ALASKA DEPARTMENT OF FISH AND GAME
JUNEAU, ALASKA

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WOLF INVESTIGATIONS

by

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Volume III
Annual Project Segment Report
Federal Aid in Wildlife Restoration Act
Project W-6-R-3, Work Plan K

The subject matter contained within these reports is often fragmentary in nature and the findings may not be conclusive; consequently, permission to publish the contents is withheld pending permission of the Department of Fish and Game.

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JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: K Title: Wolf Investigations

Job No: 1 Title: Wolf Predation on Sitka Black-Tailed Deer

PERIOD COVERED: July 1, 1961 to April 15, 1962

ABSTRACT

Coronation Island Study

A litter of pups was born in the spring of 1961 as a result of the release of two pairs of two-year old wolves on Coronation Island in October 1960. Later reports indicated that two adult female wolves were shot by fishermen during July at Egg Harbor.

Analysis of fecal droppings collected during the spring and summer indicate that the wolves on Coronation Island utilize harbor seal (Phoca vitulina) to a large degree. However, the remains of 23 deer, presumably killed by wolves, were found.

Cubes of seal blubber impegnated with numbered plastic discs were located at several stations on the island in the hope that the blubber would be ingested by wolves and the plastic discs in the fecal droppings would yield information about wolf movements.

Ten permanent vegetation photo plots were established on Coronation Island to show future changes in deer range conditions resulting from removal of deer by wolves.

Bounty Information

Numbers of wolves bountied in Southeastern Alaska during the years 1949 through 1959 have remained relatively constant. The age structure of the bounty harvest suggests that wolf populations are experiencing a high level of exploitation.

Forty-five per cent of a sample of 22 wolves bountied during the winter of 1961-1962 were juveniles under a year of age.

RECOMMENDATIONS

The Coronation Island study should be continued and the Photo Plot program should be expanded and supplemented with quantitative data such as line intercept transects.

Whenever available, skulls and reproductive parts of wolves should be saved.

The skulls of wolf specimens on hand should be used to provide teeth for sectioning to cross check age techniques.

An accurate record of the number of wolves bountied in Southeastern Alaska should be obtained by the Department of Fish and Game each year.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: K Title: Wolf Investigations

Job No: 1 Title: Wolf Predation on Sitka Black-Tailed Deer

PERIOD COVERED: July 1, 1961 to April 15, 1962

OBJECTIVES

To continue the collection of biological data from wolves with emphasis on morphological features, reproduction and age determination studies, and to determine the ecological relationships resulting from wolf predation on the Sitka black-tailed deer.

TECHNIQUES

Wolf carcasses obtained from trappers and bounty hunters provide measurements of growth and related morphological features of wolves in Southeastern Alaska. The skulls and the baculum in males were used for age determination studies. Reproductive tracts from wolves were preserved for examination to determine the chronology and sequence of events in the reproductive cycle of Southeastern Alaska wolves. The Coronation Island studies were conducted by the author with the assistance of Duane Johnson. Food habits of the Coronation Island wolves were determined by examination of fecal samples. Remains of deer presumably killed by the Coronation Island wolves provided information on sex, age, and physical condition of kills. Kills were marked with orange plastic tape to avoid duplication of data. Permanent vegetation photo plots were established and all photographs were taken with a 2-1/4 x 2-1/4 inch twin lens reflex camera. Information obtained from bounty affidavits was used to determine numbers of wolves bountied in Southeastern Alaska from 1949 to 1959, excluding 1957 during which the data are not complete.

FINDINGS

Coronation Island Wolf - Deer Observations

According to information obtained by Alaska Department of Fish and Game Biologist, Loren Croxton, the two ear-tagged female wolves released on Coronation Island in the fall of 1960 were shot and killed at Egg Harbor by a fisherman during July. One of the females was reported to have been lactating. Howling and tracks and scats seen throughout the summer indicated that both males survived.

Tracks of wolf pups were observed on August 2, 25, and 27. On August 11, while investigating a wolf rearing area similar to the one described in W-6-R-1, Job K-2, a wolf pup weighing 40 or 50 pounds, was attracted by the sound of a game call, simulating the distress call of a deer fawn, and was observed in the open from a distance of 20 yards. The presence of pups on the island substantiates for the first time that female wolves bear young at two years of age.

Wolf litters usually number about seven or eight pups. Providing no additional mortality ensued, seven juveniles and the two adult males constitute the Coronation Island wolf population.

The small size of Coronation Island (25 to 30 square miles), permits extensive coverage by foot. A day's travel overland will take a hiker to any desired portion of the island. In view of this aspect, inch cubes of seal blubber with imbedded numbered 3/8 inch diameter, white, plastic discs were left at the rearing area for the wolves to eat with the intention of tracing movements by relocating the discs in fecal samples. Of the 50 baits distributed, 48 were apparently injested by wolves but time did not allow a continued baiting of the area and no discs were recovered in scats.

Food Habits

Coronation Island wolves were dependent on harbor seals as food to an unusual degree. How the wolves managed to secure the 46 per cent frequency of seal remains occurring in scats is

not known. A seal rookery exists on the rocks just west of the entrance to Egg Harbor and on occasion seals haul out on the beaches at Windy Bay and near Helm Point. Past food habit studies on Kupreanof Island indicate that wolves feed primarily on deer when they are numerous. Table 1 shows the frequency of major food items contained in 146 scats examined during the spring and summer on Coronation Island.

Remains of 23 deer presumably killed by wolves were examined and all available information derived from these is contained in Table 2. Observations of deer on Coronation Island during the spring and summer are included in Table 3.

The effects of removal of deer by wolves will be most apparent in future range condition changes. These we presume will be dramatic since the Coronation Island deer range is grossly over-utilized. Available browse species such as Vaccinium sp. appear practically nonexistant. Interruption of the continuous removal of browse by deer will provide visual range condition changes in the future. Ten permanent vegetation photo plots comprising 25 photographs were established to provide comparisons between present and future range conditions.

Population Studies

In Southeastern Alaska the wolf range includes the 7,500 square miles of islands south of Frederick Sound. Information obtained from bounty affidavits from 1949 through 1959, excluding 1957, shows that the bounty hunter harvest averages 71 wolves per year or 1 wolf per 105 square miles per year. Numbers of wolves bountied have remained relatively constant during this period with a high of 85 bountied in 1952 and a low of 64 bountied in 1959. There is some indication that the harvest in 1957, for which adequate data are believed lacking, is far below the average of 71 animals.

Skulls of 90 wolves received from predator control operations and bounty hunters have been aged to date. Age techniques are reported in W-6-R-1 and 2, Jobs K-2 and K-1, respectively. Ages assigned to specimens collected during the 1961-1962 segment are found in Table 4. Figure 1 shows the baculum weights of males plotted against the ages assigned to the corresponding skull.

Table 1. Summary of analysis of wolf scats collected on Coronation Island during the spring and summer of 1961.

Deer		Harbor Seal		Unidentified	
No.	Per Cent	No.	Per Cent	No.	Per Cent
114	78	63	43	3	2

A total of 146 scats were examined. Of the scats (114) containing deer remains, 26 per cent contained remains of fawns.

Table 2. Information obtained from deer presumably killed by wolves on Coronation Island - 1960 and 1961.

Age		Sex		Condition (From bone marrow)	
Yrs.	No.	Category	No.	Category	No.
Under 1	5	Adult males	2	Good	11
1 - 2	1	Adult females	2	Poor	2
2 - 3	0	Adult (sex ?)	12	Unknown	10
3 - 4	1	Fawns	5		
4 - 5	4				
5 +	3				
Unknown	9				

Table 3. Deer observed on Coronation Island during the spring and summer of 1961.

Sex Composition

Males	Females	Unidentified
5	16	11

Age Composition

Adult	Yearlings	Fawns	Unidentified
25	2	1	4

Reaction to Human Presence		Reason Observed	
Alarmed	Not Alarmed	Called	Not Called
10	22	8	24

Table 4. Estimated ages of wolves by skull characteristics.*

Specimen No.	Sex	Ossification of Sutures	Sagittal Crest	Angle of Ramus	Tooth Wear	Bacula Wt. gms.	Bacula Length mm.	Estimated Age
PG-13-59	M	3	3+	3	medium	5.9	124	47 months
PG-52-61	M	2	2	2+	nil	2.0	109	13 months
PG-53-61	M	2	2	2+	nil+	3.1	105	19 months
PG-54-61	F	2+	2	3	slight			19 months
PG-55-61	M	1	1	1	nil+			7 months
PG-56-61	F	3	3	3	slight			32 months
PG-57-62	F	3	3	3	slight+			32 months
PG-58-62	F	1	1	1	nil+			8 months
PG-59-62	F	1	1	1	nil+			8 months
PG-60-62	F	2+	2+	3	slight			20 months
PG-61-62	F	1	missing	1	nil			8 months
PG-62-62	M	1	1	1	nil			8 months
PG-63-62	M	2+	3	2+	slight			20 months
PG-64-62	F	2+	2	2+	nil+			20 months
PG-65-61	M	-1	-1	-1	nil		less than	6 months
PG-66-61	M	-1	-1	-1	nil		less than	6 months
PG-67-61	F	-1	-1	-1	nil		less than	6 months
PG-68-61	F	-1	-1	-1	nil		less than	6 months
PG-69-62	F	2	2	2+	slight			21 months
PG-70-62	M				nil	2.4	99	11 months
PG-72-62	M					4.5	114	23 months?
PG-73-62	M					4.0	112	23 months

* Wolf specimen PG-13-59 was formerly aged as 35 months but is re-aged here on the basis of the baculum weight. Wolves PG-70, 72, and 73-62 were aged on the basis of bacula weights.

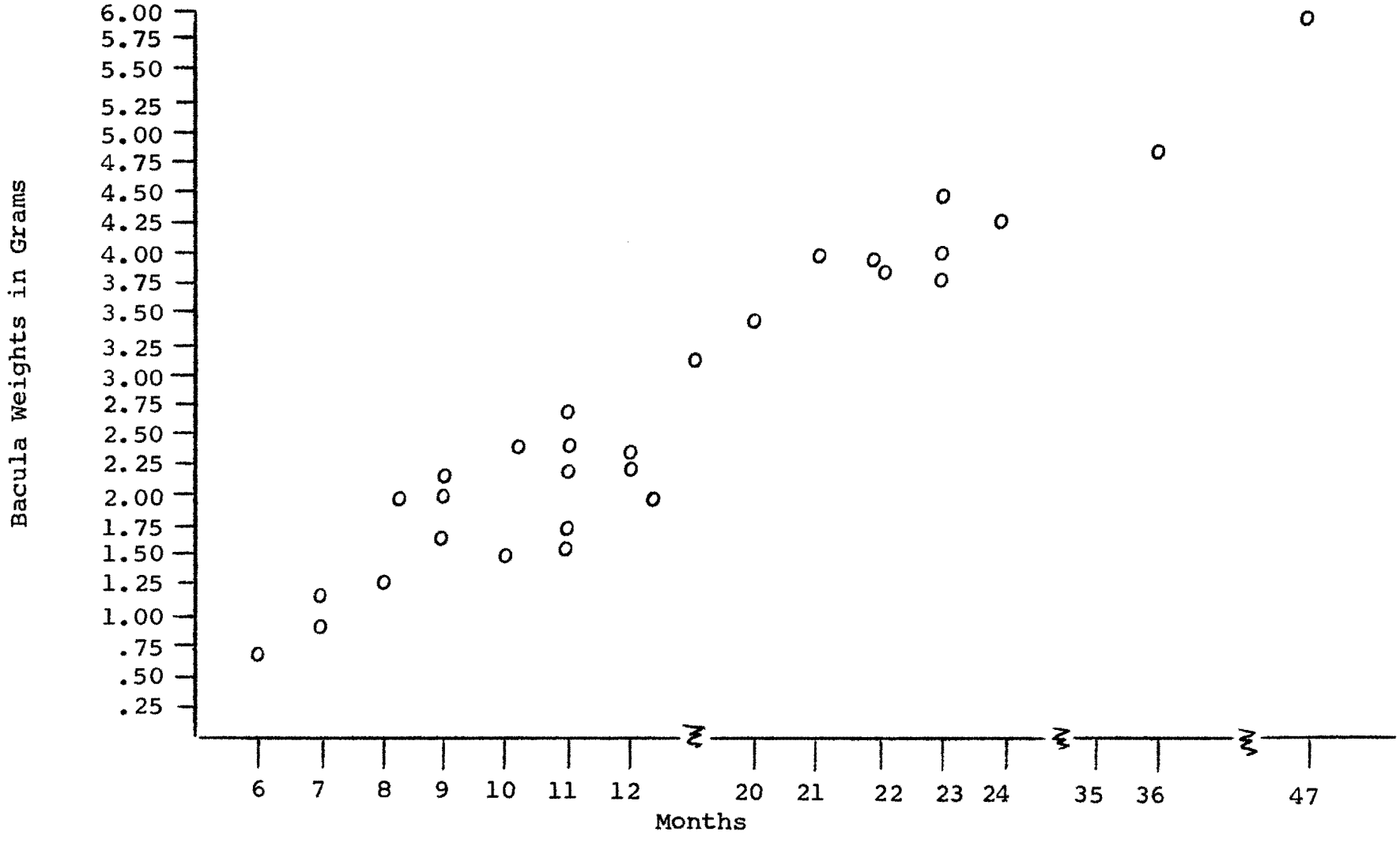

Figure 1. Bacula weights of wolves plotted against ages as determined by skull characteristics.

Recent studies by Alaska Department of Fish and Game Biologist, Robert Rausch, in arctic and subarctic regions, where wolves are shot from airplanes and age specific selectivity does not operate, show that the juvenile component under a year of age comprises approximately 50 per cent of the population. One would expect that if age-specific selectivity biased the sample it would be apparent from a comparison of wolves taken by distinctly different methods during the same period such as trapping and wolves taken incidental to hunting. The similarity of the percentage of various ages as sampled by the foregoing methods during the period 1957 through 1962 are evident in Figure 2.

Table 5 is the expected growth table of the female segment of the population using the following information derived from Southeastern Alaska wolf studies:

1. Mortality does not appear to be age specific.

2. A 50:50 sex ratio exists in the wolf population.

3. Females breed at age 22 months.

4. Wolf litters generally average around seven or eight animals.

5. Wild wolves do not live beyond six years of age.

Figure 3 is the growth curve derived from Table 5. Figure 4 shows the age structure of the theoretical population as derived from Table 5 and includes the aged sample of 90 wolves expanded by 3.2 times for comparative purposes. Our sample essentially superimposes the theoretical age structure curve. The calculations that provide the composite life table presented in Table 6 rest on the assumption that the aged sample is representative of the population. Using the data in Table 6, the mortality and survival curves are plotted in Figure 5.

Parallelism between the mortality and the survival curve is typical of data derived from heavily exploited populations and mortality curves from these generally assume the shape of a normal population curve such as ours does.

Although a harvest of 70 wolves per year represents heavy exploitation, our data show that recruitment can be affected by

Figure 2. Percentage frequency of age classes of wolves trapped and shot during the period 1957 - 1962.

Table 5. Theoretical wolf growth table (female component of population).

Year	Breeding Population	Reproductive Rate	Recruitment (Female)	Total Female Population
1	0	0	0	1
2	1	4	4	5
3	1	4	4	9
4	5	4	20	29
5	9	4	36	65
6	29	4	116	181

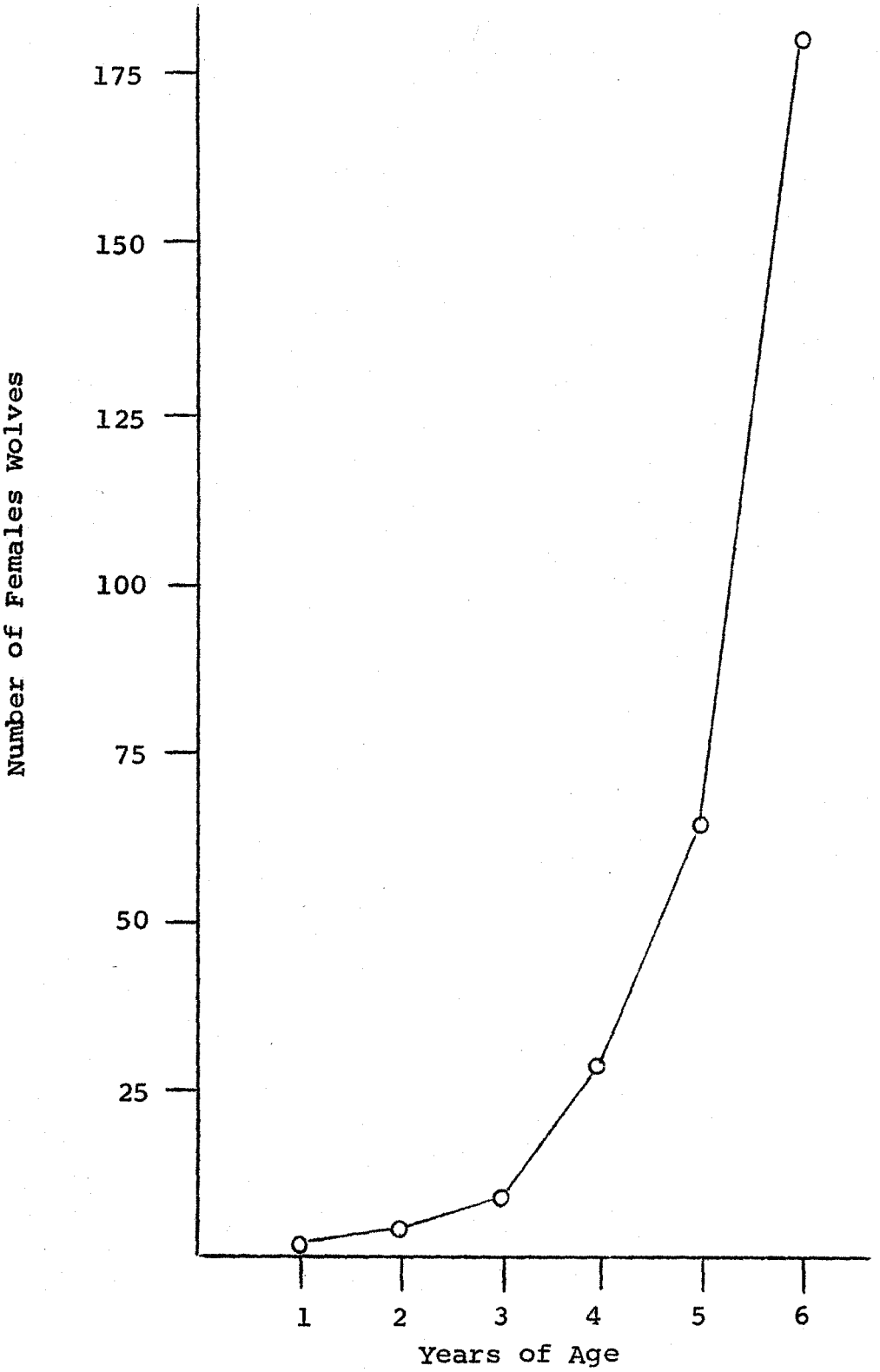

Figure 3. Wolf growth curve (females).

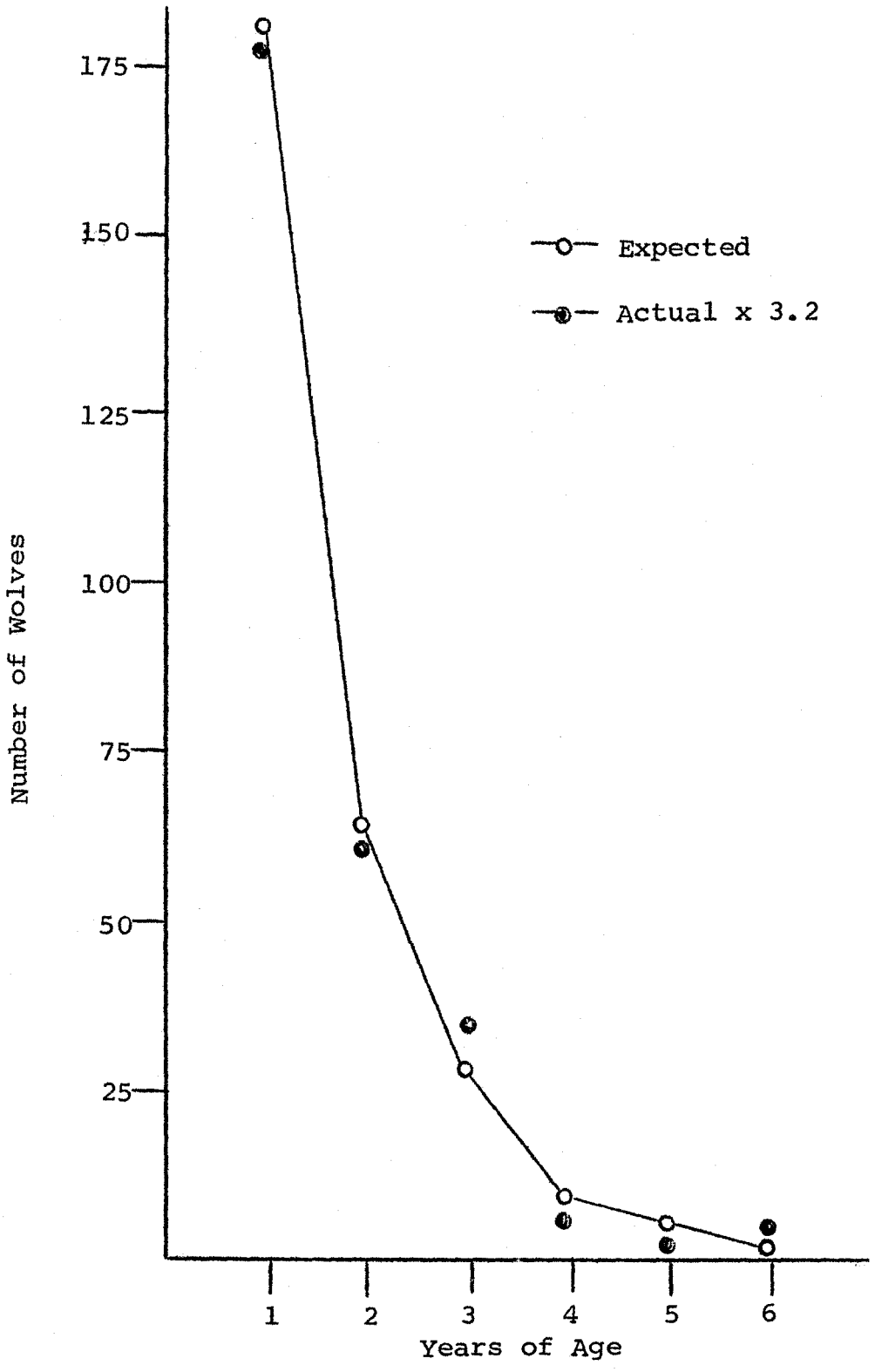

Figure 4. Comparison between expected and sampled age structure.

Table 6. Composite wolf life table.

Age Class	Sample Size n_x	No. Deaths Per 1000 d_x	No. Survivers Per 1000 l_x	Mortality Rate ($\frac{d_x}{l_x}$ x 1000) q_x	Mean No. Alive Between Age Class L_x	Mean Expectation of Life e_x
1	56	623	1000	623	688.5	1.12
2	19	211	377	560	271.5	1.15
3	11	122	166	735	105.0	1.00
4	2	22	44	500	33.0	1.25
5	1	11	22	500	16.5	1.00
6	1	11	11	1000	5.5	.50

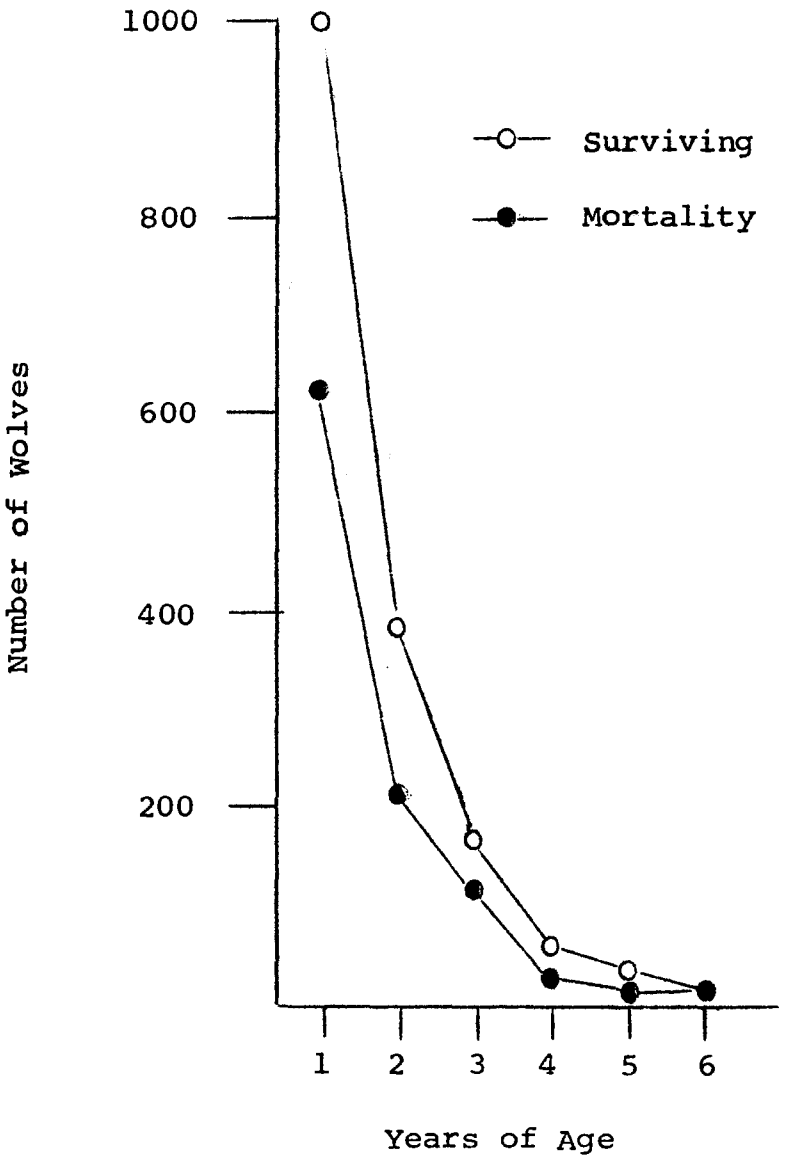

Figure 5. Mortality and survival curves.

doubling the number harvested or 140 wolves, more or less. Following parturation the wolf population numbering a little over 200 animals yields a density approximation 1 wolf per 40 square miles.

On Coronation Island in the early spring following the release of four wolves, sign of wolves in the form of beds, scats, deer kills, and tracks were virtually everywhere as compared to other areas within the wolf range. Here a known density approximating one wolf per seven square miles existed. On a comparative basis, emperical knowledge derived from 4 years of close attention to wolf sign in Southeastern forces me to reject estimates of wolves exceeding 1 wolf per 25 square miles. Using this figure as a maximum density, however, would place the wolf population at parturation as being around 300 animals.

If the wolf population were not at its saturation point at between 200 and 300 animals then it would be reasonable to expect a substantial increase in the population should removal of the bounty harvest be effected. Discontinuation of predator control operations after the winter of 1958 - 1959 have logically resulted in population increase. Coincidental with the expected rise in wolf population numbers, deer hunter success and total deer kill have risen yearly since 1959.

Reproduction

Presently, mortality rather than reproductive failure appears to be the limiting factor in the wolf population. Information on reproduction is lacking at present but in the future may prove to be of significant influence on population densities. Reproductive organs collected from 26 female and 24 male wolves are currently being analyzed by Dr. H. W. Mossman at the Bardeen Medical Laboratories of the University of Wisconsin in Madison, Wisconsin. A report of Dr. Mossman's findings will be submitted to the Department at a later date.

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JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: K Title: Wolf Investigations

Job No: 2 Title: Ecology of the Wolf in Southcentral Alaska

PERIOD COVERED: July 1, 1961 to May 31, 1962

ABSTRACT

On February 24, 1962, 57 hours were flown in 9 aircraft by 9 pilots and 12 observers in an attempt to census the wolves in the Nelchina wolf study area. Tracking and sighting conditions were good; 33 wolves were observed. One hundred and two wolves were represented by 27 track sightings of from 1 to 10 animals in each pack, averaging 3.8 wolves per pack. Coupling the number of wolves actually observed with those represented by tracks, a minimal figure of 135 was obtained; this then in terms of total hours flown (on February 24) represented 2.0 wolves per hour. The total wolf population was estimated to be between 145 and 160 animals. Of the 45 carcasses of big game animals located during this census, 17 had been fed upon by wolves. Wolf sign was scanty in the Talkeetna Mountains, but otherwise occurred randomly over the area. The results of the 1962 census were compared to those of the 1961 census. Twenty-three wolverines and 33 foxes were observed in addition to wolves. Twenty-nine wolves were seen on the study area other than during the census.

RECOMMENDATIONS

Any wolf census designed to encompass large tracts of land should be loosely scheduled so that the maximum advantage might be realized from the optimum sighting conditions whenever they might exist.

At least one individual in each aircraft (the pilot if possible) should be experienced in tracking wolves from the air.

A minimum of two 150 horsepower Supercubs and preferably four or more, should be utilized to accomplish any future census of the study area.

There should be a yearly census of wolves in the Nelchina study area for at least the next three years to determine if the population is expanding, and if it is, to measure its annual increment of growth.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: K Title: Wolf Investigations

Job No: 2 Title: Ecology of the Wolf in Southcentral Alaska

PERIOD COVERED: July 1, 1961 to May 31, 1962

OBJECTIVES

Primary

To determine the number of wolves in the Nelchina wolf study area, located in Game Management Units 13 and 14.

Secondary

To record pack sizes and color combinations; to record numbers and kinds of prey and carrion species; to record areas in which wolves were active; and to record the total number of wolverines and foxes observed during the census.

TECHNIQUES

Through the combined efforts of the U. S. Fish and Wildlife Service and the Alaska Department of Fish and Game, a census of the entire study area was conducted on February 24, 1962. Additional wolf data were accrued incidental to a caribou census carried on by the same personnel during February 25 and 26, 1962.

Twenty-one men in 9 aircraft conducted the wolf census within the boundaries of the 18,000 square mile study area in Game Management Unit 14 north of the Kashwitna River and Game Management Unit 13. The area was subdivided into nine segments and one aircraft was assigned to census each section. All nine sections were censused drainage by drainage until completely covered. Five 2-place, 150 horse-power Supercubs; one 2-place 150 horse-power

Champions; and three 4-place, 180 horse-power Cessnas were utilized. These afforded transportation and a feasible means to track wolves. A pilot and observer were present in each Supercub and the Champion; the Cessnas each carried two observers in addition to the pilot.

Other than emergency gear and winter clothing, no specialized equipment or materials, except aircraft, were utilized.

A tally of wolverines and foxes observed incidental to the census was maintained.

Of the 21 participants in this census, 13 had had previous experience tracking wolves from the air. The estimated experience varied from 20 hours to 2,500 hours per person and when 2 estimations, one of 1,500 and one of 2,500 hours, were detracted from the totals the average experience of the 11 remaining men was 101 hours.

Time and the configuration of the terrain made it impossible to land and inspect sufficient moose and caribou carcasses to allow an intelligent discussion of how these animals died.

Sightings of wolves, their tracks, and animals fed on by wolves were noted as to specific locality, these locations being entered upon a 1/250,000 scale U. S. Geological Survey map of the area.

Paxson Lodge (Mile 185, Richardson Highway) was selected as the base of operations because of its location and facilities.

Records of periodic wolf sightings in the study area were maintained from July 1, 1961, through May 31, 1962.

FINDINGS

This census was conducted February 24, 1962.

Tracking and sighting conditions were good. Snow depths varied from two to four feet; surface snow was loose and not so old as to allow an accumulation of confusing tracks, and snow-free, windblown areas were confined to a few isolated ridges.

Little or no turbulance plagued the pilots and observers.

The 9 aircraft were flown a total of 57 hours during which

the occupants were actively searching for wolves and wolf tracks.

Eighty-eight tracks and 24 wolves, representing a nonduplicated total of 112 animals, were observed during the 1 day census on February 24 (Table 1). This was 2.0 wolves accounted for per hour of flying. Other wolves and sign sighted during the caribou census of February 25 and 26, not duplicating observations of the 24th, were included in the following computations used to derive a population figure.

The 8 packs sighted (ranging from 1 to 10 wolves) totaled 33 animals (19 black and 14 gray) for an average pack size of 4.1 (Table 2).

Sightings (by tracks) of 27 nonduplicated packs accounted for 102 wolves. The pack sizes ranged from one to ten animals and averaged 3.8, a figure approximating the 4.1 average pack size of the nonduplicated wolf sightings.

When the locations of the 33 wolves observed were checked against the locations of the track sightings, 52 of the 154 tracks seen were believed to have been duplicated either by other track or animal sightings. Thus the total population for the study area, determined through the combination of tracks and animals observed, was 135. Projecting this minimal population figure, an estimated 145 to 160 wolves were believed to inhabit the study area.

Throughout the course of the survey the remains of 45 animals (18 moose, 17 caribou, 1 sheep, and 9 unknowns) were found (Table 3). As previously mentioned, physical examination of these carcasses was not feasible, thus it is impossible to accurately state how these animals died. Wolf tracks or wolves were noted at 17 of these sites indicating that probably 8 caribou, 8 moose, and 1 unknown carcass were fed upon by wolves. Tracks and sign in one instance strongly inferred a caribou was chased, overtaken, dispatched, and fed upon by wolves. One wolf was seen carrying a ptarmigan in its mouth.

All animals fed upon by wolves are not necessarily killed by them. Ronald O. Skoog (viva voce) estimates that 10 per cent of all dead caribou examined by him in the field within the last ten years had died from assorted natural causes other than predation. Carcasses remaining from the fall hunting season may also be utilized by wolves later in the winter. This past winter (1961 and 1962) heavy snows caused a higher than usual winter mortality of moose; thus, along several river valleys carcasses were available to wolves.

Table 1. Non-duplicated wolf track and wolf sightings by day.

Date	Track Sightings	Animal Sightings
Feb. 24	88	24
Feb. 25	11	8
Feb. 26	3	1
Totals	102	33

Table 2. Non-duplicated wolf track and wolf sightings by section.

Section	Non-Duplicated Track Sightings	Non-Duplicated Wolf Sightings	Non-Duplicated Totals
1	10	0	10
2	11	13	24
3	23	11	34
4	20	0	20
5	12	0	12
6	3	0	3
7	5	0	5
8	18	2	20
9	0	7	7
Totals	102	33	135

102 (total non-duplicated track sightings) ÷ 27 (total number non-duplicated packs represented by tracks) = 3.8 (average pack size determined from track sightings).

33 (total non-duplicated wolf sightings) ÷ 8 (total number non-duplicated packs represented by animal sightings) = 4.1 (average pack size determined from animal sightings).

135 (total all non-duplicated sightings ÷ 35 (total number non-duplicated packs) = 3.9 (average pack size determined from all non-duplicated track and animal sightings).

Table 3. Carcass sightings.

Section	Moose	Caribou	Sheep	Unknown
1	1	3	0	1
2	2	2	0	5
3	1	2	0	0
4	1	6	0	2
5	1	0	0	0
6	7	1	0	0
7	0	1	1	0
8	5	2	0	0
9	0	0	0	1
Totals	18	17	1	9

Wolf activity was scattered throughout most of the area but was less frequently observed in the Talkeetna Mountains than in any other portions of the tract censused. Wolves often traveled the river beds, occasionally making forays into the short adjacent drainages. In seven instances sign was sighted within ten miles of a main highway; otherwise, the wolves tended to refrain from frequenting areas where contact with humans was likely.

Table 4 compares the 1962 census of the study area with that of 1961. In 1962, 5 times as many men (21 vs. 4) in 4-1/2 times as many aircraft (9 vs. 2) spent 1-2/3 more time (57 hrs. vs. 38 hrs. 7 min.) to locate slightly less than twice as many wolf tracks (154 vs. 87) as well as wolves (33 vs. 19). The average pack size (less any duplicate track or animal sightings) was 4.7 in 1961 and 3.9 in 1962, a difference of .8 of an animal. Two and one-tenth wolves were accounted for per hour of flying in 1961 and 2.0 per hour in 1962 (figured from data collected on February 24 only). The minimum population figure in 1961, based on the combination of track and animal sightings less duplications, was 79 wolves. In 1962 with better tracking and sighting conditions, the total was 135 animals. By projecting these minimum population figures, estimates of the total wolf population on the study area were 100 to 125 in 1961, and 145 to 160 in 1962.

Twenty-three wolverines and 33 foxes (9 red, 2 cross, and 22 unknown as to species) were observed during the census on February 24.

Wolves observed on the study area other than those located during the census totaled only 29 (Table 5). This is because they are infrequently seen when snow cover is lacking, when the observer is in an aircraft flying higher than 400 feet above the ground or when timber masks the animals and/or their tracks. An unusually large pack of 15 (4 gray and 11 black) was sighted by R. O. Skoog (March 30), on the Susitna River at the mouth of Jay Creek. This outnumbers any other pack sighted during either the 1961 or 1962 censuses. Twenty-five of the 29 wolves reported were black, a fact which probably contributed to their being noticed against the snow incidental to the observer's main purpose of being afield.

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Table 4. Results of 1961 and 1962 wolf censuses.

	1961	1962
Date of Census	March 6-10	Feb. 24 (supplemental information gathered on Feb. 25 & 26)
Number of personnel	4	21
Number of aircraft	2	9
Time flown actively searching for wolves	38 hrs. 7 min.	57 hrs.
Number of packs based on all track sightings	16	45
Total tracks sighted	87	154
Number of packs based on all animal sightings	5	8
Total wolves sighted	19	33
Number blacks	12	19
Number grays	7	14
Range of pack sizes based on track sightings	1-11	1-10
Range of pack sizes based on animal sightings	1-7	1-10
Average pack size based on all non-duplicated track sightings	4.8	3.8
Average pack size based on all non-duplicated animal sightings	4.5	4.1
Average pack size based on all non-duplicated track and animal sightings	4.7	3.9
Number of wolves accounted for per hour of flying	2.1	2.0

(Continued on next page)

Table 4. (Continued)

	1961	1962
Total number non-duplicated wolves	79	135
Estimate of total population for study area	100-125	145-160

Table 5. Wolves observed on the study area other than during the census.

Date	Number Wolves	Color		Location
		Black	Gray	
Nov. 5, 1961	7	7	0	Mile 77, Denali Hwy
Nov. 18, 1961	6	6	0	Mile 143, Glenn Hwy
Jan. 26, 1962	1	1	0	Mile 85, Denali Hwy
March 30, 1962	15	11	4	On Susitna River at mouth of Jay Creek
Totals	29	25	4	

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: K Title: Wolf Investigations

Job No: 3 Title: Population Studies, Interior and Arctic Alaska

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

ABSTRACT

Approximately 200 wolf carcasses and 500 radii and ulnae were obtained and processed during the 1961-1962 project segment. Analysis of the material will be reported with the 1962-1963 segment report.

RECOMMENDATIONS

No recommendations relating to management can be made at this time.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: K Title: Wolf Investigations

Job No: 3 Title: Population Studies, Interior and Arctic Alaska

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

OBJECTIVES

To determine productivity, survival, population composition and population identity of wolves in Interior and Arctic Alaska, and to determine wolf population levels and factors influencing these levels.

TECHNIQUES

Approximately 200 wolf carcasses were obtained from professional and recreational hunters and trappers during the reporting period. An additional 500 specimens were obtained from skins presented for bounty. Specimens potentially useful in fulfilling project objectives were preserved for future analysis.

FINDINGS

Analysis of the specimens and information obtained has not been completed. The analysis of the material collected during the 1961-1962 project segment will be combined with the 1962-1963 segment and a report submitted on June 30, 1963.

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