WOLVERINE HARVEST AND CARCASS COLLECTION COPPERMINE, BAY CHIMO AND BATHURST INLET, 1992/93

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ABSTRACT

We processed 77 wolverine carcasses contributed by the hunters from Coppermine, Bay Chimo, and Bathurst Inlet during the 1992/93 season. Fourteen other wolverines were reported killed but carcasses were not submitted. The harvest tended to be clumped in 3 areas: southwest of Coppermine toward Dismal Lakes, southeast of Coppermine around Napaktolik Lake, and in the Bathurst Inlet area. Sex ratio of the harvest was 2:1 (m:f) with juvenile and yearling males predominating. Eighty six percent of the animals taken were shot. All adult females were pregnant. Fetuses were present in 80% of the adult females killed in February. Juvenile males had the highest fat measures while adult males had the lowest. Caribou occurred in 81% of the stomachs examined, about 10 times more frequently than other food items. The carcass collection program will continue in 1993/94.

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INTRODUCTION

More than 30 communities representing all regions in the Northwest Territories (NWT), harvest wolverine. Recent information (Gunn and Lee in prep, Poole pers. comm.) indicates that the number of wolverine pelts appearing on the fur market under-estimate the actual NWT harvest by 50 to 90%. Large numbers of pelts are used or sold locally and the actual harvest is unknown. This is of particular concern for the NWT as it is one of the major contributors to the annual national harvest (Dauphine 1987). The current collection of wolverine carcasses and hunter kill information was initiated in an attempt to better estimate the total harvest in the mainland Kitikmeot region, to monitor the age and sex of the harvest and to explore wolverine reproductive status and physical condition. This paper reports the results of the 1992/93 harvest collection.

METHODS

With the assistance of Department of Renewable Resources (DRR) officers in Coppermine and Cambridge Bay, and Gwen and Joseph Tikhak in Bay Chimo, wolverine carcasses were obtained from hunters and shipped to Coppermine and Yellowknife for examination. Hunters answered basic questions about their harvest to allow a short data form to be completed.

Measurements included body length from nose to base of tail, chest girth, condylobasal length, zygomatic width, sex, and reproductive condition of females: number of placental scars and corpora lutea. A female with corpora lutea or macro pregnant was considered pregnant (Banci and Harestad 1988). Estimated body weight was calculated by

subtracting the weight of the stomach contents from the carcass weight (weight of the carcass as received from the hunter) and adding 100g/paw to the carcass weight for animals with missing paws. The carcass weight was also increased by an adjustment for the weight of the fresh hide: 19% of carcass weight for females and 23% for males (Gunn and Lee in prep.).

Perirenal fat and sternal fat deposits were removed from the carcasses and weighed, and depth of back fat and inguinal fat were measured (Gunn and Lee, in prep.). Weights of perirenal and sternal fat were indexed to estimated body weight to provide a fat index: fat index = 1000 * (weight of perirenal fat + weight of sternal fat)/estimated body weight.

Stomach contents were examined by washing them over a sieve and identifying bones, fur and feathers. Age was determined by cementum aging of a lower canine and the ratio of canine pulp cavity width to tooth width (Poole et al. in prep.). Wolverines in their first year of life were classified as juveniles, as yearlings in their second, and as adults if they were 2 or older.

Statistical differences in distributions were examined with Chi Square and the influence of sex and age on measures of fat were examined with analysis of variance and least square means.

RESULTS and DISCUSSION

Ninety one wolverines were reported harvested during the 1992/93 season (Fig.1, Table 1).

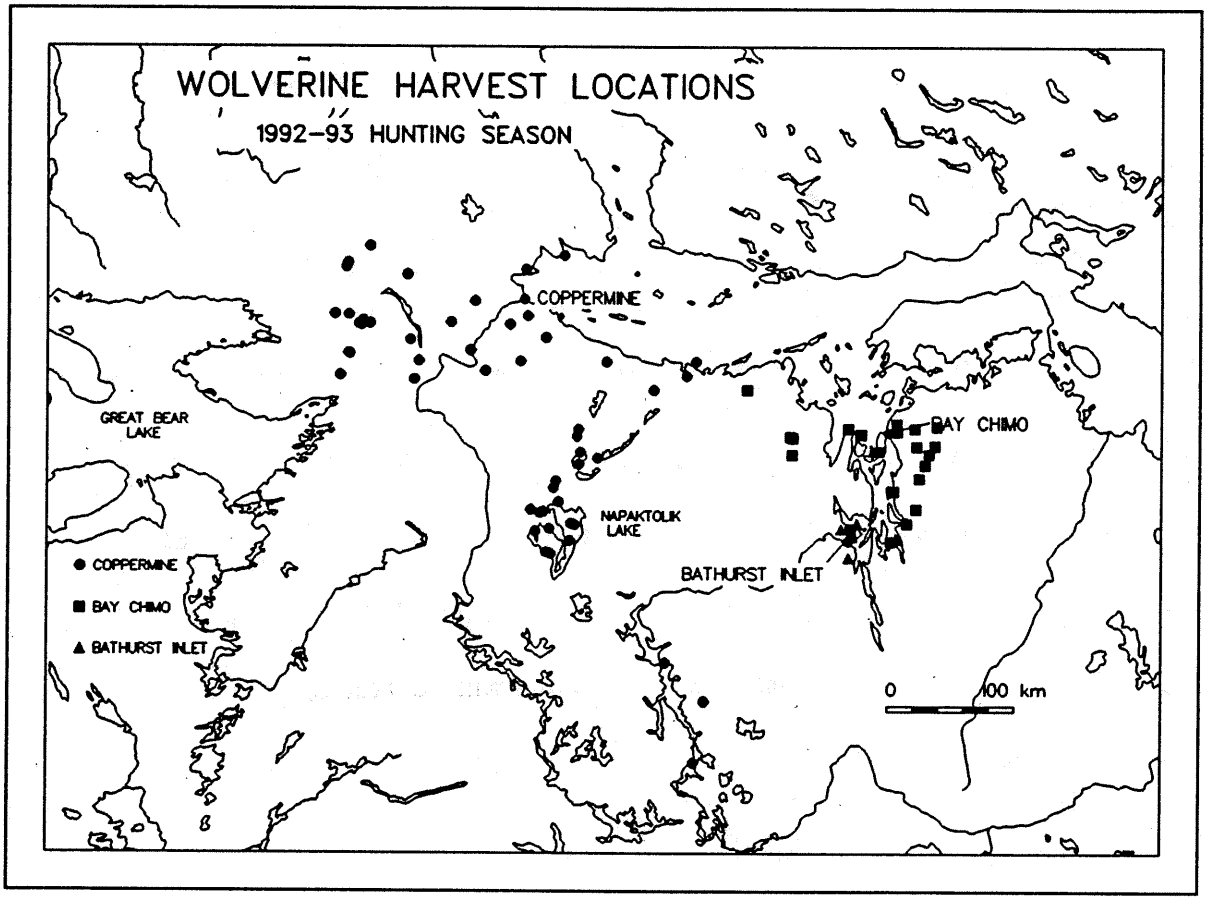

Figure 1. Locations of wolverines harvested by hunters from Coppermine, Bay Chimo, and Bathurst Inlet during the 1992/93 season.

Thirty seven hunters from Coppermine, Bay Chimo, and Bathurst Inlet turned in 77 wolverine carcasses; 14 additional wolverines were reported taken, but no carcasses were

Table 1. Total number, age, and sex of harvested wolverines.

	Males	Females	Unknown	Total
Adult	9	11	1	21
Yearling	20	6	0	26
Juvenile	18	5	0	23
Unknown	5	4	12	21
Total	52	26	13	91

submitted. Coppermine hunters took 62 animals and Bay Chimo/Bathurst Inlet took 29. Two hunters accounted for 27% of the harvest (Table 2). The harvest was clumped in 3 relatively distinct areas (Fig. 1): Dismal Lakes, Napaktolik Lake and Bathurst Inlet. Harvesting in such a way may leave unhunted areas as refugia to re-populate the hunted regions (Hatler 1989).

Table 2. Distribution of wolverine harvest among hunters.

Number of wolverines	1	2	3	4	5	9	15
Number of hunters	22	4	5	2	2	1	1
Percent of harvest	26	9	17	9	12	10	17

The harvest was comprised of 26 females, 52 males and 13 wolverines of unknown sex (Table 1). Wolverines were harvested in all months between October 1992 and May 1993 (Fig. 2). Wolverines were reported harvested in a variety of ways: 5 were taken in leg hold traps, 4 in quick kill traps, 71 (86%) were shot, 1 was run over, 1 killed with a 2x2, and 9 had no information. The proportion shot was similar to that found by Gunn and Lee (in prep.) but very different from harvest in most other areas where trapping is the predominant harvest method accounting for over 80% of the take (Rausch and Pearson 1972, Banci 1987).

The 3 age classes were nearly equally represented: juveniles 32.9%, yearlings 37.1%, and adults 30% (n=70). However, when broken down by sex, the age distribution of males favoured juveniles and yearlings (Table 1) and was significantly different than the female age distribution (P=0.032). Eighty one percent of the male harvest consisted of younger animals as compared to 50% of the female harvest. Wolverine harvests weighted toward younger male animals have been reported elsewhere (Halter 1989, Rausch and Pearson 1972) and are common with mustelids in general (Buskirk and Lindstedt 1989). The

age distribution of neither sex differed from a 1:1:1 distribution ($P > 0.1$). The percent of juveniles in the monthly harvest started off low in November and increased through February when it dropped off dramatically (Fig. 3). Samples were too small to break down monthly by sex. The ratio of juvenile to adult female ratio was 2:1. The oldest wolverine killed was a 9 year old female taken north of Dismal Lakes.

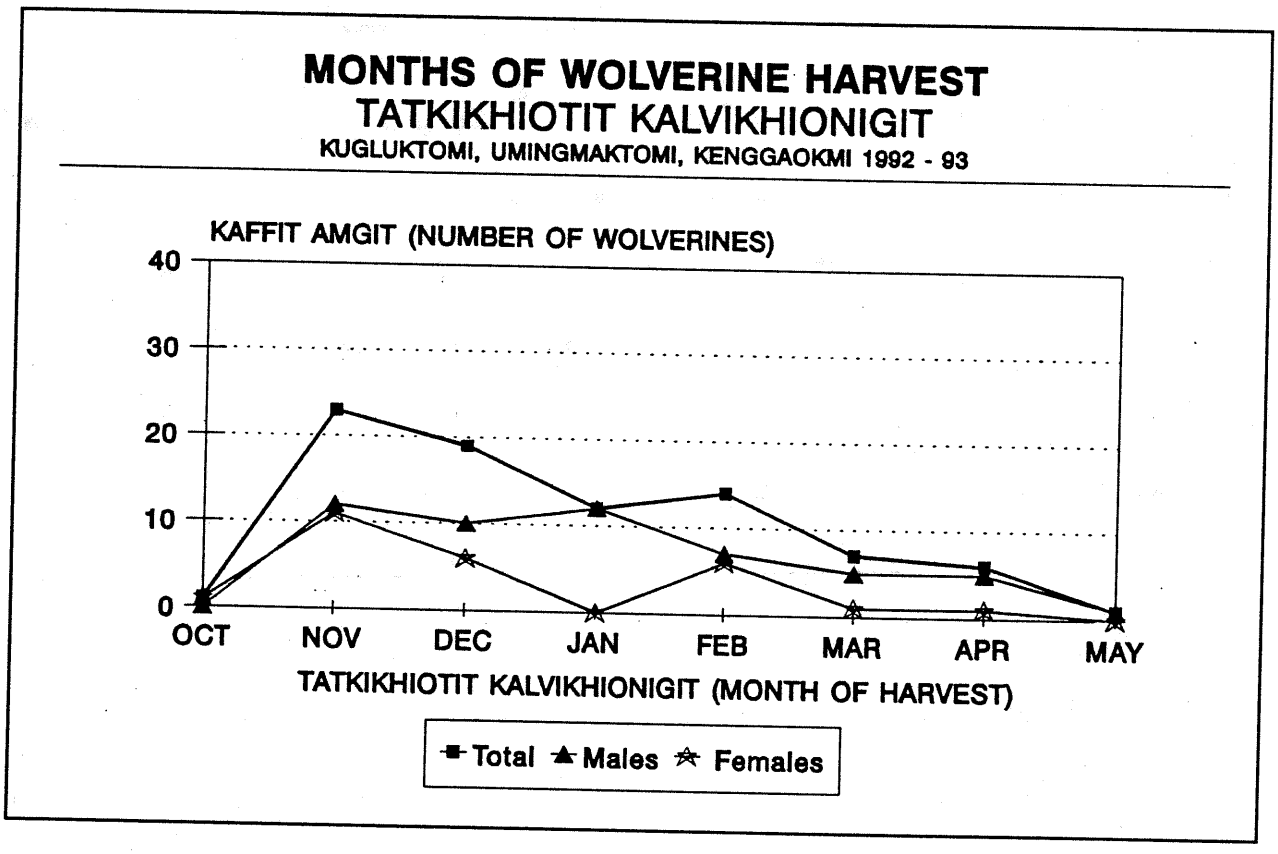

Figure 2. Months that wolverines were harvested by hunters from Coppermine, Bay Chimo, and Bathurst Inlet during the 1992/93 season.

The over all harvest was skewed toward males by 2:1. The sex ratio of the 2 younger age classes combined was 3.5:1 (m:f) and significantly differed from 1:1 ($P < 0.01$).

In contrast, the adult sex ratio (0.818) favoured females slightly and was not different than 1:1 ($P>0.65$). This would seem to be a preferred situation that the bulk of the harvest is on the younger male age classes and not the productive adult female portion.

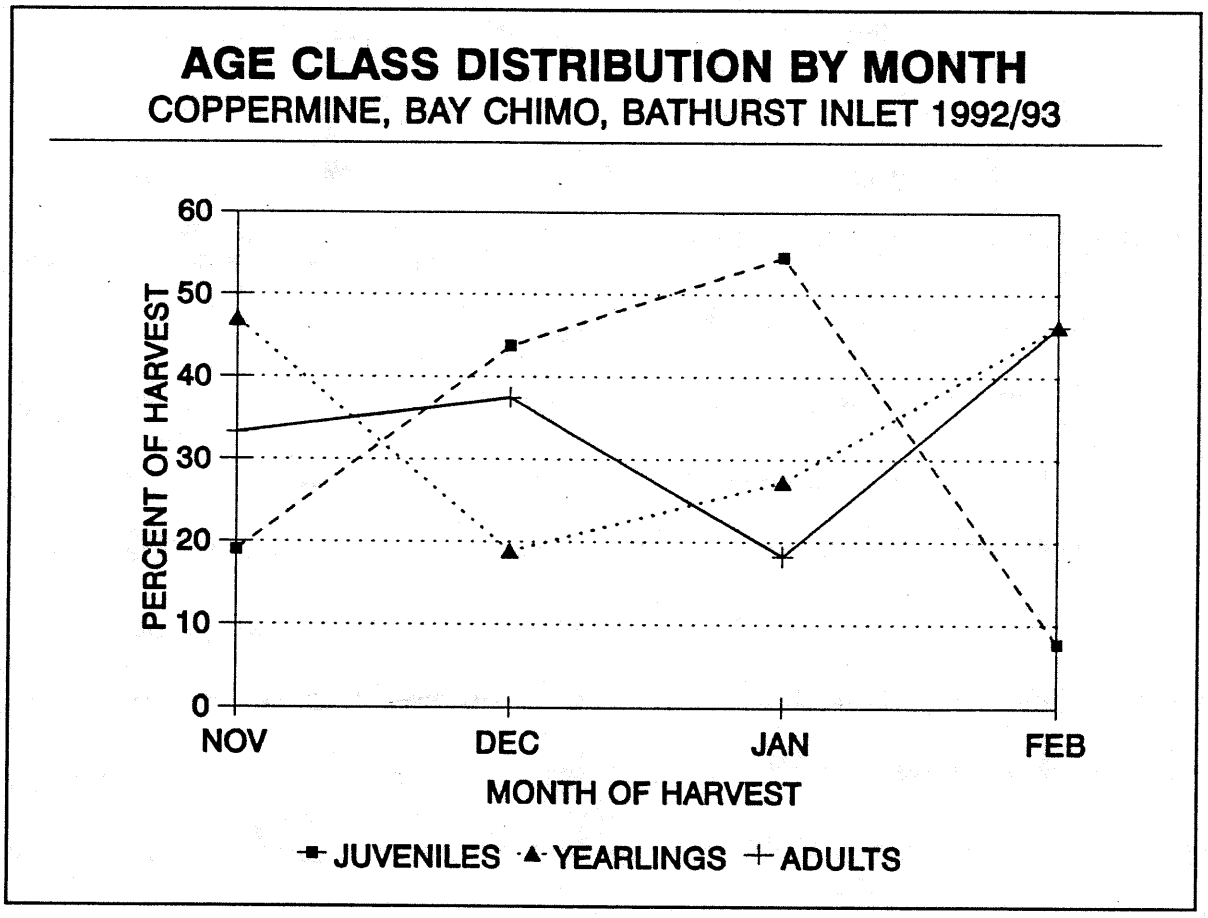

Figure 3. Percent of juvenile wolverines occurring in the harvest. Only months with samples greater than 10 are presented.

Of the 11 adult females taken 100% were pregnant, ie. had corpora lutea or were macro pregnant. Although this sample was small, this is a higher proportion pregnant than reported elsewhere (Poole 1992, Rausch and Pearson 1972, Liskop et. al. 1981). Of the 5

adult females caught in February, 4 were macro pregnant and the uterus of the 5th was very much thickened, and convoluted. Two of 6 yearling females (33%) had detectable corpora lutea but none of the juvenile females. The average litter size based on females with corpora lutea was 3.33 (n=10) and ranged from 1 to 5. The litter size of fetuses, was 3.0 (n=4) and ranged from 2 to 4. These litter sizes are similar to other studies (Hash 1987). The fetus sex ratio was 1:1 (m:f).

The mean estimated body weight of females, (8.5kg n=26) was significantly ($P<0.01$) less than that of males (12.2kg n=51). The largest male weighed 15.4kg (34 pounds) and the largest female was 10.3kg (23 pounds).

All of the wolverines that were shot or caught in quick kill traps, had measurable fat deposits (Table 3). Although juvenile males showed the highest fat measures of all age and sex groups for all fat depots, the difference was only significant ($P<0.03$) in the weight of sternal fat. The fat index for all groups was very similar to that reported by Gunn and Lee (in prep.) for the same area during the late 1980's. However, the exception was adult males which had fat measures of only half of that observed previously. Fat measures were highest in the late winter appearing to peak in February/March (Fig. 4). Back fat varied the least over the season.

Table 3. Mean measurements of fat depots on harvested wolverines.

MALES					
EXTERNAL FAT MEASURES			INTERNAL FAT MEASURES		
AGE	BACK FAT mm	INGUINAL mm	STERNAL gm	KIDNEY gm	BODY FAT INDEX
ADULT	4.0 n=8	9.1 n=19	16.0 n=8	19.3 n=8	2.94 n=8
YEARLING	5.7 n=19	16.5 n=19	26.3 n=19	33.2 n=16	4.74 n=16
JUVENILE	6.9 n=15	22.3 n=15	38.7 n=15	36.4 n=13	6.17 n=13
FEMALE					
EXTERNAL FAT MEASURES			INTERNAL FAT MEASURES		
ADULT	4.0 n=11	10.8 n=11	19.6 n=11	26.2 n=11	5.14 n=11
YEARLING	3.6 n=5	12.2 n=5	16.4 n=5	21.3 n=4	4.10 n=4
JUVENILE	3.4 n=5	10.6 n=5	22.3 n=4	22.0 n=5	4.87 n=4

Of 77 stomachs examined from wolverines shot or otherwise killed quickly, 64 contained some food items and 13 (17%) were empty. In stomachs that were not empty, caribou (*Rangifer tarandus*) occurred in 81.3%, microtines (voles, lemmings) in 9.4%, fish in 6.3%, muskox (*Ovibus moschatus*) in 4.7%, ground squirrels (*Spermaphilus parryii*) in 3.1%, and arctic hare (*Lepus arcticus*) in 1.6%. The frequency of caribou indicates a higher dependence on this species than has been reported elsewhere (Poole 1992, Boles 1975). Magoun (1987) in a study of wolverines in arctic Alaska found cached ground squirrels to be an important part of the winter diet. It would appear that on mainland Kitikmeot this is not

the case because of the abundance of caribou carrion during the winter. Fish occurred 4 times; 2 from trapped animals and 2 from wolverines that were shot. Fish is often used as trap bait and fish remains are frequently found around abandoned campsites. The contents of one stomach weighed 1.6kg.

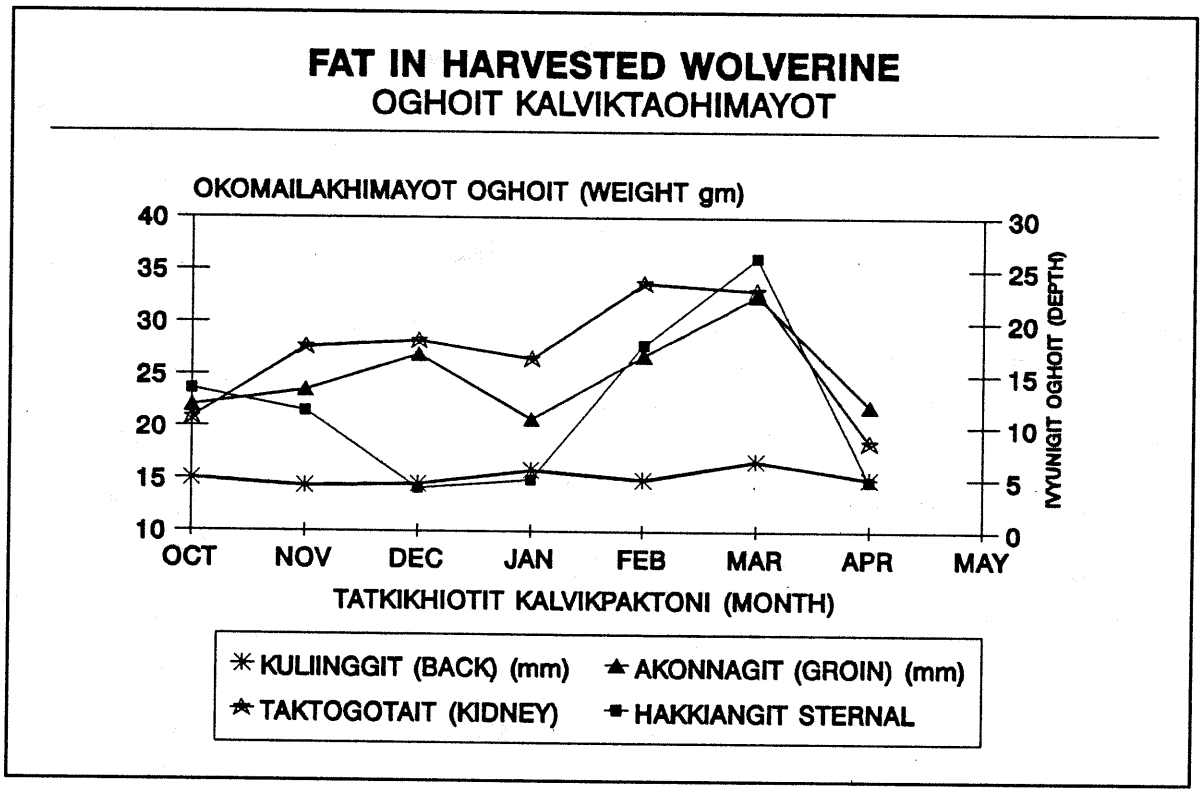

Figure 4. Mean fat measures of harvested wolverines over the period October 1992 to May 1993. Juvenile males had significantly higher sternal fat weights than other age/sex groups and are not included in the plot of that measure. Sample sizes for October and April were 1 and 2 respectively; all other months had sample sizes of 5 or more for all fat measures.

Generally the collection of harvest data cannot be relied upon to accurately reflect the

age and sex structure of the population. There can be many biases in data collection and the data probably more realistically reflects vulnerabilities of different age and sex classes to harvest. However, data such as percent adult females pregnant and number of juveniles in the harvest relative to other age classes may provide some insight in the reproductive status of the population. Additionally patterns in harvest success and total numbers have potential to provide feedback for regulation changes. In the absence of ecological data from research studies, continued collection of carcasses and harvest data can provide a window into wolverine biology.

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