Deer
Management Report
of survey-inventory activities
1 July 2002–30 June 2004

Cathy Brown, Editor
Alaska Department of Fish and Game
Division of Wildlife Conservation

Jamie Karnik, ADF&G

Funded through
Federal Aid in Wildlife Restoration
Grants W-33-1 and W-33-2, Project 2.0
December 2005

STATE OF ALASKA

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DEPARTMENT OF FISH AND GAME
McKie Campbell, Commissioner

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P.O. Box 25526
Juneau, AK 99802-5526
(907) 465-4176

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

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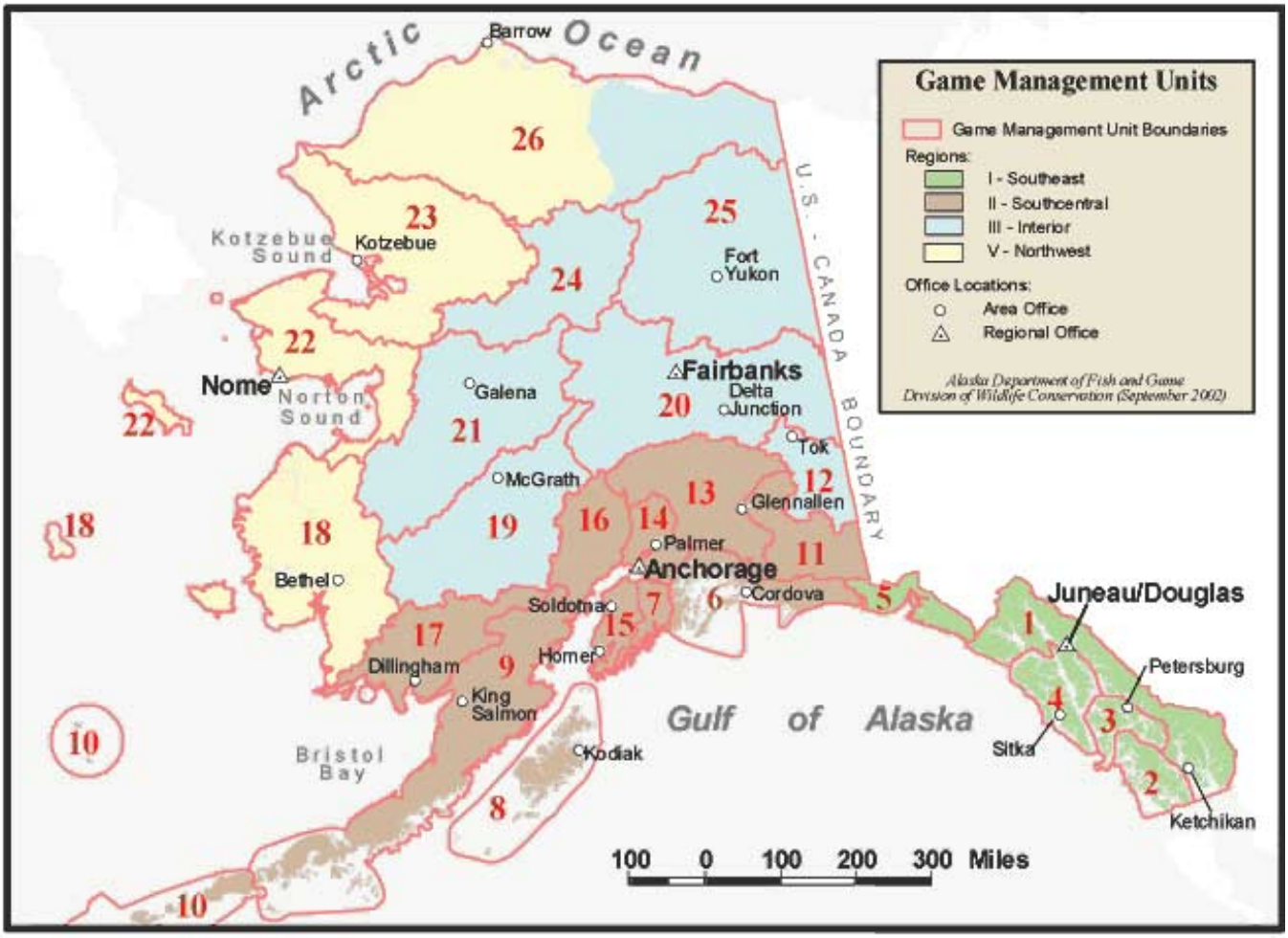
Arctic Ocean
Barrow
Kotzebue Sound
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Norton Sound
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McGrath
Fairbanks
Delta Junction
Fort Yukon
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Palmer
Anchorage
Cordova
Soldotna
Homer
Dillingham
King Salmon
Bristol Bay
Kodiak
Bethel
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
Regional Office
Alaska Department of Fish and Game
Division of Wildlife Conservation (September 2002)

DEER MANAGEMENT REPORT

TABLE OF CONTENTS

From: 1 July 2002
To: 30 June 2004

Unit Map i

Unit 1A – Drainages south of Lemesurier Point, including Behm Canal 1

Unit 1B – Southeast Alaska mainland from Cape Fanshaw to Lemesurier Point and adjacent islands 22

Unit 1C – Southeast Alaska mainland and the islands of Lynn Canal and Stephens Passage between Cape Fanshaw and the latitude of Eldred Rock, including Sullivan Island and the drainages of Berners Bay 30

Unit 2 – Prince of Wales Island 39

Unit 3 – Petersburg and Wrangell 58

Unit 4 – Admiralty, Baranof, Chichagof, and adjacent islands 70

Unit 5 – Yakutat: Cape Fairweather to Icy Bay, Eastern Gulf Coast 87

Unit 6 – Prince William Sound and North Gulf Coast 93

Unit 8 – Kodiak and adjacent islands 109

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 2002
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 1A (5300 mi^2)

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

BACKGROUND

Sitka black-tailed deer live throughout Unit 1A, although mainland densities are consistently lower than those on maritime-influenced offshore islands. Deer populations tend to fluctuate seasonally, primarily in response to winter weather and wolf and bear predation. Deer numbers are currently at moderate-to-low levels throughout most of 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 (Straugh and Rice 2003; Straugh et al. 2004).

We surveyed deer-pellet transects in 7 watersheds (value comparison units, or VCUs) during spring 2002 and 3 watersheds during spring 2003. 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. Different VCUs are visited each spring to establish long-term trends across the entire subunit. During this report period 6 areas showed a downward trend (Helm Bay, George Inlet, Carroll Pt., Gravina), 2 others showed a positive trend (Moth Bay, Duke Island,), and 2 remained stable (Dall Head, Alava Bay). Average counts of pellet-groups per meter^2 plot across the subunit were 0.6 in 2002, 0.9 in 2003, and 0.5 in 2004. The management objective of 45 deer/mi^2 has not been met in any of the 8 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 2002 deer pellet densities per plot in Unit 1A were at Alava Bay (1.22) and Moth Bay (1.09). The Alava Bay count is the highest since 1991, and the Moth Bay count is the highest on record for that VCU. New VCUs were measured at Very Inlet and Vallenar Bay during 2003 These are 2 areas where hunters spend time each year, yet we have little information about deer trends. The highest 2003 deer pellet densities in Unit 1A were at Dall Head (0.91) and Gravina (0.87), while Alava Bay had the highest densities for sites measured during 2004 (0.92), followed by Dall Head (0.66) (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 subjected 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	1 Aug–31 Dec	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. Total harvest is estimated by combining the reported harvest from the mail survey along with estimated illegal and unreported kills. The unreported and illegal take is estimated to equal approximately half of the legal harvest each season. The estimated total harvest of 251 and 211 deer during the 2002 and 2003 season, respectively, are the lowest on record (1984–2003) (Table 2). The reported number of deer killed by highway vehicle collisions in the unit remains about the same at 1–5 per year (Table 4).

Fewer hunters spent time on Gravina during 2003 than 2002, and the hunter success remains the lowest reported for any island in Southeast Alaska. The reported harvest of only 27 deer and report of only 294 hunter days on Gravina Island during the 2003 season are the lowest on record since 1990 (Table 3).

Cleveland Peninsula deer hunters reported the sixth consecutive year of declining harvest. Although hunters reported spending 83 and 66 days in the field respectively during the past 2 years hunting on the Cleveland, there were no deer reported during this period (Straugh and Rice 2003; Straugh et al. 2004) (Table 3).

Harvest Chronology. Typically most Unit 1A deer harvest occurs during August and November; however, the October harvest during both 2002 and 2003 was higher than the August harvest during both years (Table 6). Sitka black-tailed deer rut during November, and consequently, are more active 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.

Residency and Success. Most Unit 1A hunters are local residents living within the unit. During this report period 180 and 190 local resident hunters accounted for a 32% and 36% overall success rate during the 2002 and 2003 seasons. On average, approximately 11 nonlocal resident hunters are successful at harvesting deer in this area each season. The 2003 season was unusual with approximately 23 nonlocal hunters harvesting deer in this unit while another 32 nonlocal hunters were unsuccessful. The number of unsuccessful nonresident hunters pursuing deer was similar to the long term average with 5 hunters in 2002 and 4 in 2003 (Table 5).

Transport Methods. The majority of Unit 1A hunters continue to use boats to access hunting areas. Boat (67%) and highway vehicle (20%) access accounted for most harvested deer during 2002 and 2003. Boat and airplane use to access Unit 1A hunting areas are similar to the long-term averages (Table 6).

Other Mortality

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

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 from this unit 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 wolf or black bear population levels or their predation pressure on Unit 1A deer.

Currently, deer numbers remain low across most of the unit and do not show signs of recovering from the harsh winter of 1998–99, 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 2002 than in 2003. From our survey we estimate 21 proxy hunters from Ketchikan took 28 deer for a 67% success rate in 2002. We estimated only 12 hunters registered in 2003 to hunt under the proxy program and harvested 6 deer for a 50% success rate.

Participation in the federal designated hunter program by Ketchikan residents declined during this report period. No Ketchikan residents reported using the federal designated hunter program during 2002. Twelve hunters signed up for the program during 2003 and half of those were successful, harvesting an estimated 6 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, which are critical to deer during winters with heavy snowfall. U.S. Forest Service and DWC habitat models predict that the forest's capacity to support deer in average winters will decline by nearly half by 2054. This loss will be greater in years with deep snow. By 2054 we expect that few areas will meet projected hunter demand within roaded and logged portions of Unit 1A (USFS 1989). Recent timber sales by the Alaska Mental Health Trust Authority will reduce carrying capacity for deer in several popular Unit 1A hunting areas. These current sales are using both selective and clearcut methods to remove valuable timber for export. We expect this will have long-term negative effects on deer numbers, and consequently, on future hunter success in these areas.

CONCLUSIONS AND RECOMMENDATIONS

During this report period the deer harvest has remained below the long-term average for the unit, and the 2002 and 2003 harvests were the lowest since 1984. The Unit 1A days of effort per deer has improved and is now near the long-term average. Hunters on the lower Cleveland Peninsula reported no harvest in that area, and there is no indication Cleveland deer will rebound any time soon.

Deer numbers in Unit 1A remain low across the unit, and our objective of maintaining 45 deer/mi^2 in winter habitat was not achieved in any of the VCUs sampled. During this report period, half of the areas surveyed suggest a slow but positive trend.

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. However, both selective and clearcut logging activity in these popular hunting areas will likely have a negative long-term effect on deer there.

During both the past 2 years we have seen some of the mildest winters on record, and consequently, winter mortality has been low. Since the winter of 1998–99 there has not been sufficient snow depth nor snow persistence to further impact deer in southern southeast.

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). It is unclear whether the Roadless Initiative will be upheld by this current administration and if it will protect some of the most important deer habitat from future logging activities (USDA 2000).

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PREPARED BY:
Boyd Porter
Wildlife Biologist III

SUBMITTED BY:
Dale Rabe
Management Coordinator

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Table 1 Unit 1A deer pellet-group survey results, regulatory years 1981 through 2003

Area	Regulatory 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
	2001	0.41	251	0.30–0.51
	2004	0.25	170	0.15–0.35
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
	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
	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	Regulatory 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
	2002	0.18	227	0.09–0.28
	2004	0.25	309	0.18–0.32
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
	2002	0.36	84	0.21–0.50
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
	2002	1.09	150	0.84–1.34
Lucky Cove	1985	1.16	335	1.00–1.33

Table 1 continued

Area	Regulatory year	Mean pellet-groups/plot[a]	Number of plots	95% CI
(VCU 760)	1986	1.16	258	0.95–1.32

Area	Regulatory year	Mean pellet-groups/plot[a]	Number of plots	95% CI
	1988	1.02	65	0.69–1.34
	1991	1.39	271	1.07–1.70
Vallenar (VCU761)	2003	0.99	96	1.07–1.70
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
	2002	0.76	284	0.59–0.94
	2003	0.91	279	0.71–1.11
	2004	0.66	282	0.53–0.79
Duke Island (VCU 767)	1996	0.05	294	0.02–0.09
	2000	0.13	282	0.08–0.18
	2002	0.19	292	0.12–0.26
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
	2002	1.22	107	0.90–1.55
	2004	0.92	313	0.75–1.09
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

Table 1 continued

Area	Regulatory year	Mean pellet groups/plot	Number of plots	95% CI
Winstanley Island (VCU 821)	1991	0.27	49	0.11–0.42
Very Inlet (VCU 859)	2002	0.11	306	0.07–0.16
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
	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
	2003	0.87	78	0.54–1.20

[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 2003

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
2002	538	179	33	2218	4.1	251	0.5	8.9
2003	523	158	30	1502	2.9	211	0.4	7.1
$\bar{x}$	882	340	37	4366	5.0	563	0.6	8.2

[a] Includes does that 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 2003

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
	2002	178	43	24	390	2.2	0.3	50
	2003	132	21	16	294	2.2	0.2	27
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

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
	2002	0	0	0	0	0	0	0
	2003	0	0	0	0	0	0	0
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							
	2002							
	2003	11	6	55	23	2.1	0.5	6
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

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
	2000	337	103	31	1936	5.7	0.4	140
	2001	350	95	27	945	2.7	0.4	132
	2002	315	100	32	908	2.9	0.4	121
	2003	328	78	24	661	2.0	0.5	157
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
	2002	151	44	29	483	3.2	0.4	58
	2003	108	36	33	294	2.7	0.3	36
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

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
	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
	2002	70	0	0	83	1.2	0	0
	2003	26	0	0	66	2.5	0	0
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
	2002	7	7	100	14	2.0	2.0	7
	2003	0	0	0	0	0	0	0
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

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
	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
	2002	0	0	0	0	0	0	0
	2003	30	0	0	42	1.4	0	0

Table 4 Unit 1A reported and estimated deer harvest/mortality, regulatory years 1984 through 2003

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
2002	251	0	251	125	376	1–5
2003	211	0	211	105	316	1–5
$\bar{x}$	546	19	563	282	843	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 2003

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
2002	180	0	0	180	374	9	5	388
2003	190	23	0	213	273	32	4	309
$\bar{x}$	306	11	2	318	491	22	6	513

[a] Local resident includes Unit 1A residents.

Table 6 Unit 1A deer harvest chronology and hunter transport method, regulatory years 1988 through 2003

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
2002	83	103	135	175	21	0	21	25	382	14	103	14	0
2003	66	66	141	158	21	0	72	12	332	40	114	24	0
$\bar{x}$	116	60	133	190	41	7	17	58	922	255	325	19	15

[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], regulatory years 1981–2003

Regulatory year	Pellet-group data[b]	Harvest data: Total estimated harvest	Harvest data: Deer kill/ hunter day	Harvest data: Hunter success (percent)	Wolf abundance
1981	---	---	---	---	---
1982	---	---	---	---	---
1983	0.6	---	---	---	---
1984	0.7	620	0.10	42	---
1985	1.0	779	0.14	37	---
1986	1.1	859	0.12	48	---
1987	1.6	611	0.09	40	---
1988	1.0	686	0.14	43	---
1989	0.9	587	0.13	34	---
1990	1.1	723	0.14	44	---
1991[c]	0.8	347	0.11	35	86
1992	0.9	686	0.15	39	65
1993	1.0	515	0.11	34	57
1994	1.0	912	0.16	48	93
1995	1.1	914	0.18	44	80
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
2002	0.6	376	0.11	33	81
2003	0.9	316	0.14	30	83
$\bar{x}$	0.9	600	0.13	37	79

[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 to 1996 Unit 1A trapper questionnaires.
[b] Average number of pellet-groups per plot from selected sites done each year.
[c] Extremely wet but snow-free season; pellets may not have persisted as long as in past years.

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 2002
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 1B (3000 mi^2)

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

BACKGROUND

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

The most recent significant population declines occurred as a result of a series of severe winters in the late 1960s and early 1970s. The population declines led to restrictive regulations and bag limits in 1973. Unit 1B remained open, with a 1 antlered-deer limit from 1973 to 1980 and a 2 antlered-deer limit from 1981 to the present.

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 (average 1.0 pellet group/20 m^2 plot).
- Monitor deer densities using pellet-group surveys.
- Monitor deer harvest using mailed questionnaires.

METHODS

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

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Unit 1B pellet-group surveys are currently inadequate to determine deer population trends (Table 1). In spring 2003, pellet-group counts were conducted in one VCU at Horn Cliff where pellet-group density was .67 pellet-groups/plot, and nearly identical to the .60 recorded the last time the area was surveyed in 1998. No pellet-group surveys were conducted in Unit 1B during spring 2004.

MORTALITY

Harvest

Season and Bag Limit	Resident and Nonresident Hunters	
Unit 1B	1 Aug–31 Dec	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. Based on the results of the deer hunter survey, hunter harvest in 2002 continued a declining trend that began in 2000. The estimated harvest of 34 deer in 2002 was less than half of the long-term average and the lowest estimated harvest since 1984 (Table 2). Deer harvest was reported from the Thomas Bay and Horn Cliffs/Le Conte Bay areas. In 2003 the deer harvest rebounded and was only slightly below the long-term average of 100 deer per year. Deer harvest was reported from the Thomas Bay, North Arm of the Stikine River and Horn Cliff/Le Conte Bay areas.

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, and therefore, attract more nonlocal hunters. The total number of hunters decreased from 141 in 2001 to 91 in 2002, which may contribute to the low harvest that year. The number of hunters increased to 106 in 2003 but remained well below the long-term average. Despite the low harvest, success rates increased from 23% in 2001 to 33% in 2002 and 42% in 2003.

Harvest Chronology. Generally, most harvest in the unit takes place during November, October, and December, respectively (Table 4). During the report period, November, October and August, respectively, provided the highest percentage of harvest.

Transport Methods. Most hunters traveled by boat to their hunting areas (Table 5). A small percentage of hunters reported using highway vehicles in 2002 and hiking and all-terrain vehicles (ATVs) in 2003 to access hunt areas. Logging roads provide some ATV and highway vehicle access.

CONCLUSIONS AND RECOMMENDATIONS

Unit 1B deer populations exist in isolated pockets and have a patchy distribution. Unitwide, deer densities vary from moderate in some isolated areas to extremely low in others. Overall, deer populations seem stable with localized variations. Winter weather, predation, and clearcut logging have the greatest effects on deer population dynamics. There are no indications that hunting seasons or bag limits should be restricted.

LITERATURE CITED

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PREPARED BY:
Richard E. Lowell
Wildlife Biologist III

SUBMITTED BY:
Dale Rabe
Management Coordinator

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

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

Table 2 Unit 1B deer harvest, 1992–2003

Regulatory year	Estimated legal harvest						Estimated illegal harvest					Total[a]
	M	(%)	F	(%)	Unk.	Total	M	(%)	F	(%)	Unk.	
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
2002	34	(100)				34						34
2003	82	(100)				82						82

[a] Data from mail questionnaire.

Table 3 Unit 1B deer hunter residency and success, 1992–2003

Successful						Unsuccessful					
Regulatory year	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Total hunters
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
2002	30	0	0	30	(33)	52	0	9	61	(67)	91
2003	45	0	0	45	(42)	46	15	0	61	(58)	106

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

Table 4 Unit 1B deer harvest chronology by month and percent, 1992–2003

Regulatory	Harvest periods							
year	Aug	Sep	Oct	Nov	Dec	Mar	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
2001	15	18	23	27	11	0	6	43
2002	12	12	24	52	0	0	0	33
2003	20	15	27	39	0	0	0	82

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

Table 5 Unit 1B deer hunter effort, percent by transport method, 1992–2003[a]

Regulatory year	Percent of effort							Number of trips
	Airplane	Boat	3- or 4-wheeler	Foot	ORV	Highway vehicle	Not specified	
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
2002		91				4	4	NA
2003		84	8	9				NA

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

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 2002
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 1C (7600 mi^2)

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

BACKGROUND

Deer have inhabited northern Southeast Alaska since their migration from southern refugia following the Pleistocene epoch (Klein 1965). Deep snow keeps the number of deer on the mainland lower than that on adjacent islands. A 1963 population estimate suggested 200,000 deer in Southeast Alaska (Merriam 1970). The regionwide 1962 harvest was 10,500 deer. Severe winters in 1969 and 1971 increased mortality and reduced deer numbers (Olson 1979). Hunter surveys began in 1970 and continue annually. These surveys have grown from telephone contacts of a few hunters to a mail-out survey of a random list of hunters beginning in 1980. Pellet-group counts (Kirchhoff and Pitcher 1988) began in Unit 1C in 1984 and have been conducted on Douglas, Harbor, Lincoln, and Shelter Islands on a near annual basis, but rarely in mainland locations. Deer densities were relatively high throughout the early to mid 1990s but declined substantially due to severe weather in winter 1999. Evidence of the affect of this severe winter on deer was documented in Unit 4 where 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 3 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 provides 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 that have only occasionally been known to support wolves. During summer 2001, at least 7 wolves (2 adults and 5 pups) were seen on a number of occasions near Point Hilda on southern Douglas Island. A Douglas Island trapper caught 7 wolves in January 2002.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

As established by the Alaska Board of Game during its fall 2000 meeting in response to the intensive management of game law [AS 16.05.255 (i) (4)], the Unit 1C management goal is to manage the deer population to achieve and maintain a population of 6200 deer while maintaining an annual harvest of 456 deer.

MANAGEMENT OBJECTIVES

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

METHODS

A total of 11,227 deer harvest tickets were issued for the 2002 regulatory year (RY) in Southeast Alaska and 10,958 for RY 2003. (RY begins 1 July and ends 30 June, e.g., RY02 = 1 Jul 2002 through 30 Jun 2003.) We mailed nearly one third of all Southeast deer harvest ticket holders a survey each year; 56% responded in 2002 and 59% responded in 2003. 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 (Straugh and Rice 2003; Straugh et al. 2004). We conducted pellet-group surveys on Douglas and Shelter Islands in RY 2002 but only on Douglas Island in RY 2003.

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 increased over both years of this report period (Table 1). The 2002 survey results yielded a count of 0.93 groups/plot, up from the 2001 count of 0.68. In 2003 the pellet count climbed to 1.52 groups/plot, which is the highest count for this area since 1997 and the second highest going back to 1990. The relatively mild winters we have experienced since 1998 are probably responsible for the higher deer number indices.

At Inner Point on the southwest side of Douglas Island, pellet-group densities have not exceeded .88 groups/plot, whereas the mean pellet density during the period of 1985 through 1999 was 1.52 groups/plot. The relatively low densities during this report period add to a continuing low trend of pellet groups in this area. 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.

At Shelter Island, pellet transects were conducted only during RY2002 of this report period. The density of 1.41 groups/plot was substantially lower than the previous count of 2.07 in RY2000, and the second lowest during 1986–2002. The deer harvest on Shelter and adjacent Lincoln Islands during this report period was reflective of the declining pellet counts, with 60 deer harvested in RY 2002 and 30 harvested during RY 2003.

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

MORTALITY

Harvest

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

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

Hunter Harvest. Based on data gathered from the annual deer hunter survey in Unit 1C, hunters killed 358 deer in 2002 and 467 in 2003 (Table 2), with bucks composing 61% (2002) and 71% (2003) of the harvest. This mean harvest of 413 deer is substantially higher than the previous report period mean of 310 deer and only slightly less than the previous 10-year average of 420. An estimated 80% of the Unit 1C deer harvest came from Douglas Island in 2002 and and 86% in 2003. This represents a considerable increase from the previous report period when only 63% (2000) and 56% (2001) of the 1C harvest came from Douglas Island. In both of these years, Shelter and Lincoln Islands accounted for most of the displaced harvest, although the mainland along the Juneau road system has been providing increasingly better hunting opportunities. During the report period, 10 deer were reported harvested on the mainland in 2002 and 33 in 2003. This is quite remarkable considering during the past 10 years there have been several seasons where no deer were reported harvested from this area.

Hunter Residency and Success. During the report period most hunters (94% in 2002, 92% in 2003) were Unit 1C residents, while nonlocal residents composed the majority of the remaining hunters. Nonresidents made up less than 1% of the hunters during the report period (Table 3). Hunter success rate ranged from 28% in 2002 to 35% in 2003. An average of 1.6 and 1.5 deer were taken per successful hunter in 2002 and 2003, respectively. Hunters spent an average of 7.3 days of hunting per deer in 2002 and 6.5 days per deer in 2003. The average deer per hunter was 0.4 in 2002 and 0.5 in 2003. The series of relatively mild winters over the past 5 years has undoubtedly favored overwinter deer survival, which in turn has led to relatively high harvests during this report period.

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 (Straugh and Rice 2003; Straugh et al. 2004).During this report period 55% of hunters used highway vehicles for access, 35% used boats, and 8% 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 2002 hunters using boats had a success rate of 33%, compared to hunters using highway vehicles (25%). In 2003, hunters using boats to access more remote areas had a success rate of 36% compared to the 30% for those who used highway vehicles.

CONCLUSIONS AND RECOMMENDATIONS

Although we did conduct mail out-surveys to quantify deer hunting effort and harvest, we were unable to conduct pellet-group counts in each value comparison unit (VCU) on an annual basis. Only Douglas Island was surveyed during both years of the report period. Shelter was surveyed in 2002 only, and Lincoln Island and the mainland were not surveyed at all. Neither Douglas nor Shelter Islands reached the management objective stated goal of 2.0 pellet groups/plot in either year. However, the North Douglas VCU increased substantially during 2003, and will hopefully continue to increase during the next report period. The Inner Point VCU, on the other hand, remained low during the report period in spite of a recent string of mild winters that should have favored deer survival. In the past we speculated that selective cut logging and the presence of wolves in this area led to lower pellet counts, and this may still be the case. We will continue to survey these areas annually and monitor the pellet indices.

In spite of the relatively low deer pellet indices on Douglas Island, the deer harvest during 2003 was the highest since 1993. Most hunters were pleased with their success while hunting Douglas, and many were relieved that wolves hadn’t decimated the deer population as they had suspected. Given the interest most people have regarding the presence or absence of wolves on Douglas Island, efforts should be made to investigate the Hilda Cove area for signs of wolf activity.

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PREPARED BY:
Neil L. Barten
Wildlife Biologist III

SUBMITTED BY:
Dale Rabe
Wildlife Biologist IV

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Table 1 Unit 1C deer population trends as indicated by pellet-group surveys, 1986–2003

Area	Regulatory year	Mean pellet-groups/plot	Number of plots	95 % CI
Kensington (VCU 20)	1993	0.00	180	---
Portland Island (VCU 27)	1986	0.99	381	0.87–1.12
North Douglas (VCU 35)	1990	0.8	300	0.65–0.96
	1992	0.74	324	0.62–0.87
	1993	0.91	315	0.74–1.09
	1994	0.86	306	0.70–1.02
	1995	0.97	323	0.81–1.12
	1996	1.43	323	1.24–1.62
	1997	1.55	321	1.32–1.77
	1998	1.03	273	0.86–1.19
	1999	0.88	282	0.71–1.04
	2000	1.01	335	0.85–1.17
	2001	0.68	200	0.50–0.85
	2002	0.93	267	0.77-1.09
	2003	1.52	288	1.28-1.76
Inner Point (VCU 36)	1985	1.97	235	1.68–2.25
	1986	1.76	262	1.53–2.00
	1987	1.21	200	1.02–1.39
	1988	1.30	258	1.08–1.53
	1991	2.05	204	1.75–2.36
	1994	1.41	254	1.21–1.60
	1995	1.68	240	1.45–1.91
	1996	2.36	252	2.08–2.64
	1997	0.84	280	0.69–0.98
	1998	1.06	239	0.87–1.25
	1999	1.09	280	0.90–1.28
	2001	0.82	198	0.64–1.00
	2002	0.76	272	0.60-0.92
	2003	0.88	242	0.68-1.08
Rhine Creek (VCU 38)	1996	0.31	108	---
Harbor Island (VCU 65)	1986	1.28	200	1.00–1.56
Couverden (VCU 117)	1992	0.35	350	0.27–0.44

Table 1 Continued

Area	Regulatory year	Mean pellet-groups/plot	Number of plots	95 % CI
Shelter Island (VCU 124)	1986	2.91	288	2.57–3.24
	1987	3.16	130	2.62–3.70
	1988	1.42	300	1.23–1.62
	1989	1.60	300	1.37–1.82
	1992	2.00	250	1.73–2.26
	1994	1.38	297	1.20–1.56
	1996	2.51	312	2.23–2.78
	1998	1.63	290	1.42–1.85
	2000	2.07	231	1.79–2.36
	2002	1.41	300	1.19-1.63
Lincoln Island (VCU 124)	1997	1.57	207	1.27–1.77
Sullivan Island (VCU 94)	1989	1.40	250	1.17–1.62
	1998	0.64	66	0.35–0.93

Table 2 Unit 1C annual deer harvest[a], 1985 through 2003

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
2002	217	141	358
2003	330	137	467

[a] Data from expanded results of hunter surveys.

Table 3 Unit 1C deer hunter residency and success, regulatory years 1986 through 2003

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	243	23	0	0	266	(30)	557	61	10	0	628	(70)	894
2002	218	9	0	0	227	(28)	531	42	0	0	573	(72)	800
2003	292	14	8	0	314	(35)	546	48	0	0	594	(65)	908

[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 2003

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
2002	800	2598	358	.4	7.3
2003	908	3022	467	.5	6.5

* Data unavailable due to changes in survey.

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 2002
To: 30 June 2004

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 (RY) 1987, but was discontinued a year later because of public opposition. In 1995, despite state opposition, a federal 2½-month antlerless season was implemented in Unit 2. The federal antlerless season remains in effect allowing qualified rural hunters to harvest 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 during the period when many Prince of Wales Island (POW) logging camps closed and families moved into town. The population of Craig has since stabilized as some residents have moved away in search of employment, while others have started new tourism-based businesses.

Clearcut logging has been widespread in Unit 2 and its effects on deer habitat are significant and enduring. Counting national forest and private lands, ADF&G biologists estimate that 470 mi^2 of forested habitat has been cut during the past 50 years in Unit 2. The result of that timber harvest has been the removal of a large portion of important deer range, especially critical winter habitat. Habitat changes continue from additional logging and from the subsequent second growth in many 20- to 30-year-old clearcuts when they reach the exclusion stage, where the canopy closes and important understory plants disappear. Associated with logging is road building, and roads are steadily impinging on deer habitat; Unit 2 has the highest density of roads in Southeast—over 2200 miles of drivable road surface. As clearcut

logging continues to reduce old-growth habitat in Unit 2, deer populations are expected to decline. Population models estimate declines in carrying capacity of 50–60% by the end of the logging rotation in 2054. Long-term consequences of habitat loss include the inability to provide for subsistence needs and a loss of deer hunting opportunities.

State deer hunter survey data suggest numbers of hunters and deer harvested from Unit 2 declined slightly during this report period (RY 2002–RY 2003). Unfortunately, harvest survey data from these 2 years are not comparable to earlier data because many hunters no longer obtain state harvest tickets; rather, they hunt under the federal subsistence permit program. Consequently, hunting and harvest information from those hunters is no longer captured by the state survey. Further, some hunters obtaining harvest tickets also hunted under the federal program. As a result, harvest estimates from federal permit data and state harvest survey data cannot simply be merged additively to estimate total harvest.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

Action taken by the Board of Game in fall 2000 established a Unit 2 population goal of 71,000 deer and a harvest goal of 2700 deer. This action is based on the Unit 2 population being identified by the board as important for satisfying high levels of human consumptive use.

MANAGEMENT OBJECTIVES

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

METHODS

We collected population information from anecdotal reports provided by hunters and from spring pellet-group surveys. We collected harvest data from an annual questionnaire mailed to a random sample of hunters who were issued deer harvest tickets during the hunting season. We mailed harvest questionnaires to 33% of all harvest ticket holders and expanded our results to cover all harvest ticket holders (Straugh and Rice 2003; Straugh et al. 2004). Due to growing issues in Unit 2 and the poor historical survey response rates from residents of Unit 2, some POW communities were sampled at approximately 100 percent starting in 2003. Overall survey response rates were 56% in 2002 and 59% in 2003.

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 10 watersheds (value comparison units, or VCUs) during April 2002 and another 5 during April 2003. 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

Population estimates for all of Unit 2 using crude habitat capability and range quality suggest there are around 55,000 deer in Unit 2. Unit 2 deer densities vary within and between VCUs. Unit 2 deer pellet-group counts were about the same during 2002 and 2003 with some slight variation. The only site with below normal pellet averages during 2002 was in Twelve Mile Arm. The highest deer pellet densities during both years were at Red Bay and Little Ratz. The 2002 pellet group mean at Little Ratz was the highest on record for that VCU (2.32). The objective of maintaining 45 deer/mi^2 in winter habitat was only achieved in 3 of the VCUs sampled during 2002 (Red Bay, Snakey Lakes, and Little Ratz), but no sites met the objective in 2003 (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	1 Aug–31 Dec	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. After being unsuccessful for several years, proposals to the Federal Subsistence Board in 2003 resulted in a shorter deer hunting season for nonfederally qualified hunters and a season extension for local residents of Unit 2. Federal subsistence hunters have been arguing they would like to see a local preference for Unit 2 deer hunting. Some residents of Prince of Wales Island contend Ketchikan and other nonlocal hunters are impacting their ability to get the deer they need to subsist. The current federal season now runs 22 July–15 August and excludes Ketchikan and other nonlocal hunters from hunting federal lands on Prince of Wales Island until 16 August. The federal bag limit is still 4 bucks with an option to take 1 doe as part of that 4 deer bag limit 15 October–31 December. The state deer season for state and private lands in Unit 2 remains 1 August–31 December. This regulation change has also caused problems with the state mail-out survey because deer taken under federal regulations in Unit 2 are not captured in our state survey.

Hunter Harvest. Deer harvest in Unit 2 during the past 2 seasons was estimated at 2169 and 1783 deer, not reaching the harvest objective of 2700 deer during either year. Deer per hunter (1.1 deer) was slightly below the long-term average of 1.3. Average hunter days per deer (4.8) 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 3 days per deer in Unit 4. However, the majority of POW hunters used highway vehicles for transportation. Highway hunters typically report more days afield, perhaps because in heavily roaded areas like Unit 2 it is often easier to set off on a hunt using a motor vehicle than when boats or airplanes are used for transportation.

During the past 2 years reported hunter days have declined (Table 2). However, it is unlikely that actual hunter days or harvest have changed in Unit 2, but rather that how hunters report those days and harvest on our mail-out survey has changed. Under federal subsistence regulations qualified hunters can hunt part of, or the entire, season and not use state harvest tickets. Consequently, they do not report hunting time nor harvest on the state mail-out survey. One proposal recently submitted to the Federal Subsistence Board if passed will combine state and federal deer harvest tags into one tag system and provide a harvest report to track the harvest and effort in Unit 2.

We believe that Unit 2 has one of the highest illegal or unreported harvests in the region. Unreported and illegal kill is estimated to be equal to the Unit 2 reported harvest (Table 4). Of an estimated 55,000 deer in Unit 2, the illegal removal of 3000 deer equates to an estimated 5.5% 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. Hunters from 22 Alaska communities (13 from POW) participated in the 2003 Unit 2 harvest. An estimated 675 hunters (44% of the total) were residents of POW Island. The POW resident hunter success rate for Unit 2 was estimated at 3.2 days per deer in 2003, substantially higher than the overall combined resident and nonresident estimate of 4.5 days per deer. Success by local resident hunters (52%) remained similar to the long-term average of 55% (Table 5).

Nonresident hunters have never taken a high number of deer from Unit 2, and interest by nonresident hunters fluctuates yearly. During the 2002 season, 132 nonresidents spent 816 days afield and took 47 deer for a 36% success rate. More nonresident hunters were successful during 2003 than ever before. During 2003, 168 nonresident hunters reported hunting 821 days in Unit 2, and 57 of those hunters were successful taking 62 deer (Table 5). Nonresident hunters accounted for just over 2% of the total reported Unit 2 deer harvest during the past 2 seasons (Table 5).

Nonresidents spent an average of 14 days per deer harvested in Unit 2 during this report period. Nonlocal residents harvested an average of 42% and 33% of the Unit 2 harvest during 2002 and 2003 respectively. Ketchikan hunters' share of the POW harvest during the same 2 seasons remained similar to previous years at 24% and 31%. During the 2002 season, 59 does were reportedly harvested under federal subsistence permits in Unit 2, and during 2003, 77 does were reported.

Harvest Chronology. Most Unit 2 deer are harvested during August, October, and November. August has usually accounted for most of the harvest (30%). However, during this report

period, August dropped down to 22% of the reported harvest (Table 6). This is probably a combination of a shorter season during August for most hunters and also how hunters reported their activity. Most hunters now have only 2 weeks of August to hunt rather than the traditional 4 weeks.

Transport Methods. With the extensive road system in Unit 2 most hunters prefer to access hunting areas by highway vehicle. During this report period boat use was slightly higher than during the past 10 years. The long-term average boat use has been 16%, but during the past 2 years, 21% of hunters reported using boats to reach hunting areas in Unit 2 (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.

Historically, deer–vehicle collision estimates have remained low (10–25 deer/year) and have not been a significant source of Unit 2 mortality. However, the collision risk has increased with completion of extensive new POW paving projects, which now extend from Craig to Naukati and east to Thorne Bay. The main 30 road from Naukati to Coffman Cove is under construction and is scheduled for paving by fall 2005. Higher vehicle speeds, as well as an attractive food source created from grass seed planted for erosion control, will likely cause more deer–vehicle collisions.

HABITAT

Assessment

Logging continues to cause major changes to old-growth habitat. The most serious effects are in higher volume stands at low elevations, which are critical to deer during years of heavy snowfall. U.S. Forest Service (USFS) and ADF&G habitat models predict that the forest's ability to support deer in average winter conditions will decline by nearly half by the end of the logging rotation in 2054. Because of extensive loss of critical winter habitat, in some areas deer declines may exceed 60% following severe winters. By 2054 we expect few areas will meet projected hunter demand within road-accessible areas and logged portions of Unit 2 (USFS 1989). The USFS is spending some resources to look at second-growth management. Second-growth issues will be one of the top Unit 2 issues during the next 5–10 years as large tracts of previously logged areas reach the closed canopy stem exclusion stage. These large tracts of land will be converted to extremely poor deer habitat, and consequently, we expect habitat capability and deer numbers to decline. Because of ongoing Unit 2 habitat changes, we need more than ever to obtain accurate information on deer herd status to serve as a baseline to assess long-term changes. The future success of any research or survey program will depend on an informative public education campaign.

CONCLUSIONS AND RECOMMENDATIONS

Based on pellet-group data, our objective of maintaining 45 deer/mi^2 in winter habitat was achieved in 3 of the VCUs sampled during 2002, but none of the 2003 sites. Two major harvest areas in north-central POW may be reaching peak 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.

According to our mail-out harvest survey information, the Unit 2 harvest objective of 2700 deer was not met during this report period nor has this objective been met in 5 of the past 8 years. Hunters were confused during the past couple of years because of regulatory changes under federal rules that allowed federally qualified hunters to harvest deer without obtaining state deer tags. Consequently, these hunters were missed when we surveyed Unit 2 using state harvest tag contact information. Also, if hunters obtained both sets of tags and subsequently harvested deer during the state season, they did not know how they were supposed to report those deer on the mail-out survey. A few may have even reported them to both agencies. Hopefully, this confusion will be sorted out during the next year, and we will get better harvest survey information from both state and federally qualified hunters.

Wolf abundance remained moderate to relatively high in recent years, and predation continues to influence deer populations in Unit 2. An expansion of our Unit 2 deer–wolf research to include neonate fawns during 2002 indicated that black bears have a significant effect on early survival of young deer.

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

Recent road improvement projects that paved large sections of POW and the planned arrival of a new high-speed ferry at the north end are changing hunter access. New and improved access, coupled with the predicted decline of deer carrying capacity in Unit 2, will require that we monitor deer populations more closely in the future.

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PREPARED BY:
Boyd Porter
Wildlife Biologist III

SUBMITTED BY:
Dale Rabe
Management Coordinator

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Table 1 Unit 2 deer pellet-group survey results, regulatory years 1984 through 2003

Area	Regulatory year	Mean pellet-groups/plot[a]	Number of plots	95% CI
Protection	1997	1.15	332	0.99–1.30
(VCU[b] 527)	1998	0.59	281	0.47–0.71
	1999	0.56	325	0.43–0.69
	2000	0.56	325	0.46–0.66
	2002	0.70	349	0.56–0.83
	2003	0.69	319	0.53–0.85
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
	2002	1.49	289	1.28–1.71
	2003	1.15	314	0.94–1.34
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
	2002	0.69	263	0.54–0.83
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

Table 1 continued

Area	Regulatory year	Mean pellet-groups/plot[a]	Number of plots	95% CI
	1998	0.29	312	0.21–0.37
	1999	0.74	281	0.60–0.88
	2001	0.45	330	0.35–0.55
	2002	0.76	283	0.62–0.90
	2003	0.50	333	0.38–0.62
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
	2002	1.17	221	0.94–1.39
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)				
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
	2002	1.12	284	0.90–1.35
	2003	0.91	123	0.66–1.16

Table 1 continued

Area	Regulatory year	Mean pellet-groups/plot[a]	Number of plots	95% CI
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
	2002	1.45	180	1.19–1.71
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
	1999	1.38	304	1.18–1.59
	2000	1.20	287	1.00–1.39
	2002	2.32	195	1.92–2.71
	2003	1.21	335	1.03–1.39
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

Table 1 continued

Area	Regulatory year	Mean pellet-groups/plot[a]	Number of plots	95% CI
	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
	2002	0.51	220	0.38–0.63
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
	2002	0.93	332	0.75–1.10
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
	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
	2002	1.12	317	0.93–1.31
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] See Kirchhoff and Pitcher 1988

[b] Value comparison unit

Table 2 Unit 2 deer harvest data, regulatory years 1984 through 2003

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
2002	1957	1141	58	11,129	5.7	2169	1.1	5.1
2003	1518	910	60	8,000	5.3	1783	1.2	4.5
Average	2018	1363	68	12,672	6.2	2711	1.3	4.7

[a] Includes does that were reported killed.

Table 3 Unit 2 deer harvests from major harvest areas, regulatory years 1990 through 2003

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
	2002	80	37	46	158	2.0	0.8	62
	2003	79	57	72	226	2.9	1.1	83
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

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
	2000	153	75	49	875	5.7	0.7	107
	2001	197	82	42	619	3.1	0.5	97
	2002	233	108	46	1129	4.8	0.7	169
	2003	125	68	54	413	3.3	0.8	98
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
	2002	670	419	63	2941	4.4	1.1	711
	2003	508	339	67	2021	4.0	1.1	537
14–North Central POW Island	1990	664	343	52	2924	4.5	0.9	568
	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

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
	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
	2002	723	358	50	3031	4.2	0.8	573
	2003	434	265	61	1708	3.9	0.9	403
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
	2002	637	291	46	3017	4.7	0.8	532
	2003	279	158	57	1660	5.9	1.0	274

Table 4 Unit 2 reported and estimated deer harvest/mortality, regulatory years 1984 through 2003

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
2002	2091	79	2170	2170	4340	25–30
2003	1705	78	1783	1783	3566	30–50[c]
Average	2604	86	2711	2711	5422	25–30

[a] Unreported and illegal harvest estimated at 100% of reported harvest.
[b] Antlerless seasons: state season in 1987, federal season in 1995–1999.
[c] Over 60 miles of new pavement with high speed limits will cause more collisions each year.

Table 5 Unit 2 Hunter residency and success, regulatory years 1988 through 2003

Regulatory year	Successful				Unsuccessful			
	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
2002	577	517	47	1141	211	419	85	715
2003	495	357	57	909	194	309	111	614
Average	714	554	30	1298	264	355	54	673

[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 2003

Regulatory year	Month of kill							Method of transportation[a]					
	Aug	Sep	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
2002	615	281	394	657	79	0	140	49	465	65	1590	0	4
2003[c]	274	272	356	556	70	7	173	29	349	46	1320	0	0
Average	775	350	452	686	83	6	52	122	602	494	2376	53	10

[a] Numbers of successful and unsuccessful hunter trips.
[b] Includes cars, trucks, and off-road vehicles (3- and 4-wheelers).
[c] Harvest underestimated on state survey because of new federal subsistence regulations.

Table 7 Unit 2 deer pellet-group and harvest data, predator abundance (I_A)[a], and weather severity indices, regulatory years 1981 through 2003

Regulatory year	Pellet-group data[b]	Harvest data			Wolf abundance	Weather index[c]
		Total harvest	Deer kill/ hunter day	Hunter success (percent)		
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	6.3
2001	0.7	2865	0.22	66	70	1.5
2002	1.1	2170	0.19	58	72	1.8
2003	0.9	1783	0.22	60	71	1.3
Average	1.1	2680	0.23	67	60	2.7

[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.

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 2002
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 3 (3000 mi^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 increased this limit to 2 antlered deer in 1988. In 1991 a registration permit hunt with a 15–31 October season and a 1 antlered deer bag limit was opened on parts of Mitkof, Kupreanof, Woewodski, and Butterworth Islands, where the deer season had been closed since 1975. The registration permit was replaced with a harvest ticket requirement in 1995. Beginning with the 1993 hunt, the only part of Unit 3 closed to deer hunting was the area within Petersburg and Kupreanof city limits. The board abolished that prohibition in fall 2000.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

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

MANAGEMENT OBJECTIVES

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

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

METHODS

We estimated Unit 3 deer harvest from a regional questionnaire mailed randomly to 33% of deer harvest ticket holders (Straugh and Rice 2003; Straugh et al. 2004). We measured winter deer 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 well above average during the winter of 2001–02, less than half the average amount during the winter of 2002–03, and about average in 2003–04. Reduced snowfall can result in lower pellet-group densities on deer winter range by allowing deer to winter and deposit pellets at higher elevations beyond the reach of established pellet-count transects. Because winter severity can influence the results of pellet-group surveys, inferences about population trends based on year-to-year variations in observed pellet-group densities must be made with caution.

In spring 2003, pellet-group counts were conducted in 2 Unit 3 VCUs (Table 1). Woewodski (South Mitkof Island) pellet-group counts were down considerably from 1.43 pellet-groups/plot in 2001, to .50 in 2003, the lowest on record. Mitkof experienced less than half the normal amount of snowfall in the winter of 2002–03, which probably contributed to the record low pellet-group densities in spring 2003.

In spring 2004 pellet-group counts were conducted in 6 Unit 3 VCUs. Woewodski (South Mitkof Island) counts rebounded from the record low .50 pellet-groups/plot in 2003, to 1.06 in 2004, but still remained below the 10-year average of 1.30. The 4 VCUs sampled on Zarembo Island in 2004 revealed high variability in pellet count densities across the island. Three of the 4 VCUs showed declining pellet-group densities, while 1 VCU remained the same compared to 2002. At Snow Pass counts were 1.02 pellet-groups/plot, down from 1.50 in 2002. At Baht Harbor counts were 1.80 pellet-groups/plots, down from 2.75 in 2002. At St. John Harbor counts were 1.17 pellet-groups/plot, down from 1.67 in 2002. Counts at Meter Bight were .89 pellet-groups/plot, nearly identical to those in 2002.

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	15 Oct–31 Oct	1 antlered deer

Butterworth islands

Remainder of Unit 3	1 Aug–30 Nov	2 antlered deer

Board of Game Actions and Emergency Orders. At the fall 2002 meeting, the Board of Game extended the season length and increased the bag limit for deer on the Lindenberg Peninsula, aligning the deer regulations on all of Kupreanof Island with the majority of Unit 3. In another action, the board established the Petersburg Management Area, an archery-only hunt area within the Petersburg City limits, and extended the archery-only deer season in this area by an additional 2 weeks.

Hunter Harvest. Deer hunter effort and harvest changed little in Unit 3 before 1991. Hunter survey data for 1991–2003 includes Mitkof Island, which is primarily responsible for increases in both hunter numbers and kill. The unitwide 2002 harvest of 624 deer was well below the 10-year average of 817 and the lowest since the 1996 harvest of 603 deer (Table 2). The Zarembo Island harvest decreased from a near record 426 in 2001, to 277 in 2002. In 2003 the unitwide harvest increased to 901 deer. With the liberalization of the deer season and bag limit on the Lindenberg Peninsula, the Kupreanof Island deer harvest increased from 149 in 2002 to a record high of 373 in 2003. The resulting harvest increase allowed Kupreanof to surpass Zarembo as the unit's leading deer producer. Zarembo Island provided 256 deer, or about 28% of the unitwide harvest.

Hunter Residency and Success. Few nonresidents hunt deer in Unit 3, and most hunters are local residents (Table 3). Nonresidents composed just 5% and 4%, respectively, of all Unit 3 deer hunters in 2002 and 2003. Deer populations are greater and seasons and bag limits more liberal in other nearby units, attracting most nonlocal hunters to those areas. The total number of hunters decreased from 1012 in 2001 to 891 in 2002, and then increased to 970 in 2003. The success rate was 49% in 2001, 48% in 2002 and 58% in 2003.

Harvest Chronology. Table 4 shows the Unit 3 deer harvest percentage by month. Most deer harvest in the unit typically occurs during October, November, August, and September, respectively. During the report period, however, most deer harvest occurred during November, October, August, and September, respectively. The relatively high number of October kills from 1991 to 2002 coincided with the restrictive 2-week deer season on Mitkof, Butterworth, and Woewodski Islands and the Lindenberg Peninsula on Kupreanof Island. The liberalization of the deer season and bag limit on the Lindenberg Peninsula in 2003 probably contributed to the high harvest percentage in November.

Transport Methods. From 1995 through 1998 most hunters reported using boats to access their hunting areas, but from 1999 through 2001 most hunters reported using highway vehicles. In 2002 most deer hunters (49%) reported using highway vehicles to access hunting areas, while in 2003 most deer hunters (49%) used boats (Table 5).

Other Mortality

Between 1997 and 1998 the U.S. Forest Service radiocollared 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 thought to be stable with localized variations. While most areas where pellet-group surveys were conducted in spring 2003 and 2004 showed decreasing trends, we believe that annual fluctuations in winter severity probably had some influence on pellet-group densities. 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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PREPARED BY:
Richard E. Lowell
Wildlife Biologist III

SUBMITTED BY:
Dale Rabe
Management Coordinator

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Table 1 Unit 3 deer population trends as indicated by pellet-group surveys, 1981–2003

Area	Regulatory year	Mean pellet-groups/plot	Number of plots	95% CI
Security Bay	1984	.02	360	0.01–0.04
(VCU 400)	1989	.25	304	0.16–0.34
	1995	.22	268	0.15–0.29
	2000	.09	201	0.05–0.14
Pillar Bay	1988	.16	337	0.10–0.22
(VCU 403)	2000	.18	264	0.13–0.23
Malmesbury	1990	.11	206	0.05–0.18
(VCU 408)	2000	.06	254	0.03–0.09
Conclusion	1987	2.66	207	2.32–3.01
(VCU 417)	1989	.95	200	0.72–1.18
	1991	.71	200	0.53–0.88
	1996	1.45	191	1.19–1.70
Big John Bay	1994	.38	300	0.29–0.48
(VCU 427)				
431–Point Barrie	1988	.23	357	0.17–0.29
(VCU)	1993	.77	375	0.64–0.90
Big Level	1981	1.54	399	1.45–1.63
(VCU 434a)	1983	1.56	336	
	1986	1.66	382	1.41–1.90
	1989	1.07	227	
	1991	2.16	456	1.90–2.41
Little Level	1981	2.48	114	2.02–2.94
(VCU 434b)	1983	2.34	136	
	1986	1.39	122	1.07–1.70
	1989	1.52	137	
	1991	3.59	132	3.07–4.11
Castle River	1984	.19	312	0.12–0.26
(VCU 435)	1987	.51	305	0.37–0.65
	1989	.40	312	0.25–0.56
	1994	.32	310	0.20–0.40
	1998	.36	281	0.28–0.44
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	1.89	254	1.59–2.19

Table 1 continued

Area	Regulatory year	Mean pellet-groups/plot	Nr plots	95% CI
Portage Bay	1993	.43	282	0.30–0.56
(VCU 442)	1995	.43	277	0.63–0.94
	1998	.39	285	0.29–0.49
Woewodski (S. Mitkof)	1984	.088	295	0.69–1.08
(VCU 448)	1985	1.00	209	0.82–1.19
	1987	1.65	195	1.85–2.61
	1988	1.33	433	1.16–1.51
	1989	1.35	417	1.24–1.73
	1990	1.46	355	1.28–1.64
	1991	1.80	316	1.52–2.07
	1992	0.79	248	0.62–0.97
	1993	1.06	230	0.85–1.27
	1994	1.13	152	0.82–1.46
	1995	1.38	157	1.08–1.67
	1996	2.25	243	1.95–2.55
	1997	1.56	282	1.27–1.84
	1998	1.10	282	0.91–1.29
	1999	1.36	196	1.11–1.60
	2000	1.27	226	1.05–1.50
	2001	1.43	220	1.17–1.68
	2002	0.50	216	0.36–0.64
	2003	1.06	250	0.87–1.25
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	1992	1.04	114	0.77–1.30
(Central Mitkof)	1993	1.28	265	1.04–1.51
(VCU 452)	1997	1.61	245	1.34–1.88
Dry	1981	.92	91	0.56–1.28
(VCU 454)	1993	1.44	210	1.17–1.72
	1997	1.26	188	0.88–1.39

Table 1 continued

Area	Regulatory year	Mean pellet-groups/plot	Nr plots	95% CI
Vank Island Group	1981			
(VCU 455)				
a) Sokolof		1.73	900	1.61–1.85
b) Rynda		.25	281	0.18–0.32
c) Greys		.25	284	0.18–0.32
Baht	2001	2.75	109	2.10–3.41
(VCU 456)	2003	1.80	108	1.45–2.15
St. John	2001	1.67	220	1.38–1.93
(VCU 457)	2003	1.17	229	0.96–1.38
Snow Passage	1994	.57	345	0.45–0.70
(VCU 458)	1997	.98	315	0.80–1.16
	2001	1.50	280	1.28–1.72
	2003	1.02	306	0.84–1.20
Meter	2001	0.87	180	0.64–1.10
(VCU 459)	2003	0.89	180	0.68–1.10
Woronkofski	1985	1.63	646	1.45–1.81
(VCU 461)				
(All Transects)				
(Trans. 10, 11, 12)	1985	2.01	218	1.62–2.39
	1987	2.23	201	1.85–2.61
	1989	2.52	223	2.18–2.85
	1991	1.59	203	1.32–1.85
	1993	.22	225	0.13–0.31
	1994	.26	224	0.18–0.34
	1999	0.11	216	0.06–0.17
	2003	0.08	227	0.03–0.13
Mosman	1993	.07	304	0.03–0.11
(VCU 467)				

Table 1 continued

Area	Regulatory 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
	2001	.97	332	0.81–1.13
Fool's (VCU 480)	1994	.54	193	0.38–0.70
	2000	.61	201	0.45–0.77
Canoe (VCU 474)	2000	.11	228	0.06–0.17
Coronation (VCU 564)	1983	1.20	696	1.04–1.36
	1985	2.34	228	N/A
	1988	1.41	408	1.17–1.66
	1989	1.63	293	1.28–1.98
	1997	.44	289	0.34–0.55

Table 2 Unit 3 deer harvest, 1992–2003

Regulatory	Estimated legal harvest							
year	M	(%)	F	(%)	Unk.	Total	Estimated illegal harvest	Total[a]
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
2002	624	(100)			0	624	0	624
2003	888	(100)			0	888	13	901

[a] Data from mail questionnaire.

Table 3 Unit 3 deer hunter residency and success, 1992–2003

Successful						Unsuccessful					
Regulatory year	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Total[b] hunters
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
2002	363	51	14	428	(48)	413	22	28	463	(52)	891
2003	480	66	21	567	(58)	345	38	20	403	(42)	970

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

Table 4 Unit 3 deer harvest chronology percent by month, 1992–2003

Regulatory year	Harvest periods									Total[a] nr deer
	August	September	October	November	December	January	February	April	Unk.	
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
2002	15	16	25	37	0	0	0	0	8	624
2003	19	9	27	30	0	0	0	0	15	901

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

Table 5 Unit 3 deer hunter effort percent by transport method, 1992–2003[a]

Regulatory year	Percent of effort							Number of trips
	Airplane	Boat	3- or 4-wheeler	Foot	ORV	Highway vehicle	Other	
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
2002	3	38	8	2	0	49	0	NA
2003	0	49	6	2	0	40	3	NA

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

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 2002
To: 30 June 2004

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 2002–03, Unit 4 accounted for 43% of the region's hunter effort and 60% of the deer harvest (Straugh and Rice 2003). In the 2003–04 season Unit 4 accounted for 44% of the region's hunter effort and 68% of the deer harvest (Straugh et al. 2004).

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. A series of mild winters beginning in 1999–2000 to the present period have allowed an apparent recovery of deer populations. Record low snowfall was recorded during the winter of 2002–03.

Deer densities are expected to decline in the future due to habitat alteration caused by commercial logging. Kirchhoff (1994) pointed out that following clearcut logging, browse availability declines as forest regeneration progresses. He also noted that snow accumulation in clearcut areas during severe winters precludes use by deer, resulting in high starvation mortality. Farmer and Kirchhoff (1998) reiterated that differences in habitat use and mortality may be attributed to forage abundance and availability (Wallmo and Schoen 1980), nutritional quality (Hanley et al. 1989), snow (Kirchhoff and Schoen 1987), and predation risk (Kirchhoff 1994).

Since 1990 both state and federal subsistence hunting regulations have been in effect. The Alaska Board of Game adopted state regulations that apply on all lands in Unit 4. The Federal Subsistence Board promulgated regulations that apply only on federal lands and give federally

qualified subsistence hunters more liberal season dates and bag limits. While the 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 its 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.

Harvest questionnaires were mailed to a sample of hunters with deer harvest tickets to assess hunter effort and success (Straugh and Rice 2003, Straugh et al. 2004). Hunters were asked 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. These surveys have been repeated periodically.

Although no formal investigations were conducted regarding parasites in deer, several animals were inspected during the course of this reporting period. Incidence of an ectoparasite occurrence was noted.

RESULTS AND DISCUSSION

Population Status and Trend

During winters 2000–01, 2001–02, 2002–03 and 2003–04 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. Record low snowfall was recorded during the winter of 2002–03, and mild conditions persisted in 2003–04.

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 prelogging 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 2002, 2003, and 2004 indicated a slight increase in deer numbers (Table 1) (Kirchhoff 2002, Kirchhoff 2003, Converse 2004). 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, 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 2002, Straugh and Rice 2003, Straugh et al. 2004). Extrapolations of hunter reports indicated a 2002–03 estimated take of approximately 3900 bucks (76%, Table 2). During the 2003–04 season, hunters reported taking 5523 bucks (72%). There remains a strong tendency for hunters to select bucks, even though the 15 September–31 December either-sex season (the federal season goes through January) has been in effect for many years.

MORTALITY

Harvest

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

Board of Game Actions and Emergency Orders.

At the November 2004 meeting the Board of Game made no changes to existing deer hunting regulations for Unit 4.

Hunter Harvest. Responses from the hunter harvest surveys indicated there were 2213 successful deer hunters in Unit 4 during the 2002–03 season and 2834 during the 2003–04 season (Table 3). These numbers indicate a relatively stable hunter effort, continuing a trend observed over the last 10 years.

In 2002–03 the reported kill was 5117 deer. During the 2003–04 season, hunters reported killing 7621 deer. Weather during the deer hunting season influences the amount of effort put forth by hunters (Faro 1997), thus influencing the harvest. When early snow is sufficient to push deer from higher elevations to beaches, hunters are generally more successful. Shooting from boats under federal subsistence hunting regulations causes high crippling rates and loss of deer. Hunters commonly report spotlighting and poaching of deer on logging road and trails accessed by all-terrain vehicles on Kruzof Island, N. Baranof Island, and SE Chichagof Island. The extensive road system on NE Chichagof Island has frequent reports of spotlighting and poaching turned into state and federal enforcement officers. These activities also cause high crippling rates and generally result in little to no effort to recover wounded deer. Crippling loss, unreported kills, and illegal kills are difficult to accurately determine, but are estimated at about 25% of the reported harvest (Whitman 2003). Based on these estimates, the total hunter-related deer mortality was estimated to be about 6387 deer during the 2002–03 season. The estimate for the 2003–04 season is 9510 (Table 2).

Hunter Residency and Success. During 2002–03 a total of 947 successful hunters residing in Unit 4 harvested an estimated 2753 deer (2.9 deer/successful hunter) (Table 3). Nonresident hunters made up 2.4% of the Unit 4 hunters during 2002–03, a slight increase over previous

years. Alaska residents from other than Unit 4 made up most of the hunters (59% in 2002–03). During the 2002–03 season, 49% of nonresidents, 67% of Unit 4 residents, and 61% of nonlocal Alaska residents were successful at taking at least one deer.

For the 2003–04 season, a total of 1242 successful hunters residing in Unit 4 harvested an estimated 3759 deer (3.02 deer/successful hunter) (Table 3). Nonresident hunters made up 2.6% of the Unit 4 hunters during 2003–04, a slightly increasing trend. Alaska residents from other than Unit 4 made up most of the hunters (56% in 2003–04). For the 2003–04 season, 58% of nonresidents, 83% of Unit 4 residents, and 75% of nonlocal Alaska residents were successful in taking at least one deer.

Harvest Chronology. Most hunters continue to be in the field during November, resulting in the greatest single-month harvest. During the 2002–03 season, the November harvest accounted for 1916 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.

For the 2003–04 season, the November harvest accounted for 3287 deer, or 43% of the harvest (Table 4). December provided the next highest deer harvest for the unit. In contrast to other years, the federal season in January only provided 3% of the reported annual harvest.

Transport Methods. Deer hunter transportation type remains almost identical with past years (Table 5). During 2002–03 boats were used for 68% of the harvest, while 14% of the hunters used airplanes, 2% walked from their respective residences, 14% used highway vehicles, and less than 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.

As is common for Unit 4, the 2003–04 season showed most hunters (74%) using boats. They harvested 76% of the deer. Hunters using airplanes (13%) as a transportation type harvested 11% of the deer reported taken in the unit.

Other Mortality

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 2003 and 2004.

During March and early April 2004, six boat surveys were completed along more than 50 miles of beach shoreline in areas north of Sitka, Peril Strait, and Tenakee Inlet in an effort to quantify physical condition of wintering deer. During those surveys, 92 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 good shape during spring 2004. Mean condition of deer seen during this survey was 3.9. This compares to a mean condition index of 3.5 calculated from deer surveyed in a portion of the same area during late March 1999 (Whitman 2003). The 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 (Whitman 2003). Incidental examinations of additional deer indicate that incidence of lungworm in fawns is high. As a deer matures, incidence of adult worms appears to decline, but most deer show tissue scarring in the lungs from previous infestations that they have overcome. Secondary problems associated with fluid in the lungs (lungworm-pneumonia complex) were not evident. Although presence of roundworms (Metastrongylidae) does not necessarily noticeably affect deer, nutritionally stressed individuals may be compromised 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 2003), 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 2 Sitka black-tailed deer heads were collected and submitted for chronic wasting disease (CWD) testing and were found to be negative for the disease. We have no reason to suspect that CWD occurs in Unit 4 deer at this time.

HABITAT

Assessment

No data were collected.

CONCLUSIONS AND RECOMMENDATIONS

All management objectives were met during both seasons. The average kill during 2002–03 was 1.5 deer per successful hunter, with bucks composing 76% of the reported harvest. The average kill during 2003–04 was 2.1 deer per successful hunter, with bucks composing 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. Spotlighting and poaching from logging roads from all-terrain vehicle users and from passenger vehicle users on the extensive road system of NE Chichagof Island is frequently reported. 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 underreported.

A major management concern continues to be the diverging hunting regulations promulgated by the Federal Subsistence Board and the Alaska Board of Game. Different regulations for separate groups of hunters using the same resource makes enforcement difficult, confuses hunters, and lessens 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.

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PREPARED BY:
P.W. Mooney
Wildlife Biologist

SUBMITTED BY:
D. Rabe
Management Coordinator

Please cite any information taken from this section, and reference as:

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

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

Area	Regulatory year	Mean pellet groups/plot	Number of plots
190 – Idaho Inlet	1987–88	1.34	258
	1991–92	0.94	219
	1992–93	0.56	305
	1993–94	0.71	294
	1997–98	1.11	273
	2000–01	0.95	308
	2003–04	1.05	296
202 – Port Frederick	1987–88	1.87	242
	1995–96	1.02	226
209 – Suntaheen Creek	1987–88	1.22	272
	1991–92	1.13	271
	1992–93	0.73	265
	1993–94	1.05	272
	1995–96	0.98	276
	1998–99	1.02	112
	2001–02	1.35	218
218 – Pavlof River	1987–88	1.78	325
	1991–92	1.56	341
	1995–96	1.50	249
	1998–99	2.24	213
	2001–02	2.48	249
223 – Upper Tenakee	1987–88	1.47	253
	1991–92	0.59	265
	1992–93	0.47	249
	1993–94	0.61	319
	1995–96	0.56	263
231 – Saltery Bay	1987–88	2.02	256
	1991–92	0.97	256
	1992–93	0.76	227
	1993–94	0.97	193
	1995–96	1.90	152
	1996–97	1.99	170
235 – Kadashan	1987–88	2.67	221
	1991–92	1.63	282
	1992–93	1.12	385
	1993–94	1.39	294
	1995–96	2.36	204

Area	Regulatory year	Mean pellet groups/plot	Number of plots
236 – Corner Bay	1980–81	0.35	60
	1991–92	2.27	206
	1992–93	1.72	50
	1993–94	1.69	198
247 – Finger Mountain	1986–87	3.11	236
	1988–89	2.99	305
	1989–90	3.36	225
	1990–91	3.93	150
	1991–92	2.85	207
	1992–93	3.03	179
	1993–94	2.29	275
	1995–96	2.62	221
	1998–99	3.04	169
	1999–00	2.87	217
	2001–02	2.99	162
	2003–04	3.03	229
254 – Soapstone	1987–88	1.92	274
	1990–91	2.05	270
	1992–93	1.88	243
	1993–94	1.34	310
	1994–95	1.48	283
	2000–01	1.94	246
271 – Chichagof	1990–91	1.39	301
	1994–95	0.98	303
	1997–98	1.34	319
	2000–01	1.23	291
	2003–04	1.15	303
275 – Cobol	1983–84	1.15	224
	1990–91	2.96	185
	1994–95	1.45	218
	1997–98	2.19	219
	2000–01	1.94	180
	2003–04	2.97	232
288 – Range Creek	1982–83	0.51	1,788
	1983–84	0.71	303
	1984–85	1.32	224
	1996–97	1.44	353
	2002–03	1.65	355

Area	Regulatory year	Mean pellet groups/plot	Number of plots
296 – Portage Arm	1980–81	0.53	213
	1989–90	3.09	214
	1996–97	1.59	39
	2002–03	2.77	103
298 – M. Arm Kelp Bay	1989–90	2.68	306
	1996–97	2.67	100
	2002–03	1.41	140
300 – Nakwasina	1986–87	2.31	195
	1988–89	2.32	244
	1989–90	2.99	255
	1990–91	3.98	175
	1991–92	1.64	223
	1992–93	3.15	188
	1993–94	1.46	230
	1994–95	1.75	216
	1995–96	2.82	210
	1996–97	2.79	200
	1997–98	2.99	217
	1998–99	3.20	146
	1999–00	2.64	181
	2000–01	2.33	186
	2001–02	2.35	132
	2002–03	3.09	221
	2003–04	3.36	211
305 – Sea Lion Cove	1986–87	3.31	226
	1988–89	1.75	303
	1989–90	2.03	227
	1990–91	1.63	219
	1991–92	1.30	239
	1993–94	1.29	221
	1994–95	1.30	210
	1995–96	1.63	225
	1997–98	1.71	241
	1999–00	1.42	201
	2000–01	1.41	231
	2001–02	2.01	119
	2002–03	1.90	249
	2003–04	1.13	206
308 – South Kruzof	1992–93	1.62	345
	1993–94	1.71	370
	1998–99	1.38	365

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

Table 2 Unit 4 deer harvest, 1998–99 through 2002–04

Regulatory year	Estimated legal harvest[a] M	(%)	F	%	Unk	Total	Estimated illegal harvest[b]	Total
1998–1999	3400	(72)	1300	(28)		4700	1200	5900
1999–2000	4800	(71)	2000	(29)		6800	1700	8500
2000–2001	4500	(76)	1400	(24)		5900	1500	7400
2001–2002	5350	(72)	2100	(28)		7450	1850	9300
2002–2003	3883	(76)	1234	(24)		5117	1270	6387
2003–2004	5523	(72)	2098	(28)		7621	1890	9511

[a] From mail questionnaire.

[b] Includes crippling loss estimate.

Table 3 Unit 4 deer hunter residency and success, 1999–2000 through 2002–04

Regulatory year	Successful				Unsuccessful				Total nr hunters
	Local resident	Nonlocal resident	Nonresident	Total	Local resident	Nonlocal resident	Nonresident	Total	
1999–2000	1238	1217	63	2518	387	654	59	1100	3618
2000–2001	1093	1310	16	2419	499	808	39	1346	3765
2001–2002	1187	1477	40	2704	318	529	30	877	3581
2002–2003	947	1224	42	2213	375	783	43	1201	3414
2003–2004	1242	1535	57	2834	253	509	41	803	3637

Table 4 Unit 4 deer harvest chronology, 1999–2000 through 2002–2004

Regulatory year	Harvest periods														Total harvest
	August	(%)	September	(%)	October	(%)	November	(%)	December	(%)	January	(%)	Other		
1999–2000	270	(4)	383	(6)	867	(13)	2731	(40)	1711	(25)	374	(6)	425		6761
2000–2001	467	(8)	577	(10)	1297	(22)	2216	(38)	847	(14)	147	(2)	352		5905
2001–2002	351	(5)	612	(8)	1318	(18)	2739	(37)	1607	(22)	370	(5)	461		7458
2002–2003	303	(6)	402	(8)	982	(19)	1916	(37)	1008	(20)	236	(5)	269		5117
2003–2004	350	(5)	400	(5)	1206	(16)	3287	(43)	1583	(21)	245	(3)	550		7621

Table 5 Unit 4 deer harvest, percent by transport method, 1999–2000 through 2003–2004

	Percent of harvest						Number
Regulatory year	Airplane	Foot	Boat	ORV	Highway vehicle	Unknown	of hunters
1999–2000	12	3	69	3	13	0	3618
2000–2001	12	1	63	5	18	0	3765
2001–2002	10	3	72	3	13	0	3582
2002–2003	8	3	68	2	18	0	3414
2003–2004	11	1	76	2	9	1	3637

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 2002
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 5 (5800 mi^2)

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

BACKGROUND

Deer were introduced to Yakutat Bay islands in 1934, when 7 does and 5 bucks were released (Burris and McKnight 1973). These animals established a small population that persists on islands and along the eastern mainland of Yakutat Bay. Heavy snowfall and predators limit deer densities, but the population has supported small harvests over the years. Most deer are taken incidentally. There is little potential for this herd to increase because of the extreme climatic conditions and limited habitat.

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

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

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

METHODS

A total of 11,227 deer harvest tickets were issued for the 2002 regulatory year (RY) for all of Southeast Alaska and 10,958 for RY 2003. 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; 57% 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 (Straugh and Rice 2003; Straugh et al. 2004). Since 1984, Unit 5A pellet-group surveys have been conducted to gauge deer population trends. U.S. Forest

Service (USFS) crews usually perform this work. Pellet transects were conducted on 4 Yakutat islands during 2003 and on 3 islands in 2004 (Table 1).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Deer populations remain low in the Yakutat area based on our 2 indirect measures of deer numbers, i.e., pellet-group densities and deer harvest. Limited habitat and heavy snow accumulations on the mainland prevent deer from increasing significantly; however, during the report period, anecdotal information suggests the deer have expanded their range as far inland as the Dangerous River. In the past it has been almost unheard of to see a deer more than a few miles inland of the beach.

MORTALITY

Harvest

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

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

Hunter Harvest. Based on deer hunter survey data, 15 deer were harvested in 2002, and 28 taken in 2003 (Table 2). Hunter effort increased considerably from the previous report period, with 55 hunters expending 248 days of effort in 2002, and 72 hunters spending 210 days afield in 2003. 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 USFS employees stationed in Yakutat suggests the illegal harvest of deer may exceed 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 deer hunters have been local residents. This held true in 2002 and 2003 with all hunters residing in Yakutat (Table 3). Because limited habitat supports low densities of deer, it is unlikely that nonlocal hunters would choose to pursue deer in Unit 5.

Transport Methods. Boats are typically the only means of transportation used by successful hunters in 5A. However, in 2002 five hunters reported taking deer on the Yakutat forelands using a highway vehicle. Though 12 hunters reported using a highway vehicle in 2003, no deer were harvested using this method of transportation. This is similar to past years, and is expected, since nearly all deer hunting takes place on Yakutat Bay islands.

CONCLUSIONS AND RECOMMENDATIONS

The Unit 5A deer hunt allows Yakutat residents an opportunity to legally harvest a small number of deer. Although deer seem to be more widespread than in the past, habitat conditions, predation, and deep snow will prevent this population from ever growing significantly. 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 third 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. It is likely that the small harvest has little effect on the population because hunting mortality is compensatory to wolf predation or winter kill. 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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PREPARED BY:
Neil L. Barten
Wildlife Biologist III

SUBMITTED BY:
Dale Rabe
Management Coordinator

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Table 1 Unit 5A deer population trends as indicated by pellet group surveys, 1991–2003

Area	Regulatory 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
	2003	0.22	117	NA
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
	2002	0.66	200	NA
	2003	0.58	325	NA
	2004	0.86	274	NA
Ankau (VCU 369)	1991	0.03	116	0.00–0.05

Table 2 Unit 5A annual deer harvest[a], 1991 through 2003

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
2002	15	0	15
2003	28	0	28

[a] Data from expanded results of hunter surveys.

Table 3 Unit 5A deer hunter residency and success, regulatory years 1991 through 2003

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
2002	15	0	0	0	(27)	40	0	0	0	(73)	55
2003	28	0	0	0	(39)	44	0	0	0	(61)	72

[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 2003

Regulatory year	Number of hunters	Number of days hunted	Number of deer killed	Number of deer/hunter	Number of days/deer
1991	36	123	2	.1	61.5
1992	15	61	0	0	0
1993	22	149	3	.1	49.7
1994	24	89	5	.2	17.8
1995	22	61	7	.3	8.7
1996	N/A	N/A	N/A	N/A	NA
1997	29	97	5	.2	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
2002	55	248	15	.3	16.5
2003	72	210	28	.4	7.5

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 2002
To: 30 June 2004

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 forbs 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

The Alaska Department of Fish and Game (ADF&G) and the U.S. Forest Service cooperated to monitor the population trend in PWS. We conducted annual pellet-group surveys along transects (Kirchhoff and Pitcher 1988) during late May and early June at 8 sampling locations (Fig 2). Two more locations were added to annual surveys beginning in 2000–01 (Naked Island and Bay of Isles on Knight Island) to monitor the western PWS population after the road to Whittier opened. Each location had 3–5 transects consisting of a straight line of 1x20-meter plots running uphill from the beach fringe. Most transects terminated at alpine habitat. Those not reaching the alpine terminated after we had examined 100 plots. The number of plots varied, depending on the distance from the beach to the alpine and the persistence of snow during the survey. 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, ADF&G, personal communication). Once a significant year effect was detected at a location, we used Fisher's Protected LSD (least significant difference) 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). An annual snow index (Nowlin 1997) is used to determine if pellet-group density reflects current population density, or if a lag exists because of late-season mortality that would appear in the spring survey of the following year.

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 low to moderate during the reporting period (Table 1). Highest density occurred on Hawkins Island and lowest on Knight Island (Table 1). Overall density was higher during 2003–04 than in 2002–03.

Deer numbers were stable to increasing 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. MPGP decreased by 54% from 1997–98 to 1999–2000 (Table 1). The trend was reversed during the mild winter of 2000–01 and continued upward during 2001–02. The upward trend was interrupted during late 2001–02 when deep snow lingered into early spring of 2002.

Distribution and Movements

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

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 in PWS do not support this theory, reported

Reynolds (1979) and Shishido (1986). 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 one deer that had traveled 13–14 km from the location where marked. Schoen and Kirchhoff (1984) also tracked a similar movement (13.6 km) by one radiocollared deer in Southeast Alaska and determined it had dispersed from its natal watershed.

MORTALITY

Harvest

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

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

Hunter Harvest. Total estimated deer harvest reported in Unit 6 during 2002–03 was 1911 and during 2003–04 was 3007 (Table 2). The harvest during 2003–04 was a record high, primarily driven by higher harvests in western and northern/eastern PWS. The increased harvest in these areas was a result of easier access for hunters launching from Whittier. As during past years, most harvest came from Montague Island. The reported legal harvest consisted of 63% males during the reporting period.

Hunter Residency and Success. Deer hunters had annual success rates of 51% and 61% during the reporting period (Table 3). Total number of hunters was higher than average during 2003–04.

Nonlocal residents represented 57% and 62% of successful hunters during this reporting period. Local residents on average killed 2.7 deer per hunter compared to 2.2 deer per hunter for nonlocal residents. These proportions were higher than in previous years.

Harvest Chronology. Hunters killed most deer during October and 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 secondarily, airplanes. Other modes, including 3- and 4-wheelers, highway vehicles, and walking, were not used significantly (Table 5).

Other Mortality

I assumed that wounding loss and unreported and illegal harvest was 15% of the total harvest (Table 2). Deer pellet surveys indicated a decline of about 8% during the winter of 2001–02; however, the following mild winter allowed the population to increase (Figure 3).

HABITAT

Snow Depth and Duration

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 one lower and one higher than normal SI, and deer pellet density followed accordingly (Figure 3).

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%.

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.

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PREPARED BY:

David W. Crowley
Wildlife Biologist III

SUBMITTED BY:

Gino Del Frate
Management Coordinator

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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.

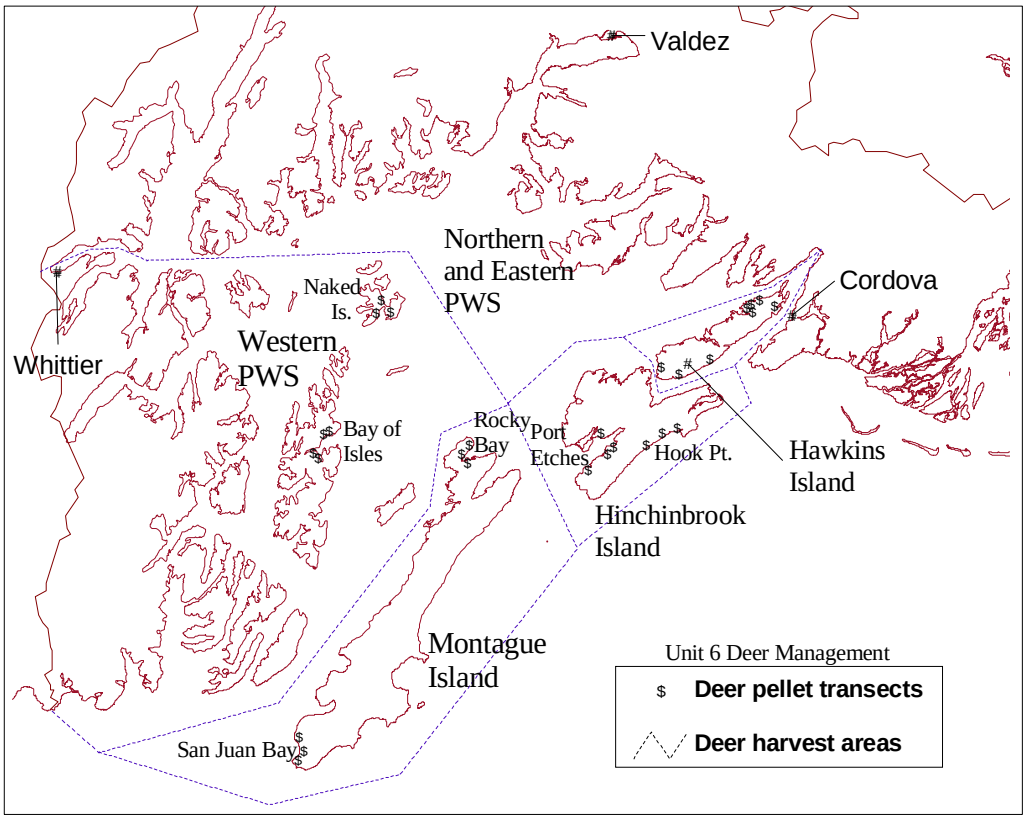

Figure 2 Locations of pellet group transects and harvest area boundaries for deer in Unit 6.

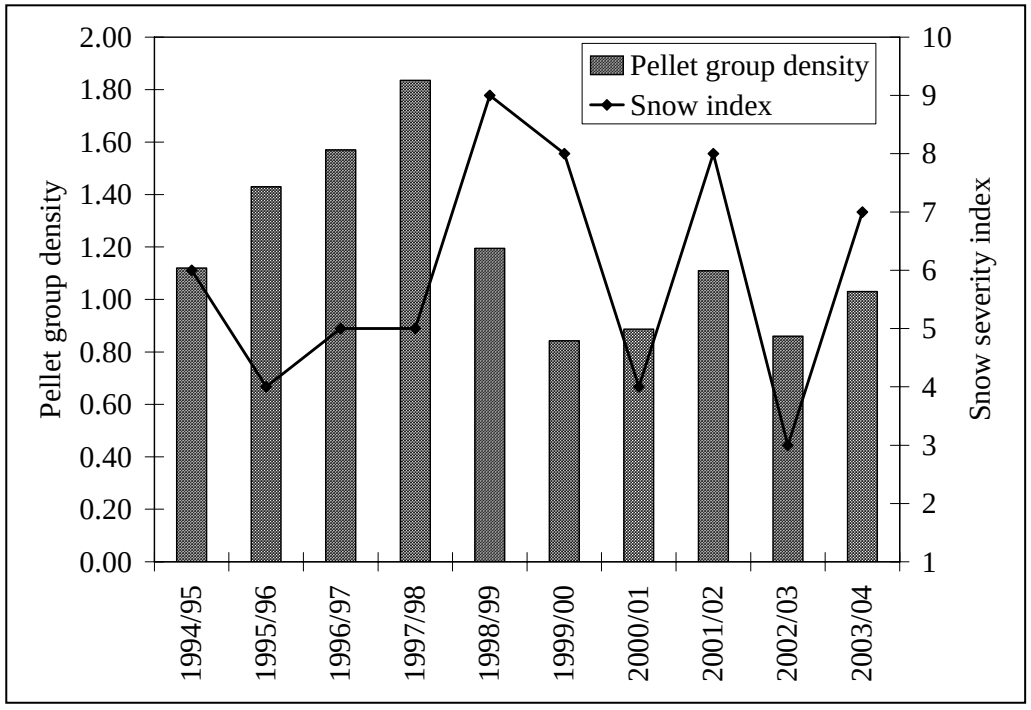

Figure 3 Deer pellet group density (number of pellet groups per 20 m^2 plot) and snow index representing depth and duration of snow at Port San Juan, Montague Island.

Table 1 Unit 6 deer population trends as indicated by spring pellet-group surveys 1999–2003. We analyzed survey data using a repeated measures technique from 1994–95 through 2001–02.

Area	Specific location/UCU	Regulatory Year[a]	MPGP[b]	S.E.[c]	Sig. diff.[d]	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
		2002–03	1.11			240
		2003–04	1.82			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
		2002–03	1.40			222
		2003–04	1.52			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
		2002–03	1.24			237
		2003–04	0.93			232

Area	Specific location/UCU	Regulatory Year[a]	MPGP[b]	S.E.[c]	Sig. diff.[d]	Number of plots
Hinchinbrook Island	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
		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
		2002–03	0.69			235
		2003–04	1.19			234
Montague Island	Rocky Bay	1989–90	1.25			250
	1803	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
		2002–03	0.58			218
		2003–04	0.70			212
	San Juan Bay	1987–88	1.01			206
	1810	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
		2002–03	0.77			237
		2003–04	0.68			223

Area	Specific location/UCU	Regulatory Year[a]	MPGP[b]	S.E.[c]	Sig. diff.[d]	Number of plots
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
		2002–03	0.72			210
		2003–04	0.84			210
Knight Island	Bay of Isles	1988–89	1.30			158
	1503	1991–92	1.16			123
		1993–94	0.45			190
		2000–01	0.43	0.087		179
		2001–02	0.35	0.087		164
		2002–03	0.36			170
		2003–04	0.36			170
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
		2002–03	0.86			1769
		2003–04	1.03			1743

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

Table 2 Unit 6 deer harvest, 1999–2003

Area	Regulatory year	Estimated legal harvest M	(%)	F	(%)	Total	Estimated illegal/unreported harvest[a]	Total
Hawkins Island	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
	2002–03	269	(65)	142	(35)	411	62	473
	2003–04	316	(63)	189	(37)	505	76	581
Hinchinbrook Island	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
	2002–03	242	(60)	160	(40)	402	60	462
	2003–04	421	(63)	245	(37)	666	100	766
Montague Island	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
	2002–03	382	(67)	185	(33)	567	85	652
	2003–04	623	(69)	280	(31)	903	135	1038
Western PWS	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
	2002–03	272	(56)	214	(44)	486	73	559
	2003–04	465	(57)	352	(43)	817	123	940

Table 2 continued

Area	Regulatory year	Estimated legal harvest M	(%)	F	(%)	Total	Estimated illegal/unreported harvest[a]	Total
Northern and	1999–00	48	(62)	29	(38)	77	12	89
Eastern PWS	2000–01	7	(18)	32	(82)	39	6	45
	2001–02	12	(100)	0	(0)	12	2	14
	2002–03	29	(100)	0	(0)	29	4	33
	2003–04	67	(58)	49	(42)	116	17	133
Unit 6 - Unknown	1999–00	11	(65)	6	(35)	17	3	20
	2000–01	0		0		0	0	0
	2001–02	0		0		0	0	0
	2002–03	13	(81)	3	(19)	16	2	18
	2003–04	0		0		0	0	0
Unit 6 - Total	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
	2002–03	1207	(63)	704	(37)	1911	478	2389
	2003–04	1892	(63)	1115	(37)	3007	752	3759

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

Table 3 Unit 6 deer hunter residency and success, 1999–2003

Regulatory year	Successful					Unsuccessful					Total hunters
	Local resident[a]	Nonlocal resident	Non resident	Total	(%)	Local resident	Nonlocal resident	Non resident	Total	(%)	
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
2002–03	346	477	14	837	(51)	226	553	32	811	(49)	1648
2003–04	401	687	26	1114	(61)	160	511	48	719	(39)	1833

[a] Resident of Unit 6

Table 4 Unit 6 deer harvest chronology percent by month, 1999–2003

Regulatory year	Harvest periods					*n*
	August	September	October	November	December	
1999–00	7	3	21	42	27	2265
2000–01	10	5	32	39	10	1785
2001–02	7	6	32	32	20	2704
2002–03	9	5	29	32	25	1902
2003–04	8	4	34	34	20	2975

Table 5 Unit 6 deer harvest percent by transport method, 1999–2003

Regulatory year	Percent of harvest						*n*
	Airplane	Boat	3- and 4-wheeler	Highway vehicle	Foot	Unknown	
1999–00	29	64	0	0	5	1	2232
2000–01	27	67	1	0	3	1	1697
2001–02	16	74	1	0	3	2	2641
2002–03	11	81	1	1	3	3	1911
2003–04	11	84	0	0	3	2	3007

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 2002
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 8 (5097 mi^2)

GEOGRAPHIC DESCRIPTION: Kodiak and adjacent islands

BACKGROUND

Officially, the Sitka black-tailed deer population in Unit 8 originated from 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, it endorsed the project and adopted regulations to protect the newly established population. In 1930, two more deer were captured from Prince of Wales Island and released on Long Island. There was, however, little natural movement from Long Island to Kodiak, so in 1934, nine deer were captured in the Rocky Pass area near Petersburg and released on Kodiak.

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

By the early 1940s deer were abundant on Long Island and occupied northeastern Kodiak Island. In 1950 they were a common sight near Kodiak city, and the first 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, hunters harvested 1811 deer 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. Twenty years later, in 1997, 8709 deer were harvested, 17% from the northern islands, 21% from northern 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 hit especially hard. There was a short reprieve from 1993 to 1996, but populations declined again in 1997. During the winter of 1998–99 the Unit 8 deer population declined precipitously.

Deer have become an important resource for the residents of, and visitors to, the Kodiak Archipelago. Venison has surpassed marine mammals as a primary source of mammalian protein for villagers, and income generated from services provided to deer hunters is a major economic factor in the local economy. In spite of the significance of this resource, we have not yet developed an objective method of measuring the population size or density. Annual hunter harvest surveys have been used to assess trends in the deer population since 1989. We assessed winter mortality by searching for and examining deer carcasses in selected coastal wintering areas and periodically used aerial surveys to assess winter conditions and physical appearance of deer. From 1990 through 1998 the U.S. Fish and Wildlife Service (FWS) experimented with various aerial and ground surveys to monitor deer population trends on the Kodiak National Wildlife Refuge (NWR). Refuge staff have also experimented with browse transects, Forward Looking Infrared Radar (FLIR), and range exclosures to investigate deer population trends.

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

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVE

Maintain a population of 70,000–75,000 deer and an annual harvest of 8000–8500 deer (5 AAC 92.108).

METHODS

Questionnaires have been mailed to hunters annually beginning with the 1989–90 season to assess trends in hunting effort and harvest. The questionnaires were sent to a random sample of deer harvest ticket holders, and harvest estimates were derived from returned questionnaires. Field interviews and posthunt interviews provided preliminary harvest data. The FWS interviewed hunters annually in the Kodiak NWR during October–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.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

The Unit 8 deer population experienced substantial winter mortality during 1968–69, 1970–71, and 1989–90. There also were higher than usual winter mortalities during the late 1970s and the early and late 1990s. After many of these occurrences, more conservative regulations were enacted and the populations quickly rebounded.

The winter of 1998–99 was the most severe in recent history. Snowfall was only slightly above normal, but persistent cold temperatures prevented snow from melting, retarded spring green-up, and increased thermal stress on the deer. The net result was the largest winter mortality event ever seen in Unit 8. Exact data are not available, but biologists with both ADF&G and Kodiak NWR estimated that more than 50% of the deer succumbed to the harsh winter weather (Van Daele 2003). The 5 successive winters (1999–2000 through 2004–05) were relatively mild, and as has happened time and again, the deer population responded positively.

We have no impartial methods of ascertaining deer numbers or densities, but annual hunter questionnaires provide reliable harvest data and an indicator of population trend. Using those data and subjective accounts, the 2004 population estimate was 60,000 deer and appeared to be increasing unitwide.

Population Composition

The percentage of males in the harvest has remained at least 73% 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 are distributed 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, averaging 454 ha (1.8 mi^2) and 107 ha (0.4 mi^2), respectively.

MORTALITY

Harvest

Season and Bag Limits. In 2002–03 and 2003–04, the open season for resident, nonresident, and federal subsistence hunters was 1 August–31 October in that portion of Kodiak Island north of a line from the head of Settlers Cove (including Peregrebni Point) to Crescent Lake (57° 52'N, 152° 08'W) and east of a line from the outlet of Crescent Lake to Mount Ellison Peak and from Mount Ellison Peak to Pokati Point at Whale Passage, and that portion of Kodiak Island east of a line from the mouth of Saltery Creek to the mouth of Elbow Creek and adjacent small islands in Chiniak Bay. The bag limit was one buck. A special weapons hunt (archery and muzzleloaders) was open in this area 1–14 November with a bag limit of one buck in 2002–03 and one deer (either sex) in 2003–04. Hunters were required to successfully complete an authorized education course before participating in the primitive weapons hunt.

The open season for resident, nonresident, and federal subsistence hunters in the remainder of Unit 8 was 1 August–31 December. The bag limit was 3 deer. In 2002–03 hunters could harvest bucks only 1 August–30 November and either sex (only 1 antlerless) 1–31 December. In 2003–04, the bucks-only season was reduced to 1 August–30 September, and deer of either sex could be taken 1 October–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. On Kodiak NWR lands, hunters could harvest deer for other qualified subsistence users if they first obtained a designated hunter permit. Proxy hunting on other lands was restricted to resident hunters who were hunting for other Alaska residents who were ≥65 years old, legally blind or ≥70% disabled.

Board of Game Actions and Emergency Orders. At its March 1999 meeting, the Alaska Board of Game 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 board later set the population objective at 70,000–75,000 deer and the annual harvest objective at 8000–8500 deer. Although the population and harvests have been below these objectives since they were established, the board has found that that no intensive management options are practical and that hunting season adjustments were the best method to aid the deer population (Van Daele 2003).

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 1 antlerless deer to be taken, and reducing the either-sex season to the month of December. In 2003, the board accepted another proposal from the Kodiak Fish and Game Advisory Committee to again liberalize the deer season by expanding the either-sex season by 2 months and the maximum doe bag limit to 3. A subcommittee that included representatives from ADF&G, Kodiak National Wildlife Refuge Kodiak Island villages, and the other members of the hunting public developed the proposal in response to relatively mild winters and subjective indications of herd increase and improving buck:doe ratios.

Hunter Harvest. Harvests during this reporting period rebounded from the low levels that followed the population decline in 1998–99. In 2002–03 the total legal harvest was estimated at 3142, and in 2003–04 it increased to 5198. During the previous 5 years the average annual harvest was 5118 deer (Table 1). In 2002–03 restrictive seasons and bag limits implemented immediately after the population decline reduced doe harvests, resulting in 94% of the kill being bucks. In 2003–04 those restrictions were relaxed and the percentage of bucks in the harvest declined to 85%. During the previous 5 years, the average annual percentage of bucks in the harvest was 79.6%

As deer populations have expanded into new areas, and various parts of the archipelago experienced differing degrees of winter mortality and harvest in the 1990s, harvest patterns shifted toward southern Kodiak Island (Smith 1995). This dynamic has stabilized in recent years. In 2002–03, 25% of the reported harvest was from the northern islands in the archipelago (hunt areas 810–813), 43% was from northern Kodiak Island (hunt areas 814–817 and 827–835), and 33% was from southern Kodiak Island (hunt areas 818–826). In 2003–04, 23% of the reported harvest was from the northern islands, 45% was from northern Kodiak, and 30% was from southern Kodiak. These proportions vary little from the averages for the previous 5 years (north islands – 22%, northern Kodiak – 46%, southern Kodiak – 32%).

Hunter Residency and Success. The number of hunters afield during this reporting period increased as the number of deer in the population rebounded. In 2002–03, an estimated 2738 hunters were afield. The number afield increased to 3102 in 2003–04, but was still somewhat lower than the previous 5-year average of 3377 (Table 2). Unit 8 residents composed 45% of the hunters in 2002–03 and 46% in 2003–04, continuing an increasing trend since the deer population decline discouraged nonlocal hunters from coming to Kodiak to hunt deer (previous 5-year average was 37.5%). Nonlocal residents composed 40% of the hunters in 2002–03 and 41% in 2003–04, a decline from the previous 5-year average (47.4%). Nonresidents composed 15% of the hunters in 2002–03 and 13% in 2003–04, a rate comparable overall to the 5-year average (14.8%)

Hunter success was 59% in 2002–03 and 77% in 2003–04. The average annual hunter success during the previous 5 years was 66.8% (Table 2). In 2002–03, the mean number of deer/hunter afield was 1.1, and increased to 1.7 deer/hunter in 2003–04. The previous 5-year average was 1.4 deer/hunter (Table 3). In 2002–03, 44% of the hunters only killed 1 deer, and in 2003–04 that figure declined to 33% (Table 4). The average percentage of hunters that killed only 1 deer during the previous 5 years was 33%.

Harvest Chronology. November is consistently the peak month of harvest in Unit 8 (Table 5). In 2002–03, 38% of the deer were harvested in November, while in 2003–04, 39% were taken in November. These percentages were comparable to the average (40.8%) of the previous 5 years.

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; however, in the past decade there has been an erosion in the proportion of hunters using aircraft. In 2002–03, 40% of the deer hunters used boats as their primary means of access, and in 2003–04, 42% used boats, similar to the average of the previous 5 years (43.2%). 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. During the 10 years prior to this reporting period, the use of highway vehicles steadily increased; however, this trend was broken in 2002–03 and 2003–04 (Table 6).

Other Mortality

Mortality surveys in coastal winter ranges documented the severe winter mortality during the winter of 1998–99 as being more than 3 times higher than during the previous 5 years (150.0 versus 47.8) (Table 7). Because of the timing of the surveys, and the delayed spring green-up, which resulted in deer dying later than usual, it was suspected that the actual mortality was much higher than the survey data reflect. As in previous years, juvenile deer were the most severely impacted portion of the population. The winter mortality in 1999–2000 to 2003–04 was very light, with few carcasses found along most transects.

Unreported deer harvest, including wounding loss and illegal kills outside the hunting season was common, resulting in an estimated kill of about 20% of the reported harvest. Free-roaming dogs are significant predators on deer near communities and isolated residences. Deer–motor vehicle collisions kill an estimated 40–50 deer annually along the Kodiak road system. Brown bear predation of deer occurs, predominantly in late winter, but is not an important limiting factor on the deer population.

HABITAT

Assessment

High deer densities in the late 1970s through the mid 1980s resulted in heavily browsed winter range in some locales. The population decline in the late 1980s reduced pressure on winter range, but we have not evaluated the level of recovery. Staff from Kodiak NWR established experimental range use transects within the refuge in 1997, and they constructed range exclosures in 1999. Preliminary data from these pilot studies of deer winter range in selected areas suggested that deer used several species of browse heavily when population levels were high. During winters with heavy snowfall that force deer onto beaches and exposed capes, vegetation in those areas receives extensive use, especially red elderberry, highbush cranberry, blueberry, and willow. There have been no objective investigations of the browse since the decline in the deer population in 1998–99, but subjective evidence suggests a notable recovery of several browse species.

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 southeastern Alaska indicated that old-growth forest was critical in maintaining deer populations (Wallmo and Schoen 1980). The effects of commercial logging activities on deer winter range on Afognak Island have not been investigated, but it appears that while it initially reduces carrying capacity, subsequent increased production of herbaceous and shrubby vegetation may benefit deer, depending on snow conditions and the availability of sufficient thermal cover and areas of reduced snow depths during harsh winters. Selinger (1995) noted that deer on Kodiak Island occupying nonconiferous brush and deciduous forest habitat have much larger summer ranges than deer in heavily forested Southeast Alaska. 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.

NON-REGULATORY MANAGEMENT PROBLEMS/NEEDS

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

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 is committed to working with ADF&G to follow through on these recommendations, although no actions were taken during this reporting period.

Hunters continued to report bucks with abnormal testicular development (“steer deer”), particularly from the south end of Kodiak. Hunter questionnaires indicated that about 3% of the bucks taken in 1999 were steer deer, with the highest prevalence being on the Hepburn Peninsula (13%). From 1999 to 2004, a local big game guide has been collecting samples from normal and abnormal deer harvested on the Aliulik and Hepburn peninsulas. Staff at the University of Guelph in Ontario, Canada, and Colorado State University analyzed these samples. Results suggest an unusual occurrence of underdeveloped testes and/or testes that had not descended in adult bucks (unilateral and bilateral crytorchidism) (Bubenik et al 2001), but the exact cause of this phenomenon has not yet been determined.

Chronic wasting disease (CWD) is having significant impacts on deer management in several states and provinces (Gross and Miller 2001). ADF&G initiated an investigation into the potential presence of CWD on the Kodiak archipelago in 2003. There have been no reported cases from Alaska, but Kodiak was considered particularly vulnerable because of the presence of a commercial elk ranch in proximity to a viable wild deer population. In 2003, hunters provided samples from 148 deer and 6 elk, and all samples were CWD-free. In 2004, an additional 400 samples from deer and 16 from elk were donated by hunters for CWD analysis.

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 the population is at low levels. There are few practical options for active management practices to enhance this deer population. Regulatory responses, such as liberalizing seasons as deer numbers increase and promulgating more conservative regulations when populations have declined, are the most effective way to manage these animals.

Although objective population data are nonexistent, Alaska Statute 16.05.255 mandated that population and harvest objectives be established for Unit 8 deer because of their importance as a source of human food. ADF&G, in close cooperation with the Kodiak Fish and Game Advisory Committee, Kodiak NWR, commercial operators, and individual hunters made an attempt to satisfy this requirement with the best available data (Van Daele 2003). We recognize there is considerable room for improvement in the estimates used for these objectives, 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, the deer population seemed to continue its rapid recovery from the winter mortality that occurred in 1998–99. There were few dead deer found during the late winter and early spring and productivity appeared robust with numerous observations of twin fawns. In response to the increased deer numbers, in 2003 the Board of Game liberalized the bag limit during October and November to allow harvest of deer of either sex. Another nonregulatory liberalization occurred during this reporting period as the number of proxy permits and federal designated hunter permits has increased tremendously, essentially negating individual hunter bag limits in some cases.

There continued to be a great deal of interagency cooperation during this reporting period. The Kodiak Fish and Game Advisory Committee worked closely with its federal subsistence counterpart, the Kodiak/Aleutians Regional Advisory Committee, to develop and review deer hunting regulations for both the state and federal boards. Staffs from the ADF&G and Kodiak NWR were active participants throughout the process. State and federal biologists also worked together to assess winter mortality and in conducting interviews of hunters in the field. We developed a cooperative research project with the U.S. Department of Agriculture to investigate

the presence and possible distribution of CWD in deer and elk on the archipelago. This program depends on hunters donating samples from their harvest, and the level of cooperation has been excellent. In addition to providing samples, the hunters were also eager to offer information on their perceptions of deer habitat, behavior, and population levels.

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 ADF&G should endorse and cooperate in well-designed and peer-reviewed baseline research to examine the cause of the abnormalities.

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PREPARED BY:
Lawrence J. Van Daele
Wildlife Biologist III

SUBMITTED BY:
Gino Del Frate
Management Coordinator

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Table 1 Unit 8 deer harvest, 1987–88 through 2003–04

Regulatory year	Estimated legal harvest[a] M (%)	F (%)	Unk.	Total	Estimated illegal harvest[b]	Estimated wounding loss[c]	Estimated total
1987–88[d]	10,844 (80)	2702 (20)	245	13,791	1379	1379	16,549
1988–89	---	---	---	---	---	---	---
1989–90	6923 (73)	2625 (27)	490	10,038	1004	1004	11,042
1990–91	5367 (67)	2739 (33)	---	8106	811	811	9728
1991–92	6569 (73)	2379 (27)	---	8948	895	895	10,738
1992–93	5144 (73)	1899 (27)	---	7043	704	704	8451
1993–94	5124 (82)	1130 (18)	---	6254	625	625	7504
1994–95	8270 (80)	2130 (20)	---	10,400	1040	1040	12,480
1995–96	5806 (81)	1387 (19)	---	7193	719	719	8631
1996–97	7041 (79)	1903 (21)	---	8944	894	894	10,474
1998–99	5879 (76)	1886 (24)	---	7921	792	792	9505
1999–2000	2801 (75)	927 (25)	---	3728	373	373	4474
2000–01	1823 (73)	668 (27)	---	2491	249	249	2989
2001–02	2756 (95)	143 (5)	---	2899	290	290	3479
2002–03	2943 (94)	200 (6)	---	3143	314	314	3770
2003–04	4430 (85)	769 (15)	---	5199	520	520	6238

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

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

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

[d] No survey was conducted in 1988–89

Table 2 Unit 8 deer hunter residency and success, 1987–88 through 2003–04

	Successful				Unsuccessful				
Regulatory year	Local[a] resident	Nonlocal resident	Nonresident	Total (%)	Local[a] resident	Nonlocal resident	Nonresident	Total (%)	Total hunters
1987–88	1851	2410	290	4551 (76)	645	665	161	1471 (24)	6022
1988–89[b]	---	---	---	---	---	---	---	---	---
1989–90	1892	2080	383	4355 (67)	1124	788	255	2167 (33)	6522
1990–91	1260	1627	185	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
2002–03	705	693	207	1605 (59)	524	413	196	1133 (41)	2738
2003–04	1065	1027	308	2400 (77)	356	242	104	702 (23)	3102

[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 1980–81 through 2003–04

Regulatory year	% Hunter success[a]	% Hunters taking bag limit[b]	% Male	% Female	Total harvest	Estimated hunters	Mean nr deer/hunter	Nr days hunted/deer
1980–81	73	37	74	26	5347	3440	1.6	3.8
1981–82[c]	---	---	---	---	---	---	---	---
1982–83[c]	---	---	---	---	---	---	---	---
1983–84	81	24	74	26	9897	4113	2.4	2.3
1984–85	81	23	74	26	8905	3948	2.3	2.6
1985–86[c]	---	---	---	---	---	---	---	---
1986–87[c]	---	---	---	---	---	---	---	---
1987–88	76	27	80	20	13,791	6022	2.3	2.3
1988–89[c]	---	---	---	---	---	---	---	---
1989–90	67	15	73	27	10,038	6521	1.5	2.5
1990–91	74	19	67	33	8106	4176	1.9	2.9
1991–92	76	31	73	27	8948	4421	2.0	2.7
1992–93	67	29	73	27	7043	4119	1.7	3.7
1993–94	80	33	82	18	6254	2946	2.1	2.4
1994–95	83	35	80	20	10,401	4708	2.2	2.4
1995–96	73	29	81	19	7193	3984	1.8	3.0
1996–97	81	31	79	21	8944	4294	2.1	2.8
1997–98	82	28	79	21	8709	4340	2.0	2.3
1998–99	73	0	76	24	7765	4475	1.7	3.2
1999–2000	56	0	75	25	3728	3251	1.1	4.8
2000–01	51	22	73	27	2491	2617	0.9	5.7
2001–02	72	29	95	5	2899	2115	1.3	4.0
2002–03	59	30	94	6	3142	2742	1.1	---
2003–04	77	42	85	15	5198	3104	1.7	---

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

[b] Maximum bag limit was 4 deer in 1980–81; 5 deer in 1981–82; 7 deer in 1982–83; 5 deer in 1983–84 to 1990–91; 5 deer on Kodiak NWR and 4 deer on nonfederal lands in 1991–92 to 2000–01; 4 deer on Kodiak NWR and 3 deer on nonfederal lands in 2001–02; and, 3 deer in 2002–03 to 2003–04.

[c] No survey conducted.

Table 4 Number and percent of hunters in Unit 8 that reported harvesting 1, 2, 3, 4, or 5+ deer, 1999–2000 through 2003–04

	1999–2000		2000–01		2001–02		2002–03[b]		2003–04	
	Hunters	%	Hunters	%	Hunters	%	Hunters	%	Hunters	%
1 deer[a]	890	48	719	54	703	44	709	44	802	33
2 deer	398	22	313	23	415	26	420	26	591	25
3 deer	280	15	191	14	434	27	416	26	921	38
4 deer	213	12	99	7	36	2	11	1	40	2
5 + deer	1	60	3	16	1	0	47	3	45	2

[a] Bag limit was 5 deer on Kodiak NWR and 4 deer on nonfederal lands in 1999–2000 to 2000–01, 4 deer on Kodiak NWR and 3 deer on nonfederal lands in 2001–02 and 3 deer in 2002–03 to 2003–04.

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Table 5 Unit 8 deer harvest chronology percent by period, 1980–81 through 2003–04

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

[a] No survey conducted.

Table 6 Unit 8 deer harvest percent by transport method, 1987–88 through 2003–04

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[a]	--	--	--	--	--	--	--	--	--	---
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[b]	19	3	43	9	0	2	15	10	2	7339
1999–2000	17	<1	42	8	0	1	15	15	2	5091
2000–01	19	<1	39	8	<1	2	18	12	3	4276
2001–02	14	<1	43	8	0	1	18	15	2	3619
2002–03	16	<1	40	7	0	<1	14	17	4	4403
2003–04	20	<1	42	7	0	2	14	12	2	4410

[a] No survey in 1988–89.

[b] Starting in 1998–99, transportation data were collected by trips taken rather than by hunter.

Table 7 Unit 8 sex and age composition of deer winter-kill from beach mortality transects, 1987–88 through 2003–04

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
2001–02[b]	0 (--)	0 (--)	0	0	0 (--)	0 (--)	0	0	0	0 (--)	0 (--)	0	0
2002–03[c]	--	--	--	--	--	--	--	--	--	--	--	--	--
2003–04[c]	--	--	--	--	--	--	--	--	--	--	--	--	--

[a] Includes fawns and yearlings.

[b] Data obtained from Kodiak NWR files

[c] Mortality data for 2002–03 and 2003–04 not yet compiled, but overwinter mortality was minimal.

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

Jamie Karnik, ADF&G