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CANADIAN WILDLIFE SERVICE

MEMORANDUM

FILE WLT-266

Ottawa, August 16, 1956.

MEMORANDUM FOR: MR. D. R. FLOOK

Attached hereto please find a copy of a report by Mr. N. S. Novakowski entitled, "Analysis of Autopsy Records of Wolves Taken in the Eskimo Point Area, 1956".

This is forwarded for your information and retention.

A. W. F. Banfield,
Chief Mammalogist,
for Chief.

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Analysis of Autopsy Records of Wolves Taken in the Eskimo Point Area, 1956

N. S. Novakowski

Canadian Wildlife Service

July, 1956

Introduction

The records herein discussed were obtained during the mop-up operations of the wolf control project in the Eskimo Point area initiated by D. R. Flook of this Service in January and February, 1956. Though the mop-up was carried out in May very few thawed specimens were encountered, the balance being frozen and as a result yielding incomplete data. Some samples from the fresh specimens were taken for laboratory examination.

Taxonomy

The taxonomy of the wolves examined is at present only tentative. They were all classed as tundra wolves belonging to the subspecies *Canis lupus hudsonicus* Goldman. It was the opinion of the guide and the writer that only one subspecies was encountered and it has been placed in the subspecies *hudsonicus* based on the range indicated by Young and Goldman (1944). A precise subspeciation of these wolves from skull measurements will be forthcoming from the University

of British Columbia at a later date.

Size of Sample

The number of wolves recorded on the autopsy cards was 59. This total includes 9 which were partially devoured and their records lacking in some vital measurements.

Color

A wide range of variability in color was encountered which could be best divided into 4 categories. The 54 individuals whose color could be determined were grouped as follows:

Grey - White with black-tipped guard hairs dorsally and white ventrally. This combination was predominant with 65 per cent of the sample of this color.

White - Individuals in this category were pure white (not the creamy white found in timber wolves recorded by Fuller and Novakowski, 1955). There were 17 per cent of this category in the sample.

Grey-Brown - Individuals in this category were grey and brown dorsally and white ventrally. There were 11 per cent of this category in the sample and 7 per cent (4 individuals) appeared to belong to one family group.

Black - There were 7 per cent of the sample in this category. One of these had a somewhat grizzled appearance (some white intermixed) and 2 had large white spots on the flanks in identical locations. These latter appeared to be litter mates.

Age Classes

The division of individuals into three age classes, less than one year, more than one year and very old, was based on the criterion of tooth wear. Aged samples of individuals in these three classes were sent by D. R. Flook to Eskimo Point to assist the guide and the writer in age classification. On this basis 8 were classified as being less than one year old, 36 as more than one year old, 8 as very old, Table 1. Some differentiation in the wide class of adults more than one year old was attempted on the basis of gradation in tooth wear. Out of the 36 individuals in this class 15 were considered to be yearling wolves. This is nearly one-half of the more than one year class.

A graph of the ages assigned in the field to those wolves less than one year and those more than one year not including the very old is presented in Figure 1. The ages assigned are very arbitrary

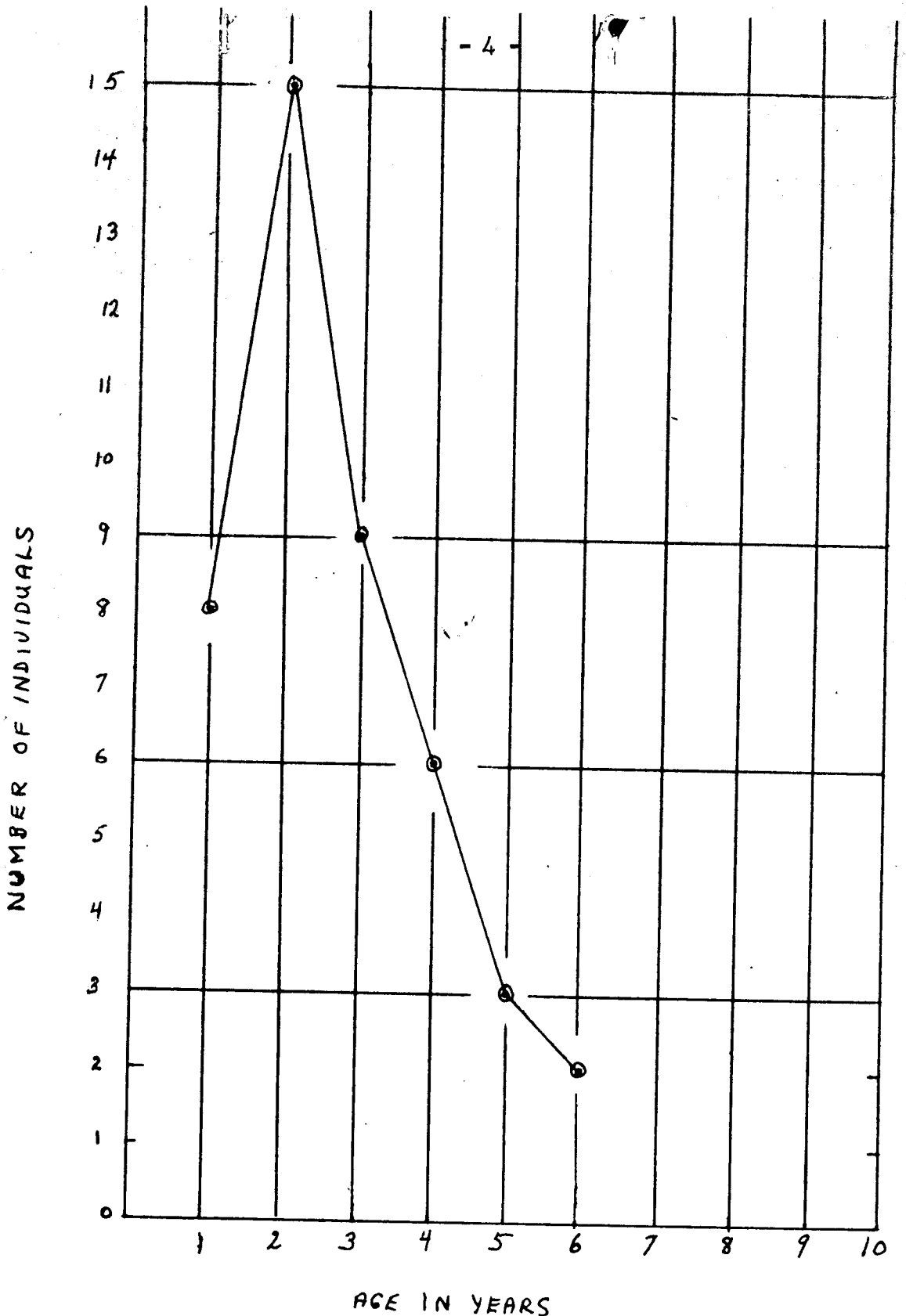

Figure 1 - Proposed age structure of sample of tundra wolves, Eskimo Point, 1956.

but a trend in representation of different ages is apparent. The abundance of yearlings in the sample (if they can be recognized as such) is likely due to the fact that they are generally taken in the poison baits along with their parents and usually the pups and are also killed as independent individuals either in a pack with no apparent family affinities or as single wolves.

Previous poisoning campaigns have been conducted against the tundra wolf in other locations. Reference to these campaigns is found in manuscript reports to the Canadian Wildlife Service by W. A. Fuller for the years 1952-1953, 1953-1954, 1954-1955, 1955-1956. The results of these campaigns in regard to age structure of the populations poisoned are shown in Table II with the results from the Eskimo Point campaign for comparison. The age structure of the population sampled in the Eskimo Point area is comparable only to the age structure of the initial year of the campaign reported by Fuller. It would appear, therefore, that the wolves in the Eskimo Point area were an unexploited population before the campaign began and changes in the age structure of the population can be expected in following years of poisoning.

Sex Representation

The sex representation in the sample was 31 males and 21 females, a ratio of 147 males to 100 females. The sex ratios shown in Table II indicate that the ratio is completely reversed in the Eskimo Point sample compared to that recorded by Fuller. Differential mortality which has likely caused this ratio is not evident in any one group though there is a suggestion of it in the very old wolves. Another reason for the high proportion of males in the sample is indicated by the higher ratio of male singles taken. Out of 9 wolves which were taken singly at 9 different bait stations 7 were males and 2 were females. The male could thus be more aggressive in taking the bait or could be travelling more as a lone individual than the female. Fifteen embryos taken from 3 pregnant female wolves during the mop-up operation in the Eskimo Point area were examined in the laboratory in Fort Smith. It was found that 8 were males and 7 were females, very near the 1:1 ratio expected.

Measurement Data

The pertinent measurement data taken in the field is

presented in Table I.

Weight - The weight of the wolves was taken with a beam balance accurate to the nearest pound. A tripod for suspending the balance and the wolves was made with spruce poles left by Flook in Eskimo Point. This tripod was necessary in a treeless land but was very cumbersome, adding nearly 50 pounds to the komatik load. A tripod of the same pattern could be constructed of aluminum piping and could be made telescopic or adjustable to reduce the burden of handling.

The average weights of the different age classes of both sexes are presented in Table I. Differences between the weight of the males and females are apparent and differences in each age class in both sexes are also apparent. However, the range of each group indicates an overlap in all classes and both sexes. It would appear that there is too much variability to consider weight as a criterion of age.

Length - Three length measurements were taken. These are:

(a) Total length - measured from the tip of the nose across the back to the last tail vertebra.

(b) Tail length - from the first to the last tail vertebra.

(c) Hind foot length - from the back of the heel to the longest claw.

(d) Height - from the shoulder to the first foot pad on the front foot.

The measurements were taken in inches and the average lengths of the four measurements for both sexes and the different age groups are shown in Table I.

A graph of the total length against the age of the wolves based on Figure I with length on the ordinate scale and age on the abscissa indicated a straight line relationship parallel to the abscissa. It appears that growth in length is definitive or nearly so at the sub-adult level (less than one year old).

It should be noted that only two specimens, both very old, attained the total length (1727 mm. and 1753 mm.) of the type specimen of Canis lupus hudsonicus (1720 mm.) recorded by Young and Goldman (1944).

Stomach Contents

The total sample showed evidence of an exclusive diet of caribou. In most cases it was possible to separate caribou flesh eaten by the wolf prior to its eating the bait since some amount of digestion had taken place and the difference in the flesh of the two

was apparent by color. The majority of the baits were skinned so that caribou hair found in the stomach of the wolf indicated that caribou was eaten prior to the wolf taking the bait.

Thirty-two wolves out of 42 that could be analysed had previously taken caribou before eating bait. Eight had bait only in the stomach and 2 had bait and wolf meat in the stomach. The wolves eaten by both of these specimens had likely been poisoned.

Parasites

Only 9 specimens were examined for parasitic infestation in the intestinal tract. Nematodes were rare and the cestode infestation varied from 1 extreme, 2 heavy, 1 moderate to 4 light. One specimen was without parasites in the intestine. No external parasitism was observed.

Samples of the intestinal parasites found have been sent to the Institute of Parasitology, MacDonald College, for speciation.

Reproduction

Of 7 females whos reproductive tract was examined 3 were found to be pregnant. The 4 which were not consisted of 2 less than one year old, 1 very old individual and 1 yearling. It is possible that the 2 that were less than one year old were immature and the very old individual was senile.

The 3 pregnant females appeared to be middle aged. The embryos taken from these wolves were preserved and the sex and size determined at Fort Smith. The results are presented in Table III.

The testis volume and spermatic activity of 2 males was determined. The volumes which were based on the water displacement method were 11 c.c. and 8 c.c. and the spermatic activity was nil in both cases. It appears that the breeding was over when these wolves were taken. The testis volume of timber wolves during the breeding season averaged 33.6 c.c. (Fuller and Novakowski, 1955).

General Condition

The general conditon of the wolves was determined by the amount of fat deposits found. Out of 52 individuals 46 were in excellent condition, the fat layers around the dorsal saddle being from one-half inch to two inches thick. The mesenteries and the renal capsules were heavily encrusted with fat. Five specimens had no fat reserves but appeared to be in good condition. One specimen, a very old male, was found to be in very poor condition. It was the longest specimen (69 inches) yet had a weight of only 88 pounds, whereas the heaviest specimen (111 pounds) was only 65 inches long. The flesh was flabby and the teeth almost all gone or broken. It is likely this wolf would soon have died of old age. One wolf taken had a trap on his front foot and though the wolf was in good condition it had no fat reserves.

Summary and Conclusions

1. Autopsy records of 59 tundra wolves taken during the mop-up operation in the Eskimo Point area, Keewatin District, have been analysed.

2. The color range of the sample was from pure white through to black. Sixty-five per cent of the sample was grey, 17 per cent was white, 11 per cent was grey-brown, and 7 per cent was black.

3. A discussion on age classes was presented. At present only three age classes can be recognized with some certainty, less than one year, more than one year and very old. Much narrower distinctions have been put forward on a very arbitrary basis. The wolf population of the Eskimo Point area is in the first year of exploitation and future poisoning campaigns in Keewatin District should include this area as a control for observing the population age structure each year. This method is perhaps the most reliable indication of success in the wolf poisoning program.

4. The measurement data of the sample, i.e., weight, total length, tail length, hind foot length and height was presented. Differences in each of these measurements were found between sexes but none that could be termed significant between age classes.

5. The stomach contents of the specimens examined indicated an exclusive diet of caribou throughout the term of the campaign.

6. The cestode infestation of those individuals examined ranged from extreme parasitization to none without any apparent harmful effects.

7. The embryos of 3 pregnant females were examined, one group of these being in a fairly advanced state of development. Four other females examined were not pregnant.

8. The general condition of the whole sample was considered excellent. It is felt that the wolves in the Eskimo Point area were taken from a resident population and their general condition attests to a plentiful food supply in the area. Very few caribou were seen during the mop-up operation and the writer is inclined to believe that the food supply of the wolves was provided not only by these few resident caribou but by numerous carcasses abandoned by the Eskimos. It is the opinion of the guide, Flook of this Service, and the writer that the abandoned carcasses supply a large part of the food until the northward migration of the caribou begins.

Table I - Synopsis of Measurement Data on Tundra Wolves, Eskimo Point, 1956.

	Less Than One Year		More Than One Year		Very Old	
	Male	Female	Male	Female	Male	Female
Total Number	3	5	22	14	6	2
Average Weight (Pounds)	75.7 (73.0-78.0)	65.2 (60.0-73.0)	86.5 (70.0-102.0)	74.8 (55.0-87.0)	91.3 (70.0-111.0)	87.5 (84.0-91.0)
Average Total Length (Inches)	62.7 (61.0-64.0)	57.8 (56.0-60.0)	62.1 (58.0-65.5)	59.7 (56.0-62.0)	63.8 (59.0-69.0)	61.0 (60.0-62.0)
Average Tail Length (Inches)	17.3 (17.0-18.0)	16.7 (15.5-17.5)	16.3 (15.0- 19.0)	15.5 (14.0-17.0)	16.5 (15.0- 19.0)	15.5 (15.0-16.0)
Average Hind Foot Length (Inches)	11.8 (11.5-12.0)	11.5 (10.5-12.0)	12.0 (11.0- 13.0)	11.2 (10.0-12.0)	11.9 (11.0- 12.5)	12.0 (11.5-12.5)
Height (Inches)	30.3 (30.0-31.0)	27.9 (26.0-29.0)	30.9 (29.0-33.0)	29.7 (28.0-31.0)	31.4 (29.0- 34.0)	28.5 (28.0-29.0)

N.B. - The range of each group is indicated in brackets.

Table II - Age Structure of Tundra Wolf Populations, Eskimo Point, 1956, and those recorded by Fuller from 1952-1956.

	Age Classes (Both Sexes)			Sex Ratio Males per 100 Females
	Less Than One Year	More Than One Year	Very Old	
Eskimo Point, 1956	8	36	8	147
Fuller, 1952-1953	5	24		---
Fuller, 1953-1954	23	43	7	77
Fuller, 1954-55	22	33	9	91
Fuller, 1955-1956	35	88	17	---

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Table III - Data on 15 Embryos Taken from 3 Female Tundra Wolves, Eskimo Point, 1956.

	Sex of Embryos		Length in millimetres of embryos	Weight of embryos (in pounds)
	Male	Female		
Specimen #8	4	2	22 mm.	---
Specimen #35	3	1	20 mm.	---
Specimen #48	1	4	75 mm.	0.3

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