

ALBERTA DEPARTMENT OF LANDS AND FORESTS
FISH AND WILDLIFE DIVISION

WILDLIFE INVESTIGATIONS

PROGRESS REPORT

ACTIVITY: Wolf Management TITLE: Biological Investigation of
SECTION: Problem Wildlife the 1973-74 Wolf Control
PROJECT NO.: _____ Program
PERIOD COVERED: November, 1973 to April, 1974

Abstract

A wolf control program was conducted by the Alberta Fish and Wildlife Division during winter, 1973-74. Investigations of population characteristics, food habits, parasitism, and diseases utilizing 115 wolf carcasses from the control program and other sources are reported here. Livestock were a major food source of wolves in agricultural and fringe areas. Increased population and range expansion in years of high pup survival may be related to increases in depredations in fringe and agricultural areas. Farmers took mainly juvenile and diseased animals. Necropsied wolves usually had obvious fat reserves; the few evidently malnourished wolves were either mangy or had suffered a crippling injury.

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DATE: January 10, 1975

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The opinions and recommendations in this report are those of the writer and do not necessarily represent Division opinion or policy.

Acknowledgements

Many people assisted in the biological evaluation of the 1973-74 wolf control program. Wolf control personnel and Wildlife Officers recorded field data and wolf measurements. Don Caldwell and Lorne Russell completed earlier reports on the program in the Peace River Region; some of the data presented here duplicates that found in their reports. John Gunson and Dave Unger have provided information and constructive suggestions and criticisms. The bulk of the wolves were necropsied by Dr. R. G. Christian of the Laboratory Services Branch, Alberta Department of Agriculture. Parasitological work was carried out by Mr. John Hunter of the same branch. Dr. Bill Samuel of the Department of Zoology, University of Alberta supervised a continuing project on mange in wolves. Arlen Todd contributed data on wolves studied at the Rochester Wildlife Research Center and generously consented to their use here. Hugh Smith of the Provincial Museum and Archives contributed information on a wolf taken near Stettler.

INTRODUCTION

Wolf depredations on livestock began to occur more frequently in Alberta during the summer of 1972 and have continued to the present time. A control program, primarily utilizing strychnine-poisoned baits in areas of livestock losses was carried out in the winter of 1972-73 and was continued in the winter of 1973-74. The results and evaluation of the damage and control aspects of the program are being reported elsewhere. The results of investigations of population characteristics, food habits, parasitism, including mange and other diseases are summarized in this report.

METHODS

All salvageable carcasses of wolves taken at poison stations were collected and delivered to the O.S. Longman Laboratory for biological and pathological analysis. Additional carcasses were obtained from a seizure of illegally trapper-poisoned wolves taken about 50 miles west of Manning, and some from farmers. Data from 15 wolves taken by registered trappers and submitted to the Rochester Wildlife Research Center were also obtained. Weight, measurements, sex, age and colour were recorded for all specimens when possible. Many specimens were submitted to the University of Alberta for more detailed parasitological analysis. The remaining wolves were necropsied. Stomach and lower intestinal samples were taken from some wolves for food habits analysis. Identification was accomplished by visual inspection. Reproductive organs from all wolves were preserved in formalin. Clearing of uteri was attempted using a series of ascending alcohols and benzol as described by Orsini (1962).

This proved time-consuming and was ineffective on partially decomposed specimens. Testis and epididymus were weighed and epididymal smears were prepared. A lower first premolar was extracted from each wolf for aging. Age was determined by counts of cemental annuli and supported by estimates from skull development. Most skulls were donated to the University of Alberta, Zoology Museum for preparation of museum specimens. The xiphoid fat bodies were removed and weighed in an attempt to index condition.

RESULTS

Of 117 wolves processed during the biological investigation, six were submitted for investigation of mange; nine consisted of heads only; two entire carcasses were donated as museum specimens and 99 were submitted for necropsy. Approximately one-third of the latter were too decomposed for complete necropsy. Thirty wolves were obtained through enforcement seizures, 13 from farmers and the Alberta Department of Agriculture and 64 from the wolf control program.

Food Analysis

Major food items were identified from the stomachs of 37 wolves and from lower intestinal samples of 29 of the same wolves (Table 1). Identified food items were cattle (beef), deer, moose, hare, raven, wolf or coyote, mink, "mouse", and ruffed grouse. The wolf or coyote, raven and mink were probably picked up at poison stations or were possibly trapped animals. Diet analysis was complicated by the use of draw baits and lack of information as to the animals used for baits.

Cervids, particularly moose, made up the bulk of food in the

trapper-poisoned sample. However, the major part of food in the stomachs was likely draw-bait or animals poisoned at bait stations. The intestinal samples, which were likely more representative, suggested heavy utilization of moose and deer. Seven of eleven food items identified from wolves shot in the Rimbey-Alder Flats area were beef while only one was deer; indicating heavy use of domestic animals by wolves in that agricultural area. Stomach and intestinal contents of wolves poisoned in the control program both show equally frequent occurrence of beef and cervids. Beef made up 46.7 percent of identified non-bait food items (including items from lower intestinal samples of control poisoned wolves) in all wolves sampled from agricultural and fringe areas (Table 2).

Sex and Age

Of 87 aged wolves taken on agricultural complaints, 37.1 percent were pups, 19.5 percent were yearlings, 18.4 percent were two-year olds and 22.8 percent were adults (Figure 1). Pup proportions varied greatly between samples: being 29.7 percent in the Peace River control program; 37.9 percent in wolves poisoned by trappers west of Manning; 41.9 percent in the Red Deer control program; 60.0 percent in the Rochester registered trapper sample; and 66.7 percent in wolves taken by farmers. Pup proportion in the Peace River control program declined from 41.3 percent in the 1972-73 program (Gunson, 1973).

Of 135 wolves sexed, 58 or 43.0 percent ($P < 0.20$) were males (Table 3). Significantly ($P < 0.03$) fewer males than females were poisoned in the Peace River Sub-division.

Condition, Diseases and Parasites

The majority of the wolves necropsied had obvious substantial reserves of fat. The three wolves from the Calgary Region were in good condition, but were noticeably less fat than was generally the case for wolves from other regions. Results of the xiphoid fat measurements were inconclusive, perhaps related to too few samples being obtained. Further investigation is recommended. The few wolves in obvious poor condition were either mangy or had crippling joint abnormalities which were probably the result of injuries.

Other abnormalities observed were bone growths on lower jaws, unhealed and healed fractured ribs, healed skull fractures and calcification of muscles about the head; the last two probably were the result of blows, some of which were undoubtedly nearly fatal. One wolf had missing toes and another had an umbilical hernia. Older wolves frequently had missing or broken teeth.

Four or ten percent of the 40 wolves taken in the Peace River control program were reported as mangy. In addition three of the six wolves taken by farmers in the same area were mangy. Mange was not reported in the Peace River region during 1972-73. Mange was not reported in the 37 Red Deer control program wolves, nor in the wolves shot by farmers in the Rimbey-Alder Flats area.

Condition was apparently an important factor predisposing adult wolves taken by farmers. Of eleven such wolves five were infected with mange and two others were reported to have been in poor condition.

Reproduction

The mean number of placental scars and embryos in 13 wolves was 6.0 (Table 4). The number of ova shed, as indicated by corpora lutea was nine and eight in two wolves with seven embryos each. Embryo development of three wolves from near Rocky Mountain House indicated a breeding season from at least early February to the first week of March.

Peak testis weights were attained by adult males in February (Figure 2). Smears showed abundant sperm in one wolf taken on December 17, 1973 and in four others taken in February and March. Testis weights and sperm counts were lower in both a mangy and a crippled wolf than other wolves of comparable capture date and age.

Colour

Of 110 wolves of known colour, 67 were classified as grey, 38 as black, three as white and two as brown. No significant regional variation was observed.

DISCUSSION

The above observations are of significance to an evaluation of the livestock-wolf conflict. Most important is the heavy wolf utilization of livestock in agricultural and fringe areas as revealed by food analysis. What proportion of livestock originated from agricultural carrion and what from predation must be determined by additional studies. Part of the data supporting livestock utilization is based on lower intestinal samples which may include material from bait stations. However, over half the samples contained food which is different from that found in the stomach while others differ from the bait known to have been used to poison the

animal. Therefore the bias introduced is probably relatively minor.

A relationship between wolf productivity and numbers of depredations may be indicated. The proportion of juvenile wolves was high in both the 1972-73 Peace River control program and the 1973-74 Red Deer control program. Both areas reported large increases in wolf depredations at these times. Additionally, the number of depredations and proportion of juveniles taken declined during the 1973-74 Peace River program. The poison technique may be biased towards juveniles, although this is not supported by other research (Fuller and Novakowski, 1955). Further research is recommended to evaluate this relationship.

Farmers appear to take a disproportionately large number of juvenile and diseased wolves. The juvenile wolves are generally from packs while the diseased wolves are often solitary. This indicates either the susceptibility of young and sick wolves to farmers or the actual composition of the wolf population in farming areas. Trappers, similarly, take a high percentage of juveniles, which is attributable to the inexperience of these animals.

REFERENCES CITED

- Fuller, W. A. and N. S. Novakowski. 1955. Wolf Control Operations, Wood Buffalo National Park, 1951-52. Canadian Wildlife Service. Wildlife Management Bulletin Ser.1 No.11.
- Gunson, John R. 1973. The 1972-73 wolf control program. Unpubl. Progress Rep. Alta. Fish and Wildlife Div. 25 pp.
- Orsini, Margaret Ward. 1962. Technique of preparation, study and photography of benzyl-benzoate cleared material for embryological studies. J. Reprod. Fertil. 3: 283-287.

TABLE 1. Analysis of stomach and lower intestine food contents of wolves obtained from various sources in Alberta during winter, 1973-74.

Area	Collection Type	Organ	Number Examined	Contents																			
				Beef		Cervid		Hare		Wolf or Coyote		Raven		Small Mammal		Ash		Ruffed Grouse		Vegetable		Empty	
				No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Peace River	Trapper Poisoned	Stomach	12	0	0	12	100	0	0	1	8.3	1	8.3	1	8.3	0	0	0	0	0	0	0	0
		Intestine	11	0	0	6	54.5	1	9.1	2	18.2	0	0	0	0	3	27.3	0	0	2	18.2	0	0
Province-wide	Control Poisoned	Stomach	19	9	47.4	9	47.4	3	15.8	1	5.3	1	5.3	0	0	0	0	0	0	0	0	1	5.3
		Intestine	12	4	33.3	4	33.3	1	8.3	0	0	1	8.3	1	8.3	2	16.7	1	8.3	0	0	0	0
Rimbey-Alder Flats	Shot by Farmers	Stomach	6	5	83.3	1	16.7	1	16.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Intestine	6	2	33.3	0	0	0	0	0	0	0	0	0	0	2	33.3	0	0	0	0	2	33.3
All Areas	All Wolves	Stomach	37	14	37.8	22	54.5	3	8.1	2	5.4	2	5.4	1	2.7	0	0	0	0	0	0	1	2.7
		Intestine	39	6	20.7	10	34.5	3	10.3	2	6.9	1	3.4	1	3.4	7	24.1	1	3.4	2	6.9	2	6.9

TABLE 2. Non-bait food items identified from stomachs and intestines¹⁾
of wolves taken in agricultural and fringe areas of Alberta
during winter, 1973-74.²⁾

Food Item	Number	Occurrence (%)
Beef	14	46.7
Cervid	6	20.0
Hare	3	10.0
"Mouse"	1	3.3
Ash	4	13.3
Ruffed grouse	1	3.3
Raven	1	3.3
Total	30	99.9

1) Includes intestinal samples of shot and control poisoned wolves; stomachs of shot wolves; and stomach contents of four poisoned wolves which are known to be different than the bait employed.

2) Two additional wolves had both beef and cervid in stomachs.

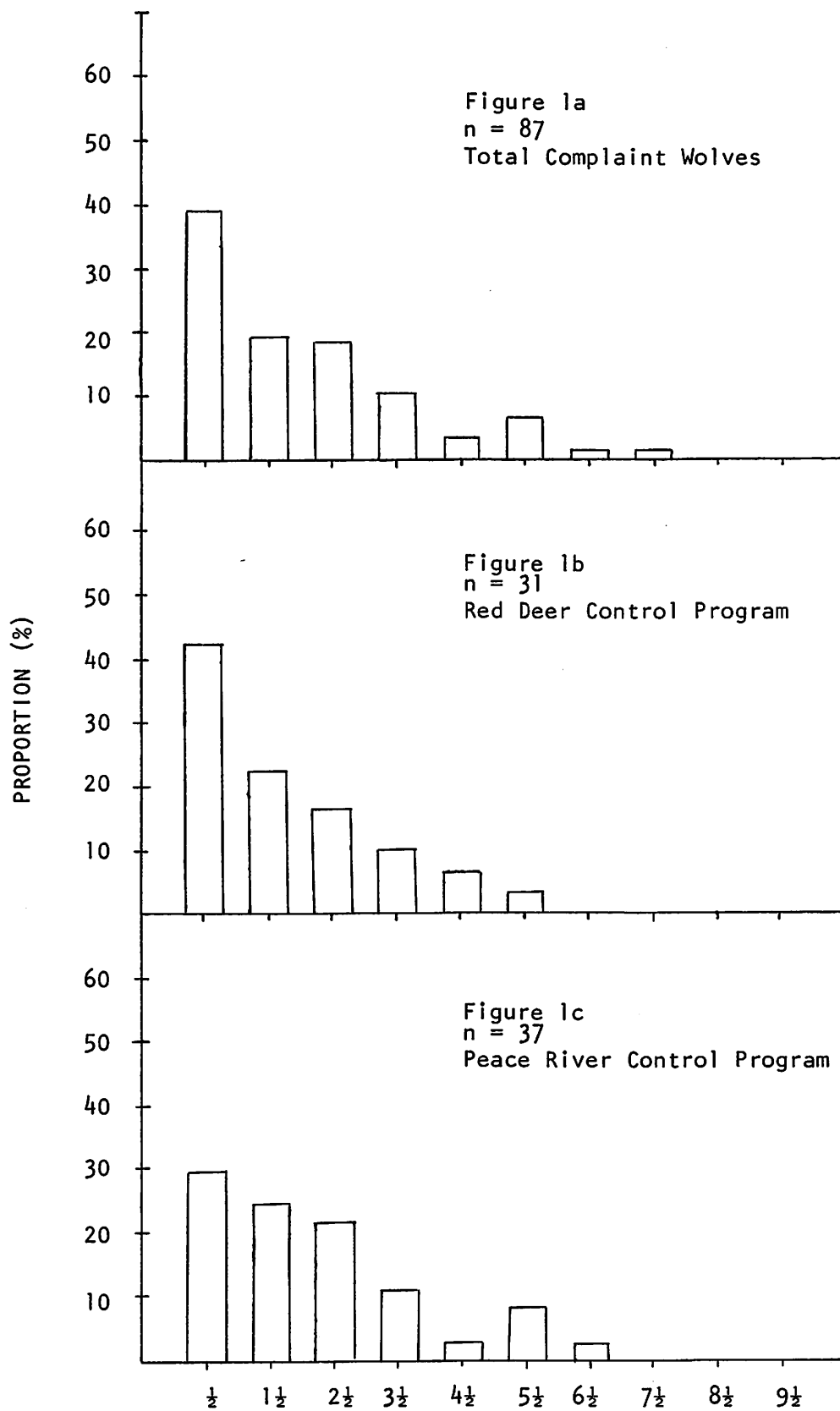
TABLE 3. Sex proportions of wolves from various sources in Alberta during winter, 1973-74.

Area		No.Wolves	No.Males	% Males
Peace River	Control poisoned	37	13	35.1
Peace River	Trapper poisoned	29	10	34.5
Peace River	Total poisoned	66	23	34.8
Red Deer	Complaint wolves	40	20	50.0
Province-wide	Registered Trappers ¹⁾	15	8	53.3
Province-wide	Complaint wolves	91	40	44.0
Province-wide	All wolves	135	58	43.0

1) Wolves turned into Rochester Wildlife Research Center by registered trappers.

TABLE 4. Embryos and placental scars in uteri of wolves taken in Alberta during winter, 1973-74.

	No. of uteri	Mean	Range
Embryos	4	7.5	7-8
Placental scars	9	5.3	3-8
Total	13	6.0	3-8



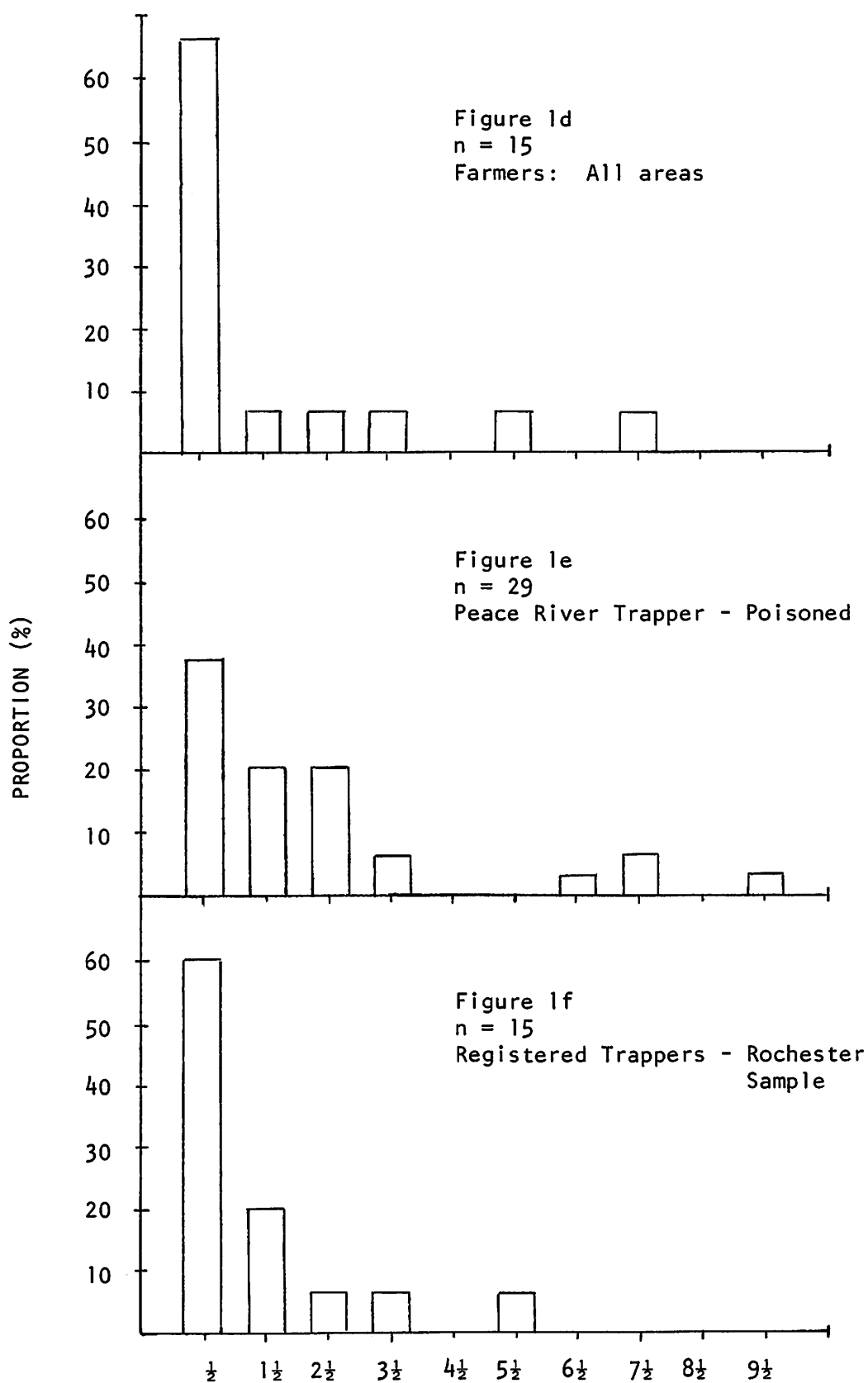


Figure 1. Age structure of wolves from various samples taken in Alberta during winter, 1973-74.

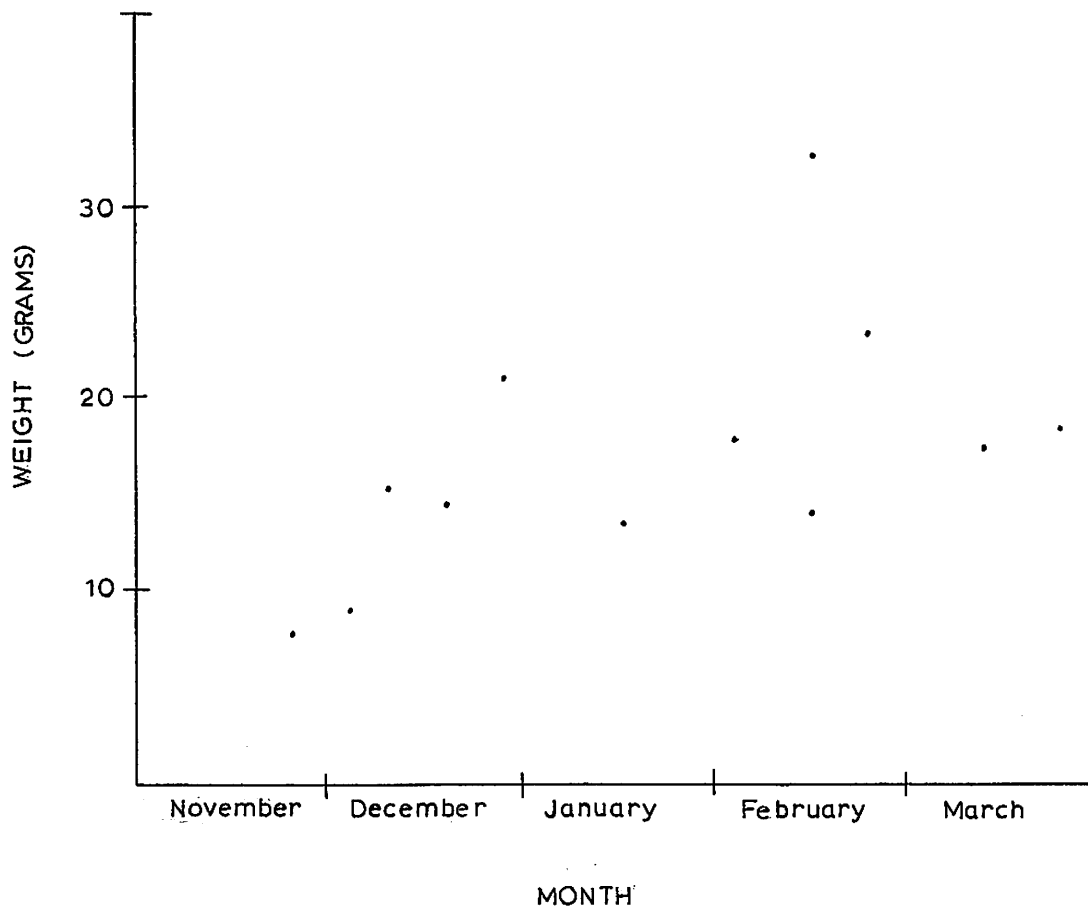


Figure 2. Testis weights of adult wolves taken by Fish and Wildlife and farmers in Alberta during winter, 1973-74.

Appendix 1. Specifics of wolves taken by Fish and Wildlife wolf control program, seizures, farmers and Department of Agriculture from April 1, 1973 to March 31, 1974.

Subdivision	Location	Date	Specimen No.	Sex	Age	Colour	Weight	Kill Method	
Calgary	20-26-7	W5	12/27	565891	F	2½	Gr	-	P
Calgary	20-26-7	W5	12/27	565892	M	2½	Gr	-	P
Calgary	17-28-6	W5	2/ 3	565900	M	3½	Gr	-	P
Calgary	19-26-7	W5	12/24	-	-	-	-	-	P
Calgary	19-26-7	W5	12/24	-	-	-	-	-	P
Red Deer	12-46-7	W5	12/20	544666	F	½	-	-	P
Red Deer	12-46-7	W5	12/20	544667	M	½	-	-	P
Red Deer	12-46-7	W5	12/20	544668	M	½	-	-	P
Red Deer	17-33-7	W5	1/ 8	692301	F	½	Bl	-	P
Red Deer	17-33-7	W5	1/ 8	692302	F	½	Gr	-	P
Red Deer	17-33-7	W5	1/ 8	692303	F	1½	Gr	-	P
Red Deer	20-38-9	W5	2/24	692304	F	2½	Gr	-	P
Red Deer	20-38-9	W5	2/24	692305	M	½	Bl	-	P
Red Deer	17-33-7	W5	2/24	692306	F	2½	Gr	-	P
Red Deer	17-33-7	W5	2/24	692307	M	2½	Gr	-	P
Red Deer	19-41-8	W5	3/ 6	692308	M	½	Gr	-	P
Red Deer	19-41-8	W5	3/ 6	692309	F	½	Gr	-	P
Red Deer	19-41-8	W5	3/ 6	692310	F	½	Bl	-	P
Red Deer	19-41-8	W5	3/ 6	692311	F	4½	Gr	-	P
Red Deer	19-41-8	W5	3/ 6	692312	F	3½	Bl	-	P
Red Deer	19-41-8	W5	3/ 6	692313	M	3½	Gr	-	P
Red Deer	19-41-8	W5	3/ 6	692314	M	1½-2½	Gr	-	P
Red Deer	3-40-10	W5	3/ 9	692315	F	½	Gr	-	P
Red Deer	20-38-9	W5	3/10	692316	F	½	Bl	-	P
Red Deer	20-38-9	W5	3/10	692317	F	1½	Bl	-	P
Red Deer	19-41-8	W5	3/11	692318	F	3½	Bl	-	P
Red Deer	13-45-9	W5	3/12	728216	M	½	Gr	-	P
Red Deer	13-45-9	W5	3/12	728217	F	5½	Bl	-	P
Red Deer	13-45-9	W5	3/12	728218	F	1½	Gr	-	P
Red Deer	13-45-9	W5	3/12	728219	M	2½	Gr	-	P
Red Deer	13-45-9	W5	3/12	728220	M	1½	Gr	-	P
Red Deer	13-45-9	W5	3/12	728221	M	1½	Gr	-	P
Red Deer	19-41-8	W5	3/25	728222	F	½	Bl	-	P
Red Deer	3-40-10	W5	3/25	728223	M	4½	Gr	-	P
Red Deer	19-41-8	W5	3/28	728224	M	2½	Gr	-	P
Red Deer	19-41-8	W5	3/28	728225	M	1½	Gr	-	P
Red Deer	20-38-9	W5	4/ 5	784994	M	-	Bl	-	P
Red Deer	3-40-10	W5	-	-	-	-	Gr	-	P
Red Deer	2-45-6	W5	-	-	-	-	-	-	P
Red Deer	2-45-6	W5	3/20	-	-	-	-	-	P
Red Deer	3-44-4	W5	-	-	-	-	-	-	P
Red Deer	3-44-4	W5	-	-	-	-	-	-	P
Red Deer	Winfield		10/17	V441073	M	½	-	-	S

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Appendix 1 (Continued)

Subdivision	Location	Date	Specimen No.	Sex	Age	Colour	Weight	Kill Method	
Red Deer	22-45-5	W5	10/17	V441076	F	-	-	S	
Red Deer	Bluffton		Jan.	V441078	M	$\frac{1}{2}$	Bl	S	
Red Deer	Bluffton		Jan.	V441079	M	$\frac{1}{2}$	Gr	S	
Red Deer	Bluffton		Jan.	V441080	M	$\frac{1}{2}$	Bl	S	
Red Deer	Bluffton		Jan.	V441081	F	$\frac{1}{2}$	Bl	S	
Red Deer	Bluffton		Jan.	V441082	F	$\frac{1}{2}$	Gr	S	
Red Deer	Bluffton		Jan.	-	-	-	-	S	
Red Deer	37-20	W5	Jan.	-	M	$3\frac{1}{2}$	Bl	S	
Peace River	13-68-5	W5	12/17	V441083	M	$3\frac{1}{2}$	Gr	121	P
Peace River	Judah		13/ 3	V441084	F	$5\frac{1}{2}$	Gr	78	S
Peace River	9-85-11	W6	11/25	V441085	F	$\frac{1}{2}$	Gr	80	P
Peace River	9-85-11	W6	1/ 3	V441086	F	$\frac{1}{2}$	Gr	-	P
Peace River	13-68-6	W6	12/24	V441087	F	$\frac{1}{2}$	Br	63	P
Peace River	12-69-1	W5	12/11	V441088	M	$1\frac{1}{2}$	Wh	92	P
Peace River	26-95-21	W5	11/23	V441089	M	$1\frac{1}{2}$	Bl	86	P
Peace River	26-95-21	W5	11/25	V441090	F	$3\frac{1}{2}$	Gr	100	P
Peace River	13-68-5	W6	12/17	V441091	F	$1\frac{1}{2}$	Gr	91	P
Peace River	12-69-1	W5	12/11	V441092	M	$3\frac{1}{2}$	Bl	104	P
Peace River	26-95-21	W5	11/22	V441093	F	$2\frac{1}{2}$ - $3\frac{1}{2}$	Gr	115	P
Peace River	26-95-21	W5	12/ 4	V441094	M	$2\frac{1}{2}$	Bl	117	P
Peace River	26-95-21	W5	11/22	V441096	F	$\frac{1}{2}$	Gr	-	P
Peace River	12-69-1	W5	12/11	V441098	F	-	Bl	102	P
Peace River	13-68-5	W6	12/17	V441202	F	$1\frac{1}{2}$	Gr	97	P
Peace River	Hawk Hills		11/ 1	V441203	M	$7\frac{1}{2}$	Gr	-	-
Peace River	Campbell Ck.		Nov.	V441204	F	$2\frac{1}{2}$	Gr	80	P
Peace River	-		-	V441205	M	$5\frac{1}{2}$	Gr	116	P
Peace River	6-85-8	W6	1/ 5	V441206	F	-	Gr	-	P
Peace River	Manning		-	V441207	F	$7\frac{1}{2}$	Gr	-	P
Peace River	Manning		-	V441208	F	$1\frac{1}{2}$	Gr	-	P
Peace River	Manning		-	V441209	F	$1\frac{1}{2}$	Bl	-	P
Peace River	Manning		-	V441210	F	$\frac{1}{2}$	Bl	-	P
Peace River	-		-	V441211	F	$2\frac{1}{2}$	Gr	-	P
Peace River	Manning		-	V441212	F	$1\frac{1}{2}$	Gr	-	P
Peace River	Manning		-	V441213	F	$\frac{1}{2}$	Gr	-	P
Peace River	69-1	W5	2/ 5	V441214	M	$1\frac{1}{2}$	Gr	100	P
Peace River	69-1	W5	2/ 5	V441215	F	$1\frac{1}{2}$	Bl	75	P
Peace River	12-69-1	W5	2/ 5	V441216	M	$\frac{1}{2}$	Gr	94	P
Peace River	12-69-1	W5	2/ 5	V441217	F	$1\frac{1}{2}$	Bl	80	P
Peace River	12-69-1	W5	2/ 5	V441218	M	$\frac{1}{2}$	Bl	90	P
Peace River	Manning		-	V441219	F	$6\frac{1}{2}$ - $7\frac{1}{2}$	Bl	-	P
Peace River	Manning		-	V441220	F	$2\frac{1}{2}$	Gr	-	P
Peace River	Manning		-	V441221	F	$\frac{1}{2}$	Bl	-	P
Peace River	Manning		-	V441222	F	$2\frac{1}{2}$	Bl	-	P
Peace River	35-109-17	W5	2/15	V441223	M	$2\frac{1}{2}$	Wh	108	P

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Appendix 1 (Continued)

Subdivision	Location	Date	Specimen No.	Sex	Age	Colour	Weight	Kill Method
Peace River	Manning	-	V441224	F	1½	-	-	P
Peace River	35-109-17 W5	2/15	V441225	F	2½	Bl	-	P
Peace River	9-85-11 W6	1/ 3	V441226	M	½	Gr	-	P
Peace River	Manning	-	V441227	F	6½	Bl	-	P
Peace River	Manning	-	V441228	M	1½	Gr	-	P
Peace River	Manning	-	V441229	F	-	Gr	-	P
Peace River	10-71-3 W5	3/12	V441230	F	2½	Bl	96	P
Peace River	26-95-21 W5	3/25	V441231	F	2½	Gr	96	P
Peace River	10-71-3 W6	3/12	V441232	F	5½	Gr	97	P
Peace River	TL2442	-	V441233	M	-	-	-	T
Peace River	Manning	-	V441234	F	½	-	-	P
Peace River	Dixonville	-	V441235	F	1½	Bl	-	S
Peace River	High Level	-	V441236	F	4½	Gr	88	P
Peace River	-	-	V441237	F	6½	-	-	P
Peace River	-	-	V441238	M	1½	Bl	110	P
Peace River	Caracajou	3/12	V441239	F	½	Gr	62	-
Peace River	-	-	V441240	F	½	Wh	105	P
Peace River	Manning	-	V441241	-	2½	-	-	P
Peace River	12-69-1 W5	2/ 5	V441242	F	5½	Bl	88	P
Peace River	9-85-11 W6	2/ 8	V441243	F	1½	Gr	-	P
Peace River	12-69-1 W5	2/ 5	V441244	M	2½	Bl	116	P
Peace River	Manning	-	V441245	M	2½	-	-	P
Peace River	Manning	-	V441246	F	½	-	-	P
Peace River	Manning	-	V441247	M	2½-3½	-	-	P
Peace River	Manning	-	V441248	M	9½	-	-	P
Peace River	Manning	-	V441249	F	1½	-	-	P
Peace River	Manning	-	V441250	M	½	-	-	P
Peace River	Manning	-	V441251	F	½	-	-	P
Peace River	Manning	-	V441251	F	½	-	-	P
Peace River	Manning	-	V441253	M	½	-	-	P
Peace River	Manning	-	V441254	M	½	-	-	P
Peace River	Manning	-	V441255	M	3½	Gr	-	P
Peace River	Manning	-	V441256	M	2½	Gr	-	P
Peace River	Manning	-	V441257	F	½	Gr	-	P
Peace River	Manning	-	V441258	M	2½	Gr	-	P
Peace River	-	-	-	F	½	Gr	76	P
Peace River	-	-	-	M	½	-	-	P
Peace River	-	-	-	-	½	-	-	P
Peace River	6-85-8 W6	1/ 5	-	-	-	-	-	P
Peace River	6-79-10 W6	7/ 3	-	-	-	-	-	S
Peace River	20-93-20 W5	7/ 1	-	F	-	-	-	S
Edson	19-64-2 W5	12/21	V441074	F	5½	Gr	-	P
Edson	Barrhead	-	-	-	-	-	-	S
St. Paul	18-89-9 W4	Dec.	-	M	-	Gr	110	T

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Appendix 1 (Continued)

Subdivision	Location	Date	Specimen No.	Sex	Age	Colour	Weight	Kill Method
St. Paul	18-89-9 W4	Dec.	-	F	-	Gr	80	T
St. Paul	Athabasca	Feb.	V441097	M	2½	Gr	-	P
St. Paul	22-69-13 W4	8/ 9	-	-	½	-	-	P
St. Paul	22-69-13 W4	8/ 9	-	-	½	-	-	P
St. Paul	22-69-13 W4	8/ 9	-	-	½	-	-	P
St. Paul	Lac La Biche	-	-	-	-	-	-	-
St. Paul	13-68-13 W4	10/12	-	-	-	-	-	S
St. Paul	Ft.McMurry	Dec.	-	-	-	-	-	-
St. Paul	St. Lina	5/25	-	-	-	-	-	S

1. Gr = Grey; Bl = Black; Wh = White; Br = Brown
2. P = Poisoned; S = Shot; T = Trapped or Snared
3. Manning ~ Poisoned by trapper 50-60 miles west of Manning