Volume 1 Report No: K-1

ANNUAL REPORT OF PROGRESS
INVESTIGATIONS PROJECT
COMPLETION OF 1959-1960 SEGMENT

State: ALASKA

Project No: W-6-R-1 Name: Game Investigations of Alaska

Work Plan: K Wolf Investigations

Job No: 1 Title: Wolf Population Studies in Southeastern Alaska

Period Covered: July 1, 1959 - June 30, 1960

Abstract:

Light snowfall, mild weather, and poor flying conditions during the winters of 1957-1958, 1958-1959, and 1959-1960, generally precluded tracking and counting wolves by air.

During February of 1959, one relatively successful aerial survey of several days duration was made in which several packs of wolves were sighted on Revillagigedo Island, one on Cleveland Peninsula and one on Prince of Wales Island. Surveys conducted in the fall of 1959 and the spring of 1960 were inadequate for population studies.

Objectives:

To determine the abundance, distribution, and extent of movements of wolves in Southeastern Alaska, and to determine the relationship between wolves and deer at various levels of abundance. This information will provide a basis for evaluating the wolf as a tool in the management of the Sitka deer.

Techniques:

To lend continuity and scope to the studies, this report is supplemented with data collected during wolf investigations and control programs conducted by the Alaska Depart-

ment of Fish and Game in co-operation with the U.S. Fish and Wildlife Service during the period from November, 1957 through June, 1959.

Aerial surveys using a Cessna 180 during February in 1959 were conducted on parts of Revillagigedo, Prince of Wales, Etolin, Kupreanof, and Mitkof Islands, and Cleveland Peninsula on the mainland. Surveys during the spring of 1960, using a Piper Super Cruiser, included parts of Kupreanof, Mitkof, Zarembo, and Woewodski Islands. Survey flights were made over snow covered muskegs and frozen lakes. Weather conditions did not permit standardization of surveys.

Past data collected under Work Plan A, makes possible a comparison of deer population dynamics between islands with wolves and those without. A review of the Federal wolf control programs in Southeastern was used to try to determine whether these data reflect periods of high and low wolf densities.

Findings:

Distribution and movements. In Southeastern Alaska the distribution of the wolf includes all of the islands and the mainland with the exception of Baranof, Chichagof, and Admiralty Islands. Frederick Sound, Stephens Passage and Icy Strait possibly act as physical barriers and restrict wolves from these islands.

The extent of wolf movements between islands south of Frederick Sound is not known. It is generally accepted, however, that wolves are excellent swimmers. In March of 1957, Mr. William Tucker killed three of six wolves just after they had swum to Read Island in Faragut Bay.

Water channels between some of the major islands in Southeastern do not restrict wolf movements. This is especially true of Kuiu, Kupreanof, and Mitkof Islands, north of Sumner Strait. Wolves theoretically can move from Kuiu to Kupreanof to Mitkof and then to the adjacent mainland with swims amounting to well under one half mile. The same situation exists between some islands south of Sumner Strait. Revillagigedo Island is within easy swimming distance of the mainland, as is Wrangell Island. Etolin Island is separated from Wrangell Island by less than one half and at extreme low tide barely one quarter mile of water. Situa-

tions where islands are in close proximity to one another exist throughout the wolf range in Southeastern and movements of wolves from island to island undoubtedly occur.

Except for four very limited observations of wolf pack movements during February of 1959, efforts to record wolf movements by air during the past three winters were generally unsuccessful due to poor tracking and/or flying conditions. Table 1 summarizes three observations and a description of the observations follows.

Table 1. Observations of wolf packs in Southeastern Alaska.

Observation Number	1*	2*	3*
Number of wolves in the pack	9	5	9
Number of days movements accounted for	3	3	2
Linear distance covered in miles	16	21	8
Number of observed deer killed	2	2	3
Minimum number of deer killed/day	.6	.6	1.5
Minimum number of deer killed/day/wolf	.1	.1	.2
Calculated days between kills/wolf	13.5	7.5	6

1* Orchard Lake, Revillagigedo Island

2* Patching Lake, Revillagigedo Island

3* Moser Bay Lakes, Revillagigedo Island

Discription of observations in Table 1. On February 13, at around noon, tracks of a pack of wolves were sighted at the extreme eastern end of Orchard Lake on Revillagigedo Island. A fresh snow cover of from one to two inches had fallen sometime between midnight and daylight of the same morning. The tracks led down the lake and along its edge. About half way to the end of the lake a deer had been killed and eaten after having been chased out of the timber onto the ice. Near the outlet end of the lake were eight grey wolves. Lee Ellis, Fish and Wildlife Predator Control Agent, reported that he had seen a ninth wolf enter the timber. As we made a second pass seven wolves ran into the timber and the remaining one entered the timber on our third pass over the area.

On February 14, the wolves were still in the area as evidenced by their fresh tracks. Tracks from the day before had been blotted out by the wind. On February 16, we saw four of the pack just above the lake at the beginning of a pass that leads from Orchard Lake to Neets Bay.

On February 17, at about mid-morning, we flew over the area and tracks indicated that the wolves hunted back and forth in the pass to Neets Bay. Remains of a deer, presumably killed and eaten by the wolves, were seen in the pass. The pack's tracks led back to and along the lake until they were lost to us in the timber at the lake's end. Most likely the wolves had left Orchard Lake the previous day following our flight over the area.

On February 12, we saw tracks of what appeared to be eight wolves in the fresh snow cover at the outlet of Hickman Lake on Revillagigedo Island. We followed the tracks along the entire length of the lake and then to Patching Lake. At Patching Lake it appeared that the pack had divided. We followed the tracks of five or six wolves along the lake until we came on five black wolves almost at the lake's end. The wolves all ran into the heavy timber as we flew by on our first pass. Poison baits were dropped on the lake in the immediate area and along the anticipated route that these wolves would take.

Returning to the area on February 13, we saw that the wolves had crossed the lake from where they were seen last.

At the point where they had reached the opposite shore there was a confusion of tracks and an eagle was sitting on the remains of a dead animal. It was not determined what sort of animal this had been, whether the wolves had killed it, or whether it had been killed by poison.

The wolf tracks were followed from this point to the end of Chamberlain Lake and the five black wolves were again seen in the sparse timber just beyond the end of the lake.

Attempts to trace the movements of this pack were unsuccessful on the next day because of turbulent winds. Flying over the area on February 17, it was observed that the wolves had climbed an almost perpendicular 1,000 foot ridge at the point where they were last seen. From here they had dropped down to the lakes in Traitors Cove. Two deer had been flushed onto the ice and killed. From appearances it was determined that the tracks had been made on or before February 14.

By backtracking this pack's movements it was determined that they had left the Traitors Cove Lakes on February 12, and had travelled through a pass to Hickman and Patching Lakes where they were seen. On February 13, they had continued to the end of Chamberlain Lake where they were again seen and then they had climbed the ridge and gone back to their starting point by February 14, circumscribing a 21 mile counter clockwise circle.

Late in the afternoon of February 14, in the vicinity of Moser Bay, Revillagigedo Island, tracks of a wolf pack were followed for several miles. These led to a small lake above Moser Bay, where we came on nine grey wolves on the ice. After the first pass seven wolves remained on the lake. Four additional passes were made over the seven wolves.

On February 16, five wolves were seen on the muskeg next to the lake. Three of these eventually ran out onto the lake and watched the airplane. From the network of tracks it was evident that the wolves had stayed and hunted in the area since we saw them on February 14. On a small muskeg pond close by there was remains of a deer that had been chased onto the ice, killed, and eaten. Another kill was located a short distance below the lake toward Moser Bay. Returning to the area again at mid-morning on

February 17, a third kill was seen on the muskeg, presumably made after our flight over the area the day before. Tracks indicated that the pack had left the area.

Miscellaneous observations. On February 13, we saw six grey wolves eating a deer which they had just killed on a small lake near Yes Bay on Cleveland Peninsula. All of the wolves ran into the timber as the plane passed over them. On February 16, tracks in the area indicated that the wolves had remained close by but whether the wolves still remained in the area, and if not, the duration of their stay could not be determined.

Some additional observations of distances traveled by wolves are listed below:

Date	Location	# Wolves	Miles	Duration
Feb. 12, 1959	Periphery Sweetwater Lakes, Prince of Wales Island	2	3	6 hrs.
Feb. 14, 1959	Thorne River to Sweetwater Lakes	6	30	Less than 2 da.
Feb. 14, 1959	Big John Bay to Salt Chuck, Kupreanof Is.	?	12	"
Feb. 17, 1959	Thorne Bay to Klawack Inlet and return, Prince of Wales Island	?	30	Less than 3 da.

Population surveys. A population survey using a Cessna 180 was made on December 10, 1958, following a fresh snowfall. The flight covered approximately 110 linear miles of Kupreanof Island. A second survey conducted from a Piper Super Cruiser on March 7, 1960, covered 170 linear miles and included parts of Kupreanof, Mitkof, Woewodski, and Zarembo Islands. Light conditions were poor and the surveys were unsuccessful because no fresh wolf tracks were observed or were not positively identified.

Although our experience in flying wolf surveys in Southeastern is limited, they do give standards to go by in future

surveys and these are:

1. A slow flying airplane is best for following wolf tracks.

2. Wolves appear to choose routes of open travel like frozen lakes. Surveys in areas where lakes are numerous should begin within a few hours after a fresh snowfall.

3. In areas without lakes at least a full day should pass following a fresh snowfall before surveys begin. This gives wolves time to make tracks and increases the frequency of encounters.

4. All surveys should be conducted during bright sunshine. Visibility on cloudy days makes tracking difficult and sometimes impossible.

Numbers and relation to deer and control of wolf numbers. The numbers of wolves in Southeastern Alaska or any island therein has never been accurately determined. An insight to the numbers of wolves present, expressed as wolves per square mile of land area, or actual numbers at specific locations, would be of obvious value in evaluating the effects of their predation on the deer population. The presence of a given number of wolves in an area would have significantly different implications at various levels of deer abundance.

Two mechnisms have been used in an effort to control wolves in Southeastern without these data. These are the bounty system, which encourages the unregulated destruction of wolves by hunters and trappers, and the State and/or Federal control progra which allow control to be relegated to areas where it is needed.

Government control of wolf numbers during the last ten years in Southeastern included the use of wolf getters, lethal stations, and air drops of lethal station baits onto frozen lakes.

Wolf getters are designed to shoot cyanide into the mouth of a wolf when an attached bait or lure is pulled.

Death results almost immediately and it is reported that wolves are seldom found more than 50 yards from a fired getter. Getters are not without disadvantages. In Southeastern Alaska the working mechanism often malfunctions or the seal that keeps water out of the cyanide often leaks and makes the getter harmless. The getter's biggest fault is that only one wolf can be taken at a time. When one member of a pack fires a getter, the remaining wolves are probably frightened away.

Lethal stations placed where wolves are known to travel are somewhat more satisfactory. The carcasses of seals, Phoca vitulina, are cut into chunks and allowed to decompose in 50 gallon drums. About 11 seals fill a drum. Five gallons of the decomposing seal, which is largely oil, is used for the lure to attract wolves to the station. One hundred lethal baits, made from fresh seal blubber cut into marshmallow sized chunks are treated with about two grams of strychine each and are placed around each station. Unlike a getter, a lethal station is capable of killing an entire pack of wolves. Lethal stations are put out after October and are destroyed before April to prevent killing black bears. One of the most obvious disadvantages of lethal stations is the impossibility of evaluating numbers of wolves killed. Without tracking conditions, the chances of recovering carcasses of wolves that have visited a station are somewhat remote. Unless stations are checked at least at two week intervals, wolf carcasses become badly decomposed or are eaten by birds (eagles, ravens, and crows) and their value as biological specimens is greatly reduced.

Air drops of lethal station baits is perhaps the most efficient method of control on islands that have large or numerous lakes, but near optimum conditions are needed for flying and lakes must have sufficient ice thickness to support the wolves. Baits are destroyed when the ice melts since strychnine is soluable in water. Recovery of carcasses is often impossible but recoveries have been made.

Table 2 summarizes the numbers of wolves seen dead, recovered, or reported killed, in control operations conducted by the Fish and Wildlife Service in Southeastern Alaska. These data are taken from Annual Reports, Alaska District, Fish and Wildlife Service, Predator and Rodent

Table 2. Numbers of wolves reported killed in Southeastern Alaska during control programs.

Fiscal Year	Wolves Killed
1949	53
1950	22
1951	30
1952	25
1953	20
1954	43
1955	43 to 56
1956	88
1957	69
1958	9 + 5 reported
1959	7

Control, Fiscal Years 1949-57, and in 1958 and 1959, from records of the Alaska Department of Fish and Game at which time control was done in cooperation with the Fish and Wildlife Service. The method of reporting in the Fish and Wildlife Service reports does not allow a breakdown of wolves taken by area, island, or method.

Providing that wolves were recovered in some consistant proportion to those killed, and that the methods of control were standardized and could be calculated on a wolf per unit of effort basis, and that the number of wolves taken in specific areas could be determined from reports, a trend of wolf abundance might be established from these data. Such is not the case so the figures in Table 2 in no way indicate the trend of wolf abundance.

At present there are several logical methods which provide a sound basis for evaluating the need for wolf control. The first of these is a comparison of deer population dynamics between islands that have wolves with those that do not. This comparison was made by Klein and Olson using data collected from 1952 through 1956 under Federal Aid in Wildlife Restoration Project W-3-R.

Wolf Range	Non Wolf Range
1. Rapidly increasing deer populations.	1. Stable or slowly increasing populations in excess of the winter range capacity.
2. Light winter mortality from starvation.	2. Heavy winter mortality.
3. Winter ranges in fair to good conditions.	3. Severly deteriorated winter ranges.

During the study the wolf range generally supported a greater annual hunter harvest of deer per unit of area under comparable hunting pressure. (Klein and Olson, 1960.)

It is recognized that additional ecological factors have a role in comparisons like this.

Since the control of wolves is primarily designed to benefit the deer hunter, highs and lows of hunter success, especially when hunting conditions are given consideration, can be used to evaluate the need for wolf control. Data presented in Table 3 are from Federal Aid In Wildlife Restoration Project W-3-R, Sitka Black-Tailed Deer Studies, June 30, 1960.

The extremely high hunter success presented in Table 3 makes a wolf control program difficult to justify.

A third criteria that indicates a need for relaxation of wolf control is the age composition and the physical condition of the deer population as determined from hunter-killed male deer. Every range can support a limited number of animals and no more. As deer populations approach the carrying capacity of the range, a change in their rate of increase is reflected by the age structure of the hunter kill. When it can be shown that the hunter harvest is not adequate to insure high productivity and that deterioration of the range is eminent, then control of wolves should be relaxed.

Recommendations:

Aerial surveys to record wolf movements and population numbers should be continued during the winter of 1960-61.

A more detailed study of wolf control programs is needed to determine whether or not the existing data can be used to show periods of high and low wolf abundance.

An evaluation of wolf bounty records is needed since time did not permit an examination of these in 1959.

The feasibility of marking wild wolves should be investigated during the winter of 1960-61.

Table 3. Deer harvest data collected during 1956 through 1959 in Southeastern Alaska.

Petersburg:	1956	1957	1958	1959
% Successful Hunters	83	74	93	89
Ave. No. Deer/Hunter	1.7	2.1	2.8	2.4
Ave. No. Days Hunted/Hunter	5.8	6.7	7.5	7.9
Wrangell:				
% Successful Hunters	81	76	92	80
Ave. No. Deer/Hunter	1.7	1.8	3.1	2.2
Ave. No. Days Hunted/Hunter	5.3	4.6	5.9	6.4
Ketchikan:				
% Successful Hunters	72	59	89	76
Ave. No. Deer/Hunter	1.3	1.2	2.3	1.8
Ave. No. Days Hunted/Hunter	4.1	5.2	6.7	5.2

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Volume 1 Report No: K-2

ANNUAL REPORT OF PROGRESS
INVESTIGATIONS PROJECT
COMPLETION OF 1959-1960 SEGMENT

State: ALASKA

Project No: W-6-R-1 Name: Game Investigations of Alaska

Work Plan: K Wolf Management Studies

Job No: 2 Title: Reproduction, Growth and Mortality of Wolves, Southeast Alaska

Period Covered: July 1, 1959 - June 30, 1960

Abstract:

In the fall of 1958 a wolf denning area was found on Kupreanof Island. During the spring of 1959, five wolves were encountered in the area and the den was located. Two of the five wolves were killed and seven wolf pups were removed from the den to be raised in captivity. Growth of the seven captive wolves was recorded during their first year of life.

Thirty-three wolf skulls were cleaned and used for age determination studies. Twenty-two of the skulls represented animals under two years of age. Eighteen of these were from animals one year or less in age.

Measurements of 33 wolves recovered during wolf control programs and received from bounty hunters were compiled. Reproductive organs from 11 female and 12 male wolves were collected and these are currently undergoing analysis.

Objectives:

To determine the chronology and sequence of events in the reproductive cycle, the rate of reproduction, the development

of young, the age at maturity, and the factors of mortality of wolves in Southeastern Alaska.

Techniques:

Carcasses of wolves taken in the course of State or Federal wolf control programs and those received from bounty hunters were weighed, measured, and examined for evidence of injury, disease, and parasites. The skulls, reproductive organs, and parasites were preserved for laboratory examination. As sufficient material becomes available, the gross and histological examination of reproductive organs will provide reliable information on the chronology and sequence of events in the reproductive cycle and the number of young born. Information on the development of young was obtained from seven captive wolves.

Findings:

Den Studies: On August 3, 1958, C. Lensink, Alaska Department of Fish and Game Biologist, and I found an area on Kupreanof Island that was being used extensively by wolves as evidenced by their scats and beds, and we presumed that a den was close by. During our examination of the area, I saw a dark grey wolf standing about 50 yards from me on a grass flat adjacent to a timbered point. Lensink joined me and as he did so the wolf saw us and took several steps away from the edge of the timber. Another wolf, smaller and lighter colored, came from behind the timbered point. It saw us almost immediately and rose on its hind legs momentarily to get a better look before bounding back around the point from where it had come. It was followed by the first wolf seen. Further investigation revealed that the wolves had also used the timbered point extensively. Beds were hollowed out at the base of trees and at the extremities of low hanging branches. A decomposing hemlock stump had been chewed and the punk chips surrounded its base. The bedding area under the timber was park-like and trails were numerous throughout the area. In the mud we found an old set of pup tracks measuring 2-1/4 inches long and 2-1/2 inches wide. Since we were unsuccessful in our attempts to locate a den we referred to the location as the "rearing area." Before leaving the area I marked 2 fresh wolf scats and 20 days later no scats were observed fresher than those I had marked, and beds and trails had not had recent use by wolves. Presumeably the wolves had not returned as a result of our

previous disturbance. Lensink and I had seen no deer tracks in the rearing area but at the time of my second visit deer tracks in the immediate vicinity were prevalent.

On October 23, 2 months later, R. Laguire and C. Graham, Fish and Wildlife Service agents, killed a 78 pound male wolf at the denning area and they reported that they had heard at least 4 others howling. I later determined that the dead wolf was a pup of approximately six months of age and quite likely one of the pups reared in this area.

On December 10, while flying over the area, I saw four sets of wolf tracks in the snow.

On May 18, 1959, I returned to the rearing area which was located at the end of an arm joining a large intertidal mud flat. I spent about half a day scouting the flats for wolf tracks without success. At approximately 4:30 p.m. I arrived in the arm below where the two wolves were seen the year before by Lensink and myself. Here I kneeled behind an old tree that had fallen outward from the timber onto the grass flats and started to observe the rearing area ahead of me. I had not had the binoculars to my eyes for more than a minute before I heard, and then saw to my left, five grey wolves running across the mud flats toward me. I stood up, shouted, and waved my arm and the leading wolf stopped for a moment just below the slight slope at the edge of the grass flat. Two wolves passed about 15 yards to my left and the wolf farthest behind continued toward me. A fifth wolf behind and to the left of the lead wolf stopped. The lead wolf started up the slope toward me and when it was 18 steps away I shot and killed it. I then turned and killed the wolf that had been farthest behind as it turned 90 degrees and started up the arm toward the area I had been watching.

Sighting back along the wolves' tracks in the mud it was apparent where they had come out of the timber onto the flats. The den was just inside the timber. At the time I was wearing hip boots and a green, knee-length rain parka complete with hood. The wolves, lying around the den, undoubtedly saw me kneeling beside the downed tree and mistook me for an animal such as a black bear. Black bears were common in the general area as evidenced by four that I had seen in the bay that afternoon. However, their absence at the denning area probably indicates that wolves do not tolerate bears close to the den. There is small doubt that the wolves would have dispersed had I thought to fire a shot in the air. After

killing the two wolves I returned to the boat for about an hour to obtain specimen recording material. In my absence the three remaining wolves had reunited and they howled during the time I took measurements of the two dead wolves. Three wolves were heard so the total number in the pack had probably been the five that I had seen. The first wolf killed was a one year old male which undoubtedly was from the litter of the previous year and brother to the wolf killed by Graham and Laguire. The second wolf killed was a female. Superficial examination of her uterus indicated that she had recently given birth to seven pups.

On the afternoon of the following day I returned with Graham, located the den, and found five male and two female pups which we took to the Experimental Fur Farm at Petersburg to be raised in captivity for growth studies. Figure 1 shows diagramatically the location of the den and rearing areas in relation to cover types.

The den proper was situated 15 yards within the edge of the timber under a decaying hemlock stump that was 12 feet high and had a diameter of 36 inches at 4 feet above the ground. The main entrance was located about four feet below the base of the stump. The opening was 15 inches high and 19 inches wide. On the opposite side of the stump from the main entrance another opening measured 20 inches wide and 14 inches high. A third opening measured 10 inches in diameter. From the main entrance a tunnel sloped downward for 90 inches to the den's lowest level which was 18 inches below the main entrance, and then up along a 30 inch slope rising 6 inches to the second entrance. Figure 2 shows the den's features in profile and as viewed from above.

Little is known about the denning activities and family life of wolves in Southeastern Alaska but observations taken at the above described den coupled with other observations offer a basis for some generalizations.

Here in Southeastern Alaska it is accepted that wolves are born during April and May following a gestation period of about 63 days. On April 24, 1955, Mr. Gainhard Samuelson, a cattle rancher at Farragut Bay, killed a female wolf that was ready to give birth to seven pups. I believe that the pups we found on May 19, 1959, were born in April. The pups born in 1958 probably left the den to frequent the rearing

Figure 1. Diagramatic sketch showing the location of the wolf den and rearing area as related to cover types.

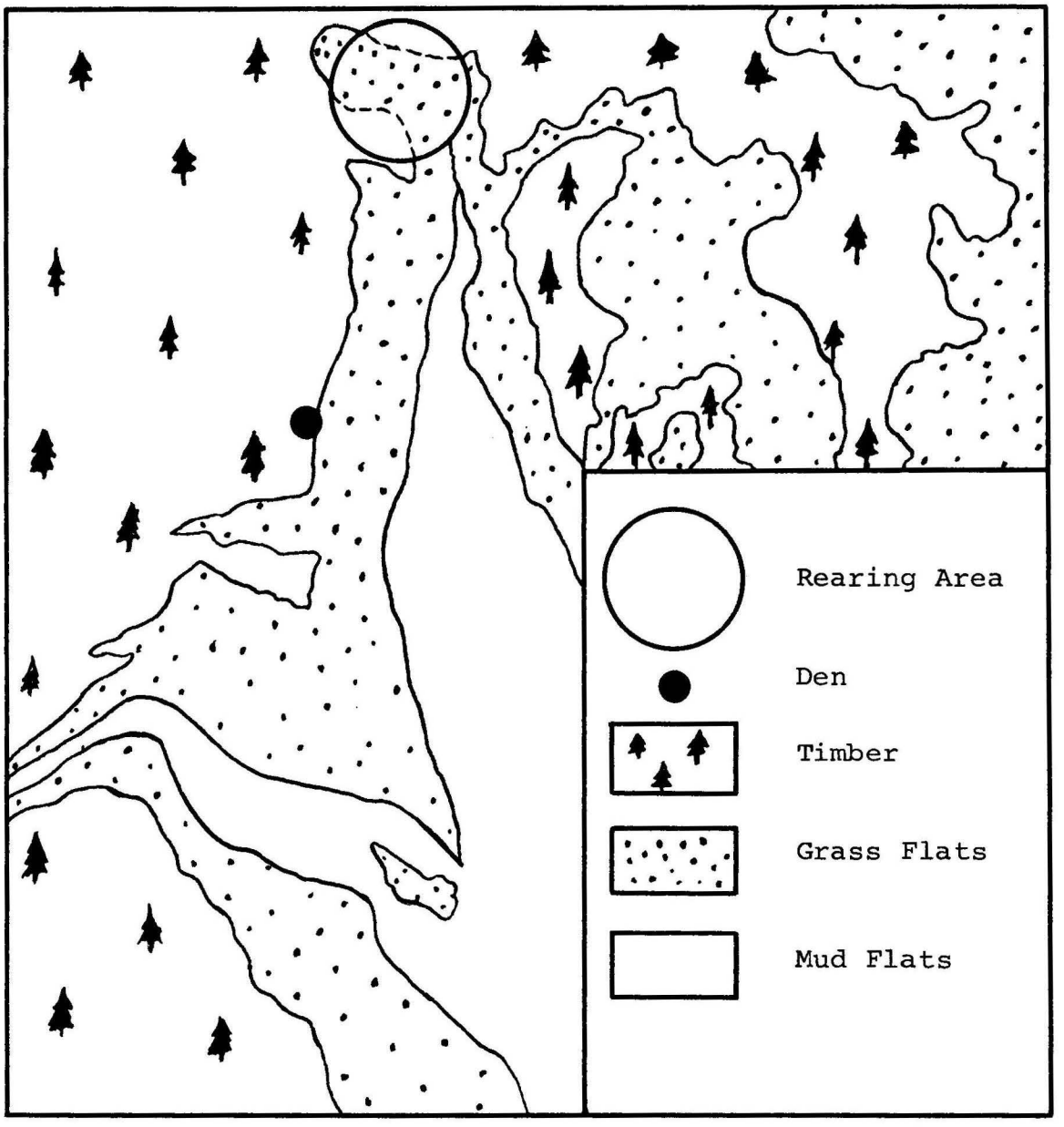
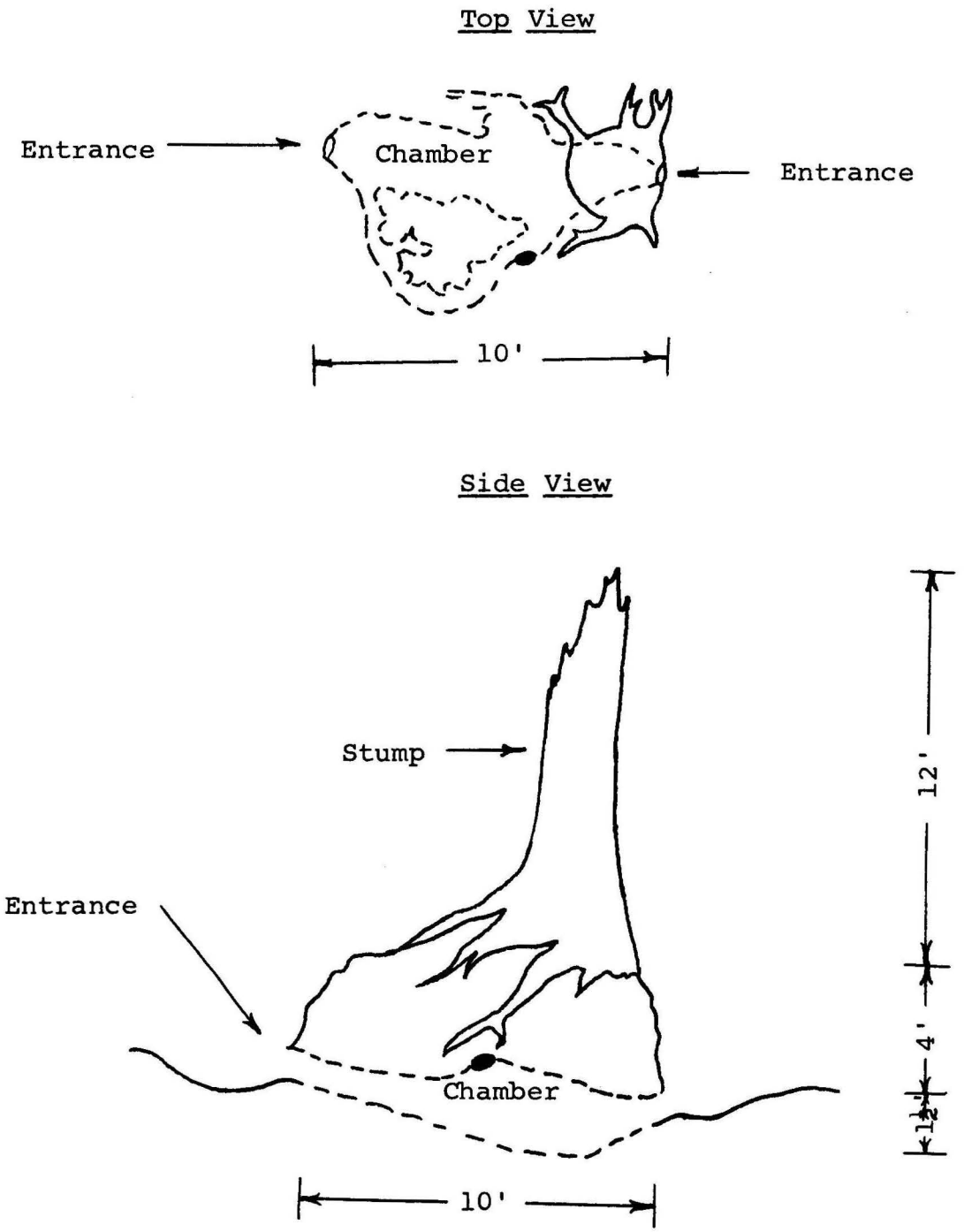


Figure 2. Top and side views of the wolf den characteristics.



area 100 to 200 yards distant during June. During May and June of 1950 Louie Hamilton of Craig steel trapped 12 wolves, about half of which were pups. The wolves were all taken within the confines of a small bay on San Fernando Island. This may indicate that pup movements away from the den at about a month of age are characteristic. The den we investigated in 1958 indicated that the wolves used the closely adjacent area until at least August, at which time they were of sufficient size to travel with the hunting pack. The denning and rearing area is probably frequented throughout the remainder of the year as evidenced by the six month old wolf killed by Laguire and Graham and the tracks I had seen in the area during December. The young wolves apparently stay with the pack and may help to raise the litter born the following spring. Wolves reach maturity at two years of age. Existing data seem to indicate that during the winter wolf packs are made up of adults accompanied by wolves one year or less in age, therefore, young wolves probably leave the family pack sometime during their second year of life. However, more information on the age structure of wolf packs is needed before this can be shown conclusively.

Aging Techniques: A reliable method for aging wolves is needed. Studies to date indicate that wolf skulls can be used for age determination using combinations of several criteria. The most important of these include the degree of suture ossification, the development of the sagital crest, and the appearance of the angle of the ramus. Table 1 outlines the present cirteria for aging wolves by the use of skull characteristics. Since these are non-specific, factors such as toothwear and the time of year that wolves are killed have to be given consideration. Toothwear as an aging criterion has limitations since the teeth of trapped wolves are usually damaged as a result of the animals' efforts to free themselves by biting the traps.

At present it is believed that certain combinations of skull measurements, the bacula in males, the reproductive tracts of females, and the examination of sectioned teeth will greatly enhance aging techniques. Table 2 summarizes the estimated age of 33 wolves as determined by the criteria outlined in Table 3.

Knowledge of the ages of wolves is desirable because the age structure of animal populations reflects their

Table 1. Defining skull characteristics used to age wolves in Table 4.

Ages	Ossification of Sutures	Scale of 4	Type
Under one year	- Nasal bones gaping and sutures not well ossified	---	1
Around one year	- Slightly advanced over type 1	----------	2
Over one year	- Sutures well ossified	----------	3
Over four years	- Sutures closed and not easily discernable	----------	4

Ages	Sagital Crest	Scale of 4	Type
Under one year	- Very little development	----------	1
Around one year	- Development incomplete anteriorly	----------	2
Over one year	- Development more complete anteriorly	----------	3
Over three years	- Gaining in bredth dorso-posteriorly forming a T in cross section	----------	4

Ages	Angle of the Ramus	Scale of 3	Type
Under one year	- A porous, blunt knob	----------	1
Around one year	- Starting to form a hook posteriorly but development incomplete	----------	2
Over one year	- Fully developed hook posteriorly, non-porous, sharply defined edges	----------	3

Table 2. Estimated ages of wolves by skull characteristics.

Specimen No.	Sex	Ossification of Sutures	Sagital Crest	Angle of Ramus	Tooth Wear	Bacula Weight grams	Bacula Length m.m.	Estimated Age	Remarks
PG-1-57	M	1	1	1	nil	0.9	86	7 months	
PG-3-58	M	2+	3	3	slight	4.0	122	21 months	
000165	M	1	1	1		0.7	77	6 months	
PG-4-59	F	4	4	3	heavy			very old	
PG-5-59	M	3	3	3	slight	3.9	118	22 - 34 months	
PG-6-59	F	3	3+	3	medium			minimum 34 months	
PG-7-59	M	3	3	3	slight	3.9	108	22 - 34 months	
PG-8-59	M	1	1	1	slight	1.5	92	10 months	
PG-9-59	F	1	2	1+	slight			11 months	
PG-10-59	M	1	1+			2.2	104	9 months	skull broken
PG-11-59	F	1	1	1				9 months	
PG-12-59	F	3		3				minimum 2 years	skull broken
PG-13-59	M	3	3+	3	medium	5.9	124	minimum 3 years	
PG-14-59	M	2+	2+	2+		3.8	115	23 months	
PG-15-59	F	2+	2	2	slight			12 months	
PG-16-59	M	3		3		4.8	118	minimum 2 years	skull broken
PG-17-59	M	3	2+	2+	slight	4.3	110	minimum 2 years	
PG-18-59	M	2+	3	2	slight	2.3	108	12 months	
PG-19-59	F	3	3	3	well worn			minimum 4 years	
PG-20-59	M	2	2	2	nil	2.3	108	12 months	
PG-21-59	F	3	2	3	slight			18 months	
PG-22-59	F	1	1	1	nil			7 months	
PG-23-59	F	1	1	1	nil			7 months	
PG-24-59	?	1	1	1	nil			7 months	
PG-25-59	F	2+	2	2	slight			19 months	
PG-26-59	F	1		1	nil			8 months	skull broken
PG-27-59	M	1	1	1	nil	1.3	85	8 months	
PG-28-60	F	2+	2	3				minimum 2 years	
HZ-1-58	F	1	1	1	nil			9 months	
40-59	M	3	4	3	well worn			minimum 3 years	
PG-29-60	F			1+				11 months	skull broken
PG-30-60	F		2	1				11 months	skull broken
PG-31-60	?	2	2	2	nil			11 months	

Table 3. Southeastern Alaska wolf measurements.*

Specimen Number	Location	Date	Sex	Weight	Total Length	Tail Length	Hind Foot	Chest Girth	Height at Shoulder	Color
PG-1-57	Etolin I.	12/57	M	85	63 1/4	19 1/2	11 1/4	26	31	black
PG-3-58	Revilla I.	2/58	M	98	66	18 1/2	11	28	31	grey
000165	Kupreanof I.	10/58	M	78	67 1/2	20	11			grey
PG-4-59	Suemez I.	2/59	F	55	60	16	10 1/4	23	21	lt.grey
PG-5-59	Prince W.I.	2/59	M	95	66	20	11	30	31 1/2	grey
PG-6-59	Suemez I.	2/59	F	70	59	17	10	26	28 1/2	grey
PG-7-59	Suemez I.	2/59	M	84	64	17	10	27	30	grey
PG-8-59	Baker I.	2/59	M	77	61	16	10 1/2	27 1/2	29	grey
PG-9-59	Prince W.I.	3/59	F	71	62	18	10 1/2	26	28	grey
PG-10-59	Kupreanof I.	1/59	M	89	67	19	11			grey
PG-11-59	Kupreanof I.	1/59	F	68	64	18	10 1/2	26	29 1/2	grey
PG-12-59	Wrang. Narrow	2/59	F	72	66 1/4	18 1/4	11			grey
PG-13-59	Mitkof I.	3/59	M	114	70 1/4	17 1/4	11 1/4			grey
PG-14-59	Kupreanof I.	3/59	M	82	65 1/4	16 1/4	10 1/4			black
PG-15-59	Wrang.Narrow	4/59	F	70	59 1/2	17 1/2	10	26	29	grey
PG-16-59	Kupreanof I.	4/59	M	87	65	17 1/2	11	28	31	grey
PG-17-59	Mitkof I.	4/59	M	97	65	18	11 1/4	30 1/2	32 1/4	grey
PG-18-59	Mainland	5/59	M	98	65	17	11 1/2	28 1/2	31	grey
PG-19-59	Kupreanof I.	5/59	F		61	16	11	30	30	grey
PG-20-59	Kupreanof I.	5/59	M		64	19	11	31 1/2	31	grey
PG-21-59	Kupreanof I.	11/59	F	75	62	18	11	26 1/2	29	grey
PG-22-59	Mainland	12/59	F		59	17	10 1/2		28 1/2	grey
PG-23-59	Mainland	12/59	F				11 1/4		29	grey
PG-24-59	Mainland	12/59	F				11		27 1/2	grey
PG-25-59	Mainland	12/59	F	76	58 1/2		11		28	grey
PG-26-59	Duck I.	12/59	F	68	62		10 1/4	25	27	grey
PG-27-59	Duck I.	12/59	M	85	60		11	29	29	grey
PG-28-59	Kupreanof I.	2/60	F	72	61 1/4	16 1/4	10	26 1/2	29 1/2	grey
40-59	Zarembo I.	9/59	M	98	66	18 1/2		31 1/2		grey
000151	Read I.	3/57	M	101	66	15 1/4	11 1/2	28 1/4		grey
000152	Read I.	3/57	F	79	60 1/2	13 1/4	10 1/4	27 1/4		grey
000153	Read I.	3/57	F	74	60 1/4	16	10 1/4	27 1/4		grey
000154	Wrangell I.	2/57	M	82	64	18	10 1/2			

* Measurements are in inches and weights are in pounds.

tendencies toward increase, decrease, or stabilization.

An insight to the age structure of wolf populations would be valuable for evaluating the effectiveness of wolf control programs.

Measurements of Wolves: Aside from their academic value, measurements of wolves may show periods of stress during adverse growing conditions caused by lack of an adequate food supply during lows in the deer population. At such times wolves may not reach their growth potential and measurements will be less than those of wolves reared during periods of near optimum conditions.

A lowering of the reproductive capacity of wolves may be coincidental with periods of decreased growth.

Table 5 gives measurements of some wolves killed in Southeastern Alaska.

Reproductive Cycle: The reproductive organs of 11 female and 12 male wolves are currently undergoing histological examination. These data will be presented in a future report.

Growth Rates of Captive Wolves: On May, 1959, five male and two female wolf pups were taken from a den on Kupreanof Island. The age of the pups was probably between three and five weeks. All of the pups had their eyes open and would readily eat meat. At the time of their removal from the den all of the pups were docile, but they preferred a darkened to a lighted environment. The pups were delivered to the Experimental Fur Farm at Petersburg by the author with the cooperation of Fish and Wildlife Service personnel, D. Klein, C. Graham, H. Larsen, and J. Johnson. The pups residence at the Fur Farm was made possible by the excellent cooperation of J. Leekley, Superintendent, and the actual feeding was done by Fur Farm personnel E. Thyness, R. Peterson, and F. Wooten.

From May to September, my activities were directed away from Petersburg and during my absence, Alaska Department of Fish and Game Biologists, H. Merriam and D. Klein, took responsibility for the care of the captive wolves, and therefore, the growth measurements in Tables 4 through 10 and the accompanying Figures 3 through 9 are principally the result

Table 4. Growth measurements* of a captive female wolf - ear tag # 12.

Date	Weight	Total Length	Tail Length	Hind Foot	Height at Shoulder	Chest Girth	Ear
May 21	5.2	20 3/4	5 7/8	4	7 3/4	11 1/2	1 1/2
May 28	7.1	23 7/8	5 7/8	4 1/2	8 3/4	12 5/8	1 5/8
June 4	9.6	26 1/2	7 1/8	5 1/8	9 1/2	13 1/2	2 1/8
June 13	12.4	32	8	6 3/8	12	14 3/4	2 3/8
June 19	14.4	34	9 1/4	6 5/8	12 1/4	14 7/8	3
June 26	17.3	38	9 1/2	7 3/8	12 3/4	15 7/8	3
July 3	20.0	39	11 3/4	7 5/8	14 1/2	17 1/2	3 1/2
July 10	22.6	42	12	8 1/8	16 1/2	17 3/8	3 1/4
July 22	27.3	44	13	8 3/4	17 1/2	18 1/2	3 1/2
Aug. 17	38.0	51 3/4	15 1/2	9 5/8	19 1/2	21 3/4	3 3/4
Sept. 1	43.0	54 3/4	15 3/4	9 3/4	22 3/4	23 3/4	4
Sept. 15	51.0	58 1/2	17	10 1/2	22	24 5/8	3 7/8
Oct. 7	61.0			10 1/2		25	
Nov. 10	70.0	62	18	10 1/2		27	4 1/8
Dec. 7	63.0	61	18	10 3/8	24	27	4 1/2
Jan. 14	81.0	64	17 1/2	11	24	28	4 3/8
Feb. 18	80.0	64	17 3/4	10 1/2	25	30	4 3/8
April 1	75.0	65	19	10 3/4	25	30 3/4	4 1/2
May 10	78.0	64 1/2	18 3/4	11 1/8	26 1/2	29	4 3/8

*Measurements are in inches and weights are in pounds.

Figure 3. Cumulative growth of female wolf - ear tag # 12.
(Data from Table 4)

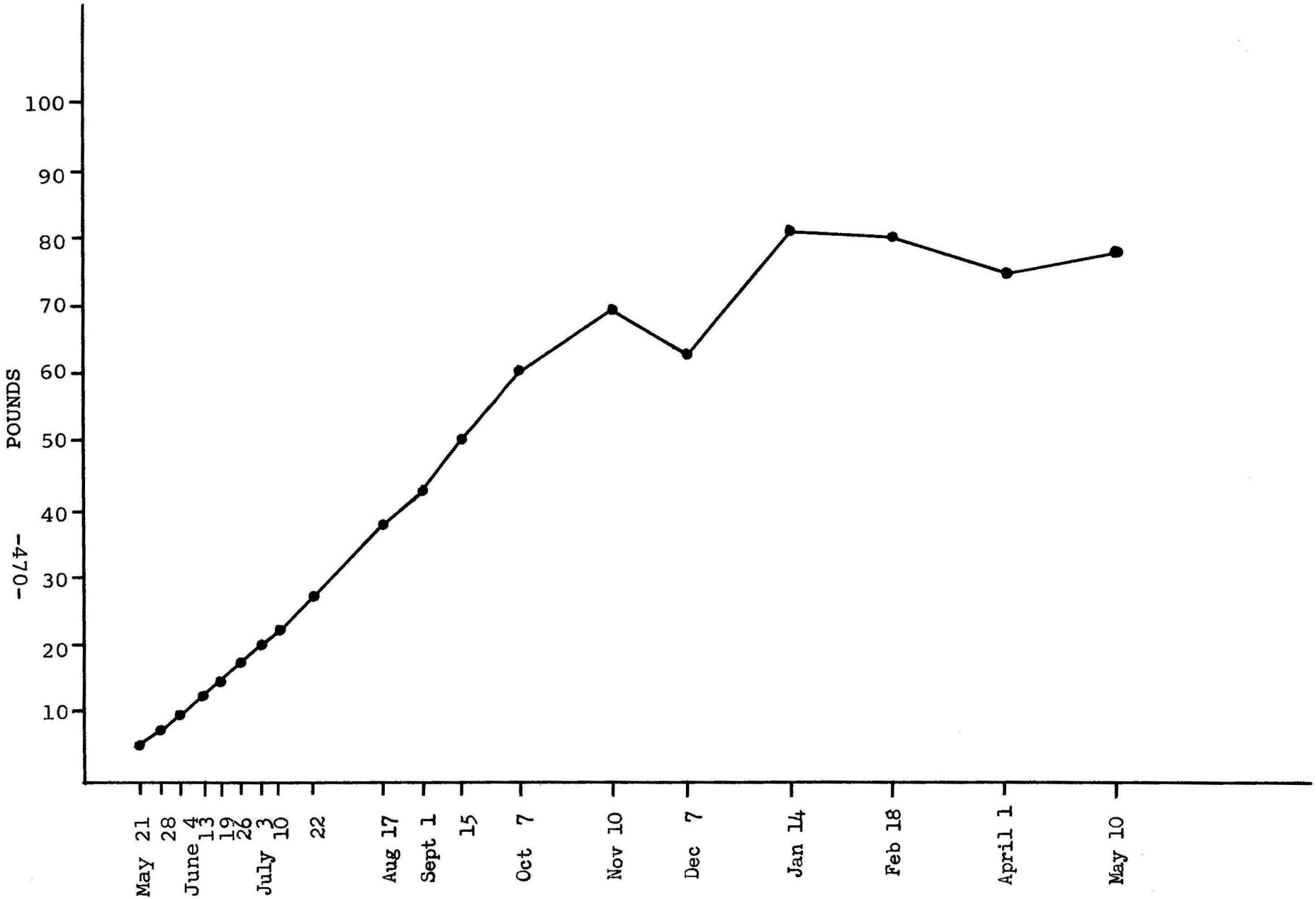


Table 5. Growth measurements* of a captive female wolf - ear tag # 11

Date	Weight	Total Length	Tail Length	Hind Foot	Height at Shoulder	Chest Girth	Ear
May 21	5.5	21 1/4	5 7/8	4 1/8	7 3/4	11 1/4	1 1/2
May 28	7.4	24 1/8	5 7/8	4 1/2	9 1/4	12 5/8	1 5/8
June 4	9.6	26 1/2	7	5 1/4	10	13 1/4	2 1/8
June 13	12.5	31 1/2	8 1/2	6	11 3/4	15 1/8	2 5/8
June 19	14.9	32 1/2	9 1/4	6 3/8	13 1/4	15 1/8	2 7/8
June 26	17.5	35 1/4	10 3/8	7 1/4	13 1/2	16	3 1/8
July 3	20.9	40	10 3/8	7 3/4	13 1/2	17 1/4	3 3/8
July 10	22.4	41 1/4	12 1/4	8	16 1/2	18 1/8	3 1/4
July 22	27.8	43	13 1/4	8 3/4	18 1/4	19 3/8	3 1/2
Aug. 17	38.0	51	15	9 1/2	20 1/4	22	4
Sept. 1	42.5	53 3/4	16	9 3/4	22 1/2	24 3/4	4
Sept. 15	50.5	57	17 3/4	10 3/8	22 1/2	24 1/4	3 7/8
Oct. 7	59.0	59 3/4	18 1/2	10 1/2	23 1/2	25 1/2	4 3/8
Nov. 10	70.0	65	18 1/2	10 5/8	25	26	4
Dec. 7	67.0	62	17 1/2	10 1/2	26	27 1/4	4 1/4
Jan. 14	78.0	63	17 1/2	11	27	29	4 1/4
Feb. 18							
April 1							
May 10	77.0	66	18 1/2	10 7/8	27	29 1/4	4 1/8

*Measurements are in inches and weights are in pounds.

Figure 4. Cumulative growth of female wolf - ear tag # 11.
(Data from table 5)

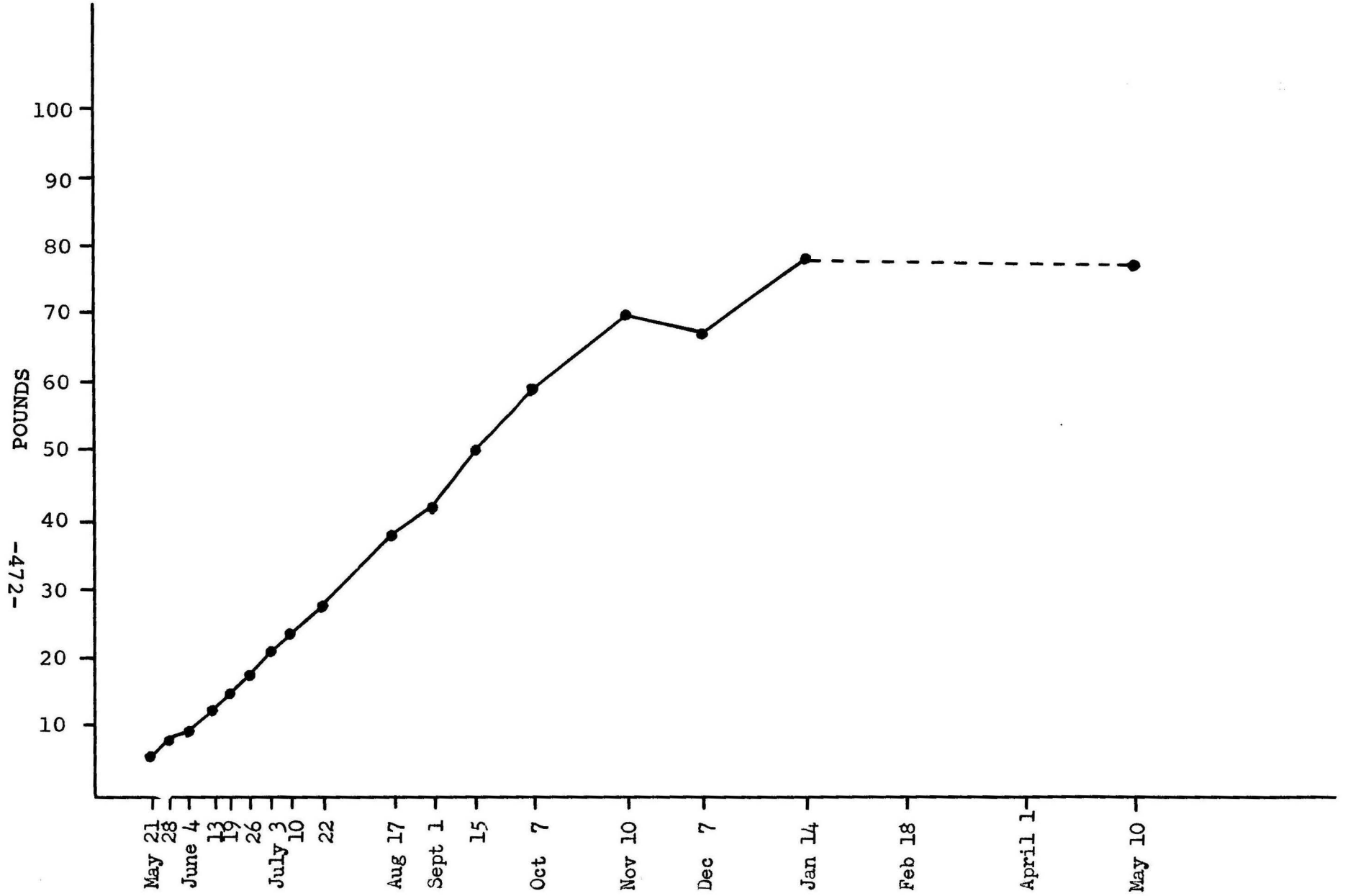


Table 6. Growth measurements* of a captive male wolf - ear tag # 3.

Date	Weight	Total Length	Tail Length	Hind Foot	Height at Shoulder	Chest Girth	Ear
May 21	5.4	20 5/8	5 5/8	4	7 3/4	11 7/8	1 5/8
May 28	7.2	24 1/8	6 3/8	4 3/8	8 7/8	12 1/4	1 1/2
June 4	9.9	26 1/4	7 3/4	5 1/8	10	13 5/8	1 7/8
June 13	13.7	31 3/4	8 1/4	6 3/8	13	15 1/4	2 7/8
June 19	16.5	34	9 1/4	7 1/8	13	15 5/8	3 1/8
June 26	19.7	37 1/2	10 1/2	7 1/2	14 1/2	16 1/2	3
July 3	23.1	39 3/4	11	8	14 3/4	17 1/4	3 1/4
July 10	25.1	41 1/4	12	8 1/2	17 1/2	18 1/2	3 5/8
July 22	31.5	46 1/4	13 1/4	9	18 3/4	19 5/8	4
Aug. 17	42.0	51	15 1/8	10 1/8	20 3/4	22 1/8	4
Sept. 1	48.5	53 1/2	16 3/4	10 1/2	24 1/2	25	4
Sept. 15	58.0	57	17 1/2	10 5/8	23	25	4 1/4
Oct. 7	70.0		17 1/2	11 1/8	24	26 1/2	4 1/4
Nov. 10	85.0		18	11 1/2	26	29	4 3/8
Dec. 7	80.5			11 1/4		30	
Jan. 14	100.0			11 5/8		30 1/2	
Feb. 18	101.0		17	11 1/2	28 3/4	32 1/4	
April 1	96.0		17 3/4	11 3/4	28	30	
May 10	100.0		18 1/4	11 5/8	28 1/4	32 7/8	5

*Measurements are in inches and weights are in pounds.

Figure 5. Cumulative growth of male wolf - ear tag # 3.
(Data from Table 6)

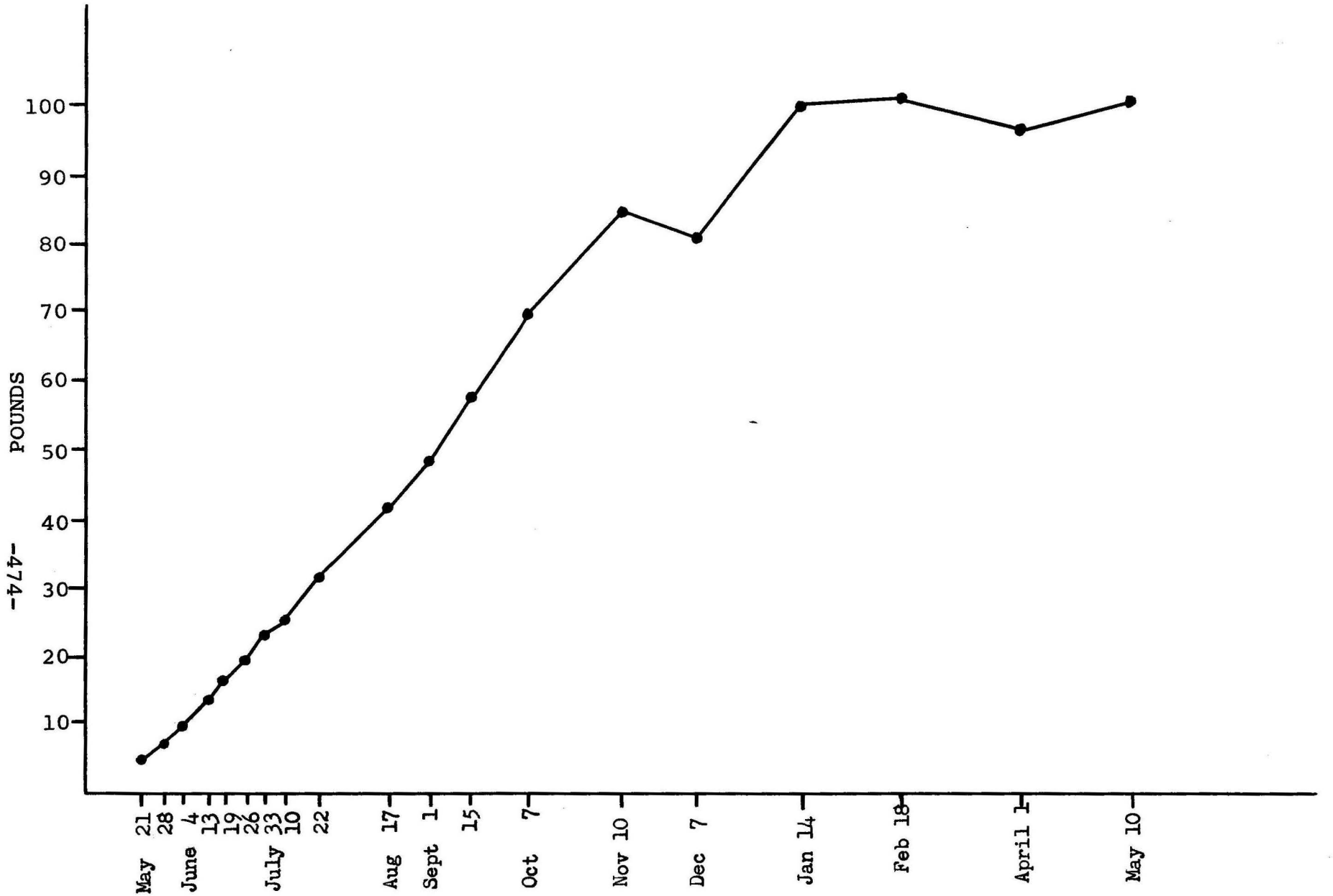


Table 7. Growth measurements* of a captive male wolf - ear tag # 2

Date	Weight	Total Length	Tail Length	Hind Foot	Height at Shoulder	Chest Girth	Ear
May 21	5.1	20 3/4	5 1/4	4	7 1/2	11 3/4	1 3/8
May 28	6.5	22 1/4	6	4 5/8	8 3/4	12 3/8	1 1/2
June 4	9.3	25 1/2	7 1/8	5	10	13 3/4	1 3/4
June 13	12.8	30 1/2	8 3/4	6 1/8	11 7/8	14 3/4	2 7/8
June 19	15.3	32 1/2	9	6 3/8	12 1/2	15 1/8	2 7/8
June 26	18.5	36 1/2	10	7 1/8	13 3/4	16 1/4	3 1/8
July 3	22.0	37 3/4	10 3/4	8	13 1/2	16 1/2	3 3/8
July 10	25.0	39 1/2	11 1/2	8 1/4	17	18 1/4	3 3/8
July 22	31.4	44	13	9	18 1/2	19	3 5/8
Aug. 17	42.0	52 1/4	14 1/2	9 3/4	21 1/4	22	4
Sept. 1	48.0	55 1/4	16	10	23 3/4	24 1/4	4
Sept. 15	59.0	58	15 5/8	11	25	25 3/8	4 1/8
Oct. 7	73.0			11 1/8	27		
Nov. 10	87.0	67 1/4	18 1/4	11	26	28	4 1/4
Dec. 7	89.0			11 1/4	27	30	
Jan. 14	103.0		18	11 5/8		31	
Feb. 18	106.0			11 3/8	29	33 3/4	
April 1	101.5			11 3/8	27 1/2	31 1/2	
May 10	101.0		18 1/8	11 5/8	28 1/4	31 3/4	4 1/2

*Measurements are in inches and weights are in pounds.

Figure 6. Cumulative growth of male wolf - ear tag # 2.
(Data from Table 7)

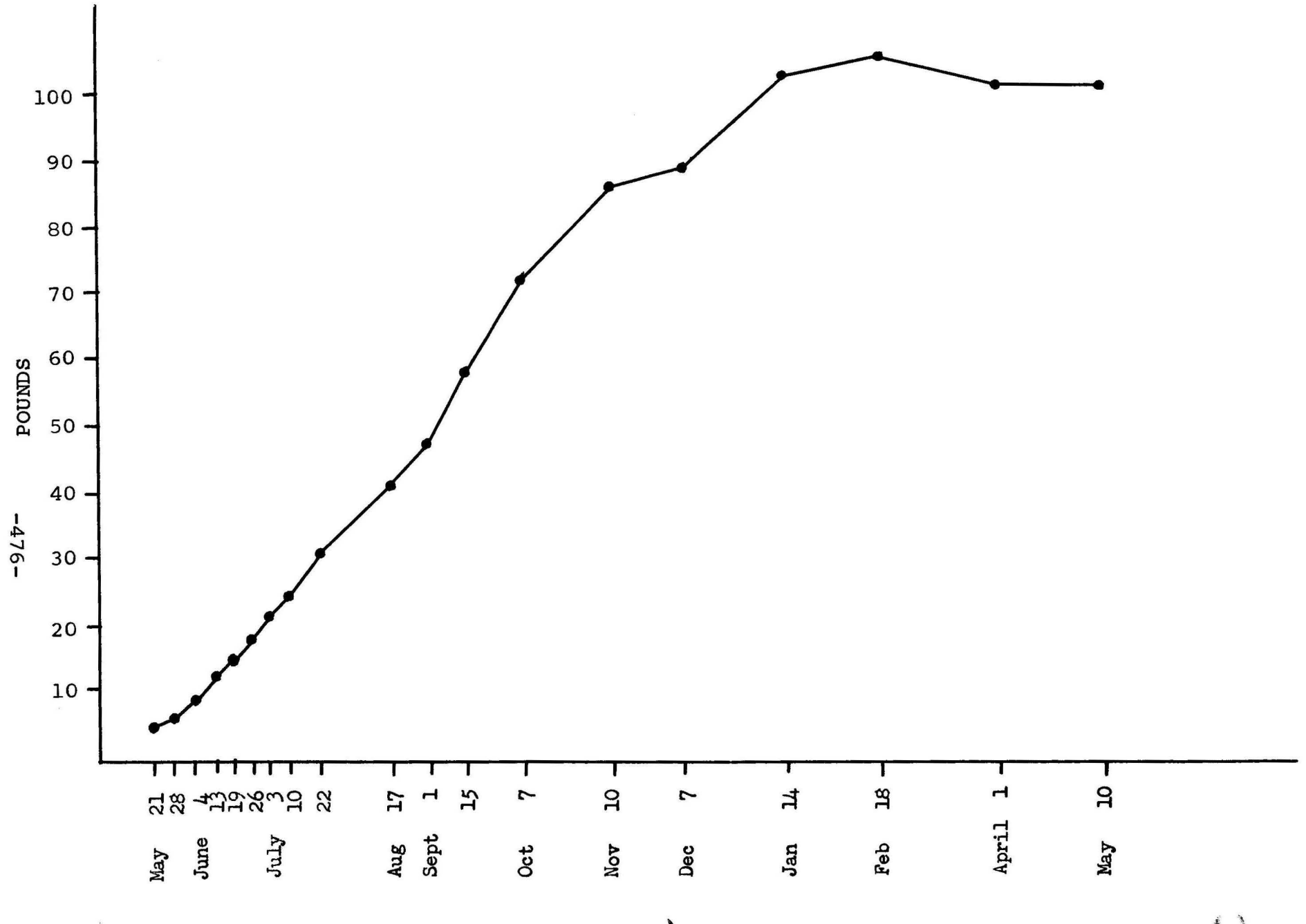


Table 8. Growth measurements* of a captive male wolf - ear tag # 5

Date	Weight	Total Length	Tail Length	Hind Foot	Height at Shoulder	Chest Girth	Ear
May 21	5.5	20 1/8	5 3/8	4 1/8	7 7/8	12	1 3/8
May 28	7.6	24	6 5/8	4 3/4	9 1/2	12 7/8	1 5/8
June 4	10.2	27	7 5/8	5 3/8	10 1/8	13 1/2	2
June 13	14	31 1/2	8 1/2	6 1/4	12 1/4	15	2 5/8
June 19	16.5	33 3/4	9	6 3/4	13 1/4	16	3
June 26	19.8	36 3/4	10	7 1/2	13 5/8	17	3 1/8
July 3	23.2	38 1/2	11 1/4	8 1/4	14 3/4	17 1/8	3 3/8
July 10	26.1	42 1/2	11 7/8	8 1/2	16 3/4	18 5/8	3 3/8
July 22	33.4	46	13 1/4	9 1/8	19 1/4	20 1/8	3 5/8
Aug. 17	43.5	52	15 1/4	10	21 1/4	22 3/4	3 3/4
Sept. 1	49.5		15 3/4	10 1/4	22		4 1/2
Sept. 15	58.5	57	17	10 1/2	24	26 1/8	4 1/8
Oct. 7	71.0						
Nov. 10	81.0			10 1/2			
Dec. 7	77.0			11 1/4		30	
Jan. 14	99.0			12		30	
Feb. 18	102.5			11		32 1/2	
April 1	101.5			11 1/4	27 3/4	31 3/4	
May 10	104.5		18	11	27	31	4 7/8

*Measurements are in inches and weights are in pounds.

Figure 7. Cumulative growth of male wolf - ear tag # 5.
(Data from Table 8)

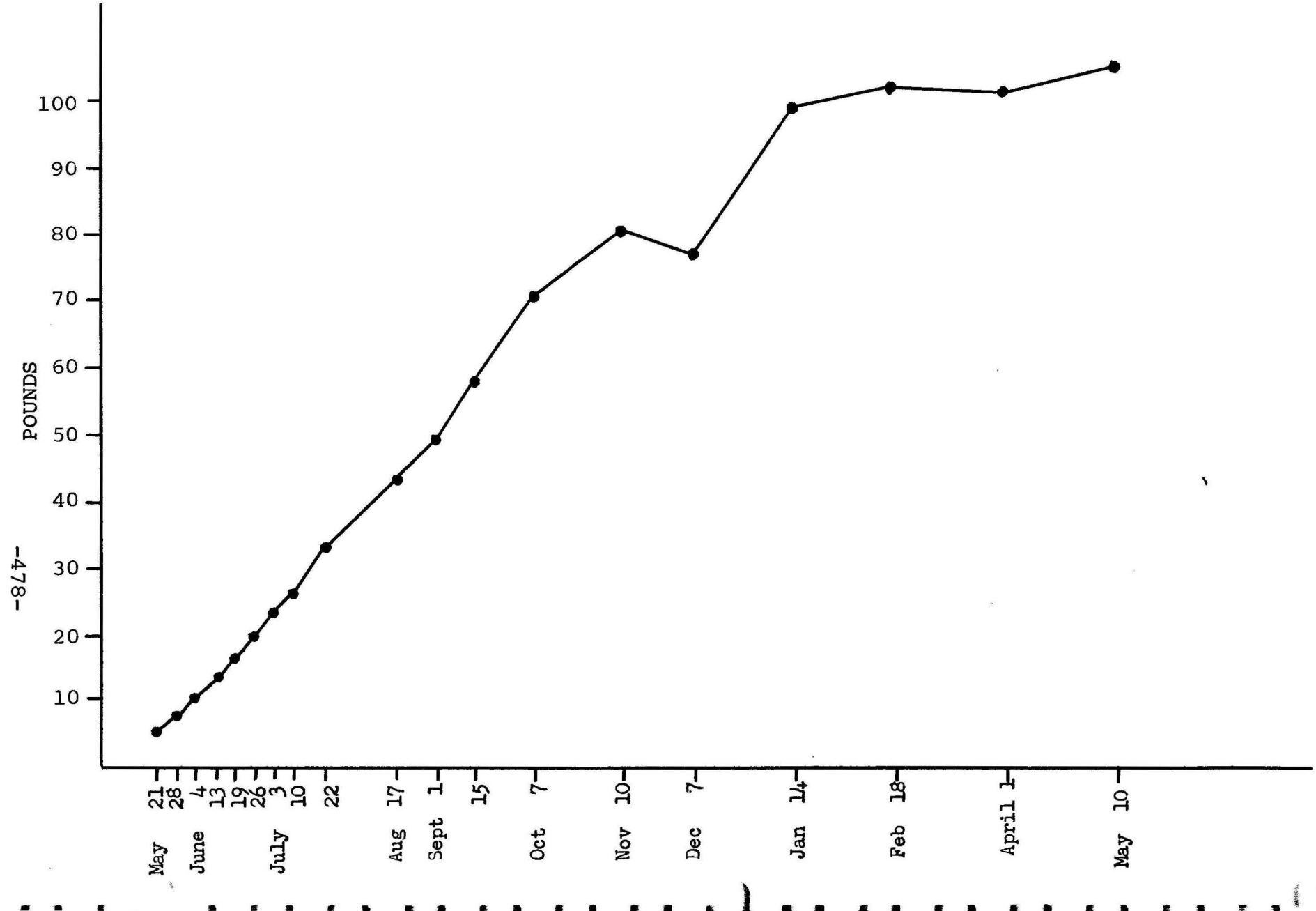


Table 9. Growth measurements* of a captive male wolf - ear tag # 13.

Date	Weight	Total Length	Tail Length	Hind Foot	Height at Shoulder	Chest Girth	Ear
May 21	5.7	22 3/8	5 3/4	4 1/8	7 5/8	12	1 3/8
May 28	8.1	25	6 1/4	5	9 1/8	14	1 5/8
June 4	10.9	27	7 1/2	5 1/2	10 1/8	14 1/4	2 1/8
June 13	14.1	32 1/2	8 1/2	6 3/8	12 5/8	15 5/8	2 1/2
June 19	17.1	34 1/4	9 3/4	7	13 1/8	16 14/	3
June 26	20.0	38 1/2	10 1/4	7 3/4	13 3/4	17 1/8	3 1/8
July 3	23.2	42	11 3/4	8 1/8	14 3/8	17 3/4	3 3/8
July 10	26.1	43 1/2	11 3/4	8 5/8	17	19 1/4	3 3/8
July 22	33.3	46	13	9 1/4	18	19 5/8	3 3/4
Aug. 17	43.5	52 3/4	15 1/2	10 3/8	20 1/4	22 1/2	4
Sept. 1	50.7	58 1/2	16	10 1/2	23 1/2	25 1/2	4
Sept. 15	61.0	62 1/2	18	11 5/8	24	25 3/4	4
Oct. 7	72.0	62 1/2	18 1/2	11 5/8	25	27	4 5/8
Nov. 10	89.5	66	18	11 1/8	25	30 1/2	4
Dec. 7	93.0			11		30	
Jan. 14	98.0	65	19	11 1/2		30	4 1/2
Feb. 18	108.0	68	17 1/2	11 1/2	29	31 3/4	4 3/4
April 1	110.0			12 1/4		34	4 1/2
May 10	107.5		17 3/4	12	28 7/8	31	4 1/2

*Measurements are in inches and weights are in pounds.

Figure 8. Cumulative growth of male wolf - ear tag # 13.
(Data from table 9)

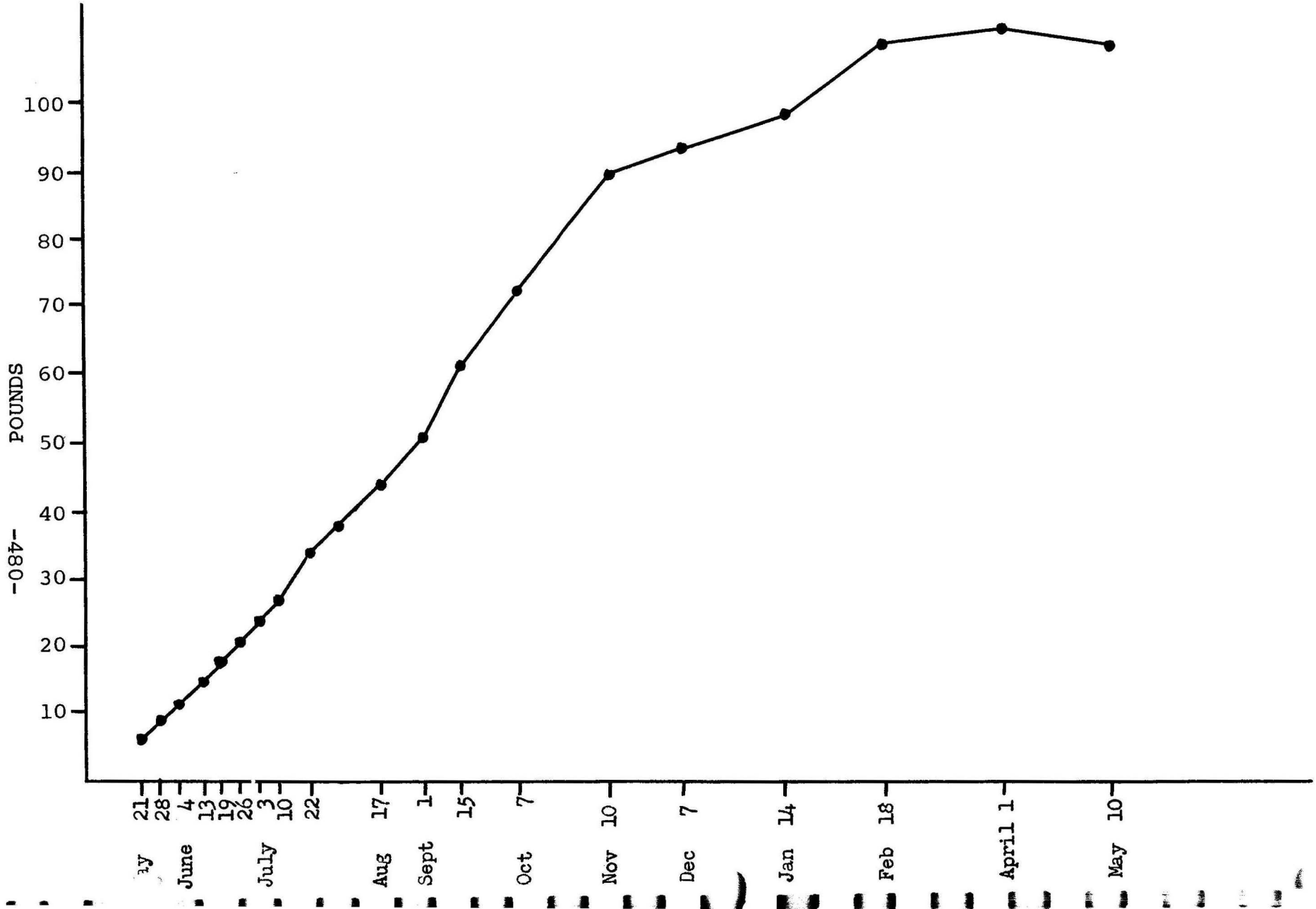
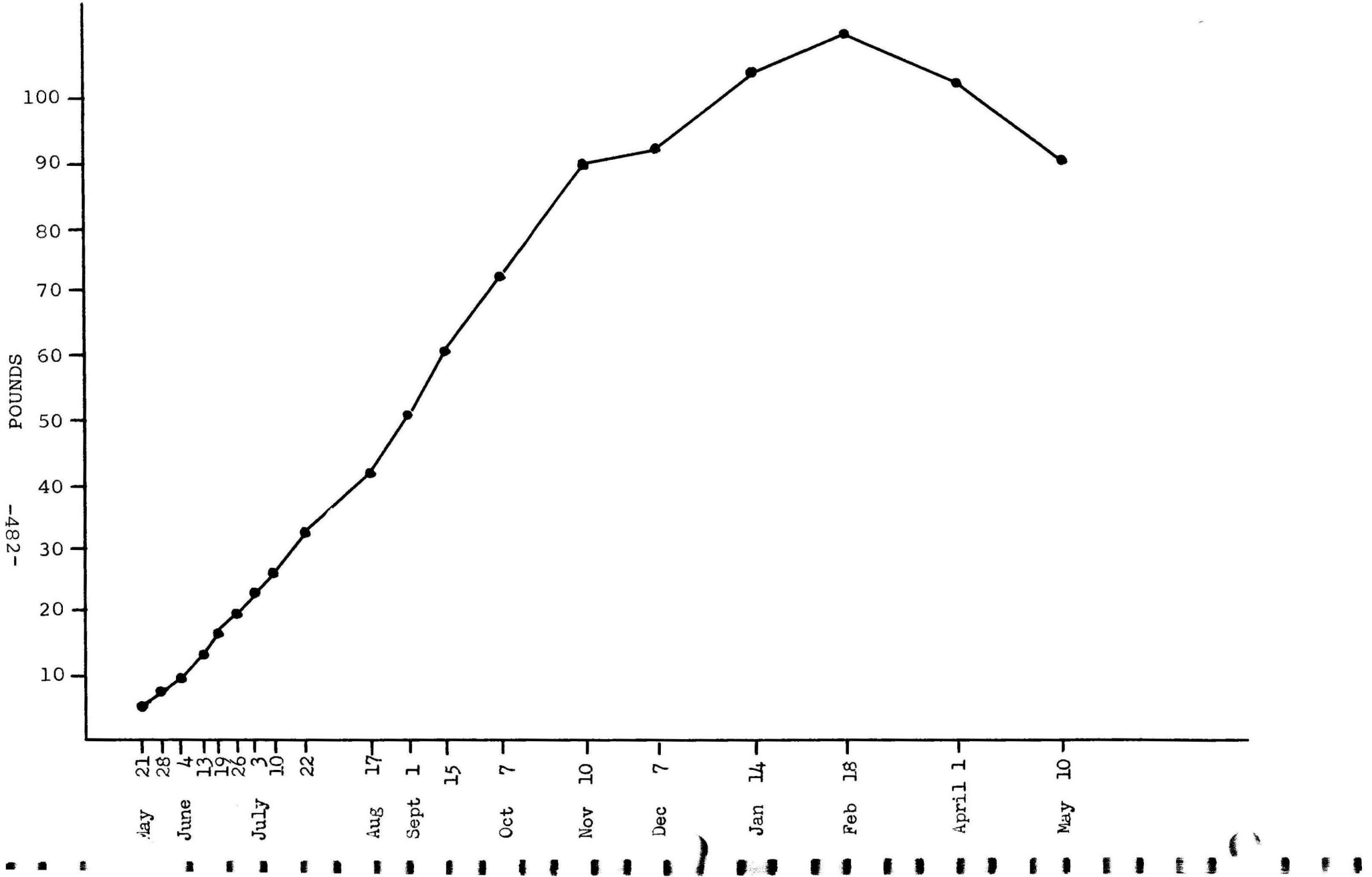


Table 10. Growth measurements* of a captive male wolf - ear tag # 15.

Date	Weight	Total Length	Tail Length	Hind Foot	Height at Shoulder	Chest Girth	Ear
May 21	5.4	21 1/4	5 7/8	4 1/8	8	11 3/4	1 1/2
May 28	7.6	24	6 1/4	4 7/8	9	13	1 1/2
June 4	9.9	27	7 1/8	5 1/4	10	14	2
June 13	13.6	32 1/2	8 3/4	6 1/8	12 1/4	15 5/8	2 5/8
June 19	16.5	34 1/2	9 1/8	6 3/4	13	16	3
June 26	19.8	37	10 3/4	7 1/2	13 1/2	17 1/2	3 1/4
July 3	23.1	40 1/4	10 3/4	8 3/8	14 5/8	17 1/8	3 3/8
July 10	26.0	42 1/2	11 3/4	8 1/2	17	19 1/4	3 1/2
July 22	32.5	46	13 1/4	9 1/8	19	19 1/2	3 1/2
Aug. 17	44.0	52	16	9 7/8	20 1/4	23 5/8	4
Sept. 1	50.5	56	16 1/4	9 7/8	22	25	4
Sept. 15	60.5	59	17 7/8	10 5/8	24	26 1/8	4
Oct. 7	72.5			11	27 1/2		
Nov. 10	90.0		18	11 1/4	26	31	4 1/8
Dec. 7	92.0			11 1/4		31	
Jan. 14	104.0	64	18	11 5/8	28	31	4 5/8
Feb. 18	109.0	67 1/2	17	11 3/4	29 1/2	33 1/4	5 1/4
April 1	101.5	68	17 1/2	11 3/4	28 1/2	33	4 1/8
May 10	89.5		17 3/4	11 7/8	29	32 1/2	4 1/4

*Measurements are in inches and weights are in pounds.

Figure 9. Cumulative growth of male wolf - ear tag # 15.
(Data from Table 10)



of their efforts.

The captive wolves were not anesthetized to facilitate handling, so apparent errors in the tabulation of some measurements are the result of the individual wolf's activity during the time that measurements were being taken. A lowered rate of weight gain was apparent for the period November 11 to December 7. The reason for this has not been determined. During December 8 through January 14, an increase in the wolves' rate of weight gain accompanied a rise in the average daily food consumption.

Table 11 summarizes the food consumed by the wolves during their first year of captive life and Table 12 gives the average pounds of food consumed during intervals between growth measurements.

Recommendations:

This report has been directed toward the compliation of the various interrelated data collected from wolves in Southeastern Alaska. An evaluation of these data will be possible when the analysis of the reproductive specimen material is completed. Efforts to collect material from wolf specimens should be continued.

Additional areas that have physical features like those of the den located on Kupreanof Island should be investigated for signs of wolf activity during August at which time the accumulation of tracks resulting from wolf movements across mud flats near denning areas makes den hunting practical.

Prepared by:

Paul Garceau
Research Biologist
30 June 1960

Approved by:

Sigurd T. Olsen
P-R Coordinator

James W. Brooks, Director
Division of Game

Table 11. Summary of food consumed by seven captive wolves between May 19, 1959, and May 10, 1960.

Date	Pounds Evaporated Milk	Table Spoons Pablum	Pounds Dry Dog Food	Miscel-lanious	Pounds Pickup*	Pounds Water Added	Total Weight Consumed	Pounds Left Uneaten
May 19 - May 21	6.3	12	0.0	1 lb.	?	?	10.0	.8
May 22 - May 28	13.6	15	3 cups		4.2	43.2	61.5	3.6
May 29 - June 4	11.9		11.0		40.4	10.3	74.0	
June 5 - June 13	17.2		18.0		74.2	15.3	116.0	8.8
June 14 - June 19	7.3		14.5		64.0	19.7	96.0	9.5
June 20 - June 26	8.2		14.5		103.4	26.9	148.5	4.5
June 27 - July 3	7.3		15.0		131.5	28.7	179.1	3.4
July 4 - July 10	7.3		10.5		159.1	40.6	180.0	28.1
July 11 - July 22	20.8		12.0		390.0	63.2	388.2	97.8
July 23 - Aug. 17	45.5		68.5		826.0	143.7	929.3	154.5
Aug. 18 - Sept. 1	27.1		22.5		529.1	72.4	528.9	122.1
Sept. 2 - Sept. 15	0.0		0.0		440.0	0.0	440.0	0.0
Sept. 16 - Oct. 7	1.8		1.5		811.2	10.3	811.2	13.6
Oct. 8 - Nov. 10	0.0		9.0		1100.1	26.0	1103.1	32.0
Nov. 11 - Dec. 7	0.0		10.0	20 lbs.	905.3	15.0	950.3	0.0
Dec. 8 - Jan. 14	0.0		0.0		2165.5	0.0	2165.5	0.0
Jan. 15 - Feb. 18	0.0		0.0		1756.2	0.0	1756.2	0.0
Feb. 19 - April 1	0.0		0.0		1513.5	0.0	1513.5	0.0
April 2 - May 10	0.0		0.0	8 beavers	1527.0	0.0	1527.0	0.0

*Pickup was generally 75% fish, 15% cerial, and 10% water.

Table 12. Average pounds of food consumed per day per period.

Periods	Pounds of Food Consumed	Number of Days	Average Pounds per Day
May 19 - 21	10.0	3	3.3
May 22 - 28	61.5	7	8.8
May 29 - June 4	74.0	7	10.7
June 5 - 13	116.0	9	12.9
June 14 - 19	96.0	6	16.0
June 20 - 26	148.5	7	21.2
June 27 - July 3	179.1	7	25.6
July 4 - 10	180.0	7	25.8
July 11 - 22	388.2	12	32.3
July 23 - Aug. 17	929.3	26	35.7
Aug. 18 - Sept. 1	528.9	15	35.2
Sept. 2 - 15	440.0	14	31.4
Sept. 16 - Oct. 7	811.2	22	36.9
Oct. 8 - Nov. 10	1103.1	34	33.3
Nov. 11 - Dec. 7	950.3	27	34.9
Dec. 8 - Jan. 14	2165.5	38	57.0
Jan. 15 - Feb. 18	1756.2	35	50.1
Feb. 19 - April 1	1513.5	43	35.2
April 2 - May 10	1527.0	38	40.1

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ANNUAL REPORT OF PROGRESS
INVESTIGATIONS PROJECT
COMPLETION OF 1959-1960 SEGMENT

State: ALASKA

Project No: W-6-R-1 Name: Game Investigations of Alaska

Work Plan: K Wolf Management Studies

Job No: 3 Title: Food Habits & Hunting Behavior of Wolves In Southeastern Alaska

Period Covered: July 1, 1959 - June 30, 1960

Abstract:

Existing information on wolf food habits indicates that wolves are nearly, if not entirely, dependent on deer on the islands of Southeastern Alaska.

At certain times, wolves localize their hunting activities and it appears that they choose to travel and hunt along frozen lakes when conditions permit.

Objectives:

To determine the food habits of wolves on a seasonal basis and with varying conditions of prey availability, the techniques of hunting and taking prey, the extent of intraspecific competion for food, and the reaction of prey to the presence of wolves.

Techniques:

Analysis of scats found along trails on Kupreanof Island during June, July, and August, and in the rearing area near a wolf den provided the means of determining

food composition.

Aerial observations of wolf kills provided some information on the manner in which the prey is hunted and killed.

Findings:

Food habits. On August 3, 1958, forty scats were examined by C. Lensink and myself in the vicinity of a wolf den on Kupreanof Island. All of these contained remains of deer. Remains of other animals were not apparent. On August 23, 79 additional scats were taken from the area and these showed a 95 percent frequency of deer remains when examined in the laboratory. Of the scats containing deer remains, 62 percent contained remains of fawns. These data cannot be shown to indicate a selective predation on fawns. Hair texture, teeth, and parts of hooves were used as criteria for distinguishing fawn from adult remains.

Field examination of 12 scats found on trails in 1958 showed 83 percent frequency of deer remains of which at least 40 percent were fawn.

Beaver remains constituted the second highest frequency of occurrance in scats but the degree to which beaver and other foods act as buffers cannot be shown until deer numbers fall considerably below their present level of abundance. At present the data clearly indicates that wolves are dependant on deer as a food on the islands in Southeastern Alaska.

A summary of food habits based on scat material is presented in Table 1.

Hunting behavior. The several observations of wolf packs described in Job 1 indicate that wolves frequently spend several days hunting over small (under 1/2 square mile) areas before moving to another area.

During cold periods it appears that wolves prefer to travel on frozen lakes. Deer that run out of the timber

Table 1. Summary of analysis of wolf scats collected on Kupreanof Island during June, July, and August, 1958.

Location	No. Examined	Deer No.	Deer %	Beaver No.	Beaver %	Mice No.	Mice %	Bird No.	Bird %
Den Site Kupreanof Is.	79	75*	95	18	23	7	9	4	5
Den Site Kupreanof Is.	40	40	100						
Trails Kupreanof Is.	12	10	83	2	17				

* Of the 75 scats containing deer remains, 46 or 62% contained remains of fawns.

One scat found at the den site contained a small piece of harbor seal hide.

onto the open ice are usually overtaken easily by pursuing wolves. It is not known if wolves deliberately chase deer onto frozen lakes or if pursued deer choose to run onto frozen lakes.

Recommendations:

Food habits of wolves as reflected by an analysis of scats can be useful information during changes in levels of deer abundance. Until there is a change in the present level of deer abundance, the time allotted for hikes on trails for the purpose of scat collection, should be reduced.

An examination of the stomach contents of dead wolves should continue whenever these are available.

Observations on the hunting behavior of wolves should be continued whenever possible.

Literature Cited:

Klein, David R. and Sigurd T. Olson, 1960. Natural Mortality Patterns of Deer in Southeastern Alaska. Journal of Wildlife Management, 24 (1):80-88.

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Volume 1 Report No: L-1

ANNUAL REPORT OF PROGRESS
INVESTIGATIONS PROJECT
COMPLETION OF 1959-1960 SEGMENT

State: ALASKA

Project No: W-6-R-1 Name: Game Investigations of Alaska

Work Plan: L Wildlife Data Collections

Job No: 1 Title: Wildlife, Reconnissance, Northwest Coastal Alaska

Period Covered: July 15, 1959 - April 15, 1960

Abstract:

Printed forms, maintained by selected individuals in various native villages, were used to gather harvest data from native communities in Northwestern Alaska. Of the 12 villages that participated during the period October 1959-March 1960, 3 depended primarily on wild terrestrial animals and the remainder on either domesticated reindeer or marine mammals.

Sport hunters largely limit their activity to terrestrial animals, except for one marine animal, the polar bear.

Waterfowl hunting is not restricted to the legal season.

The three most important management problems in Northwestern Alaska are (1) enlightening the people in regards to our regulations and conservation aims, (2) enforcing fish and game regulations, and (3) managing the caribou herds and reindeer industry so that maximum benefits accrue.