulls. The current IM harvest objective for deer should be re-evaluated to determine if it remains realistic under existing habitat conditions and in light of the relatively recent increases in moose distribution and abundance in the unit.

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While this unit report was actually published in 2016, it is part of the set of 2015 unit species management reports, so we suggest citing the report as a 2015 report to maintain its relationship to the other 2015 unit reports.

Product names used in this publication are included for completeness but do not constitute product endorsement.

Table 1. Unit 3 (estimated) deer harvest, regulatory years[a] 2002–2013.

Regulatory year	Estimated legal harvest[b]							
	M	(%)	F	(%)	Unk.	Total	Estimated illegal harvest	Total
2002[c]	624	(100)	0	(0)	0	624	0	624
2003[c]	888	(100)	0	(0)	0	888	13	901
2004[c]	921	(100)	0	(0)	0	921	0	921
2005[c]	710	(100)	0	(0)	0	710	8	718
2006[c]	594	(100)	0	(0)	0	594	16	610
2007[c]	457	(100)	0	(0)	0	457	0	457
2008[c]	328	(100)	0	(0)	0	328	5	333[d]
2009[c]	543	(100)	0	(0)	0	543	4	547
2010[c]	669	(100)	0	(0)	0	669	4	673
2011[e]	504	(100)	0	(0)	0	504	10	514
2012[e]	536	(100)	0	(0)	0	536	0	536
2013[e]	474	(100)	0	(0)	0	474	2	476

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.

[b] Estimates for RY02–RY10 are based on data from a mail questionnaire sent to hunters.

[c] Data from deer hunter questionnaire.

[d] Deer harvest reports for the 2008 hunting season were not returned from residents of Kake.

[e] Data from mandatory harvest ticket report requirement.

Table 2. Unit 3 deer population trends as indicated by pellet-group surveys, regulatory years[a] 1981–2013.

Area	Regulatory year	Mean pellet-groups/plot	Number of plots	95% CI
Security Bay	1984	0.02	360	0.01–0.04
(VCU 400)	1989	0.25	304	0.16–0.34
	1995	0.22	268	0.15–0.29
	2000	0.09	201	0.05–0.14
Pillar Bay	1988	0.16	337	0.10–0.22
(VCU 403)	2000	0.18	264	0.13–0.23
Malmesbury	1990	0.11	206	0.05–0.18
(VCU 408)	2000	0.06	254	0.03–0.09
Conclusion	1987	2.66	207	2.32–3.01
(VCU 417)	1989	0.95	200	0.72–1.18
	1991	0.71	200	0.53–0.88
	1996	1.45	191	1.19–1.70
Big John Bay	1994	0.38	300	0.29–0.48
(VCU 427)				
431–Point Barrie	1988	0.23	357	0.17–0.29
(VCU)	1993	0.77	375	0.64–0.90
Big Level	1981	1.54	399	1.45–1.63
(VCU 434a)	1983	1.56	336	
	1986	1.66	382	1.41–1.90
	1989	1.07	227	
	1991	2.16	456	1.90–2.41
Little Level	1981	2.48	114	2.02–2.94
(VCU 434b)	1983	2.34	136	
	1986	1.39	122	1.07–1.70
	1989	1.52	137	
	1991	3.59	132	3.07–4.11
Castle River	1984	0.19	312	0.12–0.26
(VCU 435)	1987	0.51	305	0.37–0.65
	1989	0.40	312	0.25–0.56
	1994	0.32	310	0.20–0.40
	1997	0.36	281	0.28–0.44
	2007	0.12	275	0.07–0.17
	2013	0.15	268	0.10–0.21

Table continues next page

Table 2. continued.

Area	Regulatory year	Mean pellet-groups/plot	Number of plots	95% CI
East Duncan Canal (VCU 437)	1990	1.12	227	0.92–1.32
	1992	0.78	213	0.63–0.94
	1998	1.04	153	0.77–1.30
	2001	1.89	254	1.59–2.19
	2007	1.37	262	1.10–1.65
	2011	0.64	289	0.51–0.77
	2012	0.60	282	0.43–1.72
	2013	0.56	263	0.40–0.71
	2014	0.47	354	0.33–0.61
Portage Bay (VCU 442)	1993	0.43	282	0.30–0.56
	1995	0.43	277	0.63–0.94
	1998	0.39	285	0.29–0.49
	2012	0.63	230	0.50–1.72
	2013	0.24	233	0.16–0.32
Woewodski (S. Mitkof) (VCU 448)	1984	.088	295	0.69–1.08
	1985	1.00	209	0.82–1.19
	1987	1.65	195	1.85–2.61
	1988	1.33	433	1.16–1.51
	1989	1.35	417	1.24–1.73
	1990	1.46	355	1.28–1.64
	1991	1.80	316	1.52–2.07
	1992	0.79	248	0.62–0.97
	1993	1.06	230	0.85–1.27
	1994	1.14	152	0.82–1.46
	1995	1.38	157	1.08–1.67
	1996	2.25	243	1.95–2.55
	1997	1.56	282	1.27–1.84
	1998	1.10	282	0.91–1.29
	1999	1.36	196	1.11–1.60
	2000	1.27	226	1.05–1.50
	2002	1.43	220	1.17–1.68
	2003	0.50	216	0.36–0.64
	2004	1.06	250	0.87–1.25
	2005	0.82	279	0.65–0.98
	2007	1.63	180	1.26–2.00
	2008	1.06	235	0.83–1.28
	2009	0.98	162	0.74–1.22
	2010	0.81	234	0.63–0.98

Table continues next page

Table 2. continued.

Area	Regulatory year	Mean pellet-groups/plot	Number of plots	95% CI
Woewodski (S. Mitkof)	2011	0.74	289	0.58–0.89
(VCU 448)	2012	0.74	229	0.56–2.15
	2013	0.64	220	0.50–0.77
	2014	0.76	225	0.58–0.93
Woewodski Island	1991	1.86	461	1.66–2.05
(VCU 448a)	1994	1.30	510	1.15–1.46
Frederick (N. Mitkof)	1981	0.08	945	0.06–0.11
(VCU 449)	1990	0.55	180	0.36–0.74
	1992	0.54	227	0.42–0.65
Blind Slough	1992	1.04	114	0.77–1.30
(Central Mitkof)	1993	1.28	265	1.04–1.51
(VCU 452)	1997	1.61	245	1.34–1.88
Dry	1981	0.92	91	0.56–1.28
(VCU 454)	1993	1.44	210	1.17–1.72
	1997	1.26	188	0.88–1.39
Vank Island Group	1981			
(VCU 455)				
a) Sokolof		1.73	900	1.61–1.85
b) Rynda		0.25	281	0.18–0.32
c) Greys		0.25	284	0.18–0.32
Baht	2001	2.75	109	2.10–3.41
(VCU 456)	2003	1.80	108	1.45–2.15
	2004	2.12	101	1.73–2.51
	2006	1.51	108	1.14–1.88
	2008	1.19	125	0.86–1.52
St. John	2001	1.67	220	1.38–1.93
(VCU 457)	2003	1.17	229	0.96–1.38
	2004	1.75	213	1.44–2.03
	2006	1.98	211	1.65–2.31
	2008	0.99	225	0.81–1.17

Table continues next page

Table 2. continued.

Area	Regulatory year	Mean pellet-groups/plot	Number of plots	95% CI
Snow Passage (VCU 458)	1994	0.57	345	0.45–0.70
	1997	0.98	315	0.80–1.16
	2001	1.50	280	1.28–1.72
	2003	1.02	306	0.84–1.20
	2004	1.08	262	0.89–1.27
	2006	1.52	289	1.26–1.78
Meter (VCU 459)	2001	0.87	180	0.64–1.10
	2003	0.89	180	0.68–1.10
	2004	1.41	155	1.07–1.75
	2008	2.29	80	1.33–3.24
Woronkofski (VCU 461) (All Transects)	1985	1.63	646	1.45–1.81
(Trans. 10, 11, 12)	1985	2.01	218	1.62–2.39
	1987	2.23	201	1.85–2.61
	1989	2.52	223	2.18–2.85
	1991	1.59	203	1.32–1.85
	1993	0.22	225	0.13–0.31
	1994	0.26	224	0.18–0.34
	1999	0.11	216	0.06–0.17
	2003	0.08	227	0.03–0.13
Mosman (VCU 467)	1993	0.07	304	0.03–0.11
Onslow (VCU 473)	1984	0.37	321	0.28–0.46
	1985	0.59	334	0.48–0.70
	1986	0.72	347	0.59–0.84
	1987	0.42	336	0.31–0.55
	1988	0.44	329	0.32–0.55
	1991	0.66	322	0.51–0.80
	1993	0.68	341	0.55–0.82
	1994	0.88	340	0.74–1.02
	1997	0.73	346	0.59–0.86
	2002	0.97	332	0.81–1.13
	2006	0.60	363	0.48–0.71
	2008	1.33	339	1.13–1.53
	2010	0.96	366	0.81–1.10

Table continues next page

Table 2. continued.

Area	Regulatory year	Mean pellet-groups/plot	Number of plots	95% CI
Fool's (VCU 480)	1994	0.54	193	0.38–0.70
	2000	0.61	201	0.45–0.77
Canoe (VCU 474)	2000	0.11	228	0.06–0.17
Coronation (VCU 564)	1983	1.20	696	1.04–1.36
	1985	2.34	228	N/A
	1988	1.41	408	1.17–1.66
	1989	1.63	293	1.28–1.98
	1997	0.44	289	0.34–0.55

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.

Table 3. Unit 3 deer hunter residency and success, regulatory years[a] 2002–2013.

	Successful						Unsuccessful						
Regulatory year	Local[b] resident	Nonlocal resident	Nonresident	Unk	Total	(%)	Local[b] resident	Nonlocal resident	Nonresident	Unk	Total	(%)	Total[c] hunters
2002[d]	363	51	14		428	(48)	413	22	28		463	(52)	891
2003[d]	480	66	21		567	(58)	345	38	20		403	(42)	970
2004[d]	500	51	9		560	(53)	410	67	21		498	(47)	1,058
2005[d]	404	64	5		473	(52)	356	71	15		442	(48)	915
2006[d]	298	40	32		370	(49)	320	57	9		386	(51)	756
2007[d]	264	14	5		283	(41)	315	66	18		399	(59)	682
2008[d]	184	25	5		214	(38)	284	31	27		342	(62)	556[e]
2009[d]	197	16	6		219	(38)	325	20	6		351	(62)	570
2010[d]	286	70	13	0	369	(51)	283	45	7	16	351	(49)	720
2011[f]	306	38	11	2	357	(52)	283	25	16	12	336	(48)	693
2012[f]	320	31	12	4	367	(45)	361	54	30	6	451	(55)	818
2013[f]	279	53	7	3	342	(42)	349	81	34	2	466	(58)	808

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.

[b] Residents of Units 1B, 3, Meyers Chuck, Point Baker, and Port Protection.

[c] Data from registration permit report, hunter survey, and harvest ticket report included.

[d] Data from deer hunter questionnaire.

[e] Deer harvest survey reports for the 2008 hunting season were not returned from residents of Kake.

[f] Data from mandatory harvest ticket hunt reports.

Table 4. Unit 3 deer percentage of harvest by month, regulatory years[a] 2002–2013.

Regulatory year	Harvest periods										Total[b] no. deer
	August	September	October	November	December	January	February	March	April	Unk.	
2002[c]	15	16	25	36	0	0	0	0	0	8	624
2003[c]	19	9	27	30	0	0	0	0	0	15	901
2004[c]	15	10	36	30	1	0	0	0	0	8	921
2005[c]	15	6	30	38	0	0	1	1	0	9	717
2006[c]	21	11	25	35	1	0	0	0	0	7	610
2007[c]	17	5	19	52	1	0	1	0	0	5	458
2008[c]	0	0	31	58	2	0	0	0	0	9	201[d]
2009[c]	13	6	15	58	0	0	0	0	0	7	548
2010[c]	15	9	27	41	2	0	0	0	0	5	674
2011[e]	17	9	19	50	2	1	0	0	0	2	515
2012[e]	16	6	17	57	2	0	0	0	0	1	537
2013[e]	12	7	25	52	3	0	0	0	0	1	476

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.

[b] May not equal harvest table due to rounding or incomplete reporting.

[c] Data from deer hunter questionnaire.

[d] Deer harvest reports for the 2008 hunting season were not returned from residents of Kake.

[e] Data from mandatory harvest ticket report requirement.

Table 5. Unit 3 deer hunter percentage of effort by transport method, regulatory years[a] 2002–2013.[b]

Regulatory year	Airplane	Boat	3- or 4-wheeler	Foot	Highway vehicle	ORV	Other	Unknown	Number of trips
2002[c]	3	38	8	2	49		0		NA
2003[c]	0	49	6	2	40		3		NA
2004[c]	1	47	5	2	43		2		1,580
2005[c]	1	39	5	2	52		0	1	1,263
2006[c]	4	51	0	1	37		1	6	756
2007[c]	1	55	5	1	35		0	3	683
2008[c]	3	53	0	2	43		0	0	546[d]
2009[c]	2	47	0	1	47		0	2	569
2010[c]	0	36	1	5	49	7	0	2	822
2011[e]	1	45	9	5	26	3	0	11	744
2012[e]	2	42	12	5	33	2	1	3	882
2013[e]	2	38	8	3	42	3	1	2	892

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.
[b] The hunter mail survey reports transport as total number of hunting trips by method.
[c] Data from deer hunter questionnaire.
[d] Deer harvest reports for the 2008 hunting season were not returned from residents of Kake.
[e] Data from mandatory harvest ticket report requirement.

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CHAPTER 6: DEER MANAGEMENT REPORT

From: 1 July 2012
To: 30 June 2014

LOCATION

GAME MANAGEMENT UNIT: 4 (5,820 mi^2)

GEOGRAPHIC DESCRIPTION: Admiralty, Baranof, Chichagof, and adjacent islands

BACKGROUND

Game Management Unit 4 (Unit 4) provides a substantial proportion of the deer hunting opportunity and harvest in Southeast Alaska. Significant changes in deer density over time are normal in the unit. Periodic declines are attributable to severe winter weather; most importantly deep snow (Olson 1979). Deer populations were low in the late 1940s following years of high winter mortality. By 1956 deer increased to exceed carrying capacity (Klein and Olson 1960). In recent history severe winters appear to be on roughly an 11-year cycle, with intervening mild winters. Most winters in Unit 4 were mild from the mid 1970s through 1987–1988, with high survival of fawns and adult deer. However, during the winter of 1988–1989 persistent deep snow caused significant deer mortality. A series of mild winters beginning in 1999, extending through 2005–2006, again allowed the population to build to a point that it likely exceeded the habitat capability needed during even a moderate winter.

Subsequently, the winters of 2006–2008 set records for snow depth not only in Unit 4 but throughout Southeast Alaska. Information from a number of sources including aerial and boat surveys for live deer, walked shoreline mortality transects, and accounts of hunters and guides, indicated very high mortality, particularly on heavily logged northern Chichagof Island where over 80% of deer may have died. Further, following the record snows of winter 2006–2007 it was common to see carcasses of winter-killed deer on northern Chichagof Island beaches and floating in bays. Other areas within the unit with more intact winter habitat (i.e. little industrial clearcut logging) and favorable topographic features appeared to have lower deer mortality.

The winter of 2009–2010 had substantially less snowfall than the previous 3 winters, and it appeared that few deer in this reduced population succumbed to winter mortality. Beginning in spring 2010 we saw noticeable increases in the numbers of fawns and yearlings during our survey and research work, as did hunters during this period. Above average snowfall with a persistent snowpack extending into early May occurred again in 2011 and 2012. However, it appeared that the snow accumulation was more gradual and allowed deer to maintain open paths from the beach fringe timber and the shoreline.

This reporting period was characterized by mild winters with little winter mortality and continued recovery of the Unit 4 deer population. Some deer wintering habitat is beginning to

show evidence of heavy browsing, indicating the population may again be approaching carrying capacity.

Deer densities in some portions of Unit 4 are expected to decline due to habitat alteration caused by commercial clearcut logging and construction of logging roads that allow hunters access to previously inaccessible areas. In Southeast Alaska important winter habitat for deer is productive old-growth forest below 800 feet elevation. Because of the variety of tree sizes and uneven canopy of old-growth forest, sunlight penetrates to ground level allowing shrubs and forbs to grow, and the tree canopy intercepts snowfall making those foods available to deer even during periods of deep snow. Kirchhoff (1994) pointed out that following clearcut logging browse and forbs are usually abundant for 20–30 years, but decline and disappear as the regenerating forest forms a dense canopy that shades-out shrubs and forbs. He also noted that snow accumulation in clearcuts and regenerating forest precludes use by deer, resulting in a reduction of the number of deer the landscape can support through the winter. Farmer and Kirchhoff (1998) reiterated that differences in habitat use and mortality of deer may be attributed to forage abundance and availability (Wallmo and Schoen 1980), nutritional quality (Hanley et al. 1989), snow (Kirchhoff and Schoen 1987), and predation risk (Kirchhoff 1994). Second-growth thinning may be able to delay the decline in browse availability in regenerating stands, but no mechanisms to restore old-growth forest structure exist other than natural regeneration, which may take several hundred years.

Hunting in Alaska is managed under state regulations, and beginning in 1990 under federal subsistence regulations. The Alaska Board of Game adopts state regulations that apply on all lands in Unit 4. The Federal Subsistence Board promulgates regulations that apply only on federal lands and provide federally-qualified subsistence hunters more liberal season dates and bag limits. Although the two sets of regulations were initially similar, they have diverged over time.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

As established by the Alaska Board of Game during its fall 2000 meeting in response to the intensive management of game law [AS 16.05.255 (k)(4)], the management goal for deer in Unit 4 is to maintain a population of 125,000 deer and an annual harvest of 7,800 deer.

MANAGEMENT OBJECTIVES

- Maintain a population capable of sustaining a mean reported harvest of at least 1.5 deer per hunter.

- Maintain a population capable of providing a minimum reported success rate of 1 deer killed per 4 days hunting effort.

- Maintain the male component of the deer harvest at a minimum of 60%.

METHODS

We collected information on the Unit 4 deer population using spring pellet-group count surveys, deer body condition surveys, fawn detection surveys, and spring mortality transects. In addition, a new technique for estimating deer abundance was further evaluated during this report period. Brinkman et al. (2010) developed a technique to identify individual deer using fecal DNA and used a DNA-based capture-recapture technique to estimate deer density in distinct watersheds on Chichagof Island. Managers are optimistic about this new technique that may provide us with a practical tool to estimate deer densities in specific watersheds throughout the region.

In RY10 we collected harvest data using a questionnaire mailed to a random sample of 33% of all hunters who were issued deer harvest tickets. To estimate total harvest and hunter effort we expanded findings from the questionnaire to account for all harvest ticket holders. To learn more about the ongoing effects of recent severe winters on northeast Chichagof Island deer population, we sampled 100% of the harvest ticket holders in the community of Hoonah

In RY11, we changed our harvest assessment technique from the hunter questionnaire used since the early 1980s to a mandatory harvest report. Under this new strategy, all hunters who acquire harvest tickets are required to turn in a harvest report indicating their effort and success.

Harvest data are stored as Region I deer harvest reports on the Alaska Department of Fish and Game Division of Wildlife Conservation's internal Wildlife Information Network (WinfoNet).

We gathered population data through spring surveys of fecal pellet groups. This technique has been used to collect population trend data since 1981. Kirchhoff and Pitcher (1988) described the methods in detail.

During winter 1998, we developed and field-tested methods to document the condition of deer that were physiologically stressed due to severe winter conditions. During periods of heavy snowfall, deer avoid deep snow by concentrating on beaches, and we established specific boat routes to examine the physical condition of these deer. We viewed deer through binoculars at ranges of 25–200 meters, and assigned each individual to 1 of 7 condition classifications. We documented changes in deer condition through the late winter. These surveys have been repeated periodically, including during this report period (see Table 7 for the classification and *Other Mortality* section for results.)

We conducted fawn surveys (presence or absence of tracks) in late June through the end of July 2010 at 14 tidal flat locations in the unit. We repeated surveys at 6 locations in June 2011 and June 2012. Although we have not conducted this type of survey regularly, we believe it can be used as an indicator of recruitment immediately following a severe winter. We only surveyed 2 areas in 2012 and 2013.

Data in this report are compiled by regulatory year (RY), with the current report period pertaining to RY12 and RY13. A regulatory year begins on 1 July and ends on 30 June of the following calendar year (e.g. RY12 = 1 July 2012–30 June 2013).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

The severe winter of RY06 was immediately followed by 2 more moderately severe winters, which led to a dramatic decline in the deer populations throughout SE Alaska.

Habitat quality and winter severity vary significantly throughout the unit because of local climatic factors, topography, and the extent of logging activities. Northern and eastern portions of the unit generally experience greater snow depths and sustain higher winter mortality. Areas clearcut prior to 1980 are entering the stem-exclusion stage where regenerating second-growth forest forms a dense, even canopy shading out shrubs and forbs and dramatically reducing food available to deer. Because of the extent of clearcut logging and the many decades before regenerating forest is again productive for deer, future carrying capacity for deer in logged areas will be lower than pre-logging levels. Many popular deer hunting areas will not be capable of sustaining harvest levels seen in the last decade.

No pellet group surveys were conducted in Unit 4 during this reporting period. However, pellet-group surveys during RY06—RY11 (McCoy 2011) indicated a slowly increasing deer population (Table 1). Severe winter conditions beginning in fall 2006 and above average snow fall extending through the following 2 winters resulted in a severe decline. Although there have been relatively few pellet group surveys since RY08, they generally indicate a growing population. Evaluation of the deer population status for management purposes should continue to be based on a variety of indicators, including pellet-group surveys, beach mortality transects, shoreline deer condition surveys, fawn-track tidal flat surveys, hunter contacts, field observations, and harvest reports.

Population Size

Due to budget restrictions, a persistent late spring snowpack, and scheduling conflicts, few traditional pellet surveys were completed during RY10 thru RY13. Instead, we used discussions with deer hunters and other observers, deer hunter harvest reports, incidental observations during aerial mountain goat surveys and browse observations to assess the status of the deer population. The milder winters during this report period provided the deer population an opportunity to rebound following the drastic decline in RY06–RY08 and this appears to be what is happening.

Population Composition

Because of dense forest we are unable to estimate ratios of bucks to does with aerial composition counts and instead focus on sex ratio of the harvest. Prior to RY11 sex composition of the legal harvest (Table 2) was estimated using data from deer hunter questionnaires mailed to about one third of harvest ticket holders. Beginning in RY11 all deer hunters were required to turn in a report distributed with all deer harvest tickets. Preliminary analyses indicate the 2 methods produce comparable results. During the RY11 season, bucks made up about 75% (5,176 bucks) of the estimated total legal harvest of 6,932 deer. For RY12, estimated legal harvest was 4,866 deer including 3,815 bucks (78%), and RY13 estimated legal harvest was 5,436 deer including 3,964 bucks (73%).

MORTALITY

Harvest

Season and Bag Limit.	Season Dates	Bag Limit
Unit 4, that portion of Chichagof Island east of Port Frederick and north of Tenakee Inlet including all drainages into Tenakee Inlet and Port Frederick.	1 August–31 December	3 deer; however, antlerless deer may be taken only from 15 September–31 December
Remainder of Unit 4	1 August–31 December	4 deer; however, antlerless deer may be taken only from 15 September –31 December

Board of Game Actions and Emergency Orders. The doe harvest was closed within the Northeast Chichagof Controlled Use Area (NECCUA) for both state and federal seasons during RY10 and RY11 by joint state emergency orders and Federal Subsistence Board actions. In RY12, the antlerless deer season in the NECCUA and an adjacent area north of Pelican was again closed in late October by emergency order and Federal Subsistence Board action to help the deer population recover further. We issued no emergency orders in RY13 after late summer deer surveys found sufficient numbers of deer and late fall weather was in a normal range.

Hunter Harvest. Responses from the hunter harvest surveys indicated there were 2,064, and 2,331 successful deer hunters in Unit 4 during RYs 2012 and 2013, respectively (Table 3). The number of successful hunters increased to a peak in RY11 and then declined as the deer population continued to grow. Weather during the deer hunting season influences hunter effort (Faro 1997), and likely success. Hunter success is usually higher in years when early snow is sufficient to concentrate deer at lower elevations. Winters of RYs 2012 and 2013 were relatively mild with little snow during early winter. Illegally shooting from boats can result in high crippling rates and loss of deer. Crippling loss, unreported kills, and illegal kills are difficult to estimate, but we believe those sources of mortality may equal 25% of the reported harvest (Whitman 2003). Based on that assumption, the total estimated illegal harvest was 1,218 and 1,359 deer during RY's 2012 and 2013, respectively (Table 2).

Hunter Residency and Success. During RY12 a total of 3,135 people hunted in Unit 4 and 2,064 (66%) hunters harvested at least 1 deer (Table 3). Residents of Unit 4 made up 46% of the successful hunters, Alaska residents from outside Unit 4 made up 50% of successful hunters, and nonresidents made up the remaining 4% of successful hunters. The number of nonlocal hunters increased from the previous season, probably due to their expectations of a rebounding deer population. The majority of the nonlocal hunters were from adjacent communities in Southeast Alaska. During RY12, 73% of Unit 4 residents, 62% of nonlocal Alaska residents, and 48% of

nonresidents were successful at taking at least 1 deer. The management objective of providing a minimum reported success rate of 1 deer killed per 4 days of hunting effort was achieved (Table 4).

In RY13 a total of 2,331 Unit 4 hunters were successful (Table 3) and harvested an estimated 5,434 deer (1.6 deer/successful hunter; Tables 2 and 4). Residents of Unit 4 made up 39% of the hunters in RY13, Alaska residents from outside Unit 4 made up 53% and nonresidents made up 6% of the hunters. During this same period, 75% of Unit 4 residents, 68% of nonlocal Alaska residents, and 57% of nonresidents were successful in taking at least 1 deer. The management objective of providing a minimum reported success rate of 1 deer killed per 4 days of hunting effort was achieved (Table 4).

Harvest Chronology. Most hunters continue to target November for deer hunting, typically resulting in the highest harvest for any month. During RY12, the November harvest was 2,453 deer, or 40% of the total harvest (Table 5). December had the next highest deer harvest (36%) followed by October (10%). More deer may have been harvested later in the year, but doe closures were implemented in late October under both state and federal management for the Northeast Chichagof Controlled Use Area (NECCUA) and an adjacent area north of Pelican. The federal season in January had a harvest of 283 deer (5% of the reported annual harvest); its variability is often related to the amount of snowfall.

In RY13, the November harvest was 2,868 deer, or 42% of total harvest (Table 5). The December harvest accounted for the next highest percentage (34%) followed by an October harvest of 10%. The federal season in January saw take of 220 deer (3%) of the reported annual harvest. During RY13 there were no doe closures in Unit 4.

Transport Methods. Deer hunters used similar forms of transportation as in the past (Table 6). During RY12–RY13 boats were used for 69% and 73%, respectively, of the harvest. Aircraft were used for 8–10% of the harvest. Hunters who walked from their respective residences took 3-4% of the harvest, and hunters using highway vehicles took 9–11% of the harvest over the 2 years. Hunters using an off-road vehicle (ORV; 3 or 4-wheelers) took 3% of the harvest. Transport methods have changed little since the RY88 when data were first collected.

Other Mortality

During RY12–RY13 winters were relatively mild with little snow accumulation at low elevations. We conducted 16 1-mile beach mortality transects during the springs of RY12 and RY13 and tallied 0.01 mortalities per mile in both years. In contrast, following the record-setting snows of RY06 we found 3.8 mortalities per mile in spring 2007.

During February thru late April, we completed 5 boat surveys along more than 150 miles (RY12 and RY13) of beach shoreline in areas north of Sitka, Peril Strait, west Admiralty Island, Tenakee Inlet, and Freshwater Bay in an effort to quantify physical condition of wintering deer. During those shoreline deer assessment surveys we classified 444 deer (RY12) and 481 deer (RY13). Mean condition of deer seen during those surveys was 4.4 (see the classification guideline scale at Table 7). Three wounding loss deer were found in spring 2012 and 4 were found in spring 2014. In spring 2013 we found no dead deer on 5 miles of beach mortality

surveys. For this reporting period we saw many deer on the beaches during spring surveys including a greater percentage of fawns and yearlings than during the previous report period.

Parasites

Incidental observations of deer lungs reveal that lungworm (*Dictyocaulus viviparous*) does occur in Unit 4 deer, but we think it is rarely fatal (Whitman 2003). Incidental examinations of additional deer indicated that incidence of lungworm in fawns is high. As a deer matures, incidence of adult worms appears to decline, but most deer show tissue scarring in the lungs from previous infestations they have overcome. Secondary problems associated with fluid in the lungs (lungworm-pneumonia complex) were not evident. Although presence of roundworms (*Metastrongylidae*) does not noticeably affect healthy deer, nutritionally stressed individuals may be compromised. We suspect that although *D. viviparous* is ubiquitous within the deer population, it only becomes a problem when deer become nutritionally stressed in conjunction with severe winter weather (Whitman 2003).

Nasal bots (*Cephenemyia jellisoni*) have been previously documented in Unit 4 deer (Whitman 2003), but their incidence is relatively low. Other than making incidental observations, we did not conduct any specific parasite examinations for ticks (*Dermacentor*) or sucking lice (*Tricholipeurus lipeuroides*) during this report period.

HABITAT

Assessment

During the report period incidental data (field notes and photographs) were collected during pellet-group and other field surveys noting the overall browse condition in the lower elevation areas. Many browse species favored by deer, such as red huckleberry and blueberry, exhibited very good leader growth. On northeast Chichagof Island, the browse leader growth was remarkable not only at low elevations but also at subalpine elevations. The decline in deer from the severe winter of RY06 allowed the deer forages to proliferate, and the deer population continues to rebound with ample forage available.

CONCLUSIONS AND RECOMMENDATIONS

All management objectives were met during both years of this report period. The average harvests per hunter during RY12 and RY13 were 1.6 and 2.4 deer, both above the objective of at least 1.5 deer per hunter. The minimum objective for a success rate of 1 deer killed per 4 days of hunting effort was also achieved during this report period. The harvest of bucks comprised 78% and 73% of the harvest in RY12 and RY13 respectively, exceeding the objective of 60%.

A major management concern continues to be the diverging hunting regulations promulgated by the Federal Subsistence Board and the Alaska Board of Game. Different regulations for separate groups of hunters using the same resource make enforcement difficult, confuse hunters, and reduce the credibility of management agencies. In addition, conflicting regulations may make management of the resource more difficult in the future. Wherever possible, the division should assist the 2 regulatory entities in standardizing deer hunting regulations. The state and the Federal Subsistence Board did work closely together in issuing emergency closures related to restricting the harvest of does in the NECCUA during the previous and current reporting period.

At this time, we do not recommend changes to the Unit 4 state regulations concerning Sitka black-tailed deer.

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Mooney, P. W. 2015. Unit 4 deer. Chapter 6, pages 6–1 through 6–14 [*In*] P. Harper and L. A. McCarthy, editors. Deer management report of survey and inventory activities 1 July 2012–30 June 2014. Alaska Department of Fish and Game, Species Management Report ADF&G/DWC/SMR-2015-3, Juneau.

While this unit report was actually published in 2016, it is part of the set of 2015 unit species management reports, so we suggest citing the report as a 2015 report to maintain its relationship to the other 2015 unit reports.

Product names used in this publication are included for completeness but do not constitute product endorsement.

Table 1. Unit 4 deer population trends as indicated by pellet-group surveys, regulatory years 2005 through 2011. No surveys conducted in Unit 4 during this report period.

VCU Area	Regulatory year	Mean pellet groups/plot	Number of plots
128 – Hawk Inlet			
	2005	2.69	322
	2007	1.19	305
	2008	1.33	290
	2009	1.35	207
171– Hood Bay			
	2006	2.76	355
	2008	1.62	301
185 – Pleasant Island			
	2005	1.33	312
	2009	0.72	291
209 – Suntaheen Creek			
	2005	1.46	329
	2009	0.51	202
	2010	1.36	265
218 – Pavlof River			
	2005	2.30	323
	2009	0.90	192
	2010	1.48	216
247 – Finger Mountain			
	2005	2.79	299
	2006	2.58	280
	2007	1.89	248
	2008	3.32	199
	2010	2.53	217
	2011	4.13	209
271 – Chichagof	2007	0.81	275
275 – Cobol	2007	2.13	176
288 – Range Creek	2006	1.82	359
	2010	1.06	341
298 – M. Arm Kelp Bay	2006	2.10	248

Table 1. continued

300 – Nakwasina			
	2005	2.22	254
	2006	3.91	205
	2007	3.40	167
	2008	3.17	166
	2010	2.77	183
	2011	3.87	192
305 –Sea Lion Cove			
	2005	1.40	252
	2006	1.41	245
	2007	0.95	221
	2008	1.44	159
	2010	1.04	249
	2011	1.58	232

Table 2. Unit 4 deer harvest, regulatory years 2009 through 2013.

	Estimated legal harvest[a]						Estimated illegal	
Regulatory year	M	(%)	F	(%)	Unk	Total	harvest[b]	Total
2009	2,710	(78)	773	(22)	0	3,483	871	4,354
2010	3,775	(81)	912	(19)	0	4,688	1,172	5,860
2011	5,130	(75)	1,738	(25)	0	6,868	1,717	8,585
2012	3,818	(78)	1,054	(22)	0	4,872	1,218	6,090
2013	3,964	(73)	1,470	(27)	0	5,434	1,359	6,793

[a] From hunt report.

[b] Includes crippling loss estimate.

Table 3. Unit 4 deer hunter residency and success, regulatory years 2009 through 2013.

	Successful					Unsuccessful					
Regulatory year	Local resident	Nonlocal resident	Nonresident	Unk	Total	Local resident	Nonlocal resident	Nonresident	Unk	Total	Total hunters
2009	810	637	50	13	1,510	289	494	56	14	854	2,364
2010	895	878	67	25	1,865	301	495	40	8	844	2,709
2011	1,163	1,203	108	21	2,495	193	420	54	1	668	3,163
2012	945	1,025	78	16	2,064	351	618	85	17	1,071	3,135
2013	960	1,197	111	63	2,331	325	566	85	20	996	3,327

Table 4. Unit 4 deer hunter success; deer harvest by days of effort, regulatory years 2009 through 2013.

Regulatory year	Hunters	Successful	Deer/hunter	Days/deer
2009	2,366	1,511	1.5	2.9
2010	2,710	1,864	1.7	2.8
2011	3,165	2,493	2.2	2.0
2012	3,136	2,064	1.6	2.5
2013	3,327	2,333	1.6	2.4

Table 5. Unit 4 deer harvest chronology, regulatory years 2009 through 2013 (Includes 25% estimated illegal harvest).

	Harvest periods												
Regulatory year	August	(%)	September	(%)	October	(%)	November	(%)	December	(%)	January	(%)	Other	Total harvest
2009	219	(5)	223	(5)	326	(7)	2,063	(47)	1,105	(25)	143	(3)	275	4,354
2010	266	(5)	270	(5)	811	(14)	2,585	(44)	1,435	(24)	174	(3)	318	5,859
2011	416	(5)	443	(5)	790	(9)	4,693	(55)	1,618	(19)	519	(6)	108	8,587
2012	271	(4)	274	(4)	595	(10)	2,453	(40)	2,176	(36)	283	(5)	40	6,092
2013	310	(5)	371	(5)	708	(10)	2,868	(42)	2,283	(34)	220	(3)	31	6,791

Table 6. Percent of Unit 4 deer harvest by transport method, regulatory years 2009 through 2013.[a]

	Percent of harvest						Number of hunters
Regulatory year	Airplane	Foot	Boat	ORV[b]	Highway Vehicle	Unknown[c]	
2009	11	5	69	1	11	4	2,366
2010	11	9	65	2	11	2	2,710
2011	8	5	76	2	6	3	3,165
2012	10	4	69	3	11	3	3,136
2013	8	3	73	3	9	3	3,327

[a] This compares harvest only, not effort of unsuccessful hunters. Number of hunters = successful and unsuccessful.

[b] 3-and 4-wheelers included.

[c] "Other" included.

Table 7. Scale for Unit 4 Shoreline Deer Assessment Classification Guidelines.

0	Dead. Observation should be accompanied by necropsy report/notes.
1	Animal may be unwilling or unable to stand. Ribs visible through coat.
2	"Humped" appearance. May be "shaky" in hind limbs when walking. Animal may be somewhat lethargic. Often hesitant to leave beach. Hips noticeably angular at illium. Hair often showing disarray or missing patches. Some posterior ribs may be visible.
3	Hair usually patchy. Some angled appearance of hips when viewed from the side. When viewed from rump, backbone visible.
4	Rounded hips, sleek coat. May have "breeding patches" of missing/scuffed hair. Very alert.
5	Fat. Classification usually reserved for late summer/early fall.
U	Unclassified. Generally used when any particular animal is too far away to be accurately classified or has departed the beach fringe before classifying.

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CHAPTER 7: DEER MANAGEMENT REPORT

From: 1 July 2012
To: 30 June 2014

LOCATION

GAME MANAGEMENT UNIT: 5 (5,800 mi^2)

GEOGRAPHIC DESCRIPTION: Cape Fairweather to Icy Bay, Eastern Gulf Coast

BACKGROUND

Deer were introduced to Yakutat Bay islands in 1934, when 7 does and 5 bucks were released (Paul 2009). These animals established a small population that persists on islands and along the eastern mainland of Yakutat Bay. Heavy snowfall and predators limit deer densities, but the population has supported small harvests over the years. Most deer are taken incidentally. There is little potential for this herd to increase because of the extreme climatic conditions and limited habitat.

Due to deer declines in the 1970s and a virtual cessation of harvest, the Unit 5 season was closed in July 1980. By the end of the 1980s, deer had recovered to some degree, and public requests for an open season were heard. In 1991 the Board of Game instituted a limited hunt in Unit 5A, with a 1-month bucks-only season. Since then, small numbers of deer have been taken in most years, including some reports of illegal harvest.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

- Maintain a population capable of sustaining a 1-month season and a bag limit of 1 buck.

METHODS

Historically, the department collected deer harvest data by mailing deer harvest surveys to a randomly selected group of hunters (approx. 33%). The survey was designed to collect information on hunter effort, hunt location, hunt timing, number of days hunted, transportation used, and the number of deer harvested. Survey results for hunter effort, success, and kill location were expanded to estimate results for all harvest ticket holders. Beginning in fall 2011, every hunter who received deer harvest tickets was provided a report card; individual reporting has replaced the random survey. Since 1984, pellet-group surveys have been conducted in Unit 5A to gauge deer population trends. U.S. Forest Service (USFS) crews usually perform this work. Pellet transect surveys were conducted in Unit 5 in May of 2014 (Table 1).

Data in this report are compiled by regulatory year (RY), with the current report period pertaining to RY12 and RY13. A regulatory year begins on July 1 and ends on June 30 of the following calendar year (e.g. RY12=July 1, 2012–June 30, 2013).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Based on our 2 indirect measures of deer numbers (i.e. pellet-group densities and deer harvest) Deer numbers remain relatively low in the Yakutat area. It was always thought that limited habitat and heavy snow accumulations on the mainland would prevent deer numbers from increasing significantly; however, anecdotal information and staff observations during the report period suggested that deer were much more abundant than ever before, and had expanded their range as far inland as the Dangerous River. In recent years, deer are routinely seen along the road system near the community of Yakutat and the areas adjacent to Highway 10. In the past it had been almost unheard of to see a deer more than a few miles inland of the beach and any deer sightings on the mainland was considered a novelty. In spring of 2008, 4 islands (Krutoi, Kriwoi, Khantaak, and Dolgi) adjacent to Yakutat in Yakutat Bay were surveyed for deer pellet densities. The survey yielded the highest documented pellet-group densities in the area, and indicates an increasing number of deer on the islands (McCoy 2008). Future surveys should give us a good indication as to whether a higher deer population is being maintained, or if the high pellet-group densities documented in spring 2008 were an anomaly. In May of 2014, with collaboration from the US Forest Service we conducted deer pellet transect surveys on Khantaak, Doggie, and Kriwoi Islands. Surveys on Khantaak Island showed some sign from moose (pellets and tracks) and areas of heavy browsing on vaccinium; some of which had killed the plant. Pellet groups decreased by 34% since the last survey in 2008, however with the recent mild winters it is possible the deer were able to move all over the island and pellet groups were more dispersed than normal. It is difficult to say whether the decline in the number of deer harvested and increase in the days of effort per deer harvested during this report period is an artifact of the small number of hunters participating in this hunt or whether it indicates a decline in the deer population.

MORTALITY

Harvest

Season and Bag Limit	Resident and Nonresident Hunters
Unit 5A	1 November–30 November: 1 antlered deer
Unit 5B	No open season

Board of Game Actions and Emergency Orders. The board made no changes to deer hunting regulations during the report period and no emergency orders were issued.

Hunter Harvest. Expanded harvest estimates based on deer hunter reports indicated that 19 deer were harvested in the unit during RY12 and 23 were taken in RY13. Despite harvest being limited to bucks, our expanded harvest estimate indicated 5 does were also harvested (Table 2). We suspect the apparent illegal harvest of female deer was the result of reporting or data entry

errors, but cannot be certain. Hunter effort decreased during the report period with 70 hunters expending 254 days of effort in RY12, and 62 hunters spending 225 days afield in RY13. The average number of days hunters took to harvest a deer varied from 13.4 days/deer in RY12 to 9.8 days/deer in RY13 (Table 3). The factors contributing to variability in the number of days of effort per deer harvested are not known, but mild weather with little snow during fall 2012 and 2013 could have made it difficult to track and find deer.

Hunter Residency and Success. Since 1991, nearly all Unit 5A deer hunters have been local residents of Yakutat. During the report period, Alaska residents took 100% of the deer harvested in the unit. Of these, local residents of Unit 5A took all 19 deer harvested in RY12 and 14 of the 18 deer harvested in RY13. Of the remaining 4 deer harvested in RY13, 3 were taken by non-local Alaska residents, and 1 was taken by a hunter whose residency is unknown (Table 4).

Transport Methods. Since nearly all deer are taken from small offshore islands, boats are typically the primary means of transportation used by deer hunters in Unit 5A. During the report period, hunters reported using boats, highway vehicles and walking, in descending order, to access deer hunting areas. Hunters are often confused regarding which mode of transportation to submit on a hunt report. This confusion comes from using various modes of transportation prior to setting out on foot in search of deer (e.g. towing a boat to harbor with highway vehicle).

CONCLUSIONS AND RECOMMENDATIONS

The only management objective for this area (maintain a population capable of sustaining a 1-month season and a 1 buck bag limit) was met during the report period. The Unit 5A deer hunt provides Yakutat residents an opportunity to legally harvest a small number of deer. During the report period the number of deer taken in Unit 5 decreased considerably compared to the preceding report period. The harvest of 19 deer in RY12, and 23 deer in RY13, were each well below the preceding 10-year average (RY02–RY11) of 32 deer per year. During the report period both the number of hunters and days hunted decreased from the preceding report period. The number of hunters participating was about the same as the 10-year average of 65 hunters, however total days hunted was substantially lower than the 10-year average of 291 days. We suspect the decrease in hunter effort during this report period resulted from a decline in the deer population following the deep snow winter of 2011–12. This hypothesis is supported by the significant drop in days hunted between RY11 and RY12.

Although deer now seem to be more widespread than in the past, we believe habitat conditions, competition with moose, predation, and deep snow winters will prevent this population from ever growing significantly. The Yakutat airport received below average snowfall in both RY12 and RY13 (180 and 106 inches, respectively) (Western Regional Climate Summary 1949–2013), with the long term average being 185.1 inches. During this report period snowfall was down significantly from the extreme winter in 2011 when 331.1 inches of snowfall was measured by the National Weather Service (http://www.arh.noaa.gov/clim/akcoopclim.php?wfo=pajk) at Yakutat airport. The impact of extreme winter weather will likely remain the most important force regulating deer numbers in the unit. Mortality transects should be established in the Yakutat area to monitor effects of severe winter weather on the unit's deer population. Pellet transect data should continue to be collected to monitor deer population trends.

As a subsistence food item to the community of Yakutat, deer appear to rank a distant second to moose. However, in recent years deer appear to have surpassed mountain goats as a locally available source of red meat. In the past, most deer were taken incidentally by people engaged in other outdoor activities who happened to detect an animal on the beach. More recently, the increased abundance of deer and improved chances of success have led to a more concerted effort by hunters to target a deer. The relatively low harvest probably has little effect on the population because hunting mortality is likely compensatory to predation or winter kill. Barring some change in habitat conditions or predation, it seems likely that deer will continue to persist at low densities and provide only limited hunting opportunity in Unit 5.

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Table 1. Unit 5A deer population trends as indicated by pellet group surveys, regulatory years 1990–2013.

Area	Regulatory year	Mean pellet groups/plot	Number of plots	95 % CI
Knight Island (VCU 361)	1990	0.81	100	0.61–1.01
	1991	0.95	100	0.74–1.16
	1993	0.44	90	0.25–0.64
	1995	0.00	153	0.00–0.00
	1996	0.03	192	0.01–0.05
	2002	0.22	117	NA
Humpback (VCU 363)	1990	0.01	118	0.00–0.03
Yakutat Islands (VCU 368)	1990	0.32	415	0.24–0.39
	1991	0.48	243	0.37–0.58
	1992	1.07	106	0.81–1.32
	1993	0.66	251	0.52–0.80
	1995	0.59	379	0.48–0.69
	1996	0.59	344	0.48–0.70
	1999	0.90	145	0.85–0.95
	2001	0.66	200	NA
	2002	0.58	325	NA
	2003	0.86	274	NA
	2007	1.97	421	1.76–2.18
	2014	1.30	462	1.14–1.46
Ankau (VCU 369)	1990	0.03	116	0.00–0.05

Table 2. Unit 5A annual deer harvest[a], regulatory years 2002–2013.

Regulatory year	Males	Females	Estimated total
2002	15	0	15
2003	28	0	28
2004	31	8	39
2005	38	0	38
2006	42	0	42
2007	19	0	19
2008	37	0	37
2009	21	0	21
2010[a]	30	0	30
2011[b]	51	0	51
2012	19	0	19
2013	18	5	23

[a] Data from RY2010 and earlier are from expanded results of hunter surveys.

[b] Data from RY2011 forward are expanded results from a report card issued with deer tags.

Table 3. Unit 5A hunter effort and success, regulatory years 2002–2013.

Regulatory year	Number of hunters	Number of days hunted	Number of deer killed	Number of deer/hunter	Number of days/deer
2002	54	277	15	.3	18.5
2003	64	228	28	.4	8.1
2004	80	343	39	.5	8.8
2005	79	373	38	.5	9.8
2006	89	317	27	.5	7.5
2007	55	272	19	.3	14.3
2008	76	298	37	.5	8.1
2009	55	170	21	.4	8.1
2010	75	308	30	.4	10.3
2011	91	324	51	.6	6.4
2012	70	254	19	.3	13.4
2013	62	225	23	.4	9.8

Table 4. Unit 5A deer hunter residency and success, regulatory years 2002–2013.

Regulatory year	Successful					Unsuccessful					Total hunters
	Local[a] resident	Nonlocal resident	Nonresident	Unk	Total (%)	Local[a] resident	Nonlocal resident	Nonresident	Unk	Total (%)	
2002	15	0	0	0	15 (28)	39	0	0	0	39 (72)	54
2003	28	0	0	0	28 (43)	32	5	0	0	37 (67)	65
2004	21	17	0	0	38 (48)	36	5	0	0	41 (52)	79
2005	21	5	0	1	27 (39)	42	0	0	0	42 (61)	69
2006	12	0	0	0	12 (19)	52	0	0	0	52 (81)	64
2007	13	6	0	0	19 (35)	30	5	0	0	35 (65)	54
2008	32	0	5	0	37 (49)	39	0	0	0	39 (51)	76
2009	21	0	0	0	21 (38)	34	0	0	0	33 (62)	55
2010	24	6	0	0	30 (40)	33	12	0	0	45 (60)	75
2011	48	4	0	0	52 (57)	31	9	0	0	40 (43)	92
2012	19	0	0	0	19 (28)	48	1	0	1	50 (72)	69
2013	14	3	0	1	18 (30)	35	2	2	4	43 (70)	61

[a] Local means residents of Unit 5A.

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CHAPTER 8: DEER MANAGEMENT REPORT

From: 1 July 2012
To: 30 June 2014

LOCATION

GAME MANAGEMENT UNIT: 6 (10,140 mi^2)

GEOGRAPHIC DESCRIPTION: Prince William Sound and North Gulf Coast

BACKGROUND

The Cordova Chamber of Commerce introduced Sitka black-tailed deer into Unit 6 between 1916 and 1923 (Paul 2009). At least 24 deer were released on Hawkins and Hinchinbrook islands in Prince William Sound (PWS). This was the first big game translocation in the state and was one of the most successful. Deer quickly occupied vacant habitat on most islands and adjacent mainland in PWS. Nearly the entire deer population occurs in Unit 6D. The population peaked in 1945, resulting in habitat damage and long-term reduction in carrying capacity according to Cordova district staff in contributions to Alaska Game Commission reports (Fred Robards, Alaska Game Commission 1952) . High winter mortality occurred in the late 1940s, mid-1950s, late 1960s, early 1970s (Reynolds 1979), and late 1990s (Crowley 2001). Predation is minimal because there are few wolves and coyotes off the mainland and bears are believed to prey on them only opportunistically.

Sitka black-tailed deer in Unit 6 are at the extreme northern limit of their range (Cowan 1969). The population usually thrives because of mild, maritime climate conditions on islands in PWS (Shishido 1986). Snow-shading canopies of old-growth forest provide accessible forage and shelter during winter, especially on the larger watersheds of the big islands (Hawkins, Hinchinbrook and Montague islands; Shishido 1986, Reynolds 1979). If forbs eventually become buried by deeper snow, blueberry stems (*Vaccinium ovalifolium)* become important forage, as does kelp.

Sitka black-tailed deer are excellent swimmers and often take to the sea in small herds for travel to neighboring islands. A resulting theory held by some local residents is of a seasonal migration of deer in PWS. Reynolds (1979) and Shishido (1986) reported that marking studies of deer in PWS do not support this theory. Deer may be dispersing from areas of high density in search of better forage, particularly when deer numbers are increasing. Deer-tagging studies in PWS indicated that seasonal movements were primarily changes in elevation, with only 2 deer traveling up to 14 km from the locations where marked. (Shishido 1986, Reynolds 1979). Schoen and Kirchhoff (1984) tracked a movement of 13.6 km by only 1 radiocollared deer in Southeast Alaska and determined it had dispersed from its natal watershed.

The most important factors limiting the deer population are snow depth and snowpack duration (Reynolds 1979). A series of mild winters allows deer to increase and disperse to less favorable habitat, only to decline during severe winters from starvation. Hunting can be a limiting factor in local areas when deep snow concentrates deer on beaches during open season (Reynolds 1979). Harvest may become a more significant factor in the future if numbers of hunters increase. However, weather will continue to constrain hunter access.

Legal deer hunting began in 1935. It was monitored from 1960 through 1979 by harvest reports and hunter contacts. Beginning in 1980, the Alaska Department of Fish and Game (ADF&G) collected most information through questionnaires mailed to deer harvest ticket holders. Annual harvests before 1978 probably ranged between 500 and 1,500 (Reynolds 1979). Harvests began to increase after 1978 and rose to 3,000 by 1987. The average estimated harvest during the 1990s was 2,160, ranging from 1,300 to 3,000 deer. The average estimated harvest during the 2000s was 2,460, ranging from 1,400 to 3,500 deer. In 2011, ADF&G began collecting deer harvest data within the harvest ticket system. Rather than sampling participants, gathering data from all individuals that acquired harvest tickets was pursued. Evaluation of this new system is ongoing.

Clear-cut logging of old-growth forest on private land in PWS was once the most important deer management concern in Unit 6 (Nowlin 1997). Currently there are no logging operations planned within important deer habitat.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

- Deer in Unit 6 were designated as a big game prey population for intensive management by the Board of Game in 2001. The intensive management objective was set at 24,000–28,000 deer capable of sustaining an annual harvest of 2,200–3,000 deer.

- Maintain a minimum harvest of 60% males.

- Maintain a minimum hunter success rate of 50%.

METHODS

ADF&G and the U.S. Forest Service (USFS) cooperate to monitor the population trend in PWS. We conduct annual pellet-group surveys along transects (Kirchhoff and Pitcher 1988) during late May and early June at 8 sampling locations (Fig. 1). Each location has 3 to 5 transects consisting of a straight line of 1- x 20-meter plots running uphill from the beach fringe. Most transects terminate at alpine habitat. Those not reaching the alpine terminate after we examine 100 plots. The number of plots varies, depending on the distance from the beach to the alpine and the persistence of snow during the survey. The minimum number of plots within a location was 164. The number of plots completed in each area depends on the amount of persistent snow. Transects are terminated when snowcover approaches 100% for the remainder of the transect. We calculate mean numbers of pellet groups per plot (MPGP) for each location and all locations combined. Kirchhoff and Pitcher (1988) suggested that MPGPs of 0.50 to 0.99, 1.00 to 1.99, and 2.00 to 2.99 relate to low, moderate, and high deer densities, respectively, for Southeast Alaska. These densities were generated for southeast Alaska and are not reasonable (have never been observed) in Prince William Sound (PWS). Deer are likely not as productive here due to the area's greater

rainfall and colder temps. Jenks natural breaks optimization was used to analyze the PWS deer pellet data into high, medium, and low categories. Based on these data, mean pellet groups per plot below 0.89 MPGP may indicate a low population, between 0.89 and 1.35 MPGP may indicate a medium population, and above 1.35 MPGP may indicate that the population is high.

Harvest data are summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY12 = 1 July 2012–30 June 2013). From RY80 through RY10, we estimated deer harvest from responses to questionnaires mailed to deer hunters who were issued harvest tickets in Southcentral Alaska. Approximately 3,000 questionnaires (30% of harvest ticket holders) were mailed to hunters annually, with a response rate averaging 66%. Follow-up letters were sent to nonresponders to attempt to achieve more complete data.

Data since RY11 were produced by using the harvest ticket system. Rather than select participants receiving questionnaires, all hunters are expected to report their activity. These data must be edited for accuracy in coding and data entry errors. While the harvest questionnaire provided a map for hunters to indicate where they focused their effort, the harvest ticket system relies on an open-ended response to location. As a result, follow-up letters must be sent to many hunters, from the Cordova office, to get more precise harvest location data. Response rates are low; therefore, harvest estimates must be expanded to account for nonresponse. This information was summarized for total harvest, hunter residency and success, harvest chronology, and transportation methods for Unit 6. Harvest data were grouped into geographic areas that included Hinchinbrook Island, Montague Island, Hawkins Island, western PWS, and northern and eastern PWS (Fig. 2).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Deer density indices in PWS, based on mean pellet groups per plot (MPGPP), declined from moderate to low during the reporting period (Fig. 1, Fig. 3, Table 1). These results correspond with anecdotal reports that estimated a 50–70% decline in the population. Deer numbers appear to have declined due to the winter of RY11, which was the most severe winter on record in terms of total snowfall and snow retention, particularly in western PWS (Fig. 4). Hawkins and Hinchinbrook islands tend to accumulate less snow than islands in western PWS because a slight temperature cline produces more rain in the east. Indeed, higher pellet group densities were observed there. In addition, both eastern islands have extensive old growth forests to support wintering deer, whereas the smaller islands of western PWS have smaller watersheds and much less winter habitat. Although Montague Island has large watersheds, much of the best deer winter habitat was clearcut during the 1980s and 1990s and the island often receives tremendous amounts of snowfall. The deer pellet surveys in 2013, the first year expected to detect the results of the severe winter of RY11, found the lowest indices on record. The 2014 survey found slight improvement, which corresponds with anecdotal reports that deer numbers are increasing.

Distribution and Movements

Deer currently occupy most of Unit 6. Highest deer indices in Unit 6D (PWS) were observed on Hinchinbrook and Hawkins islands (Fig. 1). Lower indices were observed on smaller islands and

mainland areas surrounding PWS. Occasional sightings have occurred in Units 6B and 6A, and, usually following several mild winters, on the Kenai Peninsula and as far north and west as Anchorage.

Shishido (1986), using radiocollared deer on Hinchinbrook Island, determined that deer tended to make seasonal, elevational movements within a single watershed, with timing of movements controlled by snow persistence. He estimated that average size of a deer's winter home range was 160 hectares (ha), versus 282 ha for spring, with seasonal home ranges overlapping. Sitka black-tailed deer are excellent swimmers and often take to the sea singly or in small herds for travel to neighboring islands.

MORTALITY

Harvest

Season and Bag Limit. The season for resident and nonresident hunters was 1 August–31 December. The bag limit was 5 deer for residents and 4 for nonresidents. Female deer could be taken beginning 1 October.

Board of Game Actions and Emergency Orders. An emergency order was issued that closed the state deer season on 7 December 2012 to respond to the extreme winter mortality event of the previous winter. The hunting season for federally qualified users on federal land closed for antlerless concurrently but remained open for antlered deer for the duration of the season.

In 2013, an emergency order was issued in response to the confirmed decline in the population. The buck season was unaffected but the doe season was closed 11:59 p.m. 31 October 2013. The season for does on federal land was also closed 11:59 p.m. 1 November 2013.

Hunter Harvest. Although the deer population level is usually reflected by harvest, prevailing weather conditions during the season can influence hunter activity and harvest. Total estimated deer harvest reported in Unit 6 during RY11 was revised up to 3,168 deer since the last reporting period. This is a substantial increase from RY09 and RY10 at 1,817 deer and 1,892 deer respectively (Table 2, Fig. 5). The high harvest in RY11 can likely be attributed to the early onset and persistence of significant snow that concentrated deer on the beach where they could be harvested. Conversely, the 2 years that followed the extreme weather event of RY11 have 2 of the lowest harvests on record. In RY12, the harvest was estimated at 630 deer. While this seems extreme, anectodal reports suggest that many people perceived that the population was too low to present a reasonable chance of hunting success. Harvest in RY13 increased slightly to 674 deer. Effort and a low deer population were factors contributing to this low harvest.

Harvest declines were most significant on Hawkins Island where estimated harvest dropped from 978 deer in RY11 to 54 in RY12 (a 95% decline; Table 2). Hinchinbrook Island had the second largest decline in harvest, dropping from 659 deer in RY11 to 124 in RY12 (an 81% decline). These declines may have been more influenced by effort than population status. Cordova residents predominantly hunt on these 2 islands. Being keenly aware of the severity of the winter of 2011–2012 and the resulting deer die off, more hunters may have abstained from hunting. Estimated harvests in the western portion of Prince William Sound changed from 521 deer in RY11 to 114 in RY12 (a 78% decline.) However, the effects of that winter were thought to have been worse in the western portion of PWS.

The 5-year (RY09–RY13) average of estimated harvests of deer by area hunters demonstrates that Montague Island (462 deer) yields the highest average annual number of deer, with the next highest being Hawkins Island (380 deer) and then Hinchinbrook (368 deer; Fig. 2).

It is important to note that during this time, the method for estimating harvest changed as previously mentioned. Hunters have been somewhat slow to acknowledge the mandatory reporting requirement that was implemented to replace the previous hunter survey system, for which only selected hunters were required to respond. Due to high rates of "nonreporting," adjustments are made to account for harvest that is likely to have come from nonresponders. It is important to note that 25% (RY12) to 36% (RY11) of the harvest was extrapolated to account for nonresponse.

Hunter Residency and Success. Success was defined as hunters reporting at least 1 day in the field and taking at least 1 deer during the hunting season. Deer hunters had annual success rates of 33% and 37%, respectively, during the 2 years of the reporting period, which were the lowest since we began officially quantifying harvest in a comparable way in 1984 (Table 3). The success rate of 68% in RY11 may be a result of early and significant snowfall as mentioned above. Nonlocal residents represented 61–69% of successful hunters during this reporting period. Local residents on average (5-year mean, RY09-RY13) killed 1.7 deer per hunter compared to 1.0 deer per hunter for nonlocal residents. The number of deer taken per hunter in both years of this reporting period was lower than the 10-year average RY04-RY13. For local residents, the number of deer harvested per hunter was the lowest on record. Nonresidents remained minor contributors to the deer harvest.

Harvest Chronology. In this reporting period, hunters killed the most deer during November and December (Table 4). Many hunters prefer this period because snowfall moves deer to lower elevations and increases visibility. During November the rut was in progress, making bucks more vulnerable to harvest. A higher proportion of the harvest was taken in October than December which is a return to the more normal trend. Harvest in RY10 and RY11 had shifted in recent years to more deer killed in December probably related to the timing of significant snowfall.

Transport Methods. Similar to previous years, hunters primarily used boats (81% 10-year average, RY04-RY13) but some use airplanes (14% 10-year average, RY04-RY13). Other modes, including 3- and 4-wheelers, highway vehicles, and walking, were not used significantly (Table 5). RY12, the first year following the large snow event of RY11 showed an increase in the percentage of hunters that used airplanes when in fact, airplane based hunters were simply more stable while boat based hunters dropped dramatically.

Other Mortality

Wounding loss and illegal harvest together were estimated to be at least 15% of the total reported harvest (Table 2). No major mortality events were observed during this reporting period.

CONCLUSIONS AND RECOMMENDATIONS

Under its regulatory authority for intensive management (AS 16.05.255) the Alaska Board of Game has mandated our deer population objective as 24,000– 28,000 deer and our harvest objective as 2,200–3,000 (5AAC 92.108). Because we have no estimate of population size, this

objective is, at best, an educated guess at the historical number of deer harvested to support human needs. Obtaining a population estimate has not been identified as a priority because of the survey challenges associated with finding and counting forest dwelling animals. However, based on pellet-group density, reports from stakeholders, and carcass counts, it is likely that deer numbers declined in PWS because of unprecedented snowfall and are slowly rebuilding.

Deer pellet indices are highest on Hawkins and Hinchinbrook islands, possibly indicating that more deer occur there than on other islands. However, participation in the hunt (based on hunter days per area) is highest on Montague, with the next highest western PWS. This is likely due to access from Whittier and is not reflective of deer density. Although reasonable hunting opportunity exists to sustain the intensive management objective of 2,200–3,000 deer, hunters reported taking fewer deer during the reporting period. With increased fuel costs, effort may be focused in lower quality areas that are closer to port.

We have implemented but hunters are still transitioning to a new harvest reporting process. More work should be done to inform hunters about the new harvest reporting system. Additionally, the department must develop appropriate means of assessing unreported harvest within the new system.

Pellet-group surveys and harvest data (via hunter questionnaires and now harvest ticket data) were effective tools to monitor and manage deer in Unit 6. MPGP has been a reliable index to population trend. A research project is being developed using money from a legislative Capital Improvement Project to investigate accuracy of deer pellet data using DNA. Other components of the study will likely involve movement, nutrition, and carrying capacity, comparing these factors between high and low density areas.

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While this unit report was actually published in 2016, it is part of the set of 2015 unit species management reports, so we suggest citing the report as a 2015 report to maintain its relationship to the other 2015 unit reports.

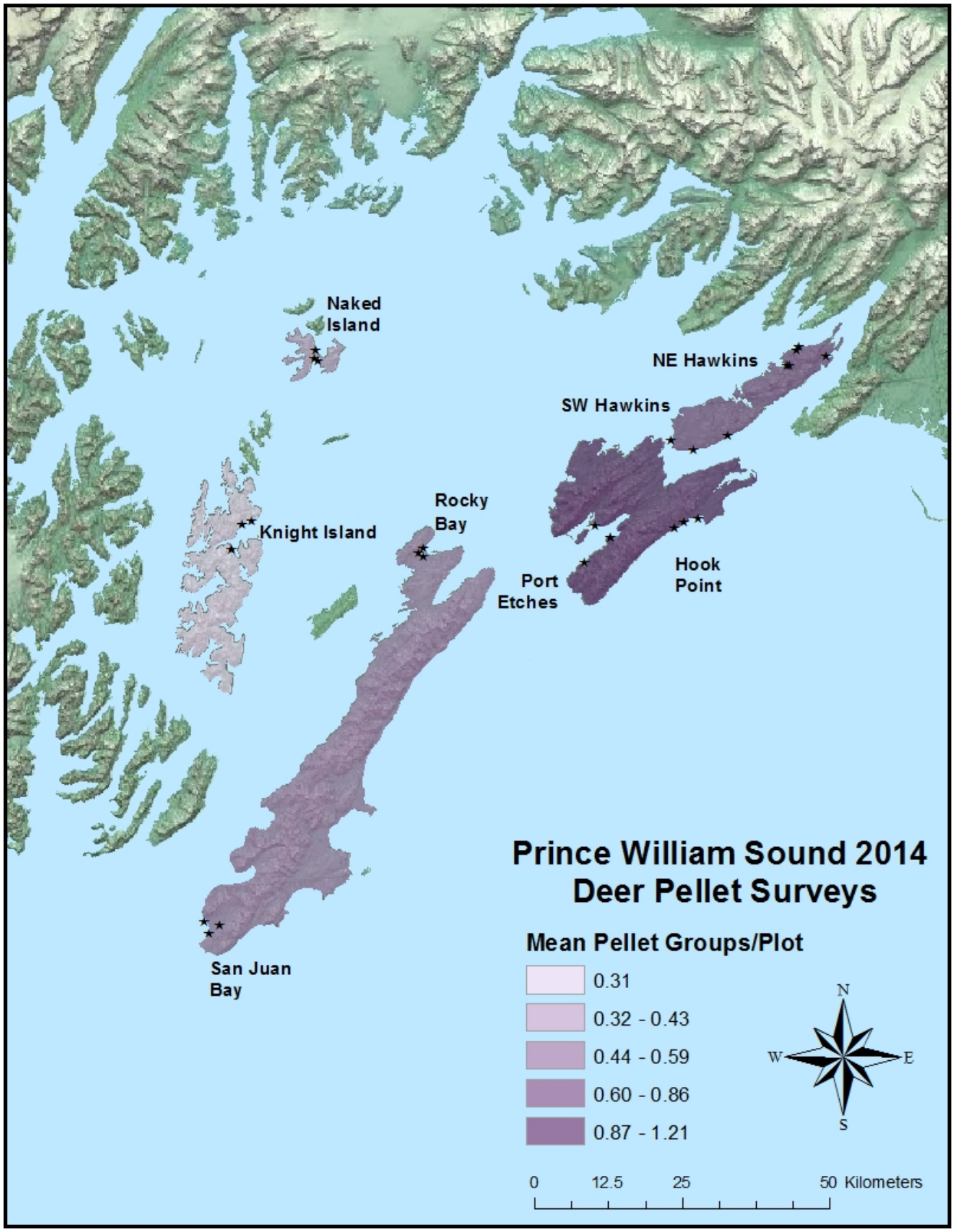

Figure 1. Locations of pellet group transects (stars) and deer pellet density by island for deer in Unit 6.

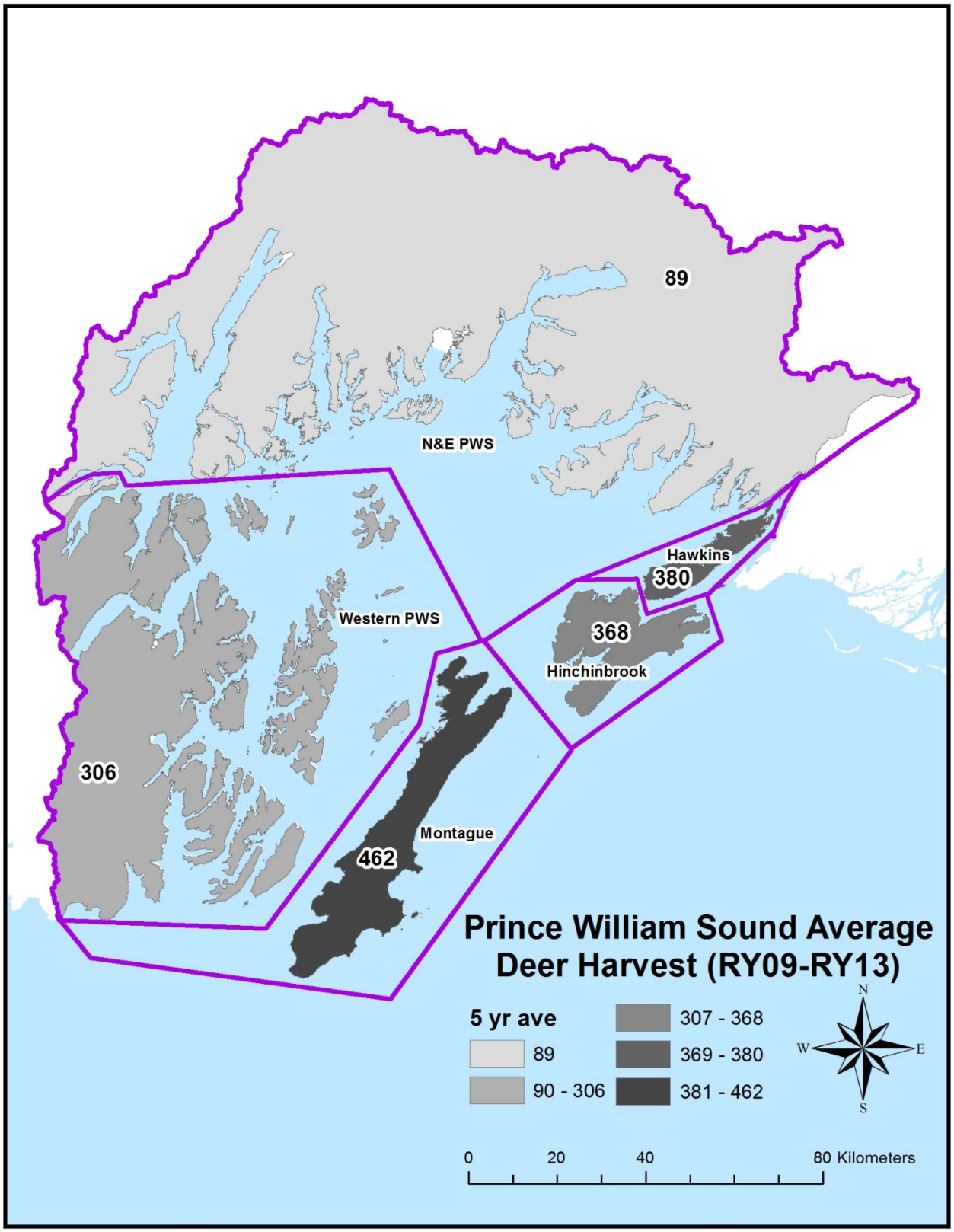

Figure 2. Average deer harvest estimates by hunt area in Unit 6D, Prince William Sound.

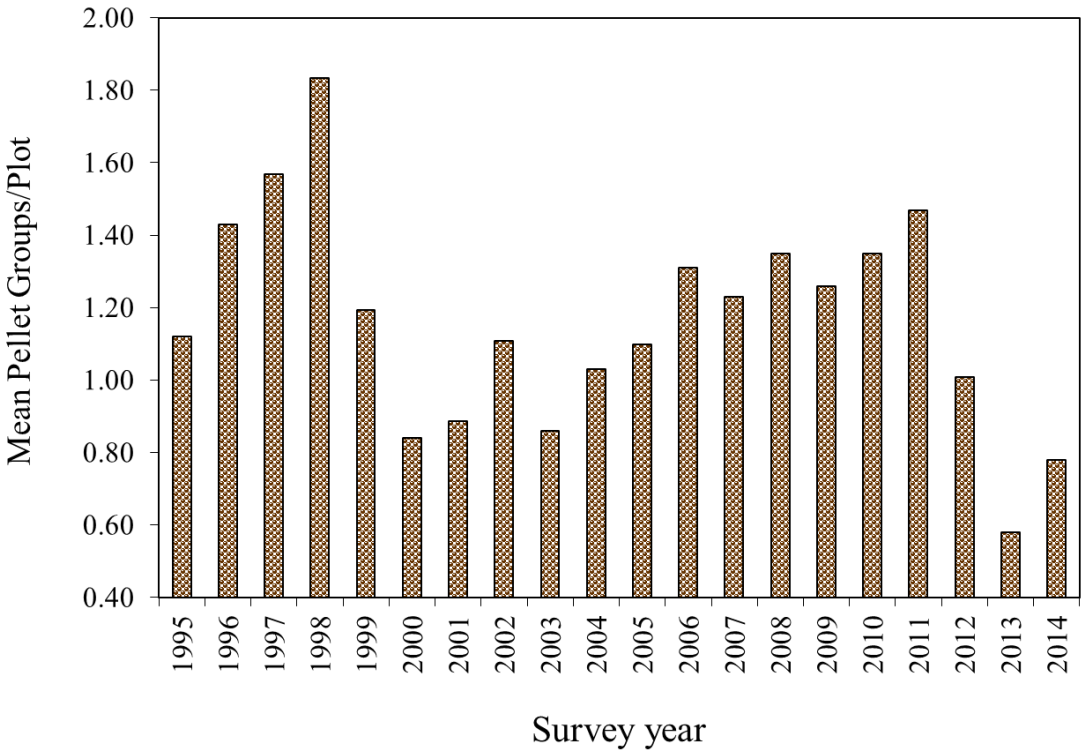

Figure 3. Deer pellet density observed in Unit 6D, Prince William Sound.

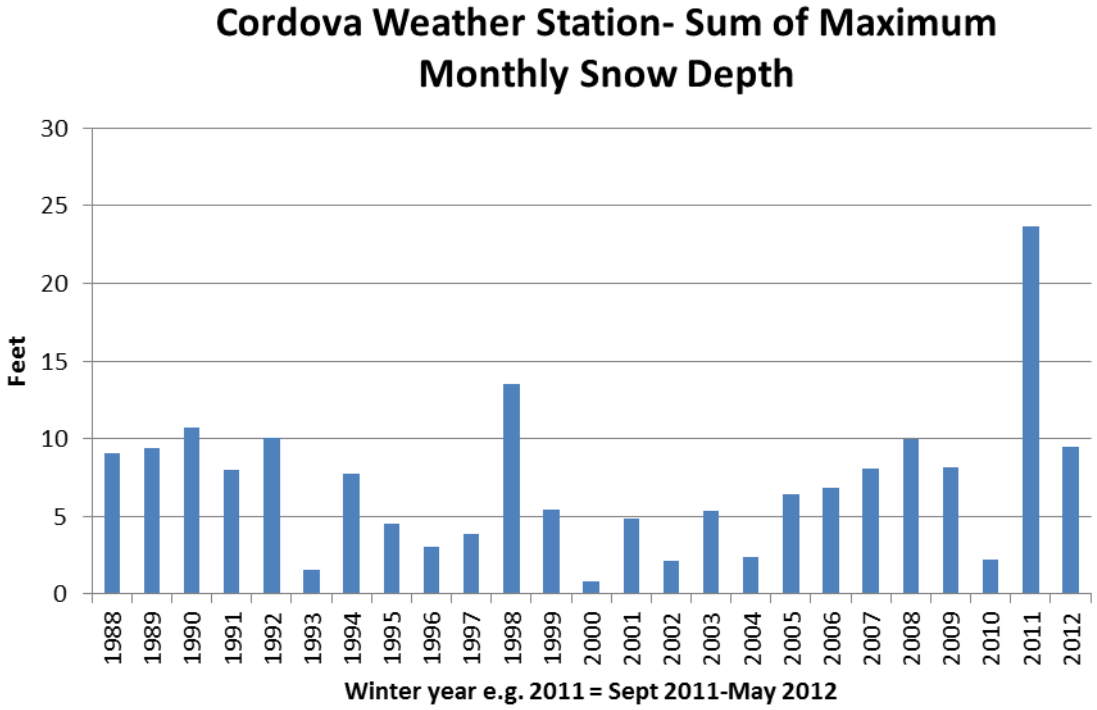

Figure 4. Weather data for Cordova in Prince William Sound.

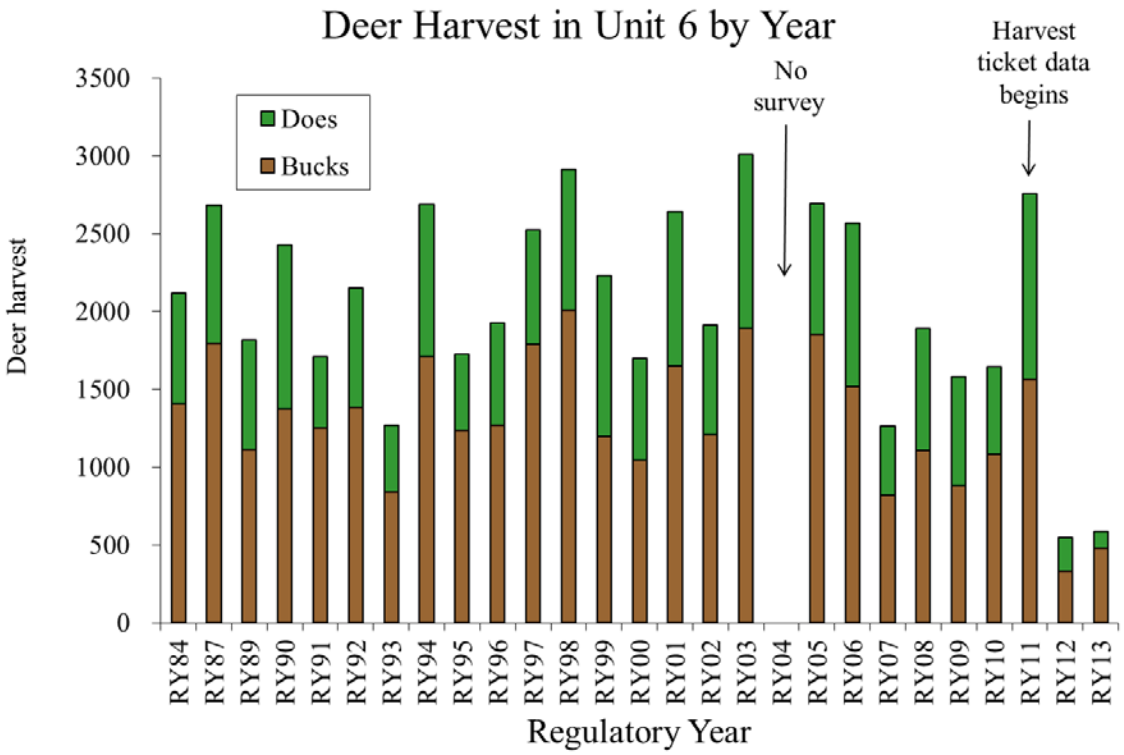

Figure 5. Estimated deer harvest in Unit 6D, Prince William Sound, regulatory years (RY) 1984–2013 A regulatory year runs from 1 July through 30 June (e.g., RY13 = 1 July 2013–30 June 2014).

Table 1. Unit 6 deer population trends as indicated by spring pellet-group surveys 2010–2014.

Area	Specific location/ UCU	Survey year	MPGP[a]	95% CI[b]	Number of plots
Knight Island	Bay of Isles	2010	0.27	0.17-0.38	175
	1503	2011	No survey		
		2012	0.28	0.17-0.39	164
		2013	0.18	0.09-0.28	174
		2014	0.31	0.17-0.44	176
Naked Island	1701	2010	0.51	0.36-0.67	210
		2011	0.51	0.36-0.66	177
		2012	0.56	0.37-0.75	187
		2013	0.23	0.11-0.34	203
		2014	0.43	0.32-0.55	210
Montague Island	Rocky Bay	2010	0.67	0.48-0.86	212
	1803	2011	No survey		
		2012	0.76	0.54-0.99	217
		2013	0.31	0.20-0.42	218
		2014	0.74	0.57-0.92	218
	San Juan Bay	2010	No survey		
	1810	2011	0.96	0.77-1.15	234
		2012	No survey		
		2013	0.59	0.43-0.75	234
		2014	0.43	0.30-0.55	214
Hinchinbrook Island	Port Etches	2010	0.92	0.75-1.09	242
	1903	2011	No survey		
		2012	1.38	1.10-1.65	193
		2013	0.67	0.51-0.83	225
		2014	1.16	0.92-1.39	243
	Hook Point	2010	1.47	1.23-1.72	234
	1905	2011	2.37	1.84-2.89	63
		2012	1.29	1.02-1.56	206
		2013	1.01	0.81-1.22	221
		2014	1.27	1.06-1.48	239

Table continues next page

Area	Specific location/ UCU	Survey year	MPGP[a]	95%CI.[b]	Number of plots
Hawkins Island	NE Hawkins 2001	2010	1.69	1.42-1.96	227
		2011	2.00	1.69-2.32	236
		2012	1.41	1.11-1.72	211
		2013	1.00	0.76-1.23	223
		2014	1.04	0.83-1.24	240
	SW Hawkins 2003	2010	1.11	0.86-1.35	157
		2011	1.95	1.60-2.30	217
		2012	1.33	1.00-1.66	141
		2013	0.54	0.39-0.68	216
		2014	0.67	0.50-0.84	222
All Areas		2010	0.98	0.89-1.06	1,457
		2011	1.47	1.33-1.61	927
		2012	1.01	0.91-1.11	1,319
		2013	0.58	0.52-0.64	1,714
		2014	0.78	0.72-0.85	1,762

[a] Mean number of pellet groups per plot.
[b] 95% Confidence Interval

Table 2. Unit 6 deer harvest, RY09–RY13.

Area	Regulatory[a] year	Estimated legal harvest[b] M	(%)	F	(%)	Total	Estimated illegal/unrecovered Harvest[c]	Total
Hawkins	RY09	216	(60)	143	(40)	359	54	413
Island	RY10	236	(75)	78	(25)	314	47	361
	RY11	461	(54)	389	(46)	850	128	978
	RY12	33	(70)	14	(30)	47	7	54
	RY13	73	(88)	10	(12)	83	12	95
Hinchinbrook	RY09	206	(60)	140	(40)	346	52	398
Island	RY10	314	(69)	140	(31)	454	68	522
	RY11	351	(61)	222	(39)	573	86	659
	RY12	63	(58)	45	(42)	108	16	124
	RY13	106	(91)	11	(9)	117	18	135
Montague	RY09	196	(52)	180	(48)	376	56	432
Island	RY10	303	(60)	206	(40)	509	76	585
	RY11	384	(56)	304	(44)	688	103	791
	RY12	149	(59)	103	(41)	252	38	290
	RY13	143	(78)	41	(22)	184	28	212
Western PWS	RY09	164	(49)	170	(51)	334	50	384
	RY10	185	(63)	108	(37)	293	44	337
	RY11	251	(55)	202	(45)	453	68	521
	RY12	56	(57)	43	(43)	99	15	114
	RY13	108	(71)	44	(29)	152	23	175
Northern and	RY09	92	(71)	37	(29)	129	19	148
Eastern PWS	RY10	36	(54)	31	(46)	67	10	77
	RY11	77	(56)	61	(44)	138	21	159
	RY12	26	(81)	6	(19)	32	5	37
	RY13	21	(91)	2	(9)	23	3	26
Unit 6	RY09	7	(19)	29	(81)	36	5	41
Unknown	RY10	8	(100)	0	(0)	8	1	9
	RY11	39	(74)	14	(26)	53	8	61
	RY12	6	(60)	4	(40)	10	2	12
	RY13	26	(96)	1	(4)	27	4	31
Unit 6 - Total	RY09	881	(56)	699	(44)	1,580	237	1,817
	RY10	1,082	(66)	563	(34)	1,645	247	1,892
	RY11	1,563	(57)	1,192	(43)	2,755	413	3,168
	RY12	333	(61)	215	(39)	548	82	630
	RY13	477	(81)	109	(19)	586	88	674

[a] A regulatory year (RY) runs from 1 July through 30 June (e.g., RY13 = 1 July 2013–30 June 2014).
[b] From Deer Hunter Questionnaire Survey for all years until RY11 when harvest ticket data collection began.
[c] Unquantified, but estimated to be 15% of reported total. Calculated total unit estimate of illegal kill, and therefore also total harvest may not exactly equal the total of individual units added together, due to rounding.

Table 3. Unit 6 deer hunter residency and success, regulatory years[a] 2009–2013.

	Successful					Unsuccessful					
Regulatory year	Local Resident[b]	Nonlocal resident	Non-resident	Total	(%)	Local resident	Nonlocal resident	Non-resident	Total	(%)	Total hunters
RY09	212	357	22	591	(46)	143	494	61	698	(54)	1,289
RY10	262	345	25	632	(53)	90	430	35	555	(47)	1,187
RY11	368	570	27	965	(68)	87	339	22	448	(32)	1,413
RY12	77	198	12	287	(33)	119	418	38	575	(67)	862
RY13	106	172	3	281	(37)	99	343	35	477	(63)	758

[a] A regulatory year runs from 1 July through 30 June (e.g., RY13 = 1 July 2013–30 June 2014).
[b] Resident of Unit 6.

Table 4. Unit 6 deer harvest chronology percent by month, regulatory years[a] 2009–2013.

Regulatory year	Harvest periods						
	Aug	Sep	Oct	Nov	Dec	Unk	*n*
RY09	11	6	29	35	18	0	1,582
RY10	8	8	19	35	27	1	1,644
RY11	4	2	20	37	24	13	2,745
RY12	10	3	30	37	20	0	542
RY13	11	5	34	23	26	0	575

[a] A regulatory year runs from 1 July through 30 June (e.g., RY13 = 1 July 2013–30 June 2014).

Table 5. Unit 6 deer harvest percent by transport method, regulatory years[a] 2009–2013.

Regulatory year	Percent of harvest						
	Airplane	Boat	3- and 4-wheeler	Highway vehicle	Foot	Unknown	*n*
RY09	14	81	0	1	2	2	1,545
RY10	11	84	0	1	2	1	1,636
RY11	11	84	0	0	0	4	2,730
RY12	29	68	1	0	1	1	538
RY13	18	80	1	0	0	1	570

[a] A regulatory year runs from 1 July through 30 June (e.g., RY13 = 1 July 2013–30 June 2014).

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CHAPTER 9: DEER MANAGEMENT REPORT

From: 1 July 2012
To: 30 June 2014

LOCATION

GAME MANAGEMENT UNIT: 8 (5,097 mi^2)

GEOGRAPHIC DESCRIPTION: Kodiak and adjacent islands

BACKGROUND

Officially, the Sitka black-tailed deer population in Unit 8 originated from 3 transplants between 1924 and 1934, totaling 25 deer (Paul 2009). In May 1923, the U.S. Secretary of Agriculture authorized the first transplant of deer to Kodiak and the project commenced the following year when 14 animals were captured near Sitka and released on Long Island just east of Kodiak city. Soon after the Alaska Game Commission was established in 1925 it endorsed the project and adopted regulations to protect the newly established population. In 1930, 2 additional deer were captured from Prince of Wales Island and released on Long Island. There was, however, little movement from Long Island to Kodiak, as noted in a March 1931 report from the Alaska Game Commission to the Territorial Legislature stating only 3 does and 2 bucks had been observed on Kodiak Island (Burris and McKnight 1973). Due to the lack of movement of deer from Long Island to Kodiak Island transplant efforts were renewed in 1934 and 9 deer were captured in the Rocky Pass area near Petersburg and released on Kodiak.

Other evidence, however, suggests deer have been on the archipelago since at least the turn of the last century. A letter dated 15 March 1919 (ADF&G files, Kodiak) from the U.S. Marshal's Office to the Territorial Governor states "The Alaska Commercial Company planted some deer on Kodiak Island some 20 years ago and up to the time of the Katmai eruption [1912] they were increasing very nicely…" The correspondence noted that ash from the eruption had decimated the deer population on Kodiak, and hunters had killed all the deer on Long Island. A note from the U.S. Department of Agriculture to the governor on 26 April 1919 states, "I note your request that protection be continued on deer on Kodiak and Long Islands and will reinsert this in the regulations." We have not found any further information on the date, source, or size of this "original" transplant of deer to Kodiak.

By the early 1940s deer were abundant on Long Island and occupied northeastern Kodiak Island (Van Daele et al. 2013). In 1950 they were a common sight near Kodiak city, and the first officially sanctioned hunt was held in 1953 (Burris and McKnight 1973). The deer population continued to expand into unoccupied habitats, and by the late 1960s deer had dispersed throughout Kodiak, Afognak, and adjacent islands (Smith 1979). The expansion of deer on the

southern part of Kodiak Island continued for the next several decades, eventually allowing population expansion to Sitkinak and Tugidak islands in the early 1980s.

Winter mortality proved to be the most significant factor limiting the deer population. Deer herds suffered high mortality during the 1968–1969 and 1970–1971 winters, causing declines in harvests and hunter success (Alexander 1970, 1973). The population rebounded from 1972 to the mid-1980s, when it reached peak numbers, exceeding 100,000 animals unitwide (Smith 1989). Severe winter conditions prevailed from 1987 through 1992, and deer in the northern part of the archipelago were hit especially hard. There was a short reprieve from 1993 to 1996, but populations declined again in 1997. During the winter of 1998–1999 the Unit 8 deer population declined precipitously (Van Daele 2003). The 5 successive winters (1999–2000 through 2005–2006) were relatively mild. Harsh winter weather returned in 2006–2007 and 2008–2009, along with increased deer mortality. Mild winters were observed during 2009–2010 through 2010–2011. The winter of 2011–2012 was again harsh, and an estimated 40% of the deer herd perished due in part to record snowfall conditions.

Deer have become an important resource for the residents of, and visitors to, the Kodiak Archipelago. Venison has surpassed marine mammals as a primary source of mammalian protein for villagers, and income generated from services provided to deer hunters is a major factor in the local economy. In spite of the significance of this resource, we have not yet developed an objective method of measuring the population size or density. Annual hunter harvest surveys have been used to assess trends in the deer population since 1989. We assessed winter mortality by searching for and examining deer carcasses in selected coastal wintering areas and periodically used aerial surveys to assess winter conditions and physical appearance of deer. From 1990 through 1998 the U.S. Fish and Wildlife Service (USFWS) experimented with various aerial and ground surveys to monitor deer population trends on the Kodiak National Wildlife Refuge (NWR, Zwiefelhofer and Stovall 1992). Refuge staff also experimented with browse transects, Forward Looking Infrared Radar (FLIR), and range exclosures to investigate deer population trends. Most recently, NWR staff has attempted to obtain a population estimate for deer in nonforested habitats of the island, specifically in the Olga flats and Ayakulik areas, and along the Aliulik Peninsula, using aerial mark-recapture distance sampling techniques (Cobb 2014).

Seasons and bag limits were liberal during the past 3 decades. Seasons ranged from 153 to 184 days, and bag limits ranged from 3 bucks to 7 deer. Most regulatory changes were initiated in response to perceived population trends and hunting effort. The unit typically has been divided into 2–3 hunt areas. The road systems emanating from Kodiak city and Port Lions have had the most restrictive regulations, while more remote areas have been more liberal. Gender restrictions are usually predicated on protecting maternal does while their fawns are still dependent on them or restricting doe harvests during times when the population is recovering from declines. Because of the subjective nature of much of the data used in deer management, close cooperation between the Alaska Department of Fish and Game (ADF&G), USFWS, the Kodiak Fish and Game Advisory Committee, and the general public is critical.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVE

Maintain a population of 70,000–75,000 deer and an annual harvest of 8,000–8,500 deer (5 AAC 92.108).

METHODS

From regulatory year 89 (RY89) to RY10 (a regulatory year runs from 1 July through 30 June; e.g., RY11 = 1 July 2011–30 June 2012) questionnaires were mailed to hunters annually to assess trends in hunting effort and harvest. Questionnaires were sent to a random sample of deer harvest ticket holders and harvest estimates were derived from data collected from returned questionnaires. However, in RY11, a statewide deer harvest ticket system was implemented and all individuals obtaining deer harvest tickets were required to report their harvest and a summary of their hunting effort. Harvest information is summarized by regulatory year and includes total harvest, hunter residency and success, transportation method, and harvest chronology. In addition, guides and transporters frequently submitted voluntary summaries of hunting activities which served as anecdotal information when investigating hunting and deer population trends.

We annually assessed natural mortality by searching for deer carcasses in selected known coastal wintering areas. Mortality surveys provided a relative index of winter mortality, but current methods are not consistent or sufficiently rigorous to provide conclusive findings. To supplement information obtained from mortality surveys, we conducted opportunistic flights to observe snow conditions and overall herd condition during winter months. Reports from the public, particularly spring bear hunters, also provided anecdotal information on winter conditions and deer mortality.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

The Unit 8 deer population experienced substantial winter mortality during RY68, RY70, RY89, and RY98. Following these population declines, more conservative regulations were enacted and the populations quickly rebounded (Van Daele 2003).

In the years following the severe winter of 1998–1999, there were 7 successive mild winters followed by harsh winter weather again in 2006–2007 and 2008–2009 resulting in substantial deer mortality. The winters of 2009–2010 through 2010–2011 were moderate and a noticeable increase in fawn survival was observed. However, the winter of 2011–2012 was severe and an unprecedented 40% of the deer herd was estimated to have perished due to record snowfall conditions. The winters of 2012–2013 and 2013–2014 have been moderate to mild and all reports and observations indicate the deer population is rebounding.

Currently, we have no impartial methods of ascertaining deer numbers or densities, but annual hunter harvest reports provide reliable harvest data, and, combined with anecdotal evidence, serve as an indicator of overall population trend.

Distribution and Movements

Deer are distributed throughout Unit 8 except in the more remote Semedi, Barren, and Chirikof island groups. Within the past 30 years, deer colonized Tugidak Island, about 20 miles south of Kodiak Island. It is important to note, Tugidak Island is a State Critical Habitat Area identified as important to ground-nesting birds and harbor seals. If deer flourish on the island, it could result in detrimental impacts to the native flora and fauna, so increased monitoring is warranted.

Our knowledge of deer movements in Unit 8 is based on Selinger (1995), who documented movements between summer and winter ranges for 21 radiocollared female deer monitored in 1990 and 1991 near Spiridon Bay on western Kodiak Island. Distances between summer and winter ranges did not exceed 5 km (3 miles) for 14 deer, but 7 deer moved 22 km (13 miles). The mean date of movement was 29 May between winter and summer ranges, and 20 October for movement between summer and winter ranges. Summer home ranges were larger than winter home ranges, averaging 454 ha (1.8 mi^2) and 107 ha (0.4 mi^2), respectively.

MORTALITY

Harvest

Season and Bag Limits. During this reporting period the open season for resident, nonresident, and federal subsistence hunters was 1 August–31 October in that portion of Kodiak Island north of a line from the head of Settlers Cove (including Peregrebni Point) to Crescent Lake (57° 52'N, 152° 08'W) and east of a line from the outlet of Crescent Lake to Mount Ellison Peak and from Mount Ellison Peak to Pokati Point at Whale Passage, and that portion of Kodiak Island east of a line from the mouth of Saltery Creek to the mouth of Elbow Creek and adjacent small islands in Chiniak Bay. The bag limit was 1 buck. A special weapons hunt (archery and muzzleloaders) was open in this area 1–14 November with a bag limit of 1 deer (either sex). Hunters were required to successfully complete a special weapons education course before participating in the hunt. In the fall of 2011, a special-weapons youth hunt was opened within the 1 deer bag limit area along the Kodiak road system. From 15 November through 31 December youth hunters within the ages of 10 to 18 that had successfully completed a basic hunter education course and an archery/muzzleloader course were able to participate in the hunt. The bag limit was 1 deer (either sex).

The open season for resident, nonresident, and federal subsistence hunters in the remainder of Unit 8 was 1 August–31 December. The bag limit was 3 deer. Hunters could harvest only bucks 1 August–30 September and deer of either sex could be taken October through December.

Federal subsistence hunting regulations mirrored state regulations, except that residents of Unit 8 could continue to hunt on the Kodiak NWR throughout January. On Kodiak NWR lands, hunters could harvest deer for other qualified subsistence users if they first obtained a designated hunter permit. Proxy hunting on other lands was restricted to resident hunters who were hunting for other Alaska residents who were ≥65 years old, legally blind, or ≥70% disabled.

Board of Game Actions and Emergency Orders. No Board of Game actions regarding deer in Unit 8 occurred during this reporting period.

Hunter Harvest. Harvest during this reporting period was lower than in previous years, presumably due to the severe winter in RY11. Hunter effort and the number of hunters participating in deer hunts often declines following harsh winters as reports of increased winter deer mortality and reduced densities discourage hunters from going afield. Historical data suggests hunter effort, hunter participation, and hunter success increase gradually as deer numbers rebound in the years following a severe winter. The total estimated legal harvest was 2,856 in RY12, and increased to 3,251 in RY13 (Table 1). During the previous 5 years of reported harvest (RY07–RY11) the mean annual harvest was 4,047.2 deer, which further highlights the reduction in harvest commonly observed following a severe winter. In RY12 and RY13 the percentage of bucks in the harvest was 76% and the previous 5-year (RY07–RY11) mean was 76.8%.

Harvest Composition. The percent males in the annual harvest remained at least 75% from RY03 to RY13 (range 75%–86%), and peaked at 86% in RY05; however, no harvest data were available in 2004 (Table 1). Following the peak in male harvest in RY05, the percentage of males in the harvest has been consistent with the RY03–RY13 mean of 78.1%.

Hunter Residency and Success. The estimated number of hunters afield during this reporting period increased slightly from 2,686 in RY12 to 2,781 in RY13 (Table 2). The estimated mean number of hunters afield during the previous 5 years (RY07–RY11) was 2,968. Despite the decline in hunters in recent years, we anticipate an increase in hunter participation as the deer population recovers from the devastating winter of 2011–2012. Unit 8 residents comprised 40% of deer hunters in RY12 and 39% in RY13, comparable to the previous 5-year mean of 38%. Nonlocal residents comprised 44% of the hunters in RY12 and 48% in RY13, also comparable to the previous 5-year mean of 43%. Nonresidents comprised 16% of the hunters in RY12 and 13% in RY13, a proportion comparable to the 5-year mean of 19%.

When compared to the 5-year mean, estimated hunter success decreased during this reporting period from 57% in RY12 to 64% in RY13. The mean annual hunter success during the previous 5 years was 68% (Table 2). The mean number of deer harvested per hunter was 1.0 in RY12 and 1.1 in RY13. The previous 5-year (RY07–RY11) mean was 1.3 deer per hunter (Table 3). In RY10, 40% of the hunters killed 1 deer, and 33% of hunter took $\geq$3 deer (Table 4). Data regarding the number of deer harvested by each specific hunter were not available for RY11–RY13. Decreased hunter success and the decreased number of deer harvested per hunter observed during this reporting period presumably reflect the decreased deer numbers following the population decline in RY11. Not surprisingly, hunter effort (i.e., number of days hunted/deer) declined in recent years as the deer population rebounded and expanded.

Harvest Chronology. November is consistently the peak month of harvest in Unit 8 (Table 5). In RY12 and RY13, 45% and 49%, respectively, of deer taken were harvested in November, similar to the 5-year mean of 45%. Hunters prefer to hunt during the months of October and November on Kodiak as the onset of snow in the higher elevations forces deer to move to lower elevations, making them more vulnerable to hunters. Also, deer typically enter the rut in November resulting in increased male vulnerability.

Transport Methods. Boats and aircraft have been the most favored means of transportation for deer hunters in Unit 8, presumably due to the inaccessibility of the island. In RY12, 44% of the

deer hunters used boats and 26% used aircraft as their primary means of access. In RY13, 44% of deer hunters used boats and 25% used aircraft. Averages for the previous 5 years were 42.2% and 19.6% for boats and aircraft, respectively (Table 6). Charter boats are consistently common modes of transportation for deer hunters throughout the archipelago; however, the number of operators from Homer and other off-island locations appears to fluctuate with deer density and availability.

Other Mortality

A severe winter in 2011–2012 resulted in high fawn mortality and a noticeable decline in the deer population on most parts of the archipelago (Table 7). The number of deer mortalities identified along transects during this reporting period was more than a 50% reduction following the 2011–2012 winter. The winters of 2012–2013 and 2013–2014 were comparatively mild and abundant food resources were readily available throughout most of the winter, resulting in a significant reduction in winter mortality throughout much of the archipelago.

Anecdotal evidence suggests unreported deer harvest, including wounding loss and illegal kills outside the hunting season, was common, resulting in an estimated additional kill of 20% of the reported harvest. Free-roaming dogs are significant predators on deer near communities and isolated residences (Van Daele, et al. 2013). Deer–motor vehicle collisions kill an estimated 40–50 deer annually along the Kodiak road system. Brown bear predation of deer occurs, predominantly in late winter/early spring as bears emerge from dens and deer exhibit reduced body condition and increased vulnerability. However, bears do not appear to be an important factor limiting the deer population.

HABITAT ASSESSMENT

High deer densities in the late 1970s through the mid-1980s resulted in heavily browsed winter range in some locales. The population decline in the late 1980s reduced pressure on winter range, but we did not evaluate the level of recovery. Staff from Kodiak NWR established small range exclosures in 1999; however, they have never conducted an objective analysis, and the exclosures simply provide an example of unbrowsed vegetative growth. During winters with heavy snowfall that force deer onto beaches and exposed capes, vegetation in those areas receives extensive use, especially red elderberry, highbush cranberry, blueberry, and willow. There have been no objective investigations of the browse since the decline in the deer population in 1998–1999.

Much of the Sitka spruce forest of central and eastern Afognak Island, as well as private land on the Chiniak Peninsula of northeastern Kodiak Island, has been clearcut. In the northern range of Sitka black-tailed deer, maintenance of mature forest with a patchy understory for foraging and a well-developed canopy for snow interception are of paramount importance (Nelson et al. 2008). Deer may benefit from increased forage plants in young clearcuts on Afognak Island as long as a mosaic of mature stands are available to provide sufficient thermal cover and areas of reduced snow depths during harsh winters. Selinger (1995) noted that deer on Kodiak Island occupying nonconiferous brush and deciduous forest habitat have much larger summer ranges than deer in heavily forested Southeast Alaska, and hypothesized that Kodiak deer may have adopted a strategy that allows them to accumulate greater fat reserves in summer that enhance their survival in areas without coniferous forest.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

Hunters continued to report harvested bucks with malformed antlers caused by abnormal testicular development ("steer deer"), particularly from the south end of Kodiak. Hunter questionnaires indicated that about 3% of the bucks taken in 1999 were steer deer, with the highest prevalence being on the Hepburn Peninsula (13%). From 1999 to 2010, a local big game guide collected samples from normal and abnormal deer harvested on the Aliulik and Hepburn peninsulas. Staff at the University of Guelph in Ontario, Canada, and Colorado State University analyzed these samples. Results suggest an unusual occurrence of underdeveloped testes and/or testes that had not descended in adult bucks (unilateral and bilateral cryptorchidism; Bubenik et al. 2001). The cause of this phenomenon has not been determined, but it is likely caused by an environmental factor rather than a genetic anomaly (Veeramachaneni et al. 2006; Latch et al. 2008). In spite of the increasing reports of abnormal deer, harvest data from the affected areas do not indicate discernable changes in the population and we feel that no management action is practical or necessary at this time.

CONCLUSIONS AND RECOMMENDATIONS

Sitka black-tailed deer on the Kodiak Archipelago is an introduced ungulate using an island habitat. There are no significant natural predators of deer on the archipelago and vegetation comprising the islands has evolved in the absence of any indigenous herbivores (except for seasonal use by brown bears). The dense coniferous cover similar to the old-growth forests of this ungulate's ancestral home in Southeast Alaska is not available in much of the archipelago, and during most winters deer are forced onto beaches by snow and/or cold temperatures. Consequently, the deer population is prone to dramatic population swings. Hunting harvest is presumably compensatory, as winter severity is the primary limiting factor. The potential success of implementing management strategies to enhance Kodiak's deer population is uncertain.

Several techniques for assessing and estimating the deer population have been considered and attempted (Van Daele 2003, Cobb 2014); however, hunter harvest reports and anecdotal evidence collected from hunters, guides, and transporters continue to be the primary tools for assessing population trends. Even though objective population data are nonexistent, Alaska Statute 16.05.255 mandates that population and harvest objectives be established for Unit 8 deer because of their importance as a human food resource. ADF&G, in close cooperation with the Kodiak Fish and Game Advisory Committee, Kodiak NWR, commercial operators, and individual hunters made an attempt to satisfy this requirement by using the best available data to estimate population size and harvest. We recognize there is considerable room for improvement in the current estimates and data gathering techniques and anticipate changes in management objectives as these techniques are implemented and refined.

A great deal of interagency cooperation continued to occur during this reporting period. The Kodiak Fish and Game Advisory Committee worked closely with its federal subsistence counterpart, the Kodiak/Aleutians Regional Advisory Council, to develop and review deer hunting regulations for both the state and federal boards. Staffs from ADF&G and the Kodiak NWR were active participants throughout the process. State and federal biologists also worked together to assess winter mortality and conduct interviews of hunters, guides, and transporters in the field.

Deer harvest information collected by hunter harvest report cards provided objective data and assisted with refining our management program; however, development of rigorous population estimation and monitoring techniques that will address the unique population characteristics and rugged terrain on Kodiak is greatly needed. The data collected from harvest report cards form the basis of our management reports and provide insight into inter-annual deer population fluctuations. The deer harvest ticket reporting system has improved with online reporting capabilities and provides managers with up to date harvest information. We will continue to monitor the efficiency of the new reporting system and identify methods to further refine our data gathering techniques.

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While this unit report was actually published in 2016, it is part of the set of 2015 unit species management reports, so we suggest citing the report as a 2015 report to maintain its relationship to the other 2015 unit reports.

Table 1. Game Management Unit 8 deer harvest during regulatory years[a] 2002 through 2013, Kodiak Archipelago, Alaska.

Regulatory year	Estimated legal harvest				Estimated illegal harvest[b]	Estimated wounding loss[c]	Estimated total[d,e]
	Male (%)	Female (%)	Unknown	Total			
RY02	2,943 (94)	200 (6)	---	3,143	314	314	3,771
RY03	4,430 (85)	769 (15)	---	5,199	520	520	6,239
RY04[f]	---	---	---	---	---	---	---
RY05	5,635 (86)	936 (14)	---	6,571	657	657	7,885
RY06	4,369 (81)	1,053 (19)	---	5,422	542	542	6,506
RY07	2,563 (78)	727 (22)	---	3,290	329	329	3,948
RY08	2,792 (75)	921 (25)	---	3,713	372	372	4,459
RY09	3,057 (75)	1,030 (25)	---	4,087	409	409	4,906
RY10	3,035 (75)	1,011 (25)	---	4,046	405	405	4,856
RY11	4,123 (81)	977 (19)	---	5,100	510	510	6,120
RY12	2,165 (76)	691 (24)	---	2,856	286	286	3,428
RY13	2,457 (76)	794 (24)	---	3,251	325	325	3,901

[a] A regulatory year (RY) runs from 1 July through 30 June (e.g., RY13 = 1 July 2013–30 June 2014). Harvest data for RY02–RY10 were extrapolated from the results of a mail questionnaire survey. No survey was conducted in RY04. Harvest data for RY11–RY13 were derived from harvest tickets.

[b] Although illegal harvest has not been quantified, it is presumed to be about 10% of the legal harvest.

[c] Although wounding loss has not been quantified, it is presumed to be about 10% of the legal harvest.

[d] Harvest estimates include both State and Federal (subsistence) harvest.

[e] Harvest information is based on the best available data at the time of this publication

[f] No deer harvest information was available in RY04.

Table 2. Game Management Unit 8 deer hunter residency and success during regulatory years[a] 2002 through 2013, Kodiak Archipelago, Alaska.

	Successful				Unsuccessful				
Regulatory year[b]	Local resident[c]	Nonlocal resident	Nonresident	Total (%)	Local resident[c]	Nonlocal resident	Nonresident	Total(%)	Total hunters
RY02	705	693	207	1,605 (59)	524	413	196	1,133 (41)	2,738
RY03	1,065	1,027	308	2,400 (77)	356	242	104	702 (23)	3,102
RY04	---	---	---	---	---	---	---	---	---
RY05	1,268	1,350	430	3,048 (83)	292	185	139	616 (17)	3,664
RY06	1,154	1,135	433	2,722 (71)	429	414	245	1,088 (29)	3,810
RY07	583	630	588	1,801 (59)	360	486	412	1,258 (41)	3,059
RY08	882	732	206	1,820 (63)	447	451	158	1,056 (37)	2,876
RY09	725	968	291	1,984 (73)	296	338	86	720 (27)	2,704
RY10	767	876	302	1,945 (68)	347	360	202	909 (32)	2,854
RY11	1,002	1,158	406	2,566 (77)	295	313	172	780 (23)	3,346
RY12	608	718	218	1,544 (57)	467	453	222	1,142 (43)	2,686
RY13	679	906	181	1,766 (64)	410	427	178	1,015 (36)	2,781

[a] A regulatory year (RY) runs from 1 July through 30 June (e.g., RY13 = 1 July 2013–30 June 2014). Harvest data for RY02–RY10 were extrapolated from the results of a mail questionnaire survey. No survey was conducted in RY04.

[b] Harvest data for RY11–RY13 were derived from harvest tickets.

[c] 'Local resident' includes only residents of Unit 8.

Table 3. Game Management Unit 8 comparison of deer harvest for regulatory years[a] 2002 through 2013, Kodiak Archipelago, Alaska.

Regulatory year	% Hunter success	% Hunters taking bag limit[b]	% Male	% Female	Total harvest	Estimated hunters	Mean number deer/hunter	Number days hunted/deer
RY02	59	30	94	6	3,143	2,738	1.1	4.8
RY03	77	42	85	15	5,199	3,102	1.7	3.0
RY04	---	---	---	---	---	---	---	---
RY05	83	42	86	14	6,571	3,664	1.8	3.6
RY06	71	35	81	19	5,422	3,810	1.4	3.7
RY07	59	25	78	22	3,290	3,059	1.1	4.6
RY08	63	34	75	25	3,713	2,876	1.3	4.1
RY09	73	36	75	25	4,087	2,704	1.5	3.6
RY10	68	34	75	25	4,046	2,854	1.4	5.4
RY11	77	--	81	19	5,100	3,346	1.5	4.8
RY12	57	--	76	24	2,856	2,686	1.1	4.6
RY13	64	--	76	24	3,251	2,781	1.2	4.1

[a] A regulatory year (RY) runs from 1 July through 30 June (e.g., RY13 = 1 July 2013–30 June 2014). Harvest data for RY02–RY10 were extrapolated from the results of a mail questionnaire survey. No survey was conducted in RY04.

[b] Maximum bag limit was 4 deer in RY80; 5 deer in RY81; 7 deer in RY82; 5 deer in RY83–RY90; 5 deer on Kodiak NWR and 4 deer on nonfederal lands in RY91–RY00; 4 deer on Kodiak NWR and 3 deer on nonfederal lands in RY01; and 3 deer in RY02–RY13.

Table 4. Number and percent of hunters in Game Management Unit 8 that reported harvesting 1, 2, 3, 4, or 5+ deer, in regulatory years[a] 2002 through 2013, Kodiak Archipelago, Alaska.

Regulatory year	1 deer Hunters	%	2 deer Hunters	%	3 deer Hunters	%	4 deer Hunters	%	5+ deer Hunters	%
RY02	709	44	420	26	416	26	11	1	47	3
RY03	802	33	591	25	921	38	40	2	45	2
RY04[b]	---	--	---	--	---	--	---	--	---	--
RY05	1,113	37	655	22	1,164	39	56	2	31	1
RY06	1,122	41	646	24	874	32	47	2	17	1
RY07	893	50	469	26	397	22	15	1	26	1
RY08	740	35	443	21	874	41	47	2	17	1
RY09	704	36	563	28	671	34	7	<1	38	2
RY10	772	40	520	27	573	29	14	1	67	3
RY11[a]	---	--	---	--	---	--	---	--	---	--
RY12[a]	---	--	---	--	---	--	---	--	---	--
RY13[a]	---	--	---	--	---	--	---	--	---	--

[a] A regulatory year (RY) runs from 1 July through 30 June (e.g., RY13 = 1 July 2013–30 June 2014). Harvest data for RY02–RY10 were extrapolated from the results of a mail questionnaire survey.

[b] Data not available as no survey was conducted in RY04.

Table 5. Game Management Unit 8 deer harvest chronology percent by period, in regulatory years[a] 2002 through 2013, Kodiak Archipelago, Alaska.

Regulatory year	Harvest periods (%)						
	August	September	October	November	December	January	*n*
RY02	6	6	23	38	25	2	3,143
RY03	7	7	21	39	25	1	5,199
RY04[b]	--	--	--	--	--	--	---
RY05	7	6	24	45	17	1	6,571
RY06	6	6	21	46	20	1	5,422
RY07	7	5	19	44	23	2	3,290
RY08	6	7	21	45	18	3	3,713
RY09	6	3	19	47	23	2	4,087
RY10	7	9	21	40	22	1	4,046
RY11	6	3	22	49	20	<1	5,100
RY12	6	4	25	45	19	1	2,856
RY13	5	3	21	49	20	<1	3,251

[a] A regulatory year (RY) runs from 1 July through 30 June (e.g., RY13 = 1 July 2013–30 June 2014). Harvest data for RY02–RY10 were extrapolated from the results of a mail questionnaire survey.

[b] Data not available as no survey was conducted in RY04.

Table 6. Game Management Unit 8 deer harvest percent by transport method, in regulatory years[a] 2002 through 2013, Kodiak Archipelago, Alaska.

Regulatory year	Percent of harvest									
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Other	Unknown	*n*
RY02	16	<1	40	7	0	<1	14	17	4	4,403
RY03	20	<1	42	7	0	2	14	12	2	4,410
RY04[b]	--	--	--	--	--	--	--	--	--	---
RY05	21	<1	43	10	0	<1	15	11	<1	5,638
RY06	18	<1	39	9	0	2	18	14	--	5,924
RY07	21	<1	40	9	0	1	17	12	--	4,524
RY08	15	1	37	13	0	<1	17	16	<1	4,870
RY09	20	<1	46	7	0	1	12	13	<1	3,929
RY10	18	0	44	7	0	1	15	12	3	4,046
RY11[c]	24	<1	44	7	<1	1	12	6	5	4,804
RY12[c]	26	<1	43	8	<1	1	14	7	--	2,747
RY13[c]	25	<1	44	8	0	2	17	4	--	2,875

[a] A regulatory year (RY) runs from 1 July through 30 June (e.g., RY13 = 1 July 2013–30 June 2014). Harvest data for RY02–RY10 were extrapolated from the results of a mail questionnaire survey.

[b] Data not available as no survey was conducted in RY04.

[c] Harvest ticket system implemented beginning in RY11.

Table 7. Game Management Unit 8 sex and age composition of deer winter-kill from beach mortality transects, in regulatory years[a] 2002 through 2013, Kodiak Archipelago, Alaska.

Regulatory	Adult				Juvenile[a]				Unk age/	All			
year	M (%)	F (%)	Unk	Total	M (%)	F (%)	Unk	Total	gender	M (%)	F (%)	Unk	Total
RY02[c]	0	0	0	0	0	0	0	0	0	0 (--)	0 (--)	0	0
RY03[c]	3 (30)	7 (70)	5	15	1 (50)	1 (50)	13	15	5	4 (33)	8 (67)	23	35
RY04[c]	0 (--)	2 (100)	2	4	0 (--)	0 (--)	5	5	0	0 (--)	2 (100)	7	9
RY05[c]	4 (36)	7 (64)	3	14	8 (67)	4 (33)	29	41	1	12 (52)	11 (48)	33	56
RY06[c]	0 (--)	2 (100)	1	3	4 (80)	1 (20)	36	41	1	4 (57)	3 (43)	38	45
RY07[c]	0 (--)	1 (100)	3	4	8 (100)	0 (--)	35	43	3	8 (89)	1 (11)	41	50
RY08[c]	1 (100)	0 (--)	--	1	1 (25)	3 (75)	14	18	2	2 (40)	3 (60)	16	21
RY09[c]	0 (--)	0 (--)	--	0	7 (64)	4 (36)	17	28	1	7 (64)	4 (36)	18	29
RY10[c]	0 (--)	1 (100)	3	4	0 (--)	1 (100)	12	13	1	0 (--)	2 (100)	16	18
RY11[c]	2 (33)	4 (66)	2	8	6 (60)	4 (40)	11	21	0	8 (50)	8 (50)	13	29
RY12	3 (38)	5 (63)	2	10	6 (55)	5 (45)	10	21	0	9 (47)	10 (53)	12	31
RY13	2 (100)	0 (--)	6	8	2 (100)	0 (--)	3	5	2	4 (100)	0 (--)	11	15

[a] A regulatory year (RY) runs from 1 July through 30 June (e.g., RY13 = 1 July 2013–30 June 2014).

[b] Includes fawns and yearlings.

[c] Data obtained from Kodiak National Wildlife Refuge files.


ALASKA
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