Species Management Report, ADF&G/DWC/SMR-2013-1

Deer Management Report of Survey-Inventory Activities, 1 July 2010–30 June 2012

Patricia Harper, editor

2013

Alaska Department of Fish and Game Division of Wildlife Conservation

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Alaska Department of Fish and Game
Division of Wildlife Conservation
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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.

If this report is referenced in its entirety, please reference as follows:

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The editor thanks Tom Paul for his assistance with editing of these reports.

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Cover Photo: A big buck that has begun to shed his winter hair and grow new antlers eyes a human family near Indian River at Sitka before heading back into the woods. ©2013 Phil Mooney.

DEER MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2012

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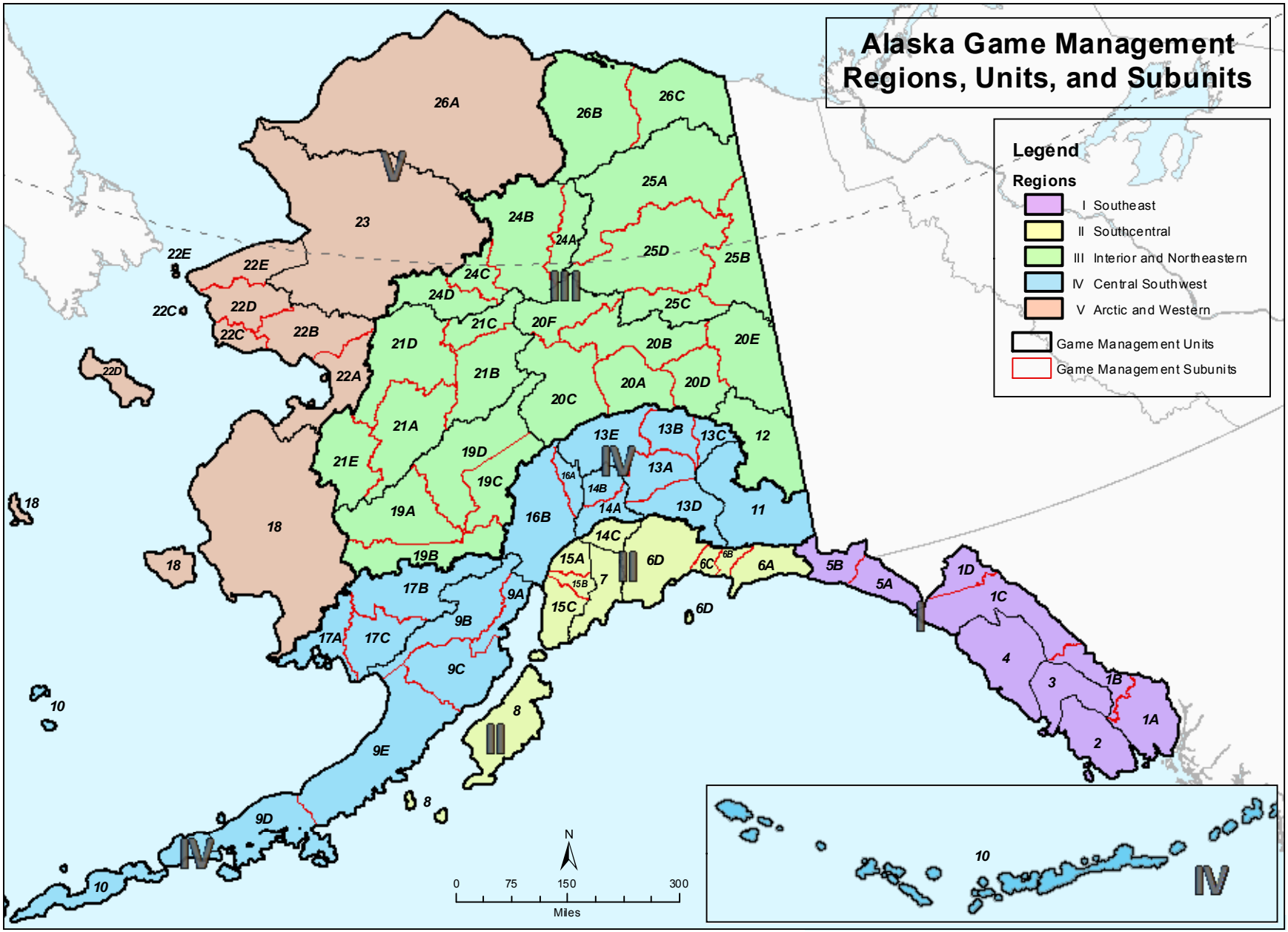
Alaska Game Management
Regions, Units, and Subunits
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Regions
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Game Management Units
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SPECIES

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 PO BOX 115526
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DEER MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2012

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 seasonally, we believe this is primarily in response to winter weather and wolf and bear predation. Deer numbers are currently at very low levels throughout most of 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 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 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

Under 5 AAC 92.108 we have established a Unit 1A population goal of 15,000 deer and an annual hunter harvest of 700 deer, based on high consumptive use of the deer population in this subunit. We are currently evaluating these population and harvest objectives to see if they are realistic given the current state of available winter habitat and present deer population levels. Staff has drafted a feasibility assessment (ADF&G 2012a) and operational plan (ADF&G 2013) for implementing wolf control under the intensive management law, to 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. For this reporting period deer pellet surveys were conducted in Unit 1A during May 2010 at Helm Bay (VCU 716) and North Gravina Island (VCU 999), and during spring 2011 on south Gravina (765).

During RY10 we gathered harvest data from an annual hunter questionnaire, which 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. That deer harvest survey had been conducted since the early 1980s. However at the fall 2010 Board meeting 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 of 2011. A hunting report is attached to harvest tickets, and all hunters are required to submit the report. Our harvest data for RY11 is based on the harvest ticket report and statistically expanded to all hunters like the mail survey.

One problem encountered with the new system is that the department encouraged hunters to report their hunting effort and harvest "on-line" during RY11, the first year of the deer harvest ticket report. However, the on-line system did not function properly, and many hunters got frustrated with the reporting process and simply gave up. We do not know how this affected the data for hunting effort and harvest for RY11.

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 end of 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 ticket report form to report their hunting effort to the department.

At its spring 2013 meeting, the Alaska Board of Game heard a report on the department's feasibility assessment (ADF&G 2012a) and plans for intensive management activities on Gravina Island. After reviewing the department's feasibility assessment the board directed the department to prepare an operational plan (ADF&G 2013) and to develop and submit a regulatory proposal for the intensive management activities.

Hunter Harvest. The harvest survey in RY10 and the harvest ticket report in RY11 indicate an estimated harvest of 189 and 176 deer during RY10 and RY11 respectively. This is slightly below the recent 10 year average of 207 deer. Unit 1A hunters reported spending less time to harvest a deer during the past 2 years (7.3 days) than the 10 year average of 8.6 days per deer. The estimated number of successful hunters rebounded during this report period from an average of 72 during RY07–RY09 to an average of 137 successful hunters this report period (Table 1).

Hunter numbers on Gravina Island near Ketchikan continue to be low. During RY10, 89 hunters reported a harvest of 25 deer, and in RY11, 73 hunters reported taking 15 deer on Gravina Island. Both of these harvests though low are higher than RY07 when only 9 deer were reported taken. Although Gravina Island is located near Ketchikan and is accessible by boat and has a short road system, many local hunters opt to spend their hunting effort in areas with higher deer densities, such as those on Revillagigedo Island (Revilla). A total of 98 and 148 deer were reportedly harvested by hunters on Revilla during the 2010 and 2011 seasons respectfully. Numbers of hunters in the field and total deer harvest reported during 2010 on Revilla Island was one of the lowest on record with 243 hunters reporting a harvest of 98 deer (Table 2).

No deer were reported harvested on the Cleveland Peninsula (Cleveland) in RY07 and RY08 even though from our mail survey we estimated an average of 32 hunters hunted that area. Based on hunt reports, we estimate 25 and 7 deer were harvested during RY10 and RY11 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 to determine if Intensive Management tools may be able 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 half of the legal harvest each season (Table 3).

Residency and Success. Over 90% of Unit 1A hunters are local residents living within the unit. During the 2 years of this report period, 88 and 115 local hunters were successful for an average success rate of 27% in RY10 and 37% in RY11. This is similar to the 10-year average success rate for local hunters of 52% (Table 4). On average over the past 10 years, approximately 18 nonlocal resident hunters have been successful harvesting deer in this area each season. During RY10, 38 nonlocal Alaskan hunters were successful in Unit 1A for a 95% success rate. Nonresidents did a little better than most years with 13 and 9 non Alaska hunters successful during the 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). The 9 days hunting per deer harvested in RY10 and 15 days per deer in RY11 was a higher hunter effort than the 10 year average (Table 1).

Other Mortality

Vehicle–deer collisions have remained low (1–5 deer/year), and collisions are not a significant source of deer mortality in most of Unit 1A. Unreported and illegal harvest is estimated at 50% of the reported Unit 1A harvest (see above).

HABITAT

Assessment

Logging continues to cause major changes in mid to low elevation old-growth winter deer habitat. The most serious effects are in higher volume stands at low elevations which are critical to deer during winters with heavy snowfall (McNay and Voller 1995). Based on field observations and our best estimates of Unit 1A deer populations, we are currently close to these predicted low deer habitat model values. 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. Current timber sales are using both selective and clearcut harvest methods to remove old growth timber that provides valuable habitat structure for deer. The decline in deer numbers we see now in Unit 1A is likely to continue as the remaining 15–30 year old harvested timber stands become unable to support deer and winter range is reduced. We expect to see long-term negative effects on deer numbers, and consequently, on future hunter success in most areas near Ketchikan. The Tongass Land Management Plan predicted that by 2054 few areas would provide enough deer to meet projected hunter demand within roaded and logged portions of Unit 1A (USFS 1989). At the time of this report, Unit 1A deer numbers are no longer meeting local hunter demands nor are they meeting established Intensive Management deer harvest objectives.

Pellet Survey Trends

We interpret pellet-group transect data cautiously because the survey is designed to provide long-term deer trends and not measure year to year changes. It also is not designed to estimate deer density. We count pellet groups along transect lines on a compass heading, designating each 20 meter segment of the transect as a "plot". Pellet groups are tallied if the individual pellet group falls within a 1 meter band, half meter either side of the 20 meter chain, along the transect. For this reporting period we conducted deer pellet surveys in Unit 1A during May 2010 at Helm Bay (VCU 716) and north Gravina Island (VCU 999). Results during 2010 were 0.24 and 0.33 pellet groups/plot for Helm Bay and north Gravina respectively (McCoy 2010). This represents a slight decline in pellet groups/plot from the previous surveys at this location in 2008 when we measured 0.55 groups/plot. The north Gravina VCU currently has reduced deer carrying capacity after State Mental Health and State Forestry timber harvests removed large tracts of important deer winter range during 2005 and 2006. We sampled one VCU during RY10 at south Gravina (765) and found 0.43 pellet groups/plot. During RY11 we also sampled south Gravina and measured 0.53 pellet groups/plot.

Helicopter assisted timber harvest compromised the integrity of deer monitoring transects located at the north end of Gravina (999) for several years (2007 and 2008) because cutting occurred in the spring at the same time we typically sample these sites. After logging ended, an

attempt to sample this VCU was unsuccessful when field crews encountered extensive leftover helicopter logging slash along 2 transects and stopped the survey for safety reasons. We were not successful in locating a replacement location with intact deer winter range in this north Gravina VCU and consequently we abandoned pellet surveys there after 2010. We are reevaluating how best to establish a meaningful long-term measure of deer trends on north Gravina Island.

An ADF&G supported graduate student project recently developed and tested a new pellet based non invasive deer monitoring tool. Biologists used path sampling and DNA extraction from fresh deer fecal pellets to generate a modified mark –recapture estimate of deer in several watersheds. The path sampling can be used alone to estimate deer trends and improve encounter rates, or along with the more extensive but more precise DNA estimate. We hope these new tools will enable managers to accurately and precisely estimate the abundance of deer in densely vegetated habitats like those found in Southeast Alaska. The limitations of the mark-recapture technique are the high cost to obtain and analyze the samples and the increased manpower needed to obtain the estimate. We also do not know whether this method can be successful in an area with low deer densities (Brinkman 2011). We will test the path sampling technique parallel to our traditional pellet transects in several areas near Ketchikan with low deer densities during Spring 2013 to compare methods.

CONCLUSIONS AND RECOMMENDATIONS

During this report period the deer harvest remained slightly below the 10-year average for the unit and well below the management objective of 700 deer. The Cleveland Peninsula continues to be an area of high concern for managers. Harvests from this area traditionally 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. This abysmal trend has continued with an average of 16 deer reported taken during the current report period.

Another area of concern is Gravina Island which traditionally produced a high proportion of Unit 1A deer. However, harvests on Gravina have dropped dramatically since RY01 and during this report period we estimate only 40 deer were legally harvested from the 100 square mile island near Ketchikan.

South Revilla Island continues to produce most of the Unit 1A deer harvest. Easy access from Ketchikan makes this area a popular hunting destination. However, both selective and clearcut logging activity will likely have long-term negative impacts on deer in this area by removing critical deer winter habitat. Deer harvest from Revilla averaged 120 deer/year during this report period compared to an average annual harvest of 206 deer from RY02–RY09. This trend is not likely to change any time soon.

We are currently testing the Brinkman DNA estimator and trail method of pellet surveys in an area just north of Unit 1A to see if the technique works in an area with lower deer density. We will be testing the trail sampling method along with, and parallel to, our traditional transects to compare the two estimates during spring 2013 in Unit 1A.

With deer numbers remaining low in most of Unit 1A hunters are selecting other more productive areas such as nearby Unit 2, and consequently we are seeing less hunter effort and fewer deer harvested in Unit 1A.

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Table 1. Unit 1A reported deer harvest data, regulatory years 2002 through 2011.

Regulatory year	Nr Hunters Expanded[b]	Nr 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
2002	517	165	32	2,147	4.2	237	0.5	9.1
2003	487	158	32	1,448	3.0	212	0.4	6.8
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
$\bar{x}$	369	130	35	1,474	4.2	207	0.6	8.6

[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 2002 through 2011.

	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
Gravina Island	2002	177	43	24	390	2.2	0.3	50
	2003	126	12	10	271	2.2	0.1	18
	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
	$\bar{x}$	130	30	22	383	2.9	0.3	44
Revilla Island								
	2002	397	143	36	1,511	3.8	0.5	186
	2003	404	126	31	1,019	2.5	0.4	163
	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
	$\bar{x}$	330	123	37	1,225	3.7	0.6	189

	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
Cleveland								
	2002	95	7	7	259	2.7	0.1	7
	2003	35	0	0	63	1.8	0	0
	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
	$\bar{x}$	40	8	20	108	2.7	0.3	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 2002 through 2011.

Regulatory year	Reported harvest			Unreported & illegal harvest[a]	Estimated total harvest	Estimated Nr road kills
	Male	Female	Total			
2002	244	0	244	122	366	1–5
2003	187	0	187	94	281	1–5
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				1–5
2009	216	5				1–5
2010	189	3	154	77	231	1–5
2011	170	6	221	111	332	1–5
$\bar{x}$	253	3	192	96	288	1–5

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

Table 4. Unit 1A deer hunter residency and success, regulatory years 2002 through 2011.

	Successful				Unsuccessful			
Regulatory year	Local resident[a]	Nonlocal resident	Nonresident	Total	Local resident[a]	Nonlocal resident	Nonresident	Total
2002	172	0	0	172	345	9	0	354
2003	139	0	0	139	320	28	4	352
2004	179	15	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
$\bar{x}$	140	18	7	164	256	20	8	312

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

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DEER MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2012

LOCATION

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

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

BACKGROUND

Except in 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.

The most recent significant population declines 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.

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 1998 through 2011, the estimated Unit 1B deer harvest ranged from a low of 34 to a high of 114, and the estimated number of hunters varied from 66 to 186 (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 deer densities using pellet-group surveys.
- Monitor deer harvest using mailed questionnaires.

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, since then the deer harvest data have been derived 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 deer populations have declined to low levels. 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. However, at the fall 2010 BOG meeting, the board adopted a public proposal to extend the wolf hunting season in Unit 3 by 31 days (1August– 31 May). This included portions of 1B (located south of Bradfield Canal and the East Fork Bradfield River) as well as all of Unit 1A and 3. This was done as an attempt to increase deer numbers and make more deer available to hunters. At the department's request, the board approved expedited review and implementation of the wolf hunting season extension so the new regulation would become effective during the spring 2011 season.

Hunter Harvest. The estimated Unit 1B harvest (including illegal harvest) declined from 121 deer in RY09 to 103 deer in RY10, and 83 deer in RY11. Yet both years of this report period remained well above the preceding 10-year average of 61 deer per year. Deer harvest was reported in 7 Wildlife Analysis Areas (WAAs), including WAA 1603 (Thomas Bay), WAA 1604 (Baird Glacier), WAA 1605 (Muddy River/Patterson Glacier), WAA 1706 (Horn Cliffs/LeConte Bay), WAA 1708 (Stikine River Drainage), WAA 1816 (Seward Passage) and WAA 1817 (Vixen Inlet, Union Bay). In 2011, although the estimated harvest declined to 83 deer, it remained above the preceding 10-year average of 67 deer per year. Deer harvest was reported from 5 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).

Hunter Residency and Success. Based on estimates derived from Deer Hunter Survey responses, 27 nonresidents hunted deer in Unit 1B during RY10 and 13 were successful (Table 2). In RY11, an estimated 15 nonresidents hunted deer in the unit and 7 were successful. Deer populations are greater 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 nonresidents in particular, hunt deer incidentally while goat hunting in Unit 1B.

During the report period, the number of hunters declined from 157 in RY10, to 115 in RY11, the latter much lower than RY09 when 144 people hunted. The hunter success rate in RY10 was a relatively high 50%. In RY11 hunter success increased to 56%, well above the preceding 10-year average of 42%.

Harvest Chronology. Generally, most harvest in the unit takes place during November, October, and August, in descending order, and such was case during RY11. During RY10 September had the third highest monthly harvest (Table 4).

Transport Methods. Most Unit 1B deer hunters generally reported traveling to their hunting areas by boat (Table 5). In RY10 83% of hunters reported using boats to access their hunt area, 10%

used highway vehicles and 3% accessed their hunting area on foot. In RY11 84% of hunters reported using boats to access their hunting area, 6% accessed their hunting area on foot, and 4% used highway vehicles. 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 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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Table 1. Unit 1B deer harvest[a], regulatory years 1998–2011.

Regulatory	Estimated legal harvest						Estimated illegal harvest					
year	M	(%)	F	(%)	Unk.	Total	M	(%)	F	(%)	Unk.	Total
1998	72	(100)				72						72
1999	73	(100)				73			12	(100)		85
2000	44	(100)				44						44
2001	43	(100)				43						43
2002	34	(100)				34						34
2003	82	(100)				82						82
2004	38	(100)				38						38
2005	58	(100)				58						58
2006	114	(100)				114						114
2007	43	(100)				43						43
2008	34	(100)				34						34
2009	105	(100)				105			16	(100)		121
2010	103	(100)				103						103
2011	83	(100)				83						83

[a] Data from mail out survey.

Table 2. Unit 1B deer hunter residency and success, regulatory years 1998–2011.

Successful						Unsuccessful					
Regulatory year	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Total hunters
1998	51	5	0	56	(30)	112	14	4	130	(70)	186
1999	38	14	0	52	(33)	65	29	14	108	(67)	160
2000	36	0	0	36	(23)	97	23	0	120	(77)	156
2001	32	0	0	32	(23)	99	5	5	109	(77)	141
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[b]	54	7	13	74	(50)	61	0	14	75	(50)	157[b]
2011	57	0	7	64	(56)	36	7	8	51	(44)	115

[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.

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 1998–2011.

Regulatory year	Harvest periods							Number of Deer[a]
	Aug	Sep	Oct	Nov	Dec	Jan	Mar	Unk
1998	15	9	24	24	7	0	7	14	72
1999	5	9	0	27	14	0	0	45	85
2000	21	9	9	61	0	0	0	0	44
2001	15	18	23	27	11	0	0	6	43
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

[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 1998–2009[a].

Regulatory year	Percent of effort							Number of trips
	Airplane	Boat	3- or 4-wheeler	Foot	ORV	Highway vehicle	Horse / Dog Team	Not specified	
1998		91	4			5			NA
1999	3	94				3			NA
2000	4	90	6						NA
2001		81		2	11	6			NA
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

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

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DEER MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2012

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 200,000 deer in Southeast Alaska (Merriam 1970). The region wide 1962 harvest was 10,500 deer. Severe winters in 1969 and 1971 increased mortality and reduced deer numbers (Olson 1979). Hunter surveys began in 1970 and continue annually. These surveys have grown 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, Harbor, Lincoln, and Shelter islands on a near annual basis, but rarely in mainland locations.

Deer densities were relatively high throughout the early to mid-1990s but declined substantially due to severe winter weather in 1999. With very mild winters from 2000–2005 the deer populations across the region rebounded again to high densities. During 1994–2005 above average snowfall was only recorded at the Juneau airport during one of 11 winters (McCoy 2011) and deer responded favorably yielding higher populations, with more deer available to hunters. However, the winter of 2006–2007 was severe with record snowfall recorded in Juneau (Figure 1). Substantial snowfall occurred in 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 2007, the Southeast panhandle received snow day after day throughout the month, and by April 1, snow was at extreme levels throughout this area. The snow pack restricted deer movements and led to a substantial deer die off in Unit 1C. The severity of the winter of 2006–2007 and associated deer mortality spurred the department to implement a doe closure in both Units 1C and 4 during December of 2007 to protect female deer from further harvest.

Most Unit 1C deer occur on Douglas, Shelter, and Lincoln Islands, locations that have only occasionally been known to support wolves. Biologists receive sporadic reports of wolves on Douglas Island each year but wolves have not been officially documented in the past few years. 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 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 (i) (4)], the Unit 1C management goal is to manage the deer population to achieve and maintain a population of 6,200 deer while maintaining 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 the RY10 season. 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 of 2011. The report is attached to harvest tickets, and all hunters are required to submit it. Our harvest data for RY11 is based on the harvest ticket report. One problem encountered with the new system is that the department encouraged hunters to report their hunting effort and harvest "on-line" during RY11, the first year of the deer harvest ticket report. However, the on-line system did not function properly, and many 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 RY11.

Since 1984, Unit 1C pellet-group surveys have been conducted to gauge deer population trends. Pellet transects were conducted on Douglas, Shelter, and Sullivan Islands in Unit 1C during the report period (Table 1). Data in this report are compiled by regulatory year (RY), with the current report period pertaining to RY10 and RY11. A regulatory year begins on 1 July and ends on 30 June of the following calendar year (e.g. RY10=1 July 2010–30 June 2011).

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 and harvest report data. North Douglas Island pellet-group densities increased during the report period when compared with RY09, but were relatively low when compared with the period of RY04–RY08 (Table 1). At Inner Point on the southwest side of Douglas Island, pellet surveys were conducted only in RY10 due to the lack of staff available to conduct surveys in RY11. The RY10 survey resulted in a mean count of 2.12 pellet groups per plot. This is the third highest count in the last 15 years.

Shelter Island pellet surveys were conducted in RY10 but not in RY11. The 2010 survey resulted in a mean count of 1.86 pellet groups per plot, which is one of the higher counts 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 (RY94–RY09) is 1.50 pellet groups/plot.

Pellet surveys were conducted on Sullivan Island in RY11; surveys were previously conducted on the island in RY89 and RY98. Sullivan Island is located in the northern portion of Unit 1C just south of the Unit 1C and Unit 1D boundary at Eldred rock in Lynn Canal. Residents of Haines hunt deer on Sullivan Island and have asked the department to conduct pellet surveys on the island more consistently; the RY11 survey is intended to be the start of every other year pellet surveys. In RY11, the survey resulted in 1.47 pellet groups per plot. Because the island is surveyed infrequently there is little data to compare the RY11 result to. However, the RY11 count is similar to the RY89 results of 1.40 pellet groups per plot, and higher than the RY98 count of .64 pellet groups per plot, which was likely due to severe winter weather in RY98—RY99.

MORTALITY

Harvest

Season and Bag Limit	Resident and Nonresident Hunters	
Unit 1C Douglas, Lincoln, Shelter, 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

Board of Game Actions and Emergency Orders. No Board of Game actions were taken, or Emergency Orders issued for deer in Unit 1C during the report period.

Hunter Harvest. Based on data gathered from the RY10 deer hunter survey and RY11 deer harvest ticket report cards, hunters in Unit 1C killed 508 deer in RY10 and 388 in RY11 (Table 2), with bucks composing 68% and 70% of the annual harvest respectively. The majority of the

Unit 1C deer harvest came from Douglas Island during the report period; 368 deer in RY10, and 286 deer in RY11. Due to its proximity to Juneau and accessibility by road, Douglas Island historically has produced the highest deer harvest in Unit 1C.

The deer harvest on Shelter and adjacent Lincoln Island increased in both years of the report period. In RY10, 41 deer were harvested on Shelter/Lincoln Islands; and in RY11, 34 deer were taken. The RY10 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 (Figure 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 increased to a level similar to that of Shelter/Lincoln, with 31 deer reported taken in RY10, and 42 deer taken in RY11. 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 is 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 (87%) were Unit 1C residents; nonlocal residents composed the majority of the remaining hunters. Thirteen nonresident hunters reported effort in unit 1C during RY10; none were successful. In RY11, 29 nonresidents reported hunting in Unit 1C and 2 were successful (Table 3). Hunter success rates improved from an average of 30% during RY00–09, to 35% in RY10 and 34% in RY11 (Table 3). Unit wide, hunters spent an average of 6.6 days hunting per deer taken in RY10 and 5.9 days per deer in RY11 (Table 4). The average deer per hunter was 0.6 in RY10 and 0.5 in RY11 (Table 4). On Douglas island hunters averaged 6.7 and 5.9 days to take a deer in RY10 and RY11, respectively, taking .5 deer per hunter in both years of the report period. On Shelter Island, hunters spent 4 days on average to take a deer in RY10; and in RY11, spent an average of 3.4 days to take a deer. Shelter island hunters averaged .5 deer per hunter in both years of the report period. On Sullivan Island, hunter success was relatively high with .8 deer per hunter in RY10, and 1.0 deer per hunter in RY11. Hunters spent 3.2 days hunting per deer in RY10, and 4.0 days per deer in RY11.

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 45% of hunters used highway vehicles for access, 30% used boats, 20% accessed hunting areas by walking, and approximately 5% used an airplane, ORV and 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 Island, Shelter Island, Lincoln Island, and Sullivan Island. 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 (.7 deer/hunter) and the number of days per deer (3.3 days/deer) was lower than hunters using highway vehicles (.4 and 9.0, 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

Unlike during previous report periods, not all of the Douglas and Shelter Island pellet group transects were surveyed. This change is due to difficulty finding staff available to conduct the surveys, and the department's interest in surveying areas such as Sullivan Island on a more consistent basis. 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/plot during the report period. Overall, pellet group densities increased in Unit 1C in 2010 and decreased in 2011. The decrease in 2011 is likely due to severe winter weather (i.e. snowfall) in 2011 (Figure 1). Deer numbers appear to have continued to improve during the report period but the impacts of winter 2011 are not yet known. The harvest management objective of 456 deer was met in 2010 but not in 2011; fewer hunters hunted in 2011 and spent less time hunting deer but enjoyed reasonable success. We should consider establishing pellet group transects in mainland areas because an increasing number of hunters are interested in hunting the mainland. 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 numbers 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 winter weather isn't too severe.

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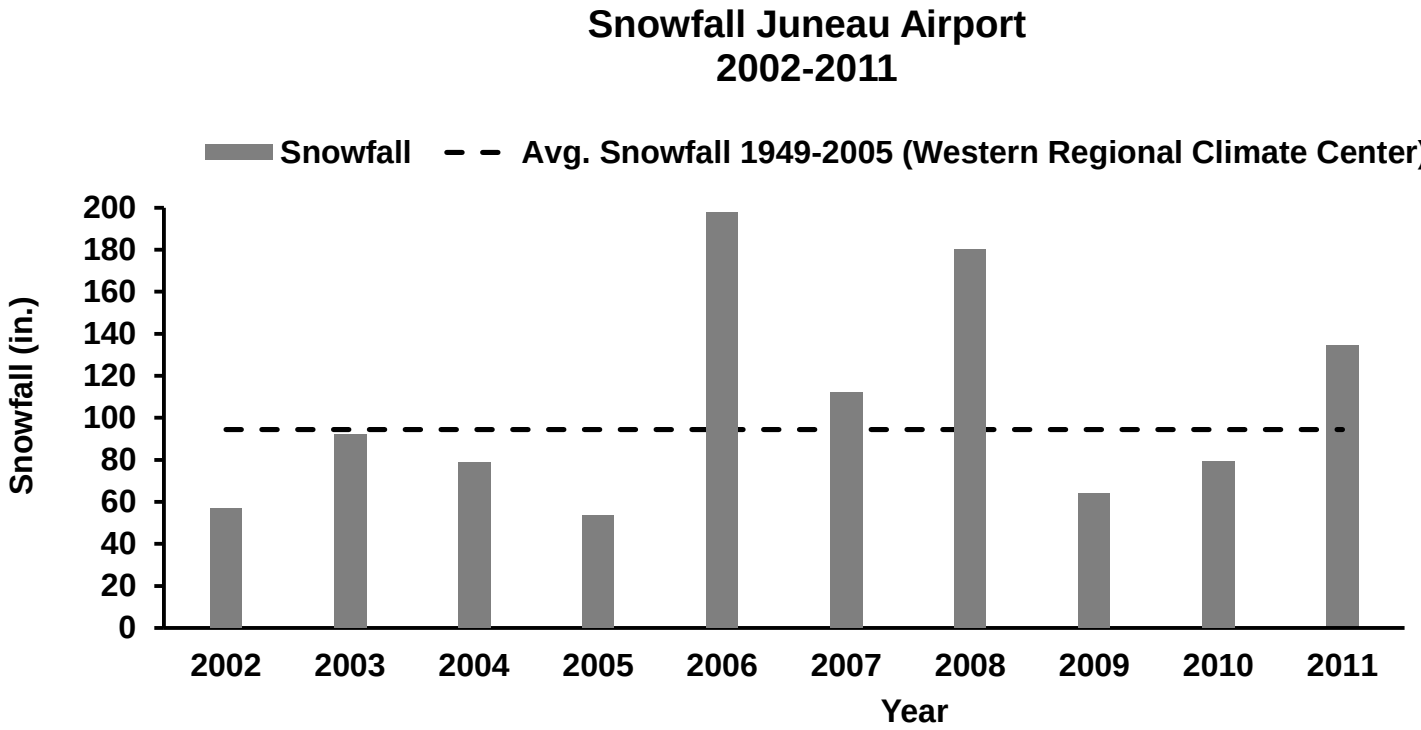

Figure 1. Annual winter snowfall measured at the Juneau airport, 2002-2011. The average snowfall is depicted as a dashed line. (Data: WFO, Juneau, AK).

Table 1. Unit 1C deer population trends as indicated by pellet-group surveys, regulatory years 1986 through 2011.

Regulatory Area	Mean pellet-year	Number groups/plot	of plots	95 % CI
Kensington (VCU 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
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

Table 1. continued.

Regulatory Area	Mean pellet-year	Number groups/plot	of plots	95 % CI
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
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

Table 2. Unit 1C annual deer harvest[a], regulatory years 1997 through 2011.

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	307
2005	281	122	404
2006	393	284	676
2007	148	30	178
2008	209	127	336
2009	217	96	313
2010	345	163	508
2011	271	116	388

[a] Data from expanded results of hunter surveys.

Table 3. Unit 1C deer hunter residency and success, regulatory years 1990 through 2011.

	Successful						Unsuccessful						
Regulatory year	Local[a] resident	Nonlocal resident	Non resident	Unk	Total	(%)	Local[a] resident	Nonlocal resident	Non resident	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	NA[b]	NA	NA	NA	NA	NA	NA	NA
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

[a] Local means the hunter is a resident of Unit 1C.

[b] Data for unsuccessful hunters unavailable due to changes in survey.

Table 4. Unit 1C hunter effort and success (by number), regulatory years 1990 through 2011.

Regulatory year	Hunters	Days hunted	Deer killed	Deer/hunter	Days/deer
1990	948	3,262	499	.5	6.5
1991	827	2,993	417	.5	7.2
1992	959	3,202	511	.5	6.3
1993	904	2,950	579	.6	5.1
1994	1,017	4,151	659	.6	6.3
1995	990	3,968	311	.3	12.8
1996	257	NA*	NA	NA	NA
1997	861	3,819	438	.5	8.7
1998	950	3,396	388	.4	8.7
1999	851	2,327	335	.4	7.0
2000	803	2,312	241	.3	9.6
2001	881	2,764	345	.4	8.0
2002	795	2,563	358	.5	7.2
2003	897	2,925	459	.5	6.4
2004	835	3,115	307	.4	10.1
2005	954	3,577	404	.4	8.9
2006	937	3,188	676	.7	4.7
2007	706	2,778	178	.3	15.6
2008	853	3,580	336	.4	10.7
2009	797	2,704	313	.4	8.6
2010	901	3,341	508	.6	6.6
2011	820	2,284	388	.5	5.9

* Data unavailable due to changes in survey.

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DEER MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2012

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 the mainland of Prince of Wales Island and the smaller adjacent islands. Deer populations tend to fluctuate seasonally, primarily in response to severe winter weather, habitat loss, and wolf and black bear predation. Although Unit 2 experienced 3 consecutive harsh winters from 2006–2009, mild weather during the winter of 2009–2010 coupled with low bear and wolf numbers resulted in an abundance of deer. Managers now believe the population at that time may have been at or near winter carrying capacity. A moderately severe winter in 2011/12 resulted in low fawn recruitment and below average adult over winter survival, particularly for older age class bucks. Examination of carcasses revealed most fawn and adult winter mortalities were a result of malnutrition. Another mild winter in 2012/13 has again increased deer numbers. Managers are continuing to monitor range conditions for over-abundance, but for now deer populations in Unit 2 appear to be healthy compared to other adjacent areas such as Units 1A and 3 where deer numbers are severely depressed.

Sitka black-tailed deer are highly valued for hunting on POW. They are an important subsistence resource as well as a sport hunting trophy. POW has a reputation for producing large-bodied and large-antlered bucks and a number of bucks qualify for the Boone and Crockett and Pope and Young record books each year. Weather conditions and population levels are the main regulators of deer harvests. The yearly harvest in Unit 2 has averaged 2,863 deer over the past 10 seasons (2002–2011) (Table 1).

Hunting of does is allowed under federal regulations though the practice has sparked much controversy. In 1995, despite state opposition, a federal 2.5 month long antlerless season was implemented in Unit 2. The federal antlerless season remains in effect today, running from October 15 through December 31, and allows qualified rural hunters under the federal subsistence program to harvest one 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 because of public opposition. The bag limit remains 4 bucks for hunters hunting under state regulations.

Craig is the largest community in Unit 2, with approximately 1,100 residents. Craig was once the fastest growing community in Alaska during the period when many Prince of Wales Island logging camps closed and families moved into this community. The population of Craig stabilized as some residents moved away in search of employment, while others started new tourism-based businesses. The population now appears to be in a slow, steady decline. Thorne Bay, the third largest community in Unit 2 (population ~ 500) was once the largest logging camp in North America with 1,500 residents at its peak in the 1960's and 1970's. The total population of Unit 2 is approximately 3,600 down from approximately 6,000 ten years ago.

Clearcut logging has been widespread in Unit 2 and its effects on deer habitat are significant and enduring. Counting national forest and private lands, ADF&G biologists estimate that 480 mi^2 of forested habitat has been cut during the past 60 years in Unit 2. The result of that timber harvest has been the removal of a large portion of important deer range, especially critical winter habitat.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

Action taken by the Board of Game in fall 2000 established a Unit 2 population goal of 71,000 deer and a harvest goal of 2,700 deer. This action is 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, from field observations, spring pellet-group surveys and spring mortality transects. In addition, a new technique for estimating deer abundance was developed during the last reporting period. Todd Brinkman, PhD developed a technique to identify individual deer using fecal DNA and used DNA-based mark and recapture techniques to estimate population trends in distinct watersheds on POW (Brinkman 2009). Testing of this new technique continues and managers are cautiously optimistic about the new methodology. It has the potential to replace traditional pellet group surveys in the future.

The Division of Wildlife Conservation (DWC) has conducted mail out hunter surveys since 1980 (with the exception of 1981). DWC mails harvest questionnaires to a random sample of 33% of all Region I deer harvest ticket holders and results are expanded (*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) to estimate hunting results of all harvest ticket holders (ADF&G 2012). We also estimate the number of hunters reporting as state

proxy hunters or federal designated hunters from all the surveys. Due to growing issues in Unit 2 and the poor historical survey response rates from residents of Unit 2, some POW communities were sampled at approximately 100% starting in 2003.

Because of continuing contentious issues surrounding allocation of deer harvest in Unit 2, from 2005 through 2010, Unit 2 deer hunters had been required to fill out a new harvest report form specific to the unit. Those hunters were removed from the mail survey list and their hunt information was instead captured on the Unit 2 report form. Data through 2010 represents total estimated deer harvest (i.e. actual reporting results multiplied by an expansion factor). Until 2004 the data was collected through a single Region I deer harvest survey. From 2005-2010 the data is a composite result of data collected through the Region I deer harvest survey and the Unit 2 specific deer harvest reporting efforts.

Beginning fall 2011, the Unit 2 report form and mail out questionnaire were replaced by a statewide deer harvest ticket report, the same as is currently used for other species such as moose, caribou and sheep.

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.

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 made no regulatory changes to the state deer seasons or bag limits in Unit 2 during this period.

Hunter Harvest. Reported deer harvest in Unit 2 during the past 2 seasons was estimated at 3,626 and 3,251 deer, well above the harvest objective of 2,700 and the 10-year average of 2,863. Deer per hunter (1.6 and 1.5 deer during RY10 and RY11, respectively) was slightly higher than the long-term average of 1.4 while the average of 3.3 and 3.4 hunter days per deer during RY10 and RY11 was lower than the long-term average of 3.7 (Table 1). This harvest data is consistent with anecdotal and field observations in Unit 2, which all suggest the Unit 2 deer population is stable to increasing and currently at a 10 to 15 year high.

Harvest during RY10 and RY11 on the main island of POW was 3,270 and 2,891 deer harvested, respectively, well above the 2,426 10-year average. Success rates in RY10 and RY11 were also very high at 74% and 73%, consistent with the long term average of 71% (Table 2).

Hunter Residency and Success. An estimated 48% of the hunters harvesting deer in Unit 2 during the past 2 years were residents of POW. Hunters living in communities of POW had a higher success rate than other hunters, with residents enjoying an average success rate of 84% during both years of the report period. 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). Nonresident interest in Unit 2 deer continues at a low but increasing rate. Nonresident hunters numbered 224 and 188 during 2010 and 2011, respectively, above the 10-year average of 142 per year. The combined nonresident success rate for the report period was 58%, higher than the 10-year average of 50%. This is indicative of 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. The Craig ADFG office has noted an increase in nonresident inquires into deer hunting over the past 5 years.

The average reported doe harvest over the past ten seasons (RY02–RY12) has been 109 or approximately 3.8% of the overall reported harvest. During the RY10 season, 101 does were reported harvested under federal subsistence permits in Unit 2. During RY11, 136 does were reported (Table 5). Based on anecdotal reports we believe this reported doe harvest is likely a very low estimate of actual female deer taken by federal subsistence hunters.

Despite current abundant populations, historically high harvests, and liberal seasons and bag limits there are continued rumblings from the subsistence community about their inability to meet their subsistence needs. These concerns are substantiated in some cases and not in others. One concern is the perception of increased hunting pressure. The numbers of hunters for this reporting period (2,250 and 2,221 in RY10 and RY11 respectively) are only slightly higher than the 10 year average of 1,924 (Table 1). The recently enacted Access Travel Management Plan (ATM) by the USFS will close 150 new miles of road to highway vehicles and convert an additional 222 miles from highway vehicle use to OHV use only (USDA 2009). The ATM may serve to squeeze the same number of hunters into smaller areas, affirming the perception of increasingly crowded hunting conditions. In addition, as clear-cuts advance past seral stages, deer are less visible which leads to the misperception that there are fewer deer available. Now and in the future, state and federal managers will continue to struggle with balancing ADF&G's mission of wildlife conservation with the Forest Service's mission to provide subsistence resources for rural residents under ANILCA (Alaska National Interest Lands Conservation Act).

Harvest Chronology. Most Unit 2 deer are harvested during August, October and November. From 2002 through 2012, August and October harvests were roughly equal comprising 17% and 18% of the harvest, respectively. The precipitous drop of August harvest beginning in 2003 is a direct result of changes to federal deer hunting regulations in 2003. Nonlocal resident hunters now have only 1 week of August to hunt before school begins. Federally qualified hunters are also taking advantage of the July season. For hunters not qualified to hunt under federal regulations, November (which coincides with the rut) is now the most popular time period to hunt by far and accounts for roughly 50% of the total nonlocal harvest (Table 6).

Transport Methods. With the extensive road system in Unit 2, highway vehicles typically dominate the preferred access methods for hunters. During this reporting period, boats accounted for about 25% of the deer hunting effort with highway vehicles accounting for 69%. This is roughly the same as the 10 year average (Table 7).

Other Mortality

We believe that Unit 2 has one of the highest illegal and unreported harvests in the region. Unreported and illegal kill is estimated to be equal to the Unit 2 reported harvest (Table 5). These estimates are based on anecdotal reports, interviews with law enforcement personnel, and former and current research on collared deer on POW. Of an estimated 75,000 deer in Unit 2, the illegal removal of an average of 2,863 deer equates to a 3.9% mortality rate. The high illegal take is partly due to the extensive and remote road system and lack of law enforcement personnel. Illegal hunting may increase as hunting becomes more difficult due to decreasing ability to see deer as clearcuts grow in, and increasing hunting pressure following higher unemployment rates. Flynn and Suring (1989) reported that actual hunter kill could be 38% greater than total estimated harvests from hunter reports because of crippling loss. Field observations and voluntary reports of wounding loss verify that our wounding loss estimates are conservative.

Historically and prior to extensive paving on the island, deer/vehicle collision estimates were low (10–25 deer/year) and were not considered a significant source of Unit 2 mortality. However, the collision risk increased with completion in 2003 of extensive new POW 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 on the 20 road to extend pavement to Naukati and planning is underway for paving the Sandy Beach Road between Thorne Bay and Coffman Cove. 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 logging activity peaked in the 1980's and early 1990's and declined thereafter, it has seen resurgence during this and the previous reporting period. The recent Logjam Timber sale involves 73 million board feet of lumber resulting in clear-cut logging of approximately 3,400 additional acres of old-growth habitat. The US Forest Service is planning another large scale sale called the Big Thorne Timber sale. This sale is currently at the draft EIS stage. This sale would allow for an additional 93 to 189 million board feet of timber from between 4,223 and 6,909 acres to be removed from the forest. Many of the timber units slated in this sale represent the last remaining quality deer winter range and travel corridors in some drainages within the central part of POW. In addition, current legislation before Congress called the Sealaska Bill has the potential to transfer up to 80,000 acres of Tongass National forest to Sealaska Corporation. Of this, potentially 75,000 acres or 117 square miles of additional old-growth habitat would be subjected to clear-cut logging. A majority of these lands would come from Unit 2. Although early seral stages of clear-cuts provide exceptional deer forage, the subsequent second growth in the 20 to 30 year old age class eventually reaches a stem exclusion stage where the canopy closes and important understory plants that deer target as forage disappear. Associated with logging is road building and roads are steadily impinging on deer habitat. As clearcut logging continues to reduce old growth habitat in Unit 2, deer populations are expected to decline. McNay and Voller (1995) in a study of the relationship between habitat and predation of Columbian black-tailed deer on Vancouver Island, British Columbia suggested that logging with the accompanying road construction and winter range fragmentation concentrates predation on resident deer. They

concluded that large blocks of intact old growth forests at low elevations are essential to sustaining healthy deer populations.

Old-growth forests retain important winter forage and provide snow interception. Population models estimate declines in carrying capacity of 50–60% by the end of the logging rotation in 2054. By 2054 we expect few areas will meet projected hunter demand within road accessible areas and logged portions of Unit 2 (USFS 1989). The USFS is spending some resources to look at second growth management and is conducting pre-commercial thinning and other treatments for wildlife in some areas. The benefits to deer in these cases may be minimal at best (Farmer et. al. 2006). Long-term consequences of habitat loss include the inability to provide for subsistence needs and a loss of deer hunting opportunities.

CONCLUSIONS AND RECOMMENDATIONS

According to our harvest estimates, the Unit 2 harvest objective of 2,700 deer was met in both years of the report period. However, anecdotal reports from hunters and public testimony during an extensive multi-agency Unit 2 deer planning effort during 2006 (Unit 2 Deer Planning Subcommittee 2005) all suggest our best efforts to improve reporting in this unit still significantly underestimate the actual number of deer harvested from Unit 2.

The reported 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. Numbers of hunters and successful hunters increased slightly during this reporting period and despite increased hunting pressure, success rates were still some of the highest on record. All of this information suggests stable to increasing deer numbers. However, managers are concerned that populations may be at or near severe winter carrying capacity and that a severe winter or series of above average snowfall winters could result in substantial reductions in deer numbers.

We should inform the public of the effects of logging on deer populations, so the public is aware of tradeoffs between timber harvest and wildlife. We anticipate that winter habitat loss through logging will reduce deer carrying capacity for many decades. Long term consequences of habitat loss include the inability to provide for subsistence needs and the loss of hunting opportunities (Wood 1990, Larsen 1993).

Regenerating clear-cuts have reduced the visibility of and access to deer to hunters in some locations. Although recent logging may provide good hunting opportunities in the short term, overall, the loss of winter habitat will most likely reduce deer levels and hunting opportunities. Impacts on habitat due to climate change are unknown at this time.

Recent road improvement projects that paved large sections of POW and the planned arrival of a new high-speed ferry that would link Coffman Cove to Petersburg are changing hunter access. New and improved access, coupled with the predicted decline of deer carrying capacity in Unit 2, will require that we monitor deer populations more closely in the future and anticipate management strategies to adapt to changing situations.

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Table 1. Unit 2 deer harvest data, regulatory years 2002 through 2011.

Regulatory year	Nr hunters	Nr successful hunters	Percent successful	Total hunter days	Average hunter days	Total deer[a]	Average deer per hunter	Average hunter days per deer
2002	1,850	1,122	61	10,426	5.6	2,176	1.2	4.8
2003	1,389	887	64	8,014	5.8	1,804	1.3	4.4
2004	1,410	1,038	74	6,818	4.8	2,184	1.5	3.1
2005	1,808	1,314	73	9,144	5.1	2,717	1.5	3.4
2006	2,075	1,551	75	10,126	4.9	3,342	1.6	3.0
2007	2,008	1,388	69	10,530	5.2	2,869	1.4	3.7
2008	2,114	1,511	72	11,120	5.3	3,318	1.6	3.4
2009	2,112	1,569	74	11,692	5.5	3,343	1.6	3.5
2010	2,250	1,683	75	11,830	5.3	3,626	1.6	3.3
2011	2,221	1,655	75	10,957	4.9	3,251	1.5	3.4
Average	1,924	1,372	67	10,066	5.2	2,863	1.4	3.7

[a] Includes does that were reported killed.

Table 2. Unit 2 deer harvest from Prince of Wales Island only, regulatory years 2002 through 2011.

	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	1,767	1,068	60	10,146	5.7	1.2	2,064
	2003	1,317	829	63	7,618	5.8	1.3	1,659
	2004	1,341	975	73	6,394	4.8	1.5	2,020
	2005	1,724	1,236	72	8,678	5.0	1.5	2,534
	2006	1,975	1,470	74	9,718	4.9	1.6	3,156
	2007	1,921	1,324	69	10,092	5.3	1.4	2,688
	2008	1,993	1,412	71	10,387	5.2	1.5	3,009
	2009	1,985	1,467	74	10,895	5.5	1.5	3,052
	2010	2,145	1,578	74	11,194	5.2	1.5	3,270
	2011	2,072	1,515	73	10,111	4.9	1.4	2,891
	Average	1,798	1,198	71	10,001	5.2	1.4	2,426

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

Table 3. Unit 1A (Ketchikan) hunters use of Unit 2 deer, regulatory years 2002 through 2011.

Regulatory year	1A Res. Successful Hunters	1A Res. Unsuccessful Hunters	Total 1A Resident Hunters	Total Hunters Unit 2	Deer Harvested By 1A Res.	Total Deer Harvested Unit 2
2002	417	316	733	1,850	766	2,176
2003	321	226	547	1,389	593	1,804
2004	425	182	607	1,410	900	2,184
2005	371	144	515	1,808	699	2,717
2006	387	196	583	2,075	771	3,342
2007	369	201	570	2,008	742	2,869
2008	456	201	657	2,114	944	3,318
2009	443	190	633	2,112	847	3,343
2010	484	196	680	2,250	1,023	3,626
2011	477	208	685	2,221	1,015	3,251
Average	415	206	621	1,924	830	2,863

Table 4. Unit 2 Hunter residency and success, regulatory years 2002 through 2011.

Regulatory year	Successful				Unsuccessful			
	Local resident[a]	Nonlocal resident	Nonresident	Total	Local resident[a]	Nonlocal resident	Nonresident	Total
2002	548	574	0	1,122	301	427	0	728
2003	475	412	0	887	172	330	0	502
2004	475	563	0	1,038	126	246	0	372
2005	736	489	89	1,314	170	217	107	494
2006	759	723	65	1,547	147	276	83	506
2007	721	593	75	1,389	165	303	151	619
2008	719	693	100	1,512	189	302	111	602
2009	748	657	139	1,544	148	290	88	526
2010	789	724	136	1,649	161	308	88	557
2011	783	725	102	1,610	141	319	86	546
Average	675	615	71	1,361	172	302	71	545

[a] Local residents include Alaskans living within Unit 2 boundaries.

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

Table 5. Unit 2 reported and estimated deer harvest/mortality, regulatory years 2002 through 2011.

Regulatory year	Reported harvest			Unreported & illegal harvest[a]	Estimated total harvest	Estimated nr road kills
	Male	Female	Total			
2002	2,085	91	2,176	2,176	5,120	25–30
2003	1,735	69	1,804	1,804	5,056	25–30
2004	2,090	94	2,184	2,184	6,058	30–50
2005	2,603	114	2,717	2,717	5,730	30–50
2006	3,230	112	3,342	3,342	4,338	30–50
2007	2,771	98	2,869	2,869	3,646	30–50
2008	3,192	126	3,318	3,318	4,294	30–50
2009	3,190	153	3,343	3,343	5,640	30–50
2010	3,525	101	3,626	3,626	6,054	30–50
2011	3,115	136	3,251	3,251	6,502	30–50
Average	2,754	109	2,863	2,863	5,244	

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

Table 6. Unit 2 deer harvest chronology, regulatory years 2002 through 2011.

	Month of kill						
Regulatory year	July	Aug	Sep	Oct	Nov	Dec	Unk/ other
2002	0	605	276	401	672	79	142
2003[ab]	78	284	287	357	566	49	182
2004	68	310	240	481	811	61	213
2005	210	485	390	503	895	76	157
2006	192	501	459	541	1,333	152	164
2007	128	428	300	450	1,217	121	226
2008	116	494	362	522	1,525	167	132
2009	122	488	263	510	1,655	183	122
2010	156	471	281	595	1,669	178	277
2011	216	579	247	491	1,562	118	38
Average	129	465	311	485	1,191	118	165

[a] Harvest underestimated on state survey because of new federal subsistence regulations.

[b] Federal subsistence deer season opens July 24.

Table 7. Unit 2 hunter transport method, regulatory years 2002 through 2011.

Regulatory year	Method of transportation[a]					
	Airplane	Boat	Foot	Highway vehicle[b]	Other	Unk
2002	75	426	41	1,469	0	28
2003	34	345	38	1,077	0	69
2004	32	330	33	1,113	0	31
2005	80	391	41	1,412	0	56
2006	81	528	56	1,570	0	34
2007	93	483	43	1,501	0	32
2008	84	793	73	1,305	1	87
2009	69	623	58	1,479	0	76
2010	54	562	71	1,668	0	145
2011	69	563	194	1,405	8	177
Average	67	504	65	1,400	1	74

[a] Numbers of successful and unsuccessful hunter trips.

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

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DEER MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2012

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. Severe winter weather causes most population declines, and predation by wolves and bears and illegal hunting have extended the length of declines.

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 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 regionwide 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 increased somewhat, and the mean harvest during this report period of 593 deer is still about 100 deer below the previous 10 year mean (Table 2).

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 deer densities using pellet-group surveys.
- Monitor deer harvest using mailed questionnaires.

METHODS

From 1980 to 2010 (with the exception of 1981), we estimated Unit 3 harvest data from 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. We measured winter deer density with 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 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 unitwide 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 2011, pellet-group counts were conducted in 3 VCUs on 2 islands in Unit 3. East Duncan pellet-group counts declined from 1.37 pellet-groups/plot in spring 2007, to 0.64 in spring 2011. Woewodski (South Mitkof Island) pellet-group counts continued a decreasing trend that began in 2007, down from 0.81 pellet-groups/plot in spring 20010 to 0.74 in spring of 2011. This represents the second lowest count since pellet-group counts were initiated in that area in 1984 (Table 1).

In spring of 2012, pellet-group counts were conducted in 3 VCUs on 2 islands in Unit 3. East Duncan pellet-group counts declined slightly from 0.64 pellet-groups/plot in spring 2011, to 0.60 in spring 2012. Portage Bay pellet-group counts increased slightly from 0.39 pellet-groups/plot in spring 1998, to 0.63 in spring 2012. Woewodski (South Mitkof Island) pellet-group counts were 0.74 pellet-groups/plot in spring 2011, which was identical to spring of 2012 (Table 1).

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

Board of Game Actions and Emergency Orders. The Board of Game took no actions and we issued no emergency orders regarding deer hunting in Unit 3 during the report period. However, at the fall 2010 BOG meeting, the board adopted a public proposal to extend the wolf hunting season in Unit 3 by 31 days (1 August– 31 May). This included portions of 1B (located south of Bradfield Canal and the East Fork Bradfield River) as well as all of Unit 1A and 3. This was done as an attempt to increase deer numbers and make more deer available to hunters. At the department's request, the board approved expedited review and implementation of the wolf hunting season extension so the new regulation would become effective during the spring 2011 season.

In fall 2010 it was brought to the Board of Game's attention that the Unit 3 deer population and harvest were well below the Intensive Management (IM) objectives. 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 submit a regulatory proposal for IM action for Board consideration at its March 2013 meeting.

Hunter Harvest. In RY10 the unitwide harvest increased to 673 deer, up from 547 deer in RY09 (Table 2). In RY11, the unitwide harvest decreased to 514.

Hunter Residency and Success. Few nonresidents hunt deer in Unit 3, and most hunters are local residents (Table 3). Nonresidents composed just 3% and 4%, respectively, of all Unit 3 deer hunters in RY10 and RY11. 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 but remained well below the preceding 10 year average of 863. The total number of hunters increased from 570 in RY09 to 720 in RY10, ending a steady decline that began in RY05. In RY11, the estimated number of hunters declined slightly to 693. The hunter success rate increased from 38% during the previous report period to 51% in RY10 and 52% in RY11.

Harvest Chronology. Table 4 shows the historical Unit 3 deer harvest percentage by month. Since 2002, the highest percentage of the unitwide 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 RY10, most hunters reported using highway vehicles, boats, and off road vehicles in descending order, to access their hunting areas. In RY11 hunters reported using boats, highway vehicles, 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

Unit 3 deer populations and estimated harvest steadily declined from RY04 to RY08. In RY05, the estimated unitwide harvest began to decline annually before reaching a low of 333 deer in RY08. Although the unitwide deer harvest rebounded to 547 in RY09 and 673 in RY10, it declined to 514 in RY11. With the possible exception of a few smaller islands, Unit 3 deer exist largely at levels well below carrying capacity.

We believe the recent declines in pellet-group densities and the decline in the estimated unitwide harvest reflect actual declines in the GMU 3 deer population. Factors potentially contributing to the decline in the unit's deer population and harvest include a series of deep snow winters, predation by wolves and bears, and continued reductions in deer carrying capacity resulting from the harvest of productive old growth stands important for overwinter survival and second growth stands entering stem exclusion. Furthermore, increasing road densities increase hunter access making deer more vulnerable to human-caused mortality.

The IM harvest objective of 900 deer in Unit 3 was last achieved in 2004 when an estimated 921 deer were taken. Future reductions in the deer season length and/or bag limit may be necessary in portions of the unit should the deer population fail to recover. It may also be necessary to reduce predation on deer in order to bring the Unit 3 deer into compliance with the IM population (15,000) and harvest (900) objectives. Research is needed to evaluate the respective roles weather, predation, and clearcut logging play in influencing Unit 3 deer populations.

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Table 1. Unit 3 deer population trends as indicated by pellet-group surveys, regulatory years 1981–2009.

Area	Regulatory year	Mean pellet-groups/plot	Number of plots	95% CI
Security Bay	1984	.02	360	0.01–0.04
(VCU 400)	1989	.25	304	0.16–0.34
	1995	.22	268	0.15–0.29
	2000	.09	201	0.05–0.14
Pillar Bay	1988	.16	337	0.10–0.22
(VCU 403)	2000	.18	264	0.13–0.23
Malmesbury	1990	.11	206	0.05–0.18
(VCU 408)	2000	.06	254	0.03–0.09
Conclusion	1987	2.66	207	2.32–3.01
(VCU 417)	1989	.95	200	0.72–1.18
	1991	.71	200	0.53–0.88
	1996	1.45	191	1.19–1.70
Big John Bay	1994	.38	300	0.29–0.48
(VCU 427)				
431–Point Barrie	1988	.23	357	0.17–0.29
(VCU)	1993	.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	.19	312	0.12–0.26
(VCU 435)	1987	.51	305	0.37–0.65
	1989	.40	312	0.25–0.56
	1994	.32	310	0.20–0.40
	1997	.36	281	0.28–0.44
	2007	.12	275	0.07–0.17

Table continues next page

Table 1. continued.

Area	Regulatory year	Mean pellet-groups/plot	Nr plots	95% CI
East Duncan Canal (VCU 437)	1990	1.12	227	0.92–1.32
	1992	.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
Portage Bay (VCU 442)	1993	.43	282	0.30–0.56
	1995	.43	277	0.63–0.94
	1998	.39	285	0.29–0.49
	2012	.63	230	0.50–1.72
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
	2011	0.74	289	0.58–0.89
	2012	0.74	229	0.56–2.15

Table continues next page

Table 1. continued.

Area	Regulatory year	Mean pellet-groups/plot	Nr plots	95% CI
Woewodski Island	1991	1.86	461	1.66–2.05
(VCU 448a)	1994	1.30	510	1.15–1.46
Frederick (N. Mitkof)	1981	.08	945	0.06–0.11
(VCU 449)	1990	.55	180	0.36–0.74
	1992	.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	.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		.25	281	0.18–0.32
c) Greys		.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
Snow Passage	1994	.57	345	0.45–0.70
(VCU 458)	1997	.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

Table continues next page

Table 1. continued.

Area	Regulatory year	Mean pellet-groups/plot	Nr plots	95% CI
Meter	2001	0.87	180	0.64–1.10
(VCU 459)	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	1985	1.63	646	1.45–1.81
(VCU 461)				
(All Transects)				
(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	.22	225	0.13–0.31
	1994	.26	224	0.18–0.34
	1999	0.11	216	0.06–0.17
	2003	0.08	227	0.03–0.13
Mosman	1993	.07	304	0.03–0.11
(VCU 467)				
Onslow	1984	.37	321	0.28–0.46
(VCU 473)	1985	.59	334	0.48–0.70
	1986	.72	347	0.59–0.84
	1987	.42	336	0.31–0.55
	1988	.44	329	0.32–0.55
	1991	.66	322	0.51–0.80
	1993	.68	341	0.55–0.82
	1994	.88	340	0.74–1.02
	1997	.73	346	0.59–0.86
	2002	.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
Fool's	1994	.54	193	0.38–0.70
(VCU 480)	2000	.61	201	0.45–0.77
Canoe	2000	.11	228	0.06–0.17
(VCU 474)				

Table continues next page

Table 1. continued.

Area	Regulatory year	Mean pellet-groups/plot	Nr plots	95% CI
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	.44	289	0.34–0.55

Table 2. Unit 3 (estimated) deer harvest, regulatory years 1996–2011.

Regulatory	Estimated legal harvest[a]							
year	M	(%)	F	(%)	Unk.	Total	Estimated illegal harvest	Total
1994	690	(100)			0	690	0	690
1995	844	(100)			0	844	22	866
1996	588	(100)			0	588	15	603
1997	773	(100)			0	773	7	780
1998	1,005	(100)			0	1,005	114	1,119
1999	862	(100)			0	862	70	932
2000	984	(100)			0	984	36	1,020
2001	853	(100)			0	853	0	853
2002	624	(100)			0	624	0	624
2003	888	(100)			0	888	13	901
2004	921	(100)			0	921	0	921
2005	710	(100)			0	710	8	718
2006	594	(100)			0	594	16	610
2007	457	(100)			0	457	0	457
2008	328	(100)			0	328	5	333[b]
2009	543	(100)			0	543	4	547
2010	669	(100)			0	669	4	673
2011[c]	504	(100)			0	504	10	514

[a] Estimates are based on data from a mail questionnaire sent to hunters.

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

[c] Data from mandatory harvest ticket report requirement

Table 3. Unit 3 deer hunter residency and success, regulatory years 1996–2011.

	Successful						Unsuccessful						
Regulatory year	Local[a] resident	Nonlocal resident	Nonresident	Unk	Total	(%)	Local[a] resident	Nonlocal resident	Nonresident	Unk	Total	(%)	Total[b] hunters
1996	379	33	6		418	N/A	N/A	N/A	N/A		N/A	N/A	N/A
1997	511	33	0		544	(49)	512	43	9		564	(51)	1,108
1998	612	48	17		677	(59)	419	32	17		468	(41)	1,145
1999	500	68	5		573	(48)	563	56	9		628	(52)	1,201
2000	513	90	0		603	(49)	526	86	5		617	(51)	1,220
2001	435	48	10		493	(49)	459	45	15		519	(51)	1,012
2002	363	51	14		428	(48)	413	22	28		463	(52)	891
2003	480	66	21		567	(58)	345	38	20		403	(42)	970
2004	500	51	9		560	(53)	410	67	21		498	(47)	1,058
2005	404	64	5		473	(52)	356	71	15		442	(48)	915
2006	298	40	32		370	(49)	320	57	9		386	(51)	756
2007	264	14	5		283	(41)	315	66	18		399	(59)	682
2008	184	25	5		214	(38)	284	31	27		342	(62)	556[c]
2009	197	16	6		219	(38)	325	20	6		351	(62)	570
2010	286	70	13	0	369	(51)	283	45	7	16	351	(49)	720
2011[d]	306	38	11	2	357	(52)	283	25	16	12	336	(48)	693

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

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

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

[d] Data from mandatory harvest ticket hunt reports

Table 4. Unit 3 deer percentage of harvest by month, regulatory years 1996–2011.

Regulatory year	Harvest periods										Total[a] nr deer
	August	September	October	November	December	January	February	March	April	Unk.	
1996	14	7	43	21	1	0	0	0	0	14	588
1997	20	10	35	26	0	1	0	0	0	8	780
1998	13	7	41	31	1	1	1	0	1	4	1,118
1999	15	9	36	33	1	0	1	0	0	5	932
2000	13	9	39	30	0	0	0	0	0	9	1,020
2001	13	14	50	18	0	1	0	0	0	4	853
2002	15	16	25	36	0	0	0	0	0	8	624
2003	19	9	27	30	0	0	0	0	0	15	901
2004	15	10	36	30	1	0	0	0	0	8	921
2005	15	6	30	38	0	0	1	1	0	9	717
2006	21	11	25	35	1	0	0	0	0	7	610
2007	17	5	19	52	1	0	1	0	0	5	458
2008	0	0	31	58	2	0	0	0	0	9	201[b]
2009	13	6	15	58	0	0	0	0	0	7	548
2010	15	9	27	41	2	0	0	0	0	5	674
2011	17	9	19	50	2	1	0	0	0	2	515

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

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

Table 5. Unit 3 deer hunter percentage of effort by transport method, regulatory year's 1996–2011[a].

Regulatory year	Airplane	Boat	3- or 4-wheeler	Foot	Highway vehicle	ORV	Other	Unknown	Number of trips
1996	1	50	13	2	34		0		NA
1997	1	55	13	0	31		0		NA
1998	1	53	6	1	39		0		NA
1999	1	35	13	1	50		0		NA
2000	2	38	7	1	52		0		NA
2001	0	37	7	0	56		0		NA
2002	3	38	8	2	49		0		NA
2003	0	49	6	2	40		3		NA
2004	1	47	5	2	43		2		1,580
2005	1	39	5	2	52		0	1	1,263
2006	4	51	0	1	37		1	6	756
2007	1	55	5	1	35		0	3	683
2008	3	53	0	2	43		0	0	546[b]
2009	2	47	0	1	47		0	2	569
2010	0	36	1	5	49	7	0	2	822
2011	1	45	9	5	26	3	0	11	744

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

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

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DEER MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2012

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 portion of the deer hunting opportunity in Southeast Alaska. Significant changes in deer density over time are normal in Unit 4. 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 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 snow caused significant deer mortality, but this was a short-term setback. A series of mild winters beginning in 1999 and extending through RY05 allowed the population to build to a point that it likely exceeded the habitat capability needed during an even moderate winter. The winters of 2006–2008 set new records for snow depth not only in Unit 4 but throughout many locations in Southeast Alaska. Based on data collected from aerial surveys, boat-based shoreline condition surveys, mortality surveys, road surveys, as well as anecdotal information from hunters who saw few deer in alpine areas during fall 2007 and 2008, guides, and project crews working in the area, deer mortality in the northern areas of Chichagof Island was very high and significantly reduced the population. Also, multitudes of deer found dead on the beaches and floating in the bays (most significantly in spring 2007) revealed just how devastating the winter had been. Other areas within the unit with more intact natural habitats (i.e. lack of industrial-sized clearcut logging units) and favorable topographic features didn't appear to be hit quite as hard. The winters of 2009–2010 had substantially less snowfall than the previous 3-year period and significantly fewer deer succumbed to winter mortality. 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.

Deer densities in some portions of Unit 4 are expected to decline in the long term due to habitat alteration caused by commercial logging. Kirchhoff (1994) pointed out that following clearcut logging, browse availability declines as forest regeneration progresses. He also noted that snow accumulation in clearcut areas during severe winters precludes use by deer, resulting in potential starvation mortality. Farmer and Kirchhoff (1998) reiterated that differences in habitat use and mortality 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 that takes place during succession changes, but no mechanisms exist to restore old growth forest structure on deer winter range other than natural regeneration, which may take several hundred years.

Since 1990 both state and federal subsistence hunting regulations have been in effect. The Alaska Board of Game adopted state regulations that apply on all lands in Unit 4. The Federal Subsistence Board promulgated regulations that apply only on federal lands and give 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 is to manage the Unit 4 deer population to achieve and maintain a population of 125,000 deer while maintaining 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 population information from anecdotal reports provided by hunters in a variety of ways: mail survey of hunters in RY10, a new harvest ticket report that as implemented in RY11, field observations during deer capture events, traditional spring pellet-group surveys, deer body condition surveys, fawn detection surveys, and spring mortality transects. In addition, a new technique for estimating deer abundance was developed experimented with during this report period. Brinkman developed a technique to identify individual deer using fecal DNA and used DNA-based mark and recapture techniques to estimate deer density in distinct watersheds on Chichagof Island (Brinkman et al. 2010). Managers are optimistic about this new technique that

may provide us with a practical tool to estimate deer density within a given geographical areas throughout the region.

In RY10 we collected harvest data using a questionnaire mailed to a random sample of hunters who were issued deer harvest tickets during the hunting season. We mailed harvest questionnaires to 33% of all harvest ticket holders and statistically expanded our results to cover all harvest ticket holders. Due to growing issues on northeast Chichagof Island associated with low deer numbers and the importance of obtaining accurate harvest data, we sampled 100% of the harvest ticket holders in the community of Hoonah to improve our harvest estimates for that community.

In RY11, we changed our harvest assessment technique from the hunter questionnaire that we had been using since the early 1980s to a harvest ticket report. Under this new strategy, all hunters who acquire harvest tickets are required to turn in a harvest report indicating their effort and success. This change to a new harvest format came with considerable growing pains as hunters had to familiarize themselves with this new reporting requirement as did the department. With the new development of electronic reporting, we encouraged hunters to report on-line, but our system was not yet ready for this change, which led to a lot of angst for hunters as well as DFG staff.

We gathered population data through spring surveys of fecal pellet groups. The technique has been used to collect population trend data since 1981. Kirchhoff and Pitcher (1988) have 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 become concentrated 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 one 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 6 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. Surveys were repeated at 6 locations in June 2011 and 2012. Although we have not conducted this type of survey regularly, we believe it can be used as an indication of recruitment immediately following a severe winter.

Although no formal investigations were conducted regarding parasites in deer, we inspected several animals during the course of this report period. We found ectoparasites (ticks and lice) on some of those animals examined.

Data in this report are compiled by regulatory year (RY), with the current report period pertaining to RY10 and RY11. A regulatory year begins on 1 July and ends on 30 June of the following calendar year (e.g., RY10 = 1 July 2010–30 June 2011.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

The severe winter of RY06, followed by moderately severe winters the following 2 years 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 logged before 1970 are entering a stage of natural reforestation with an impaired ability to support deer over the long term. Because of the extent of clearcut logging, future deer carrying capacity 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.

Pellet-group surveys during RY00-RY06 (McCoy 2009) generally reflect a slightly increasing deer population (Table 1). This is undoubtedly a result of deer being subjected to relatively light-to-moderate winter snow conditions with only minor mortality due to starvation. Severe winter conditions beginning in fall 2006 and above average snow fall extending through the following 4 winters have reversed the trend. 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 in RY10 and RY11. Although this has traditionally been our method of tracking deer trends, we instead used discussions with deer hunters and other observers as well as deer hunter harvest reports to assess the status of the deer populations. The milder winters during this report period should have provided the deer population an opportunity to rebound following the drastic decline in RY06–RY08. This is reflected in the increasing harvest in Table 2.

Population Composition

The sex composition of the legal kill (Table 2) was estimated from deer harvest questionnaires (ADF&G 2009–11). Extrapolations of hunter reports in RY10 estimated a harvest of approximately 3,775 bucks (81%). During the RY11 season, hunters reported harvesting 5,176 bucks (75%). However, these data are skewed toward bucks because of the doe closure on Northeast Chichagof Island.

MORTALITY

Harvest

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

Tenakee Inlet including all drainages into Tenakee Inlet and Port Frederick.		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 on Northeast Chichagof Island in both state and federal seasons of RY10 and RY11 by joint state emergency orders and Federal Subsistence Board actions.

Hunter Harvest. Responses from the hunter harvest surveys indicated there were 1,865 successful deer hunters in Unit 4 during RY10 and 2,501 during RY11 (Table 3). These numbers indicate a significant increase in successful hunters as the deer population continues to rebound from the severe winter of RY06. In RY10 the reported harvest was 4,688 deer. During RY11 hunters reported harvesting 6,932 deer. Weather during the deer hunting season influences the amount of effort by hunters (Faro 1997), thus influencing the harvest. When early snow is sufficient to push deer from higher elevations to beaches, hunters are generally more successful. Illegally shooting from boats causes high crippling rates and loss of deer. Crippling loss, unreported kills, and illegal kills are difficult to accurately determine, but are estimated at approximately 25% of the reported harvest (Whitman 2003). Based on that assumption, the total hunter-related deer mortality was estimated to be about 5,860 deer during RY10. The estimated kill for RY11 is 8,665 deer (Table 2).

Hunter Residency and Success. During RY10 a total of 1,865 Unit 4 hunters were successful (Table 3) and harvested an estimated 4,688 deer (2.5 deer/successful hunter). Residents of Unit 4 made up 44% of the hunters in RY10, Alaska residents from outside Unit 4 made up 51% of the hunters, and nonresidents made up the remaining 4%. The number of nonlocal hunters increased 20% from the previous season, probably due to their expectations of a rebounding deer population. The majority of the nonlocal hunters are from adjacent communities in Southeast Alaska. During RY10 75% of Unit 4 residents, 64% of nonlocal Alaska residents, and 63% of nonresidents were successful at taking at least 1 deer. In RY11 a total of 2,501 Unit 4 hunters were successful (Table 3) and harvested an estimated 6,932 deer (2.8 deer/successful hunter). Residents of Unit 4 made up 43% of the hunters in RY11, Alaska residents from outside Unit 4 made up 50% (a decrease of 1% from the previous year), and nonresidents made up 5% of the hunters. During this same period, 86% of Unit 4 residents, 74% of non-local Alaska residents, and 67% 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 7).

Harvest Chronology. Most hunters continue to target November for deer hunting, making it typically the greatest single-month for harvest. During RY10, the November harvest accounted for 2,585 deer, or 44% of the harvest (Table 4). December provided the next highest deer harvest (24%) and October (14%). Doe closures were implemented in mid-September under both state and federal management for the Northeast Chichagof Controlled Use Area (NECCUA) in fall

2010, or the harvest chronology in this area would have been different. The federal season in January generally results in about 3–8% of the reported annual harvest; its variability related to the amount of snowfall. In RY11, the November harvest accounted for 4,733 deer, or 55% of the harvest (Table 4). The December harvest accounted for the next highest percentage (19%) followed by an October harvest of 9%. The federal season in January provided 521 deer (6%) of the reported annual harvest. Doe closures were again implemented under state and federal management for the NECCUA area during mid-September 2011.

Transport Methods. Deer hunter transportation type remains almost identical with past years (Table 5). During RY10–RY11 boats were used for 79% of the harvest, and airplanes were used for 7% of the harvest. Hunters who walked from their respective residences took 5% of the harvest, and hunters using highway vehicles took 5% of the harvest over the 2 years. Hunters using an off-road vehicle (ORV; 3 or 4-wheelers) took 2% of the harvest. Transport methods have changed little since the RY88 when data were first collected.

Other Mortality

In RY10–RY11 milder weather, or at least in the manner that the snowpack accumulated, allowed deer to maintain access off the beaches and survive at a higher rate. Sixteen 1-mile beach mortality transects tallied 3.8 mortalities per mile in spring 2007, but only .03 and .02 mortalities per mile during the springs of RY10 and RY11 respectively.

During February thru late April, 7 boat surveys were completed along more than 150 miles (RY10) and 480 miles (RY11) 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, 344 deer (RY10) and 388 deer (RY11) were classified. Mean condition of deer seen during these surveys was 3.9 (see the classification guideline scale at Table 6). Two winter-killed and 2 wounding loss deer were found in spring 2011. Also, 2 radio-collared deer from a study in this area died during the winter, and both were determined to have starved. In spring 2012 we located 7 dead deer on 9 miles of beach mortality surveys. Four of the adult deer were males and 3 of those showed signs of wounding loss. The other 3 deer were fawns that appeared to have starved. For this reporting period we saw fewer deer on the beaches during our spring surveys because there was no deep snowpack holding deer at lower elevations, but the composition of deer observed had 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 is assumed to be fatal only infrequently (Whitman 2003). Incidental examinations of additional deer indicate 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 that they have overcome. Secondary problems associated with fluid in the lungs (lungworm-pneumonia complex) were not evident. Although presence of roundworms (*Metastrongylidae*) does not necessarily noticeably affect 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 favorable browse species, targeted 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 the report period. The average harvest per hunter during both RY10 and RY11 was 2.2 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 achieved during this report period. The harvest of bucks comprised 81% and 75% of the harvest in RY10 and RY11 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 lessen 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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Table 1. Unit 4 deer population trends as indicated by pellet-group surveys, regulatory years 2005 through 2010.

VCU Area	Regulatory year	Mean pellet groups/plot	Number of plots
128 – Hawk Inlet			
	2004-05	2.69	322
	2006-07	1.19	305
	2007-08	1.33	290
171– Hood Bay			
	2005-06	2.76	355
	2007-08	1.62	301
185 – Pleasant Island			
	2004-05	1.33	312
209 – Suntaheen Creek			
	2004-05	1.46	329
	2008-09	0.51	202
	2009-10	1.36	265
218 – Pavlof River			
	2004-05	2.30	323
	2008-09	0.90	192
	2009-10	1.48	216
247 – Finger Mountain			
	2004-05	2.78	299
	2005-06	2.58	280
	2006-07	1.89	248
	2007-08	3.32	199
	2009-10	2.53	217
271 – Chichagof	2006-07	2.13	176
275 – Cobol	2006-07	2.13	176
288 – Range Creek	2005-06	1.82	359
	2009-10	1.06	341
298 – M. Arm Kelp Bay	2005-06	2.10	248
	2007-08	1.91	208

Table 1. continued

300 – Nakwasina			
	2004-05	2.22	254
	2005-06	3.91	205
	2006-07	3.40	167
	2007-08	3.17	166
	2009-10	2.77	183
305 –Sea Lion Cove			
	2004-05	1.40	252
	2005-06	1.41	245
	2006-07	3.40	167
	2007-08	1.44	159
	2009-10	1.04	249

Table 2. Unit 4 deer harvest, regulatory years 2007 through 2011.

	Estimated legal harvest[a]						Estimated illegal	
Regulatory year	M	(%)	F	(%)	Unk	Total	harvest[b]	Total
2007–2008	1,511	(82)	335	(18)	0	1,846	462	2,308
2008–2009	2,893	(75)	941	(24)	21	3,855	964	4,819
2009–2010	2,708	(78)	772	(22)	0	3,480	870	4,350
2010-2011	3,775	(81)	912	(19)	0	4,688	1,172	5,860
2011-2012	5,176	(75)	1,756	(25)	0	6,932	1,733	8,665

[a] From mail questionnaire.

[b] Includes crippling loss estimate.

Table 3. Unit 4 deer hunter residency and success, regulatory years 2007 through 2011.

Regulatory year	Successful					Unsuccessful					Total # hunters
	Local resident	Nonlocal resident	Nonresident	Unk	Total	Local resident	Nonlocal resident	Nonresident	Unk	Total	
2007–2008	556	333	9		898	405	644	52		1,101	1,999
2008–2009	863	665	42		1,570	298	478	32		808	2,378
2009–2010	810	636	50	13	1,509	289	494	56	14	853	2,362
2010–2011	895	878	67	25	1,865	301	495	40	8	844	2,709
2011–2012	1,163	1,165	108	65	2,501	193	414	54	9	670	3,171

Table 4. Unit 4 deer harvest chronology, regulatory years 2007 through 2011 (This includes 25% estimated illegal harvest).

Regulatory year	Harvest periods												Total harvest
	August	(%)	September	(%)	October	(%)	November	(%)	December	(%)	January	(%)	Other	
2007–2008	205	(9)	210	(9)	175	(8)	1,121	(49)	393	(17)	69	(3)	135	2,308
2008–2009[a]	0	(0)	0	(0)	560	(14)	1,894	(49)	1,161	(30)	0	(0)	1,204	4,819
2009–2010	219	(5)	223	(5)	326	(7)	2,061	(47)	1,105	(25)	143	(3)	275	4,351
2010–2011	266	(5)	270	(5)	811	(14)	2,585	(44)	1,435	(24)	174	(3)	319	5,860
2011–2012	428	(5)	440	(5)	791	(9)	4,733	(55)	1,640	(19)	521	(6)	114	8,666

[a] Missing 2008–2009 August and September information in WinfoNet.

Table 5. Unit 4 deer harvest, percent by transport method, regulatory years 2007 through 2011.

	Percent of harvest						Number
Regulatory year	Airplane	Foot	Boat	ORV[a]	Highway Vehicle	Unknown[b]	of hunters
2007–2008	6	3	73	2	13	3	1,998
2008–2009	7	3	80	1	10	0	2,378
2009–2010	9	4	78	0	5	4	2,362
2010–2011	8	6	73	1	7	5	2,709
2011–2012	6	3	84	2	3	3	3,171

[a] 3-and 4-wheelers included.

[b] "Other" included.

(This compares harvest only, no efforts of unsuccessful hunters.) Number of hunters = successful and unsuccessful.)

Table 6. 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.

Table 7. Unit 4 deer hunter success; deer harvest by days of effort, regulatory years 2007 through 2011.

Regulatory year	Hunters	Successful	Deer/hunter	Days/deer
2007–2008	1,012	583	1.4	3.3
2008–2009	1,275	936	2.2	2.1
2009–2010	1,127	833	1.9	2.3
2010-2011	1,234	923	2.2	2.6
2011-2012	3,173	2,500	2.2	2.0

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DEER MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2012

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 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. 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 transects were not conducted in Unit 5 during the report period (Table 1).

Data in this report are compiled by regulatory year (RY), with the current report period pertaining to RY10 and RY11. A regulatory year begins on 1 July and ends on 30 June of the following calendar year (e.g. RY10=1 July 2010–30 June 2011).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Deer populations remain relatively low in the Yakutat area based on our 2 indirect measures of deer numbers (i.e. pellet-group densities and deer harvest). It was always thought that limited habitat and heavy snow accumulations on the mainland would prevent deer 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 were routinely seen along the road system near the community of Yakutat as well as 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 sighting of deer 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 densities recorded for the area, and suggests an increasing number of deer on the islands (McCoy 2008). Further surveys in future years should give us a good indication as to whether a higher deer population is being maintained, or if the pellet densities of spring 2008 were an anomaly. We did not conduct any deer pellet surveys in unit 5 during this report period. However, the deer harvest and deer/successful hunter during the report period were both the highest they have been during the past 10 years, and the days hunted/deer was the lowest. These indices all support our belief that deer abundance has increased as initially indicated by the last deer pellet surveys during spring 2008.

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 we issued no emergency orders.

Hunter Harvest. Based on deer hunter survey data, 30 deer were harvested in RY10 and 51 taken in RY11 (Table 2). The current report period's deer harvest is among the highest since the season was reopened in 1991. Hunter effort increased during the report period with 75 hunters expending 308 days of effort in RY10, and 91 hunters spending 324 days afield in RY11. The average number of days hunters took to harvest a deer in RY10 and RY11 varied substantially, with 10.3 days/deer in RY10 and 6.4 days/deer in RY11 (Table 3). We don't know the reasons for the variability in the number of days per deer, but mild weather in fall 2010 could have made it difficult to track and find deer, whereas severe winter weather in fall 2011 likely made tracking easier and concentrated deer on the beaches increasing their vulnerability. Also, in RY10 we

used a deer survey to estimate deer harvest, whereas in RY11 we used a deer harvest report. These 2 different data gathering approaches likely led to some of the variation recorded in effort and harvest.

Hunter Residency and Success. Since 1991, virtually all Unit 5A deer hunters have been residents of Yakutat. During both years of this reporting period, Alaska resident hunters took 100% of the deer harvested in Unit 5A. Of these, unit 5A residents took 24 deer in RY10 and 45 deer in RY11. The remaining harvest of 10 deer was taken by Alaska residents who live outside Unit 5A (Table 4).

Transport Methods. Boats are typically the only means of transportation used by successful hunters in 5A since nearly all deer are taken from islands that require a boat for access. Several hunters reported using highway vehicles, ORVs, and walking. In RY10, 10 successful hunters reported walking to hunting areas, and 5 reported using a highway vehicle. There is often confusion over reporting modes of transportation that comes from using multiple modes prior to hunting and harvesting deer (e.g. towing a boat to harbor with highway vehicle). An overwhelming majority of deer hunters in Unit 5A uses a boat for transport to hunting areas.

CONCLUSIONS AND RECOMMENDATIONS

The single management objective for this area (maintain a population capable of sustaining a 1-month season and a bag limit of 1 buck) was met during the report period. The Unit 5A deer hunt allows Yakutat residents an opportunity to legally harvest a small number of deer. The number of deer taken in Unit 5 increased during this report period and is higher than the 10-year mean annual harvest of 24 deer/year. The number of hunters and days hunted increased over the 10-year average of 58 hunters and 207 days hunted, indicating more people are spending more effort actively pursuing deer. Their efforts are being rewarded evidenced by the fact that the number of days to harvest a deer during the report period (8.2) was below the 10-year mean annual effort of 9.2 days/deer.

Although deer seem to be more widespread than in the past, habitat conditions, predation, and deep snow will prevent this population from ever growing significantly. The Yakutat airport received below average snowfall in RY10 (74.1 inches) (Western Regional Climate Summary 1949-2005) but the area experienced an extreme winter in 2011 when 331.1 inches of snowfall was measured at the Yakutat airport (National Weather Service, http://www.arh.noaa.gov/clim/akcoopclim.php?wfo=pajk), an increase of almost 100% of the long term average of 186.1 inches. The impact of extreme winter weather is likely to be the major force in regulating deer numbers in this area. We recommend that mortality transects be created in the Yakutat area in order to catalogue effects of severe winters on local deer populations. Pellet transect data should continue to be collected to monitor deer population trends.

The importance of deer as a subsistence food item to the community of Yakutat seems to rank a distant second to moose, but in recent years it has apparently surpassed mountain goats. In the past, most deer were taken incidentally by people who happened to detect an animal on the beach while they were conducting other activities. But in recent years, the increased abundance of deer and the better chance of success led to a more concerted effort by hunters to specifically target a

deer. It is likely that the small harvest has little effect on the deer population because hunting mortality is probably compensatory to wolf predation or winter kill. Barring some change in habitat conditions or predation on these deer, it seems likely they will continue to persist at low densities and provide some level of hunting opportunity in Unit 5.

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Table 1. Unit 5A deer population trends as indicated by pellet group surveys, regulatory years 1990–2011.

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
Ankau (VCU 369)	1990	0.03	116	0.00–0.05

Table 2. Unit 5A annual deer harvest[a], regulatory years 2002 through 2011.

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	30	0	30
2011[b]	51	0	51

[a] Data from expanded results of hunter surveys.

[b] Data from hunter-issued report card.

Table 3. Unit 5A hunter effort and success, regulatory years 2002 through 2011.

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

Table 4. Unit 5A deer hunter residency and success, regulatory years 2002 through 2011.

	Successful						Unsuccessful						
Regulatory year	Local[a] resident	Nonlocal resident	Nonresident	Unk	Total	(%)	Local[a] resident	Nonlocal resident	Nonresident	Unk	Total	(%)	Total hunters
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	45	4	0	0	49	(54)	32	8	0	0	40	(44)	91

[a] Local means residents of Unit 5A.

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DEER MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2012

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 (Robards 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.

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) (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 peaked at 3,000 in 1987. The average estimated harvest during the 1990s was 2,160, ranging from 1,300 to 3,000 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.

- To maintain a minimum harvest of 60% males.

- To 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 1x20-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.

Harvest data are summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g. RY10 = 1 July 2010–30 June 2011). From RY80-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%. Data from RY11 was produced by using the harvest ticket system. 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. 2, Fig. 3, Table 1). Deer numbers appear to have declined due to relatively severe winters during the reporting period, particularly in western PWS. 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.

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. 2). 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. During the Fall 2010 Region I Board of Game meeting the board approved a harvest reporting method to replace the deer hunter questionnaire. That change went into effect for the following regulatory year (RY11).

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.

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 RY10 was about 1,645 (Table 2). The harvest estimate increased slightly to 1,757 deer the following year. During this time, the method for estimating harvest changed as previously mentioned, so this estimate may be conservative. Harvest in RY11 was generally considered to be much higher due to the early onset and persistence of significant snow. This snow congregated deer on the beaches where they could be harvested. The average (5-year) harvest of deer by area demonstrates that Montague Island yields the highest number of deer followed by Hawkins Island (Fig. 2).

Hunter Residency and Success. Deer hunters had annual success rates of 53% and 68%, respectively, during the 2 years of the reporting period, which were slightly higher than normal (Table 3). The success rate in RY11 may be a result of early and significant snowfall as mentioned above. Nonlocal residents represented 55–60% of successful hunters during this reporting period. Local residents on average killed 2.5 deer per hunter compared to 1.3 deer per hunter for nonlocal residents. The number of deer taken per hunter in both years was higher than the 10-year average. Nonresidents remained insignificant contributors to the deer harvest.

Harvest Chronology. In this reporting period, hunters killed the most deer during November and December (Table 4). 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. Previously, a higher proportion of the harvest was taken in October than December (11 of the last 15 years). However harvest chronology has shifted in recent years with more deer killed in December than October. This may be related to the timing of significant snowfall.

Transport Methods. Similar to previous years, hunters primarily used boats but some use airplanes. Other modes, including 3- and 4-wheelers, highway vehicles, and walking, were not used significantly (Table 5).

Other Mortality

Wounding loss and illegal harvest together was estimated to be at least 15% of the total reported harvest (Table 2). Deer pellet surveys and carcass counts indicated that substantial winter mortality occurred during the winter of RY11.

CONCLUSIONS AND RECOMMENDATIONS

Under Intensive Management law (AS 16.05.255) our mandated population objective is 24,000 – 28,000 deer and harvest objective 2,200–3,000. Because we have no estimate of population size, this objective is, at best, an educated guess at the number of deer required 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.

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, followed by 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 are 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. The department is currently assessing the installation of snowdepth sensors at existing weather stations in PWS in order to update an index of snowdepth and duration as it relates to deer. However, weather stations are undergoing prioritization by user groups in response to budget cuts, and until station selection is finalized the snow index will remain suspended.

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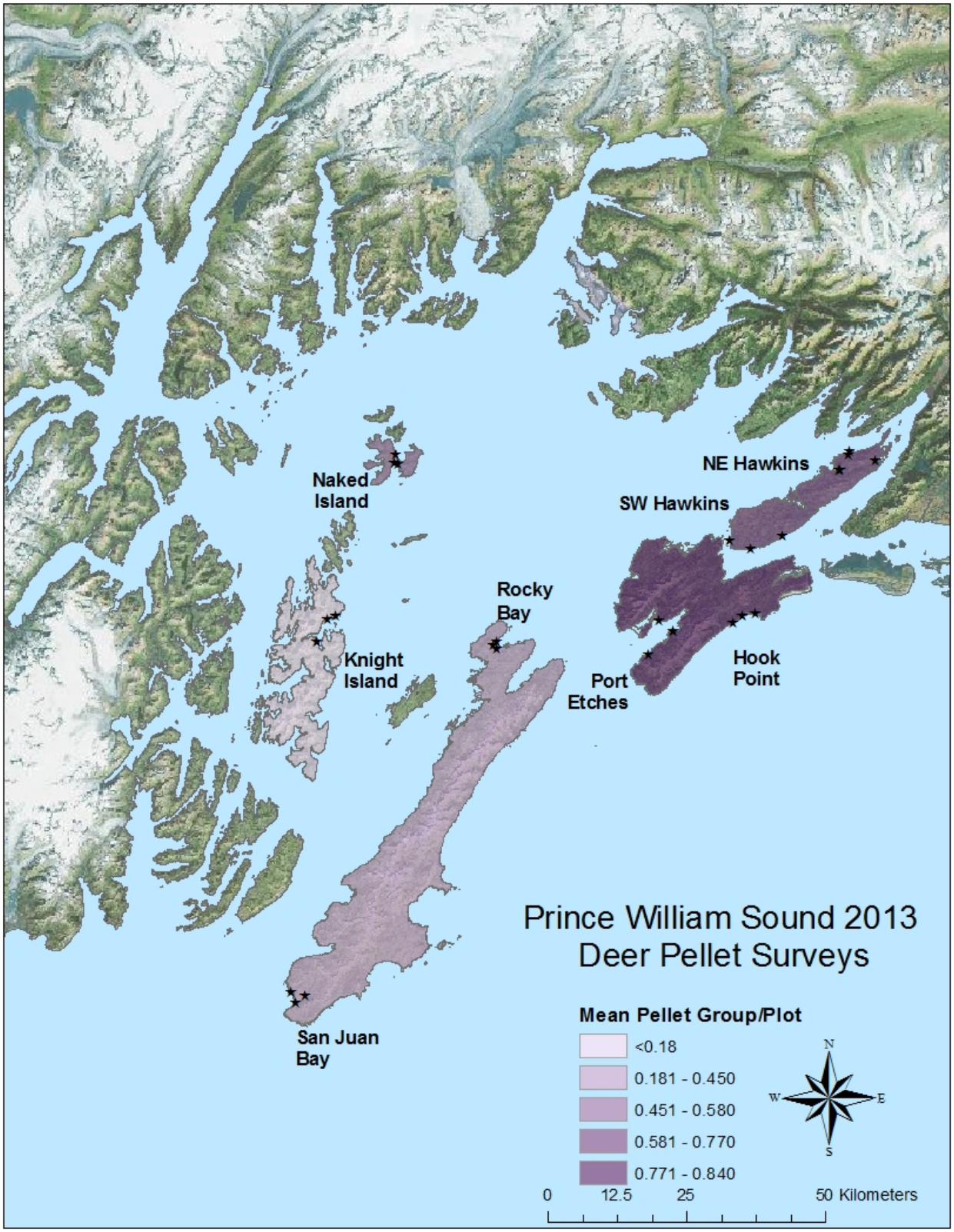

Figure 1. Locations of pellet group transects (stars) and harvest area boundaries for deer in Unit 6.

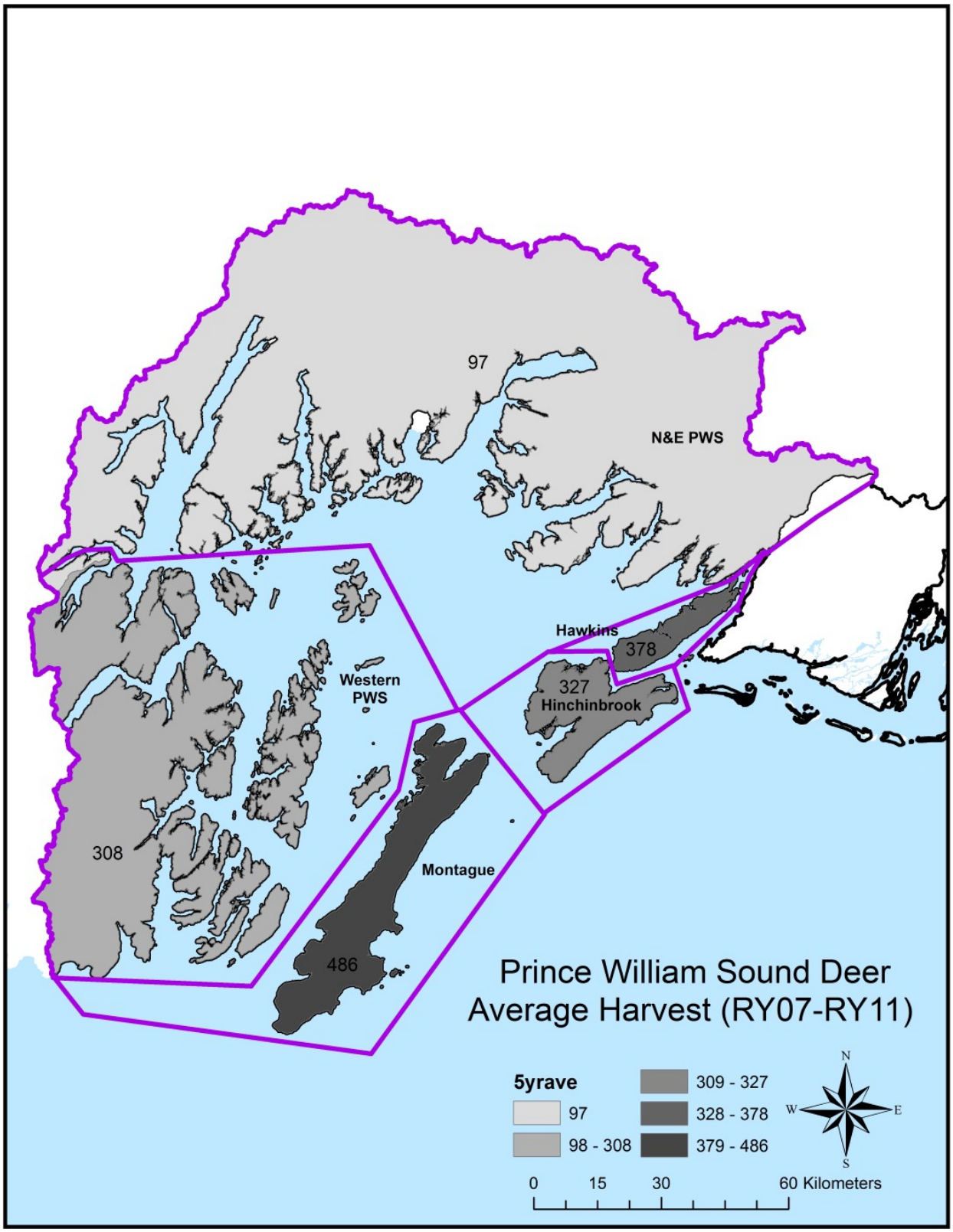

Figure 2. Average deer harvest estimates in Unit 6D, Prince William Sound.

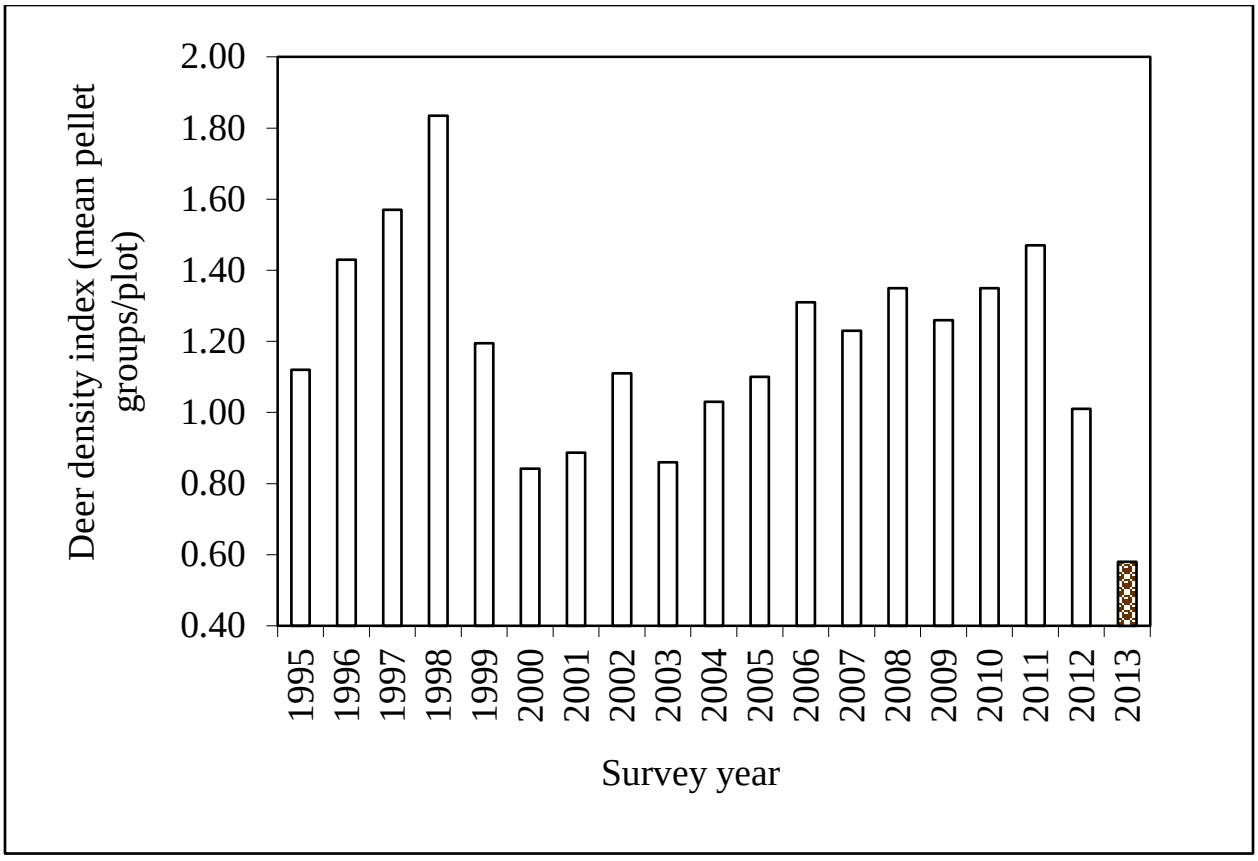

Figure 3. Deer pellet density observed in Unit 6D, Prince William Sound.

Table 1. Unit 6 deer population trends as indicated by spring pellet-group surveys 2009–2013.

Area	Specific location/ UCU	Survey Year	MPGP[a]	95%CI.[b]	Number of plots
Knight Island	Bay of Isles	2009	0.31	0.18-0.44	150
	1503	2010	0.27	0.17-0.38	175
		2011	No survey		
		2012	0.28	0.17-0.39	164
		2013	0.18	0.09-0.28	174
Naked Island	1701	2009	0.66	0.42-0.90	215
		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
Montague Island	Rocky Bay	2009	0.75	0.54-0.97	218
	1803	2010	0.67	0.48-0.86	212
		2011	No survey		
		2012	0.76	0.54-0.99	217
		2013	0.31	0.20-0.42	218
	San Juan Bay	2009	1.24	0.98-1.49	234
	1810	2010	No survey		
		2011	0.96	0.77-1.15	234
		2012	No survey		
		2013	0.59	0.43-0.75	234
Hinchinbrook Island	Port Etches	2009	No survey		
	1903	2010	0.92	0.75-1.09	242
		2011	No survey		
		2012	1.38	1.10-1.65	193
		2013	0.67	0.51-0.83	225
	Hook Point	2009	2.16	1.80-2.51	219
	1905	2010	1.47	1.23-1.72	234
		2011	2.37	1.84-2.89	63
		2012	1.29	1.02-1.56	206
		2013	1.01	0.81-1.22	221

Table continues next page

Area	Specific location/ UCU	Survey Year	MPGP[a]	95%CI.[b]	Number of plots
Hawkins Island	N.E. Hawkins 2001	2009	2.06	1.74-2.38	231
		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
	S.W. Hawkins 2003	2009	1.31	1.06-1.56	222
		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
All Areas		2009	1.26	1.06-1.56	1489
		2010	0.98	0.89-1.06	1457
		2011	1.47	1.33-1.61	927
		2012	1.01	0.91-1.11	1319
		2013	0.58	0.52-0.64	1714

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

Table 2. Unit 6 deer harvest, RY07–RY11.

Area	Regulatory Year	Estimated legal harvest[a] M	%	F	%	Total	Estimated illegal/ unrecovered harvest[b]	Total
Hawkins	RY07	181	(73)	68	(27)	249	37	286
Island	RY08	305	(71)	126	(29)	431	65	496
	RY09	216	(60)	143	(40)	359	54	413
	RY10	236	(75)	78	(25)	314	47	361
	RY11[c]	291	(54)	246	(46)	537	81	618
Hinchinbrook	RY07	160	(65)	88	(35)	248	37	285
Island	RY08	161	(73)	59	(27)	220	33	253
	RY09	206	(60)	140	(40)	346	52	398
	RY10	314	(69)	140	(31)	454	55	522
	RY11[c]	223	(61)	141	(39)	364	76	440
Montague	RY07	270	(69)	119	(31)	389	58	447
Island	RY08	358	(50)	354	(50)	712	107	819
	RY09	196	(52)	180	(48)	376	56	432
	RY10	303	(60)	206	(40)	509	76	585
	RY11[c]	250	(56)	196	(44)	446	67	513
Western PWS	RY07	142	(51)	139	(49)	281	42	323
	RY08	177	(52)	165	(48)	342	51	393
	RY09	164	(49)	170	(51)	334	50	384
	RY10	185	(63)	108	(37)	293	44	337
	RY11[c]	166	(56)	132	(44)	298	45	343
Northern and	RY07	33	(62)	20	(38)	53	8	61
Eastern PWS	RY08	102	(59)	71	(41)	173	26	199
	RY09	92	(71)	37	(29)	129	19	148
	RY10	36	(54)	31	(46)	67	10	77
	RY11[c]	48	(56)	38	(44)	86	13	99
Unit 6	RY07	32	(73)	12	(27)	44	7	51
Unknown	RY08	6	(50)	6	(50)	12	2	14
	RY09	7	(19)	29	(81)	36	5	41
	RY10	8	(100)	0	(0)	8	1	9
	RY11[c]	19	(73)	7	(27)	26	4	30
Unit 6 – Total	RY07	818	(65)	446	(35)	1264	316	1580
	RY08	1109	(59)	781	(41)	1890	473	2363
	RY09	881	(56)	699	(44)	1580	395	1975
	RY10	1082	(66)	563	(34)	1645	247	1892
	RY11[c]	997	(57)	760	(43)	1757	264	2021

[a]From Deer Hunter Questionnaire Survey for all years until RY11 when harvest ticket data collection began.
[b]Unquantified, but estimated to be 15% of reported total.
[c]These data are preliminary and may be expanded in future reports to account for unreported harvest.

Table 3. Unit 6 deer hunter residency and success, RY07-RY11[a].

	Successful					Unsuccessful					
Regulatory year	Local resident[b]	Nonlocal resident	Non resident	Total	(%)	Local resident	Nonlocal resident	Non resident	Total	(%)	Total hunters
RY07	174	313	126	613	(41)	182	529	186	897	(59)	1510
RY08	269	510	27	806	(50)	151	604	41	796	(50)	1602
RY09	212	357	22	591	(46)	143	494	61	698	(54)	1289
RY10	262	345	25	632	(53)	90	430	35	555	(47)	1187
RY11	230	373	15	618	(68)	56	221	12	289	(32)	907

[a] These data are preliminary and may be expanded in future reports to account for unreported harvest.
[b] Resident of Unit 6

Table 4. Unit 6 deer harvest chronology percent by month RY07-RY11.

Regulatory year	Harvest periods						
	Aug	Sep	Oct	Nov	Dec	Unk	*n*
RY07	14	5	35	25	20	0	1264
RY08	13	2	34	30	21	0	1890
RY09	11	6	29	35	18	0	1580
RY10	8	8	19	35	27	1	1645
RY11	4	2	20	37	24	13	1757

Table 5. Unit 6 deer harvest percent by transport method, RY07-RY11.

Regulatory year	Percent of harvest						
	Airplane	Boat	3- and 4-wheeler	Highway vehicle	Foot	Unknown	*n*
RY07	15	76	1	1	3	4	1264
RY08	14	81	0	1	2	2	1890
RY09	14	81	0	1	2	2	1580
RY10	11	84	0	1	2	1	1645
RY11	11	83	0	0	1	5	1757

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DEER MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2012

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, totaling 25 deer, between 1924 and 1934 (Paul 2009). The U.S. Secretary of Agriculture gave authorization for the transplant in May 1923, and the project began the next year when 14 animals were captured near Sitka and released on Long Island near 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 more deer were captured from Prince of Wales Island and released on Long Island. There was, however, little natural movement from Long Island to Kodiak, so in 1934, 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 March 15, 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 April 26, 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. In 1950 they were a common sight near Kodiak city, and the first officially sanctioned hunt was held in 1953. 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 (FWS) 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.

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. Sex 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), FWS, 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

Questionnaires have been mailed to hunters annually beginning with the RY89 season to assess trends in hunting effort and harvest. The questionnaires were sent to a random sample of deer harvest ticket holders and harvest estimates were derived from returned questionnaires. Field

interviews and posthunt interviews provided preliminary harvest data. Guides and transporters frequently submitted voluntary summaries of hunting activities.

We assessed natural mortality by searching for deer carcasses in selected coastal winter ranges each year. These surveys provided a relative index of winter mortality, but the methods used were not consistent enough to provide unbiased trend data. To supplement information obtained from the beach surveys, we made occasional flights to observe snow conditions and condition of deer during winter months. Reports from the public, particularly spring bear hunters, also provided 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 regulatory years (RY) 1968, 1970, 1989, and 1998 (a regulatory year runs from 1 July through 30 June; e.g., RY68 = 1 July 1968–30 June 1969). Following many of these occurrences, more conservative regulations were enacted and the populations quickly rebounded (Van Daele 2003).

In the years since the last severe winter mortality (1998–1999), there were 5 successive mild winters (1999–2000 through 2005–2006) followed by harsh winter weather in 2006–2007 and 2008–2009, that was associated with increased deer mortality. The winters of 2009–2010 through 2010–2011 were moderate and there was a noticeable increase in fawn survival. The winter of 2011–2012 was again harsh and an estimated 40% of the deer herd perished due to record snowfall conditions.

We have no impartial methods of ascertaining deer numbers or densities, but annual hunter questionnaires provide reliable harvest data and an indicator of population trend. Using those data and subjective accounts, the 2012 population estimate was 45,000 deer unitwide.

Population Composition

The percentage of males in the harvest has remained at least 73% from regulatory year 1990 (RY90) to RY11, and peaked at 95% in RY01. In the past 10 years, the percentage of males in the harvest has decreased annually and reached a plateau and started increasing again during this reporting period (Table 1).

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. Tugidak is a State Critical Habitat Area important to ground-nesting birds and harbor seals. If deer proliferate on the island, it could result in detrimental impacts to the native flora and fauna.

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 one 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 open within the 1 deer bag limit area along the Kodiak road system. From November 15 through December 31 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 one 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 conformed to the 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. In March 2011, the Board of Game adopted a special-weapons youth hunt within the northeast Kodiak hunt area. Hunters between the ages of 10–18 who successfully completed a basic and archery/muzzleloader hunter education course could take 1 deer of either sex during the season of 15 November–31 December 31.

Hunter Harvest. Harvests during this reporting period appeared to peak after a rebound from the low levels that followed the population decline in winter 1998–99. In RY10 the total reported harvest was estimated at 4,046; that increased to 4,804 in RY11. During the previous 5 years of reported harvest (RY05–RY09) the average annual harvest was 4,617.2 deer. In RY10 the percentage of bucks in the harvest was 75%, in RY11 the percentage of bucks was 81%, and the previous 5-year (RY05–RY09) average was 79.0%.

In recent years northern Kodiak has been the area that usually has the most harvest. In RY10, 16% of the reported harvest was from the northern islands in the archipelago (hunt areas 810–

813), 49% was from northern Kodiak Island (hunt areas 814–817 and 827–835), and 33% was from southern Kodiak Island (hunt areas 818–826). No data were available for RY11.

Hunter Residency and Success. The number of hunters afield during this reporting period increased slightly from an estimated 2,855 in RY10 to 3,266 in RY11. The average number of hunters afield during the previous 5 years of reported data (RY05–RY09) was 3,222 (Table 2). Unit 8 residents composed 39% of the hunters in RY10 and 40% in RY11, comparable to the previous 5-year average (39.8%). Nonlocal residents composed 43% of the hunters in RY10 and 43% in RY11, also comparable to the previous 5-year average (41.7%). Nonresidents composed 18% of the hunters in RY10 and 17% in RY11, a proportion comparable to the 5-year average (18.5%).

Hunter success increased during this reporting period from 68% in RY10 to 76% in RY11. The average annual hunter success during the previous 5 years was 69.8% (Table 2). The mean number of deer harvested per hunter afield was 1.1 in RY10 and 1.4 deer per hunter in RY11. The previous 5-year (RY05–RY09) average was 1.4 deer per hunter (Table 3). In RY10, 40% of the hunters killed only 1 deer, and 33% of hunter took $\geq$3 deer (Table 4). No data were available for RY11. The average percentage of hunters that killed only 1 deer during the previous 5 years was 41.0%, while the average percentage of hunters taking $\geq$3 deer during that same period was 34.4%.

Harvest Chronology. November is consistently the peak month of harvest in Unit 8 (Table 5). In RY10, 40% of the deer were harvested in November, compared to RY11 during which 49% were harvested in November. This percentage was higher than the average (45.4%) of the previous 5 years.

Transport Methods. Boats and aircraft have been the most favored means of transportation for deer hunters in Unit 8. In RY10, 44% of the deer hunters used boats and 18% used aircraft as their primary means of access. In RY11, 44% of deer hunters used boats and 24% used aircraft. Averages for the previous 5 years were 41.0% for boats and 18.8% for aircraft (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 seems to increase and decline with the availability of deer.

Other Mortality

The winter mortality in 1999–2000 through 2003–2004 was very light, with few carcasses found along most transects. More normal winter conditions in 2004–2005 and 2005–2006 increased deer mortality, but hunter reports and incidental observations suggested the population remained stable to increasing during that time. Harsher winters returned in 2006–2007, 2008–2009, and 2011–2012, resulting in high fawn mortality and a perceptible decline in the deer population on most parts of the archipelago (Table 7).

Unreported deer harvest, including wounding loss and illegal kills outside the hunting season was common, resulting in an estimated additional kill of about 20% of the reported harvest. Free-roaming dogs are significant predators on deer near communities and isolated residences. 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, but is not an important limiting factor on 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 have not evaluated 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 a graphic 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 1998–99.

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 blacktailed 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 non-coniferous 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 bucks with 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 more 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.

Chronic wasting disease (CWD) is having significant impacts on deer management in several states and provinces (Gross and Miller 2001). ADF&G initiated an investigation into the potential presence of CWD on the Kodiak Archipelago in 2003. There have been no reported cases from Alaska, but Kodiak was considered particularly vulnerable because of the presence of a commercial elk ranch in proximity to a viable wild deer population. From 2003 to 2008 hunters provided samples from 1,398 deer and 81 elk and all of these samples were CWD-free. In

addition to providing samples, the hunters were also eager to offer information on their perceptions of deer habitat, behavior, and population levels. In 2009 the investigation was suspended due to the lack of any positive CWD findings and a re-direction of Federal funds.

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 and vegetation evolved in the absence of any indigenous herbivores (except for seasonal use by brown bears). Much of the archipelago does not provide dense coniferous cover similar to old-growth forests of these ungulates' ancestral homes in Southeast Alaska, 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 may not increase deer mortality, except when the population is low, because many harvested deer would have died during winter anyway. There are few practical options for active management practices to enhance this deer population. Regulatory responses, such as liberalizing seasons as deer numbers increase and promulgating more conservative regulations when populations have declined, are the most effective ways to manage these animals.

Improving precision in assessing deer population trends is desirable, but is difficult and expensive. Several techniques have been considered and attempted (Van Daele 2003); however, hunter questionnaire surveys and anecdotal evidence continue to be the primary tools for assessing the population. 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 source of human food. 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 with the best available data (Van Daele 2003). We recognize there is considerable room for improvement in the estimates used for these objectives.

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 Committee, 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 in the field.

Deer harvest information collected by hunter questionnaires provided objective data that greatly assisted our management program. These data form the basis of our management reports and provide an insight into interannual deer population changes. The primary reason questionnaires were used instead of more conventional harvest report cards was due to the extended length of the hunting season and the multiple bag limits that complicate reporting and reduce compliance because hunters forget to send in report cards. Although the current system was cost-effective and reliable, recent advances in the department's ability to use the internet for communicating with hunters, coupled with increases in postal rates, has provided incentive for development of a new method of gathering deer harvest data that is more efficient.

Recently, the department has adopted the harvest ticket process for assessing hunter harvest, transportation, and commercial services. During the next reporting period we will be assessing this new program and comparing it to historical information.

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Table 1. Unit 8 deer harvest, in regulatory years 2002 through 2011.

Regulatory year	Estimated legal harvest[a]				Estimated illegal harvest[b]	Estimated wounding loss[c]	Estimated total
	Male (%)	Female (%)	Unknown	Total			
2002	2943 (94)	200 (6)	---	3143	314	314	3771
2003	4430 (85)	769 (15)	---	5199	520	520	6239
2004[d]	---	---	---	---	---	---	---
2005	5635 (86)	936 (14)	---	6571	657	657	7885
2006	4369 (81)	1053 (19)	---	5422	542	542	6506
2007	2563 (78)	727 (22)	---	3290	329	329	3948
2008	2792 (75)	921 (25)	---	3715	372	372	4459
2009	3057 (75)	1030 (25)	---	4088	409	409	4906
2010	3035(75)	1676 (25)	---	4046	405	405	4856
2011	3908 (81)	896 (19)	---	4804	480	480	5764

[a] Harvest data extrapolated from the results of a mail questionnaire survey, totals may not exactly coincide with other data due to the extrapolation.

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

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

[d] No survey was conducted in RY04.

Table 2. Unit 8 deer hunter residency and success, in regulatory years 2002 through 2011.

	Successful[a]				Unsuccessful				
Regulatory year	Local[b] resident	Nonlocal resident	Nonresident	Total (%)	Local[b] resident	Nonlocal resident	Nonresident	Total(%)	Total hunters
2002	705	693	207	1605 (59)	524	413	196	1133 (41)	2738
2003	1065	1027	308	2400 (77)	356	242	104	702 (23)	3102
2004[c]	---	---	---	---	---	---	---	---	---
2005	1268	1350	430	3048 (83)	292	185	139	616 (17)	3664
2006	1154	1135	433	2721 (71)	429	414	245	1088 (29)	3809
2007	583	630	588	1801 (59)	360	486	412	1258 (41)	3059
2008	882	732	206	1820 (63)	447	451	158	1056 (37)	2876
2009	725	968	291	1984 (73)	296	338	86	720 (27)	2704
2010	767	876	302	1946 (68)	347	360	202	909 (32)	2855
2011	981	1093	403	2477 (76)	317	297	175	789 (24)	3266

[a] Harvest data extrapolated from the results of a mail questionnaire survey, totals may not exactly coincide with other data due to the extrapolation.

[b] Includes residents of Unit 8.

[c] No survey was conducted in RY04.

Table 3. Unit 8 comparison of deer hunter questionnaire results for regulatory years 2002 through 2011.

Regulatory year	% Hunter success[a]	% Hunters taking bag limit[b]	% Male	% Female	Total harvest	Estimated hunters	Mean number deer/hunter	Number days hunted/deer
2002	59	30	94	6	3142	2738	1.1	4.8
2003	77	42	85	15	5198	3102	1.7	3.0
2004[c]	---	---	---	---	---	---	---	---
2005	83	42	86	14	6571	3664	1.8	3.6
2006	71	35	81	19	5422	3809	1.4	3.7
2007	59	25	78	22	3290	3059	1.1	4.6
2008	63	34	75	25	3715	2876	1.3	4.1
2009	73	36	75	25	4088	2704	1.5	3.6
2010	63	34	75	25	4046	3679	1.1	5.4
2011	76	--	81	19	4804	3343	1.4	4.8

[a] Harvest data are expanded from returned hunter questionnaires.

[b] Maximum bag limit was 4 deer in 1980–81; 5 deer in 1981–82; 7 deer in 1982–83; 5 deer in 1983–84 to 1990–91; 5 deer on Kodiak NWR and 4 deer on nonfederal lands in 1991–92 to 2000–01; 4 deer on Kodiak NWR and 3 deer on nonfederal lands in 2001–02; and, 3 deer in 2002–03 to 2009–2010.

[c] No survey was conducted in RY04.

Table 4. Number and percent of hunters in Unit 8 that reported harvesting 1, 2, 3, 4, or 5+ deer, in regulatory years 2002 through 2011.

Regulatory year	1 deer Hunters	%	2 deer Hunters	%	3 deer[a] Hunters	%	4 deer[a] Hunters	%	≥ 5 deer[a] Hunters	%
2002	709	44	420	26	416	26	11	1	47	3
2003	802	33	591	25	921	38	40	2	45	2
2004	---	--	---	--	---	--	---	--	---	--
2005	1113	37	655	22	1164	39	56	2	31	1
2006	1122	41	646	24	874	32	47	2	17	1
2007	893	50	469	26	397	22	15	1	26	1
2008	740	35	443	21	874	41	47	2	17	1
2009	704	36	563	28	671	34	7	<1	38	2
2010	772	40	520	27	573	29	14	1	67	3
2011	---	--	---	--	---	--	---	--	---	--

Table 5. Unit 8 deer harvest chronology percent by period, in regulatory years 2002 through 2011.

Regulatory year	Harvest periods (%)						
	August	September	October	November	December	January	*n*
2002	6	6	23	38	25	2	3142
2003	7	7	21	39	25	1	5198
2004 [a]	--	--	--	--	--	--	---
2005	7	6	24	45	17	1	6468
2006	6	6	21	46	20	1	5422
2007	7	5	19	44	23	2	3290
2008	6	7	21	45	18	3	3715
2009	6	3	19	47	23	2	4088
2010	7	9	21	40	22	1	4046
2011	6	3	22	49	20	<1	4804

[a] No survey was conducted in RY04.

Table 6. Unit 8 deer harvest percent by transport method, in regulatory years 2002 through 2011.

Regulatory year	Percent of harvest									
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Other	Unknown	*n*
2002	16	<1	40	7	0	<1	14	17	4	4403
2003	20	<1	42	7	0	2	14	12	2	4410
2004[a]	--	--	--	--	--	--	--	--	--	---
2005	20	<1	42	10	0	<1	16	11	<1	5638
2006	18	<1	40	9	0	2	18	14	--	5924
2007	21	<1	40	9	0	1	17	12	--	4524
2008	15	1	37	13	0	<1	17	16	<1	4870
2009	20	<1	46	7	0	1	12	13	<1	3929
2010	18	0	44	7	0	1	15	12	3	4046
2011	24	<1	44	7	<1	1	12	6	5	4804

[a] No survey was conducted in RY04.

Table 7. Unit 8 sex and age composition of deer winter-kill from beach mortality transects, in regulatory years 2002 through 2011.

Regulatory	Adult				Juvenile[a]				Unk. age/	All			
year	M (%)	F (%)	Unk.	Total	M (%)	F (%)	Unk.	Total	gender	M (%)	F (%)	Unk.	Total
2002[b]	0	0	0	0	0	0	0	0	0	0 (--)	0 (--)	0	0
2003[b]	3 (30)	7 (70)	5	15	1 (50)	1 (50)	13	15	5	4 (33)	8 (67)	23	35
2004[b]	0 (--)	2 (100)	2	4	0 (--)	0 (--)	5	5	0	0 (--)	2 (100)	7	9
2005[b]	4 (36)	7 (64)	3	14	8 (67)	4 (33)	29	41	1	12 (52)	11 (48)	33	56
2006[b]	0 (--)	2 (100)	1	3	4 (80)	1 (20)	36	41	1	4 (57)	3 (43)	38	45
2007[b]	0 (--)	1 (100)	3	4	8 (100)	0 (--)	35	43	3	8 (89)	1 (11)	41	50
2008[b]	1 (100)	0 (--)	--	1	1 (25)	3 (75)	14	18	2	2 (25)	3 (75)	16	21
2009[b]	0 (--)	0 (--)	--	0	7 (64)	4 (36)	17	28	1	7 (64)	4 (36)	18	29
2010[b]	0 (--)	1 (100)	3	4	0 (--)	1 (100)	12	13	1	0 (--)	2 (100)	16	18
2011	2 (33)	4 (66)	2	8	6 (60)	4 (40)	11	21	0	8 (50)	8 (50)	13	29

[a] Includes fawns and yearlings.

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


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