Deer
Management Report
of survey-inventory activities
1 July 2006–30 June 2008

Patricia Harper, Editor
Alaska Department of Fish and Game
Division of Wildlife Conservation

Photo by Phil Mooney, ADF&G

Funded through
Federal Aid in Wildlife Restoration
Grants W-33-5, and W-33-6
2009

STATE OF ALASKA
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DIVISION OF WILDLIFE CONSERVATION
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Please note that population and harvest data in this report are estimates and may be refined at a later date.

Cover Photo: A Sitka black-tailed deer doe looks through alders in April 2009. *Photo by Phil Mooney, ADF&G.*

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DEER MANAGEMENT REPORT

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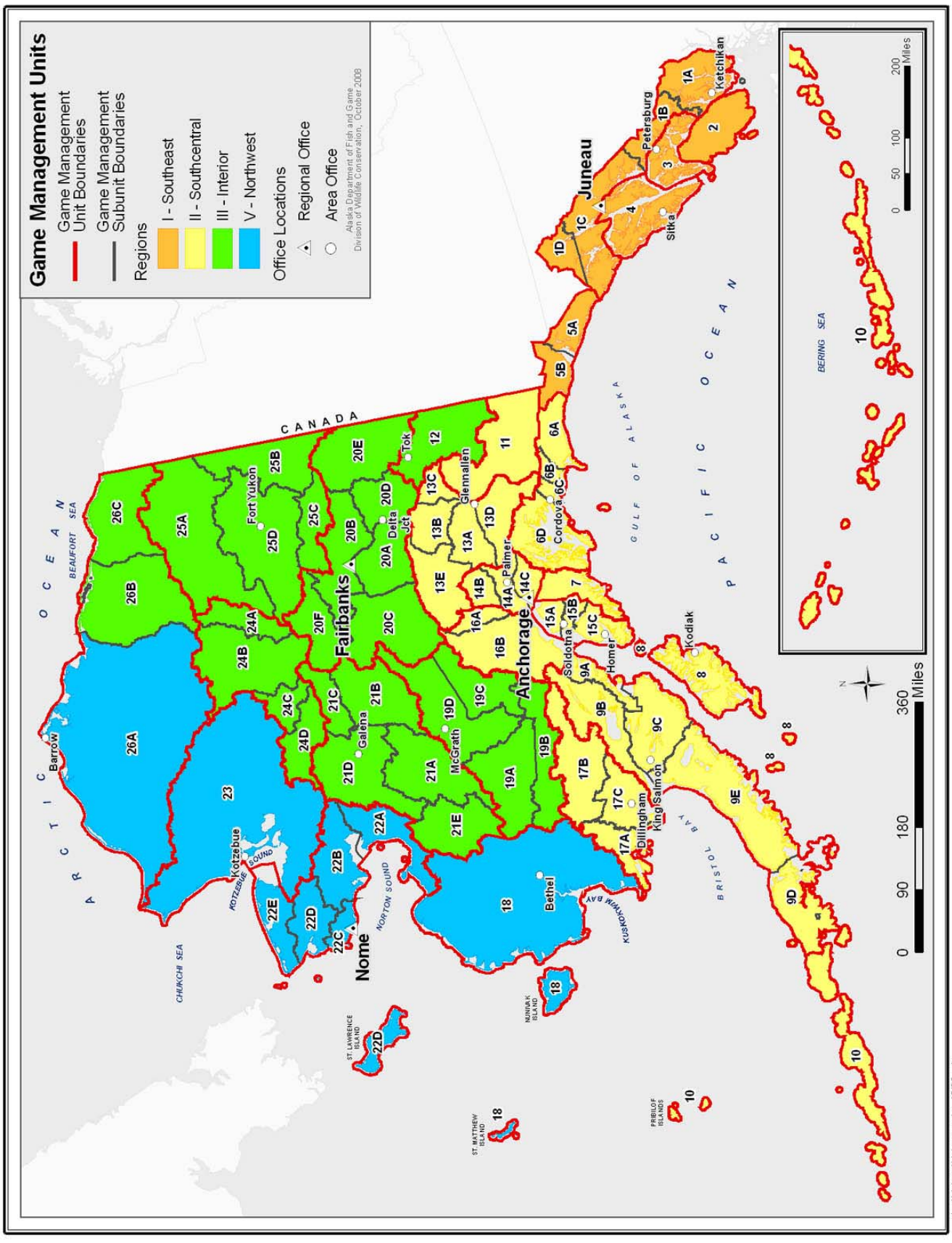

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WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 PO BOX 115526
JUNEAU, AK 99811-5526

DEER MANAGEMENT REPORT

From: 1 July 2006
To: 30 June 2008

LOCATION

GAME MANAGEMENT UNIT: 1A (5300 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, primarily in response to winter weather and wolf and bear predation. Deer numbers are currently at moderate-to-low levels throughout most of Unit 1A.

Weather conditions and population levels influence deer harvests. Unit 1A harvests ranged from 143 (2005) to 914 (1995) deer since 1984. Hunting was open each year from August through December. Limited hunting of antlerless deer was allowed before 1978, but now only bucks are legal in Unit 1A. As clearcut logging continues to reduce old-growth habitat in portions of the unit, 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.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

We have established a Unit 1A population goal of 15,000 deer and a hunter harvest goal of 700 deer, based on high consumptive use of the deer population in the subunit.

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 and to a lesser degree from hunters' anecdotal reports. We gathered harvest data from an annual hunter questionnaire,

which we mailed to a random sample of hunters who were issued deer harvest tickets (Straugh and Rice 2003; Straugh et al. 2004).

The Department of Wildlife Conservation (DWC) has mailed hunter surveys annually since 1980, with the exception of 1981. DWC mails harvest questionnaires to 33% of all Region I deer harvest ticket holders, and results are expanded to estimate hunting results of all harvest ticket holders. We also estimate the number of hunters reporting as state proxy hunters or federal designated hunters from the surveys.

The Alaska Department of Fish and Game's (ADF&G) Division of Subsistence (DS) has historically conducted personal interview household surveys to estimate deer harvests, and some of their results conflict with our estimates. DS has done 4 Subsistence Resource Personal Interview Household Surveys of rural communities within this area during the last 15 years.

Because of some contentious issues surrounding allocation of deer harvest in Unit 2 a new joint U.S. Forest Service (USFS) and ADF&G report system was developed. Starting in fall of 2005 deer hunters were asked to fill out a new voluntary harvest report form if they planned to hunt Unit 2 (Prince of Wales Island) any time during the deer season. That group of hunters was removed from the mail-out survey list and their hunt information was captured on the Unit 2 report form. Results from the Unit 2 harvest report cards were combined with the mail-out survey results. Many hunters spend time in both units during the deer season and this combined report was our best attempt to capture deer hunting efforts without duplicate reporting.

RESULTS AND DISCUSSION

MORTALITY

Harvest

Season and Bag Limit	Resident and Nonresident Hunters	
Unit 1A	1 Aug–31 Dec	4 bucks

Board of Game Actions and Emergency Orders. No Board of Game actions were taken that affected deer hunting in Unit 1A during this report period.

Hunter Harvest. Total harvest in the unit is estimated by combining the reported harvest from surveys with estimated illegal and unreported kills. The unreported and illegal take for Unit 1A is estimated to equal approximately half of the legal harvest each season. Unfortunately we should be careful when viewing the 2005 deer harvest information. This harvest information likely reflects problems and confusion with implementing a new combined report program rather than an actual dramatic shift in hunter effort and success. The estimated total harvest of 143 deer during the 2005 season would be the lowest harvest on record (1984–2005) (Table 1). During the 2005 season only 271 hunters reported spending 1313 days hunting in this unit. Prior to this reporting period an average of 755 hunters spent an average of 3006 days afield (Porter 2005) (Table 1).

Regardless of reporting problems, the last three seasons have seen a precipitous drop in hunter effort days with an average of 288 hunters spending approximately 1200 days afield. During the 2006 and 2007 seasons hunters spent about half the days afield compared to the past 10-year average (Table 1). The reported number of deer killed by highway vehicle collisions in the unit remains about the same at 1–5 per year (Table 4).

The number of hunters utilizing Gravina Island continues to drop. In 2007, 56 hunters spent time on Gravina but none reported harvesting a deer. This was the most futile effort on record for Gravina Island. After several years of no reported harvest on the Cleveland Peninsula, hunters reported 32 and 8 bucks harvested during 2004 and 2005 respectively, but then dropped back to zero and 3 bucks respectively during 2006 and 2007 (Table 2). Slow recovery of the deer herd on the Cleveland is likely a combination of low habitat quality and a series of harsh winters, along with both wolf and black bear predation.

Residency and Success. Most Unit 1A hunters are local residents living within the unit. During this report period 267 and 206 local resident hunters had 49% and 39% overall success rates during the 2006 and 2007 seasons. On average over the past 10 years, approximately 12 nonlocal resident hunters have been successful at harvesting deer in this area each season and about 2 nonresident hunters are successful. Nonresident success in 2006 was the highest it has been since 1997 with 9 nonresident hunters enjoying a 100% success rate. Most nonresident deer hunters hire registered guides. Nonlocal resident hunters also had an uncharacteristically successful year in 2006 with 52 hunters enjoying an 81% success rate. This is the highest nonlocal success on record and well above the average of 12 each year. The average of 3 hunting days per deer in 2006 was also the best hunter success on record (Table 1).

Other Mortality

Vehicle–deer collision estimates have remained low (1–5 deer/year), and collisions are not a significant source of deer mortality. Unreported and illegal harvest is estimated at 50% of the reported Unit 1A harvest. This percentage is based on local law enforcement citations and observations during the past few years and on anecdotal comments from local hunters.

HABITAT

Assessment

Logging continues to cause major changes in old-growth habitat. The most serious effects are in higher volume stands at low elevations which are critical to deer during winters with heavy snowfall. U.S. Forest Service and DWC habitat models predict that the forest's capacity to support deer in average winters will decline by nearly half by 2054. This loss will be greater in years with deep and persistent snow. By 2054 we expect that few areas will provide enough deer to meet projected hunter demand within roaded and logged portions of Unit 1A (USFS 1989). Recent timber sales by the Alaska Mental Health Trust Authority and the State of Alaska on Gravina and Revilla Islands will reduce carrying capacity for deer in several popular Unit 1A hunting areas. These current timber sales are using both selective and clearcut methods to remove valuable timber for export. We expect this will have long-term negative effects on deer numbers, and consequently, on future hunter success in these areas near Ketchikan.

CONCLUSIONS AND RECOMMENDATIONS

During this report period the deer harvest has remained below the long-term average for the unit and well below the management goal 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 90's with a high of 208 in 1994, but dropped to zero during 2002 and 2003. This abysmal trend continued during this reporting period with only 3 deer reported during 2007 and 2008 combined.

Gravina Island has traditionally produced a high proportion of Unit 1A deer. However, harvests on Gravina have dropped dramatically since 2001 and during this reporting period we estimate only 41 deer were legally harvested from the island.

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 negative long-term impacts on deer in this area by removing critical deer winter habitat.

Weather patterns in southern Southeast Alaska have been moderately severe in terms of both total snowfall and snow persistence during the past couple of seasons. Winters of 2006 and 2007 reduced deer numbers in many Unit 1A areas. Timber harvests have reduced winter habitat and consequently have reduced the carrying capacity for deer on the winter range.

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

Results from the new Unit 2 Harvest Report Card are continuing to improve as public education efforts increase and hunters become more familiar with this reporting method. The combined deer harvest estimates from the mail out survey and the Unit 2 reporting efforts provide a summary of Unit 1A deer harvest.

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TABLE 1 Unit 1A deer harvest data, regulatory years 1998 through 2007

Regulatory year	Nr hunters	Nr successful hunters	Percent successful	Hunter days	Average hunter days	Deer [a]	Average deer per hunter	Average hunter days per deer
1998	921	338	37	3481	3.8	508	0.6	6.9
1999	736	178	24	3525	4.8	277	0.4	12.7
2000	647	164	25	3709	5.7	268	0.4	13.8
2001	680	222	33	2688	4.0	352	0.5	7.6
2002	531	172	32	2196	4.1	244	0.5	9.0
2003	510	164	32	1521	3.0	218	0.4	7.0
2004	546	194	36	2326	4.3	379	0.7	6.1
2005[b]	271	106	39	1313	4.8	143	0.5	9.9
2006	340	191	56	1105	3.3	374	1.1	3.0
2007	252	90	36	1187	4.7	186	0.7	6.4
$\bar{x}$	543	182	35	2305	4.3	299	0.6	8.0

[a] Includes does that were reported killed.

[b] Harvest information for 2005 should be viewed with caution due to survey reporting inconsistencies

TABLE 2 Unit 1A deer harvest from major harvest areas, regulatory years 1990 through 2007

Major harvest area	Regulatory year	Nr hunters expanded[a]	Nr successful hunters expanded	Percent successful	Hunter days expanded	Average days per hunter	Average deer per hunter	Deer killed
1-Gravina Island	1990	221	72	33	614	2.8	0.5	101
	1991	198	46	23	624	3.2	0.2	46
	1992	179	64	36	801	4.5	0.9	160
	1993	266	52	20	553	2.1	0.3	87
	1994	246	80	33	578	2.3	0.5	115
	1995	404	164	41	1413	3.5	0.8	328
	1996	---	83	---	---	---	---	135
	1997	373	95	25	971	2.6	0.4	131
	1998	361	110	30	859	2.4	0.5	183
	1999	194	26	13	575	3.0	0.2	35
	2000	187	24	13	646	3.5	0.2	36
	2001	248	71	29	823	3.3	0.5	123
	2002	177	43	24	390	2.2	0.3	50
	2003	138	21	15	300	2.2	0.2	27
	2004	140	51	36	478	3.4	0.6	83
	2005	82	27	33	283	3.5	0.4	31
	2006	70	14	20	219	3.1	0.6	41
	2007	56	0	0	266	4.8	0.0	0
2–Revilla	1995	906	305	34	2843	3.1	0.5	410
	1996	---	227	---	---	---	---	314
	1997	562	200	36	2517	4.5	0.5	308
	1998	612	213	35	1925	3.1	0.5	292
	1999	525	119	23	2195	4.2	0.3	173
	2000	488	133	27	2587	5.3	0.4	188

TABLE 2 Unit 1A deer harvest from major harvest areas, regulatory years 1990 through 2007

Major harvest area	Regulatory year	Nr hunters expanded[a]	Nr successful hunters expanded	Percent successful	Hunter days expanded	Average days per hunter	Average deer per hunter	Deer killed
2-Revilla-cont.	2001	482	151	31	1457	3.0	0.5	223
	2002	409	150	37	1560	3.8	0.5	193
	2003	416	133	32	1055	2.5	0.4	169
	2004	420	149	35	1586	3.8	0.6	232
	2005	203	87	43	838	4.1	0.5	107
	2006	204	123	60	698	3.4	1.3	261
	2007	181	85	47	823	4.5	1.0	182
3–Cleveland Peninsula	1990	245	122	50	981	4.0	1.0	236
	1991	158	42	27	458	2.9	0.4	59
	1992	280	126	45	1159	4.1	0.9	241
	1993	262	74	28	705	2.7	0.4	109
	1994	307	155	50	1044	3.4	0.7	208
	1995	200	70	35	549	2.7	0.6	114
	1996	---	---	---	---	---	---	96
	1997	198	63	32	577	2.9	0.4	87
	1998	172	23	13	566	3.3	0.1	23
	1999	174	41	24	735	4.2	0.3	59
	2000	104	11	11	224	2.2	0.1	11
	2001	85	8	9	356	4.2	0.1	11
	2002	88	0	0	245	2.8	0	0
	2003	40	0	0	107	2.7	0	0
	2004	64	16	25	106	1.7	0.5	32
	2005	26	8	31	97	3.7	0.3	8
	2006	11	0	0	11	1.0	0.0	0
	2007	20	3	15	17	0.9	0.2	3

TABLE 2 Unit 1A deer harvest from major harvest areas, regulatory years 1990 through 2007

Major harvest area	Regulatory year	Nr hunters expanded[a]	Nr successful hunters expanded	Percent successful	Hunter days expanded	Average days per hunter	Average deer per hunter	Deer killed
4–Mainland	1995	66	28	42	56	0.8	0.1	7
	1996	---	6	---	---	---	---	---
	1997	21	6	29	176	8.4	0.3	6
	1998	33	14	42	75	2.3	0.6	19
	1999	24	0	0	52	2.2	0.0	0
	2000	15	0	0	64	4.3	0.0	0
	2001	38	10	26	120	3.2	0.3	10
	2002	7	7	100	14	2.0	1.0	7
	2003	36	0	0	55	1.5	0	0
	2004	14	0	0	35	2.5	0	0
	2005	19	0	0	52	2.7	0.0	0
	2006	20	16	80	31	1.6	1.2	24
	2007	1	0	1	0	0	0	0

[a] Expanded means harvest totals are estimated for the region based on a sample of approximately 35% 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 1998 through 2007

Regulatory	Reported harvest			Unreported & illegal	Estimated	Estimated Nr
year	Male	Female	Total	harvest[a]	total harvest	road kills
1998	508	0	508	254	762	1–5
1999	264	13	277	139	416	1–5
2000	261	6	268	134	401	1–5
2001	352	0	352	176	528	1–5
2002	244	0	244	122	366	1–5
2003	218	0	218	109	327	1–5
2004	374	5	379	190	569	1–5
2005[b]	127	5	132	66	198	1-5
2006	368	6	374	187	561	1-5
2007	180	6	186	93	279	1-5
$\bar{x}$	290	4	294	147	420	1–5

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

[b] Harvest information for 2005 should be viewed with caution due to survey reporting inconsistencies

TABLE 4 Unit 1A deer hunter residency and success, regulatory years 1998 through 2007

Regulatory year	Successful				Unsuccessful			
	Local resident[a]	Nonlocal resident	Nonresident	Total	Local resident[a]	Nonlocal resident	Nonresident	Total
1998	318	5	0	323	579	10	8	597
1999	160	18	0	178	518	31	9	558
2000	164	0	0	164	461	16	5	482
2001	209	12	0	221	440	9	10	459
2002	172	0	0	172	345	9	5	359
2003	151	13	0	164	318	23	4	345
2004	184	10	0	194	341	12	0	353
2005[b]	96	5	5	106	128	19	18	165
2006	131	52	9	192	136	12	0	148
2007	80	5	5	90	126	28	9	163
$\bar{x}$	167	12	2	180	339	17	7	363

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

[b] Harvest information for 2005 should be viewed with caution due to survey reporting inconsistencies

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
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DEER MANAGEMENT REPORT

From: 1 July 2006
To: 30 June 2008

LOCATION

GAME MANAGEMENT UNIT: 1B (3000 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, where deer densities are generally higher. From 1996 through 2007, the estimated Unit 1B deer harvest ranged from 34 to 114, while the estimated number of hunters varied from 66 to 186 (Tables 2 and 3).

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 6400 to 10,200 deer.

MANAGEMENT OBJECTIVES

- Increase deer populations on winter range (<1500 foot elevation) to 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

We estimated Unit 1B harvest data from a regional questionnaire, mailed to a random sample of 33% of deer harvest ticket holders. Relative winter deer densities are periodically measured with spring pellet-group transects in selected areas (Straugh and Rice 2003; Straugh et al. 2004).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Unit 1B pellet-group surveys are currently inadequate to determine deer population trends (Table 1). In spring 2003, the most recent year that pellet-group counts were conducted in the unit, one value comparison unit VCU at Horn Cliff 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. No pellet-group surveys were conducted in Unit 1B during the current report period.

MORTALITY

Harvest

Season and Bag Limit	Resident and Nonresident Hunters
Unit 1B	1 Aug–31 Dec 2 bucks

Board of Game Actions and Emergency Orders. No Board of Game actions took place and no emergency orders were issued regarding deer hunting in Unit 1B during the report period.

Hunter Harvest. The estimated harvest of 114 deer in 2006 was almost twice the preceding 10-year average and represents the highest estimated harvest since1994 when 184 deer were taken (Table 2). Deer harvest was reported in four Wildlife Analysis Areas (WAAs), including WAA 1603 (Thomas Bay), WAA 1605 (Muddy River/Patterson Glacier), WAA 1706 (Horn Cliffs/LeConte Bay) and WAA 1708 (Stikine River Drainage). In the wake of record snowfall during the proceeding winter, the 2007 harvest declined to just 43 deer. Deer harvest was reported from 5 WAAs including WAA 1602 (Farragut River Drainage), WAA 1603 (Thomas Bay), WAA 1605 (Muddy River/Patterson Glacier), WAA 1706 (Horn Cliffs/LeConte Bay) and WAA 1817 (Vixen inlet/Union Bay). Bolstered by the relatively high harvest in 2006 and despite the low harvest in 2007, the average annual harvest during the report period was 79 deer annually, which is above the preceding 10-year average of 68 deer per year.

Hunter Residency and Success. Based on estimates developed from Deer Hunter Survey responses, 18 nonresidents hunted deer in Unit 1B during 2006, only 5 (28%) of which were successful (Table 3). In 2007, an estimated 9 nonresidents hunted deer in the subunit during 2006, none of which were successful. Deer populations are greater and seasons and bag limits more liberal in other nearby units, and therefore, those areas attract more nonlocal hunters. The total number of hunters decreased slightly from 121 in 2005 to 118 in 2006, and yet the 2006 estimated harvest was nearly double that of the preceding year. The number of hunters decreased to 66 in 2007, the lowest number since at least 1996. The hunter success rate in 2006 was 65%, the highest since at least 1996. In 2007 hunter success declined to 41%, but remained slightly above the preceding 10 year average of 38%.

Harvest Chronology. Generally, most harvest in the unit takes place during November, October, and August, in decreasing order (Table 4). In 2006, the highest estimated harvest occurred in November, October, and August, in decreasing order. In 2007, the highest percentage of the harvest occurred in August, November, and September, in decreasing order.

Transport Methods. Most Unit 1B deer hunters generally reported traveling to their hunting areas by boat (Table 5). In addition to boats, in 2006 a small percentage of hunters reported using airplanes to access hunt areas. In 2007 most hunters reported using boats to access their hunting area, followed by foot travel, airplanes, and 3- or 4-wheelers, in decreasing order. 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 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. This area has relatively low deer density (due to typically high snow accumulation) and is largely inaccessible. Unitwide, deer densities vary from moderate in some isolated areas to extremely low in others. Overall, deer populations seem stable with localized variations. During the report period the central Alaska Panhandle, including Unit 1B, experienced back to back winters with well above average snowfall. During the winter of 2006–2007 in adjacent Unit 3, the Petersburg and Wrangell areas broke all-time records for snowfall (229.7 inches in Petersburg and 148.5 inches in Wrangell) (NOAA 2010). November of 2006 and March of 2007 were particularly harsh months, with many areas of Southeast experiencing monthly snowfall totals that approached or broke existing records. While not as severe as the preceding winter, during the winter of 2007–2008 the recorded snowpack was also well above average. Winter weather, predation, and clearcut logging have the greatest effects on deer population dynamics. Clearcut logging has and will continue to reduce deer carrying capacity in the unit. There are no indications that hunting seasons or bag limits should be further restricted.

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TABLE 1 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 2 Unit 1B deer harvest, 1996–2007

Regulatory year	Estimated legal harvest[a]						Estimated illegal harvest					
	M	(%)	F	(%)	Unk.	Total	M	(%)	F	(%)	Unk.	Total
1996	56	(100)				56						56
1997	105	(100)				105						105
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

[a] Data from mail out survey

TABLE 3 Unit 1B deer hunter residency and success, 1996–2007

Successful						Unsuccessful					
Regulatory year	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Total hunters
1996	46	6	0	52	NA	NA	NA	NA	NA	NA	NA
1997	61	12	0	73	(48)	68	11	0	79	(52)	152
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

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

TABLE 4 Unit 1B deer harvest chronology by month and percent, 1996–2007

Regulatory	Harvest periods							Number of
year	Aug	Sep	Oct	Nov	Dec	Mar	Unk	Deer[a]
1994	14	0	14	59	13	0	0	183
1995	6	0	66	28	0	0	0	75
1996	0	10	38	25	27	0	0	56
1997	4	17	41	18	13	0	7	105
1998	15	9	24	24	7	7	14	72
1999	5	9	0	27	14	0	45	85
2000	21	9	9	61	0	0	0	44
2001	15	18	23	27	11	0	6	43
2002	12	12	24	52	0	0	0	33
2003	20	15	27	38	0	0	0	82
2004	33	0	33	34	0	0	0	39
2005	43	16	19	22	0	0	0	58
2006	14	13	20	42	11	0	0	114
2007	56	9	0	28	0	0	7	43

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

TABLE 5 Unit 1B deer hunter effort, percent by transport method, 1996–2007[a]

Regulatory year	Percent of effort							Number of trips
	Airplane	Boat	3- or 4-wheeler	Foot	ORV	Highway vehicle	Not specified	
1996		100						NA
1997	4	86	7			3		NA
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

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

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 PO BOX 115526
JUNEAU, AK 99811-5526

DEER MANAGEMENT REPORT

From: 1 July 2006
To: 30 June 2008

LOCATION

GAME MANAGEMENT UNIT: 1C (7600 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 regionwide 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. 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 weather in winter 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 recorded at the Juneau airport during only 1 of 11 winters (Fig. 1) (McCoy 2007) and it is believed deer responded favorably, yielding higher populations and more deer available to hunters. However, the winter of 2006–2007 was severe, with record snowfall in Juneau (McCoy 2007). Substantial snowfall occurred in November, driving deer to beaches where they were vulnerable to hunter harvest; a substantial increase in harvest was reported in 2006. In addition, snow lingered without multiple freeze-thaw cycles, and another substantial snowfall came in March which restricted deer movements and ultimately resulted in a population level decrease in Unit 1C deer numbers. The winter of 2006–2007 spurred the department to conduct spring mortality transects in the unit, and consider regulatory action to reduce the harvest of female deer to bolster populations.

Most Unit 1C deer occur on Douglas, Shelter, and Lincoln islands; locations that have only occasionally been known to support wolves. During summer 2001, at least 7 wolves (2 adults and 5 pups) were seen on a number of occasion's near Point Hilda on southern Douglas Island. A Douglas Island trapper caught 7 wolves in January 2002. Wolves are known to occur in mainland areas of Unit 1C but are only occasionally seen; predation by wolves may be a factor keeping deer densities low 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 6200 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 mail-out surveys.
- Participate in annual deer-pellet surveys.

METHODS

A total of 8565 deer harvest tickets were issued for the 2006 regulatory year (RY) in Southeast Alaska and 7342 for RY 2007 (A regulatory year begins 1 July and ends 30 June, e.g., RY06 = 1 July 2006 through 30 June 2007). We mailed nearly one-third of all Southeast deer harvest ticket holders a survey each year; 60% (approx. 1800) responded in 2006 and 61% (approx. 1600) responded in 2007. 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 (McCoy 2006 and McCoy 2007). We conducted pellet-group surveys on Douglas and Shelter Islands in regulatory years 2006 and 2007, and Lincoln Island was surveyed in RY 2006.

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 trends from the deer harvest survey. North Douglas Island pellet-group densities indicated a gradual increase over the two years of the reporting period, with results of 2.28 and 2.84 groups per plot (PGP), respectively (Table 1) (Scott 2007). The increase in pellet density was not anticipated because we expected significant mortality due to

the severity of the 2006–2007 winter, and therefore a decline in deer numbers. Whether the pellet densities accurately reflect the trend in deer numbers in this case we can not determine. Winter weather can play a huge role in dictating where deer spend time which in turn affects the density of deer pellets on our transects.

At Inner Point on the southwest side of Douglas Island, pellet-group densities have remained low with a mean density of 1.18 PGP. During the report period pellet surveys were conducted in this area in 2006 and 2007, and showed a decrease from 2.10 to 1.59 PGP respectively (Table 1). It is likely winter weather in 2006–2007 restricted deer movements in the survey area, allowing for a reasonable (2.10) pellet group density to be detected. However, considering the severity of the previous winter, it is very likely that some of the pellets we counted were from deer that expired from winter weather conditions. The sharp decrease in pellet density during spring 2008 was anticipated due to expected high deer mortality associated with winter weather conditions during the 2 previous winters.

At Shelter Island, pellet transects were conducted during both 2006 and 2007. The density of pellet groups per plot decreased from the previous report period in both years to 1.10 and 1.05, respectively. Pellet surveys were conducted on Lincoln Island in 2006, and resulted in 0.86 groups/plot. This is a substantial decrease from the 1997 pellet survey which resulted in 1.57 groups/plot (Scott 2007). Lincoln Island is not regularly surveyed due to various constraints and survey efforts are focused on locations with higher hunter effort.

We did not conduct deer pellet surveys on Sullivan Island or the mainland during this report period.

MORTALITY

Harvest

Season and Bag Limit	Resident and Nonresident Hunters	
Unit 1C Douglas, Lincoln, Shelter, Sullivan Islands	1 Aug–31 Dec	4 deer; antlerless deer may be taken only from 15 Sep–31 Dec
Unit 1C Remainder	1 Aug–31 Dec	2 antlered deer

Board of Game Actions and Emergency Orders. An Emergency Order (EO) to close the female (doe) hunting season in Unit 1C was issued on 12 December 2007 as part of a larger closure affecting Unit 4 (Admiralty, Baranof, and Chichagof islands).

Mortality Survey. Winter severity, snow depth and duration of snow cover, are all factors that play a significant role in limiting deer numbers in Southeast, Alaska. In late winter 2006–2007, department personnel initiated beach mortality surveys in several areas of Unit 4 (Admiralty and Chichagof islands), and Unit 1C (Douglas Island) (McCoy 2007, unpublished data). Mortality surveys had been completed sporadically over the years, but in response to the perceived deer mortality levels from the recent severe winters, department biologists recognized a need to

collect as much information as possible on deer mortality, impacted age classes, and habitat use at time of expiration. In Unit 1C, Douglas Island was the only location surveyed. Four, 1-mile transects were completed on the backside of Douglas. A total of 7 mortalities were detected, a result of 1.8 mortalities (morts) per mile. For comparative purposes, other surveys completed included Unit 1A (0 morts/mile), Unit 1B (0.0 morts/mile), Unit 2 (1.2 morts/mile), Unit 3 (.4 morts/mile), and Unit 4 (3.8 morts/mile) (McCoy 2007, unpublished data). The increase in mortalities across the region coincides with deeper snow in the northern areas, and less snow in the southern areas. Often, in traditional cold spots (north- and east-facing drainages and bays) mortalities were higher than in locations oriented for better sun exposure. The average number of mortalities/mile of beach for Southeast, Alaska during the period 1952–1964 was 0.70 (McCoy 2007, unpublished data).

Hunter Harvest. Based on data gathered from the annual deer hunter survey in Unit 1C, hunters killed 640 deer in 2006 and 155 in 2007 (Table 2), with bucks composing 61% (2006) and 83% (2007) of the harvest. In 2006, the doe harvest increased to 249 animals, the largest doe harvest since 1992 (Scott 2007). RY 2006 represents the highest deer harvest since 1993 (Scott 2007). As previously indicated, deep snow in fall 2006 forced many deer to the beaches, where they were vulnerable to hunter harvest. RY 2007 represents the antithesis of the 2006 harvest with only 155 deer taken; this was due to fewer deer being available (after the high harvest and winter mortality of 2006) as well as the doe closure that was initiated in December of 2007. An estimated 69% of the Unit 1C deer harvest came from Douglas Island during the report period. Due to its proximity to Juneau and accessibility by road, Douglas Island historically has produced the highest deer harvest in Unit 1C.

The combined deer harvest on Shelter and adjacent Lincoln islands decreased in 2006 to 12 deer but increased to 17 deer in 2007, which is essentially unchanged from the last reporting period. Shelter and Lincoln islands receive little hunting pressure compared to Douglas Island. The number of days deer hunters spent on Shelter peaked in 2004 at 298 with a corresponding 16 days required to harvest a deer. In 2006, hunters spent 226 days in the field on Shelter and spent 5.8 days to harvest a deer; 112 cumulative days and 9 days per deer were required in 2007. Other less hunted areas, such as the mainland near Juneau, Chilkat Range, Holkum Bay and Cape Fanshaw, represent a small percentage of the Unit 1C deer harvest. The Juneau area mainland appears to have established itself as a deer hunting destination and now has a relatively large number of dedicated mainland hunters.

Other Mortality. A female deer with unborn twin fawns was illegally harvested in spring 2007 along the Juneau road system. During both years of the reporting period an estimated 7–10 deer were struck by vehicles and killed on Juneau roads.

Hunter Residency and Success. During the reporting period most hunters (88%) were Unit 1C residents, with nonlocal residents composing the majority of remaining hunters. Nonresidents made up 2% of the Unit 1C hunters in 2006 and 2007 (Table 3). Hunter success rate ranged from 48% in 2006 to 19% in 2007, again demonstrating the vulnerability of deer restricted to beaches. An average of 1.7 and 1.3 deer were taken per successful hunter in 2006 and 2007, respectively. Hunters spent an average of 4.4 days hunting per deer in 2006 and 15.5 days per deer in 2007 (Table 4). The average deer per hunter was 0.8 in 2006 and 0.3 in 2007 (Table 4).

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 57% of hunters used highway vehicles for access, 30% used boats, 10% used foot access, less than 1% used an airplane and 21 hunter responses did not list a method 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, Lincoln, Sullivan, and other islands in the unit. As previously noted, Douglas Island accounted for 69% of the Unit 1C deer harvest; many of the Douglas Island hunting areas are accessible by road. While the majority of hunters used highway vehicles to access hunting areas and enjoyed good success, boat hunters were able to harvest deer with less effort. The number of deer per boat based hunter (0.7) was higher, and the number of hunting days per deer (6.5) was lower for hunters using boats compared to highway vehicles (0.5 and 11.25, respectively).

CONCLUSIONS AND RECOMMENDATIONS

Nearly all value comparison units (VCUs) in Unit 1C were surveyed during the report period. North Douglas, Inner Point, and Shelter Island were surveyed in both 2006 and 2007; Lincoln Island was surveyed only in 2006. Unit 1C mainland areas were not surveyed for deer pellets during the report period. However, some thought should go towards establishing annual pellet surveys in this area because of an increasing number of hunters hunting the mainland. Based on observations and anecdotal information mainland deer numbers near Juneau appear to be increasing. All the Douglas Island pellet group transects (North Douglas and Inner Point) met or exceeded the management objective stated goal of 2.0 pellet groups/plot during the report period. Neither Shelter Island nor Lincoln Island pellet densities met management objectives. In all VCUs surveyed in 2006 and 2007, pellet group densities decreased in 2007 which is likely related to the extreme winter of 2006–2007. The natural ability of deer numbers to rebound quickly in areas without significant predator populations, such as in Unit 1C, should aid in the growth of the deer population if the winter weather isn't too severe in the coming years.

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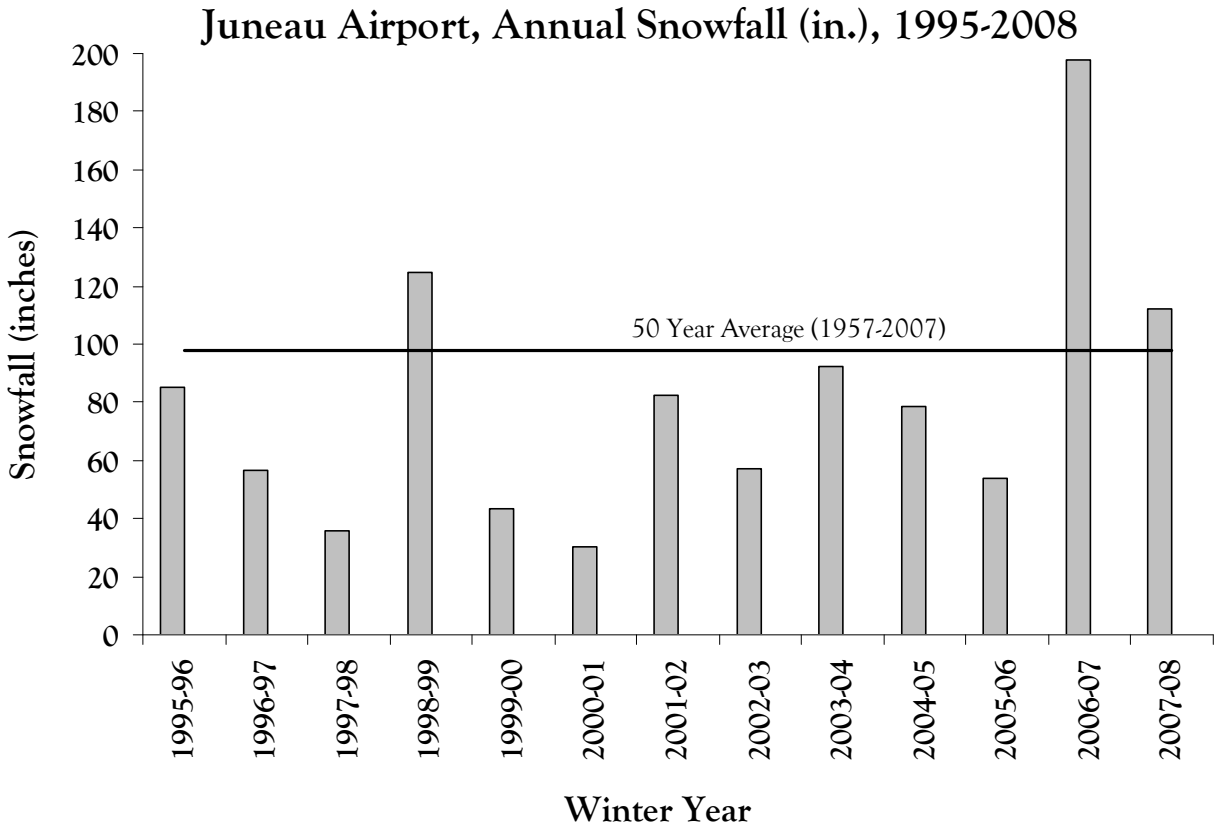

FIGURE 1. Annual winter snowfall measured at the Juneau airport, 1995-2008. The 50-year average is depicted as a solid line (Data: NOAA Weather Forecast Office, Juneau, AK).

TABLE 1 Unit 1C deer population trends as indicated by pellet-group surveys, 1986–2007

Area	Regulatory year	Mean pellet-groups/plot	Number 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)	1990	0.8	300	0.65–0.96
	1992	0.74	324	0.62–0.87
	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
Inner Point (VCU 36)	1986	1.76	262	1.53–2.00
	1987	1.21	200	1.02–1.39
	1988	1.30	258	1.08–1.53
	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
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

Table continues next page

TABLE 1 continued

Area	Regulatory year	Mean pellet-groups/plot	Number of plots	95 % CI
Shelter Island	1986	2.91	288	2.57–3.24
(VCU 124)	1987	3.16	130	2.62–3.70
	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
Lincoln Island	1997	1.57	207	1.27–1.77
(VCU 124)	2006	0.84	213	0.62–1.06
Sullivan Island	1989	1.40	250	1.17–1.62
(VCU 94)	1998	0.64	66	0.35–0.93

TABLE 2 Unit 1C annual deer harvest[a], 1987 through 2007

Regulatory year	Males	Females	Estimated total
1987	325	118	443
1988	271	218	489
1989	330	169	499
1990	245	172	417
1991	358	153	511
1992	302	277	579
1993	427	232	659
1994	210	101	311
1995	209	143	352
1996	342	96	438
1998	272	116	388
1999	196	139	335
2000	172	69	241
2001	274	71	345
2002	226	141	367
2003	335	137	472
2004	257	86	343
2005	279	221	500
2006	391	249	640
2007	129	26	155

[a] Data from expanded results of hunter surveys.

TABLE 3 Unit 1C deer hunter residency and success, regulatory years 1986 through 2007

	Successful						Unsuccessful						
Regulatory year	Local[a] resident	Nonlocal resident	Non resident	Unk	Total	(%)	Local[a] resident	Nonlocal resident	Non resident	Unk	Total	(%)	Total hunters
1986	256	8	0	0	264	(27)	655	67	4	0	726	(73)	990
1987	316	14	0	0	330	(34)	611	42	2	0	655	(66)	985
1988	232	20	0	0	252	(27)	639	45	6	0	690	(73)	942
1989	247	26	0	0	273	(29)	624	43	0	0	667	(71)	940
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)	1017
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	8	0	315	(35)	546	48	0	0	594	(65)	909
2004	233	26	4	0	263	(30)	563	41	5	0	609	(70)	872
2005	240	23	5	0	268	(29)	604	42	14	0	660	(71)	928
2006	340	28	9	0	377	(48)	361	42	5	0	408	(52)	785
2007	95	17	5	0	117	(19)	440	45	9	0	494	(81)	611

[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), 1990 through 2007

Regulatory year	Hunters	Days hunted	Deer killed	Deer/hunter	Days/deer
1990	948	3262	499	.5	6.5
1991	827	2993	417	.5	7.2
1992	959	3202	511	.5	6.3
1993	904	2950	579	.6	5.1
1994	1,017	4151	659	.6	6.3
1995	990	3968	311	.3	12.8
1996	257	NA[a]	NA	NA	NA
1997	861	3819	457	.5	8.4
1998	950	3396	388	.4	8.7
1999	851	2327	335	.4	7.0
2000	803	2312	241	.3	9.6
2001	881	2764	345	.4	8.0
2002	795	2612	367	.5	7.1
2003	910	3038	472	.5	6.4
2004	872	3262	343	.4	9.5
2005	928	3601	500	.5	7.2
2006	784	2783	640	.8	4.4
2007	611	2403	155	.3	15.5

[a] Data not available due to changes in survey.

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 PO BOX 115526
JUNEAU, AK 99811-5526

DEER MANAGEMENT REPORT

From: 1 July 2006
To: 30 June 2008

LOCATION

GAME MANAGEMENT UNIT: Unit 2 (3600 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. Deer populations tend to fluctuate seasonally, primarily in response to severe winter weather, habitat loss, and wolf and black bear predation. Currently deer numbers are at moderate levels throughout most of southern Southeast Alaska.

Weather conditions and population levels influence deer harvests. Unit 2 harvests ranged from 1823 to 3028 deer and have averaged 2505 deer during the past 11 seasons. Hunting seasons have generally extended from August through November or December, and limited hunting of antlerless deer was allowed before 1978. A three-week antlerless season was initiated in Unit 2 during regulatory year (RY) 1987, but was discontinued a year later because of public opposition. In 1995, despite state opposition, a federal 2½-month antlerless season was implemented in Unit 2. The federal antlerless season remains in effect, allowing qualified rural hunters to harvest one female deer as part of their 5 deer bag limit. In the fall of 2007 the annual bag limit for qualified rural hunters increased from 4 to 5 deer under federal hunting regulations. The bag limit remains 4 bucks for hunters hunting under state regulations.

Craig is the largest community in Unit 2, with approximately 1200 residents. Craig was once the fastest growing community in Alaska during the period when many Prince of Wales Island (POW) logging camps closed and families moved into town. The population of Craig stabilized as some residents moved away in search of employment, while others started new tourism-based businesses, but now appears to be in a slow decline, possibly as a result of the current economic recession.

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 470 mi^2 of forested habitat has been cut during the past 50 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.

Habitat changes continue from additional logging and from the subsequent second growth in many 20- to 30-year-old clearcuts when they reach the stem exclusion stage, where the canopy closes and important understory plants disappear. Associated with logging is road building, and roads are steadily impinging on deer habitat; Unit 2 has the highest density of roads in Southeast—over 2200 miles of drivable road surface. As clearcut logging continues to reduce old-growth habitat in Unit 2, deer populations are expected to decline. Population models estimate declines in carrying capacity of 50–60% by the end of the logging rotation in 2054. Long-term consequences of habitat loss include the inability to provide for subsistence needs and a loss of deer hunting opportunities.

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 2700 deer. This action is based on the Unit 2 population being identified by the board as important for satisfying high levels of human consumptive use.

MANAGEMENT OBJECTIVES

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

METHODS

We collected population information from anecdotal reports provided by hunters and from spring pellet-group surveys. We collected harvest data from an annual 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 expanded our results to cover all harvest ticket holders (Straugh and Rice 2003; Straugh et al. 2004). 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 percent starting in 2003.

Because of some contentious issues surrounding allocation of deer harvest in Unit 2 a new report system was developed. Starting in fall 2005 deer hunters were required to fill out a new harvest report form if they planned to hunt Unit 2 (Prince of Wales Island) any time during the deer season. Those hunters were removed from the mail out survey list and their hunt information was instead captured on the Unit 2 report form. Results from the Unit 2 harvest report cards were combined with the mail-out survey results.

RESULTS AND DISCUSSION

MORTALITY

Harvest

Season and Bag Limit	Resident and Nonresident Hunters	
Unit 2	1 Aug–31 Dec	4 bucks

Season and Bag Limit continued: 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. No regulatory changes were made to the state deer seasons or bag limits during this period. After being unsuccessful for several years, public proposals to the Federal Subsistence Board in 2003 resulted in a shorter deer hunting season for hunters who are not federally qualified and a season extension for federally-qualified residents of of Units 1A, 2, and 3. Federal subsistence hunters have been arguing that they would like to see a local preference for Unit 2 deer hunting. Some residents of Prince of Wales Island contend Ketchikan and other nonlocal hunters are impacting their ability to get the deer they need to subsist. The current federal season now runs 24 July–15 August and excludes Ketchikan and other nonlocal hunters (those outside of Units 1A, 2, and 3) from hunting federal lands on Prince of Wales Island until 16 August. The federal bag limit increased starting fall of 2007. Rather than 4 bucks, the new federal bag limit is 5 bucks with an option to take one doe as part of a 5-deer bag limit, 15 October–31 December. The state deer season for hunting state and private lands in Unit 2 remains 1 August–31 December.

Hunter Harvest. Reported deer harvest in Unit 2 during the past 2 seasons was estimated at 3027 and 2883 deer, well above the harvest objective of 2770 both seasons and the 11-year average of 2505. Deer per hunter (1.6 and 1.5 deer during 2006 and 2007, respectively) was slightly higher than the long-term average of 1.3 while the average hunter-days per deer of 3.0 and 3.5 was lower than the long-term average of 4.3 hunter days/deer (Table 1). This harvest data is consistent with anecdotal and field observations in Unit 2, which all suggest the Unit 2 deer population is healthy, stable, and currently at a 12–15 year high.

Harvest during 2006 and 2007 on the main island of POW was the highest it has been since 2000 with 2656 and 2695 deer harvested respectively. Success rates in 2006 and 2007 were also very high, matching the 72% success during the previous reporting period and well above the long term average of 64% (Table 2).

We believe that Unit 2 has one of the highest illegal or unreported harvests in the region. Unreported and illegal kill is estimated to be equal to the Unit 2 reported harvest (Table 3). Of an estimated 70,000 deer in Unit 2, the illegal removal of 3000 deer equates to an estimated 4.3% mortality rate. This is partly due to the extensive and increasing road system and the lack of law enforcement personnel. Illegal hunting may increase with a growing human population, additional roads, and higher unemployment rates. Additionally, Flynn and Suring (1989) reported that actual hunter kill could be 38% greater than total estimated harvests from hunter reports because of crippling loss.

Hunter Residency and Success. An estimated 52% of the hunters harvesting deer in Unit 2 during the past 2 years were residents of POW Island. Hunters living in communities of POW had a higher success rate than other hunters, with residents enjoying a combined 82% success rate during 2006 and 2007. Nonresident effort continues to increase in Unit 2 and in 2007 the highest number of out-of-state hunters on record was documented at 219 hunters. Nonresident success rates averaging 38% in this period were typical of historical averages.

Ketchikan hunters' share of the POW harvest during the 2006 and 2007 seasons remained similar to previous years at 26% and 25%.

During the 2006 season, 112 does were reportedly harvested under federal subsistence permits in Unit 2, and during 2007, 116 does were reported (Table 3). 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.

Harvest Chronology. Most Unit 2 deer are harvested during August, October, and November. From 1997 through 2002 August accounted for most of the harvest (27%). However, it has been lower in recent years and during this report period, the August take was just only 15% of the reported harvest (Table 5). This is probably due to a combination of a shorter season during August for many hunters and also how hunters reported their activity. Because of recent changes in federal regulations most nonlocal resident hunters now have less than 2 weeks of August to hunt. Federally qualified hunters are also taking advantage of the July season. For hunters not qualified to hunt under federal regulations November is now more popular and accounts for 42% of the recent harvest (Table 5).

Transport Methods. With the extensive road system in Unit 2 most hunters prefer to access hunting areas by highway vehicle. Highway vehicles were used for most deer hunting effort (71%) followed by 21% use of boats (Table 6).

Other Mortality

Historically, deer–vehicle collision estimates have remained low (10–25 deer/year) and have not been a significant source of Unit 2 mortality. However, the collision risk has increased with completion of extensive new POW paving projects, which now extend from Craig to Naukati and east to Thorne Bay. In addition, construction and paving of the main 30 road to Coffman Cove was nearly completed in 2008. Higher vehicle speeds, as well as an attractive food source created from grass planted for erosion control near the roads, will likely cause more deer–vehicle collisions.

HABITAT

Assessment

Logging continues to cause major changes to old-growth habitat. The most serious effects are in higher volume stands at low elevations, which are critical to deer during years of heavy snowfall. U.S. Forest Service (USFS) and ADF&G habitat models predict that the forest's ability to support deer in average winter conditions will decline by nearly half by the end of the logging rotation in 2054. Because of extensive loss of critical winter habitat, in some areas deer declines may exceed 60% following severe winters. 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. Second-growth issues will be one of the top Unit 2 issues during the next 5–10 years as large tracts of previously logged areas reach the closed canopy stem exclusion stage. These large tracts of land will be converted to extremely poor deer habitat, and consequently, we expect habitat carrying-capacity and deer numbers to decline. Because of ongoing Unit 2 habitat changes, we need more than ever

to obtain accurate information on deer herd status to serve as a baseline to assess long-term changes. The future success of any research or survey program will depend on an informative public education campaign.

CONCLUSIONS AND RECOMMENDATIONS

According to our combined harvest survey information, the Unit 2 harvest objective of 2700 deer was met in both 2006 and 2007. However, anecdotal reports from hunters and public testimony during an extensive multi-agency Unit 2 deer planning effort 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 deer numbers in Unit 2. Numbers of hunters have remained similar while those same hunters have enjoyed better success and spent less time to harvest a deer. All of this information suggests stable 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).

Recent road improvement projects that paved large sections of POW and the planned arrival of a new high-speed ferry at the north end 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.

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TABLE 1 Unit 2 deer harvest data, regulatory years 1997 through 2007

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
1997	1,767	959	54	11,441	6.5	1,842	1.0	6.2
1998	1,968	1,278	65	10,476	5.3	2,426	1.2	4.3
1999	1,938	1,219	63	13,347	6.9	2,527	1.3	5.3
2000	2,252	1,419	63	13,896	6.2	3,028	1.3	4.6
2001	2,047	1,356	66	13,160	6.4	2,865	1.4	4.6
2002	1,956	1,140	58	11,129	5.7	2,169	1.1	5.1
2003	1,518	910	60	8,007	5.3	1,823	1.2	4.4
2004	1,508	1,064	71	7,089	4.7	2,147	1.4	3.3
2005	1,890	1,361	72	10,481	5.5	2,820	1.5	3.7
2006	1,891	1,374	73	9,095	4.8	3,027	1.6	3.0
2007	1,964	1,366	70	10,165	5.2	2,883	1.5	3.5
Average	1,882	1,222	65	10,753	5.7	2,505	1.3	4.3

[a] Includes does that were reported killed.

TABLE 2 Unit 2 deer harvest from Prince of Wales Island only, regulatory years 1997 through 2007

	Regulatory Year	Nr hunters expanded[a]	Nr successful hunters expanded	Percent successful	Hunter days expanded	Average days per hunter	Average deer per hunter	Deer killed
POW Island	1997	1,711	912	53	10,853	6.3	1.0	1,761
	1998	1,868	1,178	63	9,956	5.3	1.2	2,242
	1999	1,833	1,137	62	12,664	6.9	1.3	2,363
	2000	2,150	1,352	63	13,161	6.1	1.3	2,770
	2001	1,907	1,252	66	12,376	6.5	1.4	2,597
	2002	1,814	1,076	59	10,327	5.7	1.1	2,027
	2003	1,385	810	58	7,295	5.3	1.1	1,575
	2004	1,391	963	69	6,530	4.7	1.4	1,915
	2005	1,825	1,293	71	9,199	5.0	1.4	2,603
	2006	1,704	1,235	72	7,958	4.7	1.6	2,656
	2007	1,862	1,296	70	9,734	5.2	1.4	2,695
	Average	1,768	1,137	64	10,005	5.7	1.3	2,291

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

TABLE 3 Unit 2 reported and estimated deer harvest/mortality, regulatory years 1997 through 2007

Regulatory year	Reported harvest			Unreported & illegal harvest[a]	Estimated total harvest	Estimated nr road kills
	Male	Female	Total			
1997	1,718	124	1,842	1,842	3,684	25–30
1998	2,426	134	2,560	2,560	5,120	25–30
1999	2,330	198	2,528	2,527	5,054	25–30
2000	2,798	231	3,029	3,028	6,056	25–30
2001	2,736	129	2,865	2,865	5,730	25–30
2002	2,090	79	2,169	2,169	4,338	25–30
2003	1,712	111	1,823	1,823	3,646	30–50[c]
2004	2,072	75	2,147	2,147	4,294	30–50
2005	2,673	147	2,820	2,820	5,640	30–50
2006	2,915	112	3,027	3,027	6,054	30–50
2007	2,767	116	2,883	2,883	5,766	30–50
Average	2,385	132	2,517	2,517	5,035	25–30

[a] Unreported and illegal harvest estimated at 100% of reported harvest
[b] Antlerless seasons: state season in 1987, federal season in 1995–1999
[c] Over 75 miles of new pavement with high speed limits will cause more collisions each year.

TABLE 4 Unit 2 Hunter residency and success, regulatory years 1997 through 2007

Regulatory year	Successful				Unsuccessful			
	Local resident[a]	Nonlocal resident	Nonresident	Total	Local resident[a]	Nonlocal resident	Nonresident	Total
1997	568	382	9	959	306	431	71	808
1998	765	505	8	1,278	270	381	39	690
1999	691	479	50	1,220	281	361	76	718
2000	851	530	38	1,419	434	322	77	833
2001	724	587	45	1,356	299	334	59	692
2002	577	517	47	1,141	311	420	85	816
2003	489	363	57	909	184	313	111	608
2004	497	515	52	1,064	151	220	73	444
2005	713	563	85	1,361	168	266	95	529
2006	721	590	63	1,374	144	297	78	519
2007	702	588	75	1,365	157	298	144	599
Average	663	511	48	1,223	246	331	83	660

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

TABLE 5 Unit 2 deer harvest chronology, regulatory years 1997 through 2007

Regulatory year	Month of kill							
	July	Aug	Sep	Oct	Nov	Dec	Jan	Unk/ other
1997	0	438	269	378	565	65	0	126
1998	0	881	356	489	605	68	0	156
1999	0	545	437	568	717	117	19	126
2000	0	814	372	721	924	88	8	101
2001	10	688	428	567	951	89	5	132
2002	5	615	281	393	657	79	0	140
2003[ab]	73	274	272	390	562	70	7	174
2004	73	315	236	452	809	60	4	197
2005	207	480	391	509	964	100	8	161
2006	178	479	332	505	1223	154	2	154
2007	140	411	294	469	1230	123	5	211
Average	134[c]	540	333	495	837	92	5	153

[a] Harvest underestimated on state survey because of new federal subsistence regulations
[b] Federal subsistence deer season opens July 24
[c] 2003-2007

TABLE 6 Unit 2 hunter transport method, regulatory years 1997 through 2007

Regulatory year	Method of transportation[a]					
	Airplane	Boat	Foot	Highway vehicle[b]	Other	Unk
1997	91	269	29	1,377	0	0
1998	79	336	54	1,488	5	9
1999	59	273	28	1,567	5	5
2000	91	323	60	1,749	9	21
2001	99	329	46	1,568	0	4
2002	69	356	27	1,483	0	21
2003	38	295	38	1,091	0	56
2004	50	293	13	1,139	5	8
2005	83	336	21	1,405	3	42
2006	88	415	39	1,328	6	15
2007	84	395	30	1,423	0	33
Average	76	329	35	1,420	3	19

[a] Numbers of successful and unsuccessful hunter trips
[b] Includes cars, trucks, and off-road vehicles (3- and 4-wheelers)

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 PO BOX 115526
JUNEAU, AK 99811-5526

DEER MANAGEMENT REPORT

From: 1 July 2006
To: 30 June 2008

LOCATION

GAME MANAGEMENT UNIT: 3 (3000 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.

The most recent significant population decline resulted from a series of severe winters in the late 1960s and early 1970s, which 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 1994 and 2005, the estimated Unit 3 deer harvest ranged from 603 to 1119, while the number of hunters varied from 891 to 1220.

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

- Increase deer populations on winter range (<1500 ft elevation) to 32 deer/mi^2, measured by a mean pellet density of 1.0 pellet group/20 m^2 plot.
- Monitor deer densities using pellet-group surveys.
- Monitor deer harvest using mailed questionnaires.

METHODS

We estimated Unit 3 deer harvest from a regional questionnaire mailed randomly to 33% of deer harvest ticket holders (Straugh and Rice 2003; Straugh et al. 2004). We measured winter deer density with spring pellet-group transects in selected areas.

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 and 2007–2008. 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.

In spring 2006, pellet-group counts were conducted in 4 Value Comparison Units (VCUs) on 2 islands in Unit 3 (Table 1). Woewodski (South Mitkof Island) pellet-group counts nearly doubled from .82 pellet-groups/plot in spring 2005, to 1.63 in spring 2006, the highest since 1996. The 3 VCUs sampled on Zarembo Island in spring 2006 revealed high variability in pellet count densities across the island. Two of the 3 VCUs sampled on Zarembo Island in spring 2006 showed increasing pellet-group densities, while one VCU declined compared to spring 2004. At

Baht Harbor counts were 1.51 pellet-groups/plot, down from 2.12 in spring 2004. At St. John Harbor counts were 1.98 pellet-groups/plot, up from 1.75 in spring 2004. Counts at Snow Passage were 1.52 pellet-groups/plot, up from 1.08 in spring 2004.

In spring 2007, pellet-group counts were conducted in three VCUs on two islands in Unit 3. Castle River (southern Kupreanof Island) pellet-group counts decreased from .36 pellet-groups/plot in spring 1997 to .12 in spring of 2007, which represents the lowest count since pellet-group counts were initiated in that area in 1984. East Duncan Canal (South Lindenberg Peninsula, Kupreanof Island) pellet-group counts decreased slightly from 1.89 pellet-groups/plot in 2001 to 1.37 in spring 2007. Pellet group counts conducted on Woewodski (South Mitkof Island) decreased from 1.63 pellet-groups/plot in 2006 to 1.06 in spring 2007, and likely reflect a decrease in deer populations resulting from record snowfall during winter of 2006–2007.

MORTALITY

Harvest

Season and Bag Limit		Resident and Nonresident Hunters	
Unit 3, Mitkof Island, the Petersburg Management Area	2006	15 Oct–15 Nov	One buck
	2007	15 Oct–15 Dec	Two bucks
Unit 3, remainder of Mitkof Island, Woewodski and Butterworth islands		15 Oct–31 Oct	One buck
Remainder of Unit 3		1 Aug–30 Nov	Two bucks

Board of Game Actions and Emergency Orders. At the fall 2006 meeting, the Board of Game extended the deer season in the Petersburg Management Area on Mitkof Island by one month and increased the bag limit in this archery-only area from 1 to 2 bucks. No Board of Game actions took place and no emergency orders were issued regarding deer hunting in the remainder of Unit 3 during the report period.

Hunter Harvest. Deer hunter effort and harvest changed little in Unit 3 before 1991. Hunter survey data for 1991–2007 includes Mitkof Island, which is primarily responsible for increases in both hunter numbers and kill. In 2006, the estimated unitwide harvest of 610 deer was well below the preceding 10-year average of 847 (Table 2). In 2007 the estimated harvest further decreased to 457 deer, the lowest since 1991, when the estimated harvest was 411 deer. The total number of hunters decreased from 915 in 2005 to 756 in 2006, and further decreased to 682 in 2007. The decline in the number of hunters during the report period, and reduced deer abundance resulting from severe winter weather likely contributed to the low harvest estimates in 2006 and 2007. Prior to 2003, Zarembo Island functioned as the leading deer producer in the unit. Since the liberalization of the deer season and bag limit on the Lindenberg Peninsula in 2003, the Kupreanof Island deer harvest surpassed that of Zarembo from 2003 to 2006. In 2007, Zarembo once again edged out Kupreanof as unit's leading deer producer.

Hunter Residency and Success. Few nonresidents hunt deer in Unit 3, and most hunters are local residents (Table 3). Nonresidents composed just 5% and 3%, respectively, of all Unit 3 deer hunters in 2006 and 2007. Deer populations are greater and seasons and bag limits more liberal in other nearby units, attracting most nonlocal hunters to those areas. The total number of hunters decreased from 915 in 2005 to 756 in 2006, and then decreased further to 682 in 2007. The success rate was 52% in 2005, 49% in 2006, and 41% in 2007.

Harvest Chronology. Table 4 shows the historical Unit 3 deer harvest percentage by month. The highest percentage of the unitwide deer harvest typically occurs during October, followed in descending order by November, August, and September. However, during both 2006 and 2007 the highest percentage of the harvest occurred during November, followed in descending order by October, August, and September.

Transport Methods. From 1995 through 1998 most hunters reported using boats to access their hunting areas, but from 1999 through 2002 most hunters reported using highway vehicles. In 2003 and 2004 most deer hunters reported using boats to access hunting areas. In 2005 most deer hunters (52%) once again reported using highway vehicles to access hunting areas. In 2006 and 2007, most deer hunters reported using boats to access hunting areas, including 51% and 55%, respectively (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 natural causes.

CONCLUSIONS AND RECOMMENDATIONS

Unit 3 deer populations are thought to be stable with localized variations. With the exception of Zarembo and possibly a few smaller islands, Unit 3 deer exist largely at levels below carrying capacity. During the report period the central Alaska Panhandle, including Unit 3, experienced consecutive winters with well above average snowfall. During the winter of 2006–2007, the Petersburg and Wrangell areas broke all-time records for snowfall (229.7 inches Petersburg and 148.5 inches Wrangell) (NOAA 2010). November of 2006 and March of 2007 were particularly harsh months, with many areas of Southeast experiencing monthly snowfall totals that approached or broke existing records. While not as severe as the preceding winter, during the winter of 2007–2008 the recorded snowpack was also well above average. Most areas where pellet-group surveys were conducted in spring 2006 showed increased pellet-group densities. However, following record snowfall during the winter of 2006–2007, 3 of 4 areas sampled in spring of 2007 experienced declining pellet-group densities compared to when previously sampled. We believe that while annual fluctuations in winter severity have some influence on pellet-group densities, and considering winter weather severity in 2006–2007, we believe reduced pellet-group densities in spring of 2007 reflect actual declines in deer numbers. Winter weather, predation, and clearcut logging have the greatest effects on deer population dynamics. Clearcut logging has and will continue to reduce deer carrying capacity in the unit and increasing road densities serve to increase hunter access, making more deer more vulnerable to human-caused mortality. There are no indications that hunting seasons or bag limits should be restricted; all Unit 3 can remain open for deer hunting.

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TABLE 1 Unit 3 deer population trends as indicated by pellet-group surveys, 1981–2007

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	1990	1.12	227	0.92–1.32
(VCU 437)	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
Portage Bay	1993	.43	282	0.30–0.56
(VCU 442)	1995	.43	277	0.63–0.94
	1998	.39	285	0.29–0.49
Woewodski (S. Mitkof)	1984	.088	295	0.69–1.08
(VCU 448)	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	1.13	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
	2001	1.43	220	1.17–1.68
	2002	0.50	216	0.36–0.64
	2003	1.06	250	0.87–1.25
	2004	0.82	279	0.65–0.98
	2006	1.63	180	1.26–2.00
	2007	1.06	235	0.83–1.28
4Woewodski 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

Table continues next page

TABLE 1 continued

Area	Regulatory year	Mean pellet-groups/plot	Nr plots	95% CI
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	
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	
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	290	
Meter	2001	0.87	180	0.64–1.10
(VCU 459)	2003	0.89	180	0.68–1.10
	2004	1.41	155	1.75–1.07

Table continues next page

TABLE 1 continued

Area	Regulatory year	Mean pellet-groups/plot	Nr plots	95% CI
Woronkofski (VCU 461) (All Transects) (Trans. 10, 11, 12)	1985	1.63	646	1.45–1.81
	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 (VCU 467)	1993	.07	304	0.03–0.11
Onslow (VCU 473)	1984	.37	321	0.28–0.46
	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
	2001	.97	332	0.81–1.13
	2005	0.60	363	0.48–0.71
	2007	1.33	339	1.13–1.53
Fool's (VCU 480)	1994	.54	193	0.38–0.70
	2000	.61	201	0.45–0.77
Canoe (VCU 474)	2000	.11	228	0.06–0.17
Coronation (VCU 564)	1983	1.20	696	1.04–1.36
	1985	2.34	228	N/A
	1988	1.41	408	1.17–1.66
	1989	1.63	293	1.28–1.98
	1997	.44	289	0.34–0.55

TABLE 2 Unit 3 (estimated) deer harvest, 1996–2007

Regulatory year	Estimated legal harvest[a] 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

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

TABLE 3 Unit 3 deer hunter residency and success, 1996–2007

Successful						Unsuccessful					
Regulatory year	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Local[a] resident	Nonlocal resident	Nonresident	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

[a] Residents of Units 1B, 3, Meyers Chuck, Point Baker, and Port Protection.
[b] Data from registration permit report and hunter survey included.

TABLE 4 Unit 3 deer harvest chronology percent by month, 1996–2007

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

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

TABLE 5 Unit 3 deer hunter effort percent by transport method, 1996–2007[a]

Regulatory year	Airplane	Boat	3- or 4-wheeler	Foot	ORV	Highway vehicle	Other	Unknown	Number of trips
1996	1	50	13	2	0	34	0		NA
1997	1	55	13	0	0	31	0		NA
1998	1	53	6	1	0	39	0		NA
1999	1	35	13	1	0	50	0		NA
2000	2	38	7	1	0	52	0		NA
2001	0	37	7	0	0	56	0		NA
2002	3	38	8	2	0	49	0		NA
2003	0	49	6	2	0	40	3		NA
2004	1	47	5	2	0	43	2		1,580
2005	1	39	5	2	0	52	0	1	1,263
2006	4	51	0	1	0	37	1	6	756
2007	1	55	5	1	0	35	0	3	683

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

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 PO BOX 115526
JUNEAU, AK 99811-5526

DEER MANAGEMENT REPORT

From: 1 July 2006
To: 30 June 2008

LOCATION

GAME MANAGEMENT UNIT: 4 (5820 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. However, the severe winter of 2006–2007 dealt a significant blow to the population with major losses occurring throughout the unit. Hunter success and effort reflected the deer population decline. The following winter of 2007–2008 produced above average snowfall and a long-lasting snowpack well into late May in many locations. During 2006–2007, Unit 4 accounted for 46% of the region's hunter effort and 59% of the deer harvest (Straugh 2007). In the 2007–2008 season, Unit 4 accounted for 48% of the region's hunter effort and 71% of the deer harvest (Straugh 2008).

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 winters of 1988–1989 through 1990–1991, persistent snow caused significant deer mortality. During the winters of 1994–1995 and 1998–1999 many fawns died, but these appeared to be relatively minor setbacks. A series of mild winters beginning in 1999 until 2005–2006 allowed the population to build to a point that it likely exceeded the habitat capability. The winter of 2006–2007 set new records for snow depth not only in Unit 4, but throughout many locations in Southeast. Deer mortality in the northern areas of Chichagof Island was very high and could easily have exceeded 50% or more of the population, based on data collected from aerial surveys, boat-based shoreline condition surveys, mortality surveys, road surveys, as well as anecdotal information from hunters, guides, and project crews working in the area. Additionally, multitudes of deer found dead on the beaches, floating in the bays, and also the lack of deer seen by hunters in the alpine the following fall all indicated the severity of the winter had led to high mortality. Other areas within the unit with more intact natural habitats (lack of clearcut logging practices) didn't appear to be hit quite as hard. The following winter of

2007–2008 again set records for snowfall and a late snowpack extending well into June. Although overall winter mortality was not as visible, the lack of fawn recruitment delayed a population rebound.

Deer densities are expected to decline in the future 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 high 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).

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. While the two sets of regulations were initially quite similar, they now continue to diverge.

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 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 7800 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 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.

We conducted winter mortality surveys (beach transects) on a number of previously established trend areas during spring.

Harvest questionnaires were mailed to a sample of hunters with deer harvest tickets to assess hunter effort and success (Straugh 2007, Straugh 2008). Hunters were asked to supply information on hunting effort, deer harvested, months hunted, and kill locations on an area-specific basis.

During winter 1998–1999, 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 specific boat routes were established to examine the physical condition of these deer. Deer were viewed through binoculars at ranges of 25–200 meters, and each individual was assigned into one of 7 condition classifications. Changes in deer condition were documented through the late winter. These surveys have been repeated periodically (see Table 6 for the classification chart).

In December 2006, shoreline deer condition assessment surveys began (as a result of high snowfall in November that concentrated deer on the beaches) and the survey areas were greatly expanded to obtain a better overall assessment over a greater portion of the unit. These expanded surveys continued throughout 2007 and 2008.

Due to the record winter snowfall of 2006–2007, aerial shoreline surveys were conducted by department staff beginning in March 2007. These surveys also included a site visit to 10 locations on Admiralty Island and 8 on Chichagof Island to collect snow depth, live deer sightings, and deer mortality counts (Lewis, 2007).

Fawn surveys (presence or absence of tracks) were conducted in late June through the end of July (2008) at 14 tidal flat locations in the unit. While this type of survey has not been used with regularity, we used it as an indication of recruitment immediately following a severe winter.

Although no formal investigations were conducted regarding parasites in deer, several animals were inspected during the course of this reporting period. Incidence of ectoparasites (ticks and lice) has been noted on some of those animals examined.

RESULTS AND DISCUSSION

Population Status and Trend

Mild winter conditions persisted from 2000–2006 and there was very little winter mortality recorded. It is highly probable that the deer population grew to a point that it exceeded the habitat carrying capacity. Evidence of this is indicated during pellet surveys where personnel made many notations of “severe browsing.” Comments occurred not only at lower winter elevations that would see concentrated deer numbers, but also at elevations at 900–1500’. Beach mortality and other field survey crews photographed and documented excessive browsing in many areas of the unit.

A series of winter storms beginning in November 2006 broke a mild winter period going back to 1999. The winter of 2006–2007 ended up with the deepest snowfall measurements on record for many locations in Southeast Alaska. Significant snowfall during the entire month of March 2007 left places like upper Tenakee Inlet with 122 inches of snow at the high tide line well into the month of April. Late spring snow combined with a deep and persistent snowpack resulting in a high mortality rate among deer. It is likely the deep snow limited foraging opportunities while also draining reserves during locomotion. These two factors proved too much for many deer as mortalities became commonplace throughout many areas of the unit. With their fat reserves exhausted and existing on a maintenance diet, the lack of access to forage and the effort needed to search for it caused many deer mortalities.

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 current harvest levels.

Pellet-group surveys over the last 10–year period, prior to the surveys conducted in the spring of 2007, 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 since 2007 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 questionnaires.

Population Size

Deer pellet-group surveys conducted during the springs of 2007 and 2008 were not conclusively lower as one would have expected, given the rather severe winters preceding these counts (Table 1). In some cases, the deer pellet density actually increased. This pellet count technique may not fully reflect deer populations in late winter because deer that deposited pellets during December or January may have died in February or March. Snowfall that concentrates deer in restricted habitats may result in high pellet densities in such areas. In years with little snow accumulation, wintering deer may be scattered over wide areas or at elevations above transect boundaries.

The drastic decline in harvest from 2006 to 2007 is a good reflection of the lower deer population. After the severe winter of 2006, we expected the 2007 harvest to be much lower, and indeed it was (Table 3). The combination of substantially fewer deer along with the late closure of the doe season across much of the unit led to the low harvest of 2007. Not only does the decline in harvest reflect a downturn in population size, but our surveys indicated a significant lack of physical evidence of deer; few pellets on summer range, excellent growth of preferred deer browse at all elevations, lack of deer tracks, and few sightings during key locations and time periods.

Population Composition

The sex composition of the legal kill (Table 2) was estimated from deer harvest questionnaires (Straugh 2007, Straugh 2008). Extrapolations of hunter reports in 2006–07 estimated a harvest of approximately 5537 bucks (72%). During the 2007-08 season, hunters reported harvesting 1516 bucks (82%).

MORTALITY

Harvest

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

Board of Game Actions and Emergency Orders

Concern for the significant winter mortality of 2006–2007 prompted an emergency closure of the doe season on northeast Chichagof Island in November 2007 followed by a doe closure for the remainder of the unit in December. The Federal Subsistence Board followed with a doe closure on northeast Chichagof Island in late November and a unit wide doe closure beginning 1 January 2008. In early October 2008, the doe harvest on northeast Chichagof Island was again closed by state emergency orders and Federal Subsistence Board actions for the remainder of the season.

At the November 2008 meeting, the Board of Game heard a Unit 4 report detailing the current deer survey efforts and results. The emergency closure actions regarding doe harvest were reviewed and no changes were made to the existing deer hunting regulations for Unit 4.

Hunter Harvest. The department utilizes a mail survey from a random sample of about 35% of all deer hunters to gather harvest data. Approximately 60-65% of the hunters receiving the survey respond. A statistically applied expansion factor is added to that data to generate the numbers used in this report. Responses from the hunter harvest surveys indicated there were 2400 successful deer hunters in Unit 4 during the 2006–2007 season and 898 during the 2007–2008 season (Table 3). These numbers indicate a significant reduction in hunter effort because of the deer population decline beginning with the severe winter of 2006–2007. Likewise, the effects of the doe closure may have further affected the reduction. The decline reverses a stable trend observed over the previous decade.

In 2006–2007 the reported kill was 7712 deer. During the 2007–2008 season, hunters reported killing 1852 deer. Weather during the deer hunting season influences the amount of effort put forth 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. Hunters commonly report seeing spotlighting and poaching of deer on logging roads and trails accessed by all-terrain vehicles on

Kruzof, N. Baranof, and Chichagof islands. Frequent reports of spotlighting and poaching on the extensive road system on NE and NW Chichagof Island have been reported to state and federal enforcement officers. These activities cause high crippling rates and generally result in little to no effort to recover wounded 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 these estimates, the total hunter-related deer mortality was estimated to be about 9640 deer during the 2006–2007 season. The estimate for the 2007–2008 season is 2315 deer (Table 2). Shoreline and beach mortality surveys conducted during December 2006 through 2008 documented more than a dozen dead deer found just within the beach fringe timber. These deer left blood trails from the shoreline to the tree fringe but were never recovered, likely because the shooter(s) did not come ashore to recover the deer.

Hunter Residency and Success. During 2006–2007 a total of 1157 successful hunters residing in Unit 4 (Table 3) harvested an estimated 4531 deer (3.9 deer/successful hunter). Nonresident hunters made up 4.6% of the Unit 4 hunters during 2006–2007, a slight increase over the previous season. Alaska residents from other than Unit 4 (50%) were slightly more but nearly equaled the number of resident hunters (45%). The number of nonlocal hunters declined 12% from the previous season. The majority of the nonlocal hunters are from adjacent communities in Southeast Alaska that also saw significant snowfall push deer to the beaches early in November 2006. During that season, 65% of nonresidents, 83%of Unit 4 residents, and 75% of nonlocal Alaska residents were successful at taking at least one deer.

For the 2007–2008 season, a total of 556 successful hunters residing in Unit 4 (Table 3) harvested an estimated 1306 deer (2.3 deer/successful hunter). Nonresident hunters accounted for only 4% of the Unit 4 hunters during 2007–2008; versus 5% during the previous season. The number of nonlocal Alaska residents from other than Unit 4, also declined to 49% of the total hunters. For this season, 13% of nonresidents, 58% of Unit 4 residents, and 34% of non-local Alaska residents were successful in taking at least one deer.

Harvest Chronology. Most hunters continue to be in the field during November, resulting in the greatest single-month harvest. During the 2006–2007 season, the November harvest accounted for 4523 deer, or 47% of the harvest (Table 4). December provided the next highest deer harvest (25%) from Unit 4 with October (12%) following next. The federal season in January generally results in about 5–8% of the reported annual harvest, but is variable depending on amount of snowfall.

In November 2007, doe closures were implemented for northeast Chichagof Island on state and federal land. This was followed in December by a doe closure for the rest of state lands in the unit. On 1 January 2008, the Federal Subsistence Board followed with a doe closure for most of federal lands in Unit 4.

For the 2007–2008 season, the November harvest accounted for 1129 deer, or 49% of the harvest (Table 4). The December harvest (17%) was followed with August and September harvests of 9% each month for the next highest deer harvest months for the unit. The federal season in January provided 3% of the reported annual harvest. Doe closures were implemented in early

October 2008 on northeast Chichagof Island for both state and federal lands. Doe closures were not extended to remaining areas in Unit 4.

Transport Methods. Deer hunter transportation type remains almost identical with past years (Table 5). During 2006–2007 boats were used for 77% of the harvest, while airplanes were used for 11% of the harvest. Hunters who walked from their respective residences took 2% of the harvest while hunters using highway vehicles took 9% of the harvest. Hunters using an off-road vehicle (ORV; 3 or 4-wheelers) took only 1% of the harvest. Transport methods have changed little since the 1988–1989 season, when data were first collected.

As is common for Unit 4, most hunters used boats during the 2007–2008 season and these hunters harvested 71% of the deer. Hunters using airplanes as a transportation type harvested 8% of the deer reported taken in the unit, while those using highway vehicles took 15% of the harvest.

Other Mortality

Starvation mortality due to severe winters had significant effect on Unit 4 deer during this reporting period. Data were collected on 10 established beach mortality transects during spring, indicating that winter mortality was negligible in springs 2005–2006. However, the deep and persistent snow during the winter of 2006–2007 changed that and surveys on 16 transects found 65 mortalities along 17.2 miles (3.8 mortalities /mile). The number of mortalities/mile exceeded those found during any of the last 50 years in which a survey was conducted. In 2007–2008 the number of winter-killed deer found declined; likely the result of the significant population decline and winter-kill mortality witnessed the previous year. The 16 transects were again surveyed in the spring of 2008 and the number of mortalities/mile decreased to 1.57 (27 deer).

During March and early April in 2005 and 2006, nine boat surveys were completed along more than 50 miles of beach shoreline in areas north of Sitka, Peril Strait, and Tenakee Inlet in an effort to quantify physical condition of wintering deer. During those shoreline deer assessment surveys, 109 deer (2005) and 89 deer (2006) were classified. Mean condition of deer seen during these surveys was 3.8 (see the classification guideline scale at Table 6). In comparison, shoreline deer assessment surveys began in December 2006 and continued into May 2007. More than 200 miles were surveyed with 315 deer reviewed. Seventeen winter-killed deer were found and another 73 were considered to be in "poor" condition. One hundred deer were considered to be in fair condition and the other 125 were deemed too far away to be accurately classified. Mean body condition of deer seen during these surveys was 2.24.

Shoreline deer assessment surveys in 2008 began in February and continued through early May and covered much of the same areas as the previous year. Fewer dead deer were found and the mean overall assessment condition of 472 deer reviewed rose to 2.87. Snow depth and late spring snowpack in the last week in April on south Baranof Island exceeded what was present the previous year. Results of the surveys indicate that deer wintering at low elevations in the area were in better shape than the spring of 2007 but well below a mean condition index of 3.5 calculated from deer surveyed in a portion of the same area during late March 1999 (Whitman 2003).

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 incidental observations, no specific parasite examinations for ticks (*Dermacentor*) or sucking lice (*Tricholipeurus lipeuroides*) were conducted during this reporting period.

In 2005–2006, 42 Sitka black-tailed deer heads were collected and submitted for chronic wasting disease (CWD) testing and were found to be negative for the disease. Deer head collection and testing continued in 2006–2007 with 117 heads collected and submitted for testing. All test results were negative and we have no reason to suspect that CWD occurs in Unit 4 deer at this time.

HABITAT

Assessment

Incidental data (field notes and photographs) were collected during surveys noting the overall browse condition in the lower elevation areas. Following the severe deer population decline of 2006–2007 many favorable browse species 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. This was additional evidence the deer population was severely reduced as very little browsing was apparent on even the most favored browse and forb plant species.

CONCLUSIONS AND RECOMMENDATIONS

Not all management objectives were met during both seasons. The average harvest during the 2006–2007 season was 4 deer per hunter. In 2007–2008 the success rate declined to 1.2 deer per hunter. In 2006–07 and 2007–08, bucks comprised 72% and 82% respectively of the reported harvest. The minimum objective for a success rate of 1 deer killed per 4 days of hunting effort was not met in the 2007–2008 season when it dropped to 1 deer per 5 days of hunting effort.

Weather during the deer hunting season influences the amount of effort put forth 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. Shooting from boats, although illegal, still occurs frequently, undoubtedly causing high crippling rates and loss of deer. Extensive field surveys (both in number of shoreline miles and areas covered during the past 2

years) revealed dozens of deer that appeared to have been wounded, lost and not recovered. Spotlighting and poaching from logging roads from all-terrain vehicle users, from passenger vehicle users on the extensive road system of NE Chichagof Island, and from boats is frequently reported. Therefore, illegal take and wounding losses are currently estimated at 25% above the legal kill. Currently, deer densities have declined throughout most areas and remain below estimated carrying capacity. There are many areas within the unit that exhibit significant browsing of key plant species as a result of the series of mild winters prior to 2006. Those winters allowed deer to remain at higher elevations for a greater period of the year and likely contributed to a reduced hunter harvest from easily accessible shoreline hunts. Deep snow in November 2006 pushed many deer to the beach, where they remained very accessible for the remainder of the hunting season.

Predation mortality from brown bears is suspected to contribute an additional 15–20% mortality to the annual total number of deer harvested by hunters. This is based on estimates of brown bear densities along with field observations of predation by bears on deer and goats. We suspect that the extent of the harvest under federal "designated hunter" stipulations is grossly underreported.

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 two 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 during this reporting period.

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

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TABLE 1 Unit 4 deer population trends as indicated by pellet-group surveys, 1985–2008

VCU Area	Regulatory year	Mean pellet groups/plot	Number of plots
128 – Hawk Inlet	1985–86	1.92	286
	1986–87	2.54	278
	1988–89	1.82	334
	1989–90	2.19	250
	1991–92	1.61	319
	1995–96	1.26	325
	1998–99	1.25	176
	2001–02	1.17	183
	2004-05	2.69	322
	2006-07	1.19	305
	2007-08	1.33	290
171– Hood Bay	1986–87	2.31	358
	1988–89	1.77	366
	1989–90	1.85	375
	1991–92	1.91	360
	1993–94	1.64	371
	1999–00	1.04	349
	2002–03	1.41	220
	2005-06	2.76	355
	2007-08	1.62	301
182 – Pybus Bay	1985–86	2.00	235
	1986–87	2.03	242
	1988–89	2.00	156
	1989–90	1.72	221
	1991–92	1.13	236
	1994–95	1.48	205
	1997–98	1.37	256
185 – Pleasant Island	1990–91	1.38	311
	1991–92	1.34	210
	1992–93	1.77	305
	1993–94	1.26	345
	1998–99	1.82	223
	2001–02	1.96	351
	2004-05	1.33	312
189 – Port Althorp	1987–88	1.80	195
	1990–91	1.92	223
	1991–92	1.36	261
	1992–93	1.39	248
	1993–94	1.31	253
	1994–95	2.12	98
	1997–98	1.48	281
	2000–01	1.82	225

TABLE 1 Unit 4 deer population trends as indicated by pellet-group surveys, 1985–2008

VCU Area	Regulatory year	Mean pellet groups/plot	Number of plots
190 – Idaho Inlet	1987–88	1.34	258
	1991–92	0.94	219
	1992–93	0.56	305
	1993–94	0.71	294
	1997–98	1.11	273
	2000–01	0.95	308
	2003–04	1.05	296
202 – Port Frederick	1987–88	1.87	242
	1995–96	1.02	226
209 – Suntaheen Creek	1987–88	1.22	272
	1991–92	1.13	271
	1992–93	0.73	265
	1993–94	1.05	272
	1995–96	0.98	276
	1998–99	1.02	112
	2001–02	1.35	218
	2004-05	1.44	329
211 – Point Augusta	1982-83	1.78	757
	1992-93	2.08	286
	1996-97	3.30	234
218 – Pavlof River	1987–88	1.78	325
	1991–92	1.56	341
	1995–96	1.50	249
	1998–99	2.24	213
	2001–02	2.48	249
	2004-05	2.30	323

TABLE 1 Unit 4 deer population trends as indicated by pellet-group surveys, 1985–2008

VCU Area	Regulatory year	Mean pellet groups/plot	Number of plots
223 – Upper Tenakee	1987–88	1.47	253
	1991–92	0.59	265
	1992–93	0.47	249
	1993–94	0.61	319
236 – Corner Bay	1980–81	0.35	60
	1991–92	2.27	206
	1992–93	1.72	50
	1993–94	1.69	198
247 – Finger Mountain	1986–87	3.11	236
	1988–89	2.99	305
	1989–90	3.36	225
	1990–91	3.93	150
	1991–92	2.85	207
	1992–93	3.03	179
	1993–94	2.29	275
	1995–96	2.62	221
	1998–99	3.04	169
	1999–00	2.87	217
	2001–02	2.99	162
	2003–04	3.03	229
	2004-05	2.78	299
	2005-06	2.58	280
	2006-07	1.89	248
	2007-08	3.32	199
254 – Soapstone	1987–88	1.92	274
	1990–91	2.05	270
	1992–93	1.88	243
	1993–94	1.34	310
	1994–95	1.48	283

Table continues next page

TABLE 1 Unit 4 deer population trends as indicated by pellet-group surveys, 1985–2008

VCU Area	Regulatory year	Mean pellet groups/plot	Number of plots
254 – Soapstone (continued)	2000–01	1.94	246
271 – Chichagof	1990–91	1.39	301
	1994–95	0.98	303
	1997–98	1.34	319
	2000–01	1.23	291
	2003–04	1.15	303
	2006-07	2.13	176
275 – Cobol	1983–84	1.15	224
	1990–91	2.96	185
	1994–95	1.45	218
	1997–98	2.19	219
	2000–01	1.94	180
	2003–04	2.97	232
	2006-07	2.13	176
288 – Range Creek	1982–83	0.51	1788
	1983–84	0.71	303
	1984–85	1.32	224
	1996–97	1.44	353
	2002–03	1.65	355
	2005-06	1.82	359
296 – Portage Arm	1980–81	0.53	213
	1989–90	3.09	214
	1996–97	1.59	39
	2002-03	2.77	103
298 – M. Arm Kelp Bay	2002–03	2.77	103
	1989–90	2.68	306
	1996–97	2.67	100
	2002–03	1.41	140
	2005-06	2.10	248
	2007-08	1.91	208
300 – Nakwasina	1986–87	2.31	195
	1988–89	2.32	244
	1989–90	2.99	255
	1990–91	3.98	175

Table continues next page

TABLE 1 Unit 4 deer population trends as indicated by pellet-group surveys, 1985–2008

VCU Area	Regulatory year	Mean pellet groups/plot	Number of plots
300 – Nakwasina (continued)	1991–92	1.64	223
	1992–93	3.15	188
	1993–94	1.46	230
	1994–95	1.75	216
	1995–96	2.82	210
	1996–97	2.79	200
	1997–98	2.99	217
	1998–99	3.20	146
	1999–00	2.64	181
	2000–01	2.33	186
	2001–02	2.35	132
	2002–03	3.09	221
305 – Sea Lion Cove	1986–87	3.31	226
	1988–89	1.75	303
	1990–91	1.63	219
	1991–92	1.30	239
	1993–94	1.29	221
	1994–95	1.30	210
	1995–96	1.63	225
	1997–98	1.71	241
	1999–00	1.42	201
	2000–01	1.41	231
	2001–02	2.01	119
	2002–03	1.90	249
	2003–04	1.13	206
	2004-05	1.40	252
	2005-06	1.41	245
	2006-07	3.40	167
	2007-08	1.44	159
308 – South Kruzof	1992–93	1.62	345
	1993–94	1.71	370
	1998–99	1.38	365

Table continues next page

TABLE 1 Unit 4 deer population trends as indicated by pellet-group surveys, 1985–2008

VCU Area	Regulatory year	Mean pellet groups/plot	Number of plots
339 – Cape Ommaney	1987–88	1.74	172
	1999–00	1.26	270
	2002–03	1.56	221
344 – Whale Bay	1999–00	1.40	260
	2002–03	1.70	279
348 – West Crawfish	1989–90	1.35	360
	1999–00	1.34	211
	2002–03	1.31	313

TABLE 2 Unit 4 deer harvest, 2003–2004 through 2007–2008

	Estimated legal harvest[a]						Estimated illegal	
Regulatory year	M	(%)	F	%	Unk	Total	harvest[b]	Total
2003–2004	5523	(72)	2098	(28)		7621	1905	9526
2004–2005	4817	(71)	1982	(29)		6799	1700	8499
2005–2006	4829	(70)	2082	(30)		6911	1728	8639
2006–2007	5537	(72)	2175	(28)		7712	1928	9640
2007–2008	1516	(82)	335	(18)		1851	463	2314

[a] From mail questionnaire.
[b] Includes crippling loss estimate.

TABLE 3 Unit 4 deer hunter residency and success, 2003–2004 through 2007–2008

Regulatory year	Successful				Unsuccessful				Total # hunters
	Local resident	Nonlocal resident	Nonresident	Total	Local resident	Nonlocal resident	Nonresident	Total	
2003–2004	1242	1535	57	2834	253	509	41	803	3637
2004–2005	1064	1347	82	2493	283	544	43	870	3363
2005–2006	1124	1214	102	2440	291	525	46	862	3302
2006–2007	1157	1151	92	2400	244	382	50	676	3076
2007–2008	556	333	9	898	405	648	61	1114	2012

TABLE 4 Unit 4 deer harvest chronology, 2003–2004 through 2007–2008

Regulatory year	Harvest periods														Total harvest
	August	(%)	September	(%)	October	(%)	November	(%)	December	(%)	January	(%)	Other		
2003–2004	476	(5)	476	(5)	1524	(16)	4096	(43)	2000	(21)	285	(3)	669		9526
2004–2005	765	(9)	680	(8)	1445	(17)	3315	(39)	1020	(12)	510	(6)	714		8499
2005–2006	604	(7)	691	(8)	1382	(16)	3283	(38)	1296	(15)	691	(8)	692		8639
2006–2007	420	(4)	373	(4)	1198	(12)	4523	(47)	2426	(25)	419	(4)	283		9642
2007–2008	205	(9)	210	(9)	175	(8)	1129	(49)	393	(17)	69	(3)	134		2315

TABLE 5 Unit 4 deer harvest, percent by transport method, 2003–2004 through 2007–2008

	Percent of harvest						Number
Regulatory year	Airplane	Foot	Boat	ORV[1]	Highway vehicle	Unknown[2]	of hunters
2003–2004	11	1	76	2	9	1	3637
2004–2005	13	1	70	2	13	1	3363
2005–2006	8	2	72	2	13	3	3302
2006–2007	11	2	77	1	9	1	3077
2007–2008	8	2	71	2	15	2	1750

[1] 3-and 4-wheelers included
[2] "Other" included

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.

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 PO BOX 115526
JUNEAU, AK 99811-5526

DEER MANAGEMENT REPORT

From: 1 July 2006
To: 30 June 2008

LOCATION

GAME MANAGEMENT UNIT: 5 (5800 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 (Burris and McKnight 1973). 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 Alaska Board of Game instituted a limited hunt in Unit 5A. 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

A total of 8565 deer harvest tickets were issued for the 2006 regulatory year (RY) in Southeast Alaska and 7342 for RY 2007 (a RY begins 1 July and ends 30 June, e.g., RY06 = 1 July 2006 through 30 June 2007). We mailed nearly one third of all Southeast deer harvest ticket holders a survey each year; 60% responded in 2006 and 61% responded in 2007. 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 (Straugh and

Rice 2003; Straugh et al. 2004). Since 1984, Unit 5A pellet-group surveys have been conducted to gauge deer population trends. U.S. Forest Service (USFS) crews usually conduct Unit 5 pellet surveys. Pellet transects were not conducted in Unit 5 during the report period (Table 1).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Deer populations remain relatively low in the Yakutat area based on our two 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 gathered during the previous 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 almost a novelty. This was apparently the result of a series of mild winters during the mid 1990s through 2005. During the report period, winter severity increased, but was not as extreme as in the southern portion of the region. In RY 2007, 4 islands (Krutoi, Kriwoi, Khantaak, and Dolgi) adjacent to Yakutat in Yakutat Bay were surveyed for deer pellet densities. The results of the spring 2008 pellet survey yielded the highest densities recorded for the area, and suggest an increasing number of deer on the islands of Yakutat Bay(McCoy 2008). Further surveys in future years should give us a good indication as to whether a higher deer population is the trend or if the pellet densities of 2007 are an anomaly.

MORTALITY

Harvest

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

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

Hunter Harvest. Based on deer hunter survey data, 12 deer were harvested in 2006, and 13 taken in 2007 (Table 2). Hunter effort decreased from the previous report period, with 64 hunters expending 201 days of effort in 2006, and 42 hunters spending 254 days afield in 2007. Since 2003, the number of days per deer harvested in Unit 5 has increased and was 16.8 days and 19.5 days in 2006 and 2007, respectively (Table 4). Because these figures are expanded from the hunter survey, significant error is possible due to low effort and harvest in this area. Based on anecdotal information collected while in Yakutat, this seems to be the case given that most people we encounter seem to agree that there are more deer than in the past and more being harvested.

Illegal Harvest. Anecdotal information collected from both Alaska Department of Fish and Game (ADF&G) and USFS employees stationed in Yakutat suggests that there may be some illegal harvest of deer in Unit 5A, but the scope of this take is unknown.

Hunter Residency and Success. Since 1991, virtually all Unit 5A deer hunters have been local residents. During 2006 and 2007 resident hunters took 12 and 13 deer, respectively; no nonresident or nonlocal harvest was recorded (Table 3).

Transport Methods. Boats are typically the only means of transportation used by successful hunters in 5A. Several hunters reported using highway vehicles and walking, but all successful hunters reported hunting from a boat in 2006 and 2007. This is similar to past years, and is expected, since nearly all deer hunting takes place on Yakutat Bay islands.

CONCLUSIONS AND RECOMMENDATIONS

The Unit 5A deer hunt allows Yakutat residents an opportunity to legally harvest a small number of 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. Unit 5, specifically Yakutat, received above average snowfall during both years of the reporting period. During winter RY 2006, the Yakutat airport received 213.3 inches of snow; during winter RY 2007 170.7 inches of snow was recorded at ground level. During the period 1995–2005 an average of 144.7 inches of snow fell at the Yakutat airport (NOAA 2009). The impact of extreme winter weather is likely to be the major force in regulating deer numbers in this area. Mortality transects should be created in the Yakutat area in an effort 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 be a distant second to moose, but in recent years has seemed to surpass that of mountain goats. In the past, most deer were taken incidentally by people who happened to detect an animal on the beach while they were involved in 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 population, because hunting mortality is probably small compared to 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, 1990–2007

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], 1992 through 2007

Regulatory year	Males	Females	Estimated total
1992	0	0	0
1993	3	0	3
1994	5	0	5
1995	7	0	7
1996	0	0	0
1997	0	5	5
1998	5	0	5
1999	5	0	5
2000	0	0	0
2001	4	0	4
2002	15	0	15
2003	28	0	28
2004	31	8	39
2005	27	0	27
2006	12	0	12
2007	13	0	13

[a] Data from extrapolated results of hunter surveys.

TABLE 3 Unit 5A deer hunter residency and success, regulatory years 1991 through 2007

Regulatory year	Successful						Unsuccessful						Total hunters
	Local[a] resident	Nonlocal resident	Nonresident	Unk	Total	(%)	Local[a] resident	Nonlocal resident	Nonresident	Unk	Total	(%)	
1991	2	0	0	0	2	(6)	34	0	0	0	34	(94)	36
1992	0	0	0	0	0	(0)	15	0	0	0	15	(100)	15
1993	3	0	0	0	3	(14)	19	0	0	0	19	(86)	22
1994	5	0	0	0	5	(21)	15	4	0	0	19	(79)	24
1995	7	0	0	0	7	(32)	15	0	0	0	15	(68)	22
1996	0	0	0	0	0	NA[b]	NA	NA	NA	NA	NA	NA	NA
1997	0	5	0	0	5	(17)	19	0	5	0	24	(83)	29
1998	5	0	0	0	5	(17)	24	0	0	0	24	(83)	29
1999	0	5	0	0	5	(25)	15	0	0	0	15	(75)	20
2000	0	0	0	0	0	(0)	4	0	0	0	4	(100)	4
2001	4	0	0	0	4	(15)	16	6	0	0	22	(85)	26
2002	15	0	0	0	15	(27)	40	0	0	0	40	(73)	55
2003	28	0	0	0	28	(39)	44	0	0	0	44	(61)	72
2004	21	17	0	0	38	(51)	36	0	0	0	36	(49)	74
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	0	0	0	13	(31)	29	0	0	0	29	(69)	42

[a] Local means residents of Unit 5A.

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

TABLE 4 Unit 5A hunter effort and success, 1991 through 2007

Regulatory year	Number of hunters	Number of days hunted	Number of deer killed	Number of deer/hunter	Number of days/deer
1991	36	123	2	.1	61.5
1992	15	61	0	0	0
1993	22	149	3	.1	49.7
1994	24	89	5	.2	17.8
1995	22	61	7	.3	8.7
1996	N/A	N/A	N/A	N/A	NA
1997	29	97	5	.2	19.4
1998	29	92	5	.2	18.4
1999	20	30	5	.3	6.0
2000	4	9	0	0	0
2001	26	34	4	.2	8.5
2002	55	248	15	.3	16.5
2003	72	210	28	.4	7.5
2004	80	343	39	.5	8.8
2005	69	332	27	.4	12.3
2006	64	201	12	.2	16.8
2007	42	254	13	.3	19.5

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 PO BOX 115526
JUNEAU, AK 99811-5526

DEER MANAGEMENT REPORT

From: 1 July 2006
To: 30 June 2008

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 (Burris and McKnight 1973). 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. 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).

Sitka black-tailed deer in Unit 6 are at the extreme northern limit of their range (Cowan 1969). The population thrives because of favorable environmental conditions on islands in PWS. The climate is milder on the big islands (Hawkins, Hinchinbrook and Montague) compared to the surrounding mainland because of strong maritime influence (Shishido 1986). Snow-shading canopies of old-growth forest provide accessible forage and shelter during winter (Shishido 1986; Reynolds 1979). Although formal research on food habits has not been conducted in PWS, it has been assumed that primary winter forage includes bunchberry (*Cornus Canadensis)*, trailing bramble (*Rubus pedatus)*, and goldthread (*Coptus* spp). If forbs become buried by deeper snow, blueberry stems (*Vaccinium ovalifolium)* become important forage. Predation is minimal because there are few wolves and coyotes off the mainland. A change in these conditions could significantly influence the deer population.

Shishido (1986), using radiocollared deer on Hinchinbrook Island, determined that deer tended to make seasonal elevation movements within a single watershed, with timing of movements controlled by annual snow persistence. He estimated that average size of a deer's winter home range was 160 ha, versus 282 ha for spring, with seasonal home ranges often overlapping.

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, mass

migration of deer in PWS. Reynolds (1979) and Shishido (1986) reported that marking studies of deer in PWS do not support this theory. I suspect that these deer are actually 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 13–14 km from the location 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 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; however, this is a relatively rare occurrence (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, ADF&G collected most information through questionnaires mailed to deer harvest ticket holders. Annual harvests before 1978 probably ranged between 500 and 1500 (Reynolds 1979). Harvests began to increase after 1978 and peaked at 3000 in 1987. The average estimated harvest during the 1990s was 2160, ranging from 1300 to 3000 deer.

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

- To maintain a deer population capable of sustaining an annual harvest of 1500 deer.
- To maintain a minimum harvest of 60% males.
- To maintain a minimum hunter success rate of 50%.

METHODS

The Alaska Department of Fish and Game (ADF&G) and the U.S. Forest Service (USFS) cooperated to monitor the population trend in PWS. We conducted annual pellet-group surveys along transects (Kirchhoff and Pitcher 1988) during late May and early June at 8 sampling locations (Fig. 2). Two more locations were added to annual surveys beginning in 2000–2001 (Naked Island and Bay of Isles on Knight Island) to monitor the western PWS population after the road to Whittier opened. Each location had 3–5 transects consisting of a straight line of 1x20-meter plots running uphill from the beach fringe. Most transects terminated at alpine habitat. Those not reaching the alpine terminated after we had examined 100 plots. The number of plots varied, 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. We calculated 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 were low, moderate, and high densities, respectively, for Southeast Alaska.

Although invaluable as an indicator of population trend, spring pellet-group density has an inherent lag time, particularly during winters with heavy snow. Deer that die in late winter have deposited pellets that may be counted, thereby biasing the index upward (Kirchhoff and Pitcher 1988). An annual snow index (Nowlin 1997) was previously used to determine if pellet-group density reflects current population density, or if a lag exists because of late-season mortality that would appear in the spring survey of the following year. However, the weather station used to collect snow data stopped measuring daily snow depth. A substitute source has yet to be determined.

We estimated deer harvest from responses to questionnaires mailed to deer hunters who were issued harvest tickets in Southcentral Alaska. Approximately 3000 questionnaires (30% of harvest ticket holders) were mailed to hunters annually, with a response rate averaging 66%. I summarized total harvest, hunter residency and success, harvest chronology, and transportation methods for Unit 6. I grouped harvest data into geographic areas that included Hinchinbrook Island, Montague Island, Hawkins Island, western PWS, and northern and eastern PWS (Fig. 1).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Based on pellet group densities, deer density in PWS was low to moderate during the reporting period, with the exception of Hawkins Island, where density was high (Table 1). Deer numbers were not increasing because of relatively severe winters during the reporting period.

Distribution and Movements

Deer currently occupy most of Unit 6. Highest deer densities in Unit 6D (PWS) generally occurred on the big islands. Lower densities occurred on smaller islands and mainland areas surrounding PWS. Occasional sightings have occurred in Units 6B and 6A, and, after several mild winters, on the Kenai Peninsula and as far north and west as Anchorage.

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. Antlerless deer could be taken beginning 1 October.

Board of Game Actions and Emergency Orders. There were no regulatory changes or emergency orders issued during this reporting period.

Hunter Harvest. Total estimated deer harvest reported in Unit 6 during 2006–2007 was about 2600 (Table 2). Harvest declined to only 1300 deer the following year. The decrease was

attributed to lower deer numbers and poor fall weather during 2007–2008. As during past years, most harvest came from Montague Island.

Hunter Residency and Success. Deer hunters had annual success rates of 59% and 41%, respectively, during the 2-year reporting period (Table 3). Nonlocal residents represented 51–64% of successful hunters during this reporting period. Local residents on average killed 2.4 deer per hunter compared to 1.4 deer per hunter for nonlocal residents. Nonresidents remained insignificant contributors to the deer harvest. These proportions were similar to previous years.

Harvest Chronology. Hunters killed most deer during October and November (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. Harvest chronology has remained unchanged for many years.

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

Other Mortality

I estimated that the combination of wounding loss and unreported and illegal harvest was at least 15% of the total reported harvest (Table 2). Deer pellet surveys and snow index indicated that very little winter mortality occurred during the reporting period (Fig. 2).

CONCLUSIONS AND RECOMMENDATIONS

We achieved our objectives to maintain a deer population capable of sustaining an annual harvest of 1500 deer and a minimum hunter success rate of 50%.

Pellet-group surveys and hunter questionnaires were effective tools to monitor and manage deer in Unit 6. MPGP has been a reliable index to population trend.

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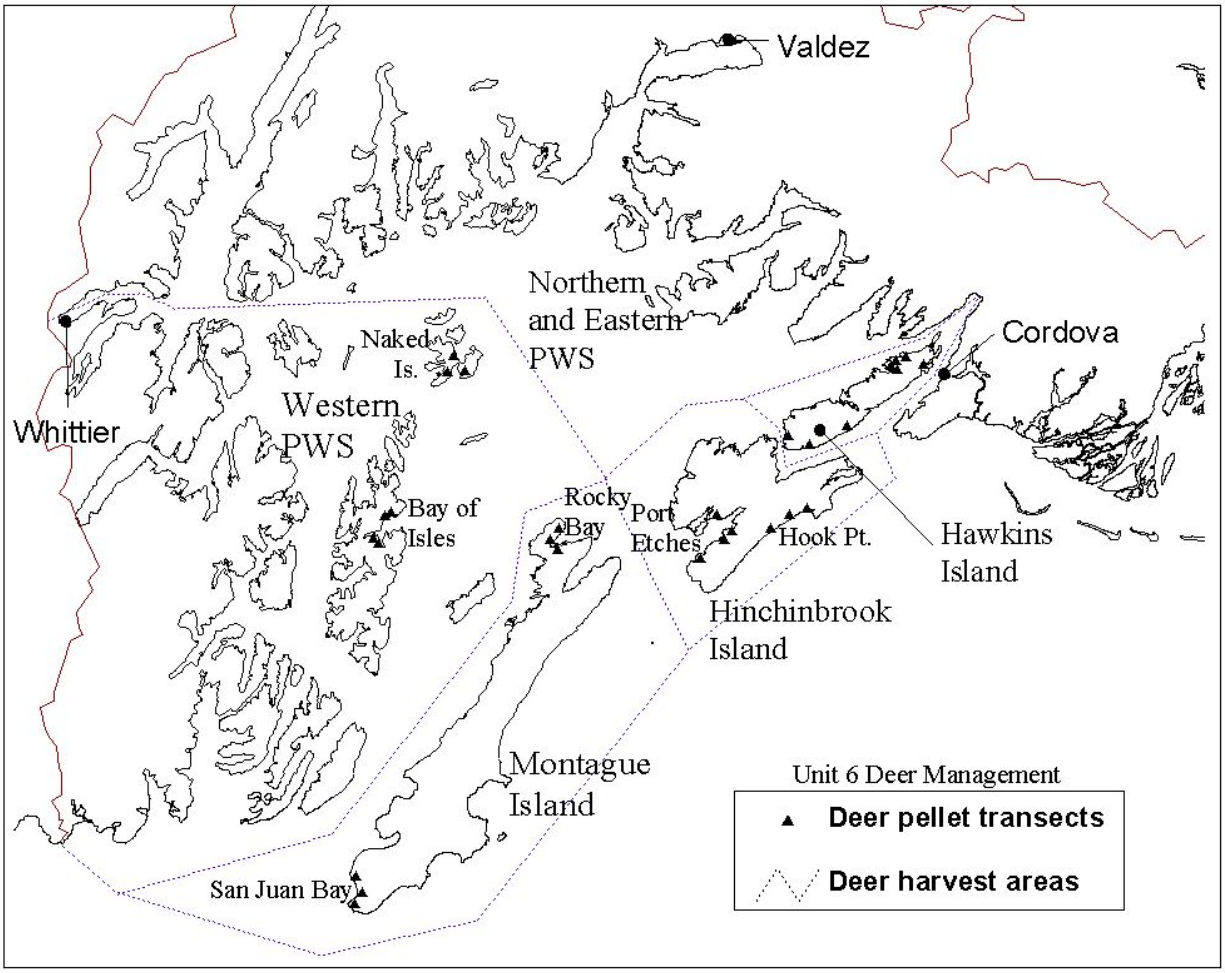

FIGURE 1 Locations of pellet group transects and harvest area boundaries for deer in Unit 6.

TABLE 1 Unit 6 deer population trends as indicated by spring pellet-group surveys 2003–2007

Area	Specific location/UCU	Regulatory Year[a]	MPGP[b]	S.D.[c]	Number of plots
Knight Island	Bay of Isles	2003–04	0.36	1.03	170
	1503	2004–05	No survey		
		2005–06	0.45	0.92	177
		2006–07	0.33	1.00	172
		2007–08	0.42	1.29	170
Naked Island	1701	2003–04	0.84	1.36	210
		2004–05	0.59	0.99	210
		2005–06	0.73	1.09	210
		2006–07	0.60	1.15	210
		2007–08	0.59	1.16	192
Montague Island	Rocky Bay	2003–04	0.70	1.22	212
	1803	2004–05	0.92	1.28	218
		2005–06	1.25	1.85	217
		2006–07	No survey		
		2007–08	0.97	2.14	241
	San Juan Bay	2003–04	0.68	1.89	223
	1810	2004–05	No survey		
		2005–06	No survey		
		2006–07	No survey		
		2007–08	No survey		
Hinchinbrook Island	Hook Point	2003–04	0.93	1.48	232
	1905	2004–05	No survey		
		2005–06	No survey		
		2006–07	No survey		
		2007–08	No survey		
	Port Etches	2003–04	1.19	1.39	234
	1903	2004–05	1.09	1.48	233
		2005–06	1.37	1.69	239
		2006–07	No survey		
		2007–08	1.67	2.07	230

Table continues next page

TABLE 1 continued

Area	Specific location/UCU	Regulatory Year[a]	MPGP[b]	S.D.[c]	Number of plots
Hawkins Island	N.E. Hawkins	2003–04	1.82	2.40	240
	2001	2004–05	1.39	1.72	205
		2005–06	No survey		
		2006–07	2.10	2.77	240
		2007–08	2.15	2.62	235
	S.W. Hawkins	2003–04	1.52	2.01	222
	2003	2004–05	1.90	2.42	87
		2005–06	No survey		
		2006–07	1.62	2.29	222
		2007–08	1.93	2.89	217
All Areas		2003–04	1.04	1.73	1743
		2004–05	1.08	1.56	953
		2005–06	1.99	1.51	843
		2006–07	1.23	2.14	844
		2007–08	1.35	2.26	1285

[a] Surveys occur during spring of each regulatory year.
[b] Mean number of pellet groups per plot.
[c] Standard deviation.

TABLE 2 Unit 6 deer harvest, 2003–2007

Area	Regulatory year	Estimated legal harvest[a] M	(%)	F	(%)	Total	Estimated illegal/unreported harvest[b]	Total
Hawkins Island	2003–04	316	(63)	189	(37)	505	76	581
	2004–05	No survey						
	2005–06	492	(77)	146	(23)	638	96	734
	2006–07	258	(66)	130	(34)	388	58	446
	2007–08	181	(73)	68	(27)	249	37	286
Hinchinbrook Island	2003–04	421	(63)	245	(37)	666	100	766
	2004–05	No survey						
	2005–06	399	(76)	124	(24)	523	78	601
	2006–07	445	(59)	313	(41)	758	114	872
	2007–08	160	(65)	88	(35)	248	37	285
Montague Island	2003–04	623	(69)	280	(31)	903	135	1038
	2004–05	No survey						
	2005–06	571	(70)	243	(30)	814	122	936
	2006–07	435	(60)	289	(40)	724	109	833
	2007–08	270	(69)	119	(31)	389	58	447
Western PWS	2003–04	465	(57)	352	(43)	817	123	940
	2004–05	No survey						
	2005–06	363	(54)	306	(46)	669	100	769
	2006–07	255	(49)	266	(51)	521	78	599
	2007–08	142	(51)	139	(49)	281	42	323

Table continues next page

TABLE 2 continued

Area	Regulatory year	Estimated legal harvest[a] M	(%)	F	(%)	Total	Estimated illegal/unreported harvest[b]	Total
Northern and	2003–04	67	(58)	49	(42)	116	17	133
Eastern PWS	2004–05	No	survey					
	2005–06	28	(54)	24	(46)	52	8	60
	2006–07	43	(55)	35	(45)	78	12	90
	2007–08	33	(62)	20	(38)	53	8	61
Unit 6 - Unknown	2003–04	0		0		0	0	0
	2004–05	No	survey					
	2005–06	0		0		0	0	0
	2006–07	81	(84)	16	(16)	97	15	112
	2007–08	32	(73)	12	(27)	44	7	51
Unit 6 - Total	2003–04	1892	(63)	1115	(37)	3007	752	3759
	2004–05	No	survey					
	2005–06	1853	(69)	843	(31)	2696	674	3370
	2006–07	1517	(59)	1049	(41)	2566	642	3208
	2007–08	818	(65)	446	(35)	1264	316	1580

[a]From Deer Hunter Questionnaire Survey
[b]Unquantified, but estimated to be 15% of reported total.

TABLE 3 Unit 6 deer hunter residency and success, 2003–2007

Regulatory year	Successful					Unsuccessful					Total hunters
	Local resident[a]	Nonlocal resident	Non resident	Total	(%)	Local resident	Nonlocal resident	Non resident	Total	(%)	
2003–04	401	687	26	1114	(61)	160	511	48	719	(39)	1833
2004–05	No survey										
2005–06	362	596	36	994	(59)	134	516	27	677	(41)	1671
2006–07	329	614	21	964	(59)	122	531	21	674	(41)	1638
2007–08	174	313	126	613	(41)	182	529	186	897	(59)	1510

[a] Resident of Unit 6

TABLE 4 Unit 6 deer harvest chronology percent by month, 2003–2007

Regulatory year	Harvest periods					*n*
	August	September	October	November	December	
2003–04	8	4	34	34	20	2975
2004–05	No survey					
2005–06	10	8.5	32	30	19	2696
2006–07	7	5	30	33	24	2566
2007–08	14	5	35	25	20	1267

TABLE 5 Unit 6 deer harvest percent by transport method, 2003–2007

Regulatory year	Percent of harvest						*n*
	Airplane	Boat	3- and 4-wheeler	Highway vehicle	Foot	Unknown	
2003–04	11	84	0	0	3	2	3007
2004–05	No survey						
2005–06	11	85	1	0	1	2	2741
2006–07	9	86	1	1	1	2	2494
2007–08	15	76	1	1	3	4	1253

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 PO BOX 115526
JUNEAU, AK 99811-5526

DEER MANAGEMENT REPORT

From: 1 July 2006
To: 30 June 2008

LOCATION

GAME MANAGEMENT UNIT: 8 (5097 mi^2)

GEOGRAPHIC DESCRIPTION: Kodiak and adjacent islands

BACKGROUND

Officially, the Sitka black-tailed deer population in Unit 8 originated from three transplants, totaling 25 deer, between 1924 and 1934 (Burris and McKnight 1973). 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 two 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 nine deer were captured in the Rocky Pass area near Petersburg and released on Kodiak.

Recently rediscovered 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 of 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 1968–69 and 1970–71 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 1998–99 the Unit 8 deer population declined precipitously (Van Daele 2003).

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 economic 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). 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 2 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 8000–8500 deer (5 AAC 92.108).

METHODS

Questionnaires have been mailed to hunters annually beginning with the 1989–90 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 1968–69, 1970–71, and 1989–90. Also, there were higher than usual winter mortalities during the late 1970s and the early and late 1990s. After many of these occurrences, more conservative regulations were enacted and the populations quickly rebounded.

The winter of 1998–99 was the most severe in recent history. Snowfall was only slightly above normal, but persistent cold temperatures prevented snow from melting, retarded spring green-up, and increased thermal stress on the deer. The net result was the largest winter mortality event ever seen in Unit 8. Exact data are not available, but biologists with both ADF&G and Kodiak NWR estimated that more than 50% of the deer succumbed to the harsh winter weather (Van Daele 2003). The five successive winters (1999–2000 through 2004–05) were relatively mild, and the winters of 2004–05 and 2005–06 were moderate. The deer population responded by increasing steadily. Harsh winter weather returned in 2006-07 and 2007-08, along with increased deer mortality, especially impacting fawns.

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 2008 population estimate was 60,000 deer and appeared to be decreasing unitwide.

Population Composition

The percentage of males in the harvest has remained at least 73% since 1990–91 and peaked at 95% in 2001–02 (Table 1). In spite of a reduction in hunter success and in the number of deer harvested after the population decline in 1999, the percentage of males in the harvest remained high. Reasons for this include more conservative doe seasons and bag limits in 2000–01 through 2002-03. These regulatory changes were made to reduce hunting pressure on the does to stimulate a more rapid recovery from the population decline. An anticipated side effect of the changes was a reduction in the number of bucks in the population. While no objective data were available, it appeared that buck:doe ratios were reduced, and several incidents of late-born fawns were reported. With liberalization of doe harvest regulations in 2003–04 the percentage of does in the harvest increased and subjective observations suggested a recovery of buck:doe ratios.

DISTRIBUTION AND MOVEMENTS

Deer are distributed throughout Unit 8 except in the more remote Semedi, Barren, and Chirikof Island groups. Within the past 25 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.

Selinger (1995) 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 between winter and summer ranges was 29 May , and 20 October was the mean date 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 an authorized education course before participating in the primitive weapons hunt.

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 from 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 $\geq$65 years old, legally blind, or $\geq$70% disabled.

Board of Game Actions and Emergency Orders. The Board of Game made no changes to the deer hunting regulations in Unit 8 during this reporting period. During its March 2007 meeting, the Board required deer harvest tickets to be used sequentially and that hunters carry all unused deer harvest tickets with them while they were hunting. During deliberation, the Board clarified its intent by noting hunters need only carry the number of tickets corresponding to the maximum bag limit in the unit (e.g. three harvest tickets in Unit 8).

Hunter Harvest. Harvests during this reporting period appeared to peak after a rebound from the low levels that followed the population decline in 1998–99. In 2006–07 the total legal harvest was estimated at 5422, and went down to 3290 in 2007–08. During the previous 5 years of reported harvest the average annual harvest was 4060 deer (note: no hunter harvest questionnaire was conducted for the 2004–05 season, Table 1). In 2006–07 the percentage of bucks in the harvest was 81%, and in 2007–08 the percentage of bucks was 78%, a decline from the previous 5-year (2000-01 through 2005-06) average of 86.6%.

As deer populations expanded into new areas, and various parts of the archipelago experienced differing degrees of winter mortality and harvest in the 1990s, harvest patterns shifted toward southern Kodiak Island (Smith 1995). This dynamic has fluctuated in recent years, with northern Kodiak again being the area that usually has the most harvest. In 2006–07, 19% of the reported harvest was from the northern islands in the archipelago (hunt areas 810–813), 53% was from northern Kodiak Island (hunt areas 814–817 and 827–835), and 28% was from southern Kodiak Island (hunt areas 818–826). In 2007–08, 19% of the reported harvest was from the northern islands, 44% was from northern Kodiak, and 37% was from southern Kodiak. The averages for the previous 5 years were: north islands—24.9%; northern Kodiak—44.9%; and, southern Kodiak—30.3%.

Hunter Residency and Success. The number of hunters afield during this reporting period declined from an estimated 3809 in 2006–07 to 3059 in 2007–08. The average number of hunters afield during the previous five years of reported data was 2847 (Table 2). Unit 8 residents composed 42% of the hunters in 2006–07 and 31% in 2007-08, a slight decrease from the previous 5-year average (43.8%). Nonlocal residents composed 41% of the hunters in 2006–07 and 33% in 2007–08, a decline from the previous 5-year average (41.7%). Nonresidents composed 18% of the hunters in 2006–07 and 33% in 2007-08, an increase compared to the 5-year average (14.5%).

Hunter success declined during this reporting period from 71% in 2006–07 to 59% in 2007–08. The average annual hunter success during the previous five years was 68.4% (Table 2). The mean number of deer harvested per hunter afield was 1.4 in 2006–07 and decreased to 1.1 deer per hunter in 2007–08. The previous 5-year average was 1.4 deer per hunter (Table 3). In 2006–07, 41% of the hunters killed only 1 deer, and in 2007–08 that figure increased to 50% (Table 4). In 2006–07, 35% of hunters took $\geq$3 deer, and in 2007-08 that percentage decreased to 24%. The average percentage of hunters that killed only 1 deer during the previous 5 years was 42.0%, while the average percentage of hunters taking $\geq$3 deer during that same period was 36.4%.

Harvest Chronology. November is consistently the peak month of harvest in Unit 8 (Table 5). In 2006–07, 46% of the deer were harvested in November, compared to 2007–08 during which 44% were harvested in November. This percentage was higher than the average (40.2%) of the previous five years.

Transport Methods. Boats and aircraft have been the most favored means of transportation for deer hunters in Unit 8 since inception of the harvest questionnaire. In 2006–07, 40% of the deer hunters used boats and 18% used aircraft as their primary means of access. In 2007–08, 40% of deer hunters used boats and 21% used aircraft. Averages for the previous 5 years were 41.5% for boats and 18.0% 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

Mortality surveys in coastal winter ranges documented the severe winter mortality during the winter of 1998–99 as being more than 3 times higher than average winter mortality during the previous 5 years (150 versus 47.8) (Table 7). Because of the timing of the surveys, and the delayed spring green-up, which resulted in deer dying later than usual, it was suspected that the actual mortality was much higher than the survey data reflect. As in previous years, juvenile deer were the most severely impacted portion of the population. The winter mortality in 1999–2000 through 2003–04 was very light, with few carcasses found along most transects. More normal winter conditions in 2004–05 and 2005–06 increased deer mortality, but hunter reports and incidental observations suggested the population remained stable to increasing during that time. Harsher winters returned in 2006–07 and 2007–08, resulting in high fawn mortality and a perceptible decline in the deer population on most parts of the archipelago.

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 experimental range use transects within the refuge in 1997 and they constructed range exclosures in 1999. Preliminary data from these pilot studies of deer winter range in selected areas suggested deer used several species of browse heavily when population levels were high. 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 has been clearcut, beginning in 1975. Logging began in 1993 on private land on the Chiniak Peninsula of northeastern Kodiak Island. Mature spruce habitats in those areas were converted to seral shrub-grass communities. In the northern range of Sitka blacktails, 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). The effects of commercial logging activities on deer winter range on Afognak Island have not been investigated, but it appears that while it initially reduces carrying capacity, subsequent increased production of herbaceous and shrubby vegetation may benefit deer, 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. He 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.

NON-REGULATORY MANAGEMENT PROBLEMS/NEEDS

Improving precision in assessing deer population trends is desirable, but is difficult and expensive. Hunter questionnaire surveys are the most economical, albeit indirect, method of monitoring deer population trends in Unit 8. Kodiak NWR staff initiated aerial and ground deer counts in wintering areas in the refuge in 1992 and concluded that aerial surveys required intensive effort to develop corrections for variations in sightability (Zwiefelhofer and Stovall 1992). Pellet-group counts are used in forested habitat of southeastern Alaska to monitor deer population trends (Kirchhoff and Pitcher 1988); however, the shrub/graminoid communities used by wintering deer on Kodiak Island do not provide suitable conditions for these types of surveys. The Kodiak NWR staff established some pellet-group transects in the Olga Bay area in 1994, but results were inconclusive and the surveys were discontinued in 1996. Refuge staff members have also experimented with FLIR equipment mounted on a U.S. Coast Guard HH-60 helicopter to census deer on winter ranges on northwestern Kodiak Island, but results were not promising.

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 2008, a local big game guide has been collecting 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 crytorchidism) (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).

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 2007 hunters provided samples from 1301 deer and 68 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.

CONCLUSIONS AND RECOMMENDATIONS

Sitka black-tailed deer on the Kodiak Archipelago is an introduced ungulate using an island habitat. There are no 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 is suspected to be compensatory for some of the annual winter mortality (i.e. many of the deer that are harvested would likely have been died during the winter anyway), except when the population is at low levels. 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.

Although objective population data are nonexistent, Alaska Statute 16.05.255 mandated 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.

During this reporting period, the deer population seemed to curtail its recovery from the winter mortality that occurred in 1998–99, suffering from a pair of harsh winters. There were many dead deer found during the late winter and early spring and a noticeable decline in the number of young deer. We also saw a decline in hunter success, percent bucks in the harvest, and in the number of hunters afield—all indicators that the unitwide deer population was declining.

There continued to be a great deal of interagency cooperation 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 the ADF&G and 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 with atypical antler development have been observed on Kodiak for at least the past 40 years. In recent years, the condition appears to be more common, particularly on the south end of the island. Evidence suggests the aberrations are caused by abnormal testicular development, but the cause is unknown. Diet or contaminants are potential culprits in causing these abnormalities, but it is possible that part of the perceived increase is due to a higher survival rate of atesticular bucks that do not deplete their fat reserves by participating in the rut prior to winter. 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. It is important, however, to monitor the situation, and ADF&G should endorse and cooperate in well-designed and peer-reviewed baseline research to examine the cause of the abnormalities.

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TABLE 1 Unit 8 deer harvest, 1987–88 through 2007–08

Regulatory year	Estimated legal harvest[a]				Estimated illegal harvest[b]	Estimated wounding loss[c]	Estimated total
	Male (%)	Female (%)	Unknown	Total			
1987–88[d]	10,844 (80)	2702 (20)	245	13,791	1379	1379	16,549
1988–89	---	---	---	---	---	---	---
1989–90	6923 (73)	2625 (27)	490	10,038	1004	1004	12,046
1990–91	5367 (66)	2739 (34)	---	8106	811	811	9728
1991–92	6569 (73)	2379 (27)	---	8948	895	895	10,738
1992–93	5144 (73)	1899 (27)	---	7043	704	704	8451
1993–94	5124 (82)	1130 (18)	---	6254	625	625	7504
1994–95	8270 (80)	2130 (20)	---	10,400	1040	1040	12,480
1995–96	5806 (81)	1387 (19)	---	7193	719	719	8631
1996–97	7041 (79)	1903 (21)	---	8944	894	894	10,732
1997–98	6860 (79)	1849 (21)	---	8709	871	871	10,451
1998–99	5993 (76)	1928 (24)	---	7921	792	792	9505
1999–2000	2801 (75)	927 (25)	---	3728	373	373	4474
2000–01	1823 (73)	668 (27)	---	2491	249	249	2989
2001–02	2756 (95)	143 (5)	---	2899	290	290	3479
2002–03	2943 (94)	200 (6)	---	3143	314	314	3771
2003–04	4430 (85)	769 (15)	---	5199	520	520	6239
2004-05	---	---	---	---	---	---	---
2005-06	5635 (86)	936 (14)	---	6571	657	657	7885
2006-07	4369 (81)	1053 (19)	---	5422	542	542	6506
2007-08	2563 (78)	727 (22)	---	3290	329	329	3948

[a] Harvest data extrapolated from the results of a mail questionnaire survey

[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 1988–89 and 2004-05

TABLE 2 Unit 8 deer hunter residency and success, 1987–88 through 2007–08

	Successful				Unsuccessful				
Regulatory year	Local[a] resident	Nonlocal resident	Nonresident	Total (%)	Local[a] resident	Nonlocal resident	Nonresident	Total(%)	Total hunters
1987–88	1851	2410	290	4551 (76)	645	665	161	1471 (24)	6022
1988–89[b]	---	---	---	---	---	---	---	---	---
1989–90	1892	2080	383	4355 (67)	1124	788	255	2167 (33)	6522
1990–91	1260	1627	185	3072 (74)	550	448	107	1105 (26)	41764177
1991–92	1414	1702	262	3378 (76)	479	479	85	1043 (24)	4421
1992–93	1221	1345	207	2773 (67)	541	645	160	1346 (33)	4119
1993–94	935	1247	159	2341 (79)	256	286	63	605 (21)	2946
1994–95	1690	1917	287	3894 (83)	372	314	129	815 (17)	47084709
1995–96	1164	1440	300	2904 (73)	480	440	160	1080 (27)	3984
1996–97	1428	1689	339	3456 (80)	348	368	122	838 (20)	4294
1997–98	1372	1749	422	3543 (82)	324	354	119	797 (18)	4340
1998–99	1062	1830	398	3290 (74	370	548	267	1185 (26)	45604475
1999–2000	638	829	372	1839 (57)	567	571	274	1412 (43)	3251
2000–01	515	608	201	1324 (51)	503	533	257	1293 (49)	2617
2001–02	629	753	134	1516 (72)	238	293	68	599 (28)	2115
2002–03	705	693	207	1605 (59)	524	413	196	1133 (41)	2738
2003–04	1065	1027	308	2400 (77)	356	242	104	702 (23)	3102
2004-05	---	---	---	---	---	---	---	---	---
2005-06	1268	1350	430	3048 (83)	292	185	139	616 (17)	3664
2006-07	1154	1135	433	2721 (71)	429	414	245	1088(29)	3809
2007-08	583	630	588	1801 (59)	360	486	412	1258 (41)	3059

[a] Includes residents of Unit 8

[b] No survey was conducted in 1988–89 and 2004-05

TABLE 3 Unit 8 comparison of deer hunter questionnaire results for 1980–81 through 2007–08

Regulatory year	% Hunter success[a]	% Hunters taking bag limit[b]	% Male	% Female	Total harvest	Estimated hunters	Mean number deer/hunter	Number days hunted/deer
1980–81	73	37	74	26	5347	3440	1.6	3.8
1981–82[c]	---	---	---	---	---	---	---	---
1982–83[c]	---	---	---	---	---	---	---	---
1983–84	81	24	74	26	9897	4113	2.4	2.3
1984–85	81	23	74	26	8905	3948	2.3	2.6
1985–86[c]	---	---	---	---	---	---	---	---
1986–87[c]	---	---	---	---	---	---	---	---
1987–88	76	27	80	20	13,791	6022	2.3	2.3
1988–89[c]	---	---	---	---	---	---	---	---
1989–90	67	15	73	27	10,038	6521	1.5	2.5
1990–91	74	19	67	33	8106	4176	1.9	2.9
1991–92	76	31	73	27	8948	4421	2.0	2.7
1992–93	67	29	73	27	7043	4119	1.7	3.7
1993–94	80	33	82	18	6254	2946	2.1	2.4
1994–95	83	35	80	20	10,401	4708	2.2	2.4
1995–96	73	29	81	19	7193	3984	1.8	3.0
1996–97	81	31	79	21	8944	4294	2.1	2.8
1997–98	82	28	79	21	8709	4340	2.0	2.3
1998–99	73	0	76	24	7765	4475	1.7	3.2
1999–2000	56	0	75	25	3728	3251	1.1	4.8
2000–01	51	22	73	27	2491	2617	1.0	5.7
2001–02	72	29	95	5	2899	2115	1.4	4.0
2002–03	59	30	94	6	3142	2742	1.1	4.8
2003–04	77	42	85	15	5198	3104	1.7	3.0
2004-05[c]	---	---	---	---	---	---	---	---
2005-06	83	42	86	14	6571	3664	1.8	3.6
2006-07	71	35	81	19	5422	3809	1.4	3.7
2007-08	59	25	78	22	3290	3058	1.1	4.6

[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 2007–08

[c] No survey conducted

TABLE 4 Number and percent of hunters in Unit 8 that reported harvesting 1, 2, 3, 4, or 5+ deer, 2002–03 through 2007–08

	2002–03		2003–04[b]		2005–06		2006–07		2007–08	
	Hunters	%	Hunters	%	Hunters	%	Hunters	%	Hunters	%
1 deer	709	44	802	33	1113	37	1122	41	893	50
2 deer	420	26	591	25	655	22	646	24	469	26
3 deer[a]	416	26	921	38	1164	39	874	32	397	22
4 deer[a]	11	1	40	2	56	2	47	2	15	1
5 + deer[a]	47	3	45	2	31	1	17	1	26	1

[a] Maximum bag limit was 3 in all areas

[b] No deer harvest questionnaire was sent out for the 2004-05 hunting season

TABLE 5 Unit 8 deer harvest chronology percent by period, 1980–81 through 2007–08

Regulatory year	Harvest periods (%)						*n*
	August	September	October	November	December	January	
1980–81	6	9	24	33	22	6	5347
1981–82[a]	--	--	--	--	--	--	---
1982–83[a]	--	--	--	--	--	--	---
1983–84	5	7	25	37	18	7	9897
1984–85	5	9	28	41	15	3	8905
1985–86[a]	--	--	--	--	--	--	---
1986–87[a]	--	--	--	--	--	--	---
1987–88	5	8	26	41	18	3	13,791
1988–89[a]	--	--	--	--	--	--	---
1989–90	3	6	20	51	18	3	10,038
1990–91	5	4	24	43	23	2	8106
1991–92	5	5	20	40	30	0	8948
1992–93	4	5	26	39	26	0	7043
1993–94	5	7	31	39	19	0	6254
1994–95	4	5	29	36	24	0	10,401
1995–96	5	4	25	48	17	<1	7193
1996–97	4	6	25	39	26	0	8944
1997–98	4	3	23	43	28	0	8709
1998–99	5	5	20	40	30	<1	7902
1999–2000	5	6	23	42	23	0	3732
2000–01	6	5	24	44	16	<1	2510
2001–02	10	8	22	35	22	2	2939
2002–03	6	6	23	38	25	2	3142
2003–04	7	7	21	39	25	1	5198
2004-05[a]	--	--	--	--	--	--	---
2005-06	7	6	24	45	17	1	6468
2006-07	6	6	21	46	20	1	5422
2007-08	7	5	19	44	23	2	3290

[a] No survey conducted.

TABLE 6 Unit 8 deer harvest percent by transport method, 1998–88 through 2007–08

Regulatory year	Percent of harvest									
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Other	Unknown	*n*
1998–99	19	3	43	9	0	2	15	10	2	7339
1999–2000	17	<1	42	8	0	1	15	15	2	5091
2000–01	19	<1	39	8	<1	2	18	12	3	4276
2001–02	14	<1	43	8	0	1	18	15	2	3619
2002–03	16	<1	40	7	0	<1	14	17	4	4403
2003–04	20	<1	42	7	0	2	14	12	2	4410
2004-05[a]	--	--	--	--	--	--	--	--	--	---
2005-06	20	<1	42	9	0	<1	15	10	<1	5719
2006-07	18	<1	40	9	0	2	18	14	--	5924
2007-08	21	<1	40	9	0	1	17	12	--	4524

[a] No survey in 2004-05.

TABLE 7 Unit 8 sex and age composition of deer winter-kill from beach mortality transects, 1987–88 through 2007–08

Regulatory	Adult				Juvenile[a]				Unk. age/	All			
Year	M (%)	F (%)	Unk.	Total	M (%)	F (%)	Unk.	Total	gender	M (%)	F (%)	Unk.	Total
1987–88	8 (89)	1 (11)	3	12	6 (50)	6 (50)	18	30	10	14 (67	7 (33)	31	52
1988–89	22 (85)	4 (15)	0	26	43 (57)	32 (43)	69	144	16	65 (64)	36 (36)	85	186
1989–90	9 (41)	13 (59)	16	38	9 (50)	9 (50)	73	91	2	18 (45)	22 (55)	91	131
1990–91	--	--	--	--	--	--	--	--	--	3 (75)	1 (25)	4	8
1991–92	25 (76)	8 (24)	4	17	31 (57)	23 (43)	22	76	17	56 (64)	31 (36)	43	130
1992–93	0 (--)	0 (--)	0	0	0 (--)	0 (--)	1	1	0	0 (--)	0 (--)	1	1
1993–94	15 (100)	0 (--)	2	17	2 (50)	2 (50)	8	12	0	17 (89)	2 (11)	10	29
1994–95	5 (83)	1 (17)	10	16	7 (47)	8 (53)	27	42	2	12 (57)	9 (43)	39	60
1995–96	0 (--)	0 (--)	1	1	4 (66)	2 (33)	28	34	1	4 (67)	2 (33)	30	36
1996–97[b]	5 (55)	4 (45)	2	11	17 (77)	5 (23)	47	69	1	22 (71)	9 (29)	50	81
1997–98[b]	1 (100)	0 (--)	2	3	8 (62)	5 (48)	15	28	1	9 (64)	5 (36)	18	32
1998–99[b]	9 (33)	18 (67)	23	50	12 (33)	24 (67)	61	97	3	21 (33)	42 (67)	87	150
1999–2000[b]	0 (--)	1 (100)	0	1	1 (33)	2 (67)	6	9	0	1 (25)	3 (75)	6	10
2000–01[b]	0 (--)	0 (--)	0	0	0 (--)	0 (--)	0	0	0	0 (--)	0 (--)	0	0
2001–02[b]	0 (--)	0 (--)	6	6	0 (--)	0 (--)	5	5	2	0 (--)	0 (--)	13	13
2002–03[b]	0	0	0	0	0	0	0	0	0	0 (--)	0 (--)	0	0
2003–04[b]	3 (30)	7 (70)	5	15	1 (50)	1 (50)	13	15	5	4 (33)	8 (67)	23	35
2004-05[b]	0 (--)	2 (100)	2	4	0 (--)	0 (--)	5	5	0	0 (--)	2 (100)	7	9
2005-06[b]	4 (36)	7 (64)	3	14	8 (67)	4 (33)	29	41	1	12 (52)	11 (48)	33	56
2006-07[b]	0 (--)	2 (100)	1	3	4 (80)	1 (20)	36	41	1	4 (57)	3 (43)	38	45
2007-08[b]	0 (--)	1 (100)	3	4	8 (100)	0 (--)	35	43	3	8 (89)	1 (11)	41	50

[a] Includes fawns and yearlings.
[b] Data obtained from Kodiak National Wildlife Refuge files

The Federal Aid in Wildlife Restoration Program consists of funds from a 10% to 11% manufacturer's excise tax collected from the sales of handguns, sporting rifles, shotguns, ammunition, and archery equipment. The Federal Aid program allots funds back to states through a formula based on each state's geographic area and number of paid hunting license holders. Alaska receives a maximum 5% of revenues collected each year. The Alaska Department of Fish and Game uses federal aid funds to help restore, conserve and manage wild birds and mammals to benefit the public. These funds are also used to educate hunters to develop the skills, knowledge and attitudes for responsible hunting.

Photo by Phil Mooney, ADF&G