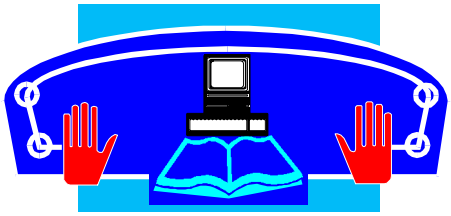

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RESIDENT HUNTER HARVEST SURVEY - MAIN REPORT
Sector: Wildlife Products
5-2-39
Statistics/Surveys
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Resident Hunter Harvest Survey

MAIN REPORT

Norecon Ltd.
Yellowknife, NWT
March, 1994

ADRIAN D'HONDT 3-748

Resident Hunter Harvest Survey

MAIN REPORT

Norecon **Ltd.**
Yellowknife, NWT
March, 1994

Table of Contents

Introduction

Since 1982/83 the Department of Renewable Resources' Wildlife Management Division has been collecting wildlife harvest information by surveying big-game license-holders annually with mailed questionnaires.

Through this survey and other programs, the Division now has collected a wealth of raw data on resident harvesting of barren-ground and woodland caribou, moose, Dan's sheep, black bear and mountain goat as well as wolf and wolverines, upland gamebirds, geese, ducks and hare.

However, the data was recorded in two different computer formats (Rbase 5000 and SAS) and the structures of databases varied from year to year. This inconsistency made it virtually impossible to compute annual harvest estimates efficiently and effectively, and hence severely hampered the data's usefulness as a resource management tool.

The Wildlife Management Division therefore contracted Norecon Ltd. to

- compile the data into a standard, uniform DBF file format;
- analyse the data from various perspectives; and
- prepare a report on the results of the analysis.

The Division also requested a recommendation on the merits of administering three "waves" of questiomaires as opposed to one, based on the results of the analysis, and the comparative effectiveness of the ratio and linear regression methods of estimation in this situation.

Finally, the Division called for suggestions on how best to transmit the results of its annual surveys to the hunting public in future.

We have divided the results of our work into three separate documents. This Main Report presents the highlights of the harvest data, our statistical analysis and survey recommendations, as well as suggestions for disseminating information to the public. A second volume, consisting entirely of tables generated from the unified database, presents detailed information on reported harvest, license and tag sales, and survey wave results. A third document, or manual, discusses the structure of the new database as a guide for future users. In addition, it provides instructions on using a compiled, standalone computer program we have provided to allow Division staff to generate the same tables we generated in preparing this report.

A Note of Caution

Before undertaking any analysis of the data, we had to convert it from Rbase (1982/83 — 1989/90) and SAS (1990/91 — 1991/92) formats into standard DBF format and, to the extent possible, store the converted data in a uniform database structure that would be both efficient and effective, i.e. that minimizes disk space requirements while still permitting reasonably quick reporting.

Briefly, there were two main tables for each year prior to 1990-91. One contained tag information along with hunter names and addresses, etc. which were based on GNWT license and tag sales downloaded from the government's mainframe computer. This table was used as the source for the three survey mail-outs and to capture the resulting response information, i.e. which individual hunters returned completed surveys and in which survey wave, and which surveys were returned by the post office as undeliverable. The second main table captured harvest information by species age and sex, where applicable, along with hunt location, the number of days spent hunting, etc. Additionally, in some years, there was an accessory table listing community codes and corresponding community names. A similar table listed species names and matching codes.

We encountered numerous difficulties in creating a unified database, some of which warrant mention here inasmuch as they might adversely affect the accuracy of the data contained in this report (and of course the database itself).

The two main tables were linked by hunter license number, except in 1982/83. The 82/83 tables contained another field — question number — which appeared to link the two tables, and which we therefore used for that purpose, but the resulting link was not perfect. As well, there were 28 cases in which the same license numbers appeared twice in the tags table in the same year. This was probably the result of people losing tags and purchasing new ones, but as the duplication would cause havoc with statistical analysis, and as there were relatively few occurrences, we deleted the duplicates.

Further discrepancies were caused by the communities table which accompanied the annual database for three years. Although the GNWT has a set of "official" codes for all territorial communities, the community codes in this table (COMMREG.DBF) were not the same as those used by the GNWT. To take but one important example, whereas the GNWT uses 105 and 109 for Yellowknife and Hay River respectively, COMMREG.DBF reversed these numbers. At first we used the COMMREG.DBF codes to identify communities and regions stored as codes in the two main tables, but the results were quite obviously wrong — Hay River entries far exceeded those for Yellowknife, for example. In the end, it was decided to revert to the standard GNWT codes, as this seemed to produce the most plausible region/community distribution.

Where appropriate, the harvest tables included fields for both total kill and kills by sex and age. However, in many, if not most, cases total kills did not equal the sum of corresponding kills by sex and age. Whatever the reason for this imbalance, it limits the usefulness of the age and sex information in estimating total harvest, and at best should be used only to estimate percentages of total harvest by age and sex.

This same imbalance also hampered our reorganizing the survey tables for the last two years, i.e. 1990/91 and 1991/92, whose structures were completely different from the previous years. In the last two years, harvest information was stored in separate tables for small game, waterfowl and each big game species. Moreover, unlike the previous years' tables, which contained one record for each individual hunt, the later ones appeared to contain one record for each hunter, regardless of the number of times the hunter actually hunted. As this structure is not nearly as efficient or effective as the previous one, we reorganized the data into a modified version of the earlier structure (as detailed in a separate database manual).

In so doing, however, we had no choice but to develop a total kill field by summing males, females and juveniles (where applicable), or full and part curl for Dall's sheep. Thus the total kill fields for the last two years necessarily equate to the sum of their respective sex and age breakdowns, whereas they frequently do not in prior years.

Finally, problems with the download of mainframe information in the last two years, and duplication of hunter information across nine separate tables for each year made it impossible to extrapolate harvest estimates on the basis of tag sales for the last two years.

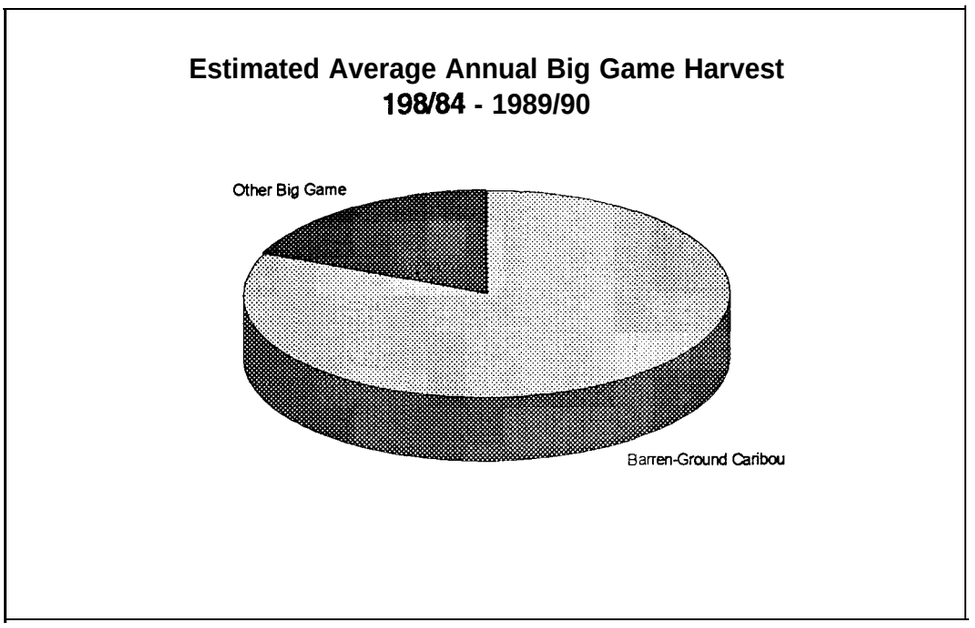
Harvest Highlights

This section highlights some survey results and trends using both the reported harvest, i.e. , the figures provided by survey respondents, and the estimated harvest, i.e. the statistical extrapolation of reported results, detailed in the next section.

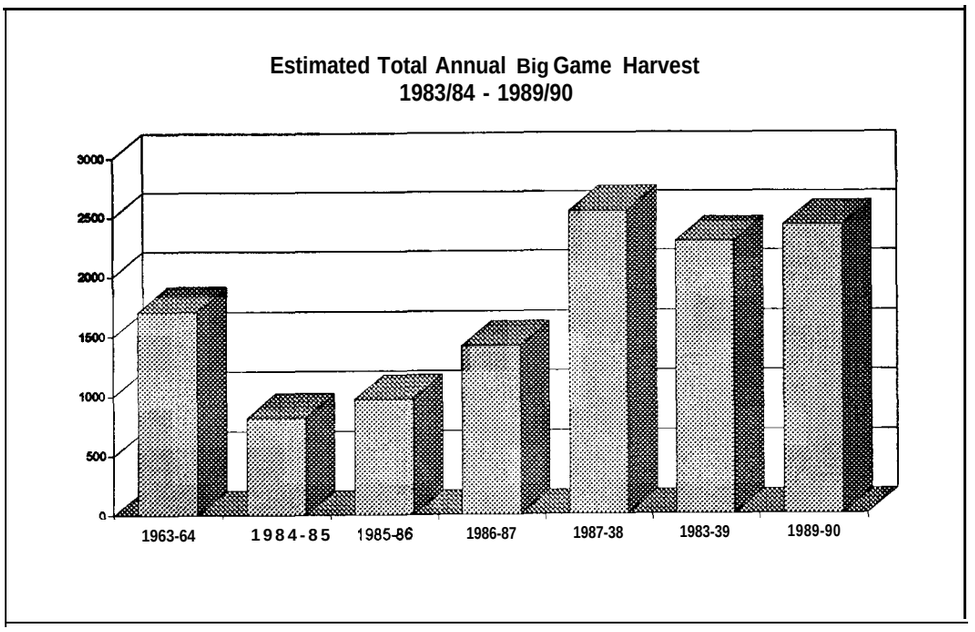
Barren-ground caribou is consistently and by far the most frequent big-game target of resident NWT hunters. The estimated average annual harvest of barren-ground caribou was 4.5 times larger than the annual average harvest of all other big game combined.

Estimated Annual Big Game Harvest by Species

Year	Barren Caribou	Wood. Caribou	Moose	Black Bear	Dall's Sheep	Mountain Goat	Annual Totals
1983-84	1,294	86	230	46	47	7	1,710
1984-85	538	59	173	33	14	3	820
1985-86	661	58	214	16	20	4	973
1986-87	1,219	41	136	9	11	1	1,417
1987-88	2,203	61	225	34	22		2,545
1988-89	1,975	83	192	21	14		2,285
1989-90	2,085	61	217	34	26		2,423
Total	9,975	449	1,387	193	154	15	12,173
Average	1,425	64.1	198.1	27.6	22	3.8	1,740.6



The estimated big-game harvest increased significantly after 1986, because the maximum allowable number of barren-ground caribou tags per hunter increased from three to five.

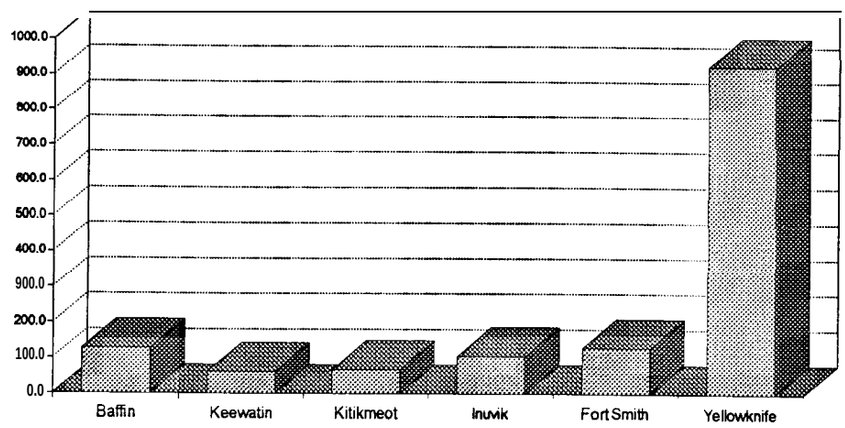


Regionally, of course, Yellowknife hunters' harvest exceeded all others by a wide margin.

Annual Estimated Big Game Harvest by Region

Region	Annual Total	Annual Average
Baffin	904	129.1
Keewatin	438	62.6
Kitikmeot	476	68
Inuvik	744	106.3
Fort Smith	915	130.7
Yellowknife	6,477	925.3

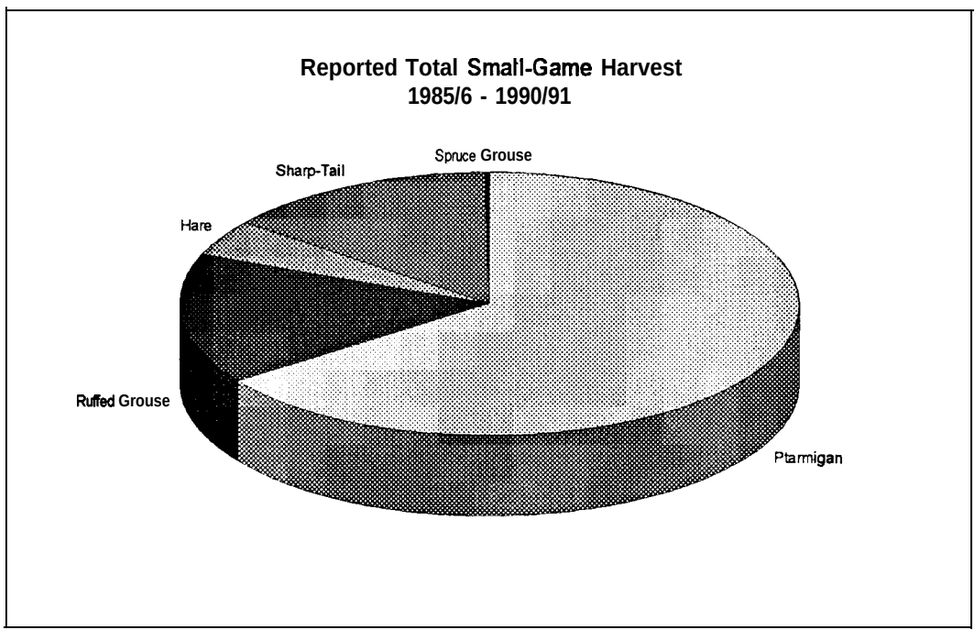
Estimated Average Annual Big Game Harvest
1983/84 - 1989/90



Small Game

Ptarmigan comprised by far the largest proportion of the small-game harvest since 1985/86, when the survey began recording small-game harvests (although hare were not recorded until 1989/90).

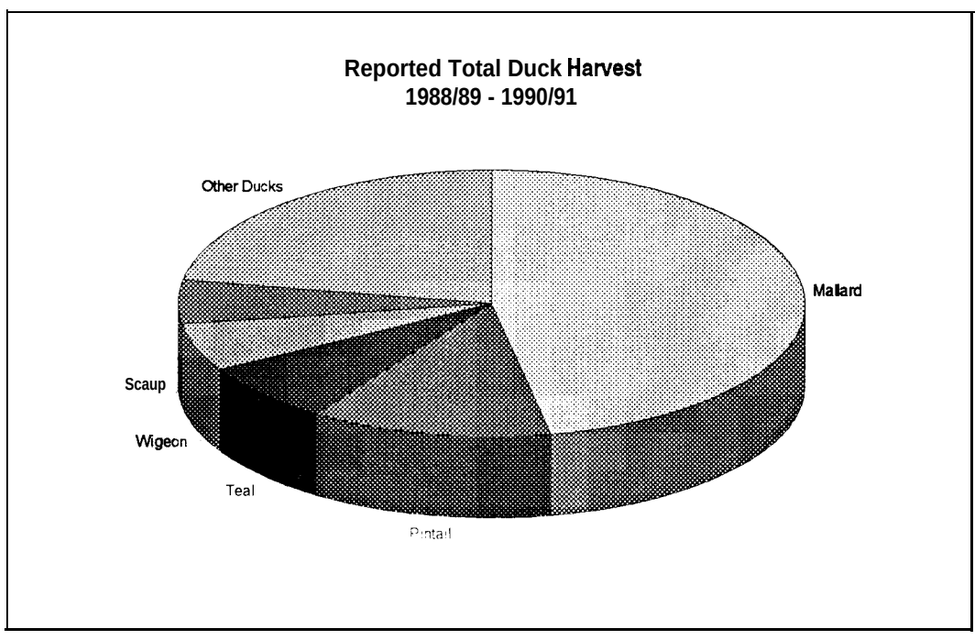
Reported Small-Game Harvest, 1985/86 - 1990/91		
Ptarmigan	29,593	65%
Ruffed Grouse	7,316	16%
Hare	1,961	4%
Sharp-Tail	6,535	14%
Spruce Grouse	8	0%



Ducks .

Mallard comprised almost half of the total reported duck harvest between 1989/90, when the survey began recording waterfowl hunts, and 1990/91.

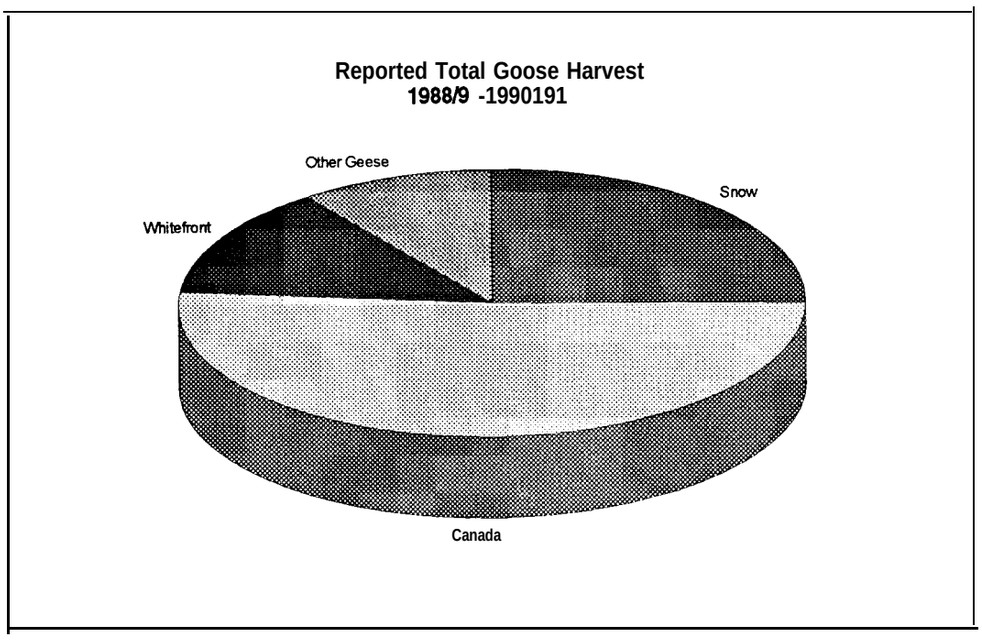
Reported Duck Harvest, 1988/89 - 1990/91		
Mallard	1,439	47%
Pintail	386	13%
Teal	213	7%
Wigeon	179	6%
Scaup	166	5%
Other Ducks	673	22%



Geese

Canada geese comprised more than half of the total reported goose harvest between 1989/90 and 1990/91.

Reported Goose Harvest, 1988/89 - 1990/91		
Snow	157	25%
Canada	320	52%
Whitefront	82	1370
Other Geese	62	1070



Statistical Analysis

Good research is the key to good management of any resource. If the research is not effective, resource management decisions are at best not supported and at worst erroneously influenced. Hunters maybe deprived of legitimate opportunities to harvest a resource if estimated harvests overstate the impact of the hunt on animal populations. On the other hand, underestimating the harvest may result in decisions which lead to overharvesting of resources.

Reliability and Validity

The key issue here is data reliability and validity. While the theory of measuring these variables can be very complex, the concepts of reliability and validity have simple explanations and direct practical implications. Many of the effectiveness, efficiency and accountability questions raised by the Division involve either reliability or validity issues.

Reliability and validity are basic concepts related to the measurement of an event, and maybe thought of as:

$$EH=AH+E$$

where EH is the measurement or observation of the characteristic in the sample population. In this case, EH represents the estimated harvest, AH is the true actual harvest and E is the error, or difference between the

calculations based on those responding the questiomaire, on the one hand, and the total of all hunters who purchased tags on the other.

Two things can go wrong with this measurement. First, the E error can be so large relative to the estimated harvest (EH) that it is a poor indicator or predictor of the actual harvest (AH). Second, the estimates derived from the sample which answered the survey (EH) can be a biased estimate of the actual hunting harvest or population (AH) so that the error in the estimate is always in the same direction. These two types of errors may be referred to as variable and systematic error.

Reliability and its measurement are more closely associated with variable error. With regard to the harvest, the estimate conversion from responding hunters to the population can be said to be reliable if a consistent approach to the survey produces the same results under the same types of conditions such as the sampling method, data collection and questionnaire design. In most cases, reliability is not a difficult issue to address. Sometimes the solution is as simple as expanding the sample size or using alternate forms of the same measure.

The major problem, and the one most difficult to identify, is systematic . or validity error. If the design of the questionnaire, sampling process or nature of the measurement itself introduces bias into the measurement process, the results will not be valid. It is also entirely possible for results to be reliable but not valid. Other validity issues include:

- the respondents ability to remember the time, location and length of the hunt;
- the number of hunts;
- the actual kills, especially of small game; and,

- the cliff erences in the survey between years.

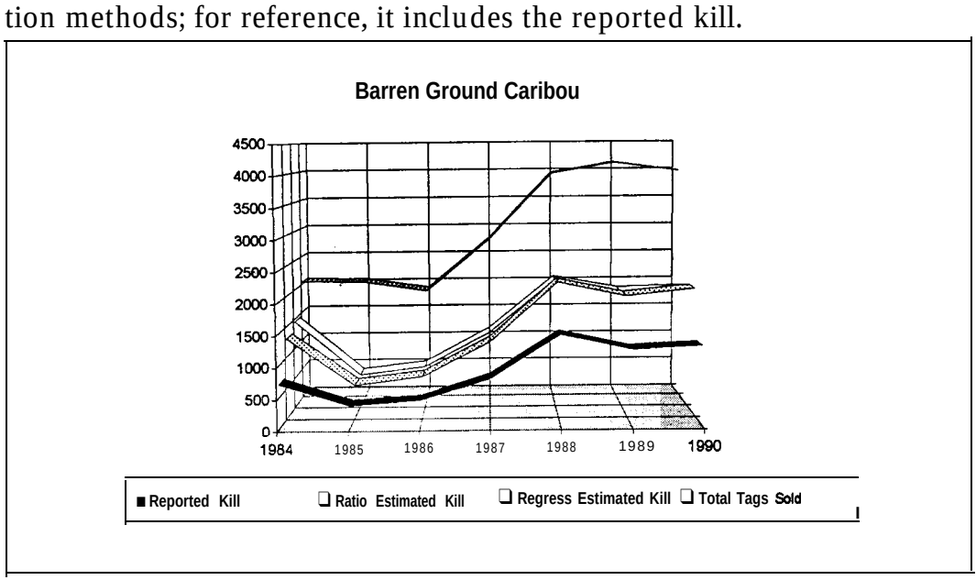
The key validity question is whether the survey responses can be used to estimate the total harvest or the characteristics of the non-respondent population. Did those answering the survey include a higher portion of people who actually hunted and were interested in reporting their kill? Did people exceeding their allowable limit not report, and what proportion of the population do they represent?

What does this mean for the analysis or estimation of the resident hunter harvest in the NWT? Simply put, invalid results are useless or worse. If the results are biased, they camot be widely used to make management decisions, and if used, may result in the wrong decisions.

Fortunately alternatives exist that can avoid or minimize validity problems without going to theoretical extremes. One approach is to use different collection or survey methods for comparison. If the results concur, validity is implied. In estimating the total harvest this might involve randomly dividing the hunter population of a test community or communities into two groups and having one respond to a mail questiomaire, with the other group being surveyed in person by Renewable Resource Officers or contract employees. If the alternative survey results comply, validity is implied. If they do not, a bias problem may exist with one or more of the data collection methods. We discuss this method further at the end of this section.

Estimating Total Harvest

Two methods were used to estimate the total harvest — the ratio and linear regression analysis methods. The latter method attempts to capture differences in responses and the hunting population; for example, whether non-responding hunters have differing success from those answering, say, the first wave of the survey. The following chart plots the total number of tags sold along with the estimated kill or harvest for barren-ground caribou — the most popular species — using both estimation methods; for reference, it includes the reported kill.



The regressions for estimating the harvest were constructed at the regional level for barren-ground caribou only. To obtain the estimate, three data points were employed, one corresponding to each survey wave. The total cumulative harvest was then regressed against the cumulative percentage of tags reporting for each wave. The estimate was obtained by estimating the value for 100% coverage of tags sold.

Significantly, the graph shows little variation between the ratio and regression method of calculating the total harvest. This is confirmed by an examination of the data in the following table:

Year	Reported Kill	Ratio Estimated Kill	Regress Estimated Kill	Total Tags Sold	Difference	% Difference
1984	712	1,294	1,449	2,036	155	11.98%
1985	360	538	527	2,023	-1	-0.19%
1986	442	661	659	1,857	-2	-0.30%
1987	777	1,219	1,248	2,772	29	2.38%
1988	1,468	2,203	2,143	3,945	-60	-2.72%
1989	1,232	1,975	1,942	4,129	-33	-1.67%
1990	1,280	2,085	1,978	3,976	-107	-5.13%

As shown in the chart, the differences between the two calculation methods is small, with the exception of the first and last years. This would lead to the conclusion that hunter behavior (success in this case) varies little between waves for most years. It is also impossible to say whether the ratio or regression method is more accurate ~~the regression method~~ is a refinement of the ratio method

Sample-Size Determination

One method of testing these assumptions is through further sampling and " the use of different methods to test the validity of any assumptions regarding the population. If the results from different sampling procedures agree, we can likely conclude that our assumptions are valid. At present, the Division attempts to capture as much information about the harvest as possible through the use of up to three waves of questionnaires. There is a danger with this approach that the non-respondent population will have different harvest success from the responding population. The regression method of estimation is used as one way of incorporating changing

responses, however differences in the population should be further explored through the application of random sampling of the non- respondent population. This should be done using a different method than the "wave mail-out".

The initial sample size (or required wave response) is dependent on the variability in the hunt and the error the Division is willing to accept. There are two basic methods for the researcher interested in accountability and efficiency to determine sample size: "required-size-per- cell" and the traditional statistical model. The required-size-per-cell approach simply requires that approximately 30 responses be obtained for each "cell" of data; other rules of thumb recommend between 50 and 100 responses, depending on the importance of the category. In this case, respondents are only be asked to identify the species of kill, which includes five big-game species, three fur bearers, four upland game birds and 10 varieties of waterfowl. This makes for 22 possible choices and the rule-of- thumb sample size of around 660.

In the case of the harvest estimate, traditional models of sample size determination do not work as well. The traditional model is based on the management specification of an allowable error or (E), the level of confidence in the sampling process **(Z)** and the variance of the sample population.

The problem with applying this technique to the hunt data is that the average or mean kill, and its variance, is very small. Since the dispersion of kills or hunting success is very small, this would seem to indicate only a very small sample size (i.e. in most cases the hunt results i zero or one kill). – Sample the large you sample, the better your estimate of mean kill.

The variance or dispersion of the data is further explained in the following sections.

Exploring Harvest Statistics

As noted above, the Division's database consists of two main tables — a harvest database recording all hunt information from respondents who hunted, and a tags database containing information on sales of licenses, tags purchased, etc. To examine the harvest data, the harvest database was translated into SPSS format and run through a series of descriptive routines. Although this information is limited to questiomaire respondents, it provides some interesting insights into hunt success and related activity. It can also be used as a check on the estimates derived by the ratio or regression methods.

One descriptive statistic developed was a 95% confidence level around a kill or harvest for every hunt, i.e. the range of harvest for every hunt in which we have 95% confidence. In 1988/89, for example, we find there is a 95% confidence level that between 1.43 and 1.79 caribou where killed for every hunt by license-holders in the Yellowknife area. In that same year there were 874 purchasers of a caribou license in Yellowknife, 525 of whom responded to the survey. If this response rate is multiplied by the number of license-holders who hunted, and then by the confidence levels of the harvest, we are 95°/0 confident that hunters from Yellowknife harvested between 1,083 and 1,356 animals in 1988/89. The regression estimate for this year is 1,268.

The descriptive analysis of the barren-ground caribou hunt in 1988/89 in Yellowknife also provides a number of other interesting indicators of success. The following table summarizes some key statistics:

Mean Kill	**1.61**	**Std Error**	**0.09**	Skewness	3
Median	1	Variance	3.69	Kurtosis	19.48
Std. Deviation	1.92	High	19	Low	**0**

Measures of Central Tendency

The mean and median are often used to describe the most expected occurrence. From the data derived from the 1988/89 hunt in Yellowknife we see that the median harvest from every hunt is 1, which means half the hunts were below 1, half were above. The mean, or average kill, of every hunt is higher, at 1.6 caribou. This is because the mean is greatly influenced by outlying values or kills. In this case, the difference between the median and the mean indicates there are more values in the high end of the survey. Looking at the range, we see that this conclusion is supported by the high observation of 19 kills, i.e. one hunter on one hunt, killed 19 caribou).

Although the range is useful for supporting our initial observations, it can only be considered an index of dispersion. Another problem with using maximum and minimum numbers is that they do not take into account the underlying distribution of kills or observations between the two extremes. There is also a danger that the high or low values represent errors in the estimate or in data entry (e.g. a data-entry operator inputting a value of 19 instead of 9 or 11).

A more common measure of variability that is based on all observations is the *variance.* If all observations or reported kills per hunt are the same,

there would be no variance. In our sample, the variance is 3.69 indicating little degree of movement around the mean; the variance is a squared measure.

From the skewness and kurtosis measure in the table we can also get an idea about the shape or distribution of these variances around the mean. If the distribution is perfectly normal, the values of both skewness and kurtosis will be zero. Since the skewness estimate is around three, the tail of the distribution on the side of kills above the mean is higher; there are more kills on the higher side of the mean. Since the kurtosis estimate is very large, we also expect the distribution to be heavily peaked around the mean or average kill. Together these estimates indicate the distribution of kills per hunts is closely distributed around its high side, and we can also expect more outlying values on the high side. (Note: there is a tendency for distributions with a high kurtosis to also have positive skewed values.)

One additional measure which can be used to examine the success of the hunt is the trimmed mean. In this example a 5% trim was applied to the data; this means the calculation excludes 5% of the highest and lowest values in the distribution (kills per hunt). The rimmed mean for the example hunt is 1.43, substantially less than the normal mean (1.61). In this case, the trimmed mean is likely a more accurate indicator of the hunt since, like the median, it measures more the cental tendency of the harvest.

Finally, information on the harvest can also be obtained from so-called "m-estimators". Unlike the trimmed mean, which divides the population or hunt information into two groups, those included and those excluded, m-estimators assign varying weights to different estimates, with the

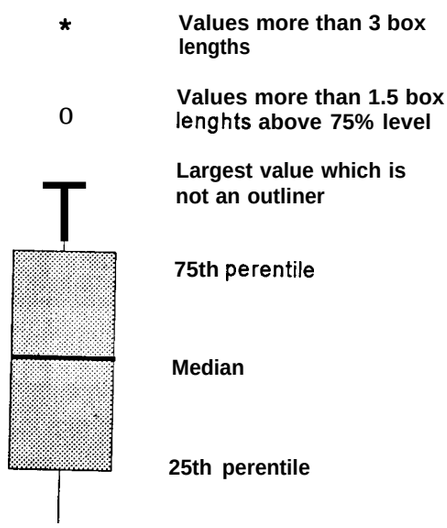
weights decreasing as distance from the mean increases. In the SPSS-calculated tables, four m-estimators are available and two are used:

> Huber, which steadily reduces the weight as measures move away from a central area; and
>
> Tukey -in which weights gradually decline to zero (after 4.6 standard units from the mean).

The adjusted means of the Huber estimator are 1.23 and for the Tukey 1.16. Again, these measures are substantially less than the non-adjusted mean, pointing to a distribution of kills or harvests which bias the average upward.

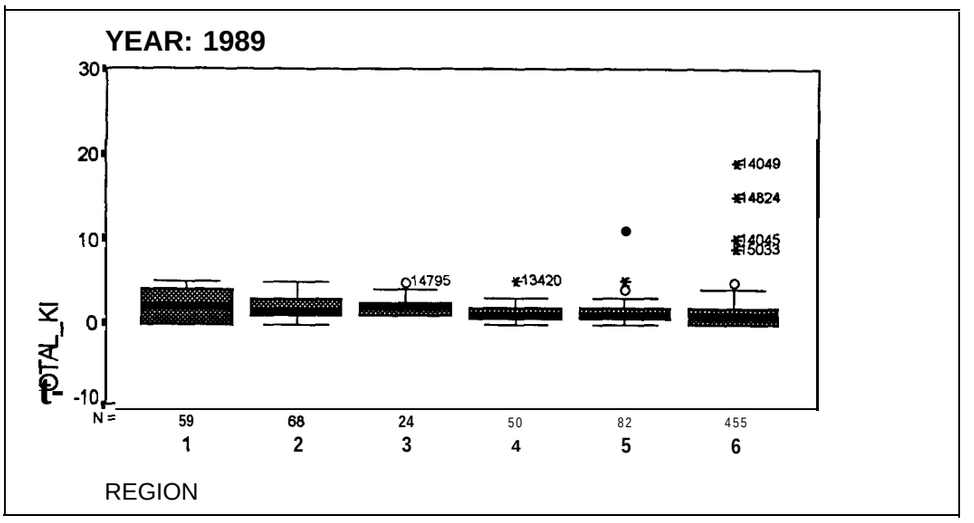
The **Box Plot**

The figure below shows an annotated sketch of a box plot. The lower boundary of the box is the 25th percentile and the upper boundary is the 75th percentile of hunt success. The horizontal line in the box represents the median. Half of the observations have values inside the box.

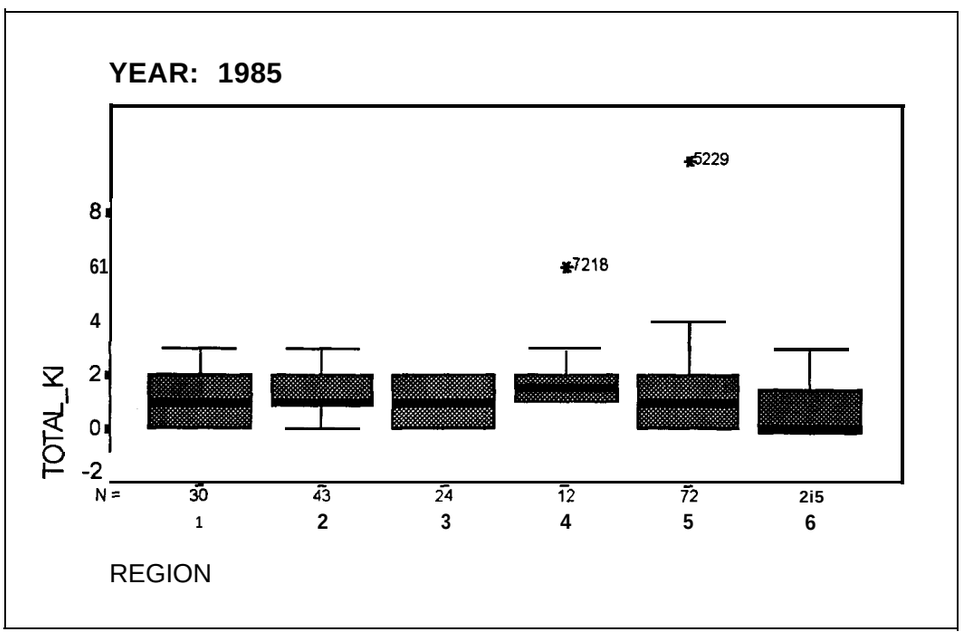


The box plot can also show outlying cases in two ways. Cases which are more than 3 box lengths from the upper or lower edge of the box are called extreme values and shown as *. Values that are between 1.5 and 3 box lengths from the extremes of the box ends are called outliners and shown as 0. The largest and smallest values in the observation that are not outliners are also shown by lines drawn from the ends of each box.

Using SPSS, a series of box plots was calculated for different hunts in every region. The following example shows the 1988/89 hunt for caribou in the Yellowknife (considered a region for this data).

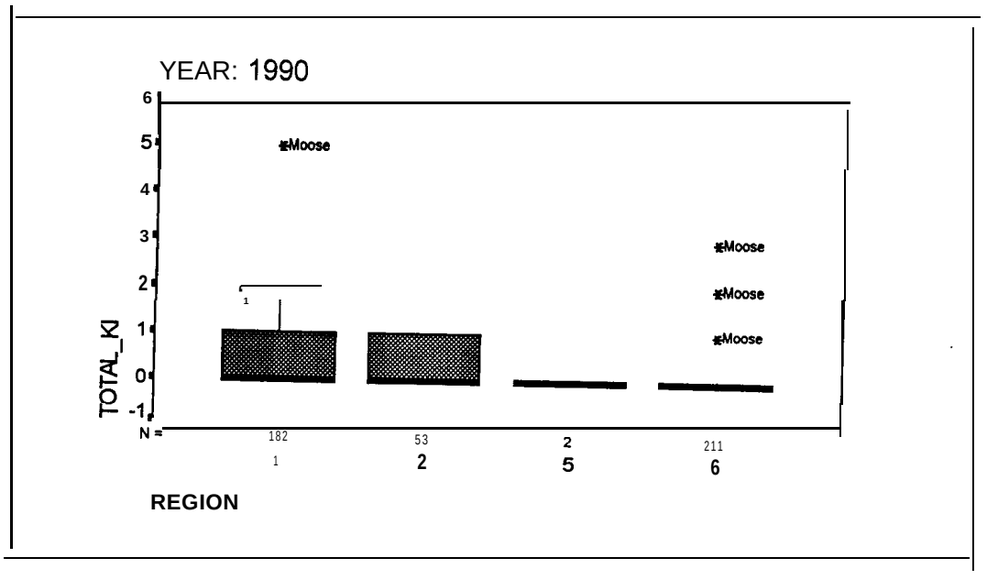


Yellowknife is shown as Region 6 (to the far right). As supported by the other estimates we see that the distribution is fairly evenly spread about the median (the value of the median is 1) with a significant number of measures or kills well above the 75% percentile of expected kills. For comparison purposes, the hunt is also shown for 1984/85.



The box plot for the barren-ground harvest in 1984/85 shows a much different distribution. First of all, the variance, especially in Region 6, or Yellowknife, is reduced over the 1988/89 level. Second, the number of extreme values is reduced and there are no outlying values. This likely means the hunt was more difficult during these years, with reduced opportunities to harvest a similar number of animals. This conclusion is supported by the median value which is zero. On the other hand, the harvest in most of the other regions was more successful, with the highest number of outlyers being found in Region 5.

The following chart shows another sample box plot for the moose hunt.



The box plot shows that the moose hunt was most successful in Regions 1 and 2. There was also some success in Region 6, with three hunts resulting in extraordinary successful harvests. One hunt resulted in three kills, another in two, and one hunter harvested a single animal. The median value is zero.

Conclusion and Recommendations

In most years since 1982/83 the Wildlife Management Division has at-tempted to secure the greatest number of hunter survey responses possible by mailing three successive waves of questionnaires. The major problem with this, and any other survey, is extrapolating the information collected from the surveys to the entire resident hunting population. Doing this requires an underlying assumption that the hunting success or activity of the non-responding, or unknown, population is the same as those responding.

To address this problem, the Division has utilized regression analysis to accommodate different behaviour or success between responding groups. As shown in the charts of estimates calculated using regression analysis and those calculated as strait ratios, there was little difference in the results yielded by the two methods; only in 1989 and 1984 were there any significant differences. This also implies that any difference in hunting success among the different waves has little overall impact on the harvest estimates.

It would also seem to imply the Division need only use a single survey to estimate the total harvest. As shown in the supporting tables generated by SPSS, it is possible to use the harvest data to generate confidence intervals around the mean or average harvest. When applied to the entire hunting population this should provide a good estimate of the harvest range.

To gain additional information on the non-respondent population, the Division might consider using an alternate survey method such as random sampling and telephone follow-up surveys. Determining the sample

size of this follow-up survey, and of the initial survey response, can be calculated by two methods. However, since the outcomes of any hunt have very little variance — in most cases the hunt is either unsuccessful or results in a single kill — traditional methods of determining survey size are of little value. Instead, the Division might consider using the minimum responses-per-cell method discussed above. This would entail attempting to solicit around 30 responses for every species. If there are 22 possible species choices, a sample size of around 660 tags should suffice for validity.

The Division might also consider discussing various survey techniques with the GNWT Bureau of Statistics, which has extensive first-hand northern survey experience.

Many of the "abnormal" entries in the database — e.g. kills exceeding legal limits, the mismatch between total kill and their age and sex breakdowns — might well have been the result of data-entry errors. As these kinds of errors could easily be "trapped" by a proper database interface, and we recommend that the Division develop such an interface to minimize data entry problems in future.

Reporting Results to the Public

One of our tasks for this assignment was to recommend an appropriate medium for disseminating the results of the annual hunter surveys to the hunters and the general public.

To this end we provided optional mock-ups (see next page) which could be used to produce either a "bank" newsletter or tabloid (small-format) newspaper. It has been our experience that these two media are most effective in attracting Northern (and indeed most North American) readers to otherwise drab subjects. They also allow a good deal of flexibility in terms of content and design and are relatively inexpensive to produce and distribute.

However, in an era of budget constraints, should the Department decide the costs of producing a newsletter or a tabloid outweigh the benefits, at a minimum we would recommend that the current typewritten, saddle-stitched (stapled) annual report be replaced by one with a "snappier" cover (perhaps using the mock-ups we provided), that the text be desktop published and that there be a lot more graphic illustrations.

TarGet Group

RESULTS OF THE 1994 HUNTER HARVEST STUDY

Conservation is the key to *good* hunting

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First *year* **for commercial harvest of caribou**

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CITIZEN @ 75% ACTUAL

TARGET GROUP

RESULTS OF THE 1994 HUNTER HARVEST STUDY

Department of Renewable Resources

Conservation is the key to good hunting

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The results of the 1994 Hunter Harvest Study

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Why's it so important to fillout these surveys?

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Who Benefits from these surveys

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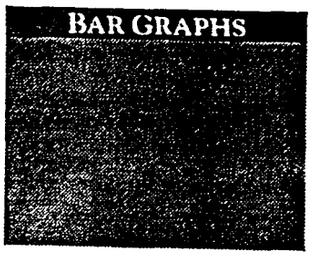

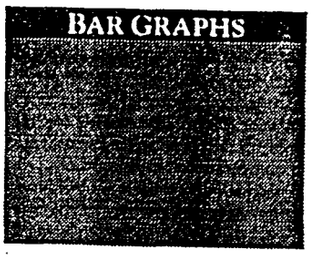

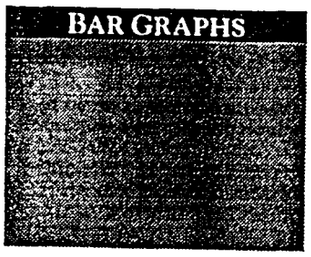

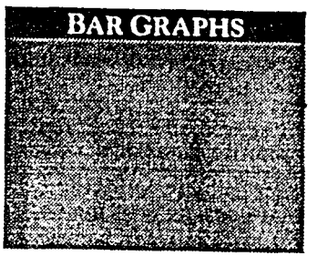

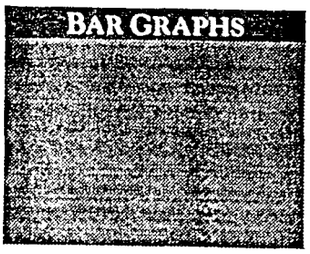

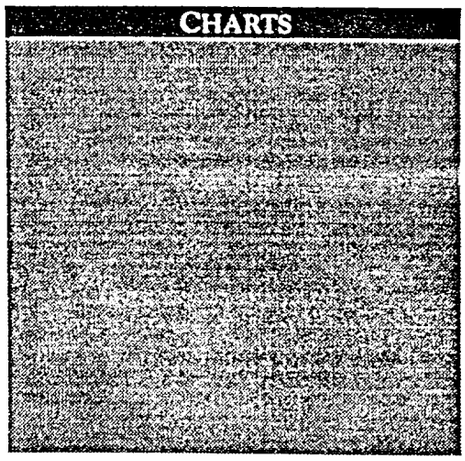
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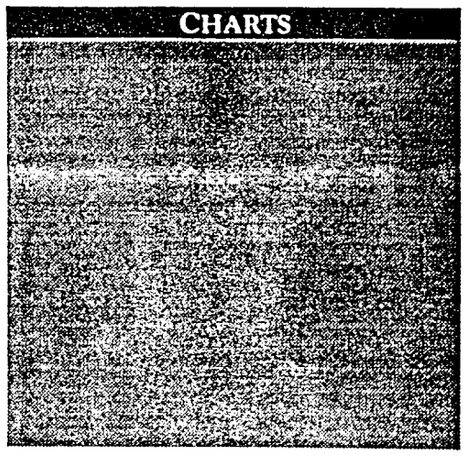
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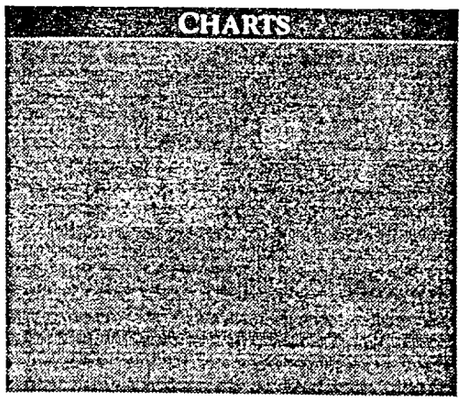
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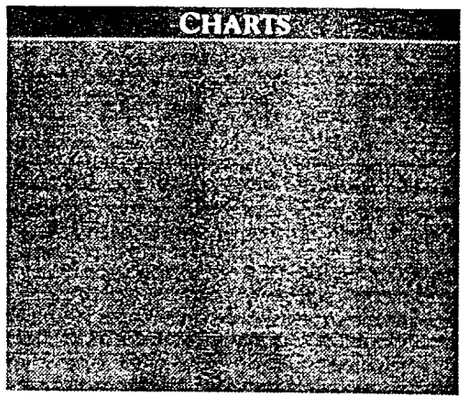
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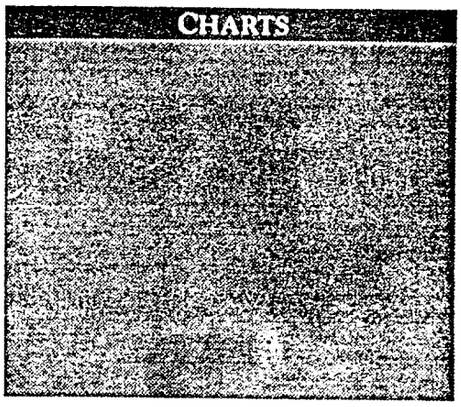
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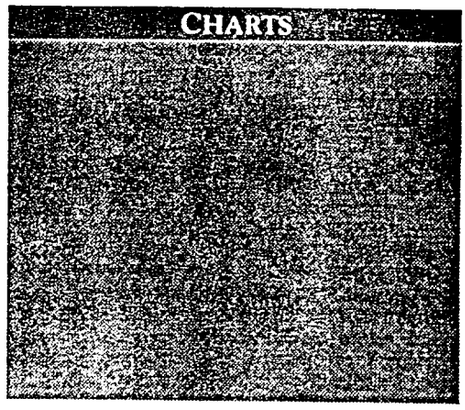
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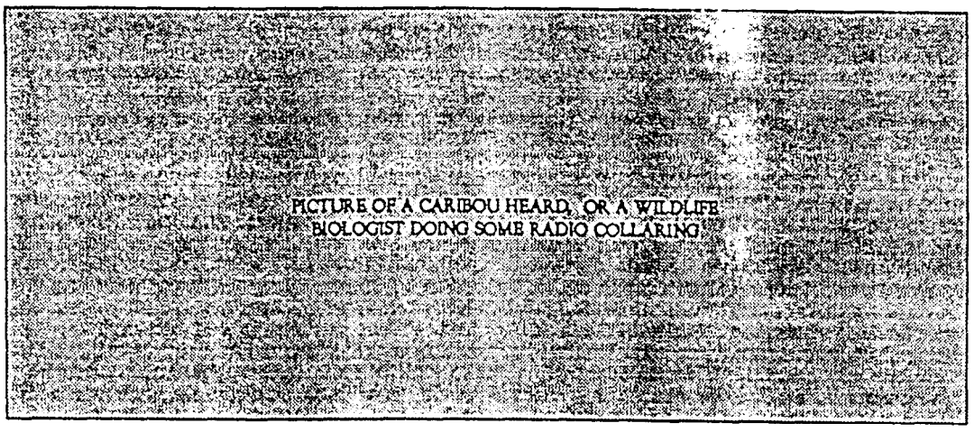

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Statistics play an important role in wildlife management

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Publishing Data here

Northwest Territories Renewable Resources
Wildlife Management Division

Harvest Estimate
BARREN-GROUND CARIBOU

Estimates exlude hunters with no tags.
Discrepancies in tag sales in 1982-3 prevented reliable estimation.
Number of Huntera and Average/ Hunter refer only to barren-ground caribou, for which huntera can purchase more than one tag.

Region	Total Kill Reported	Total Tags Sold	Number of Hunters	Average tags per Hunter	Tags Answered	Survey Coverage	Estimated Kill
			1986-7				
Fort Smith	**55**	**236**	**90**	**2.6**	155	65%	**83**
Inuvik	44	297	141	2.1	176	59%	74
Kitikmeot	48	94	37	2.5	72	76%	62
Keewatin	41	146	55	2.6	116	79%	51
Baffin	53	289	102	**2.8**	**220**	**76%**	**69**
Yellowknife	536	1,710	691	2.4	1,044	61%	877
Total	**777**	**2,772**	**1,116**	**2.4**	**1,783**		**1,219**
			1987-8				
Fort Smith	161	239	74	3.2	189	79%	203
Inuvik	**65**	**314**	**133**	**2.3**	**199**	**63%**	**102**
Kitikmeot	**7**	**0** **100**	**35**	**2.8**	**88**	**88%**	**79**
Keewatin	**67**	**203**	**54**	**3.7**	**144**	**70%**	**94**
Baffin	81	317	98	3.2	195	61%	131
Yellowknife	1,024	2,772	887	3.1	1,783	64%	1,592
Total	**1,468**	**3,945**	**1,281**	**3.1**	**2,598**		**2,203**
			1988-9				
Fort Smith	135	352	102	**3.4**	**226**	**64%**	**210**
Inuvik	116	414	157	2.6	282	68%	170
Kitikmeot	**50**	**114**	**33**	**3.4**	**84**	**73%**	**67**
Keewatin	**64**	**202**	**57**	**3.5**	**120**	**59%**	**107**
Baffin	**134**	334	106	3.1	230	68%	194
Yellowknife	733	2,713	874	3.1	1,624	59%	1,224
Total	**1,232**	4,129	1,329	3.1	2,566		1,975

Harvest Estimate

BARREN-GROUND CARIBOU

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Region	Total Kill Reported	Total Tags Sold	Number of Hunters	Average tags per Hunter	Tags Answered	Survey Coverage	Estimated Kill
			1989-O				
Fort Smith	156	366	89	4.1	239	65%	238
Inuvik	115	420	149	2.8	277	650/o	174
Kitikmeot	81	129	38	3.3	97	75%	107
Keewatin	**46**	**167**	**52**	**3.2**	**108**	**64%**	**71**
Baffin	**122**	**304**	**91**	**3.3**	**228**	**75%**	**162**
Yellowknife	760	2,593	817	3.1	1,481	57%	1,330
Total	**1,280**	**3,979**	**1,236**	**3.1**	**2,430**		**2,085**

Harvest Estimate
BLACK BEAR

Estimates exlude hunters with no tags.
Discrepencies in tag sales in 1982-3 prevented reliable estimation.

Region	Total Kill Reported	Total Tags Sold	Tags Answered	Survey Coverage	Estimated Kill
1983-4					
Fort Smith	18	120	79	65%	27
Inuvik	2	54	30	55%	3
Yellowknife	9	168	96	57%	15
Total	29	342	5		46
1984-5					
Fort Smith	13	184	130	70%	18
Inuvik	2	53	36	67%	2
Kitikmeot	o	1	0	o%	o
Yellowknife	7	262	153	58%	11
Total	22	0	319		*33*
1985-6					
Fort Smith	7	177	112	63%	11
Inuvik	1	50	30	60%	1
Yellowknife	2	211	118	55?40	3
Total	10	438	260		*16*
1986-7					
Fort Smith	4	127	78	61%	6
Inuvik	1	42	25	599'0	1
Yellowknife	1	170	105	61%	1
Total	6	339	208		9

Harvest Estimate
BLACK BEAR

Estimates exlude hunters with no tags,
Discrepancies in tag sales in 1982-3 prevented reliable estimation.

Region	Total Kill Reported	Total Tags Sold	Tags Answered	Survey Coverage	Estimated Kill
1987-8					
Baffin	0	2	2	100?40	0
Fort Smith	7	132	82	62%	11
Inuvik	2	46	33	71%	2
Yellowknife	13	207	133	64%	20
Total	22	387	250		34
1988-9					
Fort Smith	9	113	72	63%	14
Inuvik	1	34	22	64%	1
Yellowknife	3	209	117	55%	5
Total	13	356	211		21
1989-O					
Fort Smith	7	94	63	67%	10
Inuvik	2	28	22	78%	2
Yellowknife	12	204	114	55%	21
Total	21	326	199		34

Harvest Estimate
DALL'S SHEEP

Estimates exhale hunters with no tags.
Discrepancies in tag sales in 1982-3 prevented reliable estimation.

Region	Total Kill Reported	Total Tags Sold	Tags Answered	Survey Coverage	Estimated Kill
1983-4					
Fort Smith	18	**45**	**28**	**62%**	**28**
Inuvik	6	**51**	34	**66%**	9
Yellowknife	5	26	13	**50%**	10
Total	**29**	**122**	**75**		**47**
1984-5					
Fort Smith	10	45	34	75%	13
Inuvik	1	41	25	60%	1
Total	**11**	**86**	**59**		**14**
1985-6					
Fort Smith	4	52	34	**65%**	6
Inuvik	2	41	29	**70%**	2
Yellowknife	7	24	15	**62%**	11
Total	**13**	**117**	**78**		**20**
1986-7					
Fort Smith	3	36	20	**55%**	**5**
Inuvik	**4**	**31**	**21**	**67%**	**5**
Yellowknife	**0**	**12**	**6**	**50%**	**0**
Total	**7**	**79**	**47**		**11**

Harvest Estimate
DALL'S SHEEP

Estimates exlude hunters with no tags.
Discrepancies in tag sales in 1982-3 prevented reliable estimation.

Region	Total Kill Reported	Total Tags Sold	Tags Answered	Survey Coverage	Estimated Kill
1987-8					
Baffin	o	1	1	1 00%	o
Fort Smith	2	22	13	59%	3
Inuvik	a	41	27	65%	12
Kitikrneot	o	1	1	100?40	o
Yellowknife	4	18	11	619'0	6
Total	**14**	**83**	**53**		**22**
1988-9					
Baffin	o	1	1	1 00%	o
Fort Smith	5	19	12	63%	7
Inuvik	5	41	29	70%	7
Kitikmeot	o	1	1	1 00%	o
Yellowknife	o	9	4	44%	o
Total	10	71	47		14
1989-O					
Fort Smith	7	26	19	73%	9
Inuvik	11	30	23	76%	14
Yellowknife	2	15	12	80%	2
Total	**20**	**71**	**54**		**26**

Harvest Estimate

MOOSE

Estimates exclude hunters with no tags.
Discrepancies in tag sales in 1982-3 prevented reliable estimation.

R g	Total Kill Reported	Total Tags Sold	Tags Answered	Survey Coverage	Estimated Kill
1983-4					
Baffin	1	0	0	0?40	o
Fort Smith	99	431	250	58%	170
Inuvik	13	164	85	51%	25
Keewatin	o	0	0	09'0	0
Kitikmeot	o	3	2	66%	o
Yellowknife	19	413	225	54?40	34
Total	**132**	**1,011**	**562**		**230**
1984-5					
Baffin	1	2	2	1 00%	1
Fort Smith	64	700	469	67%	95
Inuvik	15	183	123	67%	22
Kitikmeot	0	5	4	80?40	0
Yellowknife	32	607	355	58%	54
Total	**112**	**1,497**	**953**		**173**
1985-6					
Fort Smith	84	719	471	65%	128
Inuvik	25	178	109	61%	40
Kitikmeot	o	4	4	10070	0
Yellowknife	27	573	343	59%	45
Total	**136**	**1,474**	**927**		**214**

Harvest Estimate

MOOSE

Estimates exlude hunters with no tags.
Discrepancies in tag sales in 1982-3 prevented reliable estimation.

Region	Total Kill Reported	Total Tags Sold	Tags Answered	Survey Coverage	Estimated Kill
1986-7					
Fort Smith	66	515	322	62%	105
Inuvik	9	147	93	63%	14
Kitikmeot	o	3	3	100%	o
Yellowknife	10	**532**	**3 2 5**	**61%**	**16**
Total	**85**	**1,197**	**743**		**136**
1987-8					
Baffin	1	***4***	***2***	50%	2
Fort Smith	65	571	354	62%	104
Inuvik	16	157	99	63%	25
Kitikmeot	2	3	3	100?40	2
Yellowknife	60	657	433	65%	91
Total	**144**	**1,392**	**891**		**225**
1988-9					
Fort Smith	46	466	295	63%	72,
Inuvik	16	143	96	67%	23
Kitikmeot	o	3	3	1 00%	0
Yellowknife	57	722	428	**59%**	96
Total	**119**	**1,334**	**822**		**192**

Harvest Estimate

MOOSE

Estimates exlude hunters with no tags.
Discrepancies in tag sales in 1982-3 prevented reliable estimation.

Region	Total Kill Reported	Total Tags Sold	Tags Answered	Survey Coverage	Estimated Kill
		1989-O			
Baffin	0	4	3	75%	0
Fort Smith	63	447	290	64%	97
Inuvik	19	133	84	63%	30
Yellowknife	48	690	367	53%	90
Total	130	1,274	744		217

Harvest Estimate
MOUNTAIN GOAT

Estimates exlude hunters with no tags,
Discrepancies in tag sales in 1982-3 prevented reliable estimation.

Region	Total Kill Reported	Total Tags Sold	Tags Answered	Survey Coverage	Estimated Kill
		1983-4			
Fort Smith	5	17	12	70%	7
Yellowknife	o	4	1	25%	o
Total	**5**	**21**	**13**		**7**
		1984-5			
Fort Smith	3	29	22	**75%**	3
Total	**3**	**29**	**22**		**3**
		1985-6			
Fort Smith	3	28	19	67%	4
Total	3	28	19		4
		1986-7			
Fort Smith	1	12	7	58%	1
Total	1	12	7		1

Harvest Estimate
WOODLAND CARIBOU

Estimates exlude hunters with no tags.
Discrepancies in tag sales in 1982-3 prevented reliable estimation.

Region	Total Kill Reported	Total Tags Sold	Tags Answered	Survey Coverage	Estimated Kill
1983-4					
Fort Smith	36	285	158	55%	64
Inuvik	5	84	43	51?40	9
Kitikmeot	1	0	0	o%	o
Yellowknife	6	247	127	51%	11
Total	**48**	**616**	**328**		**86**
1984-5					
Fort Smith	27	486	316	65%	41
Inuvik	6	111	70	63%	9
Kitikmeot	o	0	0	0%	o
Yellowknife	5	354	200	56%	8
Total	**38**	**951**	**586**		**59**
1985-6					
Fort Smith	23	535	341	63%	36
Inuvik	10	92	53	57%	17
Keewatin	1	1	1	1 00%	1
Yellowknife	2	361	197	54%	3
Total	36	989	592		58
1986-7					
Baffin	0	0	0	o%	o
Fort Smith	9	358	209	58%	15
Inuvik	11	83	51	61'?40	17
Kitikmeot	o	1	1	1 00%	o
Yellowknife	5	312	182	58%	8
Total	**25**	**754**	**443**		**41**

Harvest Estimate
WOODLAND CARIBOU

Estimates exlude hunters with no tags.
Discrepancies in tag sales in 1982-3 prevented reliable estimation.

Region	Total Kill Reported	Total Tags Sold	Tags Answered	Survey Coverage	Estimated Kill
1987-8					
Baffin	o	3	2	66%	o
Fort Smith	18	376	219	58%	30
Inuvik	11	89	61	68%	16
Yellowknife	9	381	234	61%	14
Total	**38**	**849**	**516**		**61**
1988-9					
Baffin	o	1	,1	100%	o
Fort Smith	24	315	197	62°%	38
Inuvik	8	70	47	67%	11
Kitikmeot	1	1	1	1 00%	1
Yellowknife	18	422	235	55%	32
Total	**51**	**809**	**481**		**83**
1989-O					
Baffin	1	1	1	1 00%	1
Fort Smith	25	293	193	65%	37
Inuvik	8	61	45	73%	10
Yellowknife	6	412	212	51%	11
Total	**40**	**767**	**461**		**61**

Harvest Estimate

WOLF

Estimates exlude hunters with no tags.
Discrepancies in tag sales in 1982-3 prevented reliable estimation.

Region	Total Kill Reported	Total Tags Sold	Tags Answered	Survey Coverage	Estimated Kill
1983-4					
Baffin	0	4	3	75%	0
Fort Smith	30	37	25	67%	44
Inuvik	3	28	17	60%	4
Keewatin	1	2	2	100?40	1
Kitikmeot	2	4	3	75%	2
Yellowknife	16	103	55	53%	29
Total	**52**	**178**	**105**		**82**
1984-5					
Fort Smith	41	101	67	66%	61
Inuvik	2	47	34	72%	2
Keewatin	3	3	2	66'%	4
Kitikmeot	0	1	1	100%	0
Yellowknife	5	167	100	59%	8
Total	**51**	**319**	**204**		**77**
1985-6					
Baffin	1	2	1	50%	2
Fort Smith	37	57	39	68%	54
Inuvik	4	31	21	67%	5
Keewatin	0	3	2	66%	0
Kitikmeot	0	2	2	100?"0	0
Yellowknife	5	122	69	56%	8
Total	**47**	**217**	**134**		**70**

Harvest Estimate
WOLF

Estimates exlude hunters with no tags.
Discrepancies in tag sales in 1982-3 prevented reliable estimation.

Region	Total Kill Reported	Total Tags Sold	Tags Answered	Survey Coverage	Estimated Kill
1986-7					
Baffin	0	20	12	60%	0
Fort Smith	7	36	19	52%	13
Inuvik	2	35	21	60%	3
Keewatin	1	5	4	80%	1
Kitikmeot	2	9	6	66%	3
Yellowknife	6	131	83	63%	9
Total	18	236	145		30
1987-8					
Baffin	2	1	1	1 00%	2
Fort Smith	7	0	0	o%	0
Inuvik	2	0	0	0%	0
Keewatin	4	0	0	o%	0
Kitikmeot	0	0	0	0%	0
Yellowknife	15	0	0	o%	0
Total	30	1	1		2.
1988-9					
Baffin	0	0	0	o%	0
Fort Smith	4	0	0	0%	0
Inuvik	6	0	0	o%	0
Keewatin	0	0	0	o%	0
Kitikmeot	0	0	0	o%	0
Yellowknife	9	0	0	0%	0
Total	19	0	0		0

Harvest Estimate
WOLF

Estimates exlude hunters with no tags.
Discrepancies in tag sales in 1982-3 prevented reliable estimation.

Region	Total Kill Reported	Total Tags Sold	Tags Answered	Survey Coverage	Estimated Kill
		1989-O			
Baffin	0	0	0	0%	0
Fort Smith	2	0	0	o%	0
Inuvik	1	0	0	0%	0
Keewatin	0	0	0	o%	0
Kitikmeot	1	0	0	o%	0
Yellowknife	9	1	1	1009'0	9
Total	**13**	**1**	**1**		**9**

Harvest Estimate
WOLVERINE

Estimates exlude hunters with no tags.
Discrepancies in tag sales in 1982-3 prevented reliable estimation.

Region	Total Kill Reported	Total Tags Sold	Tags Answered	Survey Coverage	Estimated Kill
1983-4					
Fort Smith	3	7	5	71%	4
Kitikmeot	2	3	2	66%	3
Total	5	10	7		7
1984-5					
Yellowknife	5	23	19	82%	6
Total	5	23	19		6
1985-6					
Fort Smith	4	13	11	84%	4
Keewatin	0	2	2	1 00%	o
Kitikmeot	o	2	2	100?40	o
Yellowknife	1	16	10	62%	1
Total	5	33	25		6
1986-7					
Fort Smith	o	9	7	779'0	0
Inuvik	o	18	14	77%	o
Yellowknife	o	31	21	67%	o
Total	o	58	42		0

Harvest Estimate
WOLVERINE

Estimates exlude hunters with no tags.
Discrepancies in tag sales in 1982-3 prevented reliable estimation,

Region	Total Kill Reported	Total Tags Sold	Tags Answered	Survey Coverage	Estimated Kill
1987-a					
Kitikmeot	o	0	0	o%	o
Yellowknife	4	0	0	0?40	o
Total	**4**	**0**	**0**		**0**
1988-9					
Inuvik	1	0	0	o%	o
Keewatin	o	0	0	o%	o
Kitikmeot	o	0	0	09'0	0
Yellowknife	3	0	0	o%	o
Total	**4**	0	0		0
1989-O					
Fort Smith	o	0	0	o%	o
Inuvik	1	0	0	o%	o
Kitikmeot	o	0	0	0?40	o
Total	1	0	0		0.

Harvest Estimates

Barren Ground Caribou	Year	Reported Kill	Ratio Estimated Kill	Total Tags Sold
	1984	712	1294	2036
	1985	360	528	2023
	1986	442	661	1857
	1987	777	1219	2772
	1988	1468	2203	3945
	1989	1232	1975	4129
	1990	1260	2085	3976

Woodland Caribou	Year	Reported Kill	Ratio Estimated Kill	Total Tags Sold
	1984	48	86	616
	1965	36	59	951
	1986	38	56	989
	1967	25	41	754
	1988	36	61	649
	1989	51	83	809
	1990	40	61	767

Moose	Year	Reported Kill	Ratio Estimated Kill	Total Tags Sold
	1984	132	230	1011
	1985	112	173	1497
	1966	136	214	1474
	1987	85	136	1197
	1966	144	225	1392
	1989	119	192	1334
	1990	130	217	1274

Black Bear	Year	Reported Kill	Ratio Estimated Kill	Total Tags Sold
	1984	712	1294	2036
	1985	360	528	2023
	1966	442	661	1657
	1967	777	1219	2772
	1988	1466	2203	3945
	1989	1232	1975	4129
	1990	1260	2085	3976

Dall's Sheep	Year	Reported Kill	Ratio Estimated Kill	Total Tags Sold
	1984	29	47	122
	1985	11	14	66
	1966	13	20	117
	1987	7	11	79
	1988	14	22	83
	1969	10	14	71
	1990	20	26	71

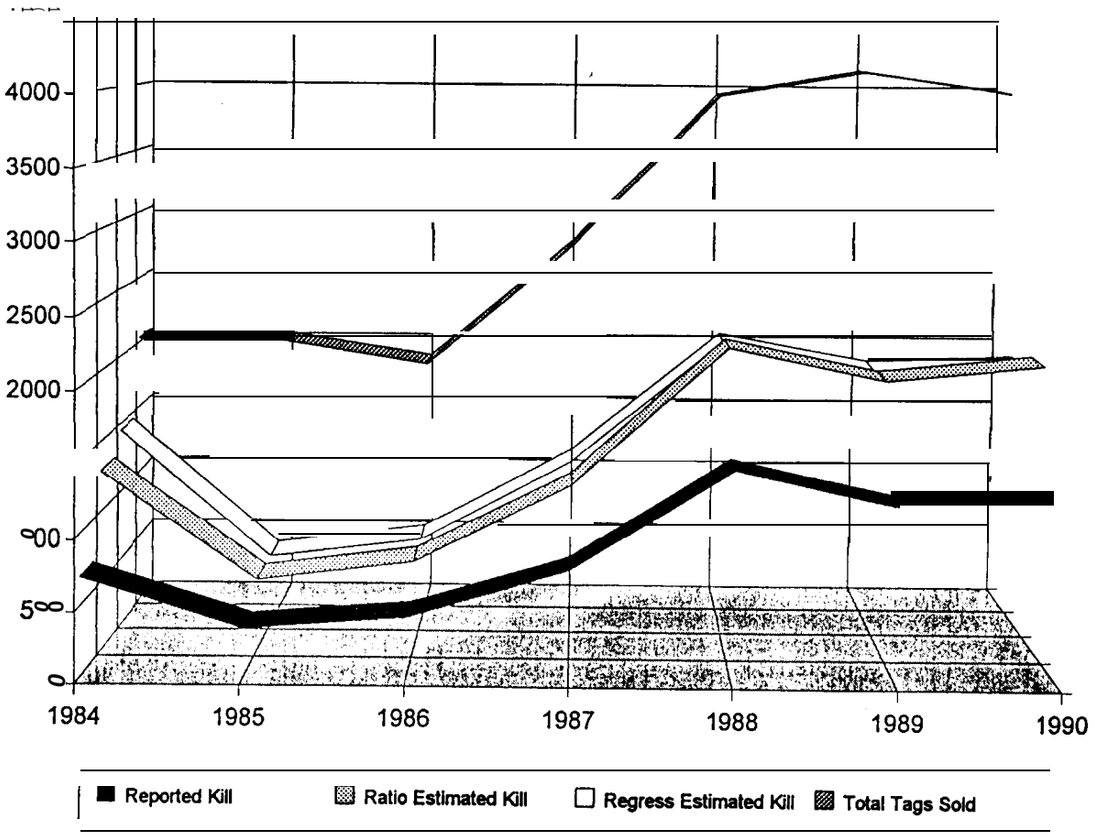
Harvest Estimates

Mountain Goat	Year	Reported Kill	Ratio Estimated Kill	Total Tags Sold
	1984	5	7	21
	1985	3	3	29
	1986	3	4	28
	1987	1	1	12
	1988	0	0	0
	1989	0	0	0
	1990	0	0	0

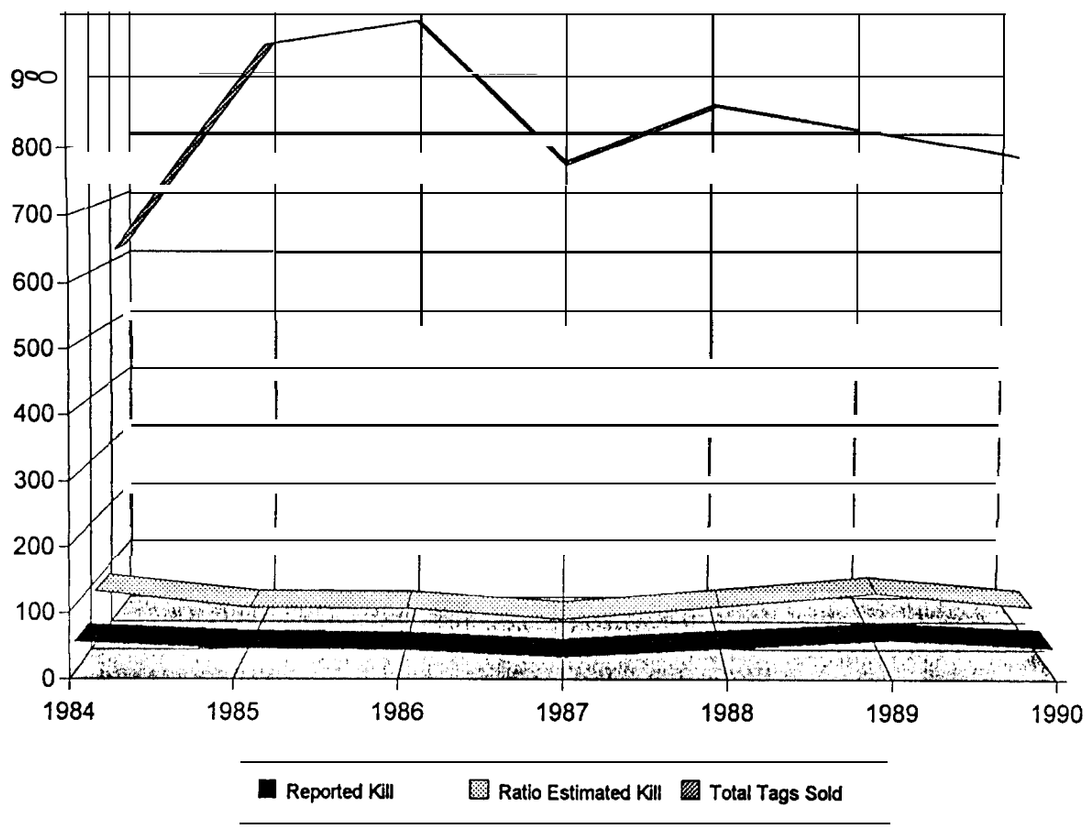
Wolf	Year	Reported Kill	Ratio Estimated Kill	Total Tags Sold
	1984	52	82	82
	1985	51	77	77
	1986	47	70	70
	1987	18	30	30
	1988	30	2	2
	1989	19	0	0
	1990	13	1	9

Wolverine	Year	Reported Kill	Ratio Estimated Kill	Total Tags Sold
	1984	5	7	10
	1985	5	6	23
	1986	5	6	33
	1987	0	0	58
	1988	4	0	0
	1989	4	0	0
	1990	1	0	0

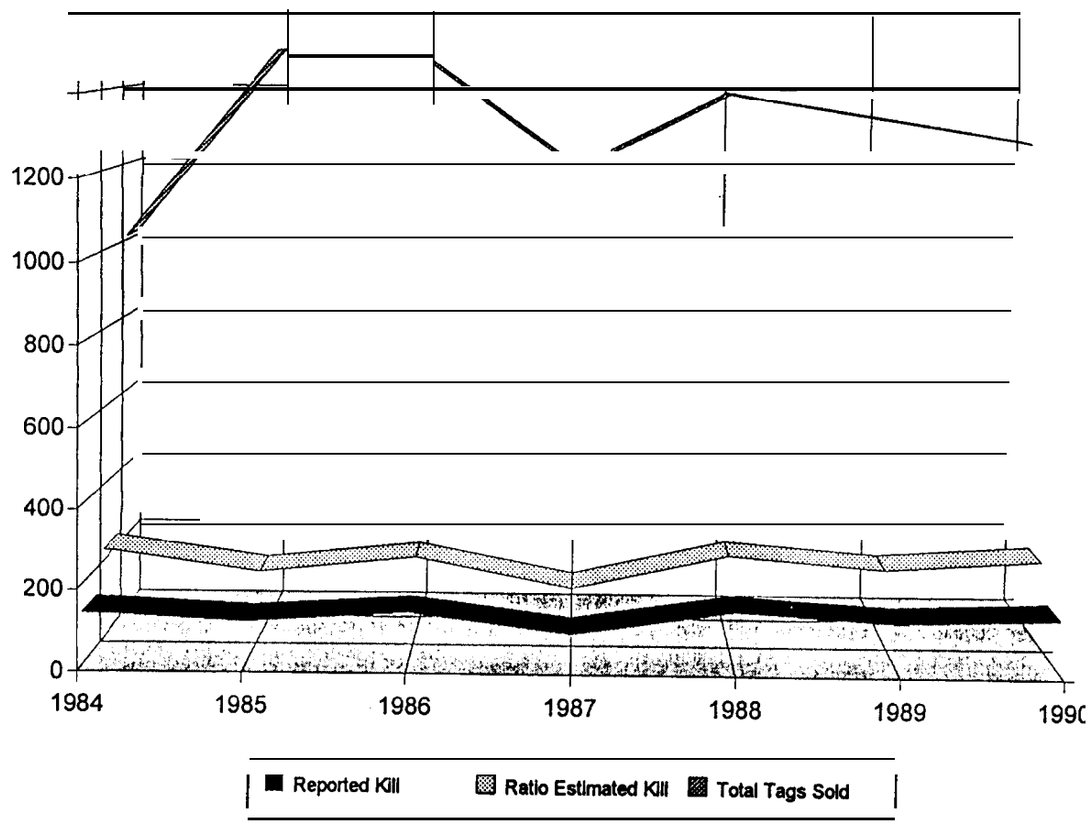
Barren Ground Caribou



Woodland Caribou



Moose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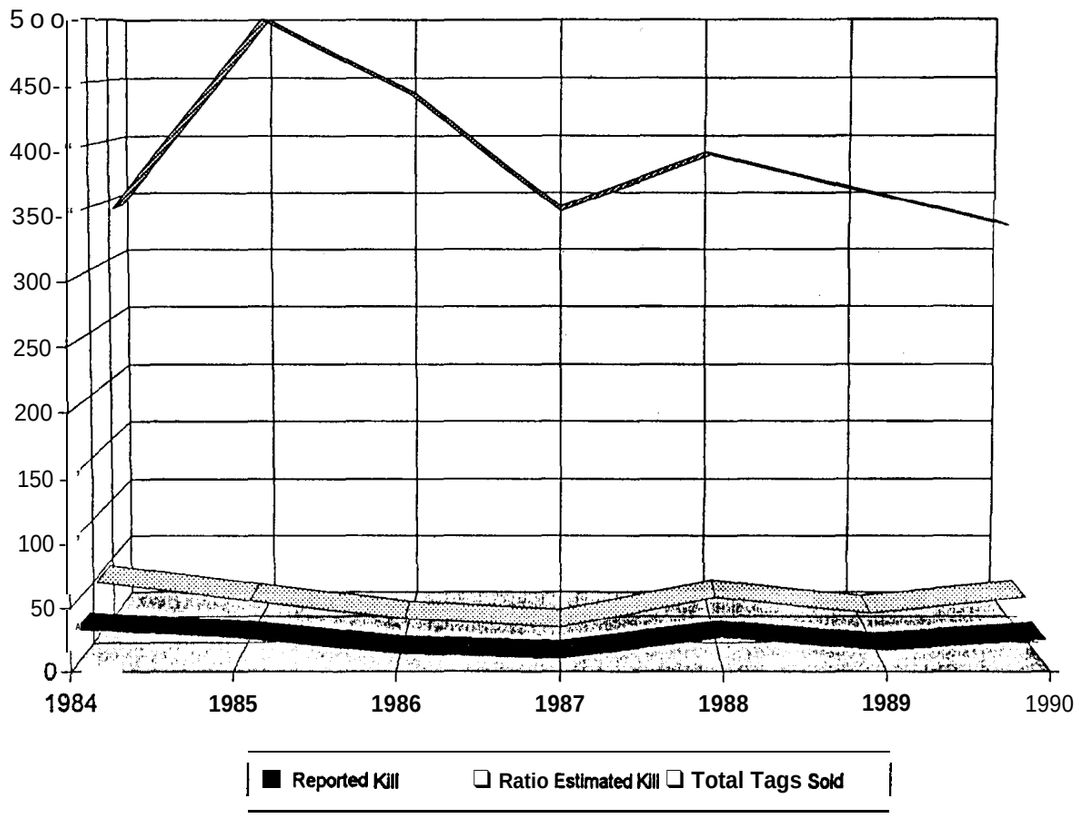
Ratio Estimated Kill
Total Tags Sold

Black Bear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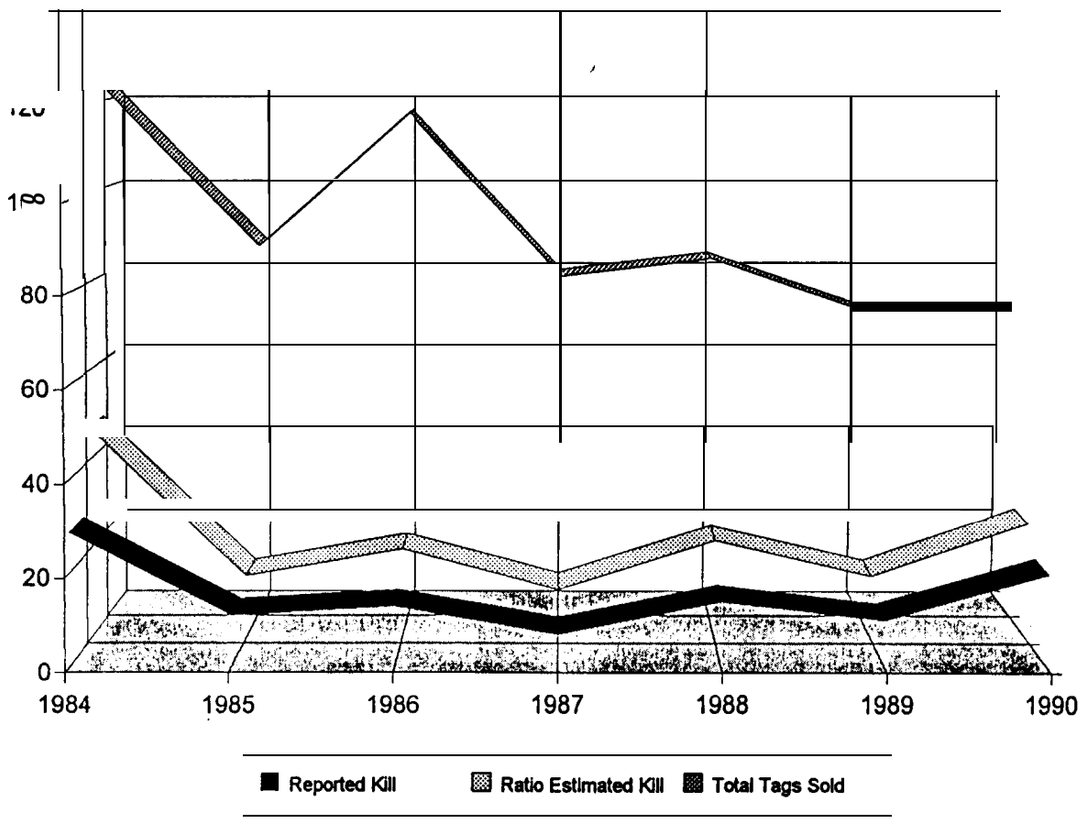
Reported Kill
Ratio Estimated Kill
Total Tags Sold

Dall's Sheep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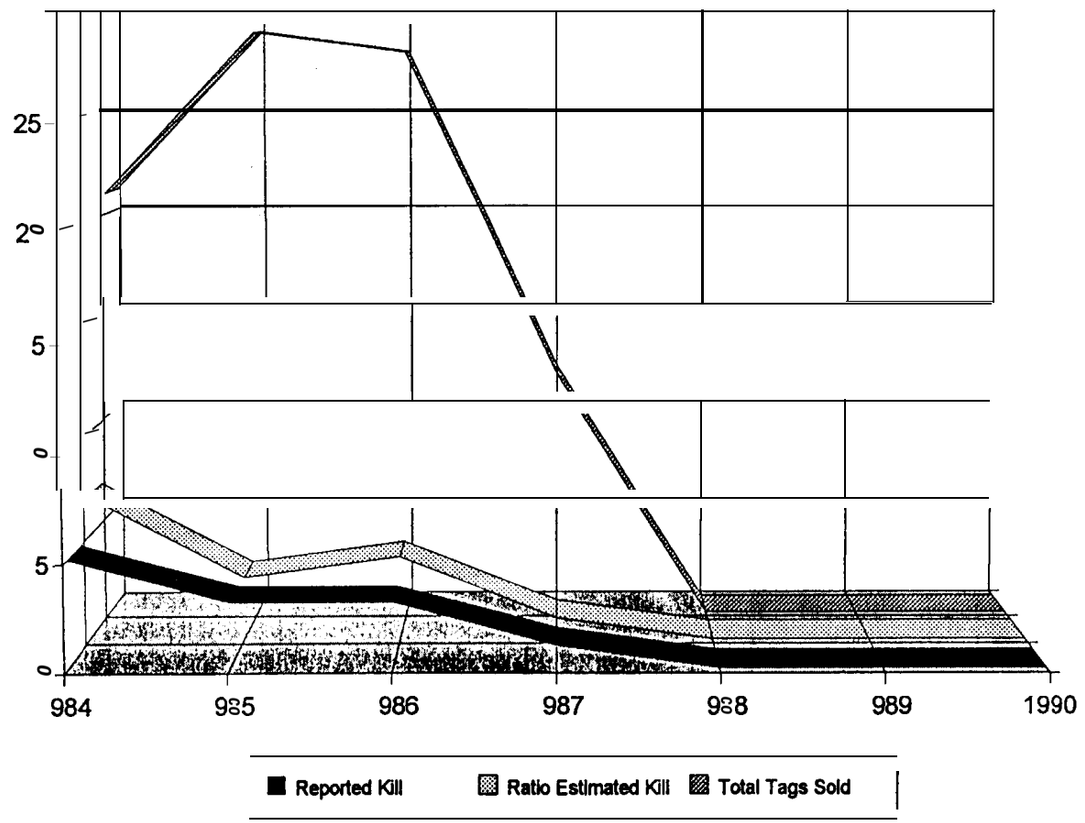
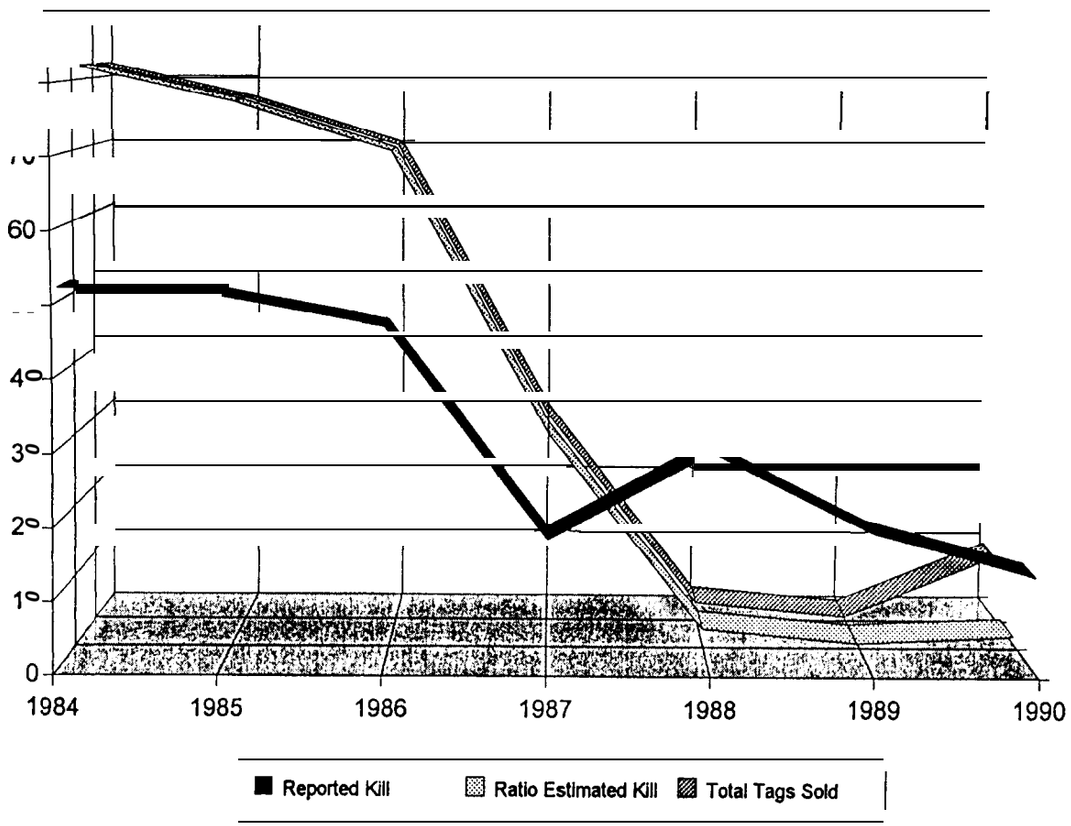
Ratio Estimated Kill
Total Tags Sold

Mountain Goat



Wolf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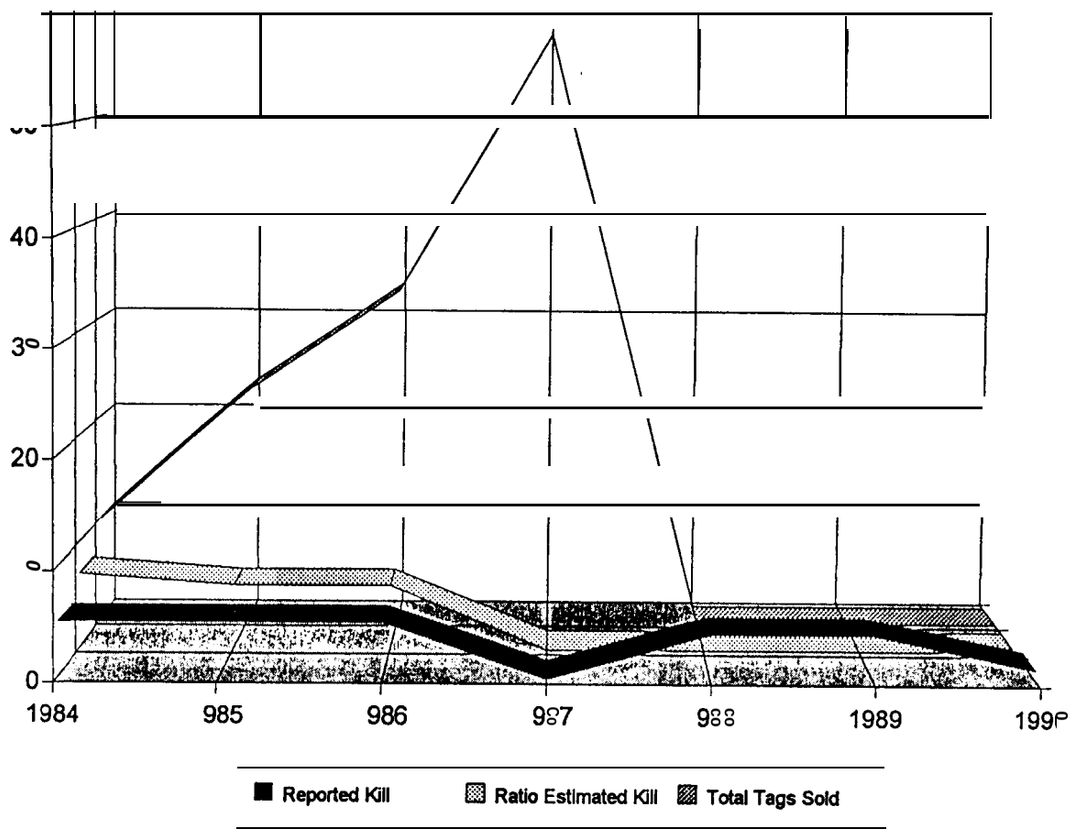
Ratio Estimated Kill
Total Tags Sold

Wolverine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Ratio Estimated Kill
Total Tags Sold

Baffin Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	99	99	43%	53	53	53
Wave 2	49	148	64%	24	77	77
None	0	148	64%	0	77	#N/A
Estimate			36%	41.1	118	
Total			100%	118		

Annual Tag Sales

Baffin	232

Regression Data

113.632653	Mn
0	SEn
1	R2
0	F
113.632653	Slope
4.51020408	Intercept

Fort Smith Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	65	65	52%	22	22	22
Wave 2	22	87	69%	10	32	32
None	0	87	69%	0	32	#N/A
Estimate			31%	17.7	49.7	
Total			100%	49.		

Annual Tag Sales

Fort Smith	126

Regression Data

572727273	Mn
0	SEn
1	R2
0	F
572727273	Slope
-7.5454545	Intercept

Inuvik Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	74	74	43%	10	10	10
Wave 2	44	118	68%	15	25	25
None	0	118	68%	0	25	#N/A
Estimate			32%	18.7	43.7	
Total			100%	43.7		

Annual Tag Sales

Inuvik	173

Regression Data

58.9772727	Mn
0	SEn
1	R2
0	F
58.9772727	Slope
-15.227273	Intercept

Keewaun Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	26	26	47%	18	18	18
Wave 2	10	36	65%	[illegible]	25	25
None	0	36	65%	0	25	#N/A
Estimate			35%	13.3	38.3	
Total			100%	38.3		

Annual Tag Sales

Keewatin	55

Regression Date

38.5	Mn
0	SEn
1	RZ
0	F
38.5	Slope
-0.2	Intercept

Kitikmeot Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	57	57	56%	33	33	33
Wave 2	20	77	76%	8	41	41
None	0	77	76%	0	41	#N/A
Estimate			24%	9.6	50.6	
Total			100%	50.6		

Annual Tag Sales

Kitikmeot	101

Regression Data

40.4	Mn
0	SEn
1	RZ
0	F
40.4	Slope
10.2	Intercept

Yellowknife Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	327	327	34%	1 off	loa	loa
Wave 2	184	511	53%	41	149	149
None	a	511	53%	a	149	#N/A
Estimate			47%	101.6	250.6	
Total			100%	250.61		

Annual Tag Sales

Yellowknife	967

Regression Data

215.472826	Mn
0	SEn
1	RZ
0	F
215.472826	Slope
35,135	Intercept

Baffin Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	97	97	42%	58	58	58
Wave 2	40	137	60%	19	77	78.5
Wave 3	0	137	60%	3	80	78.5
Estimate			40%	45.7	126	
Total			100%	126		

Annual Tag Sales	
Baffin	229

Regression Data	
117.3625	Mn
14.8739863	SEn
0.98419204	R2
62.2592593	F
117.3625	Slope
8.2875	Intercept

Sm

	Responding	Cumulative Respons	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	34	34	43%	23	23	23
Wave 2	15	49	6.%	14	37	40.5
Wave 3	0	49	6.%	7	44	40.5
Estimate			39%	32.7	76.7	
Total			100%	76.7		

Annual Tag Sales	
Fort Smith	80

Regression Data	
93.3333333	Mn
32.3316151	SEn
0.89285714	R2
8.33333333	F
93.3333333	Slope
-16.666667	Intercept

Inuvik Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	94	94	36%	38	38	38
Wave 2	46	140	54%	16	54	54
Wave 3	0	140	54%	0	54	54
Estimate			46%	41.4	95.4	
Total			100%	95.4		

Annual Tag Sales	
Inuvik	259

Regression Data	
90.0869565	Mn
4.8998E-14	SEn
1	R2
3.3804E+30	F
90.0869565	Slope
5.30434783	Intercept

Keewatin Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	26	26	43%	13	13	13
Wave 2	12	38	62%	2	15	15
Wave 3	0	38	62%	0	15	15
Estimate			38%	3.833	18.83	
Total			100%	18.833		

Annual Tag Sales	
Keewatin	61

Regression Data	
10.1666667	Mn
9.1197E-14	SEn
1	RZ
1.2428E+28	F
10.1666667	Slope
8.66666667	Intercept

Kitikmeot Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	50	50	55%	39	39	39
Wave 2	18	68	75%	18	57	57
Wave 3	0	68	75%	0	57	57
Estimate			25%	23	80	
Total			100%	80		

Annual Tag Sales	
Kitikmeot	91

Regression Data	
91	Mn
1.0061E-12	SEn
1	RZ
8.1803E+27	F
91	Slope
-11	Intercept

Yellowknife Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	462	462	35%	410	410	410
Wave 2	222	684	52%	165	576	577
Wave 3	0	684	52%	2	578	577
Estimate			4s?6	474.4	1052	
Total			100%	105Z4		

Annual Taa Sales	
Yellowknife	1316

Regression Data	
989[illegible]	Mn
10.2674724	SEn
0.999[illegible]	RZ
9296.33333	F
989[illegible]	Slope
62.4594585	Intercept

Barren Ground Caribou - Regression Estimates

Baffin Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	77	77	37%	61	61	60.4
Wave 2	65	142	68%	21	82	84.3
Wave 3	22	164	78%	12	94	92.3
Estimate			22%	15.2	109	
Total			100%	109		

Annual Tag Sales

Baffin 210

Regression Data

76.9669327	Mn
9.42061842	SEn
0.98523979	R2
66.749733	F
76.9669327	Slope
32.2089917	Intercept

Fort Smith Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	49	49	36%	21	21	21.2
Wave 2	30	79	59%	7	28	27.1
Wave 3	8	87	64%	0	28	28.7
Estimate			36%	10.2	38.2	
Total			100%	38.2		

Annual Tag Sales

135

Regression Data

26.6860465	Mn
5.43783393	SEn
0.96013289	R2
24.0833333	F
26.6860465	Slope
11.5	Intercept

Inuvik Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	87	87	39%	28	28	26.9
Wave 2	42	129	57%	8	36	38.6
Wave 3	28	157	70%	12	48	46.4
Estimate			30%	17.3	65.3	
Total			100%	65.3		

Annual Tag Sales

Inuvik

Regression Data

62.593985	Mn
14.6508057	SEn
0.94806094	R2
18.2533333	F
62.593985	Slope
2.7443609	Intercept

Barren Ground Caribou - Regression Estimates

Keewatin Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	27	27	50%	22	22	22
Wave 2	12	39	72%	0	22	22.5
Wave 3	1	40	74%	1	23	22.5
Estimate			26%	0.166	23.17	
Total			100%	23.166		

Annual Tag Sales	
Keewatin	64

Regression Data	
2.40764331	Mn
3.57442332	SEn
0.31210191	R2
0.45337037	F
2.40764331	Slope
20.7575518	Intercept

Kitikmeot Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	38	38	47%	11	11	10.8
Wave 2	17	55	68%	7	18	18.7
Wave 3	6	61	75%	4	22	21.5
Estimate			25%	8.756	30.76	
Total			100"%	30.756		

Annual Tag Sales	
Kitikmeot	81

Regression Data	-1
37.5597719	Mn
4.27131031	SEn
0.98723276	R2
77.3254438	F
37.8897719	Slope
-8.8032787	Intercept

Yellowknife Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	444	444	34%	74	74	74.1
Wave 2	254	698	53%	55	129	128
Wave 3	80	778	59%	16	145	145
Estimate			41%	115.8	260.8	
Total			100%	260.78		

Annual Tag Sales	
Yellowknife	1318

Regression Data	
281.4379851	Mn
4.20357773	SEn
0.99977696	R2
4482.57185	F
281.437985	Slope
-20.661844	Intercept

Baffin Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	95	95	48%	40	40	40.6
Wave 2	39	134	69%	30	70	67.4
Wave 3	11	145	74%	3	73	75
Estimate			26%	36.4	109	
Total			100%	10		

Annual Taa Sales I

Baffin	195

Regression Data

134.315548	Mn
17.3685974	SEn
0.98355345	R2
59.8030153	F
134.315548	Slope
-24.870111	Intercept

Fort Smith Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	78	78	54%	36	36	37.9
Wave 2	9	87	60%	9	45	41.6
Wave 3	12	99	68%	0	45	46.5
Estimate			32%	20.1	65.1	
Total			100%	65.1		

Annual Tag Sales

Fort Smith	145

Regression Data

58.7837838	Mn
40.7266001	SEn
0.67567568	R2
2.08333333	F
58.7837838	Slope
6.32432432	Intercept

Inuvik Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	95	95	40%	23	23	23.2
Wave 2	33	128	54%	9	32	31.3
Wave 3	17	145	61%	3	35	35.5
Estimate			39%	23.4	58.4	
Total			100%	58.4		

Annual Tag Sales

Inuvik	239

Regression Data

58.4249613	Mn
5.76427223	SEn
0.99035982	R2
102.73251	F
58.4249613	Slope
0.01340897	Intercept

Keewatin Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	33	33	36%	24	24	24.2
Wave 2	26	59	65%	18	42	40.6
Wave 3	4	63	69%	0	42	43.2
Estimate			31%	18.9	60.9	
Total			100%	60.905		

Annual Tag Sales

Keewatin	91

Regression Data

57.6180905	Mn
7.12839001	SEn
0.98492462	R2
65.3333333	F
57.6180905	Slope
3.28643216	Intercept

Kitikmeot Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	41	41	52%	28	28	27.8
Wave 2	25	66	84%	16	44	45
Wave 3	6	72	91%	6	50	49.2
Estimate			9%	3.993	53.99	
Total			100%	53.99		

Annual Tag Sales

Kitikmeot	79

Regression Data

54.4525277	Mn
4.55544312	SEn
0.99304982	R2
142.881116	F
54.4525277	Slope
-0.459926	Intercept

Yellowknife Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	426	426	39%	129	129	127
Wave 2	142	570	52%	32	161	166
Wave 3	104	674	61%	36	197	194
Estimate			39%	115.3	312.3	
Total			100%	312.34		

Annual Tag Sales

Yellowknife	1106

Regression Data

302.392411	Mn
37.3515386	SEn
0.96497207	R2
65.5427685	F
302.392411	Slope
9.95234764	Intercept

Baffin Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	153	153	53%	35	35	34.9
Wave 2	47	200	69%	12	47	47.4
Wave 3	20	220	76%	6	53	52.7
Estimate			24%	18.1	71.1	
Total			100%	71.1		

Annual Tag Sales

Baffin	289

Regression Data

76.9526627	Mn
2.96190937	SEn
0.99852071	R2
675	F
76.9526627	Slope
-5.8579882	Intercept

Fort Smith Region

	Responding	Cumulat Respons	# Responding	Kills Reported	Cumulative Kills	Re ression Estimate
Wave 1	84	84	36%	28	28	27.4
Wave 2	52	13e	58%	16	44	46.3
Wave 3	19	155	66%	11	55	53.3
Estimate			34%	27.8	82.8	
Total			100%	82.8		

Annual Tag Sales

Fort Smith	2	3	6

Regression Data

86.1199	Mn
13.5	SEn
0.975	R2
40.60	F
86.1199	Slope
-3.28	Intercept

Inuvik Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	123	123	41%	31	31	29.9
Wave 2	25	148	50%	3	34	36.1
Wave 3	28	176	59%	10	44	43
Estimate			41%	29	73	
Total			100%	73		

Annual Tag Sales

Inuvik	297

Regression Data

73.5106686	Mn
20.2A50377	SEn
0.9295005	R2
13.1964497	F
73.5106686	Slope
-0.5457563	Intercept

Barren Ground Caribou - Regression Estimates

Keewatin Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	82	82	56%	32	32	32.3
Wave 2	26	108	74%	9	41	39.7
Wave 3	8	116	79%	0	41	42
Estimate	1		21%	9.532	50.53	
Total			100%	50.53		

Annual Tag Sales

Keewatin	146

Regression Data

41.5822785	Mn
9.60301587	SEn
0.94936709	RZ
18.75	F
41.5822785	Slope
8.94936709	Intercept

Kitikmeot Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	59	59	63%	39	39	38.9
Wave 2	12	71	76%	8	45	46.2
Wave 3	1	72	77%	3	48	46.9
Estimate			23%	12.31	60.31	
Total			100%	60.306		

Annual Tag Sales

Kitikmeot	94

Regression Data

57.477707	Mn
15.5553608	SEn
0.93175614	RZ
13.6533333	F
57.477707	Slope
2.82802548	Intercept

Yellowknife Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	645	645	38%	309	309	308
Wave 2	265	910	53%	144	453	457
Wave 3	134	1044	61%	83	536	533
Estimate	1		39%	373.6	909.6	
Total			100%	909.63		

Annual Tag Sales

Yellowknife	1710

Regression Data

966.731816	Mn
32.3140599	SEn
0.99886394	RZ
895.012233	F
966.731816	Slope
-57.106431	Intercept

$Y = -57.106431 + 966.73X$

309 : 38

: 53

453

: 61

457 : 1.

kills

tags

Baffin Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	34	34	11%	23	23	27.7
Wave 2	31	6	21%	21	44	38.2
Wave 3	130	195	62%	37	81	82.1
Estimate			38%	42.4	123	
Total			100%	123		

Annual Tag Sales

Baffin	317

Regression Data

107.150952	Mn
19.852043	SEn
0.96681353	R2
29.1327617	F
107.150952	Slope
16.2078023	Intercept

Fort Smith Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	74	74	32%	58	58	57.1
Wave 2	90	164	70%	68	126	131
Wave 3	20	184	79%	25	151	147
Estimate			21%	37	188	
Total			100%	188		

Annual Tag Sales

Fort Smith	234

Regression Data

191.402913	Mn
17.5105293	SEn
0.99169993	R2
119.480916	F
191.402913	Slope
-3.3932039	Intercept

Inuvik Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	134	134	41%	58	58	58.9
Wave 2	49	183	56%	15	73	70.5
Wave 3	26	209	64%	2	75	76.6
Estimate			36%	29.4	104	
Total			100%	104		

Annual Tag Sales

Inuvik	326

Regression Data

77.247989	Mn
18.9470674	SEn
0.94325363	R2
16.6222712	F
77.247989	Slope
27.112020023	Intercept

Keewatin Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	87	87	44%	29	29	29
Wave 2	47	134	68%	25	54	54.2
Wave 3	5	139	70%	3	57	56.8
Estimate			30%	31.46	88.46	
Total			100%	88.463		

Annual Tag Sales	
Keewatin	198

Regression Data	
106.097205	Mn
1.11117635	SEn
0.99988332	RZ
91'16.29587	F
106.097205	Slope
-17.63467	Intercept

Kitikmeot Region

	Respo d g	Cumulative Response	# Responding	Kills Repo ed	Cumulative Kills	Re ression Estimate
Wave 1	50	50	51%	46	4s	47.9
Wave 2	24	74	76%	23	88	63.9
Wave 3	14	88	90%	1	70	73.2
Estimate			10%	9.897	79.9	
Total			100%	79.857		

Annual Tag Sales	
Kitikmeot	98

Regression Data	
65.36285159	Mn
22.82617788	SEn
0.89130016	RZ
8.19964566	F
65.36285159	Slope
14.534296	Intercept

Yellowknife Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	942	942	34%	592	592	601
Wave 2	551	1493	54%	325	917	890
Wave 3	290	1783	64%	107	1024	1042
Estimate			36%	535.7	1560	
Total			100%	155'9.7		

Annual Tag Sales	
Yellowknife	2772

Regression Data	
1451.63293	Mn
154.751707	SEn
0.98876302	RZ
87.9919053	F
1451.63293	Slope
108.043329	Intercept

Baffin Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	152	152	46%	103	103	103
Wave 2	58	210	63%	24	127	126
Wave 3	20	230	69%	7	134	134
Estimate			31%	42.1	176	
Total			100%	176		

Annual Tag Sales

Baffin	334.

Regression Data

133.966288	Mn
4.34701135	SEn
0.9989482	R2
948.750426	F
133.966288	Slope
42.1835906	Intercept

Fort Smith Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	155	155	44%	92	92	91.5
Wave 2	62	217	62%	31	123	127
Wave 3	9	226	64%	12	135	132
Estimate			36%	68.2	203	
Total			100%	203		

Annual Tag Sales

Fort Smith	352

Regression Data

199.555655	Mn
31.6196828	SEn
0.97550836	R2
39.8302524	F
199.555655	Slope
3.66071827	Intercept

Inuvik Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	184	184	44%	77	77	77.5
Wave 2	83	267	64%	39	116	113
Wave 3	15	282	68%	0	116	119
Estimate			32%	58.6	175	
Total			100%	175		

Annual Tag Sates

Inuvik	414

Regression Data

174.807154	Mn
25.0918402	SEn
0.97981218	R2
48.5348148	F
174.807154	Slope
-0.1671851	Intercept

Barren Ground Caribou - Regression Estimates

Keewatin Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	76	76	38%	46	46	46.2
Wave 2	37	113	56%	17	63	61.9
Wave 3	7	120	59%	1	64	64.9
Estimate	1		41%	35.82	99.82	
Total			100%	99.81		

Annual Tag Sales

Keewatin	202

Regression Data

86.0035778	Mn
8.55387265	SEn
0.9902047	R2
101.089827	F
86.0035778	Slope
13.8133572	Intercept

Kitikmeot Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	57	57	50%	29	29	29.1
Wave 2	24	81	71%	21	50	48.7
Wave 3	3	84	74%	0	50	51.2
Estimate			26%	25.6	75.6	
Total			100%	75.6003		

Annual Tag Sales

Kitikmeot	114

Regression Data

92.9178082	Mn
9.46696263	SEn
0.9897265	R2
96.3333333	F
92.9178082	Slope
-17.315068	Intercept

Yellowknife Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	1013	1013	37%	473	473	475
Wave 2	466	1479	55%	213	666	677
Wave 3	145	1624	60%	47	733	740
Estimate			40%	478.7	1212	
Total			100%	1211 .7		

Annual Tag Sales

Yellowknife	2713

Regression Data

1175.40608	Mn
69.0293746	SEn
0.9965626	R2
289.93991	F
1175.40608	Slope
36.2482085	Intercept

Barren Ground Caribou - Regression Estimates

Baffin Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	140	140	46%	85	85	85
Wave 2	50	190	63%	21	106	106
Wave 3	38	228	75%	16	122	122
Estimate			25%	31.9	154	
Total			100%	154		

Annual Tag Sales

Baffin	304

Regression Data

127.811068	Mn
0.09009984	SEn
0.9999995	R2
2012283	F
127.811088	Slope
26.1331128	Intercept

Fort Smith Region

	R	C	#	Ki	Cu	Re
Wave 1	135	135	37%	110	110	109
Wave 2	84	219	60%	30	140	144
Wave 3	20	239	65%	16	156	153
Estimate			35%	49.6	206	
Total			100%	206		

Annual Tag Sales

Fort Smith	366

Regression Data

152.71366	Mn
25.8124104	SEn
0.97222413	R2
35.0024666	F
152.71366	Slope
52.8568301	Intercept

Inuvik Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	168	168	40%	94	94	93.6
Wave 2	80	248	59%	13	107	108
Wave 3	29	277	66%	8	115	114
Estimat.			34%	25.5	141	
Total			100%	141		

Annual Tag Sales

Inuvik	420

Regression Data

78.2146219	Mn
10.0053515	SEn
0.98389949	R2
61.1098465	F
78.2146219	Slope
62.3152913	Intercept

Barren Ground Caribou - Regression Estimates

Keewaun Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	70	70	42%	28	28	27.8
Wave 2	16	86	51%	7	35	35.4
Wave 3	22	108	65%	11	46	45.8
Estimate			35%	27.88	73.88	
Total			100%	73.88		

Annual Tag Sales	
Keewatin	167

Regression Data	
79.3708791	Mn
2.91371551	SEn
0.99865418	R2
742.041322	F
79.3708791	Slope
-5.4908425	Intercept

Kitikmeot Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	74	74	57%	63	63	63
Wave 2	23	97	75%	15	78	79.5
Wave 3	0	97	75%	3	81	79.5
Estimate			25%	21.46	102.5	
Total			100%	102.46		

Annual Tag Sales	
Kitikmeot	129

Regression Data	
92.5434783	Mn
14.5718188	SEn
0.97580645	R2
40.3333333	F
92.5434783	Slope
9.91304348	Intercept

Yellowknife Region

	Responding	Cumulative Response	# Responding	Kills Reported	Cumulative Kills	Regression Estimate
Wave 1	871	871	34%	451	451	447
Wave 2	445	1316	51%	203	654	668
Wave 3	165	1481	57%	106	760	750
Estimate			43%	541.4	1301	
Total			100%	1301.41		

Annual Tag Sales	
Yellowknife	2683

Regression Data	
1286.25562	Mn
102.816215	SEn
0.99365104	R2
156.506129	F
1286.25562	Slope
15.1638236	Intercept