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DEER REPORT

by

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Volume VII
Annual Project Segment Report
Federal Aid in Wildlife Restoration
Projects W-6-R-6, Work Plan A and W-15-R-1, Work Plan J

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(Printed August 1966)

WORK PLAN SEGMENT REPORT
FEDERAL AID IN WILDLIFE RESTORATION

STATE:	<u>Alaska</u>		
PROJECTS:	<u>W-6-R-6</u>	TITLE:	<u>Alaska Wildlife Investigations</u>
AND:	<u>W-15-R-1</u>	TITLE:	<u>Big Game Investigations</u>
WORK PLANS:	<u>A (W-6-R)</u>	TITLE:	<u>Sitka Black-Tailed Deer</u>
AND:	<u>J (W-15-R)</u>	TITLE:	<u>Deer</u>
JOBS:	<u>1, 2, 3, 4</u>		

PERIOD COVERED: January 1, 1965 to December 31, 1965

ABSTRACT

Deer populations in Southeast Alaska And Prince William Sound remain at approximately the same level of abundance as in 1964. In Southeast Alaska there is some reduction in northern areas offset by increases in southern localities. Deer on Kodiak Island continue to increase in number and expand their range.

Winter losses were higher than average in Southeast Alaska. (1.4 dead deer per mile of beach). Mortality in Prince William Sound and on Kodiak Island were light.

Winter use of key browse species averaged 66 percent in Southeast Alaska and 74 percent in Prince William Sound. This is higher than normal for both areas. Studies of artificially clipped plots indicate ranges begin to deteriorate with sustained use of approximately 70 percent.

Hunter harvest in 1965 was about 10,000 in Southeast Alaska, 1,200 in Prince William Sound and 1,000 on Kodiak Island. Hunter success was slightly lower than average in Southeast Alaska and above average for both Prince William Sound and Kodiak Island.

A large proportion of deer taken in the hunter harvest continues to be older-age animals.

RECOMMENDATIONS

No recommendations relative to management are made at this time.

WORK PLAN SEGMENT REPORT
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STATE: Alaska

PROJECTS: W-6-R-6 TITLE: Alaska Wildlife Investigations
AND: W-15-R-1 TITLE: Big Game Investigations

WORK PLANS: A (W-6-R) TITLE: Sitka Black-Tailed Deer
AND J (W-15-R) TITLE: Deer

JOBS: 1, 2, 3, 4

PERIOD COVERED: January 1, 1965 to December 31, 1965

OBJECTIVES

To evaluate:

1. Population status and trends.
2. Mortality factors.
3. Habitat conditions.
4. Hunter harvest.

TECHNIQUES

Populations

Deer pellet groups were counted in Southeast Alaska and Prince William Sound to determine the validity of this technique as an index of abundance and trends for Alaskan deer. Plots were located along straight-line transects which ran from sea level to 1200 feet in elevation. Clusters of four 100-square-foot circular plots were established at 100 foot elevation intervals, beginning at 100 feet and ending at 1200 feet. All groups found on each plot were counted, regardless of age. Plots were checked in July after deer had moved to summer ranges. Transects were situated on timbered hillsides known to be deer wintering ranges. In addition to pellet group transects, a 1,000-square-foot check plot was established to determine rate of decomposition of deer pellets. Fresh pellet groups were collected outside the plot after new snowfalls and placed within the plot to augment those dropped naturally within the plot.

Aerial surveys were flown on Kodiak Island and in the vicinity of Prince William Sound. Surveys on Kodiak Island consisted of a random sample of square-mile plots which were flown during winter months when snow cover was present. Fall alpine surveys were employed in Prince William Sound where the majority of the deer congregate on the high open ranges during the summer and fall months.

Hunter success and age classes represented in the hunter harvest were used in all areas as a measure of deer abundance and composition. Throughout the hunting season deer jaws were collected for aging, and post-season hunter interviews were made in all major towns and villages within the Sitka black-tail deer range to determine hunter success.

Reproductive tracts were collected when possible. Analysis has not been completed at the time of this report.

Natural Mortality

Winter mortality surveys were made in March and April. Deer carcasses were counted along established transects. On Kodiak Island ten transects, varying in length from one to four miles, were checked. Total length of transects was 20 miles. In Prince William Sound and Southeast Alaska transects were all one-half mile in length: five were located in Prince William Sound and 69 in Southeast Alaska. Field work in Prince William Sound and Southeast Alaska was performed by U. S. Forest Service personnel under a cooperative agreement with the Alaska Department of Fish and Game. Data collected included number of carcasses, sex, age, condition of bone marrow, location, and cause of death when possible.

The impact of wolf predation on a deer population was studied on Coronation Island. Factors measured included deer and wolf numbers, wolf productivity and food habits, and changes in habitat. Seven 50-foot line intercept transects were checked in August. All vegetation along each transect was recorded.

Habitat

Seventy-four browse utilization transects, each one-half mile in length, were checked in Prince William Sound and Southeast Alaska during the months of March and April. The technique is described in the W-6-R-3 Segment Report.

Additional condition and trend transects were located in Southeast Alaska and Prince William Sound by U. S. Forest Service personnel. The procedure is also described in the W-6-R-3 Segment Report.

Deer food species were collected at monthly intervals from various vegetative types and elevation levels in both Prince William Sound and Southeast Alaska. These were dried and stored for future nutrient analysis.

Deer feeding observations were made on Kodiak Island to ascertain preferred food species. Stomach samples were also collected during the hunting season.

A final collection of seven deer was made during February and March from the Skowl Arm area of Prince of Wales Island. Tissue samples were analyzed for DDT content by the Wisconsin Alumni Research Foundation Laboratory in Madison, Wisconsin.

The proposed study to evaluate the impact of logging on deer range was postponed due to other commitments.

Hunter Harvest

The magnitude and characteristics of the deer hunter harvest was measured through hunter interviews immediately after the season closed. Hunters were interviewed at random in all towns and villages within the deer range. Approximately 10 percent of all deer hunters were queried regarding success, number of deer taken, number of days hunted and sex and location of kills.

Acknowledgments

Cooperating biologists who have accomplished much of the field research documented in this report include Sterling Eide and Ben Ballenger, Kodiak Island; Loyal Johnson, Prince William Sound; and John Crawford and James Faro, Southeast Alaska.

FINDINGS

Southeast Alaska

Populations

Assessment of total deer numbers in Southeast Alaska continues to be a problem. Many techniques have been tested, including winter beach counts, fall alpine aerial and ground counts, road counts, track counts and tagging for Lincoln Index returns. These methods have not provided the information necessary for population estimates. Results have been described in previous segment reports. During the past two years pellet group counts have been utilized with some success. Information obtained from the hunter harvest still is the best measure of deer abundance in Southeast Alaska.

Deer numbers have remained relatively static for the past several years. Deer are abundant in most areas as indicated by the high hunter success and the number of deer taken per hunter. Winter losses were somewhat higher than average during the winter of 1964-1965, but not sufficiently large to influence deer numbers in most areas during the 1965 hunting season. Hunting continues to have little impact on Alaskan deer populations. Only a small portion of available habitat is actually hunted.

Southeast Alaska contains approximately 25,000 square miles of deer habitat. The estimated population is about 250,000 deer. Recent findings on the deer-wolf study at Coronation Island indicate that this estimate may be low. Four wolves were released on Coronation Island (30 square miles) in 1960. The deer population at that time was estimated at about 10 per square mile or 300 deer. The number of wolves present on the island increased to at least nine by the summer of 1965. Wolf scat analyses indicate that throughout this period the major food item for wolves was deer. By the summer of 1965 the deer population had been reduced to at least one-third of its original size, yet wolves were still obtaining them in sufficient numbers for food. By 1965, the nine wolves must have been taking at least 150 deer per year. This amount of food would not be sufficient to sustain them and would require augmentation from other sources. This being the case, the original estimate of 10 deer per square mile must have been low, probably as much as 100 percent.

The 1960 deer population on Coronation Island was determined by comparison with other deer habitat in Southeast Alaska where densities were estimated at about 20 per square mile. It follows that if the population estimate on Coronation Island was low, then the base was also low. It is probable therefore, that the better ranges of Alaska have deer densities approaching 40 per square mile.

Ten pellet group transects, established in 1964, were again checked in 1965. These data are tabulated in Table 1. The average number of groups found per transect was 57.6 in 1965 compared to 35.1 in 1964. Deer utilized winter ranges for about a month longer in 1965 than in 1964 which accounts for the increase in the number of groups per plot. Peak use in 1964 was at the 700 foot level. In 1965 the greatest concentration of deer appeared to be at 300 feet; however, concentrations were greater at all elevations in 1965 than in 1964.

Pellet groups placed within a check plot in January and February of 1965 evidenced little decomposition by December, 1965. Further information on decomposition must be obtained to determine if clearing plots of pellet groups each year is necessary.

In 1965, 65 percent of the deer killed by hunters were three years old or older, compared to 49 percent in 1964. The decrease in representation of younger animals is primarily due to losses during the previous winter. Age class distribution of hunter killed deer from 1959 through 1965 is given in Table 2. In 1965 the average hunter success was 73 percent. Hunters took an average of 1.7 deer each with an effort of 2.8 days per deer. Success and deer per hunter were slightly lower than the ten year average (77 percent and 1.9 deer); however, effort (days per deer) in 1965 was only 2.8 compared to the ten year average of 3.1. The large proportion of older age animals in the harvest and the high success per unit effort evince that hunting is not noticeably influencing Alaska's deer populations.

Table 2. Age classes of deer represented in the hunter harvest, Southeast Alaska, 1959-1965.

Year	Age Class (%)							Sample Size
	Fawns	1-1/2	2-1/2	3-1/2	4-1/2	5-1/2	3-1/2- and Older	
1965	0	16	19	35	24	6	65	148
1964	1	20	30	20	22	7	49	87
1963	2	16	11	37	27	7	71	106
1962	2	11	32	24	24	7	55	183
1961	3	23	22	26	19	7	52	703
1960	4	24	21	27	14	10	51	412
1959	3	19	30	20	21	7	48	281

Natural Mortality

Deer mortality for the winter of 1964-1965 averaged 1.5 deaths per mile of beach in Southeast Alaska. Table 3 gives the mortality by area.

Mortality in 1965 was the highest since 1956 when 2.7 carcasses per mile were located. Winter losses for the past 10 years have averaged 0.7 deaths per mile of beach. Forty-nine deer carcasses were located on 69 transects, each one-half mile in length. Sixty-three percent of the losses were fawns, 27 percent adult bucks, 4 percent adult does and 6 percent unidentifiable.

Table 3. Winter mortality of deer in Southeast Alaska, 1965.

<u>District</u>	<u>No. of Transects (1/2 mile in length)</u>	<u>Deaths/Mile</u>
Ketchikan	10	0.2
Kasaan	11	0.3
Craig	8	1.2
Juneau	12	5.1
Sitka	12	0.7
Petersburg	8	0.7
Wrangell	8	0.7
All Southeast	69	1.5

The majority of deaths occurred in localities north of Petersburg with highest concentrations in the vicinities of upper Seymoure Canal and Juneau. Losses south of Petersburg were relatively light.

Mortality of the above magnitude appears to have little influence on deer abundance. Losses in 1956 averaged 2.7 deer yet in 1958 hunters took more deer than for any other year on record.

The investigation of predator-prey relationships between wolves and deer on Coronation Island which was reported in the W-6-R-5, 6 Segment Reports has been continued. Two weeks were spent on the island during both the months of May and August.

In October, 1960, four timber wolves (two males and two females) all approximately 19 months of age, were placed on Coronation Island. The island is about 30 square miles in size and supported an estimated 300 deer.

There was no knowledge of a previous predator species on the island. Deer range evidenced severe over-use and deer were about 20 percent smaller than on better ranges in Southeast Alaska. Since 1960 annual investigations have been made to evaluate changes in wolf and deer numbers, food habits of wolves, condition of deer and changes in the environment.

The deer population has continued to decline. No deer were observed during the entire period spent on the island in 1965. Three fresh deer tracks were observed on the beaches in May and several tracks were noted in the high country in August. Most of the evidence in August was in high, rough country indicating deer are seeking escape terrain.

Wolf numbers do not appear to have increased since the previous year. Observations and tracks indicate approximately 10 wolves on the 30-square-mile island. This is undoubtedly the highest wolf population per unit area in existence. No dens were located; however, tracks of two pups were observed in August. Productivity has been low. To the best of our knowledge only one litter of pups has been produced each year since 1961 with the exception of 1962 when no evidence of pups was present. The maximum number of pups known from any single litter is three.

The adjacent Spanish Islands were checked in August, 1965, for evidence of deer and wolves. A channel about one-half mile in width separates Coronation from the closest of the Spanish Island group. No evidence of wolves was found on the Spanish Islands, however, deer sign was abundant. The range showed extreme use, similar to that of Coronation Island prior to the wolf introduction.

Wolf scats have been collected each year and analyzed for food content. Results of these analyses are shown in Table 4. Deer have always been the major food source for the wolves. In spite of diminishing deer numbers, the presence of deer remains in scats increased to almost 100 percent in 1965. Harbor seal, which initially constituted a large portion of their diet, evidently became more difficult to obtain in 1964, decreasing in incidence to 8 percent by 1965. In 1965, 7 percent of the scats contained considerable wolf hair. Almost all scats contain a small amount, but these contained more than usual. This was the first evidence of intra-specific strife. Scats collected in August, 1965, had a much lower incidence of deer than those obtained in May, miscellaneous items constituting a large portion of the total content. Deer had been reduced to a level where it was becoming difficult for wolves to obtain them. Miscellaneous items in the wolf scats included mink, land otter, mice, birds and marine invertebrates. Wolves were observed scratching cockle clams (*Clinocardium* spp.) from the sandy beaches.

Table 4. Frequency of food items in wolf scats from Coronation Island, 1961-1965.

Year	No. Scats	Frequency (% in total scats)			
		Deer	Harbor Seal	Wolf	Misc.
1961	146	78	43		2
1962	18	89	48		11
1963	45	89	53		27
1964	77	95	32		14
1965	213	97	8	7	17

Table 5. Changes in plant abundance on Coronation Island. (Seven 50 foot transects)

<u>Plant Species</u>	<u>Number of Plants</u>	
	<u>1963</u>	<u>1965</u>
<u>Cornus canadensis</u>	97	218
<u>Rubus pedatus</u>	245	423
<u>Tiarella trifoliata</u>	392	515
<u>Listera spp.</u>	74	113
<u>Streptopus spp.</u>	97	139
<u>Moneses uniflora</u>	14	15
<u>Maianthum dilitatum</u>	17	43
<u>Dryopteris austriaca</u>	55	75
<u>Dryopteris linnaeana</u>	1	109
<u>Vaccinium ovalifolium</u>	43	54
<u>Menziesia ferruginea</u>	17	22
<u>Rubus spectabilis</u>	0	2
<u>Tsuga heterophylla</u>	17	45
<u>Picea sitchensis</u>	7	6

In August, 1965, one of the original male wolves placed on the island was observed. The ear tag was clearly visible. This animal was in its fifth year of life.

In 1965 the first actual measurement of vegetative changes on the island since the wolf introduction was obtained. Visual changes had been noted previously; however, in 1965 the vegetation transects established in 1963 were checked and changes in species abundance noted. Table 5 gives the 1963 and 1965 values for plant species present. Greatest increases were noted in forbs, some species increasing as much as 300 percent. Woody plant species showed little increase in incidence but growth of individual plants was apparent.

At this point in the study wolves have reached a level of abundance which is out of balance with their normal food source. Deer are still present on the island but are increasingly difficult to obtain. Wolf productivity is low. Deer food species have shown a marked increase in abundance.

Deer carcasses from all areas of Alaska were examined for parasites whenever possible. Specimens were sent to Kenneth A. Neiland, Department Parasitologist.

Habitat

Winter range use by deer in 1964-1965 was greater than average but was not excessive in most areas. Use of current growth of blueberry (Vaccinium ovalifolium), the primary winter browse species, averaged 66 percent compared to 52 percent in 1964. Average use since 1956 is 61 percent. Sitka and Juneau localities experienced the highest use, 78 and 83 percent, respectively. Plant vigor and height showed little or no change over preceding years. Table 6 presents the winter browse utilization data.

Table 6. Deer winter range use, condition index and plant height for Southeast Alaska, 1964-1965.

<u>Location</u>	<u>Ave. % Utilization*</u>	<u>Ave. Condition Index**</u>	<u>Ave. Plant Height</u>
Ketchikan	60	1.8	31
Kasaan	42	2.0	31
Craig	58	1.9	41
Juneau	83	2.0	25
Sitka	78	1.9	26
Petersburg	72	1.9	28

(Continued)

Table 6 Continued.

<u>Location</u>	<u>Ave. % Utilization*</u>	<u>Ave. Condition Index**</u>	<u>Ave. Plant Height</u>
Wrangell	64	1.8	30
All Southeast Alaska	66	1.9	30

* Utilization: Percentage of total current growth clipped

** Condition Index:

1. Good vigorous plant
2. Average plant
3. Decadent plant

Utilization values show a direct relationship to winter mortality. Increase in mortality follows an increase in browse use readings. The proportion of yearling deer in the hunter harvest has also consistently shown a direct relationship to the previous winter mortality and utilization values. An increase in utilization and mortality is reflected by fewer yearling deer in the following hunter harvest. This held true in 1965.

The effect of browse utilization at varying degrees of intensity is being studied by artificially clipped plots. Clipped plots established in 1963 simulate use of 0, 20, 40, 60, 80 and 100 percent. After two years, very little change has been noted in plant vigor. Plots simulating 80 and 100 percent use evidence some decrease in vigor but have not become decadent.

During the past two years, condition and trend transects have been established in 26 localities of Southeast Alaska. These are to be checked at three-year intervals. First readings will be in July and August, 1966.

In June, 1963, the U. S. Forest Service, Region 10, implemented a pilot project to determine the effects of a 1/4 pound DDT per acre spray application for controlling black-headed budworm (*Accleris variana*) populations. The Alaska Department of Fish and Game initiated studies to ascertain the effect of the spray on deer. Previous findings were reported in the W-6-R-5, 6 Segment Reports.

In February and March, 1965, seven additional deer were collected and tissue samples analyzed for DDT residues. The results of all tissue samples are given in Table 7. Up to 40 ppm DDT residue was found in preferred deer food species one month after spraying, but residues had virtually disappeared six months later. No measurable amount of DDT has been found in any deer muscle tissue samples. Adipose tissue contained a high of 3.60 ppm in July, 1963, but had decreased to a high of 0.28 ppm by March, 1965. Although the present amount of DDT in adipose tissue is low, it is significant that some was still present 31 months after the original application.

Hunter Harvest

Approximately 10,000 deer were taken by hunters during the open season

Table 7. DDT residues in deer tissue samples from Cabin Creek drainage,
Prince of Wales Island.

<u>Date Collected</u>	<u>Sex</u>	<u>Age</u>	ppm DDT	
			<u>Muscle</u>	<u>Adipose</u>
6-14-63	F	2	Trace	Trace
7-18-63	F	1	"	3.6
7-22-63	F	3	"	2.8
12- 6-63	M	3	"	NA*
3-12-64	F	3	"	2.9
3-12-64	M	1	"	NA
3-12-64	M	1	"	NA
3-13-64	F	2	"	2.3
3-14-64	F	1	"	2.2
2-26-65	F	4	"	NA
2-28-65	M	1	"	NA
2-28-65	F	4	"	0.14
2-28-65	F	4	"	0.11
2-28-65	F	1	"	0.16
3-3-65	F	2	"	0.28
3-3-65	F	Fawn	"	NA

NA* = Insufficient adipose tissue available for sample.

Table 8. Summary of deer harvest statistics, Southeast Alaska, 1965.

	<u>Juneau</u>	<u>Ketchikan</u>	<u>Petersburg</u>	<u>Sitka</u>	<u>Wrangell</u>	<u>Villages</u>	<u>All SE</u>
Hunter Success	62	81	79	65	69	78	73
Deer/Hunter	1.3	2.1	1.8	1.6	1.5	1.8	1.7
Days/Deer	3.3	2.2	3.5	3.0	2.8	2.3	2.8
% Female	46	36	45	30	42	28	38
License Sales	2540	2100	780	1030	380	600	7430
% Who Hunted	72	85	89	85	73	74	80.0
Actual Hunters	1830	1780	690	880	280	440	5900
Total Kill	2310	3740	1260	1400	420	840	9970
Sample Size	100	100	150	100	99	123	672

Table 9. Deer kill by town and Game Management Unit, Southeast Alaska, 1965.

	UNIT										
	1		2		3		4		All Units		
Town	M	F	M	F	M	F	M	F	M	F	Both Sexes
Juneau	100	74	0	0	75	181	1072	808	1247	1063	2310
Sitka	0	0	0	0	10	0	970	420	980	420	1400
Ketchikan	2131	1319	263	27	0	0	0	0	2394	1346	3740
Petersburg	35	40	0	17	631	510	27	0	693	567	1260
Wrangell	15	4	0	0	229	172	0	0	244	176	420
Villages	0	0	296	75	73	54	236	106	605	235	840
All SE	2281	1437	559	119	1018	917	2305	1334	6163	3807	9970
Total											
Both Sexes	3718		678		1935		3639		9970		

Table 10. Deer kill for Southeast Alaska by Unit, 1965.

Unit	Male		Female		Both Sexes	
	No.	%	No.	%	No.	%
1	2281	37	1437	38	3118	37
2	559	9	119	3	678	7
3	1018	17	917	24	1935	19
4	2305	37	1334	35	3639	37
Totals	6163	100	3807	100	9970	100

Table 11. Deer hunter harvest statistics, Southeast Alaska, 1956-1965.

Year	Hunter Success	Deer/Hunter	Days/Deer	% Kill Female	Total Kill
1956	74	1.4	4.0	15	7,800
1957	69	1.6	3.6	25	8,250
1958	85	2.4	2.6	26	13,000
1959	74	1.8	3.6	24	11,000
1960	83	2.3	2.9	21	12,400
1961	77	2.2	3.1	26	11,200
1962	74	2.0	3.2	34	11,000
1963	79	2.0	3.0	33	11,100
1964	80	2.0	2.4	31	9,950
1965	73	1.7	2.8	38	9,950

in 1965, almost identical to the take in 1964. Hunter harvest statistics are presented in Tables 8 through 11. Age composition of the kill is reported under "Populations". Hunter success averaged 73 percent, slightly lower than the ten year average. Hunters took 1.7 deer each with an effort of 2.8 days per deer. Distribution of take was somewhat different from usual, the largest portion of the kill coming from the Ketchikan district while most northern areas produced less deer than in past years.

The female portion of the kill (38 percent) was the highest on record. The stigma associated with taking does is rapidly disappearing in Alaska. Late season hunters usually prefer does because of better quality meat.

As in previous years, the majority of deer were taken during the month of November. Chronological distribution of the 1965 kill was: August - 8 percent; September - 7 percent; October - 16 percent; November - 52 percent; and December - 17 percent.

The deer harvest in both 1964 and 1965 was somewhat lower than for the preceding five years. Deer remain equally abundant; however, with the extremely liberal seasons and bag limits (August 1 - December 31, four deer of either sex) we appear to have reached a point where manipulation of regulations has little influence on total take. Availability of deer does effect take. Heavy snowfalls during November and December cause deer to concentrate near tidewater. When these conditions occur, the kill is much larger than years when little snow cover is present.

Prince William Sound

Populations

Deer populations in Prince William Sound are in good condition. Hunter success was very good in 1965. This region experiences more severe winter conditions than any other deer range in Alaska but losses have been light for the last several years. There is much less winter range available per unit area of deer habitat and deer winter food species are of lower quality than in Southeast Alaska. Mortality due to severe winter conditions is normally less than under similar conditions in Southeast Alaska. Apparently a vigorous stock of deer has evolved which is able to persist in this rigorous climate.

Two aerial surveys were flown in 1965. No differentiation of sex and age was attempted. Results are given in Table 12. Snow was still present over portions of the high range of Montague Island at the time of the July 25 flight which accounts for the smaller count than on August 26. The same localities will be flown in successive years to determine trends.

Table 12. Aerial deer counts, Prince William Sound, 1965.

Location	Number Deer Observed	
	7/25/65	8/26/65
Hawkins Island	73	20
Hinchenbrook Island	257	175
Montague Island	51	134
Totals	381	329

Table 13. Deer pellet group counts, Prince William Sound, 1965.

Transect No.	No. Plots	Pellet Groups at Each Elevation Level								Total No. Groups
		100	200	300	400	500	600	700	800	
1	32	1	10	2	4	15	5	3	2	42
2	20	4	0	3	4	7	-	-	-	18
3	28	6	1	2	1	1	1	3	-	15
4	16	0	0	4	0	-	-	-	-	4
5	28	3	1	3	1	0	2	1	-	11
Totals	124	14	12	14	10	23	8	7	2	90
Ave. Groups/Elev.:		2.80	2.40	2.80	2.00	4.60	1.60	1.40	0.40	
Ave. No. Groups/Transect = 18.0										
Ave. No. Groups/Plot		= 0.73								

Five pellet group transects were established and checked in 1965. Techniques were identical to those used in Southeast Alaska. Timber line is much lower in Prince William Sound than in Southeast and winter range more restricted. The highest plots were at 800 feet elevation. The average number of groups per plot was 0.73, considerably lower than found in Southeast Alaska (1.23). Pellet plot data is shown in Table 13.

The value of deer pellet counts in Prince William Sound appears questionable. There is a large degree of variance in vegetative cover and topography which renders it difficult to obtain comparable readings. In some areas timber line may be as low as 300 feet.

Age classes of deer in the hunter harvest are given in Table 14. Fawns constituted a larger proportion of the total harvest than from any other area of Alaska. Disregarding the fawn take, older age class representation was still less in Prince William Sound than for Southeast Alaska. The younger average age of deer taken in Prince William Sound is probably due to concentration of hunting pressure on one small island. Approximately 600 deer were taken from Hawkins Island which is only 75 square miles in size. This take of about eight deer per square mile has not noticeably influenced deer abundance for both hunter success and the take per unit effort was excellent in 1965.

Table 14. Age classes of deer in 1965 hunter harvest, Prince William Sound.

<u>Age Class</u>	<u>% of Total Kill</u>
Fawn	21
1-1/2	20
2-1/2	17
3-1/2	20
4-1/2	13
5-1/2	9

Sample Size = 148

Natural Mortality

No winter kills were observed when transects were checked in May, 1965, although a few dead deer were located earlier in the spring. Winters of equivalent intensity in Southeast Alaska usually result in losses of over one dead deer per mile of beach.

Habitat

Winter browse utilization averaged 74 percent in 1965 compared to 81 percent in 1964. Utilization is consistently higher than for Southeast Alaska where the average was 66 percent in 1965 and only 52 percent in 1964.

Hawkins Island, which receives the majority of the hunting effort, evidenced as much use as Montague and Hinchinbrook Islands where hunting pressure is light. Utilization data is summarized in Table 15.

Table 15. Deer winter range surveys, Prince William Sound, 1965.

<u>Transect Location</u>	<u>Utilization (%)</u>	<u>Condition Index</u>	<u>Plant Height</u>
Windy bay - Hawkins Is.	79	1.8	33
Port Etches - Hinchinbrook Is.	62	2.1	27
Rocky Bay - Montague Is.	78	2.0	31
Port Chalmer - Montague Is.	65	2.1	29
Green Island	85	2.3	26
Average	74	2.1	29

Vegetation collections of preferred deer food species were made at monthly intervals from various elevations and vegetative types. These have been dried for future nutrient analysis.

Hunter Harvest

For the second successive year a reliable estimate of the hunter harvest was obtained from Prince William Sound. Deer jaws were obtained for aging from approximately 13 percent of the total take. Age statistics are reported under "Populations". Other harvest statistics are given in Tables 16 and 17. The total harvest was 1170 deer, somewhat larger than in 1964. It does not include hunters from Valdez, Seward and Anchorage which would increase it to approximately 1500.

Table 16. Hunter harvest statistics for Prince William Sound, 1965.

Hunter Success	77%
Deer per Hunter	1.8
Days per Deer	2.1
% Kill Female	34
License Sales	800
Actual Hunters	650

Table 16 Continued.

Total Kill	1170
Sample Size	100

Table 17. Deer harvest by area for Prince William Sound, 1965.

<u>Area</u>	<u>% of Kill</u>	<u>Est. Total Kill</u>
Mainland	4	47
Hawkins Island	53	620
Hinchinbrook Island	26	304
Montague Island	16	187
Eastern P. W. S.	1	12
TOTAL	100	1170

Kodiak Island

Populations

Deer on Kodiak Island continue to increase in number and expand their range. Increases are primarily in areas which are not accessible by road and presently receive little hunting pressure. Populations along the road system appear static.

Aerial surveys of random sample plots and line transects were tested in 1964 and are reported in the W-6-R-5,6 Segment Reports. Plots were found to be more reliable and easier to survey than line transects. Plots 1/4-square-mile and one-square-mile in size were tested. The 1/4-square mile plot proved too small to obtain adequate sampling. A 10 percent sample of one-square-mile plots appears to be more reliable. The random sample technique is being modified to stratified sampling, as deer winter habitat is unequally distributed due to extremely irregular topography.

Hunter harvest data is presently the best index of deer population trends on Kodiak Island. In 1965 hunter success was 64 percent compared to 59 percent in 1964. The number of deer per hunter also increased from 0.9 in 1964 to 1.1 in 1965. Age classes in the harvest were more evenly distributed than in 1964 and are shown in Table 18. The 2-1/2 year age class

increased from only 5 percent in 1964 to 14 percent in 1965. The 3-1/2 year age class was lower than normal in 1965.

Table 18. Age classes of deer in 1965 hunter harvest, Kodiak Island.

<u>Age Class</u>	<u>% of Total Kill</u>
Fawn	11
1-1/2	26
2-1/2	14
3-1/2	10
4-1/2	20
5-1/2	19

Sample Size = 91

Natural Mortality

Winter losses were light on Kodiak Island in 1965, averaging 0.3 dead deer per mile. Six dead deer were found on 20 miles of transect, five of which were located on the Chiniak Peninsula. The only other carcass was from the Kupreanof Peninsula.

Habitat

There is little information on habitat available, for deer on Kodiak Island. Habitat studies are presently limited to obtaining knowledge of food habits and quality of food species. During the summer of 1965 field observations were made of feeding animals. Fireweed (*Epilobium angustifolium*) and hellebore (*Veratrum viride*) were the only two species evidencing significant use. Samples of these plants were collected and dried for nutrient analysis. Stomach samples were also obtained from hunter killed deer when possible. Analysis is not complete at this time.

Deer on Kodiak Island utilize a wide variety of plants in winter. It is doubtful that any one can be considered a key species. Browse utilization techniques employed on other deer ranges are not applicable. There is presently no evidence of range over-use by deer in any area.

Hunter Harvest

The hunter take on Kodiak Island has increased each year from 1953 to 1965. The kill in 1965 was 1040 compared to 880 in 1964. The increased take in 1965 came primarily from the Kupreanof Peninsula. Other localities remained about the same as 1964. Table 19 gives the hunter harvest statistics for 1965 and Table 20 the kill by area.

For the second consecutive year, over 400 deer have been taken from the Chiniak Peninsula, an area containing about 100 square miles. The take along the road system south of the town of Kodiak in 1965 was almost identical to that of 1964 (31 compared to 25). This area is restricted to buck hunting only.

Age composition of the deer kill is reported under populations.

Table 19. Hunter harvest statistics for Kodiak Island, 1965.

Hunter Success	64%
Deer per Hunter	1.1
Days per Deer	5.9
% Kill Female	38
License Sales	1200
Actual Hunters	950
Total Kill	1040
Sample Size	150

Table 20. Deer harvest by area for Kodiak Island, 1965.

<u>Area</u>	<u>% of Kill</u>	<u>Est. Total Kill</u>
Monaska	15	156
Road System (Restricted Area)	3	31
Chiniak Peninsula	42	437
Sharatin - Kupreanof	33	343
Afognak - Whale Island	7	73
Total	100	1040

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