Deer
Management Report
of survey-inventory activities
1 July 2000–30 June 2002

Carole Healy, Editor
Alaska Department of Fish and Game
Division of Wildlife Conservation
December 2003

ADF&G

Please note that population and harvest data in this report are estimates and may be refined at a later date.

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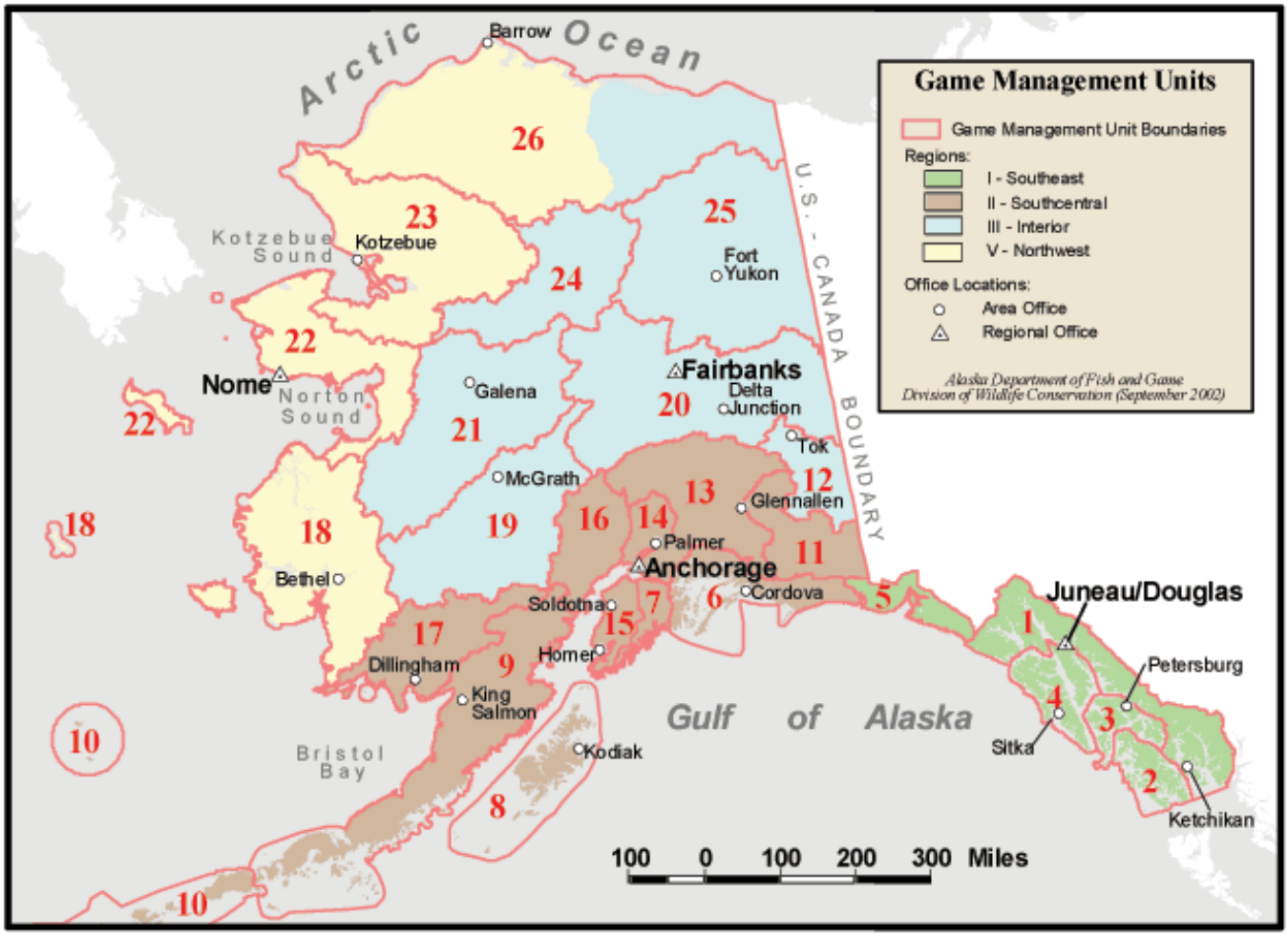
Arctic Ocean
Barrow
Kotzebue Sound
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Nome
Norton Sound
Galena
McGrath
Bethel
Fairbanks
Delta Junction
Fort Yukon
Tok
Glennallen
Palmer
Anchorage
Cordova
Soldotna
Homer
Dillingham
King Salmon
Kodiak
Bristol Bay
Gulf of Alaska
Juneau/Douglas
Petersburg
Sitka
Ketchikan
U.S. - CANADA BOUNDARY
100 0 100 200 300 Miles
Game Management Units
Game Management Unit Boundaries
Regions:
I - Southeast
II - Southcentral
III - Interior
V - Northwest
Office Locations:
Area Office
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(907) 465-4190 PO BOX 25526
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DEER MANAGEMENT REPORT

From: 1 July 2000
To: 30 June 2002

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 presently at moderate-to-low levels throughout most of southern Southeast Alaska.

Weather conditions and population levels influence deer harvests. Unit 1A harvests ranged from 267 to 912 deer during the past 10 seasons, with hunting seasons generally extending from August through December. Limited hunting of antlerless deer was allowed before 1978, but now only bucks are legal. As clearcut logging continues to reduce old-growth habitat in portions of the unit, deer populations are expected to decline. Population models indicate declines in carrying capacity of 50–60% by the end of the logging rotation in 2054. Long-term implications of habitat loss include the inability to provide for subsistence needs and the loss of hunting opportunities.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

In fall 2000 the Board of Game took action to establish a Unit 1A population goal of 15,000 deer and a 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 during the season.

We surveyed deer pellet-group transects in 5 watersheds (value comparison units–VCUs) during spring 2000 and 4 watersheds during spring 2001. Methods for conducting the surveys are described by Kirchhoff and Pitcher (1988). We conducted beach mortality transects along previously established routes in the spring to measure overwinter mortality.

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 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 in the last 15 years.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Pellet-group densities and estimated deer densities vary within and between VCUs in Unit 1A, and most of them show a declining trend during the past 5 years. Pellet-group counts on the Cleveland Peninsula have continued to decline during the past 2 years, yet counts on Gravina Island were higher and remain slightly below the long-term average. Average counts of pellet-groups per meter^2 plot across the subunit were 0.72 and 0.28 during 2000 and 2001, respectively. The management objective of 45 deer/mi^2 has not been met in any of the 9 VCUs sampled during the past 2 years. We estimate between 9 and 23 deer/mi^2 in these watersheds during the past 2 years.

The highest 2000 deer pellet densities in Unit 1A were on the north end of Gravina Island (1.24) and Dall Head (0.96). The north end count is slightly below the long-term average and the Dall Head count is slightly higher, both of which suggest stable trends in these 2 watersheds. Helm Bay deer pellet trends have continued to decline since the 1988 high count, and the 2001 counts were the lowest on record (0.41). Wolves are common along the Cleveland Peninsula and wolf and black bear predation is likely keeping this deer herd from rebounding. George Inlet data suggests pellet densities remained stable between 1994 and 1996 and declined by 47% between 1996 and 1998. Pellet counts in that watershed during 2000 were the lowest since 1984 (Table 1).

Unlike the high densities of 3.9 pellet groups per plot observed in Unit 4 (Kirchhoff 1996), Unit 1A densities represent low-to-moderate deer population levels. We believe the disparity between these densities is partly due to the presence of wolves and black bears in Unit 1A and their absence from Unit 4. Unit 1A deer habitats have been subject to more clearcut logging than most of Unit 4, where little of the timber base has been fragmented or removed.

MORTALITY

Harvest

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

Board of Game Actions and Emergency Orders. No regulatory changes were made to state seasons or bag limits during this period. No emergency orders were issued.

Hunter Harvest. Deer hunters throughout Southeast Alaska reported similar success during 2000 compared with past years and improved success during 2001. Overall survey results indicate the 2001 harvest was generally higher in northern Southeast and lower in central and southern portions of the region than it was during 2000. Both the 2000 and 2001 Unit 1A harvests have fallen below the long-term average. The estimated total unit harvest of 367 during 2001 was almost 40% higher than 2000, but is still substantially below the long-term average for the unit**.** During the 2000 season, Unit 1A had the highest average number of days/deer (13.8) for all of Southeast. That changed during 2001 when the Unit 1A days per deer value was reduced by 47% to 7.3 days/deer. Although a similar number of hunters participated during the past 2 years, hunters spent 1000 fewer days hunting in the unit in 2001 (Table 2).

The Gravina Island harvest of 123 deer during 2001 was 3.5 times higher than the previous 2 years and near the long-term average of 143. The number of hunters increased by 33% to 250 while reported hunter success rate more than doubled to 29%. Hunters spent only 7 days afield for every deer taken compared to 18 days in 2000.

Cleveland Peninsula deer hunters reported the sixth consecutive year of declining or extremely poor harvest. The number of hunter days increased by 60%, but the success rate was only 9%, and hunters spent 32 days afield for each deer taken (Paul and Straugh 2000, 2001). Expanded estimates suggest there were less than 10 deer harvested in each of the past 2 seasons on the lower Cleveland.

Despite the fact that only bucks are legal in Unit 1A, several does are reported killed each season. A total of 42 does were reported during 2000 and another 21 in 2001 (Paul and Straugh 2001, 2002). This probably represents only a portion of the illegal doe harvest in the unit. Although the degree of illegal harvests in Unit 1A is unknown, Wood (1990) thought it was considerable. Flynn and Suring (1989) estimated that actual hunter kills might be 38% greater than total estimated harvests from hunter reports because of crippling loss. The thick vegetation and wet conditions in Southeast make tracking wounded animals difficult. These incidents are rarely reported and consequently also difficult to quantify.

Harvest Chronology. Most Unit 1A deer harvest occurs during August and November, accounting for 19% and 25%, respectfully, of deer killed during 2000 and 2001 (Table 6). Sitka black-tailed deer rut during November, and consequently move more compared to other months, making them more visible and vulnerable to hunters. Bucks respond to a deer call more during the rut, thus hunters concentrate their efforts during November. Furthermore, cooler temperatures enhance meat care and present fewer biting insects.

Transport Methods. The majority of Unit 1A hunters continue to use boats to access hunting areas. Boat (75%) and highway (16%) access accounted for most harvested deer during 2000 and 2001. Boat use is up compared to the long-term average of 59%. Airplanes account for less than 3% of the reported hunter transportation to the field (Table 6).

Other Mortality

Vehicle/deer collision estimates have remained low (5–10 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. Based on staff observations and responses to trapper questionnaires, wolf populations are abundant in Unit 1A (Table 7), and we estimate that wolves and black bears consume several thousand deer each year. Person et al. (1996) estimated that 26 deer are killed per wolf per year in Unit 2. At present there are no accurate estimates of either wolf or black bear predation on deer for Unit 1A.

Black-tailed deer populations fluctuate due to extreme weather patterns throughout Alaska (Kirchhoff 1990). Previously established mortality transects provide a relative measure of overwinter loss. Winter mortality beach transects were visited during spring 2000 to search the beach fringe for deer carcasses. When a carcass was located, we examined it to determine cause of death and body condition at time of death. We classified deer by assessing marrow condition. If we found the lower jaw, we determined age by tooth wear. We believe the winter of 1998/99 was one of the most severe winters on record in Unit 1A. Snow was deep and persisted long into spring 1999. Currently, deer numbers remain low across most of the unit and do not show signs of recovering, even though subsequent winters have been much milder. Healthy wolf and bear numbers and reduced carrying capacity resulting from clearcut logging are factors hampering the recovery of Unit 1A deer.

The state proxy hunting program is becoming more popular with Unit 1A hunters. The number of hunters reporting as proxy hunters or federal designated hunters was higher in 2001 than in 2000. We estimate 18 proxy hunters from Ketchikan took 30 deer for a 67% success rate in 2000. A total of 26 hunters registered in 2001 to hunt under the proxy program and harvested 46 deer for an 80% success rate.

Participation in the federal designated hunter program also increased with Ketchikan residents. Six hunters signed up for the program during 2000, all were successful, harvesting an estimated 24 deer. All 26 federal designated hunters were successful during 2001 and harvested 56 deer.

HABITAT

Assessment

Logging continues to cause major changes in old-growth habitat. The most serious effects are in higher volume stands at low elevations, critical to deer during winters of 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 snow. By 2054 we expect that few areas will meet projected hunter demand within roaded and logged portions of Unit 1A (USFS 1989).

CONCLUSIONS AND RECOMMENDATIONS

During both years in the report period the deer harvest has fallen below the long-term average for the unit. Unit 1A had the highest average number of days/deer for all of Southeast in 2000. The 2001 season was much improved and near the long-term average. Hunters on the lower Cleveland Peninsula reported another extremely low harvest and there is no indication that deer in that area will rebound any time soon.

Based on pellet-group data, our objective of maintaining 45 deer/mi^2 in winter habitat was not achieved in any of the VCUs sampled in Unit 1A during 2000 or 2001**.**

South Revilla and Gravina islands continue to produce most of the Unit 1A deer harvest. Easy access from Ketchikan makes these areas popular hunting destinations.

Winter mortality was low during both 2000 and 2001. The winter of 2000 may go on record as being the mildest winter in over 20 years.

The Subsistence Division deer hunter survey results have been consistently high, sometimes 3 times greater than the Wildlife Conservation Division estimates. The major differences between surveys are that the DS survey estimates more hunters in communities and a higher hunter success rate. The DWC survey estimates a slightly higher number of deer taken per successful hunter. DS and DWC have agreed to work together on ways to link future surveys to discover why the results are so different.

Effort should be made to inform the public about logging effects on deer populations. We anticipate that winter habitat loss will reduce deer carrying capacity for many decades. Long-term implications of habitat loss include the inability to provide for subsistence needs and the loss of hunting opportunities (Wood 1990, Larsen 1993). Recent Congressional changes with the Roadless Initiative, if upheld, will protect some prime deer habitat from future logging activities (USDA 2000).

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Table 1 Unit 1A deer spring pellet-group survey results, calendar years 1981 through 2001

Area	Calendar year	Mean pellet-groups/plot[a]	Number of plots	95% CI
Smugglers Cove (VCU 715)	1981	0.48	147	0.30–0.66
Helm Bay (VCU 716)	1981	0.16	704	0.12–0.19
	1984	0.54	302	0.44–0.65
	1985	0.85	181	0.65–1.05
	1988	1.67	247	1.38–1.95
	1991	1.63	240	1.35–1.92
	1992	1.25	169	0.96–1.53
	1993	1.37	286	1.16–1.59
	1995	1.31	284	1.09–1.52
	1997	0.79	265	0.65–0.99
	1998	0.44	232	0.34-0.55
	1999	0.70	182	0.53–0.87
	2001	0.41	251	0.30–0.51
Port Stewart (VCU 719)	1993	1.22	289	1.03–1.42
	1995	1.61	278	1.35–1.87
	1997	1.29	289	1.08–1.50
	1999	0.77	182	0.57–0.97
	2001	0.21	289	0.13–0.29
Spacious Bay (VCU 722)	1993	0.54	300	0.43–0.64
	1995	0.45	283	0.35–0.54
	1997	0.43	276	0.33–0.53
	1999	0.09	161	0.04–0.13
	2001	0.06	285	0.02–0.09
Margaret (VCU 738)	1985	0.57	515	0.47–0.66
	1986	0.84	251	0.69–1.00
	1988	1.32	110	0.97–1.67
	1989	0.62	129	0.44–0.84
	1990	0.56	274	0.44–0.68
	1991	0.76	272	0.58–0.94
	1993	0.31	281	0.23–0.39
	1995	0.70	304	0.56–0.84
	1997	0.56	297	0.43–0.68
	1999	0.47	264	0.98–1.45
	2001	0.44	279	0.44–0.54

Table 1 Continued

Area	Calendar year	Mean pellet-groups/plot[a]	Number of plots	95% CI
George Inlet	1981	0.21	110	0.09–0.33
(VCU 748)	1984	0.27	344	0.19–0.35
	1985	0.52	313	0.39–0.65
	1989	1.41	169	1.08–1.75
	1990	1.03	240	0.82–1.25
	1991	1.49	168	1.15–1.84
	1992	0.65	195	0.49–0.81
	1994	0.95	309	0.79–1.11
	1996	0.98	305	0.76–1.19
	1998	0.52	314	0.40–0.65
	2000	0.51	270	0.38–0.64
Whitman Lake	1981	0.18	45	0.02–0.33
(VCU 752)	1987	0.16	187	0.09–0.23
	1990	0.45	193	0.32–0.59
	1992	0.20	189	0.12–0.28
	1997	0.81	181	0.63–0.98
	1998	0.47	209	0.33–0.61
Carroll Point	1985	0.66	118	0.46–0.86
(VCU 758)	1986	0.75	118	0.56–0.95
	1988	1.15	85	0.82–1.49
	1992	0.28	87	0.14–0.41
	1994	0.70	125	0.49–0.90
	1998	0.51	125	0.38–0.64
Moth Bay	1985	0.59	140	0.42–0.74
(VCU 759)	1986	0.98	156	0.79–1.17
	1988	0.72	78	0.46–0.97
	1992	0.48	136	0.30–0.66
	1994	0.95	136	0.71–1.17
	1998	0.68	176	0.53–0.82
Lucky Cove	1985	1.16	335	1.00–1.33
(VCU 760)	1986	1.16	258	0.95–1.32
	1988	1.02	65	0.69–1.34
	1990	1.10	263	0.92–127
	1991	1.39	271	1.07–1.70

Table 1 Continued

Area	Calendar year	Mean pellet-groups/plot[a]	Number of plots	95% CI
Blank Inlet (VCU 764)	1981	1.24	108	0.89–1.59
Dall Head (VCU 765)	1981	0.52	69	0.31–0.74
	1996	1.07	295	0.90–1.24
	1998	0.84	287	0.67–1.01
	2000	0.96	285	0.77–1.14
Duke Island (VCU 767)	1996	0.05	294	0.02–0.09
	2000	0.13	282	0.08–0.18
Alava Bay (VCU 769)	1985	0.52	311	0.39–0.65
	1986	0.85	326	0.68–1.01
	1991	1.64	143	1.22–2.05
	1994	0.79	326	0.64–0.94
	1996	0.93	324	0.77–1.09
	1998	0.66	335	0.52–0.79
	2000	0.75	329	0.56–0.93
Wasp Cove (VCU 772)	1985	0.41	271	0.31–0.51
	1986	0.50	300	0.38–0.62
	1989	0.58	145	0.39–0.77
	1991	0.13	207	0.07–0.18
Winstanley Island (VCU 821)	1991	0.27	49	0.11–0.42
East Gravina (all transects) (VCU 999)	1981	1.06	226	0.89–1.22
	1984	0.86	1,087	0.78–0.94
	1985	1.23	1,172	1.13–1.32
	1986	1.40	1,267	1.30–1.50
East Gravina (trans. 1–3) (VCU 999)	1984	0.88	376	0.73–1.03
	1985	1.44	224	1.20–1.67
	1986	1.62	346	1.43–1.81
	1987	1.63	334	1.41–1.84
	1988	2.07	278	1.79–2.35
	1989	1.13	182	0.86–1.41

Table 1 Continued

Area	Calendar year	Mean pellet-groups/plot[a]	Number of plots	95% CI
	1990	1.40	279	1.12–1.68
	1991	1.12	154	0.80–1.43
	1992	1.22	302	1.05–1.38
	1994	1.52	331	1.37–1.79
	1996	1.47	338	1.28–1.67
	1997	1.71	274	1.47–1.95
	1998	1.34	307	1.12–1.56
	2000	1.24	267	1.06–1.42

[a]Density classes based on mean pellet-groups/plot.
Less than 0.5 = extremely low
1.51–1.0 = low
1.01–2.0 = moderate
2.01–3.0 = high

Table 2 Unit 1A deer harvest data, regulatory years 1984 through 2001

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
1984	1060	440	42	5280	5.5	620	0.6	9.3
1985	1108	412	37	5683	5.1	779	0.7	7.3
1986	1107	529	48	7100	6.4	859	0.8	8.3
1987	946	376	40	6379	6.7	611	0.6	10.4
1988	958	413	43	4930	5.1	686	0.7	7.2
1989	982	335	34	4348	5.1	592	0.6	7.3
1990	1009	443	44	5127	5.1	723	0.7	7.1
1991	734	259	35	3094	4.2	347	0.5	8.9
1992	751	294	39	4519	6.0	686	0.9	6.6
1993	996	344	34	4465	4.5	515	0.5	8.7
1994	1067	516	48	5514	5.2	912	0.8	6.0
1995	1118	493	44	5080	4.5	914	0.8	5.5
1996[b]	---	344	---	---	---	539	---	---
1997	875	333	38	4208	2.6	528	0.6	8.0
1998	922	338	37	3482	3.8	556	0.6	6.3
1999	747	189	25	3644	4.9	287	0.4	12.7
2000	636	164	26	3684	5.8	267	0.4	13.8
2001	682	232	34	2689	3.9	367	0.5	7.3
$\bar{x}$								

[a]Includes does which were reported killed.

[b] Some harvest data not available for 1996.

Table 3 Unit 1A deer harvest from major harvest areas, regulatory years 1990 through 2001

Major harvest area	Regulatory year	Nr hunters expanded	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	35	801	4.5	0.9	160
	1993	266	52	19	553	2.1	0.3	87
	1994	246	80	32	578	2.4	0.5	115
	1995	404	164	40	1413	3.5	0.8	328
	1996	---	83	---	---	---	---	135
	1997	373	95	24	971	2.6	0.4	131
	1998	361	110	30	859	2.4	0.5	183
	1999	194	25	13	574	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
2-Annette Island	1990	16	13	78	39	2.4	1.1	18
	1991	6	0	0	11	2.0	0.0	0
	1992	16	16	100	179	10.9	5.5	91
	1993	22	11	52	112	5.1	0.6	14
	1994	15	0	0	49	3.1	0.0	0
	1995	16	13	80	84	5.2	1.2	19
	1996	---	---	---	---	---	---	---
	1997	15	9	60	15	1.0	0.6	9
	1998	12	0	0	29	2.4	0.0	0
	1999	13	6	46	58	4.5	1.5	19
	2000	19	19	100	194	10.0	1.7	31
	2001	7	0	0	43	6.1	0.0	0

Table 3 Continued

Major harvest area	Regulatory year	Nr hunters expanded	Nr successful hunters expanded	Percent successful	Hunter days expanded	Average days per hunter	Average deer per hunter	Deer killed
3-Duke Island	1990	9	2	20	18	2.0	0.2	2
	1991	33	8	26	70	2.2	0.6	20
	1992	22	3	12	58	2.6	0.1	3
	1993	15	0	0	15	1.0	0.0	0
	1994	3	0	0	7	2.0	0.0	0
	1995	19	0	0	49	2.5	0.0	0
	1996	---	---	---	---	---	---	---
	1997	12	6	50	18	1.5	0.5	6
	1998		---	---	---	---	---	---
	1999							
	2000	6	6	100	13	2.0	1.0	6
	2001	---	---	---	---	---	---	---
4–South Revilla	1990	594	180	30	2610	4.4	0.4	259
	1991	416	124	30	1134	2.7	0.4	147
	1992	341	61	18	1376	4.0	0.3	102
	1993	463	135	29	1883	4.1	0.4	188
	1994	600	212	35	2696	4.5	0.6	389
	1995	572	168	29	1925	3.4	0.4	218
	1996	---	165	---	---	---	---	229
	1997	456	170	37	1873	4.1	0.6	252
	1998	461	157	34	1356	2.9	0.5	222
	1999	458	86	19	1871	4.1	0.3	119
	2000	337	103	31	1936	5.7	0.4	140
	2001	350	95	27	945	2.7	0.4	132

Table 3 Continued

Major harvest area	Regulatory year	Nr hunters expanded	Nr successful hunters expanded	Percent successful	Hunter days expanded	Average days per hunter	Average deer per hunter	Deer killed
5–North Revilla	1990	242	82	34	801	3.3	0.4	103
	1991	204	55	27	748	3.7	0.4	76
	1992	275	55	20	846	3.1	0.3	80
	1993	345	80	23	1033	3.0	0.3	97
	1994	347	136	39	1049	3.0	0.6	192
	1995	334	137	41	918	2.7	0.6	192
	1996	---	62	---	---	---	---	85
	1997	159	42	26	445	2.8	0.4	56
	1998	175	51	29	509	2.9	0.3	61
	1999	88	29	33	282	3.2	0.5	44
	2000	175	30	17	561	3.2	0.3	48
	2001	143	55	38	502	3.5	0.6	81
6–Cleveland Peninsula	1990	245	122	50	981	4.0	1.0	236
	1991	158	42	26	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	51	1044	3.4	0.7	208
	1995	200	70	35	549	2.7	0.6	114
	1996	---	---	---	---	---	---	96
	1997	186	52	28	512	2.8	0.4	69
	1998	158	23	15	525	3.3	0.1	23
	1999	146	32	22	645	4.4	0.3	49
	2000	84	6	7	181	2.2	0.1	6
	2001	77	5	6	241	3.1	0.1	5

Table 3 Continued

Major harvest area	Regulatory Year	Nr hunters expanded	Nr successful hunters expanded	Percent successful	Hunter days expanded	Average days per hunter	Average deer per hunter	Deer killed
7–North Mainland	1990	10	2	20	58	5.8	0.4	4
	1991	11	0	0	33	3.0	0.0	0
	1992	25	8	33	75	3.0	0.3	8
	1993	38	19	49	164	4.3	0.5	19
	1994	19	1	5	84	4.5	0.1	1
	1995	28	7	26	56	2.0	0.3	7
	1996	---	---	---	---	---	---	---
	1997	15	0.0	0.0	153	10.2	0.0	0.0
	1998	9	0.0	0.0	42	4.7	0.0	0.0
	1999	14	0.0	0.0	43	3.1	0.0	0.0
	2000							
	2001	15	5	33	87	5.8	0.3	5
8–South Mainland	1990	3	0	0	7	2.5	0.0	0
	1991	9	0	0	15	1.8	0.0	0
	1992	8	0	0	25	3.0	0.0	0
	1993	---	---	---	---	---	---	-
	1994	3	3	100	7	2.0	2.0	7
	1995	38	21	56	86	2.3	0.9	35
	1996	---	6	---	---	---	---	11
	1997	6	6	100	23	3.8	1.0	6
	1998	24	14	58	33	1.4	0.8	18
	1999	10	0	0	10	1.0	0.0	0
	2000	15	0	0	64	4.3	0	0
	2001	23	5	22	33	1.4	0.2	5

Table 4 Unit 1A reported and estimated deer harvest/mortality, regulatory years 1984 through 2001

Regulatory	Reported harvest			Unreported & illegal	Estimated	Estimated Nr
year	Male	Female	Total	harvest[a]	total harvest	road kills
1984	620	0	620	310	930	1–5
1985	779	0	779	390	1169	1–5
1986	859	0	859	430	1289	1–5
1987[b]	611	0	611	306	917	1–5
1988	686	0	686	343	1029	1–5
1989	587	5	592	296	888	1–5
1990	642	81	723	361	1084	1–5
1991	331	61	347	173	520	1–5
1992	661	25	686	343	1029	1–5
1993	515	0	515	257	772	1–5
1994	877	35	912	456	1368	1–5
1995[b]	853	61	914	457	1371	1–5
1996	533	6	539	270	809	1–5
1997	459	69	528	264	792	1–5
1998	545	11	556	278	834	1–5
1999	275	13	288	144	432	1–5
2000	261	6	267	134	401	1–5
2001	367	0	367	168	535	1–5
$\bar{x}$	581	21	599	299	898	1–5

[a] Unreported and illegal harvest is estimated at 50% of reported harvest.
[b] Antlerless seasons: State season in 1987, Federal season in 1995.

Table 5 Unit 1A deer hunter residency and success, regulatory years 1988 through 2001

Regulatory year	Successful				Unsuccessful			
	Local resident[a]	Nonlocal resident	Nonresident	Total	Local resident[a]	Nonlocal resident	Nonresident	Total
1988	392	21	0	413	508	37	0	545
1989	310	25	0	335	607	40	0	647
1990	429	14	0	443	527	38	2	567
1991	259	0	0	259	418	53	4	475
1992	292	2	0	294	440	10	8	458
1993	336	3	6	345	619	21	11	651
1994	509	5	2	516	513	27	11	551
1995	464	23	6	493	601	12	12	625
1996	344	---	---	344	---	---	---	---
1997	319	0	14	333	512	16	14	542
1998	323	15	0	338	575	5	4	584
1999	161	29	0	190	517	10	0	527
2000	164	0	0	164	456	16	5	477
2001	219	12	0	232	432	9	10	351
$\bar{x}$	323	11	2	336	517	23	6	530

[a] Local residents includes Unit 1A residents.

Table 6 Unit 1A deer harvest chronology and hunter transport method, regulatory years 1988 through 2001

Regulatory Year	Month of kill							Method of transportation[a]					
	Aug	Sept	Oct	Nov	Dec	Jan	Unk	Airplane	Boat	Foot	Highway vehicle[b]	Other	Unk
1988	165	80	172	197	52	0	20	63	1456	458	518	7	107
1989	97	68	165	221	35	5	4	93	1394	411	465	25	0
1990	92	85	171	325	50	0	0	105	1366	514	515	0	14
1991	121	0	65	140	21	0	0	40	972	329	367	0	15
1992	118	33	213	283	30	0	9	35	1042	377	304	8	0
1993	126	32	88	239	30	0	0	171	1139	553	602	32	18
1994	171	33	273	315	97	21	2	117	1436	405	638	50	18
1995	206	145	179	268	116	0	0	56	1570	501	581	64	7
1996	187	28	91	170	11	0	51	---	---	---	---	---	---
1997	105	87	104	179	23	0	29	34	641	59	122	20	0
1998	136	80	113	110	54	16	5	42	667	42	171	---	---
1999	62	17	65	97	24	0	22	54	481	45	168		
2000	43	42	67	61	25	0	24	18	419	54	126	0	0
2001	79	55	78	100	40	5	10	10	534	21	81	0	10
$\bar{x}$	122	56	132	193	43	3	13	64	1009	290	358	19	

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

Table 7 Unit 1A deer pellet-group and harvest data, predator abundance(I_A)[a], and weather severity indices, regulatory years 1981 through 2001

Regulatory year	Pellet-group data[b]	Harvest data: Total harvest	Harvest data: Deer kill/ hunter day	Harvest data: Hunter success (percent)	Wolf abundance	Weather index[c]
1981	---	---	---	---	---	6.3
1982	---	---	---	---	---	1.3
1983	0.6	---	---	---	---	1.3
1984	0.7	620	0.10	42	---	4.7
1985	1.0	779	0.14	37	---	2.0
1986	1.1	859	0.12	48	---	2.7
1987	1.6	611	0.09	40	---	1.7
1988	1.0	686	0.14	43	---	4.7
1989	0.9	587	0.13	34	---	1.3
1990	1.1	723	0.14	44	---	2.3
1991[d]	0.8	347	0.11	35	86	0.3
1992	0.9	686	0.15	39	65	3.0
1993	1.0	515	0.11	34	57	1.7
1994	1.0	912	0.16	48	93	4.7
1995	1.1	914	0.18	44	80	2.7
1996	0.9	807	---	---	83	---
1997	0.7	792	0.13	38	80	---
1998	0.5	556	0.16	37	81	---
1999	0.7	287	0.08	25	82	---
2000	0.8	267	0.17	26	81	
2001	0.3	367	0.14	34	80	
$\bar{x}$	0.9	628	0.1	38	79	2.7

[a] Indices taken from Brand and Keith (1979). $I_A = [(\Sigma R_i\text{-}n)/2n] \times 100$ where: R_I = the numerical value assigned to the *ith* response ($R_I = 1$ when population level reported to be scarce, 2 when population level reported to be common, or 3 when population level reported to be abundant).
n = number of trappers that responded. Data derived from 1991 to 1996 Unit 1A trapper questionnaires.

[b] Mean number of pellet-groups per plot.

[c] Based on weather data collected at Annette Island, Alaska during November–March. Higher indices represent more severe weather conditions.

[d] Extremely wet but snow-free season; pellets may not have persisted as long as in past years.

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DEER MANAGEMENT REPORT

From: 1 July 2000
To: 30 June 2002

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. Clear-cut 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-deer (antlered) limit from 1973 to 1980 and a 2-deer (antlered) limit from 1981 to the present.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

Population objectives for Unit 1B deer are 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 (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.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Unit 1B pellet-group surveys are currently inadequate to determine deer population trends (Table 1). No pellet-group surveys were conducted in Unit 1B during spring 2000. In spring 2001, initial pellet-group counts were conducted in 2 VCU's, one at Madan Bay and one at Harding River. Anecdotal reports by hunters and observations by staff indicate that deer populations in the Thomas Bay area were increasing during the report period.

MORTALITY

Harvest

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

Board of Game Actions and Emergency Orders. There were no Board of Game actions or emergency orders issued during this report period.

Hunter Harvest. Hunter harvest in 2000 was about half of what it was in 1999. The harvest of 44 deer was also half of the long-term average (Table 2). All reported harvest came from the Thomas Bay area. The 2001, hunter harvest was nearly identical to that of 2000. All but a few deer reported came from the Thomas Bay area.

Hunter Residency and Success. Few nonresidents reported hunting deer in Unit 1B during the report period, and none were successful (Table 3). Deer populations are greater and seasons and bag limits more liberal in other nearby units, attracting more nonlocal hunters. The total number of hunters decreased slightly from 160 in 1999 to 156 in 2000, and then decreased again to 141 in 2001. The success rate declined from 32% in 1999 to 23% in both 2000 and 2001.

Harvest Chronology. Table 5 shows the deer harvest percentage by month. Generally most harvest takes place during November, October and December. In 2000, November and August provided the highest percent of harvest. In 2001, November and October provided the highest percent of harvest.

Transport Methods. Most hunters traveled by boat to their hunting areas (Table 4). A small percentage of hunters reported using airplanes in 2000 and highway vehicles in 2001 to access hunt areas. Logging roads provide some 4-wheeler and highway vehicle access.

CONCLUSIONS AND RECOMMENDATIONS

Unit 1B deer populations seem stable with localized variations. Winter weather, predation, and clearcut logging have the greatest effects on deer population dynamics. There are no indications that hunting seasons or bag limits should be restricted.

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Table 1 Unit 1B deer population trends as indicated by spring pellet-group surveys, calendar years 1991 through 2001.

Area	Calendar 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)	2001	.23	244	0.14–0.31
Harding (VCU 511)	2001	.02	207	0.00–0.05

Table 2 Unit 1B deer harvest, 1990–2001

Regulatory	Estimated legal harvest						Estimated illegal harvest					Total[a]
year	M	(%)	F	(%)	Unk.	Total	M	(%)	F	(%)	Unk.	
1990	148	(100)				148						148
1991	50	(100)				50						50
1992	142	(100)				142			6	(100)		148
1993	164	(100)				164			21	(100)		185
1994	184	(100)				184						184
1995	75	(100)				75						75
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

[a] Data from mail questionnaire.

Table 3 Unit 1B deer hunter residency and success, 1990–2001

Successful						Unsuccessful					
Regulatory year	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Total hunters
1990	89	14	0	103	(52)	80	14	3	97	(48)	200
1991	37	8	0	45	(43)	40	17	2	59	(57)	104
1992	123	10	0	133	(54)	94	18	0	112	(46)	245
1993	80	27	0	107	(56)	53	26	6	85	(44)	192
1994	107	18	0	125	(48)	100	35	2	137	(52)	262
1995	40	16	0	56	(33)	81	32	0	113	(67)	169
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	(32)	65	29	14	108	(68)	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

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

Table 4 Unit 1B deer hunter effort, percent by transport method, 1990–2001[a]

Regulatory year	Percent of effort							Number of trips
	Airplane	Boat	3- or 4-wheeler	Foot	ORV	Highway vehicle	Other	
1990		85	15	1				307
1991		86	14					148
1992		87	3	6	2	3		422
1993	10	74		8		8		244
1994	5	91	2			2		345
1995	3	89	2	3	2			226
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

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

Table 5 Unit 1B deer harvest chronology by month and percent, 1990–2000 [a]

Regulatory year	Harvest periods							
	Aug	Sep	Oct	Nov	Dec	March	Unk	Deer[a]
1990	18	10	15	53	3	0	0	148
1991	10	0	47	22	22	0	0	51
1992	39	0	5	27	30	0	0	148
1993	14	17	22	47	0	0	0	185
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

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

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DEER MANAGEMENT REPORT

From: 1 July 2000
To: 30 June 2002

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 emigration 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 were begun 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) were begun 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. Three 1-mile mortality transects conducted in upper Seymour Canal on Admiralty Island in April 1999 resulted in a total count of 18 deer carcasses. All but three of these mortalities were female deer, and all were adults. Since then, however, we believe the deer population has rebounded because of mild winters in 2000 and 2001. However, spring 2002 was very dry and cold, delaying green-up and the emergence of new vegetation that provide deer with important spring nourishment. This resulted in some deer mortality based on hunter reports of carcasses found during fall 2002.

Most Unit 1C deer occur on Douglas, Shelter, and Lincoln islands, locations which 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 occasions near Point Hilda on southern Douglas Island. A Douglas Island trapper caught seven wolves in January 2002.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

As established by the Alaska Board of Game during their 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 12,138 deer harvest tickets were issued for the 2000 regulatory year (RY = 1 July–30 June) in Southeast Alaska and 11,338 for RY 2001. We mailed nearly one third of all Southeast deer harvest ticket holders a survey each year, and 61% and 63% responded during 2000 and 2001, respectively. The survey was designed to collect information on hunter effort, hunt location, hunt timing, number of days hunted, mode of transportation, and number of deer harvested. Survey results for hunter effort, success, and kill location were expanded to estimate results for all harvest ticket holders. We conducted pellet-group surveys on Douglas and Shelter islands in spring 1999 but only on Douglas Island in spring 2000.

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. North Douglas Island pellet-group densities declined for the second consecutive report period, dropping from 1.43 and 1.55 groups/plot during 1997 and 1998, respectively, to 1.03 and 0.88 during 1999 and 2000. The pellet-group densities further declined to 1.01 and 0.68 groups/plot during spring 2001 and 2002. The decline from 1997/98 to 1999/00 likely is a reflection of the severe winter of 1998/99 that resulted in mortality on Douglas Island (2 carcasses were discovered while conducting pellet counts). However, the decline from the previous report period to the present is not so easily explained, as winters during that period have been relatively mild. The decline in pellet counts may be partly due to deer using other locations during the winter prior to sampling. Light snowfall was the rule during the winters of 2000 and 2001, allowing deer to winter at high elevations. This could have resulted in pellets being deposited at elevations above the sampled area, thereby resulting in lower pellet densities. Plotting pellet density by elevation data supports this theory as a high percentage of the pellets enumerated were between 1,000 and 1,500 feet. Also,

during spring 2002 we were unable to sample up to 1,500 feet on some transects due to persistent snow cover; these upper elevations are typically where a large proportion of the pellets are found. This could obviously lead to lower pellet densities in spite of no real change in deer numbers. In addition to sampling differences, the presence of at least 7 wolves on Douglas Island during calendar 2001 and 2002 certainly resulted in mortality that could be responsible for a decline in deer pellet groups.

At Inner Point on the southwest side of Douglas Island, pellet-group densities averaged 1.06 and 1.09 groups/plot during the previous report period, but declined to 0.82 in 2002. We did not conduct pellet counts in this area in spring 2001. The relatively low density in 2002 adds to a continuing downward trend of pellet-groups in this area, which had counts ranging from 1.21–2.36 groups/plot during 1985–1997, then dropped to an all-time low of 0.84 groups/plot in 1997. There are several possible reasons for this decline. We believe the low 1997 count was because many deer wintered above the highest pellet transect due to low snowfall that winter. It may also have been influenced by selective logging along these transects during late summer and early fall of 1997. During the winter of 1998/99, deep snow probably caused some mortality that was detected in the relatively low pellet group counts in spring 1999. Finally, during the winters of 1999–2001 wolves were present on Douglas Island, and they undoubtedly affected deer numbers and distribution on the island.

In spring 2001 the Shelter Island transects had a mean of 2.07 pellet-groups/plot compared to 1.63-pellet groups/plot during the previous survey (spring of 1999). As in other parts of the unit, the decrease in 1999 from previous years was probably due to the severe winter of 1998/99, while the increase during this report period was likely related to subsequent milder winters.

We did not conduct deer pellet surveys on adjacent Lincoln or Sullivan islands during this report period.

MORTALITY

Harvest

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

Board of Game Actions and Emergency Orders. State regulations remained unchanged during the report period.

Hunter Harvest. Based on data gathered from the annual deer hunter survey, hunters killed 241 deer in 2000 and 380 in 2001 (Table 2). The dramatic decline in harvest during the 2000 season was likely due to the deer mortality caused by deep snow during spring of 1999. An estimated 63% and 56% of the Unit 1C deer harvest came from Douglas Island in 2000 and 2001, respectively. This represents a considerable decline from the previous report period when 77% (1998) and 75% (1999) of the 1C harvest came from Douglas Island. The higher Shelter and Lincoln islands' harvest percent in 2001 supports our interpretation of higher deer pellet densities on Shelter Island during spring 2001, indicating a high deer density.

Bucks comprised 72% of the harvest in 2000 and 79% in 2001.

Hunter Residency and Success. During the report period most hunters (96% in 2000, 90% in 2001) were Unit 1C residents, while nonlocal residents composed the majority of the remaining hunters. Nonresidents made up only 1% of the hunters during each year of the report period (Table 3). Hunter success rate ranged from 23% in 2000 to 30% in 2001. The harvest of only 241 deer in RY 2000 was the lowest recorded during the past 10 years. However, the harvest rebounded to 380 deer during 2001. Overall, the mean annual harvest of 311 deer during 2000/2001 was 14% lower than that of the previous report period, and 33% lower than the mean annual harvest during 1990–1997. An average of 1.3 and 1.4 deer were taken per successful hunter in 2000 and 2001, respectively. Hunters expended an average of 9.4 days of hunting per deer in 2000 and 7.6 days per deer in 2001. The average deer per hunter was .3 in 2000 and .4 in 2001. More available deer as the herd recovered from heavy snowfall in 1998/99 undoubtedly affected the higher deer harvest in 2000.

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 56% of hunters used highway vehicles for access, 33% used boats, and 10% used foot access. There were also a few hunters who were dropped off by aircraft. 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. During both years of this report period, hunters using boats had the greatest success. In 2000 hunters using boats had a success rate of 34%, compared to hunters using foot access (24%) or highway vehicles (17%). In 2001, hunters using boats to access more remote areas had a success rate of 33% compared to the 29% for those who used highway vehicles and 26% success for those using foot access.

CONCLUSIONS AND RECOMMENDATIONS

None of Unit 1C's three management objectives were met during this report period. Although we did conduct mail out surveys to quantify deer hunting effort and harvest, we were unable to conduct pellet-group counts in each VCU on an annual basis. In addition, only Shelter Island met the objective of 2.0 pellet-groups/plot, while both VCU's on Douglas Island were well below the objective. Although the Unit 1C pellet group counts in 2000/01 were generally below the long term means, we attributed this to the lag effect of the deep snow winter of 1998/99, and expected the pellet counts to rebound to higher levels in 2001/02. However, in 2001/02, the Douglas Island counts declined again, this time to all time lows. Reasons for this are unclear, but persistent snow that prevented pellet sampling up to 1,500 feet as well as the

presence of wolves could have played a part in the low counts. It will be interesting to see if pellet counts increase during coming years. We will attempt to sample all pellet-group transects during the upcoming report period. If pellet densities remain at low levels we will consider changes to the Douglas Island hunting season and /or bag limit.

While the deer harvest was relatively low in the unit during this report period, few hunters complained about a lack of deer. This is possibly because many hunters using this area still regard it as a secondary deer hunting area to be used when weather and time do not allow them to hunt Unit 4.

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Table 1 Unit 1C deer population trends as indicated by spring pellet-group surveys, calendar years 1986 through 2001

Area	Calendar year	Mean pellet-groups/plot	Number of plots	95 % CI
Kensington (VCU 20)	1994	0.00	180	---
Portland Island (VCU 27)	1987	0.99	381	0.87–1.12
North Douglas (VCU 35)	1991	0.8	300	0.65–0.96
	1993	0.74	324	0.62–0.87
	1994	0.91	315	0.74–1.09
	1995	0.86	306	0.70–1.02
	1996	0.97	323	0.81–1.12
	1997	1.43	323	1.24–1.62
	1998	1.55	321	1.32–1.77
	1999	1.03	273	0.86–1.19
	2000	0.88	282	0.71–1.04
	2001	1.01	335	0.85–1.17
	2002	0.68	200	0.50–0.85
Inner Point (VCU 36)	1986	1.97	235	1.68–2.25
	1987	1.76	262	1.53–2.00
	1988	1.21	200	1.02–1.39
	1989	1.30	258	1.08–1.53
	1992	2.05	204	1.75–2.36
	1995	1.41	254	1.21–1.60
	1996	1.68	240	1.45–1.91
	1997	2.36	252	2.08–2.64
	1998	0.84	280	0.69–0.98
	1999	1.06	239	0.87–1.25
	2000	1.09	280	0.90–1.28
	2002	0.82	198	0.64–1.00
Rhine Creek (VCU 38)	1997	0.31	108	---
Harbor Island (VCU 65)	1987	1.28	200	1.00–1.56
Couverden (VCU 117)	1993	0.35	350	0.27–0.44
Shelter Island (VCU 124)	1987	2.91	288	2.57–3.24
	1988	3.16	130	2.62–3.70
	1989	1.42	300	1.23–1.62
	1990	1.60	300	1.37–1.82
	1993	2.00	250	1.73–2.26
	1995	1.38	297	1.20–1.56
	1997	2.51	312	2.23–2.78
	1999	1.63	290	1.42–1.85
	2001	2.07	231	1.79–2.36

Table 1 Continued

Lincoln Island (VCU 124)	1998	1.57	207	1.27–1.77
Sullivan Island (VCU 94)	1990	1.40	250	1.17–1.62
	1999	0.64	66	0.35–0.93

Table 2 Unit 1C annual deer harvest[1], 1985 through 2001

Regulatory year	Males	Females	Estimated total
1985	296	138	434
1986	347	149	496
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	353
1996	342	96	438
1998	273	111	384
1999	201	139	339
2000	172	69	241
2001	302	78	380

[1.] Data from expanded results of hunter surveys.

Table 3 Unit 1C deer hunter residency and success, regulatory years 1986 through 2001

Regulatory year	Successful						Unsuccessful						Total hunters
	Local[a] resident	Nonlocal resident	Nonresident	Unk	Total	(%)	Local[a] resident	Nonlocal resident	Nonresident	Unk	Total	(%)	
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	324	(34)	564	56	3	0	623	(66)	947
1991	209	21	0	0	230	(28)	551	42	4	0	597	(72)	827
1992	321	15	6	0	343	(36)	550	63	5	0	618	(64)	961
1993	295	8	0	0	302	(33)	549	50	2	0	601	(67)	903
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	231	4	0	0	235	(27)	583	43	9	0	635	(73)	870
1998	217	5	0	0	223	(24)	672	42	8	0	722	(76)	945
1999	206	27	0	0	233	(27)	575	49	0	0	624	(73)	857
2000	176	4	5	0	186	(23)	592	20	6	0	617	(77)	803
2001	244	23	0	0	266	(30)	557	61	10	0	628	(70)	894

[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 2001

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	1017	4151	659	.6	6.3
1995	990	3968	311	.3	12.8
1996	257	NA*	NA	NA	NA
1997	861	3645	438	.5	8.3
1998	946	3384	384	.4	8.8
1999	856	2295	339	.4	6.8
2000	803	2279	241	.3	9.4
2001	894	2895	380	.4	7.6

* Data unavailable due to changes in survey.

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DEER MANAGEMENT REPORT

From: 1 July 2000
To: 30 June 2002

LOCATION

GAME MANAGEMENT UNIT: Unit 2 (3600 mi^2)

GEOGRAPHIC DESCRIPTION: Prince of Wales 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 1880 to 3886 deer during the past 16 seasons. Hunting seasons have generally extended from August through November or December, and limited hunting of antlerless deer was allowed before 1978. A 3-week antlerless season was initiated in Unit 2 during regulatory year 1987, but was discontinued a year later because of public opposition. In 1995, despite state opposition, a federal 2 1/2-month antlerless season was implemented in Unit 2. The federal antlerless season remains in effect allowing qualified rural hunters to harvest 1 doe as part of the 4 deer bag limit.

Craig is the largest Unit 2 community with approximately 1800 residents. Craig was once the fastest growing community in Alaska when many Prince of Wales Island (POW) logging camps closed and families moved into town. The population has begun to decline as residents have moved away in search of employment. Craig had 365 fewer harvest ticket holders in 2001 than during 2000. Fewer tickets were also reportedly issued to residents of other POW communities. In all, 550 fewer deer harvest tickets were reported issued to POW residents in 2001 than in 2000. According to information supplied by license vendors, about 800 fewer people got deer harvest tickets statewide in 2001 compared to 2000.

Clearcut logging has been widespread in Unit 2 and its effects on deer habitat are significant and enduring. Counting both 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 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 the 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.

The Division of Subsistence (DS) has historically conducted personal interview household surveys to estimate deer harvest rates, and some of the results conflict with our estimates. DS has completed 4 such surveys in the last 14 years. The latest household survey was done during summer 2000 and the results are being compiled.

We surveyed deer pellet-group transects in 7 watersheds (VCUs) during April 2000 and another 7 during April 2001. Methods for conducting the surveys are described by Kirchhoff and Pitcher (1988). No beach mortality transects or aerial surveys were completed during this report period.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Unit 2 deer densities vary within and between VCUs. Unit 2 deer pellet-group counts were about the same during 2000 with several VCUs slightly higher than 1999. The 2001 counts showed 2 VCUs about the same and 5 slightly lower. The highest 2000 deer pellet densities

were at Snakey Lakes and Little Ratz. The high counts in 2001 were at Little Ratz and Snakey Lakes (Table 1).

Unlike the high densities of up to 3.9 pellet-groups per plot observed in Unit 4 (Kirchhoff 1996), Unit 2 densities represent low-to-moderate population levels. The disparity between these densities is probably due to the presence of wolves in Unit 2 and their absence from Unit 4.

MORTALITY

Harvest

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

Board of Game Actions and Emergency Orders. No regulatory changes were made to the state deer seasons or bag limits during this period. Proposals to the Federal Subsistence Board to shorten the deer hunting season for nonlocal residents were rejected during the 2002 meeting. Federal subsistence hunters would like to see a local preference for Unit 2 deer hunting.

Hunter Harvest. Deer harvest in Unit 2 during the past 2 seasons was estimated at 3023 and 2865 deer, exceeding the harvest objective both years. Deer per hunter (1.4 deer) matched the long-term average. Average hunter days per deer (4.6) also remained similar to the long-term average (4.7 hunter days/deer). Although the Unit 2 average deer per hunter is comparable to that in Unit 4, POW hunters spend 5 days afield for each deer taken compared to just over 2 days per deer in Unit 4. However, the majority of POW hunters used highway vehicles for transportation (see below). Highway hunters typically report more days afield, perhaps because in roaded areas like Unit 2 it is often a more simple matter to set off on a hunt using a motor vehicle than it is when boats or airplanes must be used for transportation.

The Unit 2 2000 season had the highest number of hunter days (13,865), the highest number of hunters, and the third highest deer harvest in over 10 years (Table 2). On Prince of Wales Island, 2000 harvest is estimated at 2770 deer, 15% higher than the long-term average. Central POW had the highest number of hunters in over 10 years with approximately 1105 hunters. The main harvest area on central POW also saw the second highest number of hunter-days during that same period while the deer per hunter value remained similar to the long-term average. Similarly, north central POW had the highest number of hunters (858 hunters) and the highest harvest (706 deer) in over 10 years during the 2000 season (Table 3). Most of these increases can be attributed to a higher number of hunters reported in Craig and Hollis (see below). Hunters from those communities took 300 more deer than usual in 2000.

POW harvest in 2001 was an estimated 2,600, lower than the previous year but still 7% higher than the long-term average. The decrease was mostly due to fewer local hunters (see below).

Elsewhere in Unit 2, harvest was variable during the 2 year period. On Heceta Island, harvest declined from 54 deer in 2000 to 31 deer in 2001 extending the downward trend to 3 years. Harvest increased on Dall and Long islands to 95 deer, about double the long-term average. Suemez Island harvest (60 per year) was double the previous 2-year period and 50% higher

than the previous 10-year average. Harvest on the "Outer" islands (including Noyes, Baker, and Lulu) equaled the long-term average. On Kosciusko, Tuxekan, and other islands of Sea Otter Sound, harvest continued the pattern from the previous two years, averaging about 20 deer and remaining 30 deer below the long-term average.

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. Of an estimated 55,000 deer in Unit 2, the illegal removal of 3,000 deer equates to an estimated 5.5% illegal 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. Nonresident hunters have never taken a high number of deer from Unit 2, and interest by nonresident hunters fluctuates yearly. Of the 115 nonresidents that hunted during 2000, 38 were successful for a 33% success rate. During the 2001 season, 104 nonresident hunters took 45 deer for a 43% success rate. Nonresident hunters accounted for just over 1% of the reported Unit 2 deer harvest during the past two seasons (Table 5). Nonlocal residents harvested an average of 40% of the Unit 2 harvest during 2000 and 2001. Ketchikan hunters' share of the POW harvest during the past 2 seasons remained similar to previous years at 26% and 29%. The number of does reported harvested under federal regulations by local hunters increased from 82 in 1998 to 231 during the 2000 season, then declined to 124 in 2001. The 2001 doe kill is still 25% higher than the long-term average. We have no measure of the reliability of these figures and the actual doe harvest may be much higher.

Local hunters' participation and success varied during this 2-year period. As noted earlier, hunter numbers in Craig were significantly higher (50%) than average in 2000 but returned to a more normal total in 2001. A total of 295 fewer people from all Prince of Wales Island (POW) communities reported hunting in 2001 compared to 2000. Nearly all communities had fewer hunters reporting with the biggest numerical declines occurring in Craig (–156) and Thorne Bay (–52) and the biggest percentage declines occurring in Whale Pass (–80%) and Hollis (–55%). The only two POW communities reporting more hunters in 2001 than the previous year were Coffman Cove and Point Baker/Port Protection. POW hunters who did hunt in 2001 enjoyed a slightly better success rate than 2000. Although the number of deer taken by Craig and Thorne Bay hunters declined with the number of hunters in the field, deer per hunter (1.4) and days per deer (4.6) were the same for Craig in 2001 as in 2000. Thorne Bay hunters spent fewer days afield for the same average number deer per hunter (1.5) as in 2000. Fewer Klawock hunters actually reported 60 more deer harvested in 2001, so deer per hunter increased from 1.2 in 2000 to 1.7 in 2001.

Success rate on POW increased during the reporting period with a 63% success rate in 2000 and 66% success in 2001. Along with increasing success, hunters reported taking a bit less than 5 days to bag a deer in 2001 compared to almost 6 days afield per deer in 2000.

Harvest Chronology. Most Unit 2 deer are harvested during August, October, and November. During the past 2 seasons August has accounted for most of the harvest (30%). Success in November dropped slightly from a 10-year average of 26% to 23% during this report period (Table 6). Poor weather during the late deer season the past several years explain the slightly lower harvest during the popular November hunt.

Hunting and harvest in particular areas. The location of hunting effort is tied to several factors, among them, access, likelihood of success, and hunter residency. In the roaded areas of Unit 2, and particularly on Prince of Wales Island, because access to all areas is similar, hunter success and residency are likely to be greater factors in determining where hunters hunt. During the 2000 and 2001 seasons hunting patterns reflected the fluctuations in hunter numbers from POW communities.

During 2000 with Craig and Hollis reporting up to 50% more hunters than previous years, effort also increased in areas most hunted by people from those communities, central and northcentral POW. The area in which Ketchikan hunters expended the most effort and reaped their highest harvest also shifted from northern POW in 1999 to central and northcentral in 2000. As a result, reported harvest in the Craig/Klawock/Thorne Bay area of central POW increased significantly in 2000 for the third straight year to 1254. Harvest was slightly higher on Northcentral and northeast POW (Staney Creek – Coffman Cove) and slightly lower on northwest POW. Because of higher reported harvest from Craig, Klawock, Hydaburg, and Ketchikan, harvest on southwest POW more than doubled (112) the 1999 total. In southeast POW, reported harvest dropped slightly from 120 to 107 deer.

During the 2001 season with almost 300 fewer hunters reported from POW communities (see above), the hunting patterns shifted. In general, there were fewer hunters from central and southern POW communities and slightly more hunters reported in northern communities (Coffman Cove, Pt. Baker). As a result, reported harvest in the Craig/Klawock/Thorne Bay area of central POW decreased significantly for the first time in 3 years and the kill in northcentral POW (Staney Creek – Coffman Cove) decreased by 10%, whereas the estimated harvest of 670 deer in northern POW areas (Whale Pass – Pt. Baker) was 45% higher than the previous year. Ketchikan hunters' greatest effort and harvest success (754 deer) on POW was evenly distributed in the central and northern areas of the island, suggesting likelihood of success was not a determining factor in the shifting hunting patterns of POW residents. Estimated harvest on southwest POW dropped more than half, from 85 in 2000 to about 40 deer in 2001, which is near the long-term average reported for the area. In southeast POW, reported harvest dropped slightly for the second consecutive year and was 97 deer.

Transport Methods. Similar to the long-term average, 77% of the harvest in GMU 2 during the past 2 years came from hunters using highway vehicles or ATVs as their main mode of transport compared to 42% for the entire region. Boat use accounted for 15% of successful hunters' access and aircraft 4% in the unit. Hunters using boats and airplanes to reach hunting areas spent fewer hunting days per deer (2.6 and 3.7 days/deer, respectively) than hunters using highway vehicles (5.2 days/deer) (Table 6).

Other Mortality

Based on staff observations and responses to the annual trapper questionnaire, we believe that wolf populations are stable in Unit 2 and at higher densities than those populations on the nearby mainland (Table 7). This suggests no noticeable changes in deer mortality due to wolf predation.

Deer are extremely vulnerable to harsh winter weather, and the extent of winter mortality depends on the severity of the season. Based on 35 radio-collared deer as part of ongoing Unit 2 predator prey research, most recent deer mortality has been mixed. Analyzing mortality of radio-collared animals during 1998–2002, we found that 7 deer were killed by humans, 4 by wolves, 16 by bears, 2 by malnutrition, and one by accidental causes. Based on recent mild winters, we believe deer experienced good over-winter survival. A pilot study using radio collars on neonate fawns found 15 of 28 fawns killed by black bears, one by wolves, and 2 illegally by humans in 2002. That study will be expanded to eventually provide better information about black bear predation on young deer fawns in different habitat types.

Vehicle collision estimates have remained low (10–25 deer/year) and are not a significant source of Unit 2 mortality. However, the collision risk will increase with completion of extensive new POW paving projects set to be finished by fall 2003. By fall 2003, paving will be complete from Klawock to Thorne Bay and Control Junction to the Naukati Junction with the main 20 road. The road from Naukati to Coffman Cove along the main 30 road is scheduled for paving by fall 2004.

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 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 (U.S. Forest Service, 1989). Recent Congressional changes via the Roadless Initiative will protect some prime deer habitat from future logging activities (USDA, 2000).

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. An attempt to gather deer condition and age data from hunters was only marginally successful during the 1999 season and resulted in 50 measurements. During that effort we established several voluntary hunter checkstations along key roads on POW to intercept hunters returning from the field. Again during 2000 we established check stations and we checked 65 deer. In our most recent effort, in cooperation with the US Forest Service we established fixed check stations in several locations in Unit 2 and in Ketchikan. This is a slightly different approach and allows us to collect data during the entire 5-month hunting season. License vendors are provided with incentives of $3 for each complete deer data form (Appendix 1). Important data

collected included a tooth for aging, number of days hunted, kill location, habitat type, and hunter residency. Hunters were offered incentive prizes through a raffle. Hunters were given one raffle ticket toward a wide range of prizes for each deer they checked (up to 4 deer per hunter). The success of this approach was better and 134 deer were checked. The future success of this program will depend on an informative public education campaign. News releases will be circulated before forthcoming hunting seasons describing our concerns and justification for check stations. We will continue to gather this data in cooperation with U.S. Forest Service staff during the 2003 deer season.

CONCLUSIONS AND RECOMMENDATIONS

Based on pellet-group data, our objective of maintaining 45 deer/mi^2 in winter habitat was not achieved in any of the VCUs sampled during this report period. However, the Unit 2 harvest objective of 2700 deer was exceeded in both 2000 (3023 deer) and 2001 (2865 deer). The number of successful hunters increased to an average of 1388, over 100 more than during the past report period. Several major harvest areas in north central POW may be reaching the peak of their productivity in terms of deer harvest. Both of these areas have easy access and large tracts of young clearcuts making deer visible and accessible to hunters. This trend is likely to shift as many of the clearcuts in these areas age and become less productive, and deer become less abundant and less visible.

Wolf abundance remained moderate to relatively high in recent years, and predation continues to influence deer populations in Unit 2. An expansion of Unit 2 deer/wolf research to include neonate fawns during 2002 indicates that black bears have a significant effect on early survival of young deer. During spring 2001, biologists radio collared 28 deer fawns; in less than 2 weeks 15 of those were killed by black bears and one by wolves. This project will be expanded during 2002 to attempt to attach 50 radio collars on neonates to better understand early mortality of young deer in Unit 2.

A major concern to ADF&G is the direction federal deer management is taking on POW. We believe the ongoing Unit 2 federal antlerless hunt is contrary to appropriate wildlife management principles and will negatively influence future deer populations in the unit. We recognize that in other parts of Southeast Alaska, especially Unit 4, long-established doe seasons have proven effective and appropriate. Compared to Unit 2, these areas have significant differences in hunter access (few to no roads) and ecological systems (few or an absence of wolves and black bears). Unit 2 deer hunters harvest does along easily accessible roaded areas. The areas most affected by this local reduction are the same areas where local residents traditionally hunt bucks. However, doe permits are increasing in popularity each year. If federal managers continue to place easy hunter access and other local desires above proper wildlife management techniques, we believe that the future for Unit 2 deer populations is bleak indeed.

Unit 2 residents make up a large part of the decline in deer tags issued in recent years. Statewide about 800 fewer harvest tickets were issued in 2001. Approximately 69% of the statewide decline is accounted for by Unit 2 residents, likely a result of a declining timber industry and shrinking human population in Unit 2.

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).

We will continue cooperative efforts with the US Forest Service to collect baseline data for Unit 2 deer using fixed check stations in fall 2003. These data will complement ongoing predator/prey research and help us measure long-term variation in deer condition in response to habitat changes. Ongoing road improvement projects, paving large sections of POW, and the arrival of new high-speed ferries will increase hunter access and affect deer populations. New and improved access, coupled with the declining deer carrying capacity, requires that we monitor Unit 2 populations more closely in the future.

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Table 1 Unit 2 deer spring pellet-group survey results, calendar years 1984 through 2001

Area	Calendar year	Mean pellet-groups/plot[b]	Number of plots	95% CI
Protection	1997	1.15	332	0.99–1.30
(VCU 527)	1998	0.59	281	0.47–0.71
	2000	0.56	325	0.46–0.66
Calder	1988	2.14	252	1.78–2.49
(VCU 528)	1997	1.17	272	0.97–1.39
	1999	0.48	165	0.31–0.62
Red Bay	1987	0.32	177	0.18–0.47
(VCU 532)	1994	0.94	256	0.74–1.14
	1996	1.19	281	0.97–1.41
	1997	1.07	248	0.89–1.25
	1998	0.73	283	0.59–0.88
	2001	0.76	337	0.61–0.90
Exchange Cove	1988	1.40	266	1.15–1.64
(VCU 539)	1992	1.10	125	0.83–1.38
	1997	1.25	303	1.04–1.46
Sarheen	1989	1.73	310	1.44–2.01
(VCU 549)	1996	1.00	334	0.83–1.16
	1997	1.00	330	0.85–1.14
	1998	0.42	355	0.33–0.51
	1999	0.64	284	0.51–0.78
	2000	0.98	293	0.78–1.17
	2001	0.45	319	0.36–0.55
Sarkar	1988	1.28	298	1.06–1.50
(VCU 554)	1992	0.53	245	0.41–0.66
	1994	0.92	292	0.77–1.07
	1997	0.61	263	0.48–0.74
	1998	0.29	312	0.21–0.37
	1999	0.74	281	0.60–0.88
	2001	0.45	330	0.35–0.55

Table 1 Continued

Area	Calendar year	Mean pellet-groups/plot[b]	Number of plots	95% CI
Warm Chuck	1984	1.02	326	1.02–1.38
(VCU 561)	1985	1.60	295	1.36–1.84
	1989	2.21	302	1.91–2.50
	1991	2.05	291	1.73–2.37
	1996	1.39	276	1.17–1.61
	1997	1.21	247	1.01–1.41
	1998	1.29	246	1.08–1.51
	2000	0.99	288	0.81–1.16
Coronation	1983	1.2	696	1.04–1.36
(VCU 564)	1985	2.34	228	
	1988	1.41	408	1.17–1.66
	1989	1.63	293	1.28–1.98
	1997	0.44	289	0.34–0.55
	2001	0.85	336	0.67–1.03
Baker	1991	0.08	256	0.04–0.12
(VCU 569)	1997	0.14	250	0.08–0.20
Thorne Lake	1992	1.20	334	1.03–1.37
(VCU 575)	1994	0.76	293	0.62–0.91
	1995	1.27	299	1.09–1.45
	1997	0.84	303	0.66–0.96
	1998	0.87	316	0.71–1.03
	1999	1.02	231	0.83–1.21
	2000	1.28	311	1.06–1.50
	2001	0.53	327	0.42–0.63
Snakey Lakes	1986	0.62	279	0.51–0.73
(VCU 578)	1988	1.05	300	0.85–1.26
	1989	1.56	200	1.26–1.86
	1993	0.77	356	0.61–1.32
	1997	1.39	310	1.17–1.60
	1998	0.71	225	0.55–0.87
	1999	0.86	250	0.67–1.05
	2000	1.55	263	1.24–1.86
	2001	0.89	358	0.74–1.03

Table 1 Continued

Area	Calendar year	Mean pellet-groups/plot[b]	Number of plots	95% CI
Luck Lake	1986	1.74	178	1.41–2.07
(VCU 581)	1988	2.11	300	1.80–2.42
	1993	1.10	175	0.87–1.32
	2001	0.60	320	0.47–0.72
Little Ratz	1992	0.94	272	0.76–1.13
(VCU 584)	1997	1.93	255	1.64–2.21
	1998	0.78	282	0.64–0.91
	2000	1.38	304	1.18–1.59
	2001	1.20	287	1.00–1.39
Tuxekan	1988	1.07	300	0.84–1.28
(VCU 587)	1997	1.04	314	0.87–1.22
	1998	0.48	353	0.37–0.58
	1999	1.26	328	1.03–1.49
Twelvemile	1985	0.31	196	019–0.43
(VCU 621)	1986	0.64	300	0.48–0.81
	1987	0.65	370	0.49–0.81
	1988	0.62	302	0.46–0.77
	1989	0.78	235	0.59–0.98
	1990	1.18	176	0.84–1.52
	1991	1.84	231	1.48–2.21
	1992	0.43	250	0.32–0.55
	1993	0.84	258	0.63–1.05
	1994	0.93	324	0.76–1.09
	1997	1.45	202	1.10–1.79
	1998	0.83	280	0.63–1.02
Trocadero	1995	1.74	235	1.41–2.06
(VCU 625)	1997	1.18	235	0.97–1.38
	1998	0.97	267	0.78–1.16
Pt. Amargua	1997	1.04	255	0.83–1.24
(VCU 628)	1998	0.93	325	0.78–1.08
Port Refugio	1985	2.69	317	2.27–3.12
(VCU 635)	1986	2.52	324	2.09–2.96

Table 1 Continued

Area	Calendar year	Mean pellet-groups/plot[b]	Number of plots	95% CI
	1987	1.76	369	1.46–2.07
	1988	1.15	270	0.90–1.40
	1989	0.80	507	0.68–0.93
	1990	1.25	232	1.03–1.48
	1991	1.13	367	0.95–1.32
	1992	0.76	255	0.57–0.95
	1993	1.35	213	0.98–1.71
	1994	1.85	280	1.51–2.19
	1997	0.82	276	0.65–1.08
	1998	0.78	315	0.61–0.96
	2000	0.94	272	0.75–1.13
Kitkun	1988	0.32	240	0.20–1.07
(VCU 679)	1989	0.89	273	0.71–1.07
	1995	0.40	264	0.28–0.52
	1997	0.31	261	0.19–0.44
Nutkwa				
(VCU 685)	1988	0.09	234	0.02–0.16

[a] Value comparison unit

Table 2 Unit 2 deer harvest data, regulatory years 1984 through 2001

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
1984	1910	1210	63	13,070	6.8	1880	1.0	6.9
1985	2025	1373	68	14,182	7.0	3151	1.6	4.5
1986	2233	1538	69	17,505	7.8	2805	1.3	6.2
1987	2481	1845	74	17,709	7.1	3886	1.6	4.5
1988	2124	1415	67	10,668	5.0	2849	1.3	3.7
1989	2132	1397	65	12,315	5.7	2806	1.3	4.4
1990	2149	1445	67	13,566	6.3	3093	1.4	4.4
1991	1664	1142	69	11,985	7.2	2466	1.5	4.9
1992	2046	1416	69	12,337	6.0	3097	1.5	4.0
1993	1986	1394	70	11,860	6.0	2807	1.4	4.2
1994	2019	1412	70	12,140	6.0	2825	1.4	4.3
1995	2143	1496	70	12,887	6.0	3277	1.5	3.9
1996	---	1889	---	---	---	2512	---	---
1997	1779	965	54	11,342	4.8	1883	1.1	6.0
1998	1958	1268	65	10,447	5.3	2492	1.3	4.2
1999	1943	1224	63	12,600	6.5	2550	1.3	4.9
2000	2231	1419	64	13,865	6.2	3023	1.4	4.6
2001	2047	1356	66	13,160	6.4	2865	1.4	4.6
Average	2051	1400	67	13,038	6.2	2793	1.4	4.7

[a] Includes does which were reported killed.

Table 3 Unit 2 deer harvests from major harvest areas, regulatory years 1990 through 2001

Major harvest area	Regulatory year	Nr hunters, expanded	Nr successful hunters, expanded	Percent successful	Total hunter days, expanded	Average days per hunter	Average deer per hunter	Total nr deer killed
9–Outer Islands	1990	62	41	65	100	1.6	0.8	47
	1991	42	30	72	89	2.1	1.2	50
	1992	107	77	72	246	2.3	1.0	107
	1993	55	22	41	203	3.7	0.7	36
	1994	146	124	84	260	1.8	1.4	198
	1995	56	41	73	245	4.4	1.8	102
	1996	---	14	---	---	---	---	14
	1997	45	27	60	127	2.8	0.5	6
	1998	22	17	77	48	2.2	0.9	21
	1999	22	11	50	82	3.7	1.2	27
	2000	71	48	68	140	2.0	1.4	96
	2001	68	58	85	143	2.1	1.4	95

Table 3 Continued

Major harvest area	Regulatory year	Nr hunters, expanded	Nr successful hunters, expanded	Percent successful	Total hunter days, expanded	Average days per hunter	Average deer per hunter	Total nr deer killed
12–Southeast POW Island	1990	264	128	48	847	3.2	0.9	234
	1991	244	121	49	904	3.7	0.7	174
	1992	270	150	56	952	3.5	0.9	247
	1993	336	102	30	1072	3.2	0.5	153
	1994	260	106	41	824	3.2	0.5	140
	1995	279	121	43	919	3.3	0.7	206
	1996	---	135	---	---	---	---	207
	1997	218	74	36	967	4.4	0.6	130
	1998	218	113	52	631	2.9	0.7	156
	1999	183	61	33	464	2.5	0.7	120
	2000	153	75	49	875	5.7	0.7	107
	2001	197	82	42	619	3.1	0.5	97
13–Central POW Island	1990	1100	626	57	6201	5.6	1.2	1271
	1991	849	580	68	5093	6.0	1.3	1129
	1992	1032	645	62	4901	4.7	1.1	1183
	1993	1005	657	65	5248	5.2	1.2	1187
	1994	973	622	64	5560	5.7	1.2	1143
	1995	1092	763	70	5341	4.9	1.3	1423
	1996	---	554	---	---	---	---	912
	1997	723	336	41	3988	5.5	0.8	585
	1998	871	513	59	3574	4.1	1.0	847
	1999	939	562	60	6053	6.4	1.1	1059
	2000	1105	686	62	5868	5.3	1.1	1254
	2001	838	565	67	3964	4.7	1.1	947

Table 3 Continued

Major harvest area	Regulatory year	Nr hunters, expanded	Nr successful hunters, expanded	Percent successful	Total hunter days, expanded	Average days per hunter	Average deer per hunter	Total nr Deer killed
14–North Central	1990	664	343	52	2924	4.5	0.9	568
POW Island	1991	553	275	50	3003	5.4	0.8	448
	1992	639	375	59	2647	4.1	1.0	662
	1993	710	418	59	3076	4.3	10.	690
	1994	570	349	61	3001	5.3	1.1	654
	1995	659	342	52	2501	3.8	1.0	646
	1996	---	351	---	---	---	---	577
	1997	580	332	54	2895	5.0	1.0	601
	1998	658	385	59	2973	4.5	0.9	584
	1999	708	389	55	3353	4.7	0.9	603
	2000	858	443	52	3765	4.4	0.8	706
	2001	621	363	58	3672	5.9	1.0	631
15–North POW Island	1990	538	382	71	2463	4.6	1.3	725
	1991	411	233	57	2016	4.9	1.1	468
	1992	477	297	62	2347	4.9	1.0	470
	1993	382	245	64	1466	3.8	1.0	364
	1994	420	298	71	1797	4.3	1.1	448
	1995	560	351	63	2480	4.4	1.1	640
	1996	---	303	---	---	---	---	500
	1997	414	231	63	1787	4.3	0.8	347
	1998	658	385	59	2973	4.5	0.9	584
	1999	701	389	55	3353	4.8	0.9	603
	2000	509	297	58	2201	4.3	1.1	536
	2001	666	373	56	3100	4.7	1.0	677

Table 4 Unit 2 reported and estimated deer harvest/mortality, regulatory years 1984 through 2001

Regulatory year	Reported harvest			Unreported & illegal harvest[a]	Estimated total harvest	Estimated nr road kills
	Male	Female	Total			
1984	1880	0	1880	1880	3760	unknown
1985	3151	0	3151	3151	6302	unknown
1986	2805	0	2805	2805	5610	unknown
1987	3616	270[b]	3886	3886	7772	20
1988	2846	3	2849	2849	5698	30
1989	2806	0	2806	2806	5612	25
1990	2952	141	3093	3093	6186	25
1991	2343	123	2466	2466	4932	25
1992	3036	61	3097	3097	6194	25
1993	2746	61	2807	2807	5614	25
1994	2762	62	2825	2825	5650	25–30
1995	2957	320[b]	3277	3277	6554	25–30
1996	2378	134	2512	2512	5024	25–30
1997	1724	159	1883	1883	3766	25–30
1998	2404	88	2492	2492	4984	25–30
1999	2352	198	2550	2550	5100	25–30
2000	2792	231	3023	3023	6046	25–30
2001	2736	129	2865	2865	5730	25–30
Average	2683	110	2793	2793	5586	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.

Table 5 Unit 2 Hunter residency and success, regulatory years 1988 through 2001

	Successful				Unsuccessful			
Regulatory year	Local resident[a]	Nonlocal resident	Nonresident	Total	Local resident[a]	Nonlocal resident	Nonresident	Total
1988	748	638	29	1415	242	430	38	710
1989	713	675	9	1397	272	425	38	735
1990	825	583	36	1444	323	351	30	704
1991	632	487	23	1142	224	276	22	522
1992	829	572	17	1418	299	291	38	628
1993	800	582	13	1395	260	294	37	591
1994	773	608	31	1412	231	321	54	606
1995	893	573	30	1496	226	385	37	648
1996	726	599	34	1359	---	---	---	---
1997	569	388	9	966	304	433	71	808
1998	760	501	8	1269	185	385	39	609
1999	502	672	50	1224	279	365	76	720
2000	851	530	38	1419	426	310	77	813
2001	725	586	45	1356	289	330	59	678
Average	739	571	27	1337	274	354	47	675

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

Table 6 Unit 2 deer harvest chronology and hunter transport method, regulatory years 1988 through 2001

Regulatory year	Month of kill							Method of transportation[a]					
	Aug	Sept	Oct	Nov	Dec	Jan	Unk	Airplane	Boat	Foot	Highway vehicle[b]	Other	Unk
1988	895	447	506	888	72	7	34	173	990	547	2875	18	55
1989	729	377	469	1,061	152	12	6	203	815	1042	3276	52	16
1990	1013	470	559	903	135	11	2	207	776	1023	3522	28	0
1991	816	272	470	793	109	5	1	36	771	617	2924	34	9
1992	1256	422	635	696	52	8	28	106	865	1113	3467	54	0
1993	1124	421	368	774	74	24	22	292	753	1082	2723	280	0
1994	911	344	578	916	68	0	8	170	1049	800	2507	68	19
1995	1253	433	553	904	124	0	10	143	666	877	3792	145	11
1996	518	163	165	331	77	6	---	---	---	---	---	---	---
1997	316	142	163	223	33	---	---	91	269	29	1388	0	0
1998	865	356	483	606	68	0	114	79	336	54	1476	5	9
1999	561	437	573	717	117	0	7	59	273	28	1569	4	10
2000	683	443	533	421	69	8	52	91	323	60	1705	44	9
2001	574	325	431	530	29	5	129	99	329	46	1512	56	4
Average	822	361	463	697	84	7	34	135	632	563	2518	61	11

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

Table 7 Unit 2 deer pellet group and harvest data, predator abundance (I_A)[a], and weather severity indices, regulatory years 1981 through 2001

		Harvest data				
Regulatory year	Pellet-group data[b]	Total harvest	Deer kill/ hunter day	Hunter success (percent)	Wolf abundance	Weather index[c]
1981	---	---	---	---	---	6.3
1982	---	---	---	---	---	1.3
1983	1.0	---	---	---	---	1.3
1984	1.8	1880	0.14	63	---	4.7
1985	1.4	3151	0.22	68	---	2.0
1986	1.0	2805	0.16	69	---	2.7
1987	1.2	3886	0.22	74	---	1.7
1988	1.3	2849	0.27	66	---	4.7
1989	1.2	2806	0.23	65	---	1.3
1990	1.3	3093	0.23	67	---	2.3
1991	0.8	2466	0.20	69	59	0.3
1992	1.0	3097	0.25	69	60	3.0
1993	1.1	2807	0.24	70	25[e]	1.7
1994	1.1	2825	0.23	70	37	4.7
1995	1.2	3277	0.25	70	37	2.7
1996	0.9	2512	---	---	37	---
1997	0.8	1265	0.17	70	70	---
1998	0.9	2492	0.24	65	68	---
1999	1.3	2550	0.19	63	72	---
2000	1.1	3023	0.22	64	72	
2001	0.7	2865	0.22	66	70	
Average	1.1	2758	0.2	68	58	2.5

[a] Indices taken from Brand and Keith (1979). $I_A = [(\Sigma R_i - n)/2n] \times 100$ where: R_i = the numerical value assigned to the *ith* response (R_i=1 when population level reported to be scarce, 2 when population level reported to be common, or 3 when population level reported to be abundant).
n = number of trappers that responded. Data derived from 1991–96 Unit 2 trapper questionnaires.
[b] Average number of pellet groups per plot.
[c] Based on weather data collected at Annette Island, Alaska during November–March. Higher indices represent more severe weather conditions.
[d] Extremely wet but snow-free season; pellets may not have persisted as long as in past years.

APPENDIX 1

Deer Check Station Form 2002

Name, hunting license, address, and telephone # are required to enter the raffle

1) Name:_____

2) Hunting License #:_____

3) Address:_____

4) Telephone #:_____

5) Date of Kill (month/day/year):_____

6) Location of Kill:_____

_____

7) WAA#:_____ Minor# _____

8) Area hunted: Alpine Clearcut Muskeg Second Growth Old Growth

9) Antler Points: Left_____ Right_____

10) Antler Beam Diameter: Left_____cm Right_____cm

11) Sex: Male Female

12) Notable Physical Characteristics_____

13) Tooth collected: Yes No

14) How did you get to where you shot the deer?

Vehicle 4-wheeler Snowmobile Walking Other_____

15) How did the number of deer you saw this year compare to last year?

Less this year About the same More this year

16) How many days did you hunt deer in GMU 2 to the nearest ½ day?_____

17) Type of weapon used: Rifle Muzzleloader Bow Shotgun

18) Weight:_____lbs. Please note what is being weighed:

_____

19) Comments/Concerns:

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 PO BOX 25526
JUNEAU, AK 99802-5526

DEER MANAGEMENT REPORT

From: 1 July 2000
To: 30 June 2002

LOCATION

GAME MANAGEMENT UNIT: 3 (3000^2)

GEOGRAPHIC DESCRIPTION: Islands of the Petersburg, Kake, and Wrangell area

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 has 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 (Board) increased this limit to 2 antlered deer in 1988. In 1991 a registration permit hunt with an October 15–31 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 Petersburg and Kupreanof city limits. The Board Board abolished that prohibition in fall 2000.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

As established by the Board during their 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. We measured winter deer densities with spring pellet-group transects in selected areas.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Snow cover in the Petersburg area was below average during the winter of 2000/01 and well above average during the winter of 2001/02. Despite contrasting winter weather conditions each year, pellet counts conducted in 2001 and 2002 revealed increasing trends in all VCU's that had been previously sampled (Table 1). Because winter severity can influence the results of surveys, the observed increasing trends during both mild and severe winters probably provides a reliable assessment of deer densities and population trends.

In spring 2001, pellet-group counts were conducted in 2 Unit 3 VCU's, including 3 newly established transects (one VCU) on Etolin and Brownson islands. Fool's Inlet (Wrangell Island) 2001 counts were .61 pellet-groups/plot, up slightly from .54 in 1994. Three new transects were established at Fisherman's Cove on Etolin and Brownson islands in 2001 and produced a mean of 2.84 pellet-groups/plot.

In spring 2002 pellet-group counts were conducted in 7 Unit 3 VCU's, including 6 newly established transects in 3 VCU's on Zarembo Island. East Duncan Canal counts were 1.80 pellet-groups/plot, up considerably from 1.04 in 1998, and the highest since transects were started there in 1990. Woewodski (South Mitkof) counts were 1.43 pellet-groups/plot, a slight increase from 1.27 in 2000. Snow Pass (Zarembo Island) counts were 1.50 pellet-groups/plot, up from .98 in 1997. The Onslow (southern Etolin and Onslow islands) counts were .97 pellet-groups/plot, up slightly .73 in 1997. The new VCU's on Zarembo Island sampled in 2002 revealed high variability in pellet count densities across the island. At Baht Harbor, St. John Harbor, and Meter Bight counts were 2.75, 1.67, and .87 pellet-groups/plot, respectively.

MORTALITY

Harvest

Season and Bag Limit	Resident and Nonresident Hunters	
Unit 3, Mitkof Island, Kupreanof Island on the Lindenberg Peninsula east of Portage Bay–Duncan Canal portage, and Woewodski and Butterworth islands	Oct 15–Oct 31	1 antlered deer
Remainder of Unit 3	Aug 1–Nov 30	2 antlered deer

Board of Game Actions and Emergency Orders. At their fall 2000 meeting, the Board abolished a regulation prohibiting deer hunting within the Petersburg and Kupreanof city limits. No emergency orders were issued during the report period.

Hunter Harvest. Deer hunter effort and harvest changed little before 1991 (Table 2). Hunter survey data for 1991–2001 includes Mitkof Island, which is primarily responsible for increases in both hunter numbers and kill. The unitwide 2000 harvest of 1020 deer was the second largest since the record 1998 harvest of 1119 deer. The Zarembo Island harvest of 430 was the highest ever. In 2001 the harvest decreased to 853 deer, but remained above the 10-year average of 773. Zarembo Island provided 426 deer or about 50% of the unitwide harvest.

Hunter Residency and Success. Few nonresidents hunt deer in Unit 3 and most hunters are local residents (Table 3). Nonresidents comprised just .4% and 2%, respectively, of all Unit 3 deer hunters in 2000 and 2001. The total number of hunters increased slightly from 1201 in 1999 to 1220 in 2000, and then decreased to 1012 in 2001. The success rate was 48% in 1999 and 49% in both 2000 and 2001. Deer populations are greater and seasons and bag limits more liberal in other nearby units, attracting most nonlocal hunters to those areas.

Harvest Chronology. Table 5 shows the Unit 3 deer harvest percentage by month. As in the past, most deer harvest during the report period took place during October, November, August, and September. One hunter reported taking a deer in January during the closed season. The relatively high number of October kills from 1991–2001 coincides with the deer season on Mitkof, Butterworth, and Woewodski islands, and the Lindenberg Peninsula on Kupreanof Island.

Transport Methods. From 1995–1997 most hunters used boats to access their hunting areas. During 2000–2001 most deer hunters, 52% and 56% respectively, used highway vehicles to access hunting areas. The increase in the use of highway vehicles and decrease in boat use in 1991–1997 reflect effort on Mitkof Island and the Lindenberg Peninsula, Kupreanof Island (Table 4).

Other Mortality

Between 1997 and 1998 the US Forest Service radio-collared 51 deer (14 bucks and 37 does) on Mitkof Island. Of the total, 12 (24%) were still alive in December 2002, 36 (71%) were confirmed mortalities, and the status of 3 (6%) was unknown. Of the 36 documented mortalities, 15 (42%) died by wolf predation, 10 (28%) by legal hunters, 2 (6%) by vehicles, 2 (6%) by poachers, 2 (6%) by starvation or natural causes, and 5 (14%) by unknown causes.

CONCLUSIONS AND RECOMMENDATIONS

Unit 3 deer populations are stable and increasing with localized variations. Pellet-group surveys in spring 2001 and 2002 showed increasing trends in all previously sampled areas. Winter weather, predation, and clearcut logging have the greatest effects on deer population dynamics. 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 spring pellet-group surveys, 1981–2001

Area	Calendar 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 (VCU 427)	1994	.38	300	0.29–0.48
Rocky Pass (VCU 428)	1989	.40	298	0.27–0.53
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
	1999	2.00	427	1.74–2.26
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
	1999	2.84	123	2.28–3.40
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
	1998	.36	281	0.28–0.44

Table 1 Continued

Area	Calendar 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
	2002	1.80	254	1.59–2.19
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
	2002	1.43	220	1.17–1.68
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
Blind Slough	1990	1.35	324	1.15–1.56
(Central Mitkof)	1992	1.04	114	0.77–1.30
(VCU 452)	1993	1.28	265	1.04–1.51
	1997	1.61	245	1.34–1.88
Dry				
(VCU 454)	1981	.92	91	0.56–1.28
	1993	1.44	210	1.17–1.72
	1997	1.26	188	0.88–1.39

Table 1 Continued

Area	Calendar year	Mean pellet-groups/plot	Nr plots	95% CI
Vank Island Group (VCU 455)	1981			
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 (VCU 456)	2002	2.75	109	2.10–3.41
St. John (VCU 457)	2002	1.67	220	1.38–1.93
Snow Passage (VCU 458)	1994	.57	345	0.45–0.70
	1997	.98	315	0.80–1.16
	2002	1.50	280	1.28–1.72
Meter (VCU 459)	2002	0.87	180	0.64–1.10
Woronkofski (VCU 461)	1985	1.63	646	1.45–1.81
(All Transects)				
(Trans. 10, 11, 12)	1985	2.01	218	1.62–2.39
	1987	2.23	201	1.85–2.61
	1989	2.52	223	2.18–2.85
	1991	1.59	203	1.32–1.85
	1993	.22	225	0.13–0.31
	1994	.26	224	0.18–0.34
	1999	.11	216	0.06–0.17
Mosman (VCU 467)	1993	.07	304	0.03–0.11

Table 1 Continued

Area	Calendar Year	Mean pellet-groups/plot	Nr plots	95% CI
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
	2002	.97	332	0.81–1.13
Fool's (VCU 480)	1994	.54	193	0.38–0.70
	2001	.61	201	0.45–0.77
Canoe (VCU 474)	2001	.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 deer harvest, 1990–2001

Regulatory year	Estimated legal harvest						Estimated illegal harvest	Total[a]
	M	(%)	F	(%)	Unk.	Total		
1990	228	(100)			0	228	22	250
1991	381	(100)			0	381	30	411
1992	581	(100)			0	581	57	638
1993	619	(100)			0	619	51	670
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	1005	(100)			0	1005	114	1119
1999	862	(100)			0	862	70	932
2000	984	(100)			0	984	36	1020
2001	853	(100)			0	853	0	853

[a] Data from mail questionnaire survey.

Table 3 Unit 3 deer hunter residency and success, 1990–2001

Successful						Unsuccessful					
Regulatory year	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Total[b] hunters
1990	131	43	0	174	(51)	145	18	2	165	(49)	339
1991	278	22	0	300	(49)	282	19	5	306	(51)	606
1992	428	45	0	473	(48)	468	46	0	514	(52)	987
1993	422	51	2	475	(45)	492	72	5	569	(55)	1044
1994	457	33	4	494	(44)	488	101	3	592	(55)	1086
1995	569	28	6	603	(58)	386	47	0	433	(42)	1036
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)	1108
1998	612	48	17	677	(59)	419	32	17	468	(41)	1145
1999	500	68	5	573	(48)	563	56	9	628	(52)	1201
2000	513	90	0	603	(49)	526	86	5	617	(51)	1220
2001	435	48	10	493	(49)	459	45	15	519	(51)	1012

[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 hunter effort percent by transport method, 1990–2001[a]

Regulatory year	Percent of effort							Number of trips
	Airplane	Boat	3- or 4-wheeler	Foot	ORV	Highway vehicle	Other	
1990	4	60	0	14	0	21	1	708
1991	1	41	1	12	3	43	0	1227
1992	1	32	4	11	1	50	1	1861
1993	2	44	2	10	4	36	2	1835
1994	1	33	4	13	2	46	1	2204
1995	1	42	5	13	4	34	1	2140
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

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

Table 5 Unit 3 deer harvest chronology percent by month, 1990–2001

Regulatory year	Harvest periods									Total[a] nr. deer
	August	September	October	November	December	January	February	April	Unk.	
1990	36	10	24	25	4	0	0	0	0	250
1991	15	11	53	21	0	0	0	0	0	410
1992	9	11	63	16	0	0	0	0	0	639
1993	21	6	45	24	1	2	0	0	0	671
1994	16	4	47	31	1	1	0	0	0	691
1995	29	7	41	23	0	0	0	0	0	866
1996	14	7	43	21	1	0	0	0	14	588
1997	20	10	35	26	0	1	0	0	8	780
1998	13	7	41	31	1	1	1	1	4	1118
1999	15	9	36	33	1	0	1	0	5	932
2000	13	9	39	30	0	0	0	0	9	1020
2001	13	14	50	18	0	1	0	0	4	853

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

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DEER MANAGEMENT REPORT

From: 1 July 2000
To: 30 June 2002

LOCATION

GAME MANAGEMENT UNIT: 4 (5820 mi^2)

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

BACKGROUND

Game Management Unit 4 (Unit 4) continues to provide the majority of the deer hunting opportunity in Southeast Alaska. During 2001–02, Unit 4 accounted for 43% of the region's hunter effort and 62% of the deer harvest (Paul and Straugh 2002).

Significant changes in deer density 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 heavy winter mortality. By 1956 deer increased to exceed carrying capacity (Klein and Olson 1960). In recent history severe winters appear to be on a 10-year cycle, with intervening mild winters. Most winters in Unit 4 were mild from the mid-1970s through 1987–88, with high survival of fawns and adult deer. However, during the winters of 1988–89 through 1990–91, persistent snow caused significant deer mortality. During the winters of 1994–95 and 1998–99, many fawns died, but these appear to be relatively minor setbacks. Winters of 1999–2000, 2000–01, and 2001–02 were mild, with apparent recovery of deer populations.

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 regrowth 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 2 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 their fall 2000 meeting in response to the Intensive Management law, 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 some previously established trend areas during spring.

We mailed a harvest questionnaire to a sample of hunters with deer harvest tickets to assess hunter effort and success (Paul and Straugh 2001, 2002). We asked hunters to supply information on hunting effort, kills, months hunted, and kill locations on an area-specific basis.

During winter 1998–99, 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 a 40-mile boat route was 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.

Although no formal investigations were conducted regarding parasites in deer, several animals were inspected during the course of this reporting period. Incidence of lungworm (*Dictyocaulus viviparous*) and ectoparasite occurrence were noted.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Pellet group surveys indicate Unit 4 Sitka black-tailed deer populations probably declined in spring 1999 due to deep and long-lasting snows. Declines were probably greater in the eastern parts of the unit (notably Admiralty Island). Although pellet group surveys still indicated lower deer populations during spring 2000 in most areas (Table 1), I assume this is a reflection of the fact that deer were not restricted to typical winter range during the preceding winter.

During winters 1999–2000 and 2000–01, deer were not apparently nutritionally stressed. Winter 2001–02 was relatively mild, but the snowpack persisted in higher elevations well into June, and minor starvation mortality probably occurred.

Habitat quality and winter severity vary significantly throughout the unit because of local climatic factors, topography, and the extent of logging activities. Eastern portions of the unit generally experience greater snow depths and sustain higher winter mortality. Areas logged before 1970 are now 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 (Table 1) generally reflect an increasing deer population. This is undoubtedly a reflection of deer being subjected to relatively light to moderate winter snow conditions with only minor starvation mortality. Evaluation of the deer population status for management purposes should continue to be based on a variety of indicators, including pellet group surveys, hunter contacts, field observations, harvest questionnaires, and mortality transects.

Population Size

Deer pellet group surveys conducted during spring 2001 and 2002 indicated a slight increase in deer numbers (Table 1) (Kirchhoff 2001, 2002). This technique alone 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 (such as 1998–99 and 1999–00), wintering deer may be scattered over wide areas or at elevations above transect boundaries.

Population Composition

The sex composition of the legal kill (Table 2) was estimated from deer harvest questionnaires (Paul and Straugh 2001, 2002). Extrapolations of hunter reports indicated a 2001–02 estimated take of approximately 5337 bucks (72%, Table 2). Hunters took an estimated 5300 (72%) bucks during 2001–02. There remains a strong tendency for hunters to select bucks, even though the September 15–December 31 either-sex season (the federal season goes through January) has been in effect for many years.

Distribution and Movements

No information.

MORTALITY

Harvest

Season and Bag Limit.	Resident and Nonresident Hunters	
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.	Aug 1–Dec 31	3 deer; however, antlerless deer may be taken only from September 15–December 31.
Remainder of Unit 4	Aug 1–Dec 31	4 deer; however, antlerless deer may be taken only from September 15–December 31.

Board of Game Actions and Emergency Orders.

At the November 2002 meeting the Board of Game made no changes to existing deer hunting regulations for Unit 4.

Hunter Harvest. Extrapolations of responses from the hunter harvest indicated there were 2421 and 2704 successful deer hunters in Unit 4 during the 2000–01 and 2001–02 seasons, respectively (Table 3). These numbers indicate relatively stable hunter effort, continuing a trend observed over the past 10 years.

In 2000–01 hunters reported killing 5900 deer. In 2001–02 the reported kill was 7500 deer. Crippling loss, unreported kills, and illegal kills are difficult to accurately determine, but are estimated at about 25% of the reported harvest (Table 2). Based on these estimates, the total hunter-related deer mortality was estimated to be about 7400 deer in 2000–01 and 9400 during the 2001–02 season. The harvest is slightly above our estimates during the previous reporting period (Whitman 2001).

Hunter Residency and Success. During 2001–02 a total of 1199 successful hunters residing in Unit 4 harvested an estimated 4001 deer (2.6 deer/successful hunter) (Table 3). Nonresident hunters made up 2.0% of the Unit 4 hunters during 2001–02, a slight increase over previous years. Alaska residents from other than Unit 4 made up most of the nonlocal hunters (56% in 2001–02). During the 2001–02 season, 57% of nonresidents, 79% of Unit 4 residents, and 74% of nonlocal Alaska residents were successful at taking at least 1 deer.

Harvest Chronology. Most hunters continue to be in the field during November, resulting in the greatest single-month harvest. During the 2001–02 season, the November harvest

accounted for 2739 deer, or 37% of the harvest (Table 4). December generally provides the next highest deer harvest from Unit 4. The federal season in January generally results in about 5–6% of the reported annual harvest, but is variable depending on amount of snowfall.

Transport Methods. Deer hunter transportation type remains almost identical with past years (Table 5). During 2001–02 boats were used for 67% of the harvest, while 12% of the hunters used airplanes, 4% walked from their respective residences, 15% used highway vehicles, and 2% used an off-road vehicle (3- or 4-wheeler). Transport methods have changed little since the 1988–89 season when data were first collected.

Other Mortality

Unlike the previous report period, starvation mortality due to severe winters had little effect on Unit 4 deer during this reporting period. Data were collected on low-elevation mortality transects during spring, indicating that winter mortality was negligible in spring 2001 and 2002.

During March 2002, three boat surveys were completed along a 40-mile stretch of beach north of Sitka in an effort to quantify physical condition of wintering deer. During those surveys, 55 deer were classified according to the following scale:

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.

Results of the survey indicate that deer wintering at low elevations in the area were in relatively good shape during spring 2002. Mean condition of deer seen during this survey was 3.95. This compares to a mean condition index of 3.5 calculated from deer in the same area during late March 1999 (Whitman 2001). This survey was designed to provide an objective way to assess relative condition of wintering deer. As such it appears to hold promise as a method of monitoring and documenting declines during severe winters.

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. We examined 5 sets of deer lungs (3 females, 2 males) during this reporting period. Two of those (40%) were found to have adult lungworms, and all infestations were judged to be relatively light. Incidental examinations of additional deer indicates 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 further. I suspect that although *D. viviparous* is ubiquitous within the deer population, they only become a problem when deer become nutritionally stressed in conjunction with severe winter weather.

Nasal bots (*Cephenemyia jellisoni*) have been previously documented in Unit 4 deer (Whitman 2001) but their incidence is relatively low. No further parasite examinations for ticks (*Dermacentor*) or sucking lice (*Tricholipeurus lipeuroides*) were conducted during this reporting period. At least two Sitka black-tailed deer heads were collected and submitted for chronic wasting disease (CWD) testing, but results are not yet available. I have no reason to suspect that CWD occurs in Unit 4 deer.

HABITAT

Assessment

No data were collected.

Enhancement

No habitat enhancement projects were conducted.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

None.

CONCLUSIONS AND RECOMMENDATIONS

All management objectives were met during both seasons. The average kill during 2001–02 was 2.1 deer per successful hunter, with bucks comprising 72% of the reported harvest.

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. Therefore, illegal take and wounding losses are currently estimated at 25% above the legal kill. Although deer densities are high throughout most areas, they remain below carrying capacity in easily accessible areas because of high hunter harvest. Predation mortality is probably negligible in most of the unit. I suspect that the extent of the harvest under federal "designated hunter" stipulations is grossly under-reported.

A major management concern continues to be the diverging hunting regulations promulgated by the Federal Subsistence Board and the State Board of Game. Different regulations for separate groups of hunters using the same resource make enforcement difficult, confuse hunters, and lessen the credibility of management agencies. In addition, conflicting regulations may make management of the resource more difficult in the future. Wherever possible the division should assist the 2 regulatory entities in standardizing deer hunting regulations.

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

ACKNOWLEDGEMENTS

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Whitman, J. S. 2003. Unit 4 deer management report. Pages 72–85 *in* C. Healy, editor. Deer management report of survey and inventory activities 1 July 2000–30 June 2002. Alaska Department of Fish and Game. Juneau, Alaska.

Table 1 Unit 4 deer population trends as indicated by pellet group surveys, 1985–2002

Area	Calendar year	Mean pellet groups/plot	Number of plots
128 – Hawk Inlet	1986	1.92	286
	1987	2.54	278
	1989	1.82	334
	1990	2.19	250
	1992	1.61	319
	1996	1.26	325
	1999	1.25	176
	2002	1.17	183
171– Hood Bay	1987	2.31	358
	1989	1.77	366
	1990	1.85	375
	1992	1.91	360
	1994	1.64	371
	2000	1.04	349
182 – Pybus Bay	1986	2.00	235
	1987	2.03	242
	1989	2.00	156
	1990	1.72	221
	1992	1.13	236
	1995	1.48	205
	1998	1.37	256
185 – Pleasant Island	1991	1.38	311
	1992	1.34	210
	1993	1.77	305
	1994	1.26	345
	1999	1.82	223
	2002	1.96	351
189 – Port Althorp	1988	1.80	195
	1991	1.92	223
	1992	1.36	261
	1993	1.39	248
	1994	1.31	253
	1995	2.12	98
	1998	1.48	281
	2001	1.82	225
190 – Idaho Inlet	1988	1.34	258
	1992	0.94	219
	1993	0.56	305
	1994	0.71	294
	1998	1.11	273
	2001	0.95	308

Table 1 Continued

Area	Calendar year	Mean pellet groups/plot	Number of plots
202 – Port Frederick	1988	1.87	242
	1996	1.02	226
209- Suntaheen Creek	1988	1.22	272
	1992	1.13	271
	1993	0.73	265
	1994	1.05	272
	1996	0.98	276
	1999	1.02	112
	2002	1.35	218
218 – Pavlof River	1988	1.78	325
	1992	1.56	341
	1996	1.50	249
	1999	2.24	213
	2002	2.48	249
223 – Upper Tenakee	1988	1.47	253
	1992	0.59	265
	1993	0.47	249
	1994	0.61	319
	1996	0.56	263
231 – Saltery Bay	1988	2.02	256
	1992	0.97	256
	1993	0.76	227
	1994	0.97	193
	1996	1.90	152
	1997	1.99	170
235 – Kadashan	1988	2.67	221
	1992	1.63	282
	1993	1.12	385
	1994	1.39	294
	1996	2.36	204
236 – Corner Bay	1981	0.35	60
	1992	2.27	206
	1993	1.72	50
	1994	1.69	198

Table 1 Continued

Area	Calendar year	Mean pellet groups/plot	Number of plots
247 – Finger Mountain	1987	3.11	236
	1989	2.99	305
	1990	3.36	225
	1991	3.93	150
	1992	2.85	207
	1993	3.03	179
	1994	2.29	275
	1996	2.62	221
	1999	3.04	169
	2000	2.87	217
	2002	2.99	162
254 – Soapstone	1988	1.92	274
	1991	2.05	270
	1993	1.88	243
	1994	1.34	310
	1995	1.48	283
	2001	1.94	246
300 – Nakwasina	1987	2.31	195
	1989	2.32	244
	1990	2.99	255
	1991	3.98	175
	1992	1.64	223
	1993	3.15	188
	1994	1.46	230
	1995	1.75	216
	1996	2.82	210
	1997	2.79	200
	1998	2.99	217
	1999	3.20	146
	2000	2.64	181
	2001	2.33	186
	2002	2.38	132
305 – Sea Lion Cove	1987	3.31	226
	1989	1.75	303
	1990	2.03	227
	1991	1.63	219
	1992	1.30	239

Table 1 Continued

Area	Calendar year	Mean pellet groups/plot	Number of plots
	1994	1.29	221
	1995	1.30	210
	1996	1.63	225
	1998	1.71	241
	2000	1.42	201
	2001	1.41	231
	2002	2.01	119
308 – South Kruzof	1993	1.62	345
	1994	1.71	370
	1999	1.38	365
339 – Cape Ommaney	2000	1.26	270
344 – Whale Bay	2000	1.40	260
348 – West Crawfish	2000	1.34	211

Table 2 Unit 4 deer harvest, 1997/98–2001/02

	Estimated legal harvest[a]						Estimated illegal	
Regulatory year	M	(%)	F	%	Unk	Total	harvest[b]	Total
1997/98	4,300	(68)	2,000	(32)		6,300	1,580	7,880
1998/99	3,400	(72)	1,300	(28)		4,700	1,200	5,900
1999/00	4,800	(71)	2,000	(29)		6,800	1,700	8,500
2000/01	4,500	(76)	1,400	(24)		5,900	1,500	7,400
2001/02	5,350	(72)	2,100	(28)		7,450	1,850	9,300

[a]From mail questionnaire.

[b]Includes crippling loss estimate.

Table 3 Unit 4 deer hunter residency and success, 1997/98–2001/02

Regulatory year	Successful				Unsuccessful				Total nr hunters
	Local resident	Nonlocal resident	Nonresident	Total	Local resident	Nonlocal resident	Nonresident	Total	
1997/98	1215	1108	14	2337	513	732	28	1273	3610
1998/99	1296	1308	25	2629	301	616	13	930	3559
1999/00	1238	1217	63	2518	387	654	59	1100	3618
2000/01	1093	1310	16	2419	499	808	39	1346	3765
2001/02	1187	1477	40	2704	318	529	30	877	3581

Table 4 Unit 4 deer harvest chronology, 1997/98–2001/02

Regulatory year	Harvest periods												Total harvest
	August	(%)	September	(%)	October	(%)	November	(%)	December	(%)	January	(%)	Other	
1997/98	327	(5)	564	(9)	1196	(20)	2246	(37)	1337	(22)	358	(6)	234	6262
1998/99	433	(6)	808	(11)	1501	(20)	2605	(34)	1304	(17)	568	(7)	376	7595
1999/00	270	(4)	383	(6)	867	(13)	2731	(40)	1711	(25)	374	(6)	425	6761
2000/01	467	(8)	577	(10)	1297	(22)	2216	(38)	847	(14)	147	(2)	352	5905
2001/02	351	(5)	612	(8)	1318	(18)	2739	(37)	1607	(22)	370	(5)	461	7458

Table 5 Unit 4 deer harvest, percent by transport method, 1997/98–2001/02

	Percent of harvest						Number
Regulatory year	Airplane	Foot	Boat	ORV	Highway vehicle	Unknown	of hunters
1997/98	9	3	68	6	14	0	3610
1998/99	11	3	72	3	11	0	3559
1999/00	12	3	69	3	13	0	3618
2000/01	12	1	63	5	18	0	3765
2001/02	10	3	72	3	13	0	3582

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DEER MANAGEMENT REPORT

From: 1 July 2000
To: 30 June 2002

LOCATION

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

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

BACKGROUND

Deer were introduced to Yakutat Bay islands in 1934, when 7 does and 5 bucks were released (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 climactic conditions and limited habitat.

Due to deer declines in the 1970s and a virtual cessation of harvest, the Unit 5 season was closed in July 1980. By the end of the 1980s deer had recovered to some degree, and public requests for an open season were heard. In 1991 the Board of Game (Board) 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 12,138 deer harvest tickets were issued for the 2000 regulatory year (RY) for all of Southeast Alaska and 11,338 for RY 2001. About one third of the region's harvest ticket holders were mailed a hunter survey in each of the 2 years within the report period; 62% responded. 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. Since 1984 Unit 5A pellet-group surveys have been conducted to gauge deer population trends. US Forest Service crews usually perform this work. Pellet transects were conducted on three Yakutat islands during 2001, and on two islands in 2002.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Deer populations remain low in the Yakutat area. Limited habitat and heavy snow accumulations on the mainland prevent deer from increasing significantly, but some Yakutat Bay islands continue to support deer. Reports from local hunters, fishermen, and others indicate that wolves have preyed significantly on deer.

MORTALITY

Harvest

Season and Bag Limit	Resident and Nonresident Hunters
Unit 5A	Nov 1–Nov 30:1 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, there were no deer killed in 2000, and only 4 taken in 2001 (Table 2). Hunter effort varied considerably between the 2 years, with only 4 hunters expending 9 days of effort in 2000, and 26 hunters spending 34 days afield in 2001. Because these figures are expanded from the hunter survey, significant error is possible due to low effort and harvest in this area.

Illegal Harvest. Anecdotal information collected from both Alaska Department of Fish and Game and US Forest Service employees stationed in Yakutat suggests the illegal harvest of deer exceeds the legal harvest. The illegal harvest method of choice seems to be spotlighting deer on beaches from skiffs.

Hunter Residency and Success. Since 1991 virtually all Unit 5A hunters have been local residents. This held true in 2000, although in 2001 six of 26 hunters were nonlocal, based on expanded survey results, numbers we believe to be an artifact of expansion error. Because limited habitat supports low densities of deer, it is unlikely that nonlocal hunters would choose to pursue deer in Unit 5.

Transport Methods. All hunters reported using boats for hunting access. 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. Habitat conditions, predation, and deep snow will prevent this population from ever growing significantly. Local trapping effort reduces some wolf predation on deer. Pellet transect data should continue to be collected to monitor deer population trends The importance of deer to the community of Yakutat seems to be a distant 3rd to moose and

mountain goats. Most deer are taken incidentally by people who happen to detect an animal on the beach while they are conducting other activities. The small harvest has little effect on the population because hunting mortality is compensatory to wolf predation or winterkill. Closure of the state hunt should be considered as a management option if pellet transects and harvest data indicate a need for such action.

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Table 1 Unit 5A deer population trends as indicated by spring pellet group surveys, 1991 through 2001

Area	Calendar year	Mean pellet groups/plot	Number of plots	95 % CI
Knight Island (VCU 361)	1991	0.81	100	0.61–1.01
	1992	0.95	100	0.74–1.16
	1994	0.44	90	0.25–0.64
	1996	0.00	153	0.00–0.00
	1997	0.03	192	0.01–0.05
Humpback (VCU 363)	1991	0.01	118	0.00–0.03
Yakutat Islands (VCU 368)	1991	0.32	415	0.24–0.39
	1992	0.48	243	0.37–0.58
	1993	1.07	106	0.81–1.32
	1994	0.66	251	0.52–0.80
	1996	0.59	379	0.48–0.69
	1997	0.59	344	0.48–0.70
	2000	0.90	145	0.85–0.95
	2001	0.66	200	NA
Ankau (VCU 369)	1991	0.03	116	0.00–0.05

Table 2 Unit 5A annual deer harvest[1], 1991 through 2001

Regulatory year	Males	Females	Estimated total
1991	2	0	2
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

[1] Data from expanded results of hunter surveys.

Table 3 Unit 5A deer hunter residency and success, regulatory years 1991 through 2001

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	(6)	34	0	0	0	(94)	36
1992	0	0	0	0	(0)	15	0	0	0	(100)	15
1993	3	0	0	0	(14)	19	0	0	0	(86)	22
1994	5	0	0	0	(21)	15	4	0	0	(79)	24
1995	7	0	0	0	(32)	15	0	0	0	(68)	22
1996	0	0	0	0	NA[b]	NA	NA	NA	NA	NA	NA
1997	0	5	0	0	(17)	19	0	5	0	(83)	29
1998	5	0	0	0	(17)	24	0	0	0	(83)	29
1999	0	5	0	0	(25)	15	0	0	0	(75)	20
2000	0	0	0	0	(0)	4	0	0	0	(100)	4
2001	4	0	0	0	(15)	16	6	0	0	(85)	26

[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 2001

Regulatory year	Number of hunters	Number of days hunted	Nrumber 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	18.2
1998	29	92	5	.2	19.0
1999	20	30	5	.3	6.0
2000	4	9	0	0	0
2001	26	34	4	.2	8.4

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DEER MANAGEMENT REPORT

From: 1 July 2000
To: 30 June 2002

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 (Fig 1., 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, and early 1970s (Reynolds 1979).

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). Primary winter forage includes *Cornus canadensis*, *Rubus pedatus*, and *Coptus* spp. until deeper snows necessitate a change from forbes to *Vaccinium ovalifolium.* Predation is minimal because there are few wolves and coyotes off the mainland. A change in these conditions could significantly influence the deer population.

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.

Clearcut logging of old-growth forest on private land in PWS has been the most important deer management concern in Unit 6, though currently there are no large-scale logging operations. Research and annual pellet-group surveys have repeatedly demonstrated the importance of old-growth forest for overwinter survival of deer in coastal ecosystems in PWS (Shishido 1986) and in southeastern Alaska (Kirchhoff 1983 and 1992, Schoen et al. 1985, Schoen 1978, Kirchhoff and Schoen 1987 and Kirchhoff and Pitcher 1988). During the 1990s, private landowners clearcut large areas on Montague Island, Port Fidalgo, and eastern PWS. The *Exxon Valdez* Oil Spill (EVOS) Trustee Council acquired (by fee simple title and conservation and timber easements) about 205,000 acres of land in eastern PWS. However, most of the habitat conserved was on the mainland where deer occur in low numbers.

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

ADF&G and the U.S. Forest Service cooperated to monitor 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). I added 2 additional locations to annual surveys beginning in 2000–01 (Naked Is. and Bay of Isles on Knight Is.) to monitor the western PWS population after the road to Whittier opened. Each location had 3–5 transects consisting of a straight line of 1 x 20 m 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 upon the distance from the beach to the alpine and upon persistence of snow during the survey. 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. Within each location, we first tested means for a time-series correlation or other covariate structure, using a repeated measures analysis (Earl Becker, personal communication). Once a significant year effect was detected at a location, we used Fisher's Protected LSD test to determine which years were different (at $P<0.05$) from one another. 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). I used an annual snow index (Nowlin 1997) to predict whether pellet-group density reflected current population density, or a lag existed because of late-season mortality that would appear in the spring survey of the following year.

We estimated deer harvest from responses to questionnaires mailed to deer hunters who were issued harvest tickets in Southcentral Alaska. Each year, staff mailed approximately 3000 questionnaires (30% of harvest ticket holders) and had a questionnaire response rate of 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 2).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Based on pellet group densities, deer density in PWS was primarily moderate during the reporting period (Table 1). Highest density occurred on Hawkins Is. and lowest on Knight Is. (Table 1). Overall density was higher during 2001–02 compared to 2000–01.

Deer numbers increased during this reporting period following a severe decline during the late 1990s. Record-high MPGPs and harvest during 1998 indicated the population was at a high density after 5 years of relatively mild winters (Fig 3). The population declined during the severe winters of 1998–99 and 1999–00 (Fig 3). MPGP decreased by 54% from 1997–98 to 1999–00 (Table 1). The trend was reversed during the mild winter of 2000–01 and continued upward during 2001–02.

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.

Shishido (1986), using radiocollared deer on Hinchinbrook Island, determined that deer tended to make seasonal, elevational movements within a single watershed, with timing of movements controlled by 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 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. Marking efforts reported Reynolds (1979) and Shishido (1986) 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. Despite small sample sizes in deer-tagging studies, Shishido (1986) and Reynolds

(1979) each reported 1 deer that had traveled 13–14 km from where they were marked. Schoen and Kirchhoff (1984) also tracked a similar movement (13.6 km) by 1 radiocollared deer in Southeast Alaska and determined that it had dispersed from its natal watershed.

MORTALITY

Harvest

Season and Bag Limit. The open season for resident and nonresident hunters was 1 August to 31 December. The bag limit was 5 deer; however, antlerless deer could be taken beginning 1 October.

Board of Game Actions and Emergency Orders. The Board of Game changed the bag limit from 4 deer to 5 beginning in 1999–00. The Board also identified the deer population in Unit 6 as being important for high levels of human consumptive use under 5 AAC 92.106. There were no regulatory changes or emergency orders issued during this reporting period.

Hunter Harvest. Total estimated deer harvest reported in Unit 6 during 2000–01 and 2001–02 was 1697 and 2641, respectively (Table 2). The low harvest during 2000–01 was a result of high deer mortality from the previous 2 severe winters (Fig 3). As during past years, most harvest came from Montague Island. Northern and eastern PWS had the lowest harvests. The reported legal harvest consisted of 62% males during 2000–01 and 63% males during 2001–02.

The opening of the road to Whittier during June 2000 has had little impact on deer harvest in western PWS (Table 2). The average number of deer harvested during the 2 seasons following the opening of the road was 3% less than the 5-year average before the road opened. The average harvest throughout Unit 6 was 5% less during the same period. Autumn weather and sea conditions in PWS limits access by hunters using small boats.

Hunter Residency and Success. Approximately 1260 individuals hunted deer in Unit 6 during 2000–01 and 54% succeeded. In 2001–02, 1470 individuals hunted deer in Unit 6 and 64% succeeded. Total numbers of hunters was lower than average during 2000–01 because of reduced numbers of deer.

Nonlocal residents represented 66% and 54% of successful hunters during this reporting period. Local residents on average killed 1.9 deer per hunter compared to 1.3 deer per hunter for nonlocal residents. These proportions were similar to those in previous years.

Harvest Chronology. Hunters killed most deer during November (Table 4). Deer were easiest to hunt during November because the bag limit was any deer, the rut was in progress, and deer were present at lower elevation because of snowfall.

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

Other Mortality

We observed 2 winter mortalities along pellet group transects in spring 2002 and none in 2001, which was typical during most previous years. After the severe winter of 1998–99 we found 6 winter mortalities. Pellet group surveys indicated an overall loss of 54% of the deer in PWS to winter starvation during the 2 winters of 1998–2000 (Table 1).

HABITAT

Snow Depth and Duration

Although snowfall was heavy during 2001–02 (Fig 3), it was limited to 1 week in February and followed by unusually clear weather. The resulting snow pack was soon hard enough for deer to walk on without sinking, which did not restrict deer to limited beach habitat as occurred during other severe winters. Nowlin (1997) demonstrated that the snow index (SI) followed deer population trends. Higher SIs resulted during years when the population decreased and low SIs were marked by years of population recovery and growth. This reporting period had 1 lower and 1 higher than normal SI and an increasing deer population.

CONCLUSIONS AND RECOMMENDATIONS

We achieved our objectives to maintain a deer population capable of sustaining an annual harvest of 1500 deer with a minimum hunter success rate of 50%. The deer population increased because of low winter mortality.

Pellet-group surveys, snow indices, and hunter questionnaires were effective tools to monitor and manage deer in Unit 6. MPGP has been a reliable index to population trend. We should add 1 near-beach mortality transect to each survey area to determine if this method reflects population MPGP and SI and if starvation mortality can be delineated from other sources of mortality such as wounding loss.

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Figure 1 Deer were captured near Sitka, Alaska by Cyrus Hanlon and his son Ike (above). Their canine partner, Tuffy, chased deer into the sea where they were roped and brought aboard for transportation to Prince William Sound and Kodiak Island.

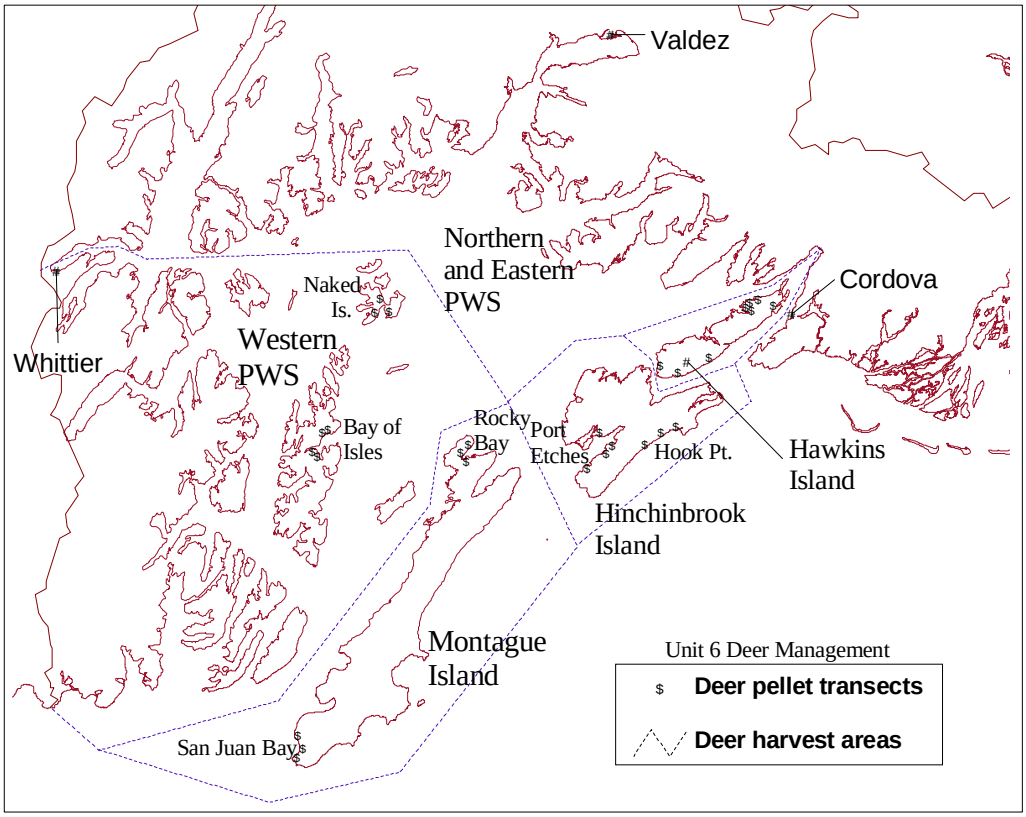

Figure 2 Locations of pellet group transects and harvest area boundaries for deer in Unit 6.

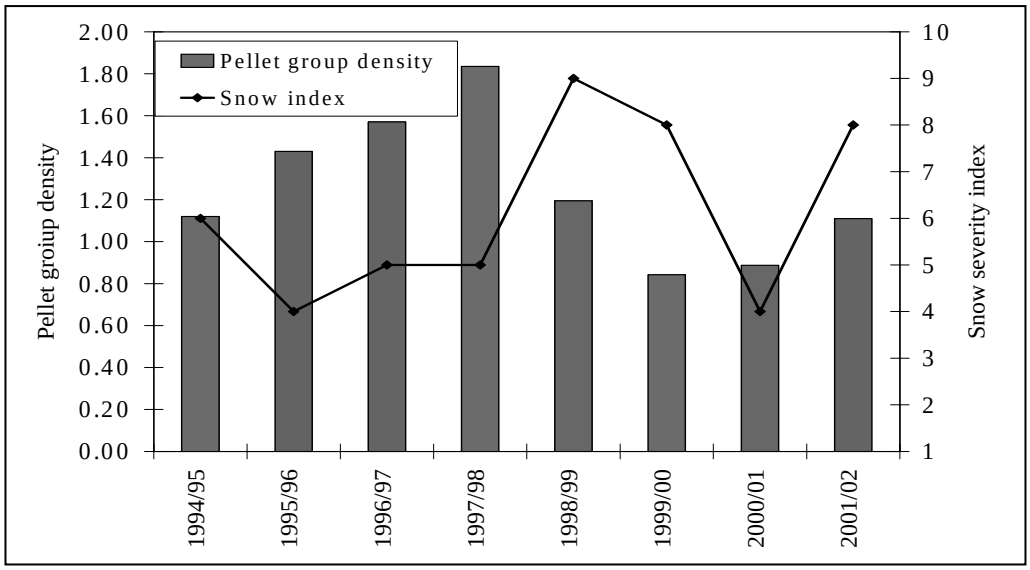

Figure 3 Deer pellet group density (number of pellet groups per 20 m^2 plot) and snow index representing depth and duration of snow at Port San Juan, Evans Island.

Table 1 Unit 6 deer population trends as indicated by spring pellet-group surveys 1997–2002. We analyzed survey data using a repeated measures technique beginning in 1994–95.

AREA	Specific location/UCU	Regulatory Year[a]	MPGP[b]	S.E.	Sig. diff.[c]	Number of plots
Hawkins Island	N.E. Hawkins	1987–88	1.32			132
	2001	1989–90	1.15			130
		1991–92	1.49			132
		1993–94	1.16			225
		1994–95	1.12	0.316	96, 98	214
		1995–96	1.84	0.316	99	243
		1996–97	1.55	0.316		
		1997–98	1.90	0.316	99	238
		1998–99	1.11	0.316		237
		1999–00	0.89	0.316	96, 97, 02,	225
		2000–01	0.96	0.316	96, 97, 98, 02	235
		2001–02	1.70	0.316	95, 99	240
	S.W. Hawkins	1987–88	0.85			168
	2003	1991–92	1.07			169
		1994–95	0.79	0.327	97, 98, 99	200
		1995–96	1.05	0.327	97, 98	222
		1996–97	1.87	0.327		223
		1997–98	1.94	0.327	99	224
		1998–99	1.42	0.327		215
		1999–00	0.85	0.327	97, 98, 99	208
		2000–01	1.05	0.327	97, 98	212
		2001–02	1.16	0.327	97, 98	222
Hinchinbrook Island	Hook Point	1987–88	1.18			226
	1905	1992–93	1.30			237
		1994–95	1.30	0.456	97, 98	244
		1995–96	1.46	0.456	98	234
		1996–97	1.98	0.456	98, 99	233
		1997–98	2.53	0.456	99	239
		1998–99	1.22	0.456		211
		1999–00	0.77	0.456	96, 97, 98	214
		2000–01	0.76	0.456	96, 97, 98	220
		2001–02	1.11	0.456	97, 98	237
	Port Etches	1989–90	2.77			137
	1903	1991–92	1.68			189
		1993–94	1.26			225
		1994–95	1.44	0.2619		228
		1995–96	1.68	0.2619		235
		1996–97	1.96	0.2619		235
		1997–98	1.77	0.2619		235

Table 1 Continued

AREA	Specific location/UCU	Regulatory Year[a]	MPGP[b]	S.E.	Sig. diff.[c]	Number of plots
Hinchinbrook Island (Cont.)	Port Etches 1903	1998–99			Did not survey	
		1999–00	1.16	0.2619		235
		2000–01	0.91	0.2619	95, 96, 97, 98, 00	227
		2001–02	0.89	0.2619	95, 96, 97, 98, 00	229
Montague Island	Rocky Bay 1803	1989–90	1.25			250
		1993–94	0.97			194
		1994–95	1.06	0.172		240
		1995–96	1.27	0.172		233
		1996–97	0.92	0.172		219
		1997–98	1.51	0.172	97	218
		1998–99	1.03	0.172	98	218
		1999–00	0.63	0.172	96, 98	218
		2000–01	0.72	0.172	96, 98	211
		2001–02	0.80	0.172	96, 98	198
	San Juan Bay 1810	1987–88	1.01			206
		1991–92	0.64			214
		1994–95	1.00	0.3574		233
		1995–96	1.29	0.3574		237
		1996–97	1.17	0.3574		234
		1997–98	1.36	0.3574		237
		1998–99			Did not survey	
		1999–00	0.75	0.3574		237
		2000–01	0.92	0.3574		235
		2001–02	1.01	0.3574		237
Naked Island	1701	1988–89	0.65			240
		1991–92	0.56			196
		1993–94	0.35			210
		1997–98	1.13			210
		2000–01	0.46	0.129		207
		2001–02	0.53	0.129		209
Knight Island	Bay of Isles 1503	1988–89	1.30			158
		1991–92	1.16			123
		1993–94	0.45			190
		2000–01	0.43	0.087		179
		2001–02	0.35	0.087		164

Table 1 Continued

AREA	Specific location/UCU	Regulatory Year[a]	MPGP[b]	S.E.	Sig. diff.[c]	Number of plots
All Areas		1994–95	1.12	0.1174	All years	1359
		1995–96	1.43	0.1729	All years	1404
		1996–97	1.57	0.1564	All years	1384
		1997–98	1.84	0.1541	All years	1601
		1998–99	1.20	0.0917	All years	881
		1999–00	0.84	0.0900	All years	1337
		2000–01	0.89	0.8522	All years	1726
		2001–02	1.11	0.1169	All years	1736

[a] Surveys occur during spring of each regulatory year.
[b] Mean number of pellet groups per plot.
[c] Years in which mean was significantly different (P<0.05), beginning in 1994–95.

Table 2 Unit 6 deer harvest, 1997–02

Area	Regulatory year	Estimated legal harvest M	(%)	F	(%)	Total	Estimated illegal/unreported harvest[a]	Total
Hawkins Island	1997–98	291	(70)	123	(30)	414	30	444
	1998–99	337	(62)	147	(38)	384	30	414
	1999–00	253	(54)	214	(46)	467	70	537
	2000–01	146	(66)	74	(34)	220	33	253
	2001–02	254	(59)	178	(41)	432	65	497
Hinchinbrook Island	1997–98	289	(67)	140	(33)	429	64	493
	1998–99	507	(70)	221	(30)	728	109	837
	1999–00	205	(55)	166	(45)	371	56	427
	2000–01	273	(61)	175	(39)	448	67	515
	2001–02	439	(65)	236	(35)	675	101	776
Montague Island	1997–98	727	(73)	263	(27)	990	149	1139
	1998–99	830	(73)	307	(27)	1137	171	1308
	1999–00	439	(50)	444	(50)	883	132	1015
	2000–01	427	(61)	270	(39)	697	105	802
	2001–02	609	(62)	380	(38)	989	148	1137
Western PWS	1997–98	356	(67)	178	(33)	534	80	614
	1998–99	336	(66)	175	(34)	511	77	588
	1999–00	241	(58)	176	(42)	417	63	480
	2000–01	193	(66)	100	(34)	293	44	337
	2001–02	338	(63)	195	(37)	533	80	613

Table 2 Continued

Area	Regulatory year	Estimated legal harvest M	(%)	F	(%)	Total	Estimated illegal/unreported harvest[a]	Total
Northern and	1997–98	99	(74)	34	(26)	133	20	153
Eastern PWS	1998–99	39	(55)	32	(45)	71	11	82
	1999–00	48	(62)	29	(38)	77	12	89
	2000–01	7	(18)	32	(82)	39	6	45
	2001–02	12	(100)	0	(0)	12	2	14
Unit 6 - Unknown	1997–98	25	(100)	0	(0)	25	4	29
	1998–99	61	(73)	23	(27)	84	13	97
	1999–00	11	(65)	6	(35)	17	3	20
	2000–01	0		0		0	0	0
	2001–02	0		0		0	0	0
Unit 6 - Total	1997–98	1788	(71)	737	(29)	2525	347	2872
	1998–99	2010	(69)	905	(31)	2915	410	3325
	1999–00	1197	(53)	1035	(46)	2232	335	2567
	2000–01	1046	(62)	651	(38)	1697	424	2121
	2001–02	1652	(63)	989	(37)	2641	660	3301

[a]Unquantified, but assumed to be 15% of reported total.

Table 3 Unit 6 deer hunter residency and success, 1997–02

Regulatory year	Successful					Unsuccessful					Total hunters
	Local resident[a]	Nonlocal resident	Non resident	Total	(%)	Local resident	Nonlocal resident	Non resident	Total	(%)	
1997–98	485	496	5	986	(66)	152	326	22	500	(34)	1485
1998–99	492	631	44	1167	(67)	159	387	29	575	(33)	1742
1999–00	345	495	18	858	(61)	168	340	43	551	(39)	1409
2000–01	224	448	11	683	(54)	149	399	26	574	(46)	1257
2001–02	407	508	26	941	(64)	143	368	16	527	(36)	1468

[a] Resident of Unit 6

Table 4 Unit 6 deer harvest chronology percent by month, 1997–01

Regulatory year	Harvest periods					*n*
	August	September	October	November	December	
1997–98	7	8	25	33	27	2675
1998–99	5	8	28	32	27	2942
1999–00	7	3	21	42	27	2265
2000–01	10	5	32	39	10	1785
2001–02	7	6	32	32	20	2704

Table 5 Unit 6 deer harvest percent by transport method, 1997–02

Regulatory year	Percent of harvest						*n*
	Airplane	Boat	3- and 4-wheeler	Highway vehicle	Foot	Unknown	
1997–98	22	74	0	2	5	0	305
1998–99	28	67	0	0	3	1	266
1999–00	29	64	0	0	5	1	337
2000–01	27	67	1	0	3	1	371
2001–02	16	74	1	0	3	2	361

Alaska Department of Fish and Game
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DEER MANAGEMENT REPORT

From: 1 July 2000
To: 30 June 2002

LOCATION

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

GEOGRAPHIC DESCRIPTION: Kodiak and Adjacent Islands

BACKGROUND

The Sitka black-tailed deer population in Unit 8 originated from 3 transplants, totaling 25 deer, between 1924 and 1934 (Burris and McKnight 1973). The 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, they endorsed the project and adopted regulations to protect the newly established population. In 1930, 2 more deer were captured from Prince of Wales Island and released on Long Island. There was, however, little natural movement from Long Island to Kodiak, so in 1934, 9 deer were captured in the Rocky Pass area near Petersburg and released on Kodiak.

By the early 1940s deer were abundant on Long Island and they occupied northeastern Kodiak Island. In 1950 they were a common sight near Kodiak city, and the first 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. In 1977, 1,811 deer were harvested in Unit 8, with 29% taken from the islands north of Kodiak, 45% from northern Kodiak Island (north of a line between Terror to Ugak Bays), and 24% taken from southern Kodiak Island. In 1997, twenty years later, 8,709 deer were harvested, 17% from the northern islands, 21% from north Kodiak, and 46% from southern Kodiak Island.

Winter mortality proved to be the most significant limiting factor for 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 1987–88 through 1992, and deer in the northern part of the archipelago were especially hard hit. 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.

Deer have become an important resource for the residents of and visitors to the Kodiak islands. Deer have 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 1990–98 the U.S. Fish and Wildlife Service (USFWS) experimented with various aerial and ground surveys to monitor deer population trends on the Kodiak National Wildlife Refuge (NWR). Refuge staff have also experimented with browse transects, Forward Looking Infrared Radar (FLIR), and range exclosures to investigate deer population trends.

There were liberal seasons and bag limits during the past 2 decades. Seasons ranged from 153 to 184 days, and bag limits ranged from 3 bucks to 7 deer of either sex. Most regulatory changes were initiated in response to perceived population trends and hunting effort. The unit has typically been divided into 2 or 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 ADF&G Division of Wildlife Conservation (ADF&G), USFWS, the Kodiak Fish and Game Advisory Committee, and the general public is critical.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVE

Maintain a deer population that will sustain an annual harvest of 8,000 deer.

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. The USFWS interviewed hunters annually in the Kodiak NWR during October through December boat-based enforcement patrols. 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. Occasional flights were made 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.

ADF&G and Kodiak NWR staff conducted winter aerial surveys in several locations on the refuge to assess techniques for monitoring population trends.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

During past years, Unit 8 deer populations have experienced substantial winter mortality during 1968–69, 1970–71, and 1989–90. There were also higher than usual winter mortalities occurring 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. These estimates were based on winter mortality transects, hunter reports, and personal observations. Mortality was observed throughout the archipelago, with the lightest reported on eastern Afognak and the outer Uyak Bay area on Kodiak Island. The 3 successive winters (1999–2000 to 2002–03) were mild and, predictably, the deer population responded positively.

In 1999, the Alaska Board of Game found that under the stipulations of AS 16.05.255 (e), deer on Kodiak were a big game population that was important for human consumption. As such, it was necessary to determine a population objective and assess the status of the current population size relative to that objective.

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. To assign a measurable population objective for the Unit, we adopted the methods used by ADF&G biologists in Southeast Alaska and tailored them to local conditions. We assumed the deer population could sustain total annual mortality (from hunting, predation, and starvation) of 33% of the preseason population. By estimating annual mortality, we back-calculated the theoretical minimum number of deer needed to sustain that mortality. This number became our minimum population “objective”.

To compute annual mortality, we recognized 4 principle components: reported kill, unreported kill, loss due to starvation, and loss due to predation. Because we only have empirical data on reported kill, some simplifying assumptions were made to estimate other components. Those assumptions were:

1) Unreported kill averages 25 % of reported kill. Hunting loss is equal to reported plus unreported kill.
2) Predation loss is assumed to equal 10 % of the reported hunting kill.
3) Starvation loss is assumed to be 150 % greater than the reported hunting kill on the average. This takes into account the variability in winter severity over a 5-year period.

If total mortality is the sum of hunting loss, predation loss, and starvation loss, then the minimum population needed to sustain total mortality is equal to total mortality/0.33 (the maximum mortality sustainable). By using the average annual harvest over the 5 years prior to the decline, these calculations result in a minimum population "objective" of 73,530 deer.

The current population estimate for the Unit is roughly 50,000 deer. By means of discussions with the Kodiak Fish and Game Advisory Committee, Kodiak NWR staff, and ADF&G staff, we have concluded that the optimum population objective for the archipelago should be 70,000 – 75,000 deer (approximately 14–15 deer/mi^2).

Population Composition

The percentage of males in the harvest has remained at least 75% since the 1993–94 season 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 percent males in the harvest remained high. Part of the reason for the large proportion of males in the harvest was due to more conservative doe seasons and bag limits. 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.

Distribution and Movements

Deer occur throughout Unit 8 except in the more remote Semedi, Barren, and Chirikof island groups. Within the past 15 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 30 October was the mean date for movement between summer and winter ranges. Summer home ranges were larger than winter home ranges, summer ranges averaging 454 ha (1.8 mi^2) and winter ranges 107 ha (0.4 mi^2).

MORTALITY

Harvest

Season and Bag Limits. In 2001–02, the open season for resident, nonresident and Federal subsistence hunters was 1 August to 31 October in that portion of Kodiak Island north of a line from the head of Settlers Cove 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) for one buck was

open in this area from November 1 to 14. Hunters were required to successfully complete an authorized education course before participating in the primitive weapons hunt.

The open season for resident, and nonresident hunters in the remainder of Unit 8 was 1 August to 31 December. The bag limit was 3 deer; bucks only from August 1 to November 30, and either sex (only 1 antlerless) from 1 to 31 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 the entire month of January.

Board of Game Actions and Emergency Orders. At its March 1999 meeting, the Alaska Board of Game (Board) identified the Sitka black-tailed deer population on the Kodiak archipelago as being important for providing high levels of human consumptive use under 5 AAC 92.106. The dramatic winter mortality experienced by this population during 1998–99 resulted in an emergency request by the Kodiak Fish and Game Advisory Committee to reduce the deer bag limit in Unit 8 during most of the December 1999 portion of the hunting season. On December 2, 1999, the Board enacted an emergency regulation reducing the bag limit during December 5–December 31, 1999 from 4 deer of either sex to 2 antlered deer for Alaska residents and 1 antlered deer for nonresidents. This emergency regulation was applicable only in that portion of Unit 8 that previously had a 4-deer bag limit. The Board's action did not affect the Federal subsistence hunting regulations for Kodiak archipelago residents hunting on federal lands (5 deer of either sex through January 31, 2000). Although this action did not directly impact many subsistence users, some local residents are not able to participate in the federal subsistence hunt because they either did not live close to federal public land, or their traditional or preferred hunting areas were not located on federal land.

The Board and the ADF&G were unsure if this emergency action constituted a "significant" reduction in harvest opportunity from an identified big game prey population. Such a reduction would trigger provisions under AS 16.05.255(f) for the Board to consider whether intensive management actions are warranted to restore the abundance or productivity of a population. They felt it prudent, however, to identify the intensive management options available to potentially enhance the deer population on the Kodiak archipelago. The ADF&G reported to the Board on 14 January 2000 that no intensive management options were practical and that hunting season adjustments were the best method to aid the deer population.

In the spring 2001 meeting, the Board accepted a proposal from the Kodiak Fish and Game Advisory Committee to reduce the bag limit to 3 deer, allowing only one antlerless deer to be taken, and reducing the either sex season to the month of December. A subcommittee that included representatives from ADF&G, Kodiak National Wildlife Service, Kodiak Island villages and members of the hunting public developed the proposal. They noted that because the current deer population was significantly below the management objective, a reduction in bag limits was necessary to encourage restoration of the population as quickly as possible. Recognition of the impacts of winter weather on recovery, and concerns about habitat degradation caused by localized overpopulation weighed into formation of the proposal, and the subcommittee noted their intent to revisit the regulation in 2003 to evaluate the status of the population and the need for continued conservative measures.

Hunter Harvest. Harvest in 2000–01 was the lowest reported since we began conducting harvest surveys 20 years ago (Table 1). The total harvest (2,491) was 66% lower than the average annual harvest for the previous 5 years (7,299). The harvest increased slightly in 2001–02, but remained below average (2,899).

The population decline in the 1990s was more precipitous in the northern part of Unit 8, prompting hunters to concentrate more effort on southern Kodiak Island (Smith 1995). In 1999–2000, forty-two percent of the reported harvest was from these areas, compared with 32% during the previous 5 years. In 2000–01 and 2001–02, the pattern was less consistent at 36% and 26%, respectfully. Harvest from the northern islands of Shuyak, Afognak, and Raspberry was lower in 1999–2000 (15%) than in any previous year, but rebounded to 30% in 2000–01 and 24% in 2001–02, up from the average of the previous 5 years (1995–96 to 1999–2000), which was 21%.

The percentage of males in the harvest was one of the lowest on record in 2000–01 at 73%, but more restrictive female harvest regulations resulted in a rapid response in 2001–02, raising the male percentage up to 95%. The 5-year average (1995–96 to 1999–2000) was 78%.

Hunter Residency and Success. The number of hunters afield in 2000–01 was down from previous years (2,617 versus the 5 year average of 4,086), and continued to decline in 2001–02 (2,115). Unit 8 residents composed 39% of the hunters in 2000–01 and 41% in 2001–02, comparable to the 5-year average (38%). Nonlocal residents composed 44% of the hunters in 2000–01 and 50% in 2001–02, comparable to the 5-year average (48%). Nonresidents composed 18% of the hunters in 2000–01 and 9% in 2001–02, the first declines after 4 consecutive years of increases, but comparable overall to the 5-year average (14%)

Hunter success in 2000–01 (Table 2) was the lowest ever recorded (50% versus a 5-yr average of 73%). During 2000–01 the mean number of deer/hunter afield was 0.9, the lowest on record, and considerably below the 5-year average of 1.7. In 2000–01, over half (54%) of the hunters only killed 1 deer (Table 4), up from the 5-year average of 33%. In 2001–02, hunter success rebounded to 71% and success increased to 1.3 deer/hunter (Table 3).

Harvest Chronology. November is consistently the peak month of harvest in Unit 8 (Table 5). In 2000–01, 44% of the deer were harvested in November, while in 2001–02 38% were taken in November. These percentages were comparable to the average (42%) of the previous 5 years (1995–96 to 1999–2000).

Transport Methods. Boats and aircraft have been the most favored means of transportation for deer hunters in Unit 8 for most of the past 15 years (Table 6). In the past decade there has been erosion in the proportion of hunters using aircraft. Because of the deer population decline proportionately fewer nonlocal residents and nonresidents, who tend to favor aircraft transport, are hunting than local residents. In 2000–01, 39% of the deer hunters used boats as their primary means of access, and in 2001–02 forty-three percent used boats, down from the average (45%) of the previous 5 years (1995–96 to 1999–2000). Charter boats are

consistently common modes of transportation for deer hunters throughout the archipelago, however, as the deer population declined, the number of operators from Homer and other off-island locations declined. Use of highway vehicles has steadily increased particularly by hunters authorized to hunt near logging roads on Afognak Island.

Other Mortality

Mortality surveys in coastal winter ranges documented the severe winter mortality during the winter of 1998–99, 3 times as many winterkilled deer were found than the previous 5-year average (150.0 versus 47.8) (Table 7). Because of survey timing, and delayed spring green-up, causing deer to die later than usual, I suspect 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 was very light, and in 2000–01 there were no carcasses found along the transects. In 2001–02 transect data were not yet available for the period. A few fawn mortalities were reported after a late winter heavy snow, but overall mortality appeared to be light.

Unreported deer harvest, including wounding loss and illegal kills outside the hunting season was common, resulting in an estimated harvest of about 20 to 25% of the reported take. Free-roaming dogs are significant predators on deer near communities and isolated residences. There are also packs of feral dogs on the southwest portion of Kodiak Island. Deer/motor vehicle collisions kill an estimated 20 to 25 deer annually. Brown bear predation of deer occurs, predominantly in late winter, but is not a limiting factor.

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 suggest that deer have heavily utilized several species of browse. 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. The long-term impact of heavy browsing on these species has not yet been determined.

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 in the Chiniak Peninsula of northeastern Kodiak Island. Mature spruce habitats in those areas were converted to seral shrub-grass communities. Studies in Southeast Alaska indicated that old-growth forest was critical in maintaining deer populations (Wallmo and Schoen 1980). Logging deer winter range on Afognak Island has not been investigated, but it appeared that while it initially reduces carrying capacity; subsequent increased production of herbaceous and shrubby vegetation may benefit deer, depending on snow conditions. Selinger (1995) noted that deer on Kodiak Island occupying nonconiferous brush and deciduous forest habitat have much larger summer ranges than deer in heavily forested Southeast Alaska. He hypothesized that

Kodiak deer may have adopted a strategy that allows them to accumulate greater fat reserves in summer that enhances their survival in areas without coniferous forest.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

Improving precision in assessing deer population trends is desirable, but it is difficult and expensive. Hunter questionnaire surveys are the most economical, although 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, concluding 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). 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 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.

Kodiak NWR sponsored a workshop in June 2000 to address continued concerns about the impact of introduced animals on native flora and fauna. Workshop participants concluded that a unitwide vegetative analysis was the highest research priority, followed closely by a comprehensive analysis of deer movements, feeding areas, and population dynamics. Refuge staff are committed to working with ADF&G to follow through on these recommendations.

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 1999–2002, 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 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).

Chronic wasting disease is having significant impacts on deer management in several states and provinces (Gross and Miller 2001). There have been no reported cases in Alaska, however there is growing concern that it may spread to the state. Kodiak is especially vulnerable due to recent importation of domestic elk to a game farm near Narrow Cape.

CONCLUSIONS AND RECOMMENDATIONS

Sitka black-tailed deer on the Kodiak archipelago are an introduced ungulate using an island habitat. There are no natural predators and the 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, except when populations are at low levels. There are few practical options for

active management practices to enhance deer populations. Regulatory responses such as liberalizing seasons as deer numbers increase, and promulgating more conservative regulations when populations have declined are the most effective way to manage these animals.

Although objective population data are non-existent, Alaska Statute 16.05.255 dictates 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 has made an attempt to satisfy this requirement with the best available data (details of this effort are presented in the *population size* section of this report). We recognize that there is considerable room for improvement in the estimates used for these objectives, but by using an open and cooperative forum we are confident they can be used as an important tool for future management.

During this reporting period, deer populations seemed to be recovering rapidly from the winter mortality that occurred in 1998–99. There were few dead deer found during the late winter and early spring in 2000–2002, and productivity appeared robust with numerous observations of twin fawns. We also saw several instances of late born fawns throughout the archipelago, suggesting a reduced buck:doe ratio. This supposition was corroborated by hunter reports. In response to the increased deer numbers, but high hunter pressure on bucks, the Kodiak Fish and Game Advisory Committee proposed liberalizing the bag limit during October and November to allow harvest of deer of either sex. ADF&G concurred with this recommendation, and the Board passed it in March 2003.

There was a great deal of interagency cooperation during this reporting period. The Kodiak Fish and Game Advisory Committee worked closely with their federal subsistence counterpart, the Kodiak/Aleutians Regional Advisory Committee in developing deer hunting regulatory proposal for both the state and federal boards. Staff from ADF&G and Kodiak NWR were active participants throughout the process. State and federal biologists also worked together to assess winter mortality and in conducting interviews of hunters in the field. We developed a cooperative research project with the University of Alaska – Fairbanks, ADF&G, and the Refuge to investigate the movements and winter ecology of deer on the Aliulik Peninsula. Unfortunately, weather and logistic concerns prevented implementation of the project as scheduled in February 2003.

Deer with atypical antler development have been observed on Kodiak for at least the past 20 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. Potential culprits are genetics, diet and contaminants. 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, survival and productivity of the deer in the affected areas do not appear to have been impacted, and we feel that no management action is practical or necessary at this time. It is important, however, to monitor the situation and the ADF&G should endorse and cooperate in base line research to examine the cause of the abnormalities.

Research to ascertain the status of chronic wasting disease on Kodiak needs to be initiated as soon as possible. ADF&G has set up a statewide task force to address research and management actions relating to the disease. The task force is also drafting proposed regulations and legislation to prevent the spread of the disease into the state. Because of the virulent nature of chronic wasting disease and our lack of a firm understanding of its diagnosis and control, we must make a concerted effort to test for its presence on the archipelago to determine appropriate management actions.

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Table 1. Unit 8 deer harvest, 1987–2002.

Regulatory year	Estimated legal harvest[a] M (%)	F (%)	Unk.	Total	Estimated illegal harvest[b]	Total
1987–88	10,844 (80)	2702 (20)	245	13,791	---	13,791
1988–89[c]	---	---	---	---	---	---
1989–90	6923 (73)	2625 (27)	490	10,038	---	10,038
1990–91	5367 (67)	2739 (33)	---	8106	---	8106
1991–92	6569 (73)	2379 (27)	---	8948	---	8948
1992–93	5144 (73)	1899 (27)	---	7043	---	7043
1993–94	5124 (82)	1130 (18)	---	6254	---	6254
1994–95	8270 (80)	2130 (20)	---	10400	---	10,401
1995–96	5806 (81)	1387 (19)	---	7193	---	7193
1996–97	7041 (79)	1903 (21)	---	8944	---	8944
1997–98	6860 (79)	1849 (21)	---	8709	---	8709
1998–99	5879 (76)	1886 (24)	---	7921	---	7765
1999–2000	2801 (75)	927 (25)	---	3728	---	3728
2000–01	1823 (73)	668 (27)	---	2491	---	2491
2001–02	2756 (95)	143 (5)	---	2899	---	2899

[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 to 15% of the legal harvest.

[c] No survey was conducted in 1988–89

Table 2. Unit 8 deer hunter residency and success, 1987–2002.

	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)	1,124	788	255	2167 (33)	6522
1990–91	1260	1627	185	3071 (74)	550	448	107	1105 (26)	4176
1991–92	1414	1702	262	3378 (76)	479	479	85	1043 (24)	4421
1992–93	1221	1345	207	2774 (67)	541	645	160	1345 (33)	4119
1993–94	935	1247	159	2341 (80)	256	286	63	605 (20)	2946
1994–95	1690	1917	287	3893 (83)	372	314	129	815 (17)	4708
1995–96	1164	1440	300	2904 (73)	480	440	160	1080 (27)	3984
1996–97	1428	1689	339	3456 (81)	348	368	122	838 (20)	4294
1997–98	1372	1749	422	3543 (82)	324	354	119	797 (19)	4340
1998–99	1062	1830	398	3290 (74)	370	548	267	1185 (26)	4560
1999–2000	638	829	372	1839 (57)	567	571	274	1412 (43)	3251
2000–01	515	608	201	1324 (50)	503	533	257	1293 (49)	2617
2001–02	629	753	134	1516 (71)	238	293	68	599 (28)	2115

[a] Includes residents of Unit 8.

[b] No survey was conducted in 1988–89.

Table 3. Unit 8 comparison of deer hunter questionnaire results for 1980–2002.

Regulatory year	% Hunter success	Hunters taking bag limit[b]	% Male	% Female	Total harvest	Estimated nr. hunters	Mean nr. deer/hunter	Nr. days hunted/deer
1980–81	73	37	74	26	5347	3440	1.6	3.8
1983–84	81	24	74	26	9897	4113	2.4	2.3
1984–85	81	23	74	26	8905	3948	2.3	2.6
1987–88	76	27	80	20	13,791	6022	2.3	2.3
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	0.9	5.7
2001–02	72	29	95	5	2899	2115	1.3	4.0

[a] Harvest data are expanded from returned hunter questionnaires

[b] Bag limit 4 deer in 1980; 5 deer in 1983 to 1990; 5 deer on Kodiak NWR and 4 deer on non-federal lands in 1991 to 2000, 4 deer on Kodiak NWR and 3 deer on non-federal lands in 2001.

Table 4. Number and percent of hunters in Unit 8 that reported harvesting 1, 2, 3, 4, or 5 deer, 1997–2002.

	1997–98		1998–99		1999–2000		2000–01		2001–02	
	Hunters	%	Hunters	%	Hunters	%	Hunters	%	Hunters	%
1 deer[a]	1137	32	1100	24	890	48	719	54	703	44
2 deer	825	23	794	18	398	22	313	23	415	26
3 deer	593	17	601	13	280	15	191	14	434	27
4 deer	857	24	756	17	213	12	99	7	36	2
5 + deer	131	4	60	1	60	3	16	1	0	-

[a] Bag limit was 5 deer on Kodiak NWR and 4 deer on non-federal lands in 1991 to 2000, 4 deer on Kodiak NWR and 3 deer on non-federal lands in 2001.

Table 5. Unit 8 deer harvest chronology percent by period, 1980–2002.

Regulatory year	Harvest periods (%)						
	August	September	October	November	December	January	*n*
1980–81	6	9	24	33	22	6	5347
1983–84	5	7	25	37	18	7	9897
1984–85	5	9	28	41	15	3	8905
1987–88	5	8	26	41	18	3	13,791
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

Table 6. Unit 8 deer harvest percent by transport method, 1987–2002.

Regulatory year	Percent of harvest									
	Airplane	Horse	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway vehicle	Other	Unknown	*n*
1987–88	34	--	39	5	--	--	16	2	3	2638
1988–89	--	--	--	--	--	--	--	--	--	---
1989–90	42	--	35	4	--	--	15	4	9	3156
1990–91	43	<1	35	4	<1	1	9	9	0	724
1991–92	43	1	39	5	<1	1	11	14	0	862
1992–93	46	1	39	4	0	2	9	10	0	831
1993–94	45	<1	42	5	0	1	9	12	0	889
1994–95	36	1	44	5	1	1	12	14	0	888
1995–96	40	<1	42	5	0	1	11	12	0	821
1996–97	35	<1	47	7	0	1	10	12	0	915
1997–98	33	<1	49	6	<1	1	13	8	0	858
1998–99	19	3	43	9	0	2	15	10	2	7339[b]
1999–2000	17	<1	42	8	0	1	15	15	2	5091[b]
2000–01	19	<1	39	8	<1	2	18	12	3	4276[b]
2001–02	14	<1	43	8	0	1	18	15	2	3619[b]

[a] No survey in 1988–89.

[b] Starting in 1998, transportation data were collected by trips taken rather than by hunter.

Table 7 Unit 8 sex and age composition of deer winterkill from beach mortality transects, 1987–2001

Regulatory	Adult				Juvenile[a]				Unk. age/	All			
Year	M (%)	F (%)	Unk.	Total	M (%)	F (%)	Unk.	Total	sex	M (%)	F (%)	Unk.	Total
1987–88	8 (89)	1 (11)	3	12	6 (50)	6 (50)	18	30	10	14 (45)	7 (23)	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	57 (64)	32 (36)	43	132
1992–93	0 (--)	0 (--)	0	0	0 (--)	0 (--)	1	1	0	0 (--)	0 (--)	1	1
1993–94	15 (88)	0 (--)	2	17	2 (17)	2 (17)	8	12	0	17 (89)	2 (11)	10	29
1994–95	5 (31)	1 (6)	10	16	7 (17)	8 (17)	27	42	2	12 (57)	9 (43)	39	60
1995–96	0 (--)	0 (--)	1	1	4 (12)	2 (6)	28	34	1	4 (67)	2 (33)	31	37
1996–97[b]	5 (45)	4 (36)	2	11	17 (25)	5 (7)	47	69	1	0 (--)	0 (--)	1	81
1997–98[b]	1 (33)	0 (--)	2	3	8 (29)	5 (18)	15	28	1	0 (--)	0 (--)	1	32
1998–99[b]	9 (6)	18 (12)	23	50	12 (8)	24 (16)	61	97	3	21 (14)	42 (28)	87	150
1999–2000[b]	0 (--)	1 (10)	0	1	1 (10)	2 (20)	6	9	0	1 (10)	3 (30)	6	10
2000–01[b]	0 (--)	0 (--)	0	0	0 (--)	0 (--)	0	0	0	0 (--)	0 (--)	0	0

[a] Includes fawns and yearlings.

[b] Data obtained from Kodiak NWR files