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Annual Report of Survey—Inventory Activities

DEER

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STATEWIDE HARVEST AND POPULATION STATUS

Sitka black-tailed deer are found in the coastal forests of Southeast Alaska, the Gulf Coast, and on Kodiak Island. In these areas, it is the major big game species, particularly for resident hunters. In 1985-86, deer populations were increasing in all units except Unit 6, where a decline was noted. Deer populations remained high in Unit 4 (Admiralty, Baranof, and Chichagof Islands) and Unit 8 (Kodiak Island), moderate to high in Unit 6, and low to moderate elsewhere.

The estimated statewide harvest of deer was approximately 27,000. As usual, heaviest harvests were obtained in Units 4 and 8, with about 10,396 and 10,000 deer harvested, respectively. Unit 6 was the only unit showing a decrease in harvest from last year; about 9% fewer deer were taken there. In no case was it felt that hunting was inhibiting population growth.

A summary of population trends and harvest levels follows:

Unit	Population level	Population trend	Estimated harvest
1A	low	increasing	779
1B	low	slight increase	39
1C	moderate	increasing	527
2	low to moderate	increasing	3,151
3	low	increasing	166
4	high	stable	10,396
6	moderate to high	slight decrease	2,000
8	high	stable to increasing	10,000

Robert A. Hinman
Deputy Director

DEER

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 1A and 2

GEOGRAPHICAL DESCRIPTION: Ketchikan area and Prince of Wales Island

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

Population numbers over much of Subunit 1A and Unit 2 appear to be increasing. The rate of increase appears to be faster in Unit 2 than in Subunit 1A. Deer populations over much of the northern and western portions of Prince of Wales Island (Unit 2) are currently at high levels. Several of the smaller islands off the west coast of Prince of Wales Island also have high population levels. However, large portions of both units have low deer numbers.

Spring pellet-group surveys, begun in 1984, were not conducted in 1986, except on Gravina Island. Late spring snowfalls delayed the sampling program, so only the Gravina transects were completed. The surveys consist of continuous 1 x 20 m plots on a predetermined compass bearing running from sea level to about 1,500 feet in elevation. Based on the surveys, estimates of densities on Gravina increased for the 3rd straight year (Table 1).

Mortality

The winter of 1985-86 was mild throughout Units 1A and 2. Heavy snow accumulated at higher elevations, but deer winter ranges received little snow. No significant winter mortality was expected; thus, beach winter mortality transects were not walked. Field observations and other reports indicated virtually no mortality due to winter conditions; the few dead deer examined showed no signs of starvation or other weather-related mortality.

Harvest and hunter information for the 1985 hunting season was obtained from a mail survey of 25% of the 12,036 southeastern Alaska licensees who acquired deer harvest tickets.

The numbers used in this report are estimated by extrapolation of the 25% sample. Tabulations were made for each unit and hunt area. Consequently, an individual who hunted in more than 1 hunt area or more than 1 unit was tallied as a hunter in each of those units or harvest areas.

Seventy-one percent of all harvest ticket holders actually hunted (Table 2). In Subunit 1A, 1,108 hunters spent 5,683 days in the field and killed 779 bucks. Thirty-seven percent of the active hunters were successful. The average number of days hunted was 5.1. Seventy-eight percent of the hunter effort in Subunit 1A occurred on Revilla and Gravina Islands. Hunter success was 26 percent on Gravina Island and 19 percent on Revilla Island.

In Unit 2, 2,025 hunters killed 3,151 deer in 14,182 days of hunting. Sixty-eight percent of the hunters were successful. Both the number of hunters and the number of deer killed increased compared with figures for 1984. Hunter success was again much higher in Unit 2 than in Subunit 1A. Most of the Unit 2 harvest was taken from the north half of Prince of Wales Island; the location coincides closely with the interconnected logging road system on the island. About 82% of the Unit 2 harvest and 76% of the hunter effort took place in this area.

Management Summary and Recommendations

Deer populations in much of Unit 2 appear to be increasing and some areas are already at a fairly high level. In Subunit 1A, deer numbers appear to be increasing slightly. Range conditions are good in both units, and with the exception of a few smaller islands, available habitat can support higher deer numbers.

The Unit 2 harvest is currently concentrated in the northern half of Prince of Wales Island along the road system. This localized effort will probably continue and increase as ferry access improves and knowledge of the area spreads among hunters. This conclusion is supported by the steady increase in the numbers of hunters and of deer killed in Unit 2 during the past 5 years.

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SUBMITTED BY:

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Survey-Inventory Coordinator

Table 1. Deer pellet-group data[a] for Subunit 1A and Unit 2, 1984-86.

Area	VCU[b] number	Year	Pellet groups		95% CI	
			n	$\bar{x}$	Lower	Upper
Heceta Is.	561	1984	326	1.20	1.02	1.38
		1985	264	1.21	1.02	1.41
Helm Bay (Cleveland Is.)	716	1984	302	0.54	0.44	0.65
		1985	135	0.58	0.43	0.74
George Inlet (Revilla Is.)	748	1984	344	0.27	0.88	0.35
		1985	257	0.46	0.34	0.57
Gravina Is.	999	1984	1,087	0.86	0.78	0.94
		1985	1,025	1.00	0.92	1.08
		1986	1,267	1.40	1.30	1.50

[a] Based on 1 x 20 m continuous plot transects running from sea level to about 1,500 feet in elevation.

[b] VCU = Value Comparison Unit (U.S. Forest Service).

Table 2. Deer harvest data for Subunit 1A and Unit 2, 1980-86.

Unit	Year	Number of hunters	% Successful	Number of hunter days	Deer killed	% Bucks
1A	1980	890	27	5,160	395	99
	1982	900	29	4,370	340	100
	1983	960	31	5,130	440	100
	1984	1,060	42	5,820	620	97
	1985	1,108	37	5,683	779	100
2	1980	620	56	4,600	615	99
	1982	1,150	58	9,190	1,185	100
	1983	1,560	62	11,290	1,740	100
	1984	1,910	63	13,070	1,880	99
	1985	2,025	68	14,182	3,152	97

DEER

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNITS: 1B and 3

GEOGRAPHICAL DESCRIPTION: Unit 1B - Southeast mainland from Cape Fanshaw to Lemesurier Point

Unit 3 - Islands of the Petersburg, Kake, and Wrangell areas

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

Sitka black-tailed deer are found on most of the islands of Unit 3 and on the mainland (Subunit 1B). During past years, populations in these units, and the rest of southeast Alaska, have peaked and crashed periodically (Olson 1979). The declines can be attributed to many factors, the most prominent being severe winters. Carnivore predation, excessive or illegal hunting, and reduced habitat carrying capacity caused by clear-cut logging have also created an impact on deer populations.

Spring pellet-group surveys were conducted on Etolin, Coronation, Onslow, Big Level, and Little Level Islands. The surveys consist of continuous 1 x 20 m plots running along a predetermined compass course from sea level to about 1,500 feet in elevation. Woronkofski Island and Mitkof Island transects were not counted in 1986 because of persistent snow conditions. In 1986, Etolin Island and Onslow Island plots (n = 334), which were combined, showed mean counts of 0.62 pellet groups/plot (n = 347) compared with 0.59 in 1985 and 0.37 in 1984 (Table 1). Big and Little Level Islands were sampled in 1986 to supplement data collected in 1981 and 1983. According to the pellet-group data, the deer population on Big Level Island has increased. The mean number of pellet groups/plot has increased from 0.65 in 1981 and 1.29 in 1983 to 1.66 in 1986. The deer population on Little Level Island shows evidence of a decline. In 1986, the pellet-group count was 1.39 pellet groups/plot compared with 2.69 in 1981 and 2.87 in 1983. No physical barrier exists between the 2 islands at low tide.

The deer population on Coronation Island appears to have increased. Pellet groups were previously counted on Coronation Island in 1983 ($\bar{x}$ = 0.78, n = 478). In 1986, the mean pellet-group count was 2.34 pellet groups/plot (n = 228). The smaller sample size in 1986 could account for part of the difference. Coronation Island has had a history of high deer numbers. Wolves were introduced on the island in the 1960's to study the effects of predation on deer herds (Merriam 1966). Wolves reduced the deer population substantially until both prey and predators declined drastically. Predators no longer occur on the island (Land and Young 1984).

Deer pellet-group surveys have not been used to determine actual numbers of deer because many factors influence the data. Persistent snow during the winters of 1984-85 and 1985-86 tended to keep deer at lower elevations (compared with 1983-84) which may have resulted in greater mean pellet-group counts. Other problems with pellet-group information include the following: deer defecation rates may vary with diet, season, and sex; decomposition rates of deer pellets are not known for the sampled areas; experience and visual acuity of observers vary; visibility of pellets is affected by light conditions, vegetation, and terrain; and pellets are not evenly distributed. The technique is most useful for determining gross annual trends in population size and for comparison of deer populations of various islands (M. Thomas, pers. commun.).

As in 1984 and 1985, a spotlight technique was used to census deer populations on Mitkof Island. The method employed 2 observers directing spotlights from a vehicle driven slowly (approximately 10 mph) along logging roads. To take into account the vegetation and terrain features, a modification of the Hahn Deer Cruise Line which is used in other states for censusing white-tailed deer was employed (Hahn 1949). The visible acreage was estimated to convert deer sightings to numbers in a given area (Shult and Armstrong 1984). Prior to running the transects, the visibility in yards was recorded at 0.1-mile intervals. The average width was multiplied by the length of the transect to determine the average visible acreage. A population index (deer/mi^2) can be used for comparative purposes, but should not be construed to be actual deer numbers.

Six spotlight transects were run in the Woodpecker Cove region of Mitkof Island, an area with an extensive road system and a growing deer population. Census lines were also conducted in the Cabin Creek, Dry Straits, and Three Lakes Loop road systems, all on Mitkof Island.

Spotlight surveys in March, 1986, on the Woodpecker Cove spotlight transects, resulted in average counts of 51.2 deer/mi^2 and 3.8 deer seen per linear mile of transect.

Average observed deer numbers declined in June, probably because of the decrease in visibility as vegetation leafed out. The transects showed an average count of 41.2 deer/mi², a figure thought to be reasonable for this portion of Mitkof Island. An average of 2.5 deer/linear mile was seen on the Woodpecker Cove transects, 0.6 deer/linear mile on the Dry Straits transect, and none on the Three Lakes Loop or Cabin Creek road transects.

Deer population levels on Kuiu and Kupreanof Islands continue to be extremely low. An August 1985 survey of the shores of Affleck Canal, Kell Bay, and Bear Harbor on Kuiu Island produced no evidence of deer. Small populations of deer exist on Kuiu Island in the vicinity of Port Malmesbury, Tebenkof Bay, Washington Bay, and Kadake Bay.

Population Composition

Antlers were undeveloped during the March spotlight survey, and while some bucks could be identified in June because of antler development, it was difficult to observe small antlers at night. Thus, no sex ratio information was collected from the surveys. Past experience has shown that over half of the deer cannot be visually identified as to sex on spotlight surveys during May and June.

Sex ratios of the deer herd in the spotlight study area were determined by a helicopter survey. All deer observed were classified by sex and age as follows: 13 bucks, 13 does, and 1 fawn. The fawn, which was captured and fitted with a radio collar, was a female. Two other fawns, captured with the aid of spotlights, were males.

Mortality

A regional survey designed to determine the legal kill was mailed to a 25% random sample of licensed hunters who obtained deer harvest tickets in southeast Alaska during the 1985 hunting season. In Unit 3, an estimated 428 hunters took 166 bucks (39% success rate) compared with an estimated 400 hunters taking 130 bucks (33% success) in 1984. The amount of effort involved in taking a deer increased from 2.2 days/deer killed in 1984 to 5.3 days/deer killed in 1985.

In Subunit 1B, the survey resulted in an estimate that 94 hunters killed 39 bucks (42% success rate) compared with an estimated 1984 kill of 5 bucks by 70 hunters (7% success rate). The amount of time it took a hunter to kill a deer increased from 3.2 days/deer in 1984 to 6.7 days/deer in 1985, but there were more successful hunters in 1985.

Predation by wolves and black bears is thought to be a significant mortality factor for deer in Units 1B and 3. Fawn mortality has been investigated on Mitkof Island since 1984 (Smith et al., unpubl. data). A fawn captured in 1984 survived through the winter of 1984-85 before shedding its radio collar. Two fawns were fitted with radio collars in June 1985; one of them was killed by a black bear within 2 weeks. The other fawn survived at least until shedding its collar in October. Three fawns (2 males and 1 female) were collared in June 1986. They survived at least through late July. Overall, 5 males and 1 female fawn were captured on Mitkof during the mortality study.

Hunter Survey Area 19, which includes Kadin, Sokolof, Zarembo, Etolin, Wrangell, and Vank Islands, was again the most popular hunting location in Units 1B and 3, accounting for 54% of the hunters and 92% of the deer harvested in Unit 3. Woronkofski Island, identified as a separate harvest area for the 1st time in 1985, was the origin of 43% of the bucks killed, for an expanded total of 71 deer and 360 hunter days of recreation.

While established mortality transects were not sampled in either unit, no dead deer were located during the pellet-group surveys; these surveys provided intensive coverage of over 11 miles of linear transects on 5 islands. Because habitat conditions were excellent in most of Units 1B and 3, winter mortality was not a major mortality factor in 1985-86.

Management Summary and Recommendations

On the basis of spotlight counts and aerial surveys, I believe a huntable deer population exists on Mitkof Island in the Woodpecker Cove area. Although adjacent Woewodski Island has not been censused, field observations and reports from trappers, hunters, and fishermen indicate that the area of high deer numbers extends to Woewodski Island. The deer season has been closed on Mitkof and Woewodski Islands since 1975. A short "bucks only" season would provide hunting recreation for residents, with no significant effect on the growth of the deer population.

Mitkof pellet group counts were not completed in 1985 because of persistent spring snow conditions. Pellet-group data showed an increase from 0.78 groups/plot in 1983 to 0.99 groups/plot in 1984. The average number of deer seen on the Woodpecker Cove spotlight counts went from 30/mi^2 in 1985 to 41/mi^2 in 1986. Although range conditions are excellent, with no sign of habitat overuse, a stand of willow and conifers planted by the U.S. Forest Service in spring 1986 was heavily damaged by browsing deer.

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Table 1. Pellet-group data[a] for Subunit 1B and Unit 3, 1984-86.

Island	VCU[b] number	Year	Pellet groups		95% CI	
			n	$\bar{x}$	Lower	Upper
Etolin	473	1984	321	0.37	0.28	0.46
		1985	334	0.59	0.48	0.70
		1986	347	0.62	0.37	0.75
Woronkofski	461	1985	646	1.63	1.45	1.81
Little Level	435	1986	122	1.39	1.07	1.70
Big Level	435	1986	382	1.66	1.42	1.90

[a] Based on 1 x 20 m continuous plot transects.

[b] VCU = Value Comparison Unit (U.S. Forest Service).

Table 2. Units 1B and 3 deer harvest data, 1982-85.

Unit	Year	Number of hunters	% Success	Hunter days	Deer killed	% Bucks
1B	1982	60	8	260	5	100
	1983	80	25	200	20	100
	1984	70	7	440	5	100
	1985	94	42	359	39	100
3	1982	290	26	1,070	75	100
	1983	260	27	1,210	80	100
	1984	400	33	1,440	130	100
	1985	428	39	1,138	166	100

DEER

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 1C

GEOGRAPHICAL DESCRIPTION: Mainland from Cape Fanshaw to the latitude of Eldred Rock

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

Deer populations appear to be holding at relatively moderate to high levels on Douglas Island and the islands of Lynn Canal. The status of mainland populations is unknown.

Spring pellet-group surveys were conducted on Douglas, Lincoln, and Shelter Islands. The surveys consisted of 1 x 20 m continous plots running along a predetermined compass course from sea level to about 1,500 feet in elevation. Pellet-group transect data indicate that populations are still increasing in the sampled areas (Table 1).

Mortality

Based on a 25% sample of the deer harvest tickets issued for the 1985-86 season, the estimated deer harvest in Subunit 1C was 527 deer (329 males and 197 females) (Table 2). About 1,096 hunters spent 3,977 days hunting deer in Subunit 1C.

Management Summary and Recommendations

Although the number of hunters afield increased about 15% compared with 1984, the harvest increased about 25%. On Shelter and Douglas Islands, deer densities appear to be moderate to high, even with the increased harvest. The loss of deer habitat in portions of Subunit 1C, due to urbanization and logging, will eventually reduce population numbers in some areas.

No season or bag limit changes are recommended at this time.

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Table 1. Deer pellet-group data[a] for Subunit 1C, southeastern Alaska, 1984-86.

Area	VCU[b] Number	Year	Pellet groups n	Pellet groups $\bar{x}$	95% CI Lower	95% CI Upper
Douglas Island	36	1985	239	1.30	1.10	1.51
		1986	235	1.97	1.68	2.25
Shelter Island	124	1984	713	1.46	1.33	1.60
		1985	774	1.82	1.67	1.97
		1986	727	2.20	2.02	2.38

[a] Based on 1 x 20 m continous plot transects running from sea level to about 1,500 feet in elevation.

[b] VCU = Value Comparison Unit (U.S. Forest Service).

Table 2. Deer harvest data for Subunit 1C, southeastern Alaska, obtained from Deer Hunter Questionnaire Mail Survey information, 1980-85.

Year	Total hunters	Successful hunters	% Success	Hunter days	Bucks killed	Does killed	Total deer killed
1980	760	160	21	2,770	175	70	245
1982	1,030	200	19	3,980	160	130	290
1983	860	170	20	3,110	220	170	390
1984	950	390	41	3,610	265	130	395
1985	1,096	306	28	3,977	329	197	527

DEER

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 4

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

PERIOD COVERED: 1 July 1985-30 June 1986

Seasons and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

Little quantitative information is available, but evidence suggests that a large number of deer exist throughout most of Unit 4. Mild winter weather conditions have resulted in high winter survival.

Spring pellet-group surveys, begun in 1984, were conducted in 4 portions of the unit (Table 1). However, unfavorable snow conditions resulted in fewer transects being surveyed compared with previous years. (The surveys consist of continous 1 x 20 m plots running along a predetermined compass bearing from sea level to about 1,500 feet in elevation.)

Mortality

The winter of 1985-86 was relatively snow-free, and apparently, little winter mortality occurred. Because of budget and manpower constraints, winter mortality transects were not examined; however, no instances of winter mortality were seen during surveys of about 44 miles of spring pellet-group transects. Additionally, no instances of winter mortality were observed during other field activities and none were reported by members of the public.

The regular-season sport harvest was estimated from results of a standard mail-out questionnaire. The harvest statistics were estimated based on questionnaires returned by 14.6% of all deer harvest ticket holders. This year, those persons pursuing deer in Unit 4 had excellent success (Table 2). About 5,017 hunters reported taking a record 10,389 deer, an average of 2.1 deer/hunter. This record deer kill occurred during a hunting season with little snow on the ground.

Usually, deep snow makes deer more vulnerable to hunters. Thus, the record harvest was probably the result of high deer numbers.

A late-season registration hunt was held on a portion of West Admiralty Island during January. As in 1983 and 1984, Game Division did not have the funds available to administer this hunt, so Subsistence Division issued and collected the permits. Permits were issued to 73 persons; 50 people actually hunted for a total of 92 days. Seven deer were taken. Thirty-seven of the permittees were residents of Angoon; only Angoon residents were successful.

Management Summary and Recommendations

Recently, mild winter conditions have resulted in high over-winter survival. Deer populations in Unit 4 are believed to be at or above optimum levels. Current season and bag limit hunting regulations are quite liberal, but population levels could accommodate increased consumptive use. The Department should enhance the public's awareness of the magnitude and dynamic nature of the unit's deer populations.

High winter mortality and the harvest of high-volume stands of old-growth timber on deer winter ranges continue to be the major potential sources of impact on deer numbers. If adequate habitat exists, deer will recover from severe winters. The removal of critical high-volume stands will result in a permanent reduction in carrying capacity.

No changes in seasons or bag limits are recommended.

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Table 1. Deer pellet-group data[a] for Unit 4, 1984-86.

Area	VCU[b] number	Year	Pellet groups		95% CI	
			n	$\bar{x}$	Lower	Upper
Barlow Cove (Admiralty Is.)	125	1984	347	1.69	1.46	1.92
		1985	347	1.55	1.35	1.76
Hawk Inlet (Admiralty Is.)	128	1984	339	1.42	1.22	1.63
		1985	204	1.69	1.43	1.95
		1986	286	1.92	1.64	2.19
Finger Mountain (Chichagof Is.)	247	1984	302	1.83	1.57	2.09
		1985	279	3.23	2.79	3.67
		1986	277	2.88	2.57	3.19
Nakwasina (Baranof Is.)	300	1984	196	2.51	2.14	2.88
		1985				
		1986	715	3.50	3.26	3.76
Sealion (Kruzoff Is.)	305	1984	320	1.36	1.14	1.58
		1986	235	2.87	2.44	3.29

[a] Based on 1 x 20 m continous plot transects running from sea level to about 1,500 feet in elevation.

[b] VCU = Value Comparison Unit (U.S. Forest Service).

Table 2. Deer harvest and winter mortality information for Unit 4, 1969-85.

Year	Total[a] kill	% Males	Hunter days per deer	Average number of deer/hunter	Number of winter-killed deer per mile of transect
1985	10,389	68	2.4	2.1	--[b]
1984	8,900	73	3.2	1.8	-[c]
1983	8,400	74	3.7	1.7	-[d]
1982	5,630	72	4.7	1.3	-
1981	5,700[e]	77	3.8	1.5	1.25
1980	4,500	75	6.7	1.4	--
1979	950	70	4.5	1.0	--
1978	2,024	70	2.5	1.1	0.72
1977	2,945	N/A	1.6	1.2	--
1976	1,475	67	7.5	0.7	--
1975	4,247[f]	57	2.2[g]	2.1[g]	0.96
1974	7,118	57	3.1	2.3	0.41
1973	7,000	67	3.5	2.5	0.78
1972	2,500	54	4.9	1.4	0.64
1971	3,040	N/A	3.3	1.7	1.11
1970	4,040	56	N/A	2.1	1.61
1969	1,756	45	8.0	0.8	--

[a] Hunter questionnaire 1980-1985; harvest ticket/report data 1975-1979; hunter interview through 1974.

[b] Eight transects examined.

[c] Thirteen transects examined.

[d] Seven transects examined.

[e] Range 4,190-7,227.

[f] Hunter interview data calculated harvest of 14,700.

[g] Data for Sitka hunters only below this year.

Table 3. Unit 4 deer harvests, by residence of hunters, 1984-85.

Community	No. of harvest tickets issued		No. of hunters		Estimated harvest	
	1984	1985	1984	1985	1984	1985
Sitka	2,193	2,311	1,665	1,583	3,242	3,680
Juneau-Douglas	3,667	3,832	2,017	2,145	3,124	3,509
Petersburg	752	689	343	322	638	904
Ketchikan and other communities in 1A & 2	3,280	3,458	116	75	242	72
Wrangell	658	687	88	51	182	127
Hoonah	303	338	245	260	561	807
Angoon	130	137	94	76	180	312
Pelican	98	89	64	59	149	88
Kake	75	154	32	102	76	203
Port Alexander	19	20	14	20	34	60
Tenakee Springs	45	50	37	44	60	149
Gustavus	47	38	33	12	53	28
Haines-Skagway	160	197	57	89	118	257
Elfin Cove	20	24	21	18	0	48
Funter Bay	10	4	29	4	71	16
Other	355	392	115	157	190	138
Totals	11,812	12,420	4,970	5,017	8,920	10,389

DEER

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 6

GEOGRAPHICAL DESCRIPTION: Prince William Sound

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

A comparison of the number of deer observed on beaches during early March in Prince William Sound indicates fewer deer in 1985-86 than in 1984-85. Two hundred and four deer were observed during a 4-day beach survey that was conducted this reporting period. Approximately 550 deer were observed under similar survey conditions in 1984-85. Although beach surveys conducted from boats are likely to produce varying results, those conducted at the same time of year and under similar weather conditions may identify trends.

Another persistent winter slowed the arrival of spring and, likewise, plant shoot emergence. Snow-melt began in mid-April. Spring phenology was a week ahead of last year, but still 1-2 weeks behind previous years. Production of fawns should improve.

Population Composition

During March beach surveys, 204 deer were observed; 105 of those deer were classified as 31 fawns (30%) and 74 adults (70%).

Mortality

Hunters in Unit 6 killed approximately 2,000 deer during this reporting period. This estimated kill figure was derived by extrapolating the number of deer killed by 100 Cordova harvest ticket holders to include all harvest ticket holders in Cordova (720) (Table 1), then dividing by 0.35. Cordova resident hunters annually kill about 35% of the total deer harvested in Unit 6, as determined in previous statewide deer hunter questionnaires (Appendix A).

Cordova deer hunters killed 70% of their deer during the months of October and November. Deep snow pushed deer to the beaches in early November. Clear skies and deep snow persisted until early December. High winds and steady rains in December curtailed hunting effort.

Winter mortality of fawns in Unit 6 was detected on a portion of Montague Island but at no other location. One male fawn, dead of starvation, and 2 other fawns in the latter stages of starvation were observed on the relatively densely populated beaches of Rocky Bay in early March. Beaches on Storey, Naked, Ingot, Knight, and Hinchinbrook Islands, however, produced no evidence of starvation. An extensive search of 3.1 miles of beaches on Hawkins Island in late April also produced no evidence of starvation.

Management Summary and Recommendations

The estimated Unit 6 deer harvest from 1980 (1,310) to 1984 (2,198) increased at an average annual rate of 14% (Appendix A). In 1985, the estimated harvest (2,000) declined by 9%. This decline is thought to be due to reduced deer population density.

No changes in season dates or bag limits are recommended. However, periodic questionnaires of statewide deer hunters or deer hunters residing within the railbelt[1] should be conducted to maintain accurate projection factors for the Cordova survey (Appendix A).

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[1] "Railbelt," as used in this report, is defined as Unit 8 and all highway-connected communities in southcentral Alaska.

Table 1. Results of Cordova deer hunter survey, Unit 6, 1985.

	Number	%
Harvest ticket holders	720	100
Sample size	100	14
Did not hunt	21	21
Hunted (active hunters)	79	79
Unsuccessful	41	52
Successful	38	48
Deer killed	98	100
Bucks	67	68
Does	31	32
(Fawns)	(16)	(16)
Means:		
Deer/Harvest ticket holder	1.0	
Deer/Active hunter	1.2	
Deer/Successful hunter	2.6	
Days/Active hunter	5.5	
Days/Successful hunter	8.1	

Appendix A.

Summary of Alaska Game Management Unit 6
Deer Hunter Questionnaires: 1980, 1983, and 1984

Background

Deer hunter report cards were required and collected between 1969 and 1979, but were discontinued because few hunters complied and little information was collected. Questionnaires were designed as improved replacements. To determine deer harvest in Game Management Units 6 and 8, Alaska deer hunter questionnaires were distributed to all harvest ticket holders in 1980 and to a sample of 6,000 railbelt harvest ticket holders in 1983 and 1984. (As used in this report, "railbelt" includes Unit 8 and all highway-connected communities in southcentral Alaska.) In addition, during most years from 1964 through 1982, a survey was taken of 100 Cordova area deer hunters to determine local deer hunter success.

Methods

Results of the 1980 questionnaire (Table 1) provided initial hunter composition data and harvest characteristics for 9 areas in Unit 6 (Fig. 1). Two successive reminder letters were sent to hunters who did not return the initial questionnaire. The reminders resulted in a 72% response rate. Railbelt hunters killed 87% of all deer killed in Unit 6; this group composed 82% of all deer hunters in the unit. In subsequent surveys, the correction factors for deer killed and for number of hunters were derived from these percentages.

Similar questionnaires were randomly distributed to 6,000 railbelt harvest ticket holders in 1983 and 1984. In 1983, 10,169 hunters from the railbelt were issued deer harvest tickets. In 1986, 11,726 were issued. In both years approximately 1% of all questionnaires were undeliverable. Hunter response rate in 1983 was 0.63 and in 1984 it was 0.77. The number of deer reported by responding hunters was then corrected for nonresponse and projected for total harvest as follows:

$$E(D_x) = T_x * M(D_x) * (1/CF) * (1/R_x)$$

$E(D_x)$ = estimated deer harvest

T_x = total railbelt ticket holders

$M(D_x)$ = mean harvest per ticket holder

$M(D_x) = S(D_x)/5940$ -- 5940 = total deliverable questionnaires

$S(D_x)$ = sum of reported harvest

CF = correction factor based on 1980 questionnaire results (.87)

R_x = surveyed hunter response rate

$$V[E(D_x)] = [(T_x^2) * V(D_x)/5940) * [1-(5940/T_x)] * (1/R_x)^2 * (1/CF)^2$$

$V[E(D_x)]$ = variance of the estimated deer harvest

$V(D_x)$ = variance of $M(D_x)$

$$CI_x = E(D_x) \pm SQRT[V(E[D_x]) * 1.64]$$

CI_x = 90% confidence intervals of $E(D_x)$

Results and Discussion

Unit 6 deer hunters killed more deer in 1984 than in 1983 or 1980 (Table 1). The estimated harvest for 1983 was 1,959 (±122 at 90% CL), and in 1984 an estimated 2,198 (±161 at 90% CL) deer were killed. These estimates exceed the 1980 estimate of 1,310 (CL not available). Harvest estimates between 1980 and 1984 represent an average annual increase of 14%. Note that the 1983 questionnaire results as reported by Reynolds (1985) have been corrected to include expected harvest by nonresponding hunters, which was omitted from Reynolds' estimate calculations.

Measures of hunter success (percentages of hunters that were successful and deer/hunter) were highest in 1983 (Table 1). Likewise, the number of hunter days/deer was lowest in 1983. Under similar hunter effort (hunting days/hunter), these measurements indicate greater density and availability of deer in 1983 compared with 1980 and 1984 (Table 1). However, 1983 success rates may be artificially high, biased by a lower response rate. Winter weather and snow depths from 1980 to 1984 favored deer survival. Deer densities should have been high in 1983 and 1984.

The number of deer killed per successful hunter increased from 2.2 in 1980 to 2.4 in both 1983 and 1984. The increase likely resulted from the bag limit increase from 4 to 5 deer in 1982 and because of greater availability of deer in the latter

years. In 1980, 12% of successful hunters killed 4 or more deer, while in 1983 and 1984, 22% of successful hunters killed 4 or more deer (Table 1).

The estimated number of Unit 6 deer hunters increased substantially between 1983 and 1984. If the low response rate in 1983 has not biased the estimation, a 57% increase in number of hunters occurred. Perhaps the high success rate of 1983 hunters enticed more hunters in 1984. Another consideration might be reduced attraction to deer hunting in Unit 8, the major competition for Unit 6.

Distribution of deer killed between 1980 and 1984 shifted more toward the larger islands (Table 2). Montague and Hinchinbrook Islands accounted for 67% of deer killed in 1984, an increase from 58% in 1980 and 60% in 1983. Hawkins Island's contribution to the Unit 6 harvest decreased from 19% in 1980 to 13% in 1983 and 11% in 1984, although the actual number of deer killed fluctuated little. Both the number of hunters and the total deer killed increased on Montague and Hinchinbrook, as hunters exploited more of the denser inland deer populations.

The results of these questionnaires and future questionnaires allow a simple projection of unit harvest by using the independently obtained Cordova hunter questionnaire results. Results from questionnaires mailed to deer hunters who hunted in 1980 and 1984 indicated that 37% and 34%, respectively, of the unit-wide harvest went to Cordova hunters (Table 1). In 1980, 100 Cordova harvest ticket holders reported they killed 83 deer. When that rate of kill (0.83) from the Cordova survey is multiplied by the number of harvest tickets issued in Cordova that year (ca. 600) and then divided by 37% (percentage of the total kill attributed to Cordova area residents), the Unit 6 estimate of harvest is 1,346, comparable to the questionnaire estimate of 1,310. The Cordova questionnaire was not conducted in 1983 and 1984, preventing similar comparisons with the questionnaires utilized for those years.

Recommendations

Because there will be changes in interest in hunting deer in Unit 6 by non-Unit 6 residents, statewide and railbelt deer hunter questionnaires should be distributed periodically to allow more accurate harvest projections. While budgets may limit frequency, a statewide questionnaire should be attempted within the next 2 years to identify any recent shifts in hunter patterns and to allow another comparison with a simultaneously conducted Cordova questionnaire. Railbelt questionnaires may be sent every other year if the separate projections correlate satisfactorily.

Results of deer hunter questionnaires mailed to southeastern Alaskans have been summarized and distributed to the participating public. No similar effort has been attempted in southcentral Alaska. A summary of the most recent Units 6 and 8 results (1984) should be distributed to railbelt residents who participated, to encourage continued cooperation and to promote Department programs.

The impact of high bag limits on Unit 6 hunter success should be considered in future regulation recommendations. Even during periods of high-density deer populations, heavy hunting pressure can quickly reduce deer availability. Successful deer hunters in both 1983 and 1984 killed 2.4 deer each; however, the percentage of successful hunters decreased substantially in 1984 when more hunters went afield (Table 1).

Literature Cited

Reynolds, J. L. 1985. Unit 6 deer survey-inventory progress report. Pages 18-20 in A. Seward, ed. Annual report of survey-inventory activities. Part VI. Deer. Vol. XV. Alaska Dep. Fish and Game. Fed. Aid in Wildl. Rest. Prog. Rep. Proj. W-22-3. Job 2.0. Juneau. 23pp.

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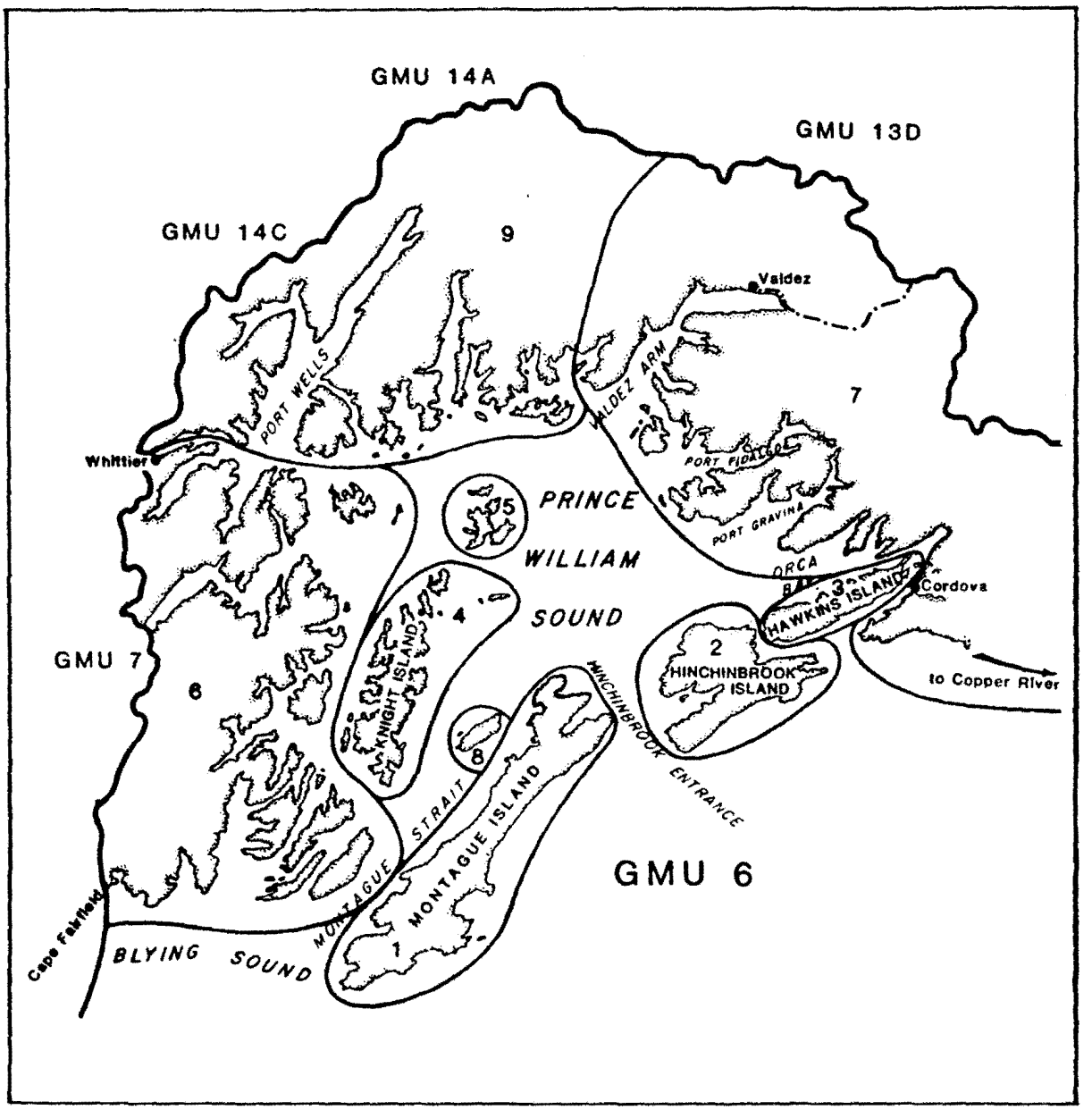

Fig. 1. Hunt areas for deer harvest tabulations and hunter composition in Unit 6, 1980.

Table 1. Comparison of deer hunter questionnaire results for Game Management Unit 6, 1980, 1983, and 1984.

	1980	1983	1984
Number harvest ticket holders sampled	16,756	10,169[a]	11,726[a]
Number questionnaires distributed	16,756	6,000	6,000
Percent of deliverable questionnaires returned	72	63	77
Number of hunters of Unit 6 responding	899	323	545
Estimate of total hunters	1,250	1,020	1,600
Numbers of reported successful hunters (%)	439(49)	260(81)	318(58)
Number of reported deer killed	942	620	746
Estimate of total deer killed	1,310	1,959	2,198
Percent male deer in reported kill	64	62	64
Percent deer killed by Cordova hunters	37	-[b]	34
Number of total reported hunter days	4,455	1,692	2,542
Estimates of total hunter days	6,350	5,540	7,800
Mean:			
Hunting days/hunter	5.0	5.2	4.8
Hunting days/deer	4.7	2.7	3.4
Deer killed/hunter	1.0	1.9	1.4
Deer killed/successful hunter	2.2	2.4	2.4
Percent successful hunters taking:			
5 or more deer[c]	0.6	10.8	11.3
4 deer	11.3	10.8	10.4
3 deer	13.5	17.7	18.2
2 deer	26.2	26.2	21.7
1 deer	48.5	34.6	38.4

[a] 1983 and 1984 questionnaires sent only to railbelt harvest ticket holders.

[b] Data collected but not separated.

[c] Legal bag limit increased from 4 to 5 deer in 1982.

Table 2. Comparison of distribution of estimated deer harvest for Game Management Unit 6, 1980, 1983, and 1984.

Area	Estimated number (%)		
	1980	1983	1984
Montague Island	590(45)	941(48)	1,183(50)
Hinchinbrook Island	170(13)	243(12)	349(17)
Hawkins Island	249(19)	262(13)	232(11)
Knight Island	79(6)	125(6)	80(4)
Naked Island	52(4)	122(6)	150(7)
Southwestern Prince William Sound	52(4)	157(8)	92(4)
Eastern Prince William Sound	26(2)	44(2)	62(3)
Green Island	52(4)	48(2)	66(3)
Northern Prince William Sound	1(0)	16(1)	15(1)
Unknown	39(3)	0(0)	15(1)

DEER

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 8

GEOGRAPHICAL DESCRIPTION: Kodiak Island and adjacent islands

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

The deer population has remained high in most of Unit 8. Population levels on Afognak Island, however, are below those of the early 1980's. The population on Kodiak Island is stable to increasing.

Population Composition

No data are available.

Mortality

Analysis of hunter questionnaire surveys for the 1983-84 and 1984-85 seasons indicates that the annual harvest in Unit 8 is approaching 10,000 deer. No hunter survey was done for the 1985-86 season, but the harvest is estimated to be at least equal to that of the previous season.

An estimated 3,948 hunters went afield and 81% were successful in the 1984-85 season (Table 1). The estimated harvest was 8,905 deer (8,564-9,246 at 90% CL), including 6,245 males, 2,202 females, and 458 of unknown sex. Hunters spent an estimated 22,830 days afield. Mean kill per hunter was 2.3 deer and hunters averaged 5.8 days afield.

Residents of Unit 8 and mainland Alaska residents comprised 42% and 58% of the surveyed hunters, respectively. Mainland Alaska residents were 87% successful compared with Unit 8 residents with 73% success. Mainland Alaska residents took 61% of the total reported kill compared with 39% for Unit 8 residents.

Distribution of the estimated 1984-85 harvest was as follows: western Kodiak, 4,243 deer (48%); eastern Kodiak, 596 deer (18%); Afognak, Raspberry, and Shuyak, 2,962 deer (33%); and unknown, 104 (1%).

October and November were the peak months of harvest in 1984 with 28% and 41% of the harvest, respectively.

An error in estimating the harvest statistics for the 1983-84 season has invalidated the analysis of the hunter questionnaire data reported by Smith (1985). The corrected estimates were approximately 50% higher than was previously reported. An estimated 4,106 hunters were in the field and hunter success was 81% during the 1983-84 season (Table 1). The estimated total kill was 9,897 deer, including 7,238 males, 2,432 females, and 227 deer of unknown sex. Hunters spent an estimated 21,903 days afield.

Natural mortality appeared to be relatively light, although prolonged winter conditions may have resulted in some late-occurring undetected losses. In April and May 1985, only 6 deer mortalities were located along 8 miles of beach transects on Shuyak, Afognak, and northeastern Kodiak Island. Deep snow in late spring and cooler than normal April-June temperatures resulted in unusually late green-up and poor overall development of vegetation in 1985. A fisherman residing on Uganik Island reported finding some deer there that appeared to have died of malnutrition as late as June. Hunters reported that deer appeared to be in good condition by fall despite the poor growing season in 1985.

No mortality surveys were done during the 1985-86 winter. Relatively light snow accumulations occurred at low elevations and mortality was probably minimal.

Management Summary and Recommendations

Harvest in Unit 8 each year since 1983 has been estimated at nearly 10,000 deer, approximately double the 5,347 deer estimated killed in 1980. Hunting effort has increased similarly with 2,738 hunters spending 11,540 days effort in 1980 compared with 3,948 hunters spending 22,830 days afield in 1984. Despite the increase in harvest and hunting effort, hunter success has remained high. The deer population has remained little affected by current harvest rates except in localized, easily accessible areas.

No changes in seasons or bag limits are recommended.

Literature Cited

Smith, R. B. 1985. Unit 8 deer survey-inventory progress report. Pages 21-23 in A. Seward, ed. Annual report of survey-inventory activities. Part VI. Deer. Vol. XV. Alaska Dep. Fish and Game. Fed. Aid in Wildl. Rest. Prog. Rep. Proj. W-22-2. Job 2.0. Juneau. 23pp.

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Table 1. Deer hunting/harvest statistics in Unit 8 for 1980-81, 1983-84 and 1984-85.

	1980-81	1983-84	1984-85
Hunters afield	2,738	4,113	3,948
Successful hunters	2,001 (73%)	3,343 (81%)	3,198 (81%)
Total harvest	5,347	9,897	8,905
Male harvest	3,930 (74%)	7,238 (73%)	6,245 (70%)
Female harvest	1,417 (26%)	2,432 (25%)	2,202 (25%)
Unknown-sex harvest	--	227 (2%)	458 (5%)
Mean deer/hunter	2.0	2.4	2.3
Days hunted	11,540	21,903	22,830
Mean days hunted	5.9	5.3	5.8
Percent of harvest by GMU 8 hunters	54%	--	39%
Percent of harvest by other Alaskans	46%	--	61%