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SITKA BLACK-TAILED DEER INVESTIGATIONS

by

Harry R. Merriam, Leader
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Volume III
Annual Project Segment Report
Federal Aid in Wildlife Restoration Act
Project W-6-R-3, Work Plan A

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TABLE OF CONTENTS

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: A Title: Sitka Black-Tailed Deer Investigations

Job No: 1-a Title: Determination of Population Levels, Structures and Trends (data analysis) Southeast Alaska

PERIOD COVERED: July 1, 1961 to June 30, 1962

ABSTRACT

The estimated deer population in Southeast Alaska is from 150,000 to 175,000 animals. Relatively heavy winter losses were sustained in the vicinities of Petersburg and Juneau; however, populations in other areas are static or increasing. The hunter kill in 1961 was approximately 11,250. Hunter success averaged 2.2 deer per hunter in 6.9 days in the field. Deer older than 2-1/2 years constituted 52 per cent of the harvest. Range utilization averaged 73 per cent for all of Southeast Alaska.

RECOMMENDATIONS

None.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
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State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

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Job No: 1-a Title: Determination of Population Levels, Structures and Trends (data analysis) Southeast Alaska

PERIOD COVERED: July 1, 1961 to June 30, 1962

TECHNIQUES

Population dynamics data were collected during the course of other investigations, compiled and evaluated to determine the current status of Southeast Alaska deer herds.

OBJECTIVES

To determine current population levels, structures, and trends of deer in Southeast Alaska.

FINDINGS

The deer population in Southeast Alaska is approximately 150,000 to 175,000 animals. This is a decrease of about 30,000 from 1960-1961 and is due to relatively heavy winter losses on the mainland north of the Stikine River and on Kupreanof, Mitkof, Admiralty, and Douglas Islands. The severity of the winter was reflected by winter range utilization averaging 85 per cent for the areas of high mortality and 73 per cent for all of Southeast Alaska. Mortality averaged 1.0 deer per mile of beach checked for all Southeast Alaska and was as high as 6.0 deer per mile in some areas. Losses occurred primarily in areas of high deer populations and should not be detrimental to the general herd welfare. Populations over the rest of Southeast Alaska remain at about the same level as in 1960 or higher.

Composition counts in alpine areas in the fall of 1961 showed more deer in all areas than in 1960. Low level composition counts made along the Mitkof Highway in June 1961, were higher than 1960 in spite of the winter losses experienced.

Fifty-two per cent of the hunter killed deer were older than 2-1/2 years of age, compared to 51 per cent in 1960. Age classes were almost identical to those of 1960, the largest being the 3-1/2 year age group which comprised 26 per cent of the total kill. The total deer kill is estimated to be 11,250 compared to 12,440 in 1960. Hunter success was 77 per cent and the average hunter took 2.2 deer in 6.9 days in the field, a slight decrease from 1960.

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JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: A Title: Sitka Black-Tailed Deer Investigations

Job No: 1-b Title: Abundance and Composition Surveys

PERIOD COVERED: July 1, 1961 to March 1, 1962

ABSTRACT

The deer population in Southeast Alaska is estimated at approximately 150,000 to 175,000 animals, a decrease of about 30,000 from 1960. The decrease is attributable to heavy winter losses in some areas. In spite of relatively severe winter mortality, reasonably large numbers of deer were observed during June counts along the Mitkof Highway. Age composition of hunter killed deer showed 52 per cent to be older than 2-1/2 years of age as compared to 51 per cent in 1960. A single inexpensive technique was developed for immobilizing deer using the drug succinylcholine chloride delivered by an arrow propelled by a crossbow. Twenty-eight deer were immobilized, tagged and released in the vicinity of Wrangell Narrows, and an additional eight fawns were tagged along the Mitkof Highway in conjunction with low level counts.

RECOMMENDATIONS

Alpine and low-level counts should be continued until the validity of the techniques as population indices is determined. Counts should be made in the same areas at approximately the same time each year. Fawns should be tagged when encountered during spring composition counts; however, a general tagging program would be inefficient except during winters when large numbers of deer are concentrated on beaches and are readily accessible for immobilization.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: A Title: Sitka Black-Tailed Deer Investigations

Job No: 1-b Title: Abundance and Composition Surveys

PERIOD COVERED: July 1, 1961 to March 1, 1962

OBJECTIVES

To determine population abundance and sex and age composition of Southeast Alaska deer herds.

TECHNIQUES

Alpine counts were made within delineated areas above 1,500 feet elevation on Kupreanof Island in late July. The location of the areas is shown on Figure 1. Sex and age composition and total numbers were recorded. Observations were made from the ground with the aid of 7 x 35 binoculars and a spotting scope with 20X and 40X eye pieces.

Low elevation counts were conducted during the month of June along the Mitkof Highway between the hours of 5:00 a.m. and 8:00 a.m. An automobile was driven slowly along the highway, stops being made when deer were observed. When fawns were encountered, an attempt was made to capture and tag them.

Immobilization techniques were tested during February and March when deer were concentrated at low elevations. Beaches were patrolled using an outboard powered skiff and deer were immobilized by intramuscular injections of the drug succinylcholine chloride.

Population trends are determined by density of deer on summer range, hunter success, deer taken per unit effort compared to previous years, age composition of hunter-killed deer and evaluation of range use.

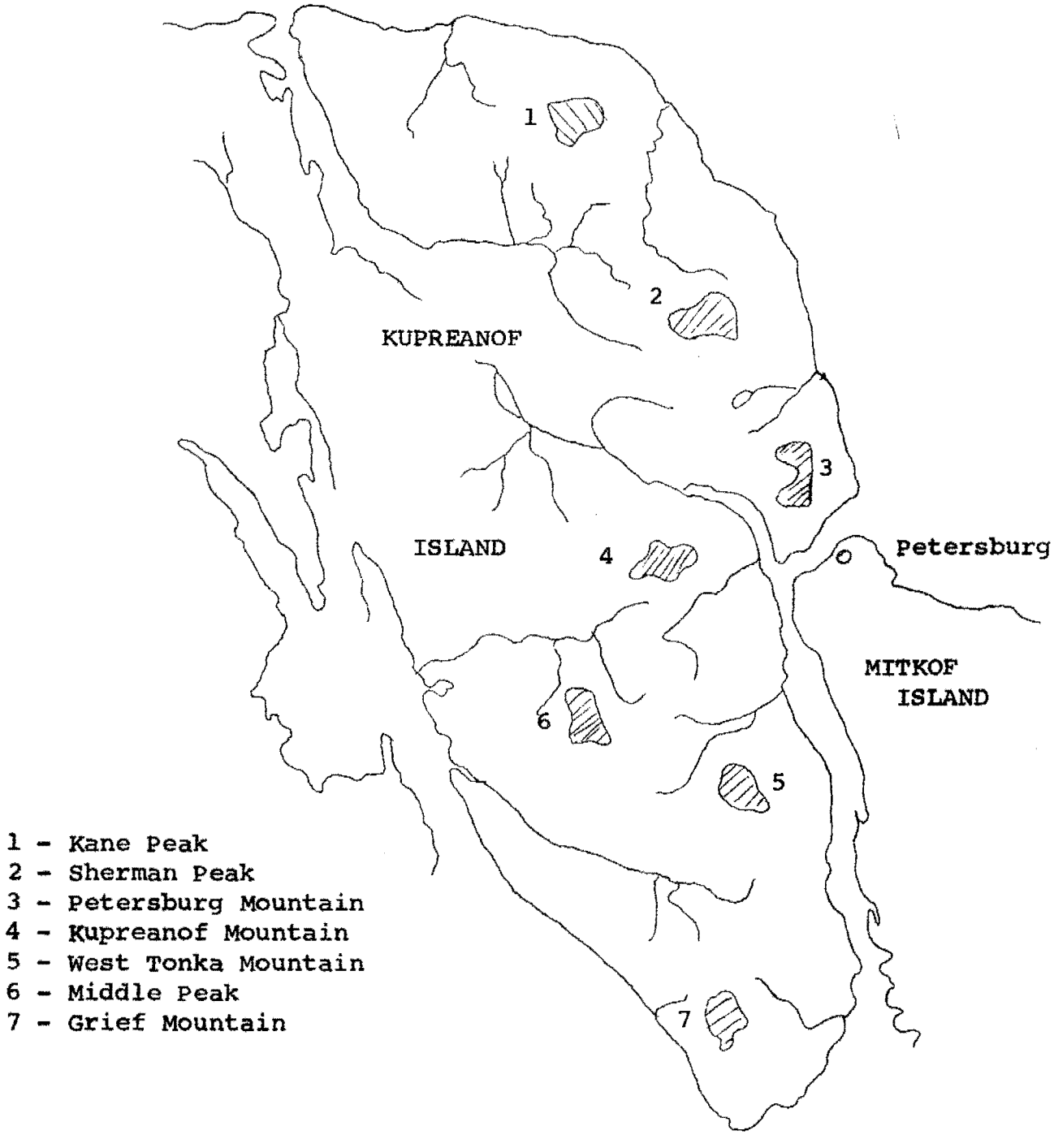

Figure 1. Map showing the locations of alpine deer counts made on Kupreanof Island, July 1961.

FINDINGS

Results of composition counts are shown in Table 1. Four hundred and sixty-four deer were observed in 7 alpine areas and 166 in 12 low-level counts. Several years data must be obtained to determine the value of alpine censuses, however, it is possibly one of the best indices for determining deer population trends in Southeast Alaska. More deer were observed in all alpine areas checked in 1961 than in 1960. Reasonably large numbers of deer were noted during June along the Mitkof Highway in spite of comparatively heavy winter losses.

The deer population in June 1962 is estimated to be approximately 150,000 to 175,000, a decrease of about 30,000 from 1961. Losses were due to relatively severe winter mortality (averaging 1.0 deer per mile of beach fringe checked) as indicated in Job 1-c of this Work Plan. Hunter success was lower in 1961 than in 1960 (77 per cent compared to 83 per cent); however, the total kill, and age classes in the kill, were almost identical to those of 1960.

A technique was developed for immobilizing deer using the arrow mounted syringe propelled by a crossbow. The results were presented as a paper at the 13th Alaska Science Conference, Juneau, Alaska, and is included in the Appendix. The use of the drug succinylcholine chloride delivered in a syringe mounted on an arrow and shot from a crossbow, appears to be an efficient and inexpensive method for obtaining live Sitka black-tailed deer in hand for biological investigations. This method is particularly applicable in Southeast Alaska where deer concentrate along the beach timber fringes during the winter months and are accessible from the water. Doses of 6.5 mg./cwt. succinylcholine chloride were effective for yearling and adult deer. The average time required to collapse after injection was 5.6 minutes and the average recovery time was 37.8 minutes from the time of injection. A dog which is proficient at trailing is a valuable aid for locating animals which become alarmed and leave the beach area before immobilization is complete. A small portable oxygen tank with a face mask adaptable to fit over a deer's nostrils is the best treatment for respiratory depression. Twenty-eight deer were immobilized, tagged and released. An additional eight fawns

Table 1. Summary of deer composition counts in Southeast Alaska, 1961.

Location	Date	Fawns	Yearlings		Adults		Unidentified	Total
			Bucks	Does	Bucks	Does		
ALPINE COUNTS								
Kupreanof Island								
Kane Peak	7-22-61	3	10	12	30	17	1	73
Sherman Peak	7-22-61	4	6	4	34	21	4	73
Petersburg Mt.	7-22-61	1	10	10	40	6	3	70
Kupreanof Mt.	7-25-61	5	17	18	46	8	3	97
West Tonka Mt.	7-20-61	2	6	9	25	8	4	54
Middle Pk.	7-20-61		6	2	20	7	2	37
Grief Mt.	7-20-61	1	8	7	31	10	3	60
Totals		16	63	62	226	77	20	464
LOW LEVEL COUNTS								
Mitkof Highway	June, 1961	13	14	16	28	51	44	166

were tagged in conjunction with low level counts along the Mitkof Highway. Table 2 records the tagging information.

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Table 2. Deer tagged during 1962.

Tag No.	Date	Location	Sex	Remarks
2002	2- 9-62	West Side, Wrangell	M	Adult
2003	2- 9-62	Narrows	M	"
2004	2-19-62	"	F	"
2005	2-19-62	"	F	"
2006	2-19-62	"	M	Fawn
2007	2-20-62	"	F	Adult
2008	2-20-62	"	M	"
2009	2-21-62	"	F	"
2010	2-21-62	"	F	"
2011	2-21-62	"	M	"
2012	2-21-62	"	F	"
2013	3- 2-62	"	F	"
2014	3- 4-62	"	F	"
2016	3- 4-62	"	F	"
2017	3- 4-62	"	M	"
2018	3- 4-62	"	M	"
2019	3- 4-62	"	F	"
2020	3- 5-62	"	M	"
2022	3- 5-62	"	M	"
2023	3- 6-62	"	M	"
2024	3- 6-62	"	F	"
2025	3- 7-62	"	M	"
2026	3- 7-62	"	M	"
2028	3- 8-62	"	F	"
2029	3- 8-62	"	F	"
2030	3- 8-62	"	F	"
2031	3- 8-62	"	F	"
2032	3- 9-62	"	F	"
2033	6-11-62	Mitkof Highway	F	Fawn
2034	6-15-62	"	M	"
2035	6-16-62	"	M	"
2036	6-19-62	"	M	"
2037	6-19-62	"	M	"
2038	6-21-62	"	M	"
2039	6-21-62	"	M	"
2040	6-22-62	"	M	"

APPENDIX

Immobilization Technique for Sitka Black-Tailed Deer in Southeast Alaska

Introduction

During recent years the use of immobilizing drugs has become increasingly popular with wildlife biologists as a means of obtaining big game animals in hand for various purposes. Numerous methods of delivery and many drugs have been tested with varying degrees of success [Buechner et al. (1), Craighead et al. (2), Crockford et al. (3, 4), Hall et al. (5), Post (6), Talbot (7), Talbot et al. (8), Troyer (9)]. During the months of February and March 1962, the writer set up an experimental project to determine the effectivesness of some of these methods and the feasibility of obtaining a large enough sample of Sitka black-tailed deer to be of value for determining movements, an estimate of population size and a known age sample of deer jaws. This paper is a preliminary report of the work completed to date with further studies contemplated in the future.

Lindenburg Peninsula, located on Kupreanof Island, was selected as the study area because it is easily accessible from Petersburg, the author's duty station, and is located adjacent to protected waters which provide access with a small boat under most weather conditions. It is also a delineated area of a suitable size (approximately 75 square miles) for a population study and receives heavy enough hunting pressure to ensure a tag return.

Succinylcholine chloride was chosen as the immobilizing drug as it is relatively fast acting, safe to handle, and because more information was available on it than any other. It is especially adaptable for use on animals in poor condition, as is very likely to be the case with deer during the winter period when they are most available for capture, for recovery is usually complete with no residual effects. Succinylcholine chloride is a myoneural blocking agent and when injected, produces a brief relaxation of skeletal muscles. It is rapidly broken down in the body by the action of cholinesterases into natural metabolites of choline and succinic acid which accounts for its short duration of action and low toxicity. Thus it is not dependent on the liver or the kidneys for detoxication or excretion. The last of the

skeletal muscles to be effected is the diaphram. The most effective antidotes are oxygen and the maintenance of respiration and circulation. It is available under several trade names; however, Anectine (Burroughs Wellcome & Co., London and New York) was used exclusively in this study.

Methods

The Palmer CO_2 powdered dart rifle was first tested using their explosive injector syringe. Under optimum conditions it performed satisfactorily up to about 40 yards, but when temperatures dropped below freezing, the range was reduced to the point of total ineffectiveness. Equally distracting was the fact that every miss meant the probable loss of a dart which cost approximately $5.00 each.

Larson (10) reports on the use of a Palmer syringe attached to an arrow and propelled by a long bow. Several long bows, ranging from 30 to 65 pounds pull, were tested using a 2 cc. Palmer syringe affixed to the end of an arrow. This arrangement showed definite possibilities; however, too much depended on the ability of the archer and the weight of the syringe caused the arrow to wobble.

Carl Anderson (11), Oregon State Game Commission, found that a simple syringe could be made from a .357 magnum case which slipped over the end of an arrow. This was then tested and, with minor modifications found to be quite satisfactory except that accuracy still depended too much on the proficiency of the archer. This arrangement was then adapted for use with a crossbow which proved the most efficient and economical of various methods tried (Figure 1a).

A crossbow with an 80 pound pull, obtained from the Whamo Manufacturing Company, was utilized throughout the project. This worked well at 25 to 40 yards, but hit too hard at close range and on occasion the body of the syringe would break through the skin and penetrate the muscle tissue. This was corrected by improvising a second trigger mechanism with a 40 pound pull which was efficient at ranges of 5 to 25 yards (Figure 1b).

Arrows are regular target bolts from which 1/4 inch of metal tip is cut, leaving a band of metal 1/4 inch wide on the

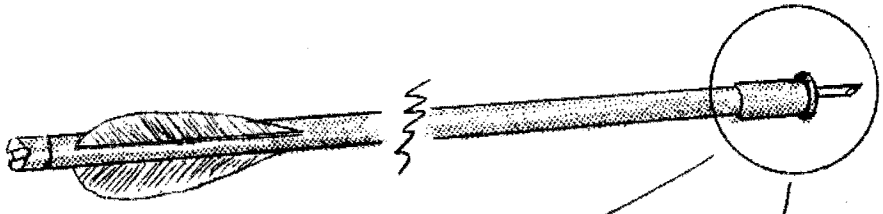
tip of the arrow which prevents deformation of the arrow tip upon impact (Figure 1c). Rubber washers, 5/32 inches thick, are cut by chucking an empty .357 case in an electric drill. The washer is lubricated with silicone grease and must fit snugly in syringe body, but not so tightly as to retard movement. Arrow shafts are painted fluorescent red to facilitate recovery.

The syringe is made by silver-soldering a 5/8 inch length of .109 OD x 012 wall thickness needle stock over the primer hole of an empty .357 magnum case (Figure 1d). This provides an inexpensive but efficient syringe, with a 1 cc. capacity, which injects the drug upon impact as the arrow shaft slides forward within the syringe. The drug is loaded through the needle of the syringe with another hypodermic needle. The shaft is then moved forward until the drug is visible at the tip of the needle to prevent possible air embolism.

During the winter months deer in Southeast Alaska concentrate in the beach fringe as snow accumulates at higher elevations. It is not uncommon to observe 30 to 50 or more deer on the beach in a day during this period. Deer were approached slowly by skiff from the water, delivering the dart when the craft grounded. Drug doses were determined immediately prior to dart delivery by visual estimation of the animal's weight aided by 7x35 binoculars. After a hit was made, the shooter would remain within the skiff so as not to alarm the animal. If the deer became alarmed and ran after being hit, the observer would wait five minutes then follow the tracks to locate the animal. A dog proved a very useful aid in trailing animals which had been hit and departed the immediate area. When immobilization was accomplished, the animal was approached and placed in a position with its head elevated to prevent inhalation of rumen or stomach contents. Care was taken at all times not to needlessly alarm the animal and further aggravate the degree of shock. If respiration became depressed, artificial respiration was given. As soon as the animal was sufficiently relaxed, it was weighed, the hind foot measurement taken and an orange numbered Hasco cattle tag placed in its ear.

Results

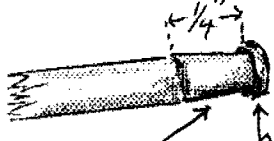
Twenty-eight deer, 12 bucks and 16 does, were successfully immobilized, tagged and released. The most deer tagged in one day was five and the average number was 2.5. The drug dosages,



1d

Needle Stock .109 OD x 012 wt.
Silver Soldered in Primer Pocket

.357 Magnum Case



Arrow Shaft

Metal Band

Rubber Washer
5/32" Thick

1c

sex and size of animals and elapsed time for immobilization and recovery are given in Table 1.

Deer generally showed little alarm when approached from the water by skiff. They would usually lift their heads, watch the boats approach for a short interval and then continue feeding. The noise of the skiff grounding alerted the animal and it would stand with its head erect watching the shooter. When struck by the dart the animal would normally make two or three leaps, stop and look at the skiff, and then continue feeding. At other times it would walk at a normal rate along the beach or into the beach fringe where it could usually be located within 100 yards of the beach.

The first signs of the drug effects were evidenced by aimless picking at food species. After about three minutes the animal's footing would become unsure causing it to stumble as it walked, and after an average of 5.6 minutes it would lie down. Under larger doses, control was lost of all skeletal muscles and breathing would become shallow and occasionally stop but, with the exception of two cases, the animals were saved by applying artificial respiration. An eye reflex was present as long as the animal remained alive. Under light doses the animal was able to retain control of its head and remain in a normal resting position.

As the effects of the drug began to wear off, the animal would first regain control of its head and then, after a few minutes, of its legs. It would usually make several attempts to gain its feet before successful; however, once accomplished recovery was remarkably complete and the animal would depart the area at its normal gait. Complete recovery was effected in an average of 38 minutes from the time of injection, ranging from a minimum of 17 to a maximum of 65 minutes. After an effective dose was attained, further increasing of the amount injected did not appear to speed immobilization time, but did prolong recovery.

Placement of the dart was important. Hits made in the heavy musculature of the neck, back and hip were very effective; whereas hits in the flank, rib cage and lower legs usually had no effect. Effective doses ranged from 5.4 to 13.9 mg./cwt., the most satisfactory being about 6.5 mg./cwt. Many variables were

Table 1. Data for Sitka black-tailed deer immobilized using succinylcholine chloride.

No.	Sex	Weight	Total Dose (Mg.)	Mg./cwt.	Time from hit to Collapse	Time from hit to Recover
2002	M	96	10	10.4	10	27
2003	M	90	12.5	13.9	0.5	17
2004	F	86	10	11.6	9	20
2005	F	82	10	12.2	6	30
2006	M	40	5	12.5	4	40
2007	F	82	8	9.8	2	20
2008	M	110	10	9.1	8	40
2009	F	90	12	13.3	5	65
2010	F	85	10	11.8	5	24
2011	M	100	10	10.0	6	61
2012	F	85	8	9.4	8	25
2013	F	90	8	8.9	5	38
2014	F	68	8	11.8	4	44
2016	F	98	7	7.2	9	41
2017	M	80	8	10.0	8	50
2018	M	110	6	5.4	6	27
2019	F	72	6	8.4	6	26
2020	M	64	4	6.3	8	26
2022	M	102	6	5.9	7	32
2023	M	74	6	8.1	9	39
2024	F	85	6	7.1	1	45
2025	M	64	6	9.4	2	38
2026	M	98	6	6.1	6	32
2028	F	80	6	7.5	4	54
2029	F	74	6	8.1	6	45
2030	F	88	6	6.8	6	65
2031	F	92	6	6.5	5	63
2032	F	104	6	5.8	2	25

Average dose - 9.0 mg./cwt.

Average time to collapse - 5.6 minutes

Average time to recover - 37.9 minutes

encountered which made the determination of exact doses difficult. The weight of the animal must first be estimated. The drug loses its potency with age; the exact amount is not known, but probably 5 to 10 per cent per month under field conditions. There may be some blow-out during delivery but, if so, it is slight as a syringe on which the needle becomes plugged on impact shows little loss of fluid. The condition and sex of animals may have an effect on the size of dose required; however, sufficient data are not yet available to make valid conclusions. Quite often the syringe needle would strike a bone and only a portion of the drug be injected.

Two cases of mortality occurred during immobilization procedures, one an adult female and the other a yearling male. Both received doses of 7.5 mg./cwt. Both animals were recovering nicely, from all outward appearances, when suddenly they died. Death may have been partially due to shock.

Conclusions

The use of succinylcholine chloride as an immobilizing drug, delivered in a syringe mounted on an arrow and shot from a crossbow, appears to be an efficient and inexpensive method for obtaining live Sitka black-tailed deer in hand for biological investigations. The method is particularly applicable in Southeast Alaska where deer concentrate along the beach timber fringes during winter months and are accessible from the water. Doses of 6.5 mg./cwt. succinylcholine chloride were effective for yearling and adult deer. The average time required to collapse after injection was 5.6 minutes and the average recovery time was 37.8 minutes from time of injection. A dog which is proficient at trailing is a valuable tool to assist in locating animals which become alarmed and leave the beach area before immobilization is complete. A small portable oxygen tank with a face mask adapted to fit over a deer's nostrils would aid in treating for respiratory depression.

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JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: A Title: Sitka Black-Tailed Deer Investigations

Job No: 1-c Title: Natural Mortality Surveys, Southeast Alaska

PERIOD COVERED: March 1, 1962 to May 15, 1962

ABSTRACT

Deer losses resulting from starvation during the winter of 1961-1962 were the highest since 1955-1956 and are estimated to be between 30,000 and 50,000 animals. The average mortality was 1.0 deer per mile of beach fringe searched as compared to 2.3 for 1956. Greatest losses were on the mainland and Mitkof, Kupreanof, Admiralty and Douglas Islands. Losses in other areas were light. Actual mortality was probably higher than that observed along the beach fringe as snow was usually not deep enough to impede travel and many deer died in localities other than the beach fringe.

RECOMMENDATIONS

Mortality surveys can be conducted by U.S. Forest Service personnel at the same time browse transects are checked. Forms for recording and instructions should be provided to standardize the sample. Additional areas should be selected to obtain more complete coverage in Southeast Alaska.

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Job No: 1-c Title: Natural Mortality Surveys, Southeast Alaska

PERIOD COVERED: March 1, 1962 to May 15, 1962

OBJECTIVES

To determine the sex and age composition, the extent and area-wise breakdown of the natural mortality as an index of the winter welfare of the deer herds.

TECHNIQUES

Areas immediately adjacent to browse transects, and the beach fringe which parallels the transect, were searched during April and May in conjunction with reading browse transects. All carcasses located were examined to determine sex, age, condition and possible cause of death. Carcasses from the previous winter usually still had remnants of hide and decaying flesh attached. The skeletons of animals which died in previous years were usually bleached white and partially covered with green algae. Thirty-five localities throughout Southeast Alaska were checked.

FINDINGS

Mortality resulting from starvation was greater during the winter of 1961-1962 than has been experienced since 1955-1956. It was clearly shown that Sitka black-tailed deer cannot survive for extended periods of time on an exclusive diet of woody plant species. High mortality was confined to the mainland (north of the Stikine River) and Mitkof, Kupreanof, Admiralty and Douglas Islands.

These localities constitute about half of the deer range in Southeast Alaksa. Mortality on other areas was negligible and the populations are considered to be increasing or stable. Assuming a population decrease only in those areas where comparatively severe mortality was experienced, and by correlating past winter range utilization and age classes of the harvest, an estimate of mortality can be made. The estimated deer population in the areas affected was about 100,000 (approximately half of the total population of Southeast Alaska). A normal deer herd consists of about 40 per cent fawns, or 40,000 animals for the area in question. Past records show that, following winters of comparable range utilization and mortality, the proportion of 1-1/2 year old animals in the following harvest decreases from about 25 per cent of the total kill to about 10 per cent, a decrease of 60 per cent for the age class. This would represent a mortality of 24,000 fawns in addition to normal losses in 1961. It has also been shown that fawns represent about 85 per cent of the total winter mortality in Southeast Alaska. It is therefore reasonable to assume that the mortality for the past winter in the northern areas of Southeast Alaska was about 28,000 or more animals.

Even though snow never accumulated to great depths on the areas of high mortality, there was some snow on the ground continuously from late November until April, forcing deer to subsist entirely on woody plant species, primarily Vaccinium ovalifolium and V. parvifolium, which alone do not provide sufficient energy to maintain basal metabolism without drawing on fat reserves. In most other areas of Southeast Alaska, snow cover was intermittent and ground forbs of high nutrient quality were available throughout the major portion of the winter. Consequently mortality in these areas was low.

The average mortality attributable to starvation was 1.0 deer per mile of beach checked for all of Southeast Alaska (18 carcasses were located in 19 miles of beach fringe searched). An additional 0.4 carcasses per mile were found which were in fair to good condition at the time of death and mortality was assumed to be from causes other than starvation. Deer winter mortality surveys are made only along beach fringes where deer congregate during periods of deep snows. During the winter of 1961-1962, snow was never deep enough to restrict travel and many deer died in areas where no surveys were made. Consequently, the actual mortality was probably considerably higher than

that observed. Usually high mortality in Southeast Alaska follows very heavy snow falls and most deer die within a few feet of the beach.

The mortality figure of 1.0 deer per mile of beach fringe searched is the highest value since 1956 when 2.3 dead deer per mile were found. Table 1 gives the losses for each area checked in 1962. Mortality was highest near Juneau where an average of 3.1 deer per mile was found. Most of the mortality was concentrated in Seymour Canal and Douglas Island. Table 2 shows the average winter losses for deer in Southeast Alaska from 1952 through 1962.

Mortality was equally divided between sexes: of 26 carcasses observed 10 were males, 11 females and 5 of undetermined sex. Examination of the bone marrow showed 18 to be in very poor condition and 6 in fair condition. No long bones were found for two of the animals. Nine fawns, seven yearlings, nine adults and one deer of unknown age were observed.

In spite of heavy losses in some areas, losses throughout Southeast Alaska were relatively light and should have no serious affect on the total deer population.

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Table 1. Winter deer losses per mile of beach in Southeast Alaska for the winter of 1961-1962.

Location	Deaths/Mile of Beach Starvation	Other
Ketchikan	0.3	0.0
Carroll Inlet	0.0	0.0
George Inlet	0.0	0.0
Gravina Island	0.0	0.0
Helm Bay	0.0	0.0
Polk Inlet	0.0	0.0
Thorne Bay	2.0	0.0
Craig	0.0	0.0
San Alberto Bay	0.0	0.0
Warm Chuck Inlet	0.0	0.0
Port St. Nicholas	0.0	0.0
Wrangell	0.3	0.3
S. Etolin Island	2.0	0.0
Thoms Place	0.0	0.0
Anita Bay	0.0	0.0
St. Johns Harbor	0.0	2.0
N. Woronkofski Is.	0.0	0.0
S. Woronkofski Is.	0.0	0.0
Petersburg	1.1	0.4
Duncan Canal	0.0	0.0
Totem Bay	2.0	0.0
Big John Bay	0.0	2.0
Portage Bay	2.0	0.0
Fivemile Creek	2.0	0.0
Wrangell Narrows	1.0	0.5
Juneau	3.1	0.8
Eliza Harbor	4.0	0.0
Pybus Bay	0.0	0.0
Gambier Bay	0.0	2.0
Mole Harbor	4.0	0.0
Windfall Harbor	6.0	2.0
King Salmon Bay	4.0	0.0
Point Hilda	4.0	2.0
Sitka	0.0	0.6
Hood Bay	0.0	4.0
Naquasina Passage	0.0	0.0
Fish Bay	0.0	0.0
Port Krestof	0.0	0.0
Ushk Bay	0.0	0.0
Katherine Island	0.0	0.0
Hoonah Sound	0.0	0.0
All Southeast Alaska	1.0	0.4

Miles of beach fringe searched: 19

Deer carcasses found: 26

Age Classes		Sex	
Fawn	9	Male	10
Yearling	7	Female	11
Adult	9	Unidentified	5
Unidentified	1		

Table 2. Winter deer losses per mile of beach for Southeast Alaska from 1952 to 1962.

Year	Deaths Per Mile of Beach	
	Starvation	Other Causes
1952	0.9	0.2
1953	0.0	0.1
1954	0.6	0.1
1955	1.0	0.3
1956	2.3	0.4
1957	0.1	0.1
1958	0.0	0.0
1959	0.2	0.1
1960	0.1	0.1
1961	0.1	0.1
1962	1.0	0.4

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: A Title: Sitka Black-Tailed Deer Investigations

Job No: 1-d Title: Characteristics of Hunter Harvest, Southeast Alaska

PERIOD COVERED: August 20, 1961 to December 31, 1961

ABSTRACT

The deer hunter harvest in 1961 is estimated to be approximately 11,250 animals. The regular season was open from August 1 through November 30 and was extended by special regulation through December 10. The bag limit was four deer of either sex, provided, that does could only be taken after September 15. Hunter success was 77 per cent and the average hunter killed 2.2 deer and spent 6.9 days in the field. The major portion of the kill came from Admiralty, Chichagof and Kupreanof Islands. Seventy-nine per cent of the kill was made after October 15 and 29 per cent during the last 2 weeks of November. Animals over 2-1/2 years of age accounted for 52 per cent of the total harvest. Twenty-six per cent of the total kill consisted of females, most of which were taken during the last month of the season. Average dressed weight of bucks ranged from 71 pounds for 1-1/2 year olds to 132 pounds for 5-1/2 year old animals. Metacarpal bone lengths showed no significant changes from 1960 values.

RECOMMENDATIONS

Sample size of deer jaws and other physical measurements are too small in areas other than Unit 3. Until more field men are available the primary effort should be concentrated in Unit 3 to maintain a continuity of data.

Hind foot measurements vary with individual techniques. This measurement should be replaced by collecting metacarpal bones which

are easily obtained and can be accurately measured.

Post season hunter interviews should be continued until a postal survey can provide the same information at a usable date. The point has been reached where increasing bag limits and seasons will no longer increase the take. Further relaxations may reduce the aesthetic value of deer as a big game animal.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: A Title: Sitka Black-Tailed Deer Investigations

Job No: 1-d Title: Characteristics of Hunter Harvest, Southeast Alaska

PERIOD COVERED: August 20, 1961 to December 31, 1961

OBJECTIVES

To secure information relative to the total deer kill, area and chronological distribution of the kill, and hunter success and to determine and evaluate the sex and age composition and physical characteristics of the deer harvested.

TECHNIQUES

Successful hunters were contacted throughout the hunting season to obtain physical data on deer taken. Weights, hind foot measurement, metacarpal bones and lower jaws were obtained. Date, location and sex of kill were also recorded. Immediately after the close of the hunting season, interviews were conducted in Juneau, Sitka, Petersburg, Wrangell, Ketchikan and the small villages to obtain information for determining hunter success, effort, distribution of hunting pressure and total deer killed in Southeast Alaska. Weights were of field-dressed deer with head, hide and legs attached. Hind foot lengths were taken from the tip of the hoof to the proximal end of the calcaneus. Metacarpal bones were removed, dried and measured with calipers at a later date. Age was determined by tooth wear and replacement in the lower jaws.

FINDINGS

Estimate of the Hunter Harvest

The estimated deer kill in Southeast Alaska for 1961 is approximately 11,250 animals. The regular open season extended from August 1 through November 30 with a bag limit of four deer of either sex, provided, that anterless deer could only be taken after September 15. The season was extended from December 1 through 10, during which period the bag limit allowed for the regular season could be completed plus one additional deer of either sex. Hunting license sales totaled 6,623 in areas where deer are hunted. Hunter interviews show that about 12.5 per cent of the people who purchase licenses do not hunt. Table 1 gives the hunter kill information for each town for 1961 and Table 2 compares kill figures from 1956 to 1961. The deer harvest in 1961 is about the same as 1959 (11,000) and slightly less than 1958 and 1960. The kill was very high in the vicinity of Petersburg (Unit 3) but was good in other areas also. It is evident that the number of deer taken in any area is directly proportional to the amount of snow which accumulates during the hunting season. If snow is present, deer are concentrated at low elevations and a large kill is realized. With little snow, deer are dispersed over wide areas and both the hunting effort and the success decline. In 1961, snow began to accumulate near Petersburg by early November and hunting was excellent for the remainder of the season. In other areas the kill was slightly less than in 1960.

Hunter Success

Hunter success (the per cent of hunters who kill at least one deer) was determined through post-season hunter interviews and is presented, with related data, in Table 1. Success averaged 77 per cent for all of Southeast Alaska and ranged from a low of 57 per cent for Juneau to 97 per cent at Petersburg. The average hunter killed 2.2 deer and spent 6.9 days in the field. Hunter success in 1961 was 6 per cent less than for 1960, but was exactly the average for the period of 1956 to 1961.

Distribution of the Harvest

The distribution of the hunter harvest for Southeast Alaska in 1961 is shown in Table 3. The greatest portion (43 per cent) came from Unit 4, which is primarily due to the presence of the large towns of Juneau and Sitka in or near this Unit. As moderate to high numbers of deer were present in most localities of Southeast

Table 1. Summary of 1961 deer hunter harvest data for Southeast Alaska.

	Juneau	Ketchikan	Petersburg	Sitka	Wrangell	Villages	All SE Alaska
Hunter Success	57	69	97	72	76	87	77
Ave. No. Deer per Hunter	1.5	1.9	3.5	1.8	2.2	2.5	2.2
Ave. No. Days Hunted	6.4	7.0	9.7	6.9	6.0	6.4	6.9
Ave. No. Days per Deer	4.3	3.8	2.8	3.7	2.7	2.5	3.1
Female Portion of Kill	28%	21%	19%	29%	27%	21%	26%
No. Licenses Sold	2498	1690	627	1022	408	378	6623
No. Actual Hunters	2186	1479	549	894	357	336	5801
Kill per Town	3279	2810	1922	1609	785	840	11,245
Sample Size	98	97	79	97	77	171	619

Table 2. Summary of deer hunter harvest data for Southeast Alaska - 1956 to 1961.

Year	Hunter Success	Deer Per Hunter	Days Per Hunter	Days Per Deer	% Kill Female	Total Kill
1956	74	1.4	5.7	4.0	15	7,780
1957	69	1.6	5.6	3.6	25	8,250
1958	85	2.4	6.3	2.6	26	13,000
1959	74	1.8	6.1	3.6	24	11,000
1960	83	2.3	6.8	2.9	21	12,450
1961	77	2.2	6.9	3.1	26	11,250

Table 3. Distribution of deer hunter harvest for 1961 in Southeast Alaska.

	Per Cent of Total Kill		
	Bucks	Does	Both Sexes
Management Unit 1			
Douglas Island	1	2	1
Mainland - No. of Stikine R.	2	0	1
Mainland - So. of Stikine R.	2	2	2
Revilla, Gravina, Duke Is.	7	7	7
All Unit 1	12	11	11
Management Unit 2			
Prince of Wales Is.	6	4	5
West Coast Is.	7	7	8
All Unit 2	13	11	13
Management Unit 3			
Kuiu Is.	2	1	2
Kupreanof Is.	14	14	14
Mitkof Is.	9	6	8
Woronkofski, Zarembo, Wrangell & Etolin Is. Group	8	12	9
All Unit 3	33	33	33
Management Unit 4			
Chichagof Is., West Coast Is. No. of Salsbury Sound	15	15	15
Baranof Is. West Coast Is. So. of Salsbury Sound	15	16	16
Admiralty Is.	12	14	12
All Unit 4	42	45	43
Total Percentile	100	100	100
Size of Sample	1,192	420	1,612

Alaska, the kill does not reflect deer abundance, but hunting pressure. Kupreanof, Chichagof and Admiralty Islands produced approximately 45 per cent of the total kill.

Chronological Distribution of the Harvest

Hunters in Southeast Alaska do the majority of their hunting late in the season when snow forces deer from the higher levels. In 1961, 79 per cent of the deer were taken after October 15 and 29 per cent during the last 2 weeks of November. The kill dropped after November because most hunters had completed their hunting by this time. In 1960, the greatest portion of the kill was made during the first 2 weeks of November, as this was the period of deepest snow accumulation. In all probability, the total take of deer would not change substantially if the season were only open during the month of November rather than for four months. Figure 1 shows the chronological distribution of the deer harvest for 1961.

Age Distribution

The age distribution of hunter killed deer was almost identical for 1960 and 1961. Table 4 shows the age distribution for all of Southeast Alaska, Table 5 the distribution of both sexes for each management Unit and Table 6, the distribution of male deer only for each Unit. The 4-1/2 age class showed the greatest difference over 1960, an increase of 5 per cent. This reflects a 3-1/2 year dominant class in 1960. Animals over 2-1/2 years of age composed 52 per cent of the kill showing the continued presence of a high proportion of older age animals in the population.

With the exception of the fawn class, the age classes for does are similar to bucks. Considering that the female kill is only one-third of the buck take, one would expect a larger proportion of young deer in the male population than the female. This shows again that hunting does not materially influence deer populations in Southeast Alaska.

Sex Ratio of the Harvest

The doe take in 1961 was 26 per cent of the total kill. This is 5 per cent more than in 1960 and is probably due to heavier hunting pressure at a later date than in 1960. By the end of the season, rutting bucks are in poor condition and many hunters prefer to take does. Table 2 compares the female take from 1956 to 1961.

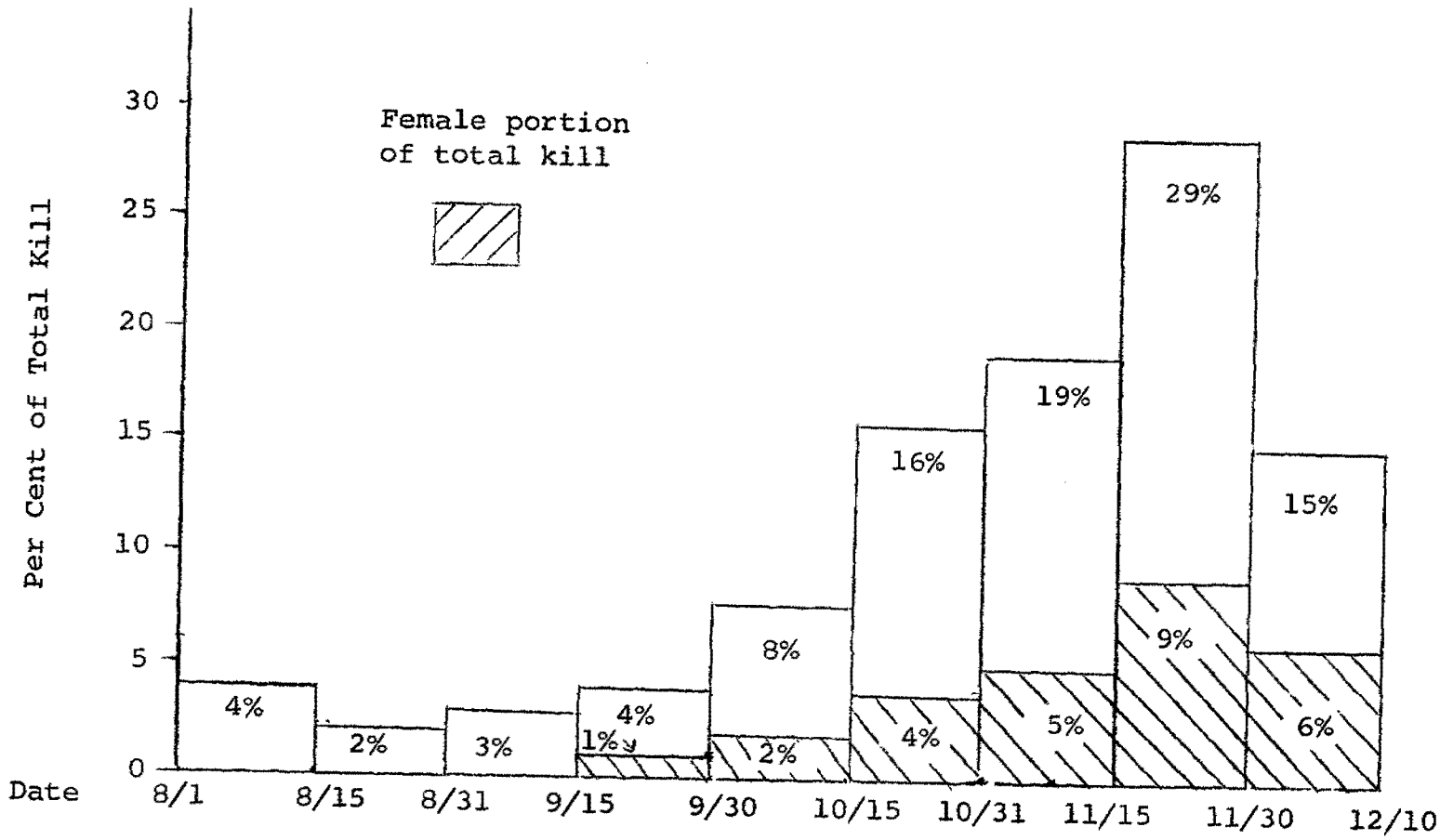

Figure 1. Chronological distribution of the 1961 deer harvest in Southeast Alaska.

Table 4. Per cent deer in each age class in the 1961 hunter harvest for Southeast Alaska.

	Age Class						Sample
	Fawn	1-1/2	2-1/2	3-1/2	4-1/2	5-1/2	Size
Bucks	2	23	23	26	19	7	560
Does	8	24	18	24	19	7	143
All Deer	3	23	22	26	19	7	703

Table 5. Per cent deer in each age class for game management units in Southeast Alaska for 1961.

	Age Class						Sample
	Fawn	1-1/2	2-1/2	3-1/2	4-1/2	5-1/2	Size
Mgmt. Unit 1	4	24	16	35	16	5	191
Mgmt. Unit 2	8	18	19	31	14	10	62
Mgmt. Unit 3	1	22	24	23	24	6	355
Mgmt. Unit 4	8	30	29	11	10	12	90

Table 6. Per cent male deer in each age class for game management units in Southeast Alaska for 1961.

	Age Class						Sample
	Fawn	1-1/2	2-1/2	3-1/2	4-1/2	5-1/2	Size
Mgmt. Unit 1	3	23	17	35	17	5	153
Mgmt. Unit 2	6	20	16	36	12	10	50
Mgmt. Unit 3	0	20	27	22	24	7	287
Mgmt. Unit 4	5	33	28	15	9	10	67

Weights and Measurements

Dressed weights, hind foot and metacarpal bone measurements are given in Tables 7, 8 and 9.

Average dressed weights for male deer ranged from 71 pounds for 1-1/2 year old animals to 132 pounds for deer 5-1/2 years of age and older. The largest buck checked in 1961 field dressed 162 pounds and was 4-1/2 years old. Weight losses, in association with the rut, are shown for bucks for the period of October 15 through November 30 in Table 10. Four and one half year old bucks lost an average of 42 pounds during this period.

A great deal of variation was noted in individual hind foot measurements, due, at least in part, to field techniques. The measurements of the metacarpal bone lengths are subject to much less error and should be indicative of trends on specific ranges as well as a comparison of different areas. Average metacarpal lengths for male deer were similar in all age classes to those of 1960 and Unit 3 and all of Southeast Alaska. Samples for Units 1, 2 and 4 were too small to be compared.

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Table 7. Average dressed weights (pounds) of deer for each age class in the 1961 hunter harvest.

	Age Class for Male Deer						Sample
	Fawn	1-1/2	2-1/2	3-1/2	4-1/2	5-1/2	Size
Mgmt. Unit 1	35	78	78	119	126	121	17
Mgmt. Unit 2	35	79		129	118	118	9
Mgmt. Unit 3		68	89	107	124	125	100
Mgmt. Unit 4		70	82	100			6
All SE Alaska	35	71	88	110	124	124	132
	Age Class for Female Deer						
All SE Alaska	38	58	65	75	78	68	30

Table 8. Chronological dressed weights (pounds) for male deer in the 1961 hunter harvest.

	Age Class				
Period	1-1/2	2-1/2	3-1/2	4-1/2	5-1/2
10/16 to 11/1	75	90	116	150	138
11/1 to 11/15	67	90	111	129	120
11/15 to 11/30	66	88	100	108	114
Sample Size	13	28	17	28	5

Table 9. Average hind foot lengths (inches) of deer for each age class in the 1961 hunter harvest.

	Age Classes for Male Deer						Sample
	Fawn	1-1/2	2-1/2	3-1/2	4-1/2	5-1/2	Size
Mgmt. Unit 1		17.0		17.4	16.9	17.2	14
Mgmt. Unit 2	15.0	16.5		18.0	17.0		8
Mgmt. Unit 3		16.6	17.3	17.3	16.9	17.6	92
Mgmt. Unit 4		16.5	17.8	16.4			5
All SE Alaska	15.0	16.7	17.3	17.3	16.9	17.5	119
	Age Classes for Female Deer						
All SE Alaska	14.3	15.9	16.2	16.5	16.2	17.0	22

Table 10. Metacarpal bone lengths (millimeters) of deer taken in the 1961 hunter harvest.

	Age Classes for Male Deer						Sample
	Fawn	1-1/2	2-1/2	3-1/2	4-1/2	5-1/2	Size
Mgmt. Unit 1	149.3	174.4	173.2	176.7	173.0		25
Mgmt. Unit 2	150.5	168.0	184.0	178.0	181.0	169.0	11
Mgmt. Unit 3		171.1	177.0	177.8	178.8	175.0	137
Mgmt. Unit 4		164.0	169.3	177.3	171.2		15
All SE Alaska	149.8	171.2	176.1	177.6	177.5	174.3	
Sample Size	5	34	50	38	50	11	188
	Age Classes for Female Deer						
All SE Alaska	150.1	162.8	165.6	167.4	167.4	156.7	52

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaksa Wildlife Investigations

Work Plan: A Title: Sitka Black-Tailed Deer Investigations

Job No: 1-e Title: Range Studies, Southeast Alaska

PERIOD COVERED: July 15, 1961 to June 30, 1962

ABSTRACT

Utilization of winter deer range averaged 73 per cent for 1962, the highest value since 1959 when it was 74 per cent and 1956 when it was 86 per cent. In spite of the heavy use, browse species in most localities still show good vigor. A technique was developed and published to furnish a standardized system which is applicable for use by U. S. Forest Service personnel in a cooperative range program. Fifteen additional browse utilization transects were established.

RECOMMENDATIONS

Standardized techniques have been developed and published for U. S. Forest Service personnel to use in determination of future winter range utilization. Assistance should be given the U. S. Forest Service in 1963 in establishing condition and trend transects to determine long term changes. Attention should be given to other factors such as logging and forest pesticide sprays which now or in the future will influence deer habitat.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: A Title: Sitka Black-Tailed Deer Investigations

Job No: 1-e Title: Range Studies, Southeast Alaska

PERIOD COVERED: July 15, 1961 to June 30, 1962

OBJECTIVES

To determine the relative degree of utilization of various food species by deer with emphasis on winter use of browse and changes in density and vigor of browse species.

To determine the affects of population density and weather conditions on degree of use, species and zones of utilization.

TECHNIQUES

A cooperative agreement was entered into whereby U.S. Forest Service personnel are responsible for the majority of the field work of reading and establishing browse transects and deer exclosures. The Department furnishes technical advise and analyzes the results.

Winter browse utilization was determined by checking transects throughout Southeast Alaska in April and May. U.S. Forest Service personnel assisted in all areas to gain knowledge in the technique. Utilization is measured by determining the percentage of the current year's growth of Vaccinium ovalifolium and V. parvifolium which deer have eaten.

FINDINGS

Winter browse utilization averaged 73 per cent for all of Southeast Alaska. In recent years, the only higher use was in

1959 (74 per cent) and 1956 (86 per cent). Utilization, plant vigor and plant height for all areas are given in Table 1. Table 2 compares utilization and winter mortality values from 1956 through 1962. Both utilization and mortality are directly related to winter weather conditions as well as deer abundance. Although the past winter was not exceptionally severe, snow covered the ground in some localities from late November until April. Deer utilize forbs extensively as long as available; however, even light snow cover forces them to depend primarily on woody plant species of which Vaccinium ovalifolium and V. parvifolium are the most important. As deer cannot survive for extended periods of time on browse species alone, the length of time the ground is covered with snow is as important as the actual snow depth.

The Helm Bay transect was the only site checked which showed lower use in 1962 than in 1961. Utilization was highest near Petersburg (88 per cent) followed closely by Sitka and Juneau which had 84 per cent each. The lowest utilization values were observed on southern Prince of Wales Island and at Thoms Place on Wrangell Island. Even though utilization figures were high, most areas showed good vigor. One winter of heavy use does not normally cause severe range deterioration; however, two or three such years in succession would.

A paper entitled "A Technique for Evaluating Browse Utilization and Range Condition on Sitka Black-Tailed Deer Habitat in Southeast Alaska" was written and is included in the Appendix. This provides a set of standards for evaluating deer ranges and for establishing transects and deer exclosures. It has been provided to the U.S. Forest Service for use as a guide in the cooperative range program. Training sessions were held at each ranger district to instruct personnel in the field application of this technique.

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Table 1. Utilization and vigor of Vaccinium ovalifolium and V. parvifolium on deer winter range, Southeast Alaska, 1961-1962.

Location	Per Cent Utilization	Vigor	Plant Height	Location	Per Cent Utilization	Vigor	Plant Height
Ketchikan	62	1.8	30	Juneau	83	1.9	26
Carroll Inlet	78	1.9	32	Eliza Harbor	71	1.8	27
George Inlet	86	2.1	28	Pybus Bay	84	2.0	21
Gravina Island	65	1.6	33	Gambier Bay	76	1.8	30
Helm Bay	59	2.5	27	Mole Harbor	95	1.9	25
Polk Inlet	21	1.4	33	King Salmon Bay	91	2.0	25
Thorne Bay	61	1.6	27	Point Hilda	82	2.1	25
Craig	42	1.6	31	Sitka	84	1.8	27
San Alberto Bay	56	1.5	33	Hood Bay	83	1.3	28
Warm Chuck Inlet	31	1.5	36	Naquasina Passage	92	2.0	24
Port St. Nicholas	22	1.6	31	Fish Bay	68	2.0	29
Halibut Harbor	59	1.9	22	Port Krestof	72	1.8	28
				Uskh Bay	92	1.7	25
Wrangell	66	2.1	30	Katherine Island	87	1.8	31
So. Etolin Island	49	1.8	29	Hoonah Sound	95	1.9	22
Thoms Place	32	1.8	30				
Anita Bay	79	2.2	32	All Southeast Alaska	73	1.9	28
St. Johns Harbor	82	2.4	27				
No. Woronkofski Is.	72	2.1	32				
So. Woronkofski Is.	80	2.1	32				
Petersburg	88	2.0	27				
Duncan Canal	94	1.8	30				
Totel Bay	60	2.1	23				
Big John Bay	84	1.8	29				
Portage Bay	94	2.1	24				
Fivemile Creek	98	2.3	28				
Wrangell Narrows	98	2.0	30				

Table 2. Comparison of winter browse utilization by deer and winter mortality in Southeast Alaska from 1956 to 1962.

Year	Per Cent Utilization	Winter Mortality
1956	86	2.3
1957	44	0.1
1958	43	0.0
1959	74	0.2
1960	66	0.1
1961	57	0.1
1962	73	1.0

APPENDIX

A Technique for Evaluating Browse Utilization and Range Condition on Sitka Black-Tailed Deer Habitat in Southeast Alaska

Knowledge of habitat conditions and the changes thereon are essential for the proper management of any big game species. This paper describes a method for evaluating the use of key browse species and determining range conditions on important winter range areas used by the Sitka black-tailed deer in Southeast Alaska. The method is designed to enable personnel with a limited amount of training to provide consistent and accurate information with a minimum of time and effort, and to permit the coverage of large geographical areas by a small number of personnel.

Utilization of key browse species on critical winter ranges and condition and trend information will be derived from:

1. Browse utilization transects.

2. Line intercept transects for condition and trend.

3. Deer exclosures.

Units, consisting of one utilization transect, two condition and trend transects, and a deer exclosure, will be established in selected index areas and assigned a unit number.

Selection of Index Areas

Transects and exclosures will be located in key winter areas used by deer. Index areas, preferably gentle sloping gravel beaches, should be of southerly exposure, of climax spruce-hemlock or hemlock-cedar type and in locations adjacent to protected waters to facilitate access from the water without undue risk to personnel or equipment. Units should be within the beach fringe area (usually within 100 yards of the edge of the beach fringe timber) as this is the area which deer are forced to utilize during critical periods of heavy snowfall.

Unit locations are to be marked with signs which are readily visible from the water. Signs should be 24 inches by 32 inches in size and white in color, with the following information printed on each sign in large black letters:

DEER RANGE UNIT
No.____
U. S. Forest Service
Alaska Dept. of Fish and Game

The location of the unit sign will be described on a permanent record form by general locality and by at least two compass bearings to well defined landmarks, and the location of each unit plotted on a USGS 1:63, 360 topographic map.

Numbering of Units

Assuming a unit is designated No. 1, the utilization transect would be Transect No. 1, the condition and trend transects Transect No. 1-a and No. 1-b respectively, and the deer exclosure Exclosure No. 1.

Browse Utilization Transects

Location of Transects: Transects are to be 40 chains in length, with stations at two-chain intervals along the transect. Station No. 0 will be at the point of beginning and Station No. 20 at the end of each transect. Station No. 0 is to be located by a bearing and distance from the unit sign. Utilization readings will commence with Station No. 1 of each transect. Transect routes are to follow the contour of the land and be approximately the same distance from the edge of the beach fringe timber at all points. At each two-chain station along the transect, from Station No. 0 to Station No. 20, a reference stake, which may be cut from native material, is to be driven into the ground. Stakes should project at least three feet above the surface of the ground and the tops blazed and painted with fluorescent orange paint. An aluminum tag with the station number stamped on it should be securely attached to each stake and Station No. 0 marked with an additional aluminum tag stamped with the transect number.

Distances between stations are to be slope chained and the bearings and distances recorded on the permanent record forms. Trees along the transect route should be well blazed and the blazes painted fluorescent orange to facilitate following.

Selection of Key Browse Plants: Utilization will be determined from observations of Vaccinium ovalifolium (blue

huckleberry) or, if these aren't available, Vaccinium parvifolium (red huckleberry) may be used. The closest representative plant to the station stake should be marked with both securely placed orange plastic tape to facilitate relocation of the plant and an aluminum tag stamped with the corresponding station number in case the orange flagging should be lost. Bearings and distances from the station stake to selected plants are to be recorded on the permanent record form. Selected plants should be between 12 and 48 inches in height, preferably about 18 inches to 30 inches and in locations which are available to deer. Plants less than 12 inches in height are not normally available during the critical period of winter use due to snow cover and plants taller than 48 inches are not normally utilized. If a plant less than 18 inches tall is selected, the utilization on the entire plant is determined; however, if the plant is taller than 18 inches, one branch is marked, the flag and tag being placed at a point approximately 18 inches from the distal end of the branch. Utilization readings will only be determined from twigs above the flag. This means that when a large plant with several branches is tagged, utilization readings will be obtained from only the one tagged branch of that plant. If no plant is available within a 50 link radius of the station stake, a record is made in the field notes that no plants were marked. In such cases, utilization will be determined from the number of stations where plants were actually tagged and the utilization measured.

Measuring Browse Utilization: Browse utilization will be determined from the percentage of total leaders (twigs) above the flag on the tagged branch which have been clipped by deer during the current period of winter use. Measurements should be made in late March and April each year, after winter utilization has ceased but before new growth has commenced. First, the total number of browsed leaders are counted, disregarding twigs having 1/4 inch or more dead wood at the tip, as these are considered to be the previous year's utilization. Unbrowsed twigs over two inches in length are next counted. Total utilization is then determined, to the closest 10 per cent, by dividing the number of browsed leaders by the total number of browsed and unbrowsed leaders. The average utilization for the transect is determined by dividing the sum of the utilization figures for all stations on the transect by the number of stations where tagged plants were observed.

Condition of Browse Plants: The general plant condition and height are also to be recorded at the same time that utilization is determined. A condition index will be assigned to each plant on a scale of three as follows:

1 = good, vigorous plant, leader growth 4 to 6 inches in length, very little dead wood.

2 = average plant, leader growth averages less than 4 inches in length, less than 25 per cent dead wood.

3 = decadent plant, leaders spindly, sparse and less than 4 inches in length, 25 per cent or more dead wood.

Plant height will be measured in inches. Measurements should be on a vertical plane from the base of the plant to the highest leader, not including the leaves.

Condition and Trend Transects

Two condition and trend transects, each 50 feet in length, will be established in each range unit with the utilization transect. These transects will be read during the months of July through September at five year intervals. Long term changes in the habitat will be measured by reference to the density of forbs and woody plants, the per cent ground cover of woody plants, and the condition and age of key browse species, Vaccinium ovalifolium and Vaccinium parvifolium.

Location of Transects: Condition and trend transects will be referenced by bearings and distances from Station No. 0 of each utilization transect. The beginning point of each condition and trend transect will be within 50 feet of the reference stake. The two condition and trend transects will form an included angle of at least 45 degrees when they are extended to a point of interception. Transects are to be located so that a stretched tape would be approximately equidistant from the ground at all points. No correction will be made for slope distances; however, the grade along the transect should not be greater than 15 per cent.

A 50 foot steel tape is to be stretched taut, under about 20 pounds tension, between two steel rods which have been driven

firmly into the ground. The tape should be parallel and as close as possible to the ground, but should not touch at any point. Using a plumb bob, permanent iron pipes (1-1/2 inches ID, 36 inches in length, with iron caps) are to be driven into the ground directly beneath the 0 and 50 foot markers leaving about 6 inches of the pipe exposed. The portion of the pipe above the ground is painted fluorescent orange and punch marks placed on the iron caps. Transect numbers will be stamped on the cap of the pipe marking the end of the transect. The bearing between the 0 and 50 foot markers will be recorded on the permanent record form. A reference stake approximately 4 feet in height will be placed beside the 0 marker to facilitate relocation.

Measuring Condition and Trend Transects: A steel tape is stretched between two steel rods so that the 0 and 50 foot marks are directly over the punch marks on the iron pipes. Height of the tape at each end is recorded and the same height used for each successive reading. Moving the plumb line along the tape, hits occurring directly above or below the stretched tape on all types of vegetation are recorded as follows:

1. Woody plants

   Key browse species V. ovalifolium and V. parvifolium - record the total ground cover, height, condition and age of the plant.

   Other woody plants (except conifer seedlings) - record only the total ground cover for each species. Coverage for trees above 6 feet in height will not be included.

2. Conifer seedlings (less than 6 inches in height).

   Record only number of plant hits (only one hit per plant).

3. Forbs

   Record number of plant hits (only one hit per plant).

Beginning at the 0 end of the transect, the plumb line is moved along the tape until a plant is encountered. If any portion of a forb or conifer seedling is encountered, including the leaves, a hit is recorded under the appropriate species. When a woody

plant is encountered, record the points, including leaves, of first and last contact, even though there may be open spaces between the branches, under "From" and "To" on the field form. The plumb line is held above the tape to determine coverage for plants which have branches extending above the tape. Nonproductive ground--bare ground, rock, litter or moss -- reflected by an absence of plant species is not recorded.

Height, condition and age of key browse species, V. ovalifolium and V. parvifolium, are recorded by the following standards:

1. Height - measured in inches on a vertical plane from the base of the plant to the uppermost leaves.

2. Condition

   1 = good, vigorous plant, leader growth 4 to 6 inches in length, very little dead wood.

   2 = average plant, leader growth averages less than 4 inches in length, less than 25 per cent dead wood.

   3 = decadent plant, leaders spindly, sparse and less than 4 inches in length, 25 per cent or more dead wood.

3. Age

   Seedling = stem diameter at 2 inches above the ground less than 1/8 inch

   Young = stem diameter at 2 inches above the ground 1/8 to 1/4 inches

   Mature = stem diameter at 2 inches above the ground more than 1/4 inch

In many cases more than one story of vegetation will be measured. In the case of forbs, the over-story of woody plants must be held aside to enable the plumb to reach the ground level.

In places where plants overlap, the ground coverage of each plant will be determined separately.

Photographs: A photograph will be made of each transect at the time of each reading. The camera will be placed on a tripod directly over the pipe at the 0 end of the transect. Height of the camera lens will vary with topography, but should be recorded and the same height used in future photographs. The camera will be focused at the 20 foot mark, using the tape as the center of the photograph. Frame size will be at least 2-1/4 inches by 2-1/4 inches and Kodak Ektachrome or equivalent film will be used. A blackboard showing the transect number, location and date of exposure will be included in the photograph.

Deer Exclosures

Location: Deer exclosures are to be constructed in the immediate area of each utilization transect on relatively level ground, usually within 100 feet of Station No. 0 of the transect. The exclosure should be readily visible from the initial station of the utilization transect, but should not interfere with the utilization or conditon and trend transects. The primary purpose of the exclosures is to provide immediate visual comparison between used and unused deer range.

Construction Techniques: Exclosures shall be rectangular in shape and 12.6 feet by 19.2 feet in size. The fence will be of 1 inch, 18 gauge, galvanized wire mesh or equivalent and 6 feet in height. Ten posts, 4 by 4 cedar or equivalent, and 8 feet in length shall be implanted to a depth of approximately 2 feet and guyed with #6 gauge galvanized wire or equivalent. Three posts will be placed on each end of the exclosure and four on each side. Spaces at bottom caused by uneven ground will be blocked with debris. Within the actual exclosure, a two milacre plot (6.6 feet by 13.2 feet) shall be established and each corner marked with an iron rod painted orange. This will allow for a 3 foot buffer zone on all sides between the exclosure fence and the actual plot.

One of the iron rods, designating the plot corners within the exclosure, shall be designated as a photo point. Camera height is to be 24 inches and point of focus, the midpoint of the plot. Photographs will be taken at five-year intervals at the time when condition and trend transects are read. Frame size will be at least 2-1/4 by 2-1/4 inches and Kodak Ektachrome or equivalent film will be used.

Equipment and Materials Needed for Each Unit

General Equipment

Axe
Hammer
Compass
Shovel
Locality maps (USGS, 1:63, 360)
Clipboard
Recording forms (permanent record, utilization and condition and trend)

Materials for Utilization Transects

21 stakes, 4 feet in length (may be cut on location)
Orange plastic tape for flagging
Two sets aluminum tags stamped from 0 to 20
Two-chain steel tape
Orange fluorescent paint
One aluminum tag stamped with transect number

Materials for Condition and Trend Transects (two transects)

Two 6 foot steel rods
50 foot steel tape
Plumb line
Six foot steel tape
Four sections iron pipe, 1-1/2" ID by 36" long
Four caps for iron pipes
Center punch
Punch for transect number
Orange fluorescent paint
Camera and film
Tripod
Exposure meter

Materials for Deer Exclosures

Ten 4 by 4 cedar posts or angle iron posts 8 feet long
70 lineal feet, one inch mesh, 18 gauge galvanized wire 6 feet high
1/4# hog rings and pliers for fastening wire
1 1/2# 1-1/2 inch staples
Four 3/8 inch steel rods, 36 inches long
50 foot tape measure
Orange fluorescent paint
80 foot (±) No. 6 gauge galvanized wire for guys
Aluminum tag, 3 by 5 inches in size, stamped with the exclosure number and the date established

Deer Browse Utilization Transect Field Form

Transect No. ..... **Location of Transect** ..... **Observers** .....

Date Checked ....

Station Number	Plant Species		No. Twigs Browsed	No. Twigs Unbrowsed	Percent Utilization	Cond. Index	Plant Height
	V.O.	V.P.					
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
Totals							

Ave. Percent Utilization ..... Ave. Condition Index ..... Ave. Plant Height .....

Deer Mortality

No.	Sex	Condition of Bone Marrow	Check if Collected	
			Pelvic Bone	Jaw
1				
2				
3				
4				
5				

Remarks:

Aids For Reading Browse Utilization Transects

Condition Index of Browse Plants

1 — good, vigorous plant, leader growth 4 to 6 inches in length, very little dead wood.

2 — average plant, leader growth averages less than 4 inches in length, less than 25 percent dead wood.

3 — decadent plant, leaders spindly, sparse and less than 4 inches in length, less than 25 percent dead wood.

Plant Height

Measurements are in inches on a vertical plane from the base of the plant to the highest leader and should not include the leaves.

Utilization

Leaders (twigs) must be at least 2 inches in length to be counted.

All twigs above plant tag showing current utilization counted.

Utilized leaders with ¼ inch or more dead wood on tip are considered previous year's utilization.

Aids For Checking Deer Mortality

Age

Collect jaw and attach tag. Record number and location on tag.

Condition

Break femur (uppermost bone of hind leg) and record color and consistency of marrow as: white-solid, grey-solid, pink-solid, pink-semisolid, pink jellatinous, pink-watery, pink-string or empty.

Sex

Determine by presence or absence of antler pedicels on skull. If no skull present, collect and tag pelvic bone. Record number and location on tag.

Location of Stations and Tagged Plants

Bearings and Distances Between Stations

Station	Bearing	Distance (chains)
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Bearings and Distances From Stations to Tagged Plants

Station	Bearing	Distance (links)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Permanent Record Form For Deer Range Units

Unit No. .....

Browse Utilization Transect No. ..... Established .....

Condition and Trend Transect No. ..... Established .....

Condition and Trend Transect No. ..... Established .....

Location of Range Unit

General Description: .....

.....

.....

.....

Bearings to Local Landmarks:

..... bears ..... degrees from unit sign

..... bears ..... degrees from unit sign

..... bears ..... degrees from unit sign

Sta. No. 0 of Browse Utilization Transect No. ..... bears ..... degrees and is ..... links from the unit sign.

Sta. 0.0 of Condition and Trend transect No. ..... bears ..... degrees and is ..... feet from Sta. No. 0 of Browse Utilization Transect No. ..... Transit bears ..... degrees from sta. 0.0. Camera height is ..... inches.

Sta. 0.0 of Condition and Trend Transect No. ..... bears ..... degrees and is ..... feet from Sta. No. 0 of Browse Utilization Transect No. ..... Transit bears ..... degrees from sta. 0.0. Camera height is ..... inches.

Deer Exclosure No. ..... bears ..... degrees and is ..... feet from Sta. 0 of Browse Transect No. .....

Photo point for deer exclosure is rod which marks the ..... corner of plot

Site Description

Forest Composition: .....

.....

Beach Type: .....

.....

Slope ..... Aspect .....

Remarks:

DEER RANGE CONDITION AND TREND TRANSECT FIELD FORM

Transect No. ____________ Location of Transect ______________________________ Observers ____________________

Date Checked ____________ ______________________________ ____________________

Tape Height at 0 ________ Tape Height at 50 ________

Bearing of Transect from 0 to 50 ____________________

Vaccinium spp.						Other Woody Plants												Conifer Seedlings					Forbs								
From	To	Total	Height	Condition	Age	From	To	Total	From	To	Total	From	To	Total	From	To	Total	Hemlock	Spruce	Cedar											
Totals																															

Remarks:

Photo Data
Camera Size ____________
Film Name ____________
Film Index ____________
Camera Height ____________

Aids For Reading Condition And Trend Transects

Condition Index for Vaccinium spp.

1—good, vigorous plant, leader growth 4 to 6 inches in length, very little dead wood.

2—average plant, leader growth averages less than 4 inches in length, less than 25 per cent dead wood.

3—decadent plant, leaders spindly, sparse and less than 4 inches in length, 25 per cent or more dead wood.

Age Classes for Vaccinium spp.

Seedling—stem diameter at 2 inches above the ground less than ⅛ inch.

Young—stem diameter at 2 inches above the ground ⅛ to ¼ inches.

Mature—stem diameter at 2 inches above the ground more than ¼ inches.

Plant Height

Measurements are in inches on a vertical plane from the base of the plant to the highest leader and should include the leaves.

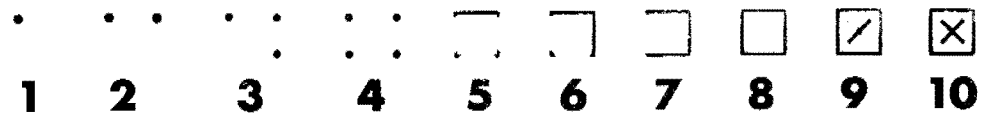
Conifer Seedlings

If less than 6 inches in height, record only as a hit; if more than 6 inches in height, record as a woody plant.

Forbs

Record only number of hits (one hit per plant).

Method of Recording Hits



JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: A Title: Sitka Black-Tailed Deer Investigations

Job No: 1-f Title: Physiology of Growth and Maintenance

PERIOD COVERED: July 1, 1961 to June 30, 1962

ABSTRACT

A portion of this study has been reported on in the publication, "Rumen contents analysis as an index to range quality," David R. Klein, Transactions of the 27th North American Wildlife Conference which was presented as a technical paper at the 27th North American Wildlife Conference. The remainder of the study is being prepared in thesis form.

RECOMMENDATIONS

Final results and conclusions of the study should be reviewed and suitable management techniques incorporated into the Department deer management program.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: A Title: Sitka Black-Tailed Deer Investigations

Job No: 1-f Title: Physiology of Growth and Maintenance

PERIOD COVERED: July 1, 1961 to June 30, 1962

OBJECTIVES

To determine the physiological factors affecting growth and maintenance in deer in Alaska and the criteria of the relationship of these factors to range types and conditions.

TECHNIQUES

During July 1961, field studies were conducted on Woronkofski Island. Sample specimens of deer were collected, weights and measurements and condition recorded and rumen samples collected for analysis.

Field work was accomplished with the assistance of biologist Kenneth Neiland and biological aid Gary Seawright in conjunction with studies under Work Plan M-2. Neiland examined all deer specimens collected to determine the degree of parasite infestation.

FINDINGS

All of the field study phase of the job has now been completed and data evaluation have been accomplished.

A portion of this study has been reported on in the publication, "Rumen contents analysis as an index to range quality," David R. Klein, Transactions of the 27th North Americal Wildlife

Conference which was presented as a technical paper at the 27th North American Wildlife Conference. The remainder of the study is being prepared in thesis form.

SUBMITTED BY:

David R. Klein
Game Biologist

APPROVED BY:

Don H. Strode
P-R Coordinator

James H. Brooks
Director, Division of Game

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: A Title: Sitka Black-Tailed Deer Investigations

Job No: 1-q Title: Productivity Studies, Southeast Alaska

PERIOD COVERED: July 1, 1961 to June 30, 1962

ABSTRACT

The first fawn was observed on June 11 and the peak of fawning occurred about June 21. Fawn:doe ratio for deer observed along the Mitkof Highway near Petersburg was 26:100. Reproductive tracts have been collected from 45 does.

RECOMMENDATIONS

Reproductive tracts from does should be obtained whenever possible. The material should be retained and all sent to a competent individual for examination. No animals should be collected for productivity information alone.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: A Title: Sitka Black-Tailed Deer Investigations

Job No: 1-g Title: Productivity Studies, Southeast Alaska

PERIOD COVERED: July 1, 1961 to June 30, 1962

OBJECTIVES

To determine productivity, reproductive potential, breeding age of both sexes, fawning dates and fawn survival for deer in Southeast Alaska.

TECHNIQUES

Road counts were made at Petersburg along the Mitkof Highway between 5:00 a.m. and 8:00 a.m. during June and July to acquire knowledge on fawning dates and productivity. Reproductive tracts were collected when possible from hunter and accident killed deer as well as those collected for scientific studies.

FINDINGS

The first newborn fawn was encountered on June 11 and weighed 5-1/4 pounds. No new fawns were seen after June 26. Fawning peak was about June 21. During road counts along the Mitkof Highway, 51 does and 13 fawns were observed. The doe:fawn ratio was 26:100 for the entire period and 31:100 from June 19 through June 26. Six of the 13 fawns counted were twins.

Reproductive tracts and embryos have been obtained from 45 deer throughout Southeast Alaska. Additional material will be collected when available and the total sample sent to a qualified person for examination.

SUBMITTED BY:

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JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: A Title: Sitka Black-Tailed Deer Investigations

Job No: 3-b Title: Abundance and Composition Surveys, Kodiak Area

PERIOD COVERED: December 1, 1961 to March 31, 1962

ABSTRACT

During the winter of 1961-1962 aerial surveys and on-the-ground counts were conducted in the Kodiak region as a means of assessing herd composition and winter distribution patterns. For the second consecutive year, mild winter during the month of December prevented the gathering of composition data prior to the shedding of antlers.

Surveys flown during February and March revealed several key winter ranges on northern Kodiak, all of which were in close juxtaposition with the coniferous forest climax.

RECOMMENDATIONS

Winter distribution and abundance data should be gathered on an annual basis to insure proper management of Kodiak Island deer herds.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: A Title: Sitka Black-Tailed Deer Investigations

Job No: 3-b Title: Abundance and Composition Surveys, Kodiak Area

PERIOD COVERED: December 1, 1961 to March 31, 1962

OBJECTIVES

To determine population abundance and sex and age composition of Kodiak deer herds.

TECHNIQUES

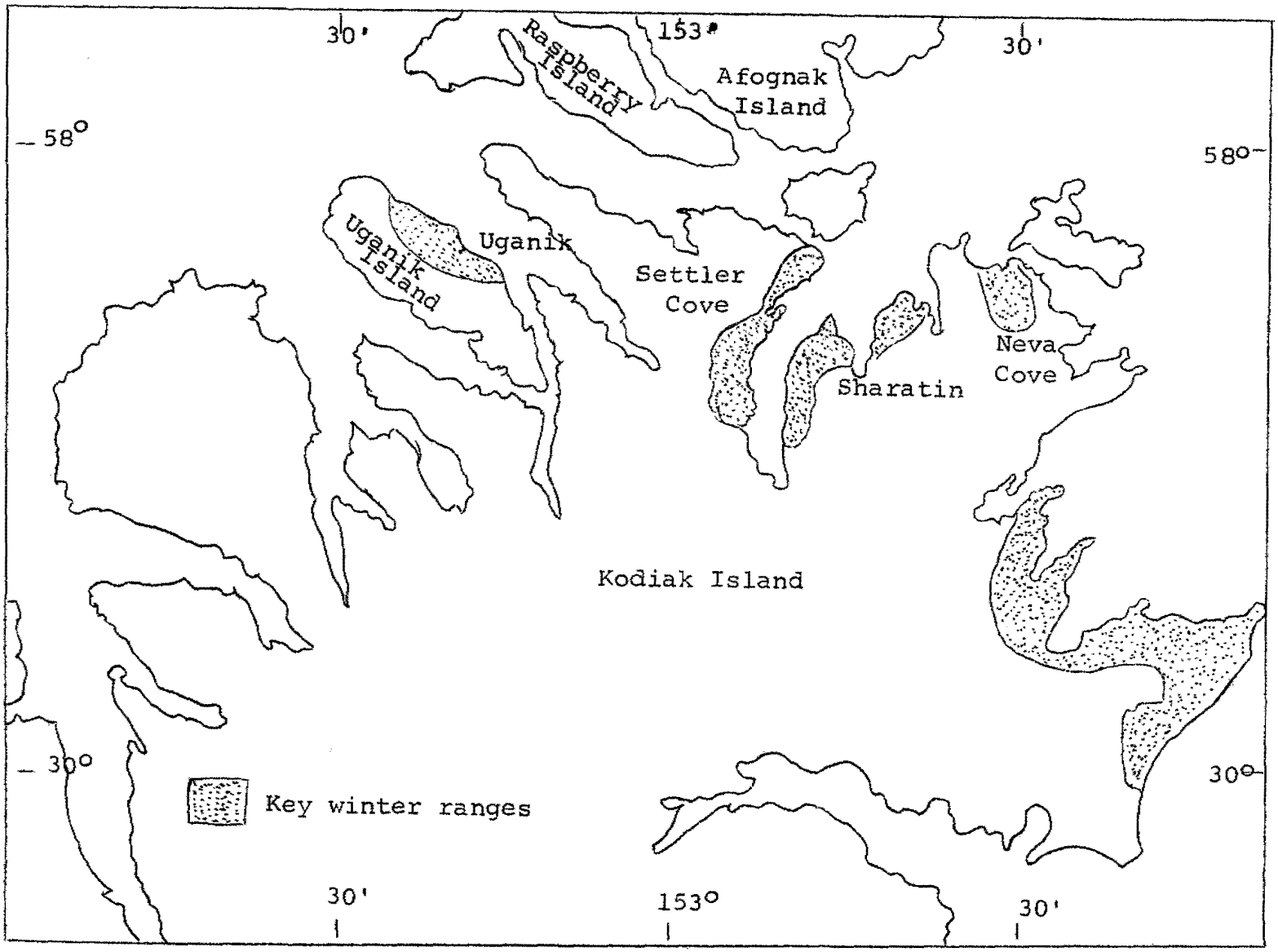
Aerial surveys were flown periodically throughout the winter of 1961-1962 as a means of assessing deer numbers and winter distribution. Ground observations to obtain sex and age composition data were conducted in December, prior to antler drop, but were again unsuccessful due to the lack of snow cover which is required to force deer onto coastal wintering ranges.

FINDINGS

Winter Distribution

During the months of February and March when sufficient snow forced deer onto coastal winter ranges, aerial surveys of northern Kodiak Island were conducted in order to access relative abundance and distribution of Island deer herds. At this time deer were found to occupy several distinct winter ranges (Figure 1) with widely scattered bands dispersed throughout the north coastal fringe of Kodiak Island. Of the several distinct winter ranges noted, Chiniak, Sharatin, Settler Cove, Neva Cove and Uganik were found to be the

Figure 1. Major wintering areas for deer inhabiting Kodiak Island, Alaska.



major winter concentration areas for Kodiak deer herds. Each of these five ranges occur within the limited Sitka spruce climax zone of northern Kodiak, a factor which apparently accounts, in part, for the successful establishment of the Sitka black-tail in this restricted portion of the Island.

The importance of the spruce climax in the ecology of deer inhabitating the Kodiak area has been apparent throughout surveys flown the past two winters. During periods of inclement weather Sitka black-tail deer, like Roosevelt elk of nearby Afognak Island, are found almost entirely within the dense spruce forest, only to venture into nearby shrublands to feed for short periods of time. Observations made during the winters of 1960-1961 and 1961-1962 revealed that no deer population of any magnitude occurs beyond the coniferous forest zone of the Kodiak Island group. The few isolated populations which have established themselves in the coniferless northwestern region of Kodiak can, in all probability, attribute their success to the relatively light snowfall of the past four or five years. It is the writer's belief that at such time as severe winter occurs in the Kodiak area, there will be heavy die-offs within these isolated populations.

Sex and Age Composition

The opportunity to ascertain sex and age composition for Kodiak deer herds did not present itself at any time during the past year due to the light snowfall and mild weather occurring in late fall and early winter.

SUBMITTED BY:

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APPROVED BY:

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P-R Coordinator

James W. Brooks
Director, Division of Game

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: A Title: Sitka Black-Tailed Deer Investigations

Job No: 3-c Title: Natural Mortality Survey, Kodiak

PERIOD COVERED: December 1, 1961 to April 30, 1962.

ABSTRACT

Natural mortality of deer populations in the Kodiak area during the winter of 1961-1962 was extremely light.

RECOMMENDATIONS

The collection of natural mortality data should be continued on an annual basis to insure proper management of Kodiak deer herds.

JOB COMPLETION REPORT
RESEARCH PRPJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: A Title: Sitka Black-Tailed Deer Investigations

Job No: 3-c Title: Natural Mortality Survey, Kodiak

PERIOD COVERED: December 1, 1961 to April 30, 1962

OBJECTIVES

To determine the sex and age composition and the extent and area-wise breakdown of natural mortality as an index to the winter welfare to Kodiak Island deer herds.

TECHNIQUES

Permanent winter mortality transects in key wintering areas established in 1961 were rechecked to record the extent of winter mortality. Beach transects were walked in March and April in the high tide zone in one direction and within 200 yards of the beach in the opposite direction. Carcasses and remains of any dead deer observed along the transects were recorded by sex and age and cause of death, if determinable through examination, was indicated. The mortality index for each transect is expressed as the number of carcasses recorded per mile of transect.

When possible, differential mortality and sex and age ratio data were gathered.

FINDINGS

During the months of March and April, nine one-mile mortality transects were walked in the Chiniak-Monashka Bay areas of north-eastern Kodiak Island. At the conclusion of checking all transects

only one deer carcass was found, which apparently represented a kill from the past winter.

Weather conditions during the winter of 1961-1962 permitted Kodiak deer to range over large areas resulting in a wide dispersal of carcasses; whereas during severe winters carcasses are concentrated along the beach fringe. Therefore, mortality during a mild or open winter may be much greater than beach surveys indicate.

Observations made during deer distribution surveys conducted in February indicated that the welfare of Kodiak deer herds at that time was good and that light winter mortality could be expected providing severe weather did not develop during the remaining portion of the winter.

SUBMITTED BY:

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APPROVED BY:

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James H. Brooks
Director, Division of Game

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: A Title: Sitka Black-Tailed Deer Investigations

Job No: 3-d Title: Characteristics of Hunter Harvest, Kodiak Area

PERIOD COVERED: August 20, 1961 to January 15, 1962

ABSTRACT

More than 500 hunters in the Kodiak area harvested 355 deer from Game Management Unit 8 during the 1961 season for a success of approximately 64 per cent for hunters bagging 1 or more animals. Of the total harvest, 170 or 48 per cent of the animals were bucks and 185 or 52 per cent were females. A sample of 59 deer jaws collected for aging purposes was found to be too small to either constitute a statistically significant representation of the harvest or suggest changes in the age structure of the population.

RECOMMENDATIONS

None.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

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OBJECTIVES

To secure information relative to the total deer kill for Game Management Unit 8, area and chronological distribution of the kill, and to evaluate the sex and age composition of the harvest.

TECHNIQUES

Harvest data for the 1961 deer season were gathered in a similar manner to that collected for the 1960 harvest report with the exception of the omission of the post-season hunter questionnaire. Information regarding hunting effort and distribution was obtained from in-the-field contacts with hunters and a post-season "on-the-street" interview.

Hunters contacted in the field were requested to report their kills and turn in deer jaws to Department personnel. Posters were distributed locally prior to the opening of the big game seasons and several advertisements were placed in the Kodiak Mirror requesting hunters to report their kills and turn in deer jaws.

As a means of obtaining data relevant to the population dynamics of Kodiak deer, lower jaws were collected throughout the season and later analyzed to establish the age structure of a sample of the 1961 harvest.

FINDINGS

Sex Breakdown of the Harvest

Of the total legal harvest of 355 deer the sex breakdown was 170 or 48 per cent males and 185 or 52 per cent females. The harvest by sexes during the 1961 season was comparable to the 1960 harvest when 44 per cent males and 56 per cent females were taken.

Age Distribution of the Kill

The age class distribution for 1961 was based on a sample of 59 jaws representing only 17 per cent of the legal harvest. Of the 59 jaws collected, 36 represented males and 23 females. The jaw sample collected during the 1961 season was found to be incomplete and too small to either constitute a statistically significant representation of the harvest or suggest changes in the age structure of the population. As such, no analysis of population structure was drawn from this sample.

The writer's absence from the Kodiak area during the final six weeks of the deer season accounts in part for the small number of jaws collected during 1961.

Distribution of the Kill by Area

As has been the case for a number of years the Kodiak road system continues to receive by far the greatest hunting effort of any Kodiak region, with the Chiniak, Broad Point and Mt. Heitman areas accounting for hearly 75 per cent of the harvest. The remaining 25 per cent of the harvest was well distributed throughout roadless northern Kodiak and adjacent islands.

During the past two years the Sharatin Bay, Neva Cove and Monashka Bay regions, all of which support good deer populations, have become increasingly popular with local hunters.

Chronological Distribution of the Harvest

Distribution of the harvest by sex and age classes again followed a previously observed pattern. During August and September and most of October, young males constitute the greater portion of the harvest, while following cool weather and the rut, older animals make up a significant proportion. Mature bucks inhabiting high, less accessible ranges moved to lowland areas

with the advent of the first heavy frosts which occurred the last week of October and early November. The greatest percentage of females in the kill occurred the latter half of November when hunters selected animals of either sex to fill their bag. Of the three month season, by far the greatest proportion of the harvest occurred during the final four weeks when deer were more readily available to the hunter.

Hunter Harvest - 1961

The 1961 deer season in Game Management Unit 8 (Kodiak Island group) was from September 1 through November 30. An additional 15 day special season was proclaimed during December to harvest additional surplus animals.

The bag limit for all areas within Unit 8 was two deer of either sex with the exception of the Kodiak road system where one animal of either sex could be harvested.

Hunter harvest information for the 1961 season was gathered from in-the-field contacts with hunters and a post season "on-the-street" interview with local Kodiak sportsmen.

Slightly more than 500 hunters legally harvested 355 deer from Game Management Unit 8 during the 1961 season for a success of approximately 64 per cent for hunters bagging 1 or more animals. The total harvest for 1961 was below that of 1960 primarily due to the one deer limit along the Kodiak road system.

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