STATE OF ALASKA
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DEER REPORT

by

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Federal Aid in Wildlife Restoration
Project W-6-R-5,6 Work Plan A

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WORK PLAN SEGMENT REPORT
FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO.: W-6-R-5, 6 TITLE: Alaska Wildlife Investigations

WORK PLAN: A TITLE: Sitka Black-Tailed Deer Studies

JOB NO.: 1, 2, 3, 4

PERIOD COVERED: July 1, 1963 to December 31, 1964

ABSTRACT

Deer populations in Southeast Alaska and Prince William Sound have changed little in the last five years. Deer are abundant in most localities. Densities are lower in Prince William Sound than in Southeast Alaska. On Kodiak Island deer are not as plentiful as in either Prince William Sound or Southeast Alaska, but are expanding their range and increasing in numbers.

Winter mortality was light in all areas in 1963 and 1964. The highest (0.8 deer per mile) occurred in Southeast Alaska in 1964. This is slightly above average, but not excessive.

Studies of deer-wolf relationships on Coronation Island show an increase in the number of wolves present, a decline in the deer population and an increase in available deer food species. The annual increment of wolves has been small. Winter mortality of deer has decreased.

Winter utilization of browse by deer in 1964 averaged 52 per cent in Southeast Alaska and 83 per cent in Prince William Sound. Vegetation collections of preferred deer food species were obtained from various types to determine nutrient quality. Vegetation and deer tissue samples were collected from a site sprayed with 1/4 pound of DDT per acre. Analysis showed a maximum of 39.2 ppm DDT residue in vegetation and 3.6 ppm in deer tissue. Residues disappeared from vegetation six months after spraying, but were still present in small amounts in deer tissue after nine months.

In 1964 hunters killed 9,970 deer in Southeast Alaska, 870 in Prince William Sound, and 880 on Kodiak Island. The kill is lower than average for Southeast Alaska. On Kodiak Island the kill has been increasing each year.

RECOMMENDATIONS

No recommendations are made at this time.

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OBJECTIVES

To evaluate population status and trends, mortality factors, habitat conditions and hunter harvest of deer in Alaska.

TECHNIQUES

Populations

Census techniques employed included aerial transects, random plots and track counts on Kodiak Island, aerial transects on Prince William Sound and ground alpine counts and highway counts in Southeast Alaska. Pellet group transects were also used in Prince William Sound and Southeast Alaska. Additional information on population status was obtained from mortality surveys, habitat conditions, hunter success and effort, and age classes in the hunter take.

Mortality Factors

Deer winter mortality surveys were made in all areas during March, April and May, depending on local conditions. A search was made along pre-established transects to determine the number of deer carcasses per mile. Sex, age, condition and location of each dead deer were recorded.

The relationship between deer and wolves was studied on Coronation Island. Transects were located to evaluate changes in habitat after the wolf introduction. Surveys were made to determine changes in wolf and deer numbers. Wolf scats were collected and analyzed for food content. Deer remains were checked to determine sex, age, condition and cause of death.

Habitat Studies

Winter utilization of browse species by deer and condition and trend of habitat were obtained from transects in Prince William Sound and Southeast Alaska. Samples of preferred deer food species were collected from each region at monthly intervals for protein analysis. Records were checked on past logging operations in Southeast Alaska to determine the affect of logging on deer habitat. Samples of vegetation and deer tissue samples were obtained from a DDT spray site, and analyzed for DDT residues.

Hunter Harvest

A sample of hunters was contacted in each town located within a deer area immediately after the close of the hunting season. Hunters were queried to evaluate success, effort and total kill and sex, date and location of kills. Jaws were collected to determine age composition and dressed weights and measurements were obtained from carcasses when possible.

FINDINGS

Southeast Alaska

Population Studies

Alpine Counts

The location of deer investigations in Southeast Alaska is shown in Figure 1. For several years biologists have been searching for a method of censusing deer in Southeast Alaska. Deer are difficult to locate because of the dense forest cover. In winter, during periods of deep snow, they congregate along the beaches. Aerial counts have been attempted at this time, but weather conditions may not be similar in successive years and no trend can be obtained.

In July, August and September, many deer migrate to alpine ranges. Aerial counts were tried at this season but animals were difficult to locate and the noise of the plane frightened deer before they could be counted.

In 1960 several alpine census units were delineated and each fall, through 1963, ground counts were made on each unit. Table 1 summarizes the results of these counts. During the four years when counts were made there was no indication that deer populations changed appreciably.

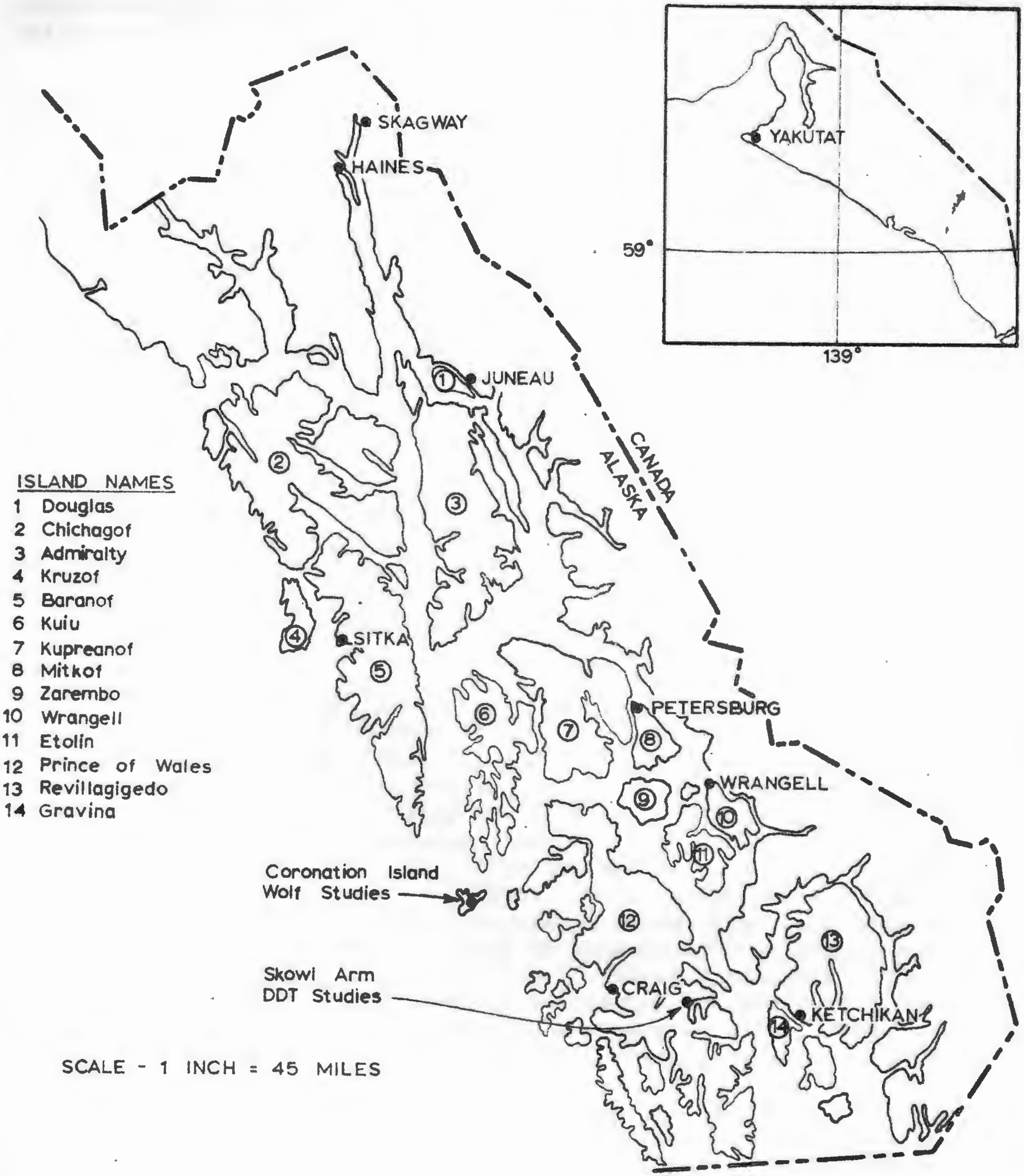

Figure [illegible] tudy areas.

Large variations were obtained in counts among units in a single year and the total number of deer observed in successive years.

Seasonal and daily weather conditions and time of day influenced numbers of deer observed. If spring weather was cold and snow remained on the high country later than usual, fewer deer used the alpine range even after it became available. More deer were observed during clear weather than inclement; however after a series of warm, clear days the numbers of deer observed decreased. The greatest amount of activity was in early morning and late afternoon.

To duplicate all the requirements for observing optimum numbers of deer in successive years for direct comparison is almost impossible. Similar conditions never existed for all counts even in one season. The method does appear to reflect deer numbers when optimum conditions are present and is useful as a spot check in key areas.

Highway Counts

In May and June of 1962 through 1964, early morning counts were made along the Mitkof Highway from the town of Petersburg to Mile 24. Table 2 summarizes these counts. The average number of deer observed per count was 13.8 in 1962, 19.0 in 1963 and 19.8 in 1964.

Pellet Plots

Thirteen pellet plot transects were established in deer winter habitat on Kupreanof and Mitkof Islands to determine the validity of the technique as an indication of deer abundance in Alaska. Plots were located along a compass bearing at 100 foot elevation intervals, beginning at 100 feet and ending at 1200 feet. Clusters of four plots were established at each elevation level. An altimeter was used to determine elevation and circular 100 square foot plots were located 45 degrees off line in four directions. Plot centers were 25 feet from the point on line. All pellet groups encountered were counted regardless of age. When a plot fell on inaccessible or very steep ground it was not included in the sample. Table 3 summarizes the data obtained from the plots. On 13 transects, 604 plots were established. The average number of groups per plot was 0.75. Groups were most abundant at the 300 and 700 foot elevation levels.

A pellet check plot of 1000 square feet was located at 250 feet elevation on the south end of Mitkof Island. The plot was cleared of all old groups and as new groups are deposited they are marked with aluminum tags to determine the length of time groups remain distinguishable.

Table 1. Alpine deer counts on Kupreanof Island, 1960-1963.

Location	Number of Deer Observed Year			
	1960	1961	1962	1963
Kane Peak	14	73	20	52
Sherman Peak	127	73	10	18
Petersburg Mt.	23	70	12	11
Kupreanof Mt.	60	97	30	90
Tonka Mt.	51	37	15	7
Grief Mt.	32	60	11	12
	307	410	98	190

Table 2. Deer counts along Mitkof Highway, 1962-1964.

	Year 1962	1963	1964
No. of Counts	12	22	8
Bucks	42	117	33
Does	67	240	72
Fawns	13	10	15
Sex Unknown	44	50	38
Total Count	166	417	158
Average Deer/Count	13.8	19.0	19.8

Natural Mortality

Winter Mortality Surveys

Winter mortality surveys were made in March and April of 1964. Sixty-eight transects, each 1/2 mile in length, were checked by U. S. Forest Service personnel as a cooperative project. Twenty-seven deer carcasses were found, an average of 0.8 deaths per mile of transect. Table 4 gives the data for each district and Table 5 compares it with mortality in previous years. Mortality in 1964 was slightly higher than average, but was not excessive. It was greatest in the Sitka district and low in all other areas.

Deer-Wolf Studies

On October 27, 1960, four timber wolves, all approximately 19 months old, were released on Coronation Island in Southeast Alaska. At the time of the transplant deer were present on the island but there was no knowledge of prior occupancy by wolves. The wolves were taken from a den on Kuiu Island when about one months old and were held in captivity until their subsequent release.

Wolves are indigenous to most of Southeast Alaska with the exception of Admiralty, Baranof and Chichagof Islands. The Sitka black-tailed deer is present in varying degrees of abundance throughout Southeast Alaska and normally is the major food item for wolves. In areas where deer and wolves co-exist, wolves must influence deer populations but the importance of this relationship has not been demonstrated. Deer populations in this northern region fluctuate greatly depending on the severity of the winter. Many people feel wolves should be controlled to provide more deer for the hunter and a bounty system, initiated by the Territorial Legislature in 1915, is still in effect.

Coronation Island (Figure 1) is situated at the outer edge of the Alexander Archipelago in Southeast Alaska, approximately 80 miles southeast of the town of Petersburg. It is about ten miles long by three and one-half miles wide covering an area of 30 square miles. The shore line is irregular, indented by several bays and exposed on the west and south to the sweep of the Pacific Ocean. The ground formation is predominantly limestone and the highest point on the island is 1,960 feet. About 80 per cent of the island is forested, 11 per cent muskeg, 6 per cent subalpine and the remainder, rock, alder slide and water. Forest cover is primarily Sitka spruce (Picea sitchensis) and western hemlock (Tsuga heterophylla) with smaller amounts of yellow cedar (Chamaecyparis nootkatensis) present. The influence of the maritime climate results in milder winters with less snow accumulation

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Table 3. Number of pellet groups found on each transect and at each elevation level, Southeast Alaska - 1964.

Transect No.	Number of Plots	Number of Pellet Groups per Plot												Total Number Groups
		100	200	300	400	500	600	700	800	900	1000	1100	1200	
1	13	0	1	0	0	0	2	2	1	0	2	0	0	8
2	48	5	3	8	2	1	5	7	3	3	13	2	1	53
3	52	1	2	5	3	2	5	5	6	6	3	2	7	47
4	52	0	3	0	0	7	0	2	1	8	0	2	1	24
5	51	4	10	10	2	5	3	9	5	6	4	4	4	66
6	48	1	2	9	1	0	0	3	2	1	7	2	1	29
7	52	1	0	1	8	1	0	3	4	3	2	7	2	32
8	52	0	0	1	2	3	3	9	7	2	2	0	1	30
9	51	1	3	2	2	0	5	1	1	2	4	3	2	26
10	48	0	8	5	7	8	2	2	2	1	3	0	0	38
11	52	5	0	3	7	1	2	4	3	6	3	2	1	37
12	45	1	0	6	1	1	1	2	2	2	0	4	3	23
13	40	8	4	3	1	1	9	7	3	3	4	0	0	43
Totals	604	27	36	53	36	30	37	56	40	43	47	28	23	456
Average per Elev.=		2.08	2.77	4.08	2.77	2.31	2.85	4.31	3.08	3.31.	3.62	2.15	1.77	

Average Number of Groups per Plot = 0.75

Table 4. Winter mortality of deer in Southeast Alaska, 1963-1964

District	No. of Transects (1/2 mile in length) 1963	1964	Deaths/Mile 1963	1964
Ketchikan	4	10	0.0	0.0
Kasaan	14	13	0.0	0.0
Craig	4	8	0.0	0.5
Juneau	8	12	0.3	0.8
Sitka	7	12	0.0	3.0
Petersburg	7	7	0.1	0.6
Wrangell	6	6	0.0	0.0
All Southeast	50	68	0.1	0.8

Table 5. Winter mortality of deer in Southeast Alaska, 1952-1964.

Year	Mortality Deaths/Mile of Beach
1952	1.1
1953	0.1
1954	0.7
1955	1.3
1956	2.7
1957	0.2
1958	0.0
1959	0.3
1960	0.2
1961	0.2
1962	1.4
1963	0.1
1964	0.8
Average for 13 years	0.7

than in most other areas of Southeast Alaska.

In 1959 when the author first visited the island, deer densities were not high compared to many other areas of southeast Alaska; however because of mild winters the deer population had probably remained stable for many years. In spite of the low deer density, utilization of food species was so great that available forest understory was almost completely removed. The more palatable food species such as red huckleberry (Vaccinium parvifolium), blueberry (V. ovalifolium), black current (Ribes bracteosum), elderberry (Sambucus racemosa), skunk cabbage (Lysichitum americanum), ground dogwood (Cornus canadensis) and deer heart (Fauria crista-galli) were usually present only in locations inaccessible to deer. Unpalatable species such as rusty menziesia (Menziesia ferruginea), sword fern (Polysticum munitum), devils club (Oplopanax horridus) and hemlock and spruce reproduction also showed heavy use.

Klein (1963) demonstrated that deer on Coronation Island (especially males) were about 20 per cent smaller than deer of equivalent age on better ranges of Southeast Alaska. He also showed that the nitrogen content of rumen samples from Coronation Island deer was significantly less (4.47 compared to 6.42 for gross sample) than from Woronkofski Island, one of the better deer ranges which also supported a wolf population.

Remains of deer carcasses within the beach fringe evidenced some annual mortality and examination of bone marrow indicated it was probably from malnutrition.

In October, 1960, two male and two female wolves were placed on the island. At least one pup was born in the spring of 1961. In July, 1961, both of the original females were killed by a fisherman; only one was lactating. In June, 1962, positive evidence of only two wolves was found. In April, 1963, an additional adult female was placed on the island. In August, 1963, a family group of three pups and two adults was seen. Tracks indicated the presence of two additional adult wolves. In July, 1964, a family group of four adults and two pups, two groups of three adults each and a single adult were seen. Some of these sightings may have been duplications; however there are at least seven adults and two pups on the island at the present time. In July, 1964, fresh wolf tracks were encountered on all beaches. A well-defined wolf trail was present in the beach fringe along the entire northern shore of the island and trails were also present on the island proper.

Wolf scats have been collected and analyzed each year since the transplant. Table 6 lists the food items identified.

Table 6. Food items contained in wolf scats from Coronation Island.

Year	No. Scats	Frequency of Food Items (% in total scats collected)		
		Deer	Harbor Seal	Other
1961	146	78	43	2
1962	18	89	(checked only for deer)	
1963	45	89	53	27
1964	77	95	32	14

Table 7. Deer observations on Coronation Island.

Year	No. Man-Days	No. Deer	Deer per Day
1959	6	49	8.2
1960	Wolf Introduction		
1961	9	32	3.6
1962	3	6	2.0
1963	8	1	0.1
1964	7	1	0.1

The primary food item of the wolves has always been deer. The incidence of deer remains in scats has increased from 78 per cent in 1961 to 95 per cent in 1964. Harbor seal (Phoca vitulina) is the second most important food item. It is not known whether these are actually killed or are dead animals which wash up on the beaches. Seals are common in the area and have been observed hauled out on gravel beaches at least 100 feet from the waters edge. Under these circumstances wolves could probably kill them. Most scats contained some wolf hair and other miscellaneous food items including mink, land otter, mice, birds and crabs. A large number of freshly broken cockle clam shells (Clinocardium spp.)were noted in the timber immediately adjacent to the beach. Tooth marks indicated that wolves had broken and probably eaten the clams. These clams are usually only a few inches below the surface in sandy intertidal areas and could easily be dug by wolves.

Since the introduction of wolves deer numbers have been reduced. In 1959 deer were not as abundant on Coronation Island as in most areas of Southeast Alaska, however evidence of deer was common. Table 7 lists deer observations per day before and after the wolf introduction.

In 1959 well-defined deer trails were present. By 1964 these trails had grown over with vegetation and were difficult to locate. Some evidence of deer was present over the entire island and at least one fresh deer track was seen on each beach searched.

When the island was first visited in 1959 carcasses of deer were common within the beach fringe. Examination of the bone marrow showed that death was usually from malnutrition. In 1964 the remains of 11 deer were found. Only fragments of bone and hair were usually present, but in all instances except one the marrow was white and solid.

The most dramatic change on the island is the vegetative cover. Previously nearly every available plant was utilized by deer. The forest was open and park-like compared to the dense understory usually found in Southeast Alaskan forests. Species which are generally unpalatable showed heavy use. This is the only site in Southeast Alaska where the writer has seen Sitka spruce hedged by deer. Inaccessible sites, such as roots of overturned trees, supported lush growth of several species of vegetation which were sparsely distributed on the forest floor. Some plants of Vaccinium ovalifolium, V. parvifolium and Menziesia ferruginea, which had at some time in the past become established and grown too tall for deer to reach, had dense clumps of dead, browsed stubs about their bases.

In June, 1962, there were already signs of a decrease in utilization. Unpalatable species such as Menziesia ferruginea, Oplopanax horridus and the fern Polysticum munitum were beginning to appear. More desirable species such as Cornus canadensis and deer fern (Blechnum spicant) were also becoming apparent. Careful observation revealed many small shoots of Vaccinium ovalifolium and V. parvifolium springing from hidden root systems. By July, 1964, changes in the vegetation could not be mistaken. The forest floor supported dense mats of Cornus canadensis and large clumps of Polysticum munitum. In many places the ground was green with small plants of Menziesia ferruginea. Fauria crista-galli and Lysichitum americanum were present on the wetter sites and the old Menziesia ferruginea and Vaccinium spp. plants had lush green shoots about their bases which were less than four years old.

Wolves have now been present on Coronation Island for four years. They successfully adapted to wild conditions and produced pups at two years of age. At least one of the original males was still alive when four years old (observed tagged animal). Wolves have the potential of producing six to eight pups per litter. Assuming a 1:1 sex ratio at birth and taking into account the death of the two original females during their second year, the maximum population at the present date could be from 80 to 130 wolves. The actual population does not approach this number. Observations indicate there are presently between 7 and 11 adult and yearling wolves and 2 pups on the 30 square mile island. This is probably the highest wild wolf population per unit area in existence today. The presence of large amounts of wolf hair in some scats indicates that intra-specific strife may be a factor for the slow increase in wolf numbers. Although their reproductive potential is great, wolves may rarely attain it. We have knowledge of three separate litters born on Coronation Island since 1960: however the maximum number of pups known in any one litter is three.

Compared with most other areas of Southeast Alaska the present deer population on Coronation Island is low, but inspite of extremely heavy predation, wolves have not eliminated the deer and in fact are presently utilizing them more than earlier. Deer numbers have been reduced; however examination of bone marrow from kills indicates that the remaining deer are in better condition than before wolves were present.

Changes in vegetative cover since the wolf introduction show that ranges in Southeast Alaska subject to heavy deer use recover rapidly when the pressure is released. Plants which appeared to have been eliminated quickly re-establish.

Habitat Studies

Winter Browse Utilization

Winter range surveys were conducted in March and April, 1964, at the same time as mortality surveys. Field surveys were made by U. S. Forest Service personnel and the data analyzed jointly by Forest Service and Alaska Department of Fish and Game biologists. The number of transects was increased from 50 in 1963 to 68 in 1964. Information obtained from surveys is presented in Table 8. Utilization is determined by the percentage of available leaders of the key browse species Vaccinium ovalifolium and V. parvifolium which deer use during the winter period. The technique is described in Job No. 1-e, Work Plan A of the W-6-R-3 segment report.

Browse utilization averaged 52 per cent in 1964 compared to 43 per cent in 1963. The current use is considered moderate. The average condition index (scale of 3: 1-good, 3-poor) was 1.9 (identical to 1963) and the average plant height 28 inches, 1 inch less than in 1963. Highest use was in the Sitka and Juneau districts with 70 and 72 per cent use, respectively. Utilization in all other districts was less than 50 per cent.

Browse Check Plot

A browse enclosure containing six 2-milacre plots was constructed in 1963. Vaccinium ovalifolium plants were clipped to simulate utilization of 0, 20, 40, 60, 80 and 100 per cent. The plots were checked and re-clipped on April 28, 1964. No loss of vigor was observed, even on the plot which simulated 100 percent use. This indicates that browse can withstand at least one year of extremely heavy use.

Range Condition and trend transects

Two 50 foot condition and trend transects are being established in the vicinity of each winter utilization transect. All vegetation along a line transect is recorded. The first transects were established in 1963. They will be checked every three years to determine long range changes in habitat.

Nutrient Quality of Deer Food Species

Beginning in June, 1964, samples of deer food species were collected at monthly intervals. Samples were dried and packaged for future nutrient analysis. Species collected included blueberry (Vaccinium ovalifolium), ground dogwood (Cornus canadensis) and deer heart (Fauria

Table 8. Deer winter range, use, condition index and plant height for Southeast Alaska, 1963-1964.

Transect Number and Location	Average Percent Utilization	Average Condition Index	Average Plant Height
Ketchikan District			
1 Helm Bay	43	2.3	27
2 Carroll Inlet	51	1.9	37
3 Carroll Inlet	66	1.9	26
4 George Inlet	64	2.1	30
5 Gravina Island	48	2.0	34
6 Traitor's Cove	15	1.7	43
7 Neets Bay	75	1.7	26
8 Spacious Bay	43	1.9	44
9 Bostwick Inlet	30	1.9	37
10 Thorne Arm	33	1.8	30
District Average	47	1.9	33
Kasaan District			
21 Polk Inlet	35	1.9	41
22 Polk Inlet	4	1.8	34
23 Thorne Bay	4	1.8	29
24 Thorne Bay	38	1.5	29
25 Moira Sound	33	2.3	33
26 Chomly Sound	55	2.4	26
27 Karta River	20	1.7	36
30 Indian Creek	2	2.1	33
31 Coffman Cove	40	1.8	25
32 Whale Pass	29	1.9	33
33 Salmon Bay	29	2.2	26
34 Red Bay	23	1.7	30
35 Union Bay	45	2.1	27
District Average	27	1.9	31

Table 8. (Continued)

Transect Number and Location	Average Percent Utilization	Average Condition Index	Average Plant Height
Craig District			
41 Warm Chuck Inlet	52	1.6	42
42 Port St. Nicholas	62	1.6	35
43 San Alberto Bay	36	1.7	40
44 Halibut Harbor	64	2.1	25
45 Shakan Bay	45	1.5	46
46 Naukati Bay	51	1.5	50
47 San Fernando Island	48	1.8	41
48 Trocadero Bay	24	1.7	49
District Average	48	1.7	41
Wrangell District			
61 Woronkofski Island	68	1.9	33
62 Thom's Place	27	1.8	34
63 Dewey Harbor	55	2.1	29
64 St. Johns Harbor	46	2.0	30
65 Woronkofski Island	47	2.1	35
66 Anita Bay	31	2.1	31
District Average	46	2.0	32
Petersburg District			
81 Wrangell Narrows	76	2.0	31
82 Big John Bay	61	2.1	32
83 Duncan Canal	30	1.8	35
84 Five Mile Creek	44	1.9	30
85 Totem Bay	56	1.9	24
86 Portage Bay	33	1.9	30
87 Ideal Cove	42	1.7	33
District Average	49	1.9	31

Table 8. (Continued)

Transect Number and Location	Average Percent Utilization	Average Condition Index	Average Plant Height
Sitka District			
101 Ushk Bay	92	1.9	27
102 Nakwasina Passage	88	1.8	24
103 Hood Bay	26	1.5	33
104 Fish Bay	72	2.0	26
105 Port Krestof	68	2.0	23
106 Hanus Bay	56	1.8	29
107 Hoonah Sound	76	1.9	24
108 Chiak Bay	52	1.8	28
109 Michell Bay	67	1.7	25
110 Crab Bay	79	1.8	27
111 Tenekee Inlet	86	1.9	31
112 Peril Strait	84	1.8	20
District Average	70	1.8	26
Juneau District			
121 Pybus Bay	64	1.9	22
122 Mole Harbor	75	2.3	27
123 Point Hilda	70	2.3	27
124 Eliza Harbor	59	1.8	28
125 Gambier Bay	45	1.9	32
126 King Salmon Bay	78	2.3	24
127 Young Bay	69	2.1	27
128 Eliza Harbor	62	1.1	40
129 Glass Peninsula	69	2.1	26
130 Whitestone Harbor	94	1.8	27
131 Neka Bay	88	2.1	21
132 Barlow Cove	90	1.8	22
District Average	72	2.0	27
Average - All Southeast	52	1.9	31

crista-galli). Samples were taken from the same local on successive collections. Sites of collections included forest fringe, forest, alpine and cut-over types. After snowfall, samples of Fauria crista-galli and Cornus canadensis were not available but Vaccinium ovalifolium was collected throughout the winter. Collections will continue until a full year of samples is obtained.

Effects of Logging on Deer Habitat

Records of the U. S. Forest Service were reviewed to obtain information on areas which had been logged in the vicinity of Petersburg. Data were obtained on 62 cut-overs dating to 1911. A series will be selected to determine succession, quality, quantity, and availability of deer food species and the influence of clearout size on deer use.

Effects of Pesticides on Deer

In June, 1963, the U. S. Forest Service, Region 10, conducted a pilot project to determine the effectiveness of a 1/4 pound DDT (dichloro-diphenyl-trichloro-ethane) per acre spray application for controlling blackheaded budworm (Acleris variana) populations. Spraying was accomplished using PBY fixed-wing aircraft and a helicopter. The Alaska Department of Fish and Game initiated studies in 1963 to ascertain the affect of such a spray on deer populations.

The spray site (Figure 1) was in the vicinity of Skowl Arm on the east side of Prince of Wales Island, Southeast Alaska, about 35 miles northwest of Ketchikan. Three drainages were sprayed; however investigations were confined to Cabin Creek drainage, which was sprayed on June 21.

Samples were taken of preferred deer food species, blueberry (Vaccinium ovalifolium) and ground dogwood (Cornus canadensis), on both sides of the drainage above Cabin Lake. Collections were made immediately prior to (June 12-19, 1963) and on two occasions after spraying (July 17-23, 1963 and December 5-7, 1963). During the collections made in June and July, two samples of each plant species were taken at each 100 foot contour interval, beginning at the lake level (200 feet above sea level) and continuing to 900 feet; however only one sample of each species was taken at 900 feet. In December only one sample of each species was taken at each elevation level, and in three cases, snow cover made it impossible to obtain Cornus canadensis samples. In the three vegetation collections, 76 Vaccinium ovalifolium and 73 Cornus canadensis samples were obtained for analysis.

Vegetation samples weighed about 1 pound each. Only that portion of the plant which deer normally utilize was taken. Samples were air-dried and sent to the Wisconsin Alumni Research Foundation, Madison, Wisconsin, where they were analyzed for residual DDT content.

Tables 9 and 10 give the results of the DDT analyses for both plant species at each elevation level for the three collections. The 60 pre-spray samples (30 each of Cornus canadensis and Vaccinium ovlifolium) all contained less than 0.05 ppm (parts per million) DDT. Analysis showed nearly all to contain traces of DDT, but in most instances it was immeasurable. The July sample (taken 30 days after spraying) ranged from a low of 0.38 ppm DDT to a high of 39.3 ppm. Vaccinium ovalifolium samples averaged slightly higher concentrations of DDT on both sides of the drainage than Cornus canadensis. The average DDT content of plants from the south side of the drainage was 7.55 ppm for Cornus canadensis and 9.75 ppm for Vaccinium ovalifolium. On the north slopes, the average for Cornus Canadensis was 2.45 and for Vaccinium ovalifolium, 2.86. Concentrations were greatest between 300 and 600 feet elevations.

In the December samples, taken 167 days after spraying, DDT residue in both plant species was either very small or absent. The highest value was 2.8 ppm and only two (of 29 collected) samples contained more than 1.0 ppm DDT.

Nine deer were collected during the project, one prior to and eight after spraying was completed. Table 11 gives the results of the tests for DDT residues in the tissue samples. One pound samples were taken of both muscle (loin) and adipose (brisket and kidney) tissues when available. All samples were frozen on the same day in which they were obtained.

No DDT was present in either fat or muscle tissues of the single specimen obtained prior to spraying nor in any of the post-spray muscle samples. All fat samples contained some DDT residue, ranging from a high of 3.6 ppm, one month after spraying, to a low of 2.2 ppm nine months after spraying. No fat was present on the male deer collected. None of the samples approached the tolerance limit of 7 ppm set by the U. S. Food and Drug Administration for beef. After the initial exposure there was no accumulation of residue in fatty tissue.

Hunter Harvest

Hunter Interviews

Immediately after the close of the hunting season, hunters were interviewed in all major towns of Southeast Alaska. In 1964 small villages were included in the sample. Hunters were queried regarding total taken and effor, and sex, date and location of kills. Tables 12 and 13 summarized the statistics for 1963 and 1964 for each town.

Table 9. DDT residues in vegetation samples from south slopes of Cabin Creek, Skowl Arm.

Sample Number	Elevation (feet)	ppm DDT					
		Cornus canadensis			Vaccinium ovalifolium		
		*6/13/63	7/21/63	12/5/63	6/13/63	7/21/63	12/5/63
1	200	0.05	2.5	0.91	<0.05	14.0	0.08
2	300	0.05	1.9	0.79	<0.05	3.1	0.05
3	400	0.05	16.7	0.95	<0.05	24.0	0.05
4	500	0.05	12.4	0.97	<0.05	13.5	0.26
5	600	0.05	39.3	2.8	<0.05	32.3	0.85
6	700	0.05	0.62	No sample	<0.05	1.2	0.08
7	800	0.05	0.43	1.5	<0.05	1.2	0.29
8	900	0.05	0.38	0.45	<0.05	1.6	0.05
9	800	0.05	1.6		<0.05	3.1	
10	700	0.05	1.7		<0.05	2.9	
11	600	0.05	11.1		<0.05	26.5	
12	500	0.05	5.1		<0.05	5.6	
13	400	0.05	1.2		<0.05	5.5	
14	300	0.05	15.2		<0.05	9.3	
15	200	0.05	1.7		<0.05	2.4	

*Spray Date - 6/21/63

Table 10. DDT residues in vegetation samples from north slopes of Cabin Creek, Skowl Arm.

Sample Number	Elevation (feet)	Cornus canadensis			Vaccinium ovalifolium		
		*6/13/63	7/21/63	12/5/63	6/13/63	7/21/63	12/5/63
1	200	0.05	1.2	0.56	<0.05	2.2	0.05
2	300	0.05	15.0	1.3	<0.05	17.0	0.10
3	400	0.05	0.73	0.45	<0.05	1.1	0.85
4	500	0.05	0.50	1.17	<0.05	0.80	0.05
5	600	0.05	0.65	No Sample	<0.05	1.1	0.38
6	700	0.05	0.52	No Sample	<0.05	1.8	0.05
7	800	0.05	2.2	0.19	<0.05	4.3	0.05
8	900	0.05	2.0	0.25	<0.05	2.9	0.05
9	800	0.05	1.2		<0.05	1.4	
10	700	0.05	0.65		<0.05	1.5	
11	600	0.05	1.0		<0.05	1.2	
12	500	0.05	0.73		<0.05	0.77	
13	400	0.05	1.0		<0.05	2.1	
14	300	0.05	8.9		<0.05	3.9	
15	200	0.05	0.52		<0.05	0.96	

*Spray Date - 6/21/63

Table 11. DDT residues in deer tissue samples from Cabin Creek drainage, Skowl arm.

Date	Sex	Age	ppm DDT	
			Muscle	Fat
6-14-63	Female	2	<0.1	<0.1
7-18-63	Female	1	<0.1	3.6
7-22-63	Female	3	<0.1	2.8
12- 6-63	Male	3	<0.1	NA*
3-12-64	Female	3	<0.1	2.9
3-12-64	Male	1	<0.1	NA
3-12-64	Male	1	<0.1	NA
3-13-64	Female	2	<0.1	2.3
3-14-64	Female	1	<0.1	2.2

*Fat sample not available

Table 14 for each Game Management Unit and Table 15 compares data back to 1956.

The hunter kill in 1964 was the lowest since 1957. This can not be attributed to scarcity of deer as the effort per deer was the lowest on record. The primary factor contributing to the low kill was inclement weather during late November and December when effort is normally at its peak. The number of deer taken per hunter remained the same as for the previous two years, but the percentage of license holders from the larger towns who actually hunted decreased from 1963.

Sex and Age Composition

Table 16 gives the sex and age composition of deer killed in 1963 and 1964. In 1964 the female portion of the kill was 31 per cent. The doe kill increased from 18 per cent during the first either-sex season in 1955 to a maximum of 34 per cent in 1962. In 1963 it decreased to 33 per cent and in 1964 to 31 per cent.

Age structure of deer populations have shown little change from year to year or among areas. There has always been a large portion of the kill over 2-1/2 years of age, usually about 50 per cent. In 1963 this increased to 71 per cent, reflecting fawn losses during the previous winter. In 1964 emphasis was placed on obtaining age data from only the Petersburg locality. The time and effort required for collections from all areas are not justified because of the small variations among districts.

In 1963 the writer assumed responsibility for Statewide deer investigations. The field season of 1963 was spent reconnoitering deer habitat in the vicinities of Yakutat, Prince William Sound and Kodiak Island. Field assistants have now been assigned to Prince William Sound (Loyal Johnson) and Kodiak (Ben Ballenger) who are responsible for the majority of field investigations included in this report.

PRINCE WILLIAM SOUND

The location of Prince William Sound deer investigations is shown in Figure 2. Deer in this area originate from transplants of 24 animals during the years 1916 through 1924. They increased rapidly and by 1945 had reached a peak population. Fish and Wildlife Service reports indicate that deer were abundant at that time. During the winters of 1949 through 1952, heavy losses from starvation occurred. Since that time the population has increased, but has never regained the level of 1945. Deer have now spread to almost every island in the Sound as well as to the mainland. The first open season was in 1935 and the bag limit was one buck. In 1963, four deer were allowed and the season was open from August 15 through December 31. The habitat

in Prince William Sound is similar to that of Southeast Alaska. Plant species are almost identical but the climate is more severe and the tree line is almost 1000 feet lower than in Southeast Alaska.

The balance between deer and habitat appeared good in all areas. Evidence of deer was abundant on Hawkins Island, which is closest to Cordova and receives the most intensive hunting effort. Both Montague and Hinchinbrook Islands have lower densities than Hawkins Island. Blueberry (Vaccinium ovalifolium) is the most important winter browse species and is abundant whereever conifer cover is present. It shows moderate use but good vigor. There are indications of heavy use which took place several years ago but the present range condition is thrifty. Deer are common on Hawkins Island, but not as abundant as in most areas of Southeast Alaska. The present hunter take is not detrimental to the herd welfare.

The amount of winter range in Prince William Sound is much more limited than in Southeast Alaska. A higher proportion of the total land area is muskeg, the timberline is lower and the beach fringe is narrower. Winters are more severe and greater fluctuations in deer numbers can be expected than in other areas of Alaska.

Population Studies

Alpine Counts

Aerial census techniques may be applicable in Prince William Sound. Timberline is lower than in Southeast Alaska and a large portion of the population concentrates on the high open range in late summer. Census areas were delineated on Hawkins, Hinchinbrook and Montague Islands. There will be flown each year in August and September. Only one flight was made in 1963 when 58 deer were observed on Hinchinbrook Island.

Pellet Transects

Initial studies were instigated to evaluate the adaptability of pellet group transects to Prince William Sound. A transect similar to but shorter than that used in Southeast Alaska appears suitable.

Natural Mortality

Mortality surveys were made in May, 1964, at Windy Bay, Constantine Harbor, Rock Bay, Port Chalmers and Green Island. No evidence of dead deer was found in any area. Periodic heavy snowfalls occurred in Prince William Sound during the winter of 1963-64. Deer concentrated in large numbers along the beaches but the expected mortality did not

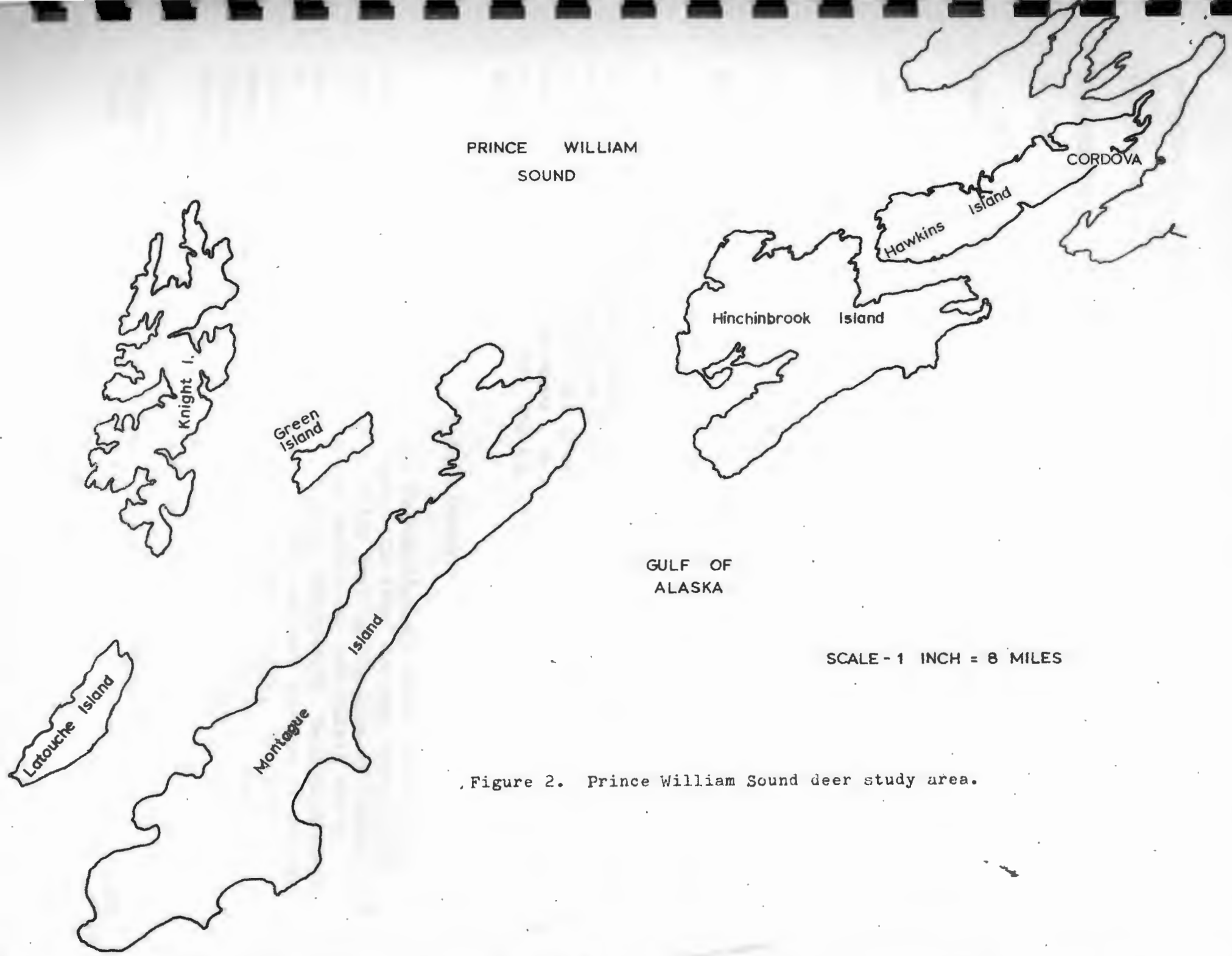

Figure 2. Prince William Sound deer study area.

materialize. Winter conditions in Prince William Sound are normally more severe than in Southeast Alaska and a hardy stock of deer appears to have evolved which is able to survive under the rigorous conditions.

Habitat Studies

Winter Browse Utilization

Five browse utilization transects were located in May, 1964. Table 17 gives the locations and the observed use.

The average use was 83 per cent compared to 52 per cent in Southeast Alaska. In spite of the much greater use, browse vigor appeared good and deer mortality was less than in Southeast Alaska.

Condition and Trend

Two condition and trend transects were established at Constantine Harbor and Rocky Bay in August, 1964.

Hunter Harvest

In 1964 the first reasonably accurate harvest estimate since 1960 was made in Prince William Sound. Statistics from 102 hunter interviews are given in Table 18. The kill figure is somewhat lower than actually occurs as only Cordova was included in the survey; a few hunters also come into the area from Valdez and Seward. Table 19 gives the kill per area. Most deer are taken from Hawkins Island which is immediately adjacent to Cordova. Hunters in Prince William Sound took a larger proportion of does (43 per cent) than from any other area in Alaska.

KODIAK ISLAND

Deer are not indigenous to the Kodiak-Afognak Island group, but were introduced from Southeast Alaska. In 1924, 16 deer were placed on Long Island (approximately four miles east of the town of Kodiak) and in 1934, 9 more were released between Middle Bay and Kalsin Bay on Kodiak Island proper. Since the original transplants, deer have spread to all of the island group adjacent to the northern portion of Kodiak Island and have been seen as far south as Karluk Lake. At present, the greatest concentrations are located on Uganik Island, Kupreanof Peninsula, Whale Island, Spruce Island, Monashka Peninsula and Chiniak Peninsula.

The heaviest hunting effort is in the region east of the National Wildlife Refuge. The first season (three days) was in 1953 with a limit of one buck. Seasons and limits have been progressively increased

Table 12. Summary of deer harvest statistics, Southeast Alaska - 1963.

	TOWN					
	Juneau	Ketchikan	Petersburg	Sitka	Wrangell	All SE Alaska
Hunter Success	57%	84%	85%	74%	81%	74%
Ave. No. Deer/Hunter	1.4	2.0	2.1	1.9	2.4	1.8
Ave. No. Days/Deer	4.5	3.5	3.1	5.1	2.2	3.2
Female Portion of Kill	33%	28%	35%	28%	32%	33%
No. License Sold	2400	2100	600	1500	500	7100
% Who Hunted	68	85	91	73	68	76
Actual No. Hunters	1630	1780	550	1100	340	5400
Total Hunter Kill	2280	3560	1160	2090	820	9910
Sample Size	103	106	289	110	100	708

Note: Sample did not include villages which would increase total by about 1200, making total kill for Southeast 11,110.

Table 13. Summary of deer harvest statistics, Southeast Alaska - 1964.

	TOWN						
	Juneau	Ketchikan	Petersburg	Sitka	Wrangell	Villages	All SE Alaska
Hunter Success	59%	76%	92%	81%	77%	92%	80%
Ave. No. Deer/Hunter	1.3	1.9	2.3	2.0	2.1	2.5	2.0
Ave. No. Days/Deer	3.0	2.8	2.6	2.1	1.8	1.9	2.4
Female Portion of Kill	21%	23%	34%	37%	36%	29%	31%
No. Licenses Sold	2500	1700	700	1100	500	600	7100
% Who Hunted	69	76	87	90	63	81	78
Actual No. Hunters	1720	1290	610	990	320	490	5540
Total Hunter Kill	2240	2460	1400	1980	670	1220	9970
Sample Size	100	104	100	100	80	98	582

Table 14. Summary of deer kill by Units, Southeast Alaska, 1963-1964.

Year	Game Management Unit 1	2	3	4	Total Kill
1963	2760	730	2460	3960	9910*
1964	2470	580	2450	4470	9970

*Does not include village kill of about 1200.

Table 15. Deer harvest statistics, Southeast Alaska, 1956-1964.

Year	Hunter* Success	Deer/ Hunter	Days/ Deer	Female Kill (%)	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

Table 16. Age composition of deer in 1963 and 1964 hunter harvest, Southeast Alaska.

Age Class	Composition (% of total buck & doe kill) 1963 Bucks	1963 Does	1963 Both Sexes	1964 Bucks	1964 Does	1964 Both Sexes
Fawn	1	1	2	1	0	1
1-1/2	9	7	16	10	10	20
2-1/2	6	5	11	24	6	30
3-1/2	24	13	37	20	0	20
4-1/2	22	5	27	20	2	22
5-1/2	5	2	7	5	2	7
Sample Size	72	34	106	69	18	87

Table 17. Browse utilization by deer in Prince William Sound, 1964.

Location	Average Utilization (%)
Windy Bay	78
Constantine Harbor	87
Rocky Bay	93
Port Chalmers	78
Green Island	75
Average for Prince William Sound	83

Table 18. Hunter harvest statistics for Prince William Sound, 1964.

Hunter Success	65%
Deer/Hunter	1.5
Days/Deer	2.6
% Kill Female	43
License Sales	790
Actual Hunters	580
Total Kill	870

Table 19. Deer kill per area for Prince William Sound, 1964.

Area	% of Kill	Est. Total Kill
Mainland	2	20
Hawkins Island	53	460
Hinchinbrook Is.	35	305
Montague Island	6	50
Green Island	4	35
Total	100	870

until in 1964 the season was open from August 1 through December 31 with a bag limit of three deer.

Figure 3 shows the location of deer studies on Kodiak Island, In 1963 the entire area was flown and Kupreanof Peninsula, Monashka Peninsula, Cliff Point, Broad Point and Chiniak Peninsula were examined on the ground.

Deer were common in all locations except along the road system between Womans Bay and Kalsin Bay; at no place did densities compare with most areas of Southeast Alaska. Few well-defined trails were observed in alpine country and no lacalities gave indications of heavy use. Evidence of deer was conspicuously lacking adjacent to the road system between Womans Bay and Kalsin Bay. In 1960, 41 per cent of the harvest came from this locality but by 1962 it had dropped to 7 per cent. In this region conifer cover is sparce. After leaf-fall, and when snow covers the ground, deer are easily seen and are much more vulnerable to hunting than in areas which have conifer cover.

In November a return trip was made to Kodiak to observe winter conditions. The weather was excellent for observations, with 6 to 12 inches of snow covering the ground and a little fresh snow every day or two. The deer habitat between Womans Bay and Kalsin Bay and also the Sharatin Peninsula was examined. Each major drainage was traveled on foot from sea level to the limit of deer use (about 1500 feet elevation). From 5 to 10 miles were traveled in a day and in this distance tracks of only 5 to 7 deer were usually observed, often several miles apart. In ten days of ground travels only six deer were seen and during an aerial flight (under optimum conditions) only 36 deer were counted in the entire area.

Inquiry was made of Kodiak Wildlife Refuge and Department of Fish and Game personnel and of local residents who have lived and hunter on Kodiak Island for several years. All were of unanimous opinion that the deer population along the road system had declined sharply in the last five years. This decline was during a period of mild winters and there were no indications of excessive mortality from causes other than hunting. Several deer were examined and found to be in excellent condition.

Deer appear capable of surviving and maintaining their numbers on sites such as the Chiniak Peninsula which has conifer cover, even when subjected to heavy hunting pressure. Where conifer cover is absent, the population apparently can be reduced by hunting and a danger of overharvest exists. Localities which are not readily accessible seem to be in no danger, even though conifer cover may be lacking. Hunting pressure in out-lying areas is so light that the annual increment is not cropped.

Figure 3. Kodiak Island deer study area.

Population Studies

Counts

During the winter and spring of 1963-64, aerial transects were flown to determine trends in deer numbers. Counts were confined to the northeast section of the island, east of a line from Sharatin Bay to Saltery Cove. This section of the island is accessible from a road system and receives most of the hunting pressure. Forest cover is predominantly Alaska alder (Alnus fruticosa) with small patches of Sitka spruce (Picea sitchensis) invading from the peninsula tips. The only large area of spruce cover is on the Chiniak Peninsula. After leaves are shed in the fall and snow is on the ground, deer can be observed from an aircraft.

Two aerial transects were established, on at 500 feet elevation and another at 1000 feet. These were flown at monthly intervals and numbers of deer observed recorded. Little correlation was noted among flights. Weather, time of day, aircraft type and pilot all contributed to variance. An entire survey was never completed in one flight.

In 1964 we began thinking of other survey techniques which would yield more meaningful data. A grid of 109 square-mile sections was plotted covering deer winter range with alder cover below 1000 feet in elevation. A hypothetical problem was set up using existing population information and found that 12 square mile plots should be sufficient for 90 percent confidence limits plus or minus 0.5 deer per plot. Plots were selected randomly and a trial sample flown. The observer flew each plot until he felt it was thoroughly covered,, each plot requiring approximately 16 minutes to fly. An average of 2.6 deer were observed on eight plots. The technique is still in the trial stage but it appears that an intentive survey of a random sample of square mile plots will give better results than the transect system. The advantages of the system are that the entire survey can be made in one flight, optimum weather and flight conditions can be selected and a more accurate estamate of deer numbers can be obtained on the plots flown.

In conjunction with the aerial surveys, a series of ground-track transects have been located in spruce cover which can not be censused from the air.

Natural Mortality

Winter mortality during 1963-64 on Kodiak was light. Only two dead deer were found on 14 miles of transect located along the beach between Cliff Point and Chiniak Peninsula.

Habitat Studies

Knowledge of Kodiak Island deer food habits in summer is limited. Field observations were made during the summer of 1964. Fireweed (Epilobium angustifolium) appears to be the primary summer food and is extremely abundant on Kodiak Island.

During the months of October, December, February and April, samples were collected of red elderberry (Sambucus racemosa), Nootka rose (Rosa nutkana), salmonberry (Rubus spectabilis) cow parsnip (Heracleum lanatum), fireweed (Epilobium angustifolium), hairgrass (Deschampsia spp.) and reedgrass (Calamagrostis spp.). All these species are used to some extent as winter food by Kodiak deer. Samples were dried and packaged and will be analyzed for protein content.

Stomach samples were collected from hunter-killed deer to determine the comparative importance of food species.

Hunter Harvest

Each year shows an increase in number of hunters and a larger kill on Kodiak Island. The take has progressively increased from 38 in 1953 to over 800 in 1964. Table 20 gives the harvest statistics for 1963 and 1964. Information for 1963 was obtained from a postal questionnaire which was mailed to all hunting license holders (1,111). Fifty-eight percent returns were received. This system is expensive, time consuming and returns are spread over a long period. Harvest statistics are spread over a long period. Harvest statistics should be obtained as quickly as possible after the close of the hunting season so the information will be available for setting the next season's regulations.

Table 20. Hunter harvest statistics for Kodiak Island, 1963-64.

	1963	1964
Hunter Success	56%	59%
Deer/Hunter	0.9	1.0
Days/Deer	6.8	5.1
% Kill Female	28	29
License Sales	1110	1100
Actual Hunters	700	880
Total Kill	630	880
Sample Size	646	150

Table 21. Distribution of Kodiak deer harvest for 1963-64.

	Harvest (% of total)		Est. Total Kill	
Location	1963	1964	1963	1964
Monashka Peninsula	22	27	140	240
Road System (restricted area)	24	3	150	25
Chiniak Peninsula	32	48	200	420
Kupreanof Peninsula	21	20	135	175
Other Areas	1	2	5	20
Total	100	100	630	880

Table 22. Age composition of deer in 1963 and 1964 hunter harvest, Kodiak Island.

	Composition (% of total kill)	
Age Class	1963	1964
Fawn	7	18
1-1/2	55	33
2-1/2	7	5
3-1/2	4	14
4-1/2	8	12
5-1/2	14	18
Sample Size	75	87

For these reasons the hunter interview, as used in Southeast Alaska, was employed on Kodiak in 1964. A sample of 150 hunters was interviewed and the data analyzed in three days in comparison to the weeks normally required to receive the returns from a postal survey. Comparison of the data in Table 20 shows a high degree of correlation between the two methods.

Field investigations in 1963 indicated a decline in deer numbers along the road system where conifer cover was absent. Based on these observations, that portion of the island lying south of the Anton Larson-Kodiak road system, north of the Kalsin Bay-Pasaghak road system, and east of a line between the mouth of the Saltery Creek and Crag Point (Figure 3) was limited to one antlered buck in 1964 rather than the three deer previous limit. The take in this area dropped from 24 percent of the total kill in 1963 to only 3 percent in 1964. Table 21 shows that the closure forced more hunting to outlying areas and the take on the Chiniak Peninsula increased from 32 per cent in 1963 to 48 per cent in 1964. The greatly increased take on the Chiniak Peninsula may be longer than desired and a close watch should be maintained.

Table 22 gives the age classes of deer represented in the 1963 and 1964 hunter harvest. A larger portion of young deer (less than 3-1/2 years of age), are taken on Kodiak Island than in Southeast Alaska or Prince William Sound.

YAKUTAT

In 1934, 22 deer were transplanted to the mainland near Yakutat. Most deer are now found on the islands of Yakutat Bay; however, a few are still scattered along the mainland, especially in areas where the timber has been cut. The first season was in 1949 with a limit of one buck. The 1964 season was from August 1 through December 31 with a bag limit of four deer.

The islands of Yakutat Bay have no elevations over 200 feet above sea level. Cover is primarily scrub,Sitka Spruce and Western Hemlock with a very dense understory of Blueberry. Deer are abundant. Their trails crisscross the islands and fresh tracks are almost always in sight. In spite of high numbers of deer per unit area, vegetation shows good growth, with little sign of over-use. Knight Island appears to support the largest number of deer and receives the lightest hunting pressure.

Most of the kill is by local residents, many of whom prefer to take deer than moose because they are easier to care for and can be taken at intervals rather than one large animal. Little actual hunting is done on the islands because of the dense cover, most of the deer being taken by skiff hunters who patrol the beaches.

Deer are common in the cut-over areas on the mainland, but the logging slash and the dense growth make it difficult to hunt.

Knight Island now shows some evidence of over-use but the rest of the islands of Yakutat Bay appear to be capable of supporting their present populations.

LITERATURE CITED

Klein, David R. 1963. Physiological response of deer on ranges of varying quality. PhD. Thesis. Univ. of British Columbia, Vancouver, B. C.

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