Resident Hunter Surveys

1997-2009

UPDATE AND REVIEW

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ABSTRACT

The NWT Resident Hunter Survey was initiated in the 1982/1983 hunting season with procedures unchanged for 27 years. The basic survey design involves mailing three waves of paper questionnaires, with reminders sent to hunters who did not respond in previous waves. Other harvest surveys exist in the NWT for some regions and hunter types, but the annual NWT Resident Hunter Survey provides the only long-term territory-wide database on harvest statistics in the NWT. This report provides details for resident hunter harvests for hunting seasons 1997/1998 to 2008/2009 inclusive, trends in hunter numbers and trends in harvesting rates per species per region. This report also provides additional information on hunting success, seasonality of hunts, and the sex ratio of hunted animals for barren-ground caribou. An analysis of declines in response rates and possible effects of non-response bias on precision, accuracy, and hence validity of the harvest results is also presented. The current survey design and possible future changes and improvements are evaluated.

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INTRODUCTION

There are four classes of licenced game hunters in the Northwest Territories (NWT):

1) *General* - subsistence harvesters, primarily Aboriginal people.

2) *Resident* - Canadian citizens or landed immigrants who have been living in the NWT for at least two consecutive years prior to application for the licence.

3) *Non-resident* - Canadian citizens or landed immigrants who live outside the NWT, or have not resided in the NWT for a full two years prior to application for the licence.

4) *Non-resident Alien* - an individual who is neither an NWT resident nor a non-resident.

The NWT Resident Hunter Survey was initiated in the hunting season 1982-83 and its procedures, based on mailed-out paper questionnaires, and result reporting format have remained basically unaltered for 27 years (see Chalmers 1990, D'Hont 2000a-g). One major change occurred in 1999 with the creation of Nunavut, resulting in the exclusion of Nunavut hunters from the survey. Based on recommendations from co-management boards, commercial harvesting for barren-ground caribou was eliminated in the Inuvialuit, Gwich'in and Sahtu settlement areas on 15 September 2006. Also in 2006, Zone I/BC/06 (Inuvialuit Settlement Region) was closed for barren-ground caribou to all resident, non-resident and non-resident alien hunters, and the number of barren-ground caribou tags available to each resident hunter in the rest of the NWT was reduced from five to two and limited to bulls only (ENR 2006, ENR 2011). In January 2010, all resident, non-resident and outfitted or commercial hunting for barren-ground caribou was closed in management zones R/BC/01 and U/BC/01, areas used mostly by the Bathurst herd of barren-ground caribou (see ENR 2011).

As described in D'Hont (2000g), survey results are organized by region for each species. Community is where the hunter resides or resided at the time of licence purchase. Region is also where a hunter resides and is designed to form groups of hunters large enough to prevent the association of hunting information with individual hunters and allow a large enough sample size for calculations of estimated kills per species. Hunters are given the opportunity to provide detailed information on the location of

their hunt, such as management zone, latitude and longitude or the name of a landmark. However, this interesting information remains in raw data format and has yet to be analysed or mapped.

The basic survey design of mailing three waves of paper questionnaires, with reminders sent to hunters who did not respond in previous waves, follows recommendations made in a report by Norecon Ltd. (GNWT 1994) based on Fillion (1975), and has been observed to this day. The design is consistent with a multiple-contact method described in Dillman (2007). Repeat mailings allow for the estimation of non-response bias, where non-respondents may have a different hunting behaviour than respondents (e.g. Pendleton 1992, Fisher 1996). This type of error may lead to over-estimation of harvest if more respondents hunted than non-respondents or to under-estimation of harvest if fewer respondents hunted than non-respondents. The former bias may be likely, as permit holders who did not hunt at all may feel that filling out a questionnaire is not necessary. To reduce this kind of bias the questionnaire format and the letter clearly instruct permit holders to send a response even if they did not hunt.

The hunting season (or hunting year) in the NWT starts on 1 July and ends on 30 June of the next year. Resident hunters wishing to hunt big game, as described in the Wildlife Act (S.N.W.T. 1999), can obtain a licence if they are at least 16 years old, and those wishing to hunt small game only, if they are at least 14 years old. Resident hunting licences for big and small game are valid for one season. Individual tags for big game and small game authorizations are issued to resident hunters for a supplemental fee. Each tag is numbered and valid for only one season. Unused tags are not refunded at the end of the season for which they were bought; they simply become invalid. Lost licences or tags can be replaced for a fee. No tags are necessary for small game hunting.

Big game species covered in this report are barren-ground caribou (*Rangifer tarandus groenlandicus*, also including *R. t. pearyi*), woodland caribou (*R.t. caribou*), moose (*Alces americanus*), black bear (*Ursus americanus*), Dall's sheep (*Ovis dalli*), wolf (*Canis lupus*), and wolverine (*Gulo gulo*). Small game species reported are spruce grouse (*Falcipennis canadensis*), ruffed grouse (*Bonasa umbellus*), sharp-tailed

grouse (*Tympanuchus phasianellus*), ptarmigan (*Lagopus sp*.; mostly willow ptarmigan, *Lagopus lagopus*, less likely *L. muta, L. leucura*), and hares (*Lepus sp*.; mostly snowshoe hare, *Lepus americanus*, less likely arctic hare, *L. arcticus*).

Information on harvest by non-resident and non-resident alien hunters has been summarised for the Mackenzie Mountains since 1995 (Veitch and Popko 1996, 1997; Veitch and Simmons 1998, 2000, 2002; Veitch et al. 2000; Larter and Allaire 2003, 2004, 2005a, 2005b, 2007, 2008).

Harvest studies are requirements in some land claim agreements to inform the calculation of "minimum need levels" in particular, and provide information for the management of wildlife in general. Between 1995-2004 the Gwich'in Renewable Resources Board (GRRB) conducted a harvest study as required by the Gwich'in Comprehensive Land Claim Agreement (1992). The study (GRRB 2009a) provided a five-year snapshot of harvesting rates by Gwich'in (general hunting licence holders) in the Settlement Area, and four years of additional information on hunting locations and wildlife demographics. An Inuvialuit Harvest Study was initiated in 1986 and provided a ten-year database (1988 to 1999) of harvest statistics from Inuvialuit (general hunting licence holders) in the Inuvialuit Settlement Region (Joint Secretariat 2003). Summary reports are available to the public on the internet and raw data are available upon request for both studies (GRRB 2009b, Joint Secretariat 2003). Environment and Natural Resources (ENR), Inuvik Region is also publishing summary harvest data from all types of hunters for species under quota in the Inuvialuit Settlement Region, for July 2005 to June 2010 (ENR 2010).

D'Hont (2000g) reported that resident hunters made up only about 20% of the NWT hunting public in 1996-97. In 2009, resident hunters totalled about 1200 compared to about 16,000 general hunting licence holders (7% of total hunting public). The proportion of general hunting licence holders who are active hunters is unknown. Despite representing only a small portion of the hunting public in the NWT,

the annual NWT Resident Hunter Survey provides the only long-term territory-wide database on harvest statistics in the NWT.

The objectives of this report are to provide:

- Details for hunting seasons 1997-98 to 2008-2009 inclusive, to update the survey results since the publication of a series of reports in 2000 (DHont 2000a-g);
- Trends in hunter numbers;
- Trends in harvesting rates per species per region;
- Additional information on barren-ground caribou: hunting success, seasonality of hunts, sex ratio of hunted animals;
- Analysis of changes in response rates and non-response bias associated with the resident hunter survey, and the effects they may have on the precision, accuracy, and validity of the harvest results; and
- An evaluation of the current survey, future changes and improvements.

METHODS

The NWT Resident Hunter Survey methods are described in detail in D'Hont (2000a-g). A general overview of procedures is given here with details on changes to methods since 2000.

Hunting licence information was moved from the Game Licensing System to a new system temporarily in 1999, then to the Licensing Information System (LISIN) in 2001. All information on hunting licences and tags sold is recorded in LISIN via internet link by ENR staff in each regional centre in the NWT. The data are entered in the summer months and are usually available in the fall for the previous hunting year. LISIN is queried in October-November each year to produce a mailing list of all resident hunters for the previous season. For example, for the July 1, 2008 to June 30, 2009 hunting season, the mailing list was queried on 13 November 2009. Due to changes in the licensing system in 1999/2000, licencing information was not available for that year. Questionnaires for the 1999/2000 season were sent a year later to the list of hunters who bought a licence the following hunting season (2000/2001).

A survey package is sent to 100% of resident hunters with a valid permit for that particular hunting season. The package (Figure 1) includes a covering letter, a map of hunting areas, a survey questionnaire on hunting activities, locations, and success, a chart of hunting trends from previous questionnaire results, and a pre-paid return envelope (not shown in Figure 1). A three-wave system (D'Hont 2000g) is followed, where the package is re-sent as a reminder in two additional mailing waves to hunters who have not responded to the previous mail-out(s). Mail-outs are done in-house at ENR headquarters, in Yellowknife, NWT.

Survey responses are returned to ENR headquarters, where staff enter the information provided into a Microsoft Access database. All completed questionnaires and information from individual hunters is kept confidential and never seen or used for compliance purposes.

Harvest is estimated per species and integrated by region. Regions are defined as:

- Inuvik = all communities in the Inuvialuit Settlement Region, the Gwich'in Settlement Area and the Sahtu Settlement Area.
- Fort Smith = all communities in the Dehcho region, South Slave region and the North Slave region, including the Tlicho Lands, except Yellowknife.
- Yellowknife = Yellowknife only.

These regional groupings of communities have been defined for the Resident Hunter Survey and have not been modified since 1983, except in 1999 when regions now in Nunavut were excluded from the survey (see D'Hont 2000g). Regional groupings were designed to report harvest statistics so that the confidentiality of information provided by individual hunters is protected and sample sizes are large enough to estimate harvest.

Estimates

The ***number of resident hunters*** per season is calculated as the number of valid (excluding replacement and void) permits sold for big game, for small game, and for either type in that season.

Reply rates per season (R) are calculated as:

$$R = \frac{r}{(Qs - Qr)}$$

where r is the number of resident hunters who responded to the questionnaire, Qs is the total number of questionnaires sent in the first wave, and Qr is the number of questionnaires returned to ENR due to outdated or erroneous addresses.

Non-respondent bias towards less hunting was investigated for eight years. Statistical significance was estimated by chi-square Cochran–Armitage tests for trend (Armitage 1955), for each year independently. A P value of less than 0.05 was considered significant. Late respondents, those who responded in wave three, are used as a proxy for non-respondents to test for bias. The null hypothesis is

that the percentage of respondents who did not hunt is independent of mail waves. The suspected trend is for an increase in non-hunting responses for each successive response wave.

Harvesting rates per species, per season and per region are estimated using either of two methods.

The ratio method is expressed as:

$$H = h * \frac{gt}{gr}$$

where H is estimated harvest, h is the total kills reported after any mail-out, gt is the number of tags sold for a particular big game species, and gr is the number of tags held by respondents. For small game, gt and gr are the number of small game licences sold and the number of licences held by respondents, respectively.

The regression method is expressed as:

$$H = m * gt$$

where H is estimated harvest, m is the best fit slope of a linear regression of reported kills accumulated up to a given wave (up to three in this case) over the accumulated tags held by respondents up to that wave, gt is the number of tags sold for a particular species. Each regression has three data points. This method is used only for barren-ground caribou in regions with a large number of tags sold as it requires adequate response rates per wave to establish a best-fit line. This regression method is considered more robust to response bias, where late respondents may have different hunting behaviours than early respondents. Norecon (GNWT 1994) and D'Hont (2000g) found that there was no significant difference in results between the ratio and regression methods. Late respondents appear to have similar hunting to those who responded earlier. Nevertheless, the regression method has been preferred and used for barren-ground caribou in the past (D'Hont 2000a-g) so this was continued in recent years. Hunting estimates that are obtained using the regression method are noted in the results (appendices).

Hunting success for barren-ground caribou was estimated as the number of tags reported used divided by the number of tags sold to respondents, per region, per season (hunting year).

Sex ratio of harvested barren-ground caribou is calculated from reported kills, per season. Because hunters also report the zone where they harvest animals, the sex ratio can be calculated for groups of management zones where most of the barren-ground caribou hunts occur.

Seasonality of barren-ground caribou hunts is estimated from month residents reported they went hunting in any region or zone.

RESULTS

Resident hunters

The number of resident hunters in the NWT has declined from more than 2000 in the early 1990s-2000s to about 1200 hunters for the past five years (Figure 2). In 2007/2008 and again in 2008/2009, small game licence holders exceeded big game licence holders in numbers. This had not occurred since 1989/1990. Details on resident hunter numbers per season are available in Appendix 1.

Reply rates

Reply rates were about 60% in the 1990s and have been declining linearly by 0.6% per year over the past 18 years to reach an approximate rate of 50% in the past five years (Figure 3). Details on reply rates are presented in Appendix 2.

The low reply rate in 1991/1992 (marked by &) was caused by the late mail-out and only one wave being mailed out due to licensing database changes and administrative backlogs in data-entry (D'Hont 2000b). In 1999/2000 (marked by #), the mail-out was done using the following year's list of hunting licences due to licensing database changes that caused loss of electronic data. Only two waves were sent in 2005/2006 (marked by *) due to time constraints. An opportunity to win a prize for a complete and returned questionnaire was offered in the early years (unmarked). A prize of $100 gift certificate offered in 2006/2007 to 2008/2009 (marked by **) and a clearer reminder in the covering letter that reporting harvest was mandatory for resident hunters according to the Wildlife Act (S.N.W.T. 1999) in 2007/2008 – 2008/2009 did not yield noticeable increases in reply rates.

Non-respondent bias

Percentage of respondents who declared not hunting at all was calculated for each wave each season from 2000/2001 to 2008/2009, excluding 2005/2006 when only two waves were sent. The percentage of respondents who did not hunt ranged from 26% to 39% and averaged 33%. There were no trends in wave responses (Figure 4, Table 1) – the percentage of respondents who did not hunt was

not statistically different among waves, except for 2001/2002 and 2007/2008 when more wave-three respondents reported not hunting than respondents from the previous two waves. So in most years, non-respondent bias towards no hunting was minimal - there was little difference in hunting behaviour between respondents and late-respondents, a proxy for non-respondents. Only in 2001/2002 and 2007/2008 is there a trend towards increasing percentage of non-hunters in consecutive waves indicating that the harvest rates for these years may have been over-estimated.

Estimated harvests per species

Details on harvest rates for all species reported for years 1997/1998 to 2009/2010 are provided in Appendix 3. Details on harvest rates for previous years were presented in D'Hont (2000 a-g).

Barren-ground Caribou

All estimated harvest data are based on the regression method, except for years 2005/2006 when only two waves were sent, and 2007/2008 and 2008/2009 when reported numbers were so low that the ratio method was preferred. Harvests show a clear increase in the early 1990s (Figure 5), followed by a decline until 2008/2009 when most hunting zones for barren-ground caribou were closed to resident hunters (and all other types of hunters as well for zones R). As of hunting season 2009/2010, only zone "I" remained open for barren-ground caribou (ENR 2009). Before closures, the decline in hunting matched the large population declines seen in all herds of barren-ground caribou in the NWT after a peak in numbers in the mid-1990s. Only about 100-150 barren-ground caribou per year were harvested by resident hunters in all regions of the NWT from 2006/2007 to 2008/2009.

Moose

Estimated harvest is calculated using the ratio method. Moose harvest has been relatively stable except for hunters from the Fort Smith region where harvest numbers have declined since the 1980s and 1990s (Figure 6). In the past 10 years (1998-99 to 2008-09), an average of 40 moose were harvested

by resident hunters from the Fort Smith region, and an additional 20 moose from the Inuvik region and 90 moose from Yellowknife.

Woodland Caribou

Estimated harvest is calculated using the ratio method. Woodland caribou harvest has been variable with no notable trends except for the Fort Smith region where numbers have declined since the 1980s and 1990s (Figure 7). In the past ten years (1998-99 to 2008-09), an average of 12 woodland caribou were harvested by resident hunters from the Fort Smith region, and an additional seven from the Inuvik region and 22 from Yellowknife.

Black Bear

Estimated harvest is calculated using the ratio method. Black bear harvest by resident hunters peaked in the mid-1990s then declined in the 2000s. A small increase in harvest has been recorded in the past five years (Figure 8). In the past ten years (1998-99 to 2008-09), an average of one black bear was harvested by resident hunters from the Fort Smith region, and an additional one from the Inuvik region and ten from Yellowknife.

Dall's Sheep

Estimated harvest is calculated using the ratio method. Dall's sheep harvest by resident hunters has remained relatively small and stable, except for 1983/1984 when Fort Smith hunters bagged an estimated 28 sheep and 2006/2007 when Yellowknife hunters took an estimated 15 sheep (Figure 9). In the past ten years (1998/1999 to 2008/2009), an average of one Dall's sheep was harvested by resident hunters from the Fort Smith region, and an additional four from the Inuvik region and three from Yellowknife.

Wolf

Estimated harvest is calculated using the ratio method. Wolf harvest by resident hunters appears opportunistic, with peak numbers occurring in years when the numbers of resident hunters were high (Figure 10). Peak wolf harvest by Fort Smith region hunters occurred in the mid-1980s, when up to 60 were harvested in one year. Peak wolf harvest by Yellowknife hunters occurred in the mid 1990s, when up to 70 wolves were harvested in one year. In the past ten years (1998-99 to 2008-09), an average of one wolf was harvested by resident hunters from the Fort Smith region, and an additional one from the Inuvik region and 15 from Yellowknife.

Wolverine

Estimated harvest is calculated using the ratio method. Wolverine harvest follows a similar pattern to wolf harvest (Figure 11). Peak in wolverine harvest by Yellowknife hunters occurred in the mid 1990s, when 20-25 wolverines were harvested in one year. On average, in the past ten years (1998-99 to 2008-09), less than one wolverine was harvested by resident hunters from the Fort Smith region and Inuvik region, and two were harvested by Yellowknife hunters.

Grouse, ptarmigan and hare

Estimated harvest is calculated using the ratio method for all of the NWT, with all regions merged. Grouse, ptarmigan and hare populations are cyclic, with peaks every ten years or so. Total resident harvests show higher numbers when resident hunter numbers were high and small game populations are at their peaks, as in the mid-1990s (Figure 12). On average, in the past ten years (1998-99 to 2008-09), about 2000 spruce grouse, 600 ruffed grouse, 300 sharp-tailed grouse, 1700 ptarmigan, and 500 snowshoe hares were harvested each year by resident hunters in the entire NWT.

Details on barren-ground caribou harvest

Hunting success

How resident hunters use barren-ground caribou tags has changed in the past 10 years for Fort Smith region and Yellowknife (Figure 13). Ten years ago, more than half of tags purchased were used. By 2007, only 10-20% of purchased tags were actually used. In Inuvik region, the percentage of tags used varied among years but showed no trend. These changes and variability in tag use make it impossible to simply use the purchase of tags by hunters as a proxy for hunting pressure without annual information on hunting behaviour actually provided by hunters.

Sex ratio of hunted barren-ground caribou

The 2006/2007 ban on harvesting female barren-ground caribou resulted in no females reported killed from that year forward. However the ratio of females to males reported harvested had been declining prior to the ban in each management zone in the NWT where the majority of barren-ground caribou hunting occurred in the past two decades (Figure 14). An increase in female harvest in the mid-2000s, followed by a decline in female take occurred mostly in the North Slave management zone.

Timing of hunts for barren-ground caribou

Most hunts for barren-ground caribou occur in the late winter and early spring months when travel by snowmobile and on ice roads is possible, and is facilitated by adequate snow cover and longer days (Figure 15). September hunts for barren-ground caribou are more difficult, are done from temporary camps mostly accessed by air, and require waiting the legal 12-hours after arriving to start hunting.

DISCUSSION

The survey detected a decline in estimated harvest of barren-ground caribou in the years when caribou population surveys detected population declines (ENR 2011). Harvest of female caribou also declined during these years. The survey also detected a decline in use of purchased barren-ground caribou tags by hunters from the Fort Smith region and Yellowknife. The survey detected cycles in harvest of grouse, ptarmigan and hare. This information has been used, in combination with other information on ptarmigan and hare collected independently (Bird Studies Canada and National Audubon Society 2009, ENR 2009a) to provide an index of population status for these species (ENR 2009b). The NWT Resident Hunter Survey is the only survey on harvesting behaviour covering the entire NWT providing trends over more than 20 years. It does not provide information on the harvest by other types of hunters in the NWT, but some of this information is available elsewhere for specific regions and years, and can be used to compare harvest rates for barren-ground caribou and for other species, as well as hunter behaviour, with the present survey.

Precision

Precision is the probability that a measurement can be consistently reproduced. For mail-out surveys, precision is reduced with increased sampling error, which occurs because information is not collected from every member of the surveyed population (i.e., resident hunters in the NWT). As noted in Dillman (2007), “the remarkable power of the sample survey is its ability to estimate closely the distribution of a characteristic in a population by obtaining information from relatively few elements of that population”. So, even with a relative small sample size, the level of precision can remain adequate.

The overall precision of harvest results from the NWT Resident Hunter Survey may be examined for a simple yes/no question on hunting in a particular season. A sample size of 517 respondents out of 1,000 surveyed (52%) will yield a survey accuracy of +/- 3% sampling error with a 95% confidence level (Dillman 2007, Table 5.1). So the precision of the survey is still excellent even in recent years with

reduced response rates of around 50%. For some species, such as Dall's sheep, wolves and wolverines, the total number of hunters and the number of hunters who responded to the questionnaire is much smaller than 1,000. Sampling error for harvest rates for these particular species may be high, but still will not affect the validity of the data. This occurs because the estimated harvest rates are bound by what is actually reported killed by resident hunters (minimum) and the total number of tags sold to hunters for that species (maximum). The estimated harvest for these species is so small that the bounded minimum and maximum can provide an estimate of possible sampling error.

Thus, the effects of low response rates on the precision of the harvest data are less problematic than one would assume. Problems with precision of the overall survey may be expected if the reply rates continue to decline and attain less than 9% of a hunting population of about 1000, at which time the sampling error would reach unacceptable levels (more than 10%).

Over the past 20 years, declines in participation rates in surveys have been documented for a wide variety of survey types and subject matter (Galea and Tracy 2007), including surveys related to the environment (Adua and Sharp 2010). Recent review studies (Lahaut et al. 2003, Galea and Tracy 2007, Groves and Peytcheva 2008, Adua and Sharp 2010) have demonstrated that these lower response rates have no serious negative effects on the precision of estimated data, but their effects on accuracy (i.e. bias) needs a closer attention.

Accuracy

Accuracy is the probability that a measurement matches the actual value of the quantity being measured. One major and likely source of inaccuracy was examined for the NWT Resident Hunter Survey: non-response bias towards no hunting. NWT residents with a permit to hunt game but who did not go hunting for any species during a particular season might have a lower propensity to respond to the questionnaire than permit holders who went hunting. This particular type of non-response bias would result in an over-estimation of harvest rates. This no-hunting bias leading to potential over-

estimation was detected for only two (2001/2002, 2007/2008) of the seasons tested. The reverse bias leading to under-estimation of harvests was not detected. The regression method is a simple way of factoring out non-response bias from estimates (Filion 1975, Lahaut et al. 2003) and was used to calculate barren-ground caribou harvest even in years with no detectable bias.

Accuracy may also be reduced by recall bias (Tarrant et al. 1993) when the survey is administered so late after the events (hunts) being recalled that respondents have to guess or offer a less accurate estimate of hunting success than if the mail-outs were timed during or just after the hunting season. The survey mail-outs (waves) are done from fall to early winter after the closure of the surveyed season in June. This timing of mail-outs is necessary due to the unavailability of hunter licensing lists before fall each year. The possible effects of recall bias on the harvest estimates have not been investigated, but if present, this bias may be consistent year after year as the timing of survey has been similar since the 1990s. This kind of bias can be investigated systematically in future years by comparing responses from hunters who replied to the questionnaire twice for the same season when questionnaires crossed in the post between mail-outs. Differences in answers between replies for the same season will provide an indication of recall bias. From a casual review of these double-replies, recall capacity seems excellent, as hunters will provide the same detailed information on hunting locations, months and numbers. The only problem with recall noted occurs if respondents mistake which season the questionnaire is for. How prevalent this kind of recall error is in the NWT Resident Hunter Survey is unknown. But, as with precision, the accuracy of each harvest estimate for a particular species and season is upper-bound to a true value that can be no higher than the total number of tags sold.

Future surveys

Harvest rates in post priori areas

Some of the most requested potential results from the NWT Resident Hunter Survey are harvest estimates calculated for specific zones defined post priori, i.e. for specific areas defined by the data requester. The survey cannot provide such estimates; residents with a hunting licence and tags for a particular species are not restricted to hunting in a particular management area if other areas are open for that species. The survey provides estimates based on the region where hunters reside, not where hunters have actually harvested wildlife or where they intended to hunt. The unavailability of harvest estimates in specific areas is not a result of the kind of hunter survey performed, but a result of how licences and tags are issued and how hunting is not restricted to specific management areas. Future surveys may obtain harvest rates by area only if wildlife legislation on hunting includes licencing by specific hunting zones in the NWT.

Reply rates and response bias

Reply rates for future surveys could be improved but care should be given to selecting techniques for improvements that will not result in a simultaneous decrease in accuracy, i.e., increased response bias. For example, Groves and Peytcheva (2008) noted in a meta-analysis of 59 studies that interviewer-administered surveys tend to produce larger response bias than do self-administered surveys. Also, there is increasing evidence that stronger efforts to include the most reluctant responders in a survey may lead to spurious data and more significantly, to bias responses and a decreased accuracy (see Fricker and Tourangeau 2010).

Survey modes

Survey respondents and wildlife management practitioners have both suggested transforming the mode of the NWT Resident Hunter Survey from a paper-based mail-out to an electronic form, either on the internet or by e-mail. These changes are not simply cosmetic and presumably cost-saving, but may result in substantive changes in coverage, response rates, response bias, or recall bias, and then overall

accuracy and continuity of survey data (Lukacs *et al.* 2011) . Coverage, for example, may be affected because different people react to, have access to, and respond to web-based questionnaires differently than to more classic paper ones (Dillman 2007, ref therein). Web-based surveys have lower response rates than mail surveys for general populations (Shih and Fan 2008), but this difference may be rapidly decreasing for some population groups with easy access to the internet (van Gelder et al. 2010). Mix-mode surveys, for example when a web-survey is followed by a mail or phone survey to induce web non-respondents to reply, may increase response bias if people respond differently in each mode (Dillman 2007). Recall bias may be reduced if a web-survey is available at any time during a hunting season. However, follow-up e-mail reminders to continue responding to the questionnaire as the season unfolds or at the end of the season may have the counter-intuitive effect of reducing completion rates, hence response rates. In a meta-analysis of surveys, Shih and Fan (2008) found that using e-mail as follow-up reminders to web-surveys produced response rates 14% lower than paper reminders to mail surveys, probably due to the negative effects of junk or spam e-mail.

In conclusion, changes in survey mode or the re-design of the NWT Resident Hunter Survey should not be attempted before a thorough and independent comprehensive review of pros and cons of doing so is performed. If the survey mode is changed, a comparative study of the effects of this change should be implemented to ensure continuity and assess harvest data quality (Dillman 2007, van Gelder et al. 2010, Lukacs *et al.* 2011).

Figure 1 NWT Resident Hunter Survey package sent to permit holders. Management zone boundaries and names did not change substantially from 1999 to 2009. Map versions shown are from September 2002 and September 2006. Older management zone names were used during the 1997/1998 survey (see D'Hont 2000g).

Environment and Natural Resources

Fall 2010

Dear Hunter:

Resident Hunter Harvest Surveys 2009/10

Thank you to all who participated in previous surveys. Remember that reporting harvest is mandatory under the NWT Wildlife Act, and is necessary for effective wildlife management. A summary of the estimated Resident Hunter wildlife harvest for past years is enclosed.

This annual questionnaire is sent to all hunters who purchased a resident big or small game NWT hunting license. The questionnaire refers to your hunting activities for last season. Please complete the form and return it in the enclosed return envelope as soon as possible (no postage required).

Below is an example of how to complete the questionnaire. A map of the Wildlife Zones is on the back of this sheet to aid you in completing the questionnaire.

DID YOU HUNT MOOSE? Yes ☑ No ☐

If yes, were you successful? Yes ☑ No ☐

Please provide the following data - **whether your hunt was successful or not.**

Hunt Location Lat/Long or nearest landmark	Wildlife Zone	Month of Hunt	# Days Hunted	Type of kill: Bull	Cow	Juvenile
63° 05' 115° 30' Masher Lake	R-BC-01	Sept.	3	1		

Some major points to consider regarding this survey are:

1. All hunting information is confidential,
2. Even if you did not hunt or if you hunted and were unsuccessful , let us know! Information on number of days hunted and location of hunt is valuable;
3. You are eligible for a prize by sending in your questionnaire. The more people who respond to this survey, the more accurate the estimate of total resident harvest will be; and
4. Provide information for hunting season from **July 1, 2009 to June 30, 2010, ONLY.**

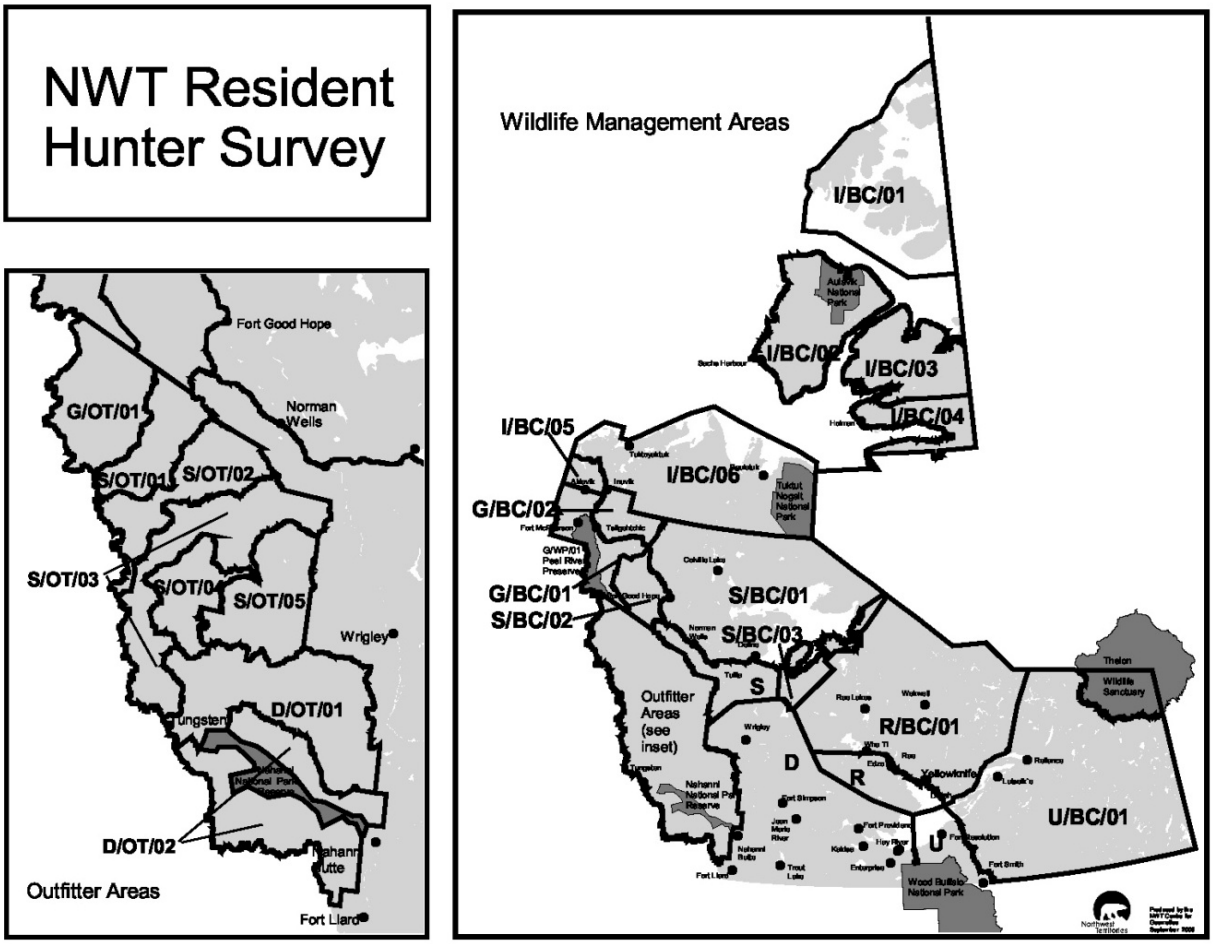
Thank you in advance for completing the questionnaire. Should you have any comments or questions, please feel free to enclose them with the survey or contact this office at (867) 920-6327.

Remember: hunt safely and responsively,

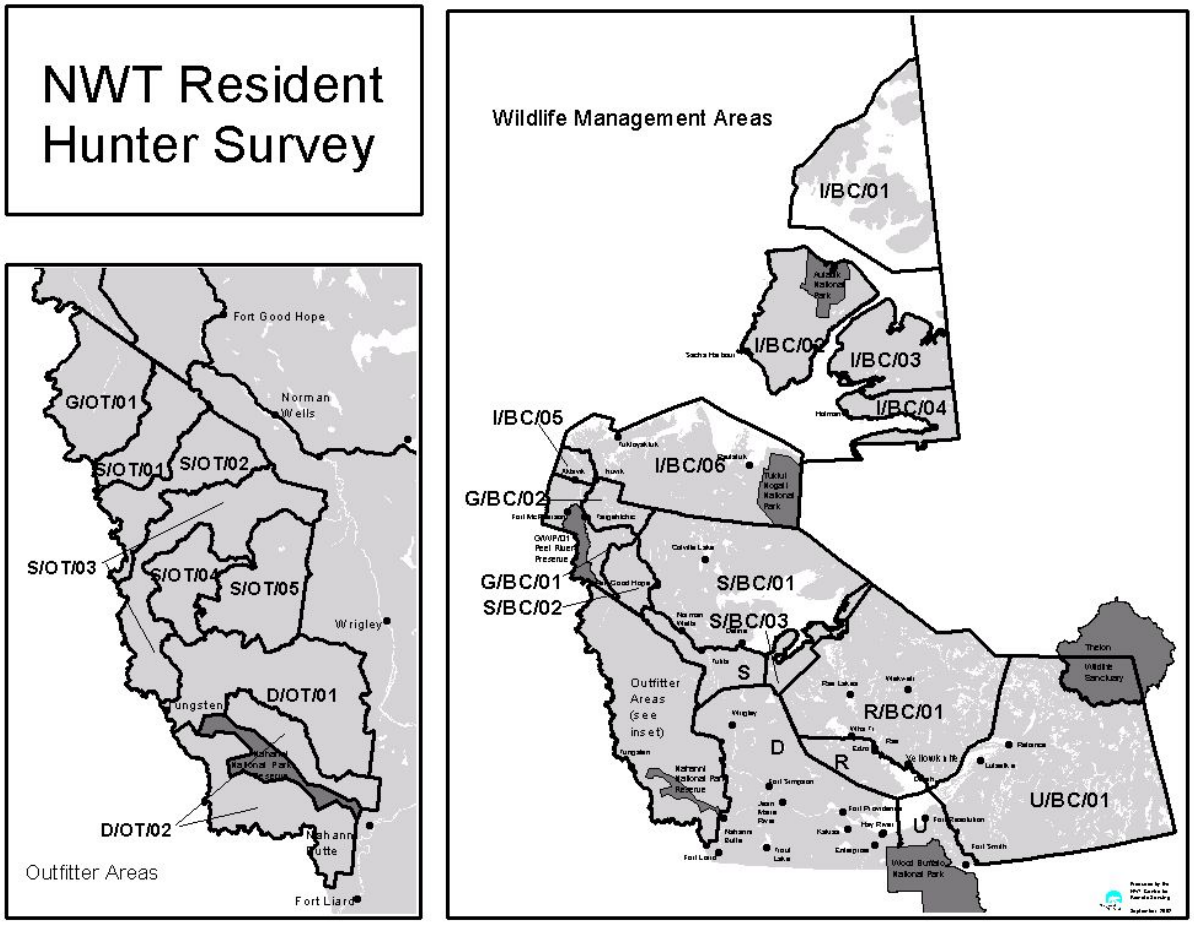
Susan Fleck
Director
Wildlife Division

Enclosures (3)

Government of The Northwest Territories, Box 1320 Yellowknife, NT, Canada X1A 2L9



Map version September 2006.



Map version September 2002.

HUNTER HARVEST QUESTIONNAIRE 2009/2010

DO NOT REMOVE LABEL.
QUESTIONNAIRE IS CONFIDENTIAL WHEN COMPLETED.

NOTE:

1. THIS QUESTIONNAIRE IS FOR THE PERIOD **JULY 1, 2009 TO JUNE 30, 2010**.
2. **PLEASE** complete each section whether your hunting trip was successful or not.
3. This information is confidential and will not be used for enforcement purposes.
4. A 'Wildlife Zone' map is enclosed.

IF YOU PURCHASED A **SMALL GAME AUTHORIZATION ONLY** PLEASE PROCEED TO **SECTION H**

A **DID YOU HUNT BARREN GROUND CARIBOU?** Yes ☐ No ☐
If yes, were you successful? Yes ☐ No ☐

Please provide the following information - **whether your hunt was successful or not.**

Hunt Location Lat/Long or nearest landmark	Wildlife Zone	Month of Hunt	# Days Hunted	Number of each type of kill: Bulls	Cows	Juveniles

B **DID YOU HUNT MOOSE?** Yes ☐ No ☐
If yes, were you successful? Yes ☐ No ☐

Please provide the following information - **whether your hunt was successful or not.**

Hunt Location Lat/Long or nearest landmark	Wildlife Zone	Month of Hunt	# Days Hunted	Type of kill: Bull	Cow	Juvenile

C **DID YOU HUNT WOODLAND CARIBOU?** Yes ☐ No ☐
If yes, were you successful? Yes ☐ No ☐

Please provide the following information - **whether your hunt was successful or not.**

Hunt Location Lat/Long or nearest landmark	Wildlife Zone	Month of Hunt	# Days Hunted	Type of kill: Bull	Cow	Juvenile

D **DID YOU HUNT BLACK BEAR?** Yes ☐ No ☐
If yes, were you successful? Yes ☐ No ☐

Please provide the following information - **whether your hunt was successful or not.**

Hunt Location Lat/long or nearest landmark	Wildlife Zone	Month of Hunt	# Days Hunted	Type of Kill: Boar	Sow

E **DID YOU HUNT WOLF?** Yes ☐ No ☐
If yes, were you successful? Yes ☐ No ☐

Please provide the following information - **whether you were successful or not**.

Hunt Location Lat/Long or nearest landmark	Wildlife Zone	Month of Hunt	# Days Hunted	# Killed

F **DID YOU HUNT WOLVERINE?** Yes ☐ No ☐
If yes, were you successful? Yes ☐ No ☐

Please provide the following information - **whether you were successful or not**.

Hunt Location Lat/Long or nearest landmark	Wildlife Zone	Month of Hunt	# Days Hunted	# Killed

G **DID YOU HUNT DALLS SHEEP?** Yes ☐ No ☐
If yes, were you successful? Yes ☐ No ☐

Please provide the following information - **whether you were successful or not**.

Hunt Location Lat/Long or nearest landmark	Wildlife Zone	Month of Hunt	# Days Hunted	Type of Kill	
				3/4 curl	full curl

H **DID YOU HUNT SMALL GAME?** Yes ☐ No ☐

How many of each kind did you bag?

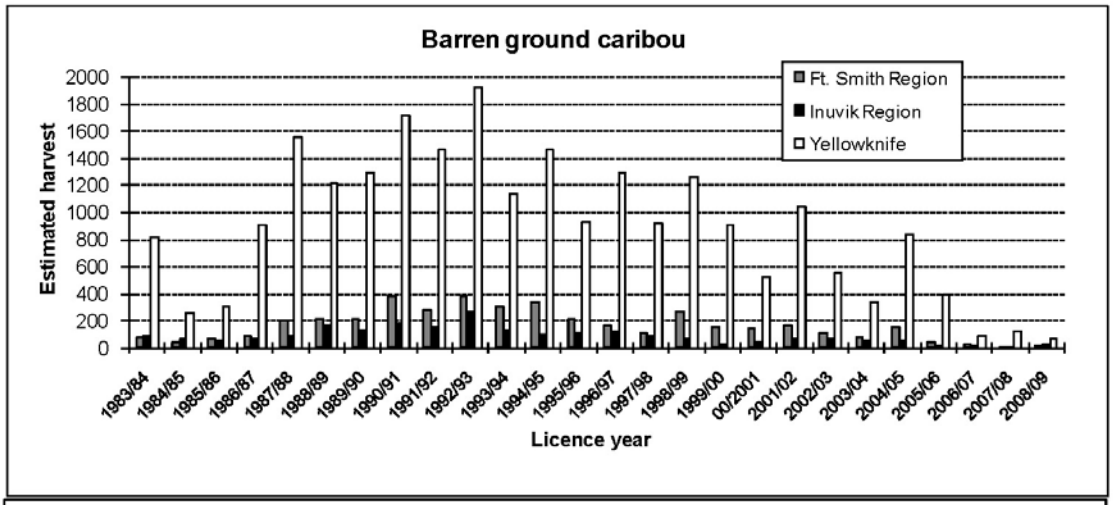
Hunt Location Lat/Long or nearest landmark	Wildlife Zone	Month of Hunt	Spruce Grouse	Ruffed Grouse	Sharp-Tailed Grouse	Ptarmigan	Hare

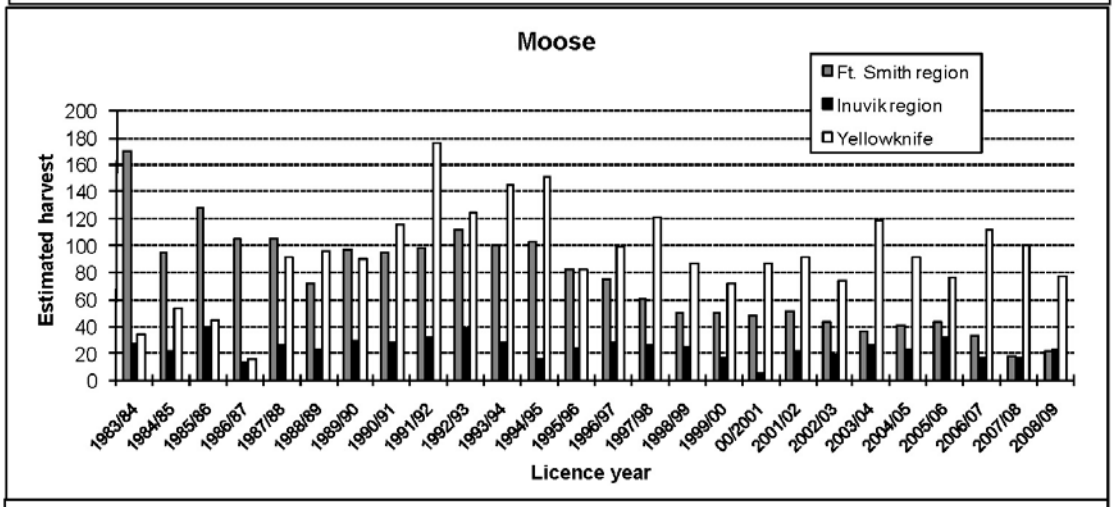
I **DID YOU HAVE A MIGRATORY BIRD PERMIT LAST YEAR?** Yes ☐ No ☐
Did you hunt waterfowl? Yes ☐ No ☐

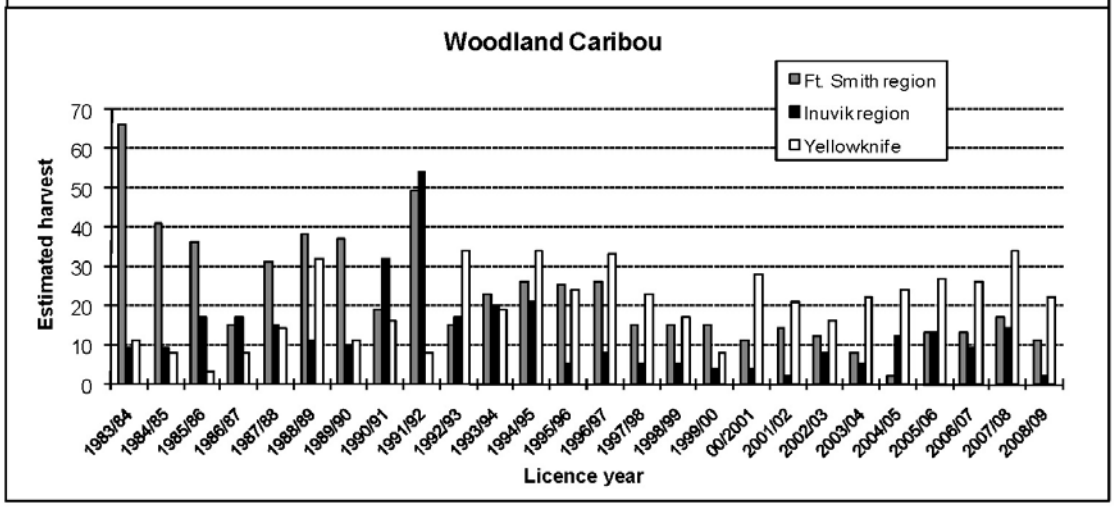
Indicate number bagged

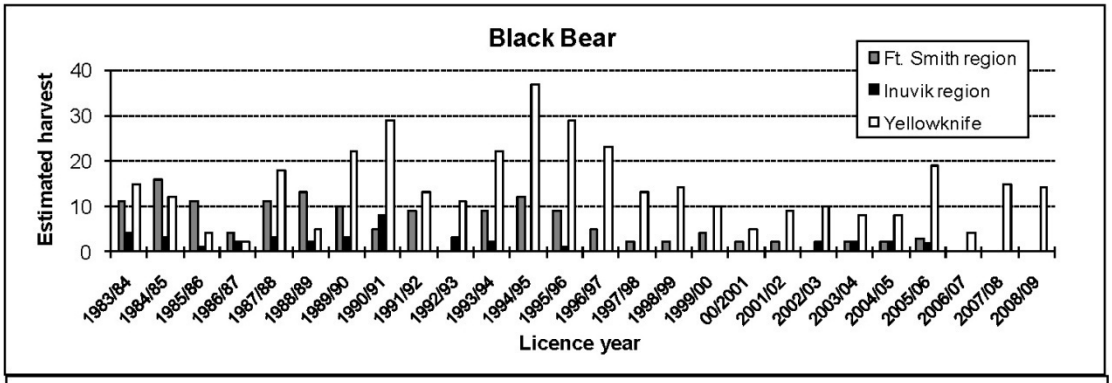
Hunt Location Lat/Long or nearest landmark	Wildlife Zone	Dates Hunted	DUCKS: Number of days hunted	Mallard	Pintail	Scaup	Teal	Wigeon	Other Ducks	GEESE: Snow Geese	Canada Geese	White Fronted Geese	Other Geese

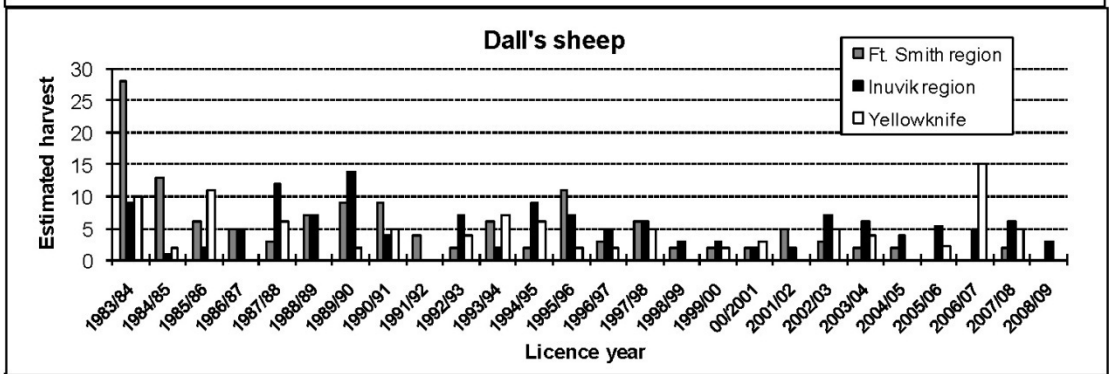
COMMENTS

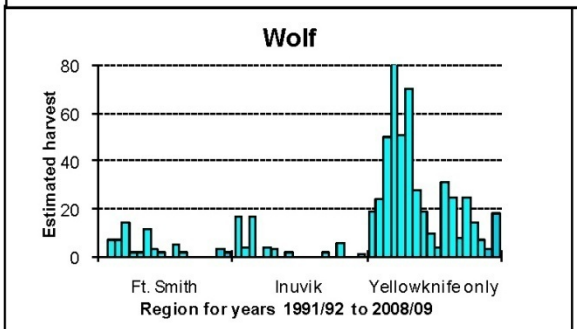

Barren ground caribou
Ft. Smith Region
Inuvik Region
Yellowknife
Estimated harvest
0
200
400
600
800
1000
1200
1400
1600
1800
2000
1983/84
1984/85
1985/86
1986/87
1987/88
1988/89
1989/90
1990/91
1991/92
1992/93
1993/94
1994/95
1995/96
1996/97
1997/98
1998/99
1999/00
00/2001
2001/02
2002/03
2003/04
2004/05
2005/06
2006/07
2007/08
2008/09
Licence year

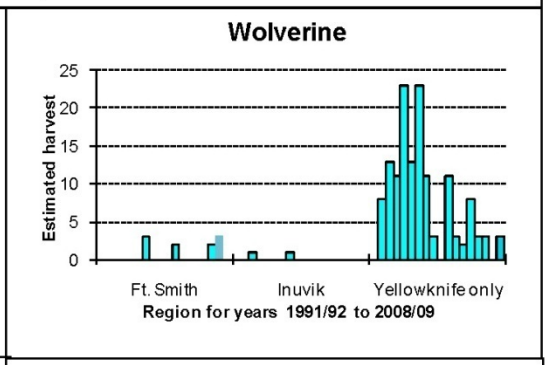

Moose
Ft. Smith region
Inuvik region
Yellowknife
Estimated harvest
0
20
40
60
80
100
120
140
160
180
200
1983/84
1984/85
1985/86
1986/87
1987/88
1988/89
1989/90
1990/91
1991/92
1992/93
1993/94
1994/95
1995/96
1996/97
1997/98
1998/99
1999/00
00/2001
2001/02
2002/03
2003/04
2004/05
2005/06
2006/07
2007/08
2008/09
Licence year

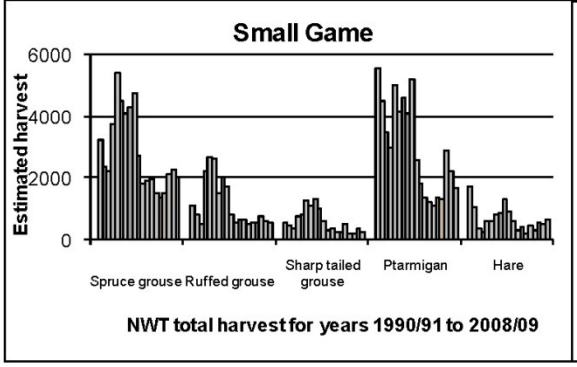

Woodland Caribou
Ft. Smith region
Inuvik region
Yellowknife
Estimated harvest
0
10
20
30
40
50
60
70
1983/84
1984/85
1985/86
1986/87
1987/88
1988/89
1989/90
1990/91
1991/92
1992/93
1993/94
1994/95
1995/96
1996/97
1997/98
1998/99
1999/00
00/2001
2001/02
2002/03
2003/04
2004/05
2005/06
2006/07
2007/08
2008/09
Licence year


Black Bear
Estimated harvest
Ft. Smith region
Inuvik region
Yellowknife
Licence year


Dall's sheep
Estimated harvest
Ft. Smith region
Inuvik region
Yellowknife
Licence year


Wolf
Estimated harvest
Ft. Smith
Inuvik
Yellowknife only
Region for years 1991/92 to 2008/09


Wolverine
Estimated harvest
Ft. Smith
Inuvik
Yellowknife only
Region for years 1991/92 to 2008/09


Small Game
Estimated harvest
Spruce grouse
Ruffed grouse
Sharp tailed grouse
Ptarmigan
Hare
NWT total harvest for years 1990/91 to 2008/09

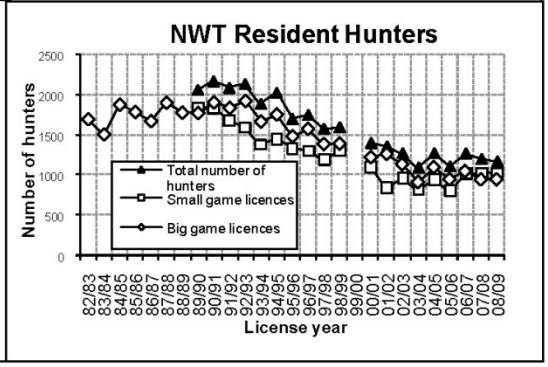

NWT Resident Hunters
Number of hunters
Total number of hunters
Small game licences
Big game licences
License year

Figure 2 Number of hunters with a resident hunter permit for small game, for big game and for either, for hunting seasons 1982-83 to 08-09. Data are NWT-wide.

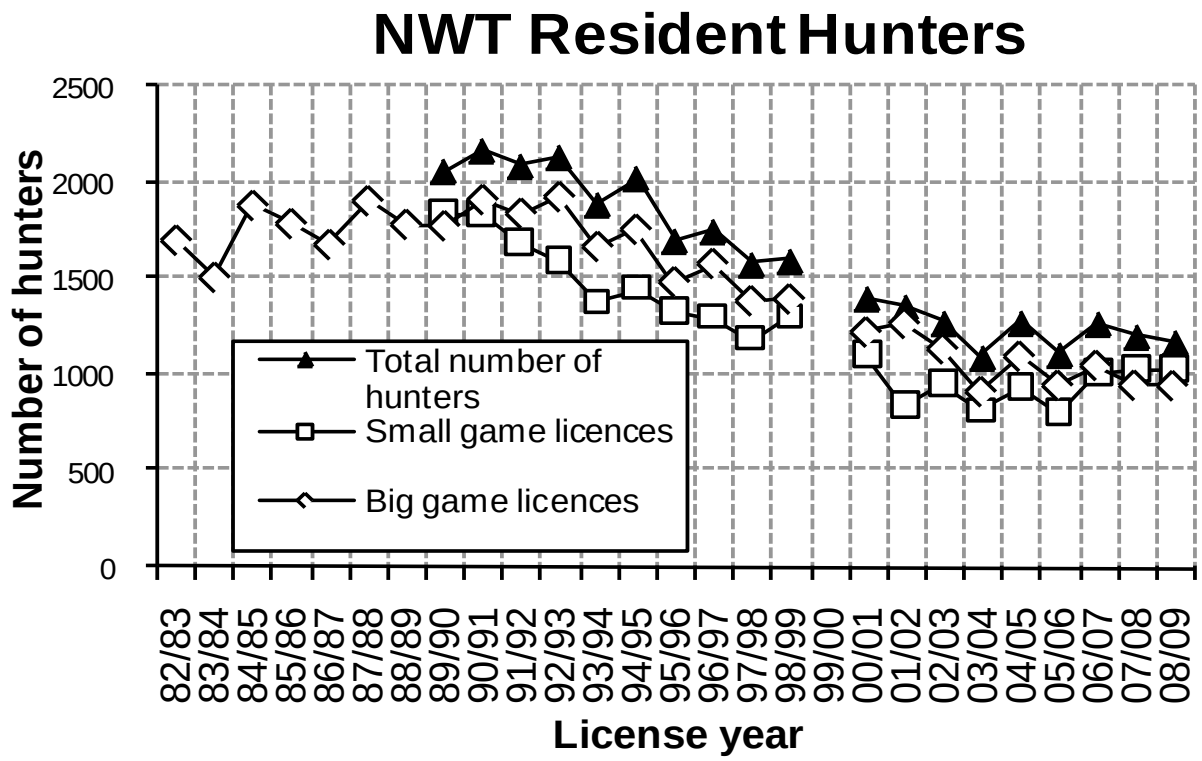


Figure 3 Reply rates to questionnaires, all mail-outs combined, for hunting seasons 1990-91 to 2008-09.

& = mailout of only one wave. # = Mailing done with previous year mailing list. * = only two mailouts done. ** = chances to win a prize of $100 gift certificate. n = includes Nunavut. Data are NWT-wide.

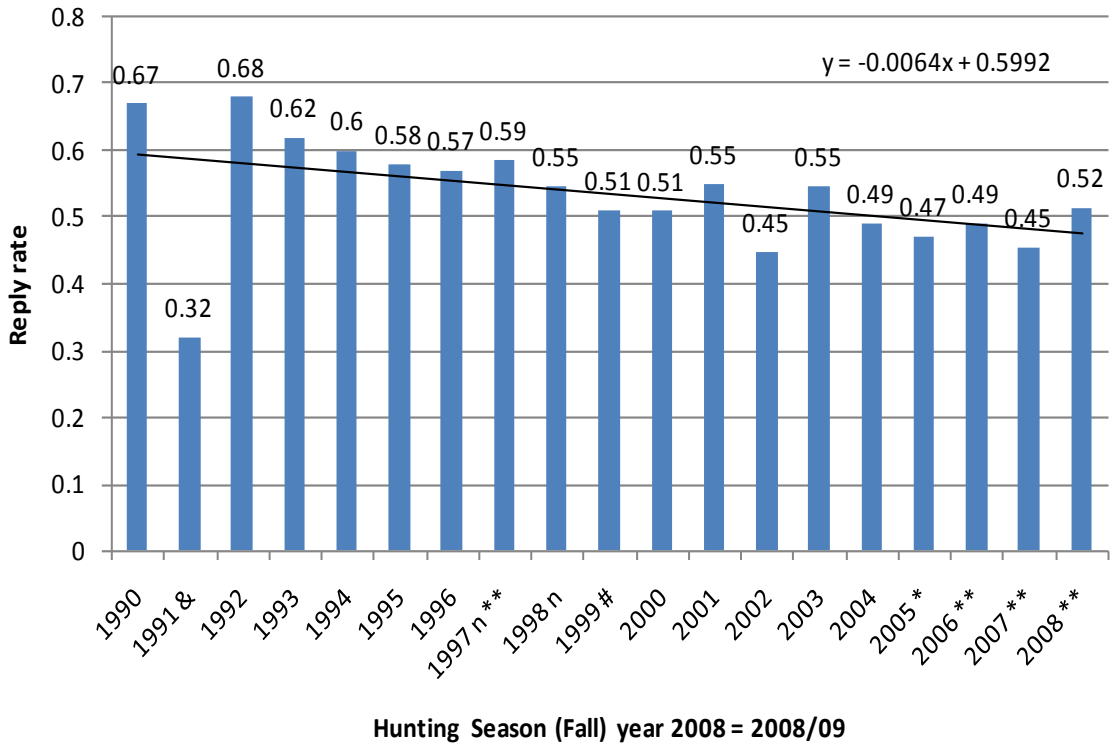


Figure 4 Percentage of respondents who indicated in wave 1, 2 or 3 that they did not hunt any species during hunting season 2000/2001 to 2008/2009, except 2005/2006 when only two mail-outs were done. Chi-square test results are shown for seasons 2001/2002 and 2007/2008 when late respondents hunted less often than earlier respondents. All other seasons show non-significant differences in hunting behaviour between early and late respondents. Data are NWT-wide.

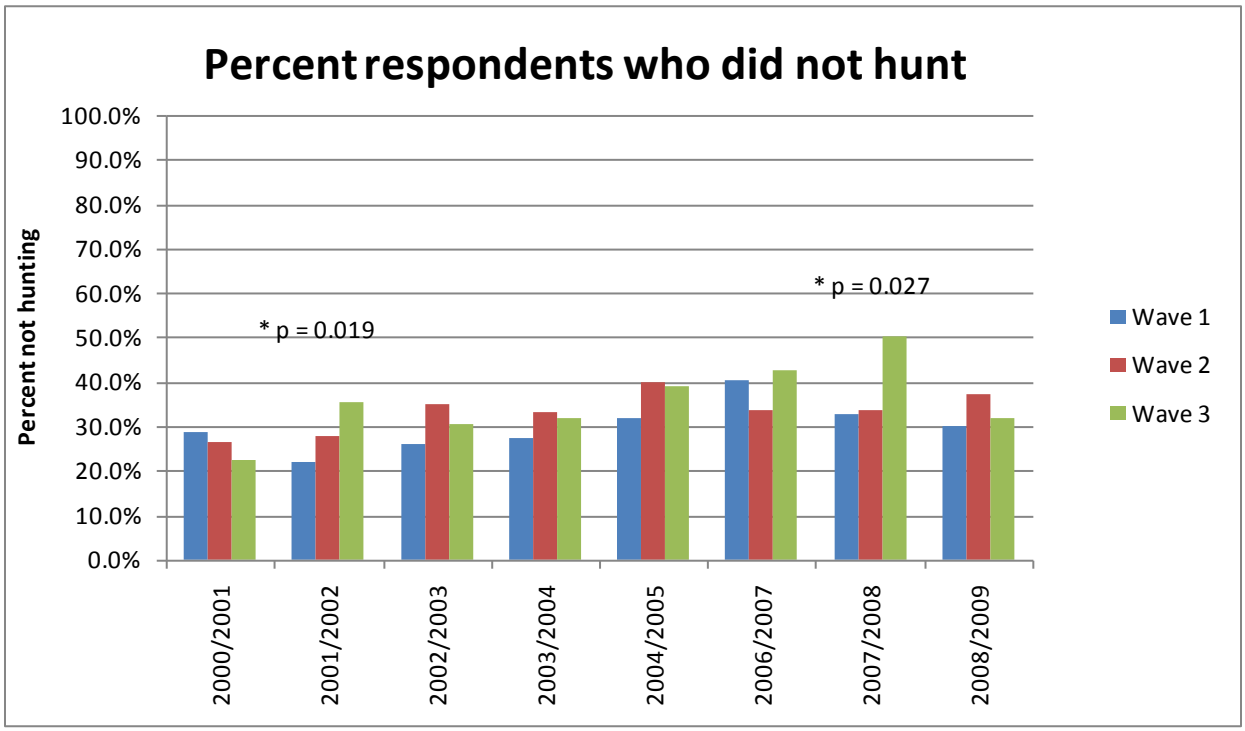


Figure 5 Estimated numbers of barren-ground caribou harvested by resident hunters in the NWT in seasons 1983/1984 to 2008/2009. Regions (Fort Smith, Inuvik, and Yellowknife) are where hunters reside, not where they hunted.

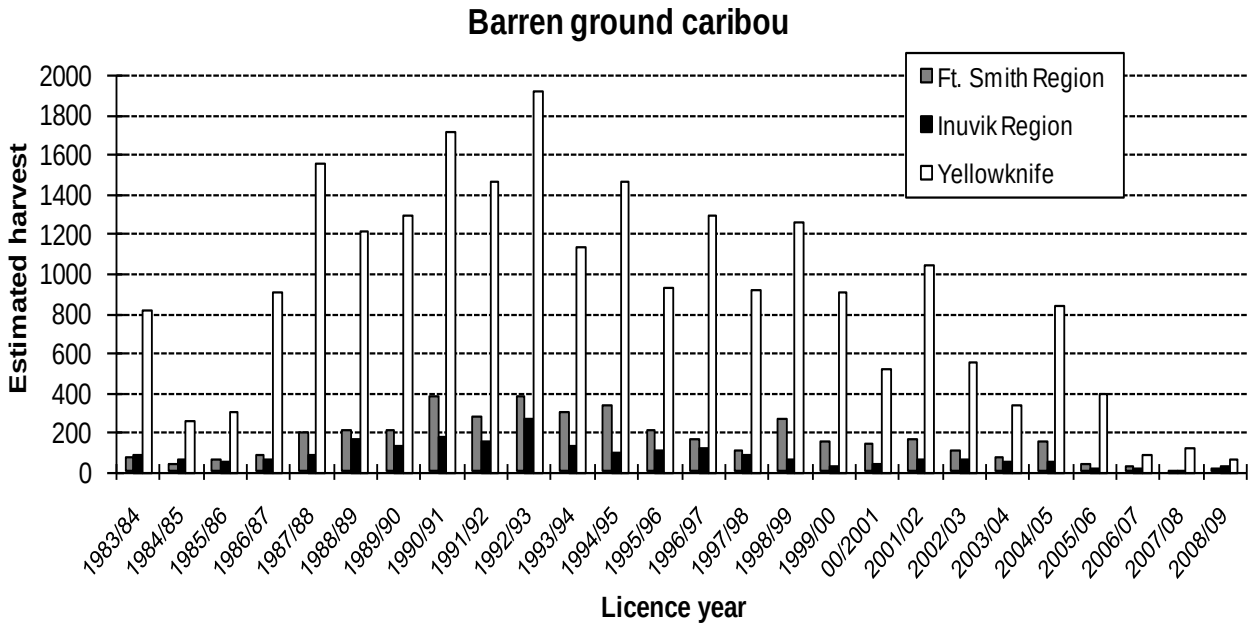


Figure 6 Estimated numbers of moose harvested by resident hunters in the NWT in seasons 1983/1984 to 2008/2009. Regions (Fort Smith, Inuvik, and Yellowknife) are where hunters reside, not where they hunted.

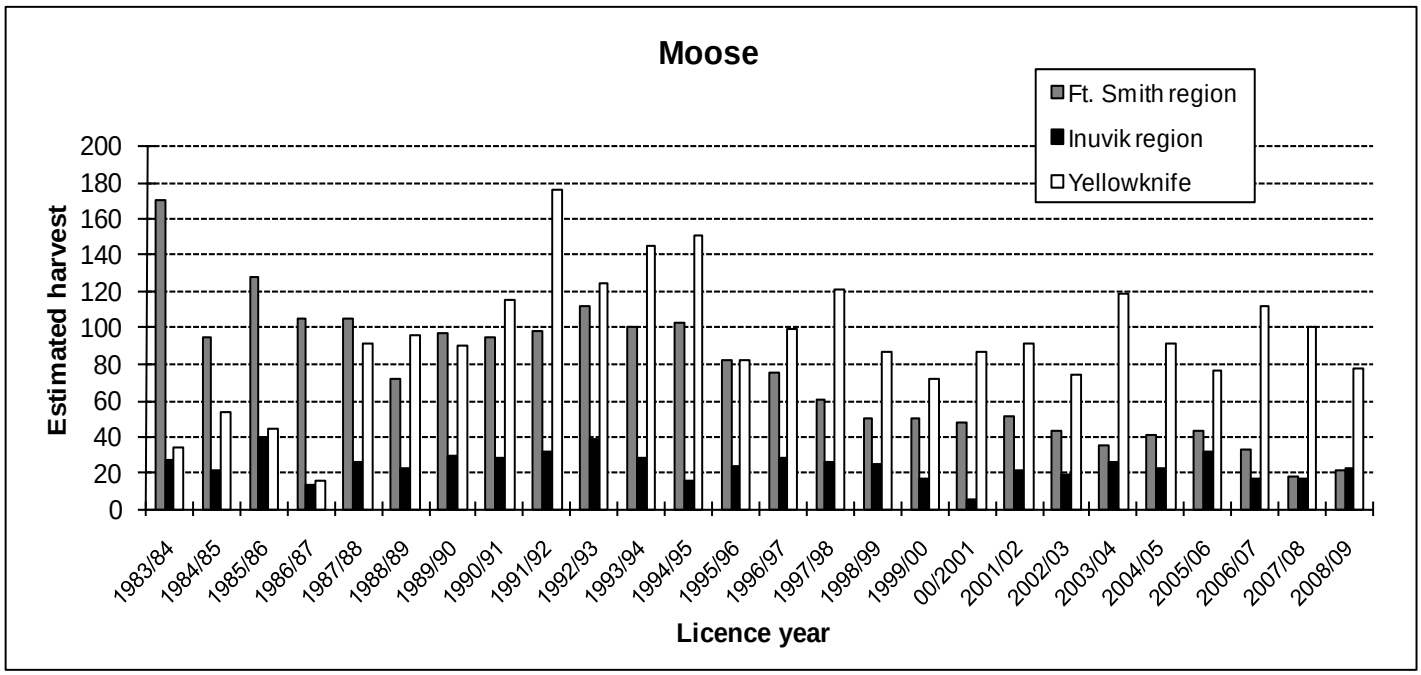


Figure 7 Estimated numbers of woodland caribou harvested by resident hunters in the NWT in seasons 1983/1984 to 2008/2009. Regions (Fort Smith, Inuvik, and Yellowknife) are where hunters reside, not where they hunted.

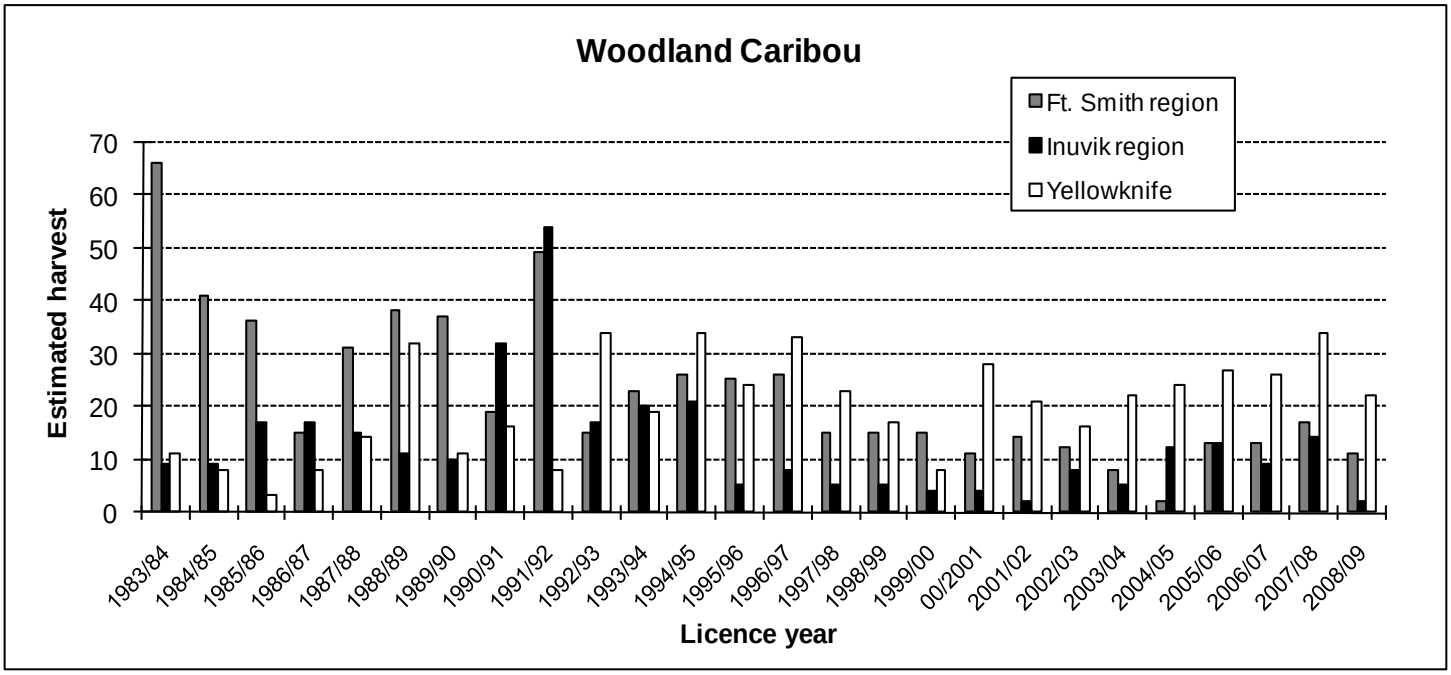


Figure 8 Estimated numbers of black bears harvested by resident hunters in the NWT in seasons 1983/1984 to 2008/2009. Regions (Fort Smith, Inuvik, and Yellowknife) are where hunters reside, not where they hunted.

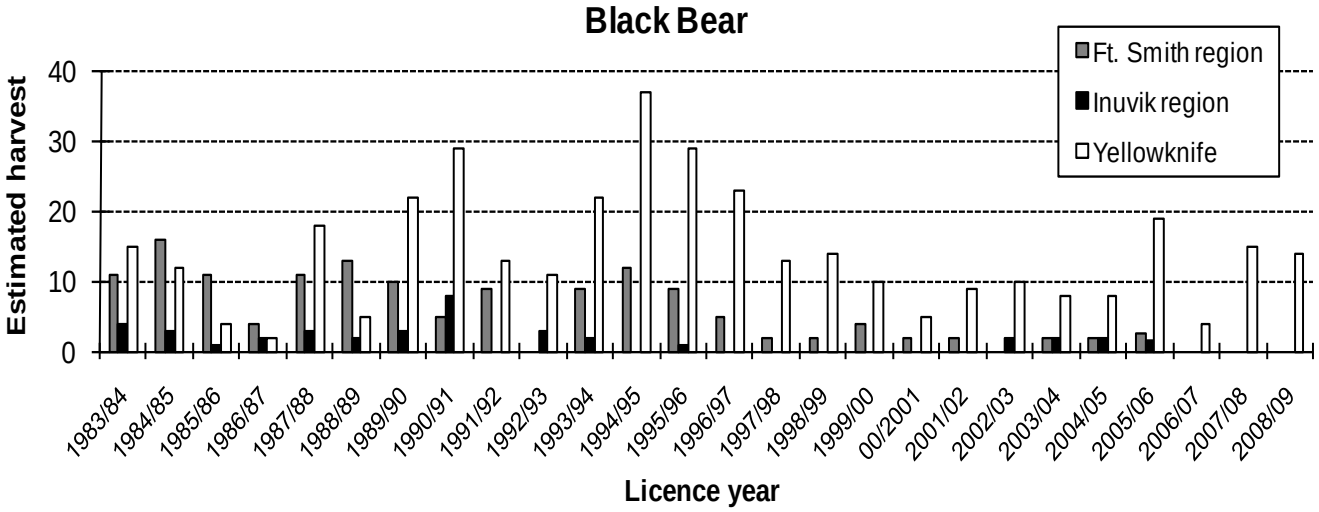


Figure 9 Estimated numbers of Dall's sheep harvested by resident hunters in the NWT in seasons 1983/1984 to 2008/2009. Regions (Fort Smith, Inuvik, and Yellowknife) are where hunters reside, not where they hunted.

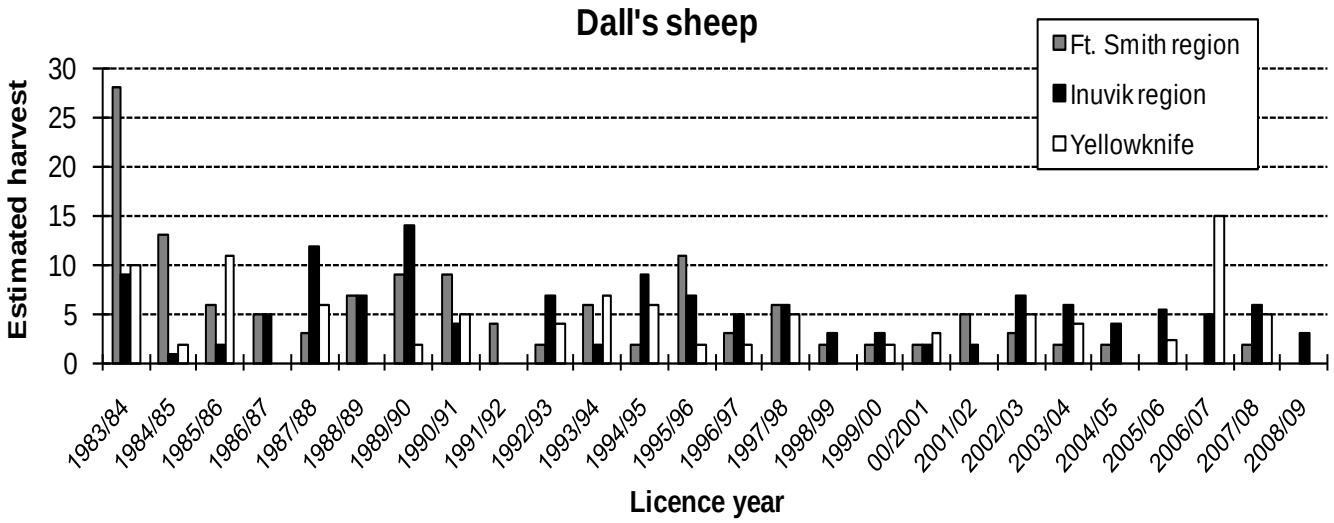


Figure 10 Estimated numbers of wolves harvested by resident hunters in the NWT in seasons 1983/1984 to 2008/2009. Regions (Fort Smith, Inuvik, and Yellowknife) are where hunters reside, not where they hunted.

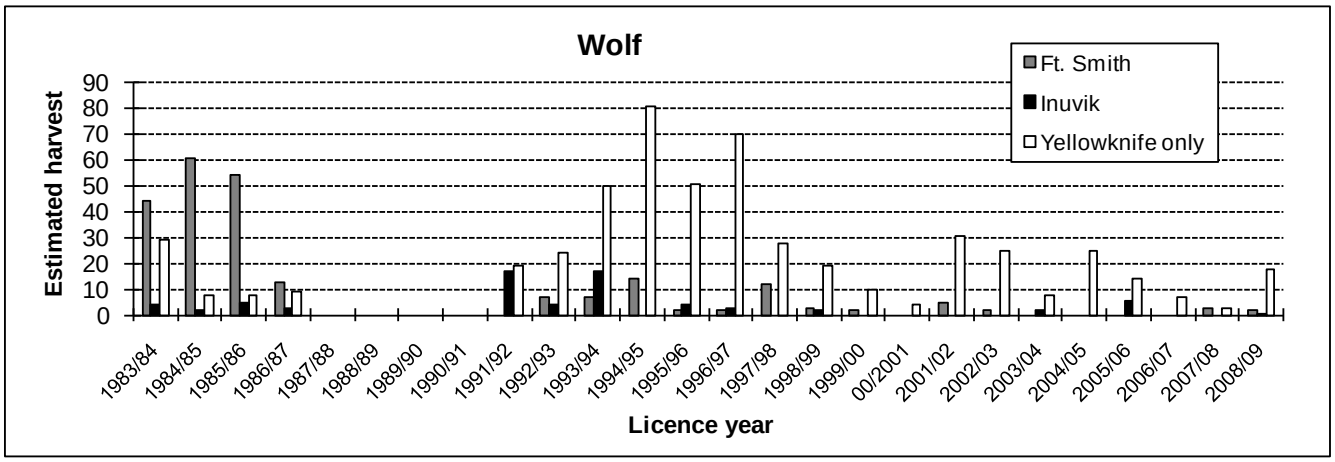


Figure 11 Estimated numbers of wolverine harvested by resident hunters in the NWT in seasons 1983/1984 to 2008/2009. Regions (Fort Smith, Inuvik, and Yellowknife) are where hunters reside, not where they hunted.

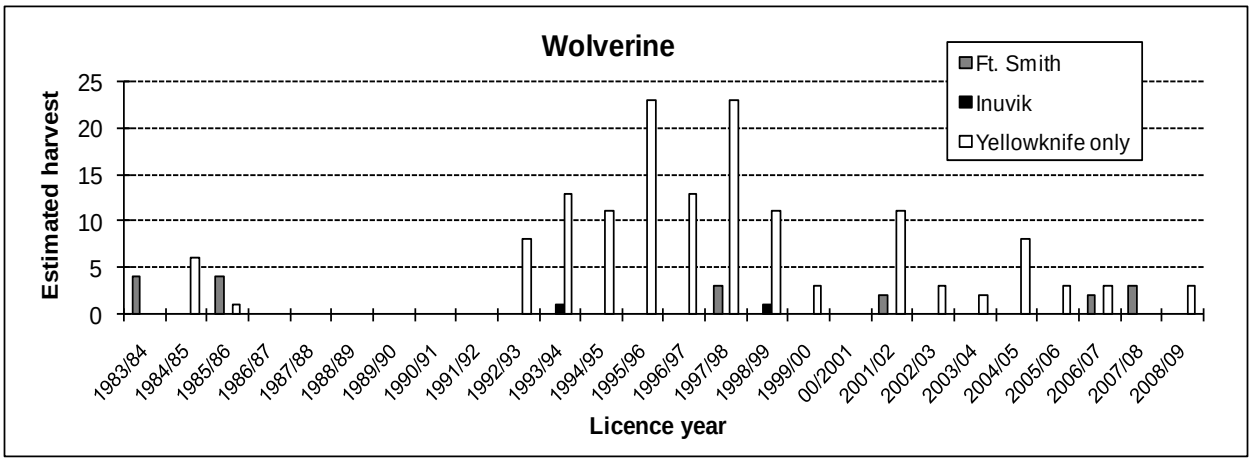
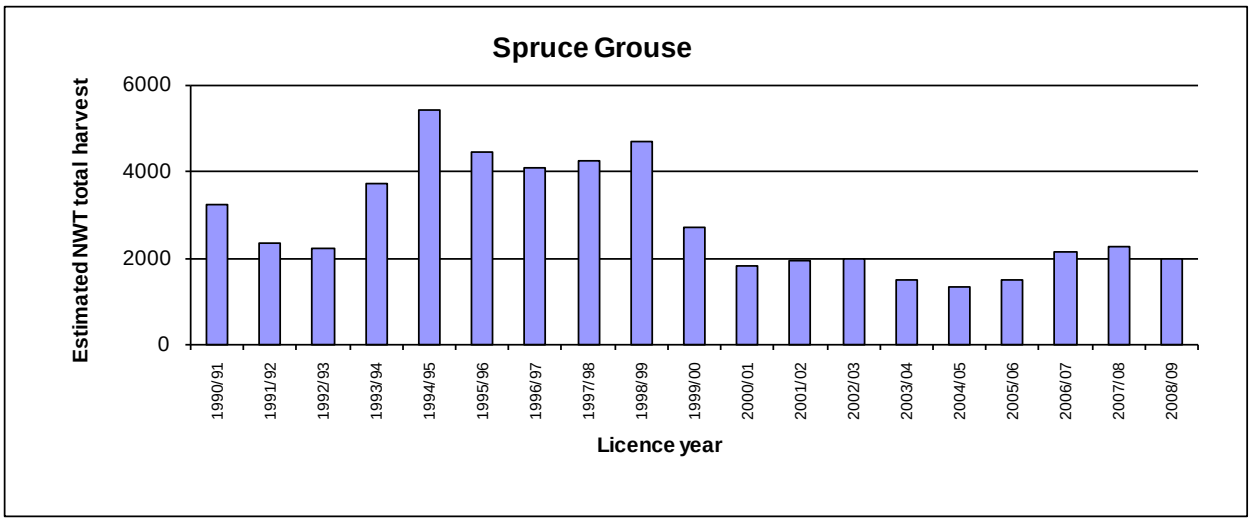
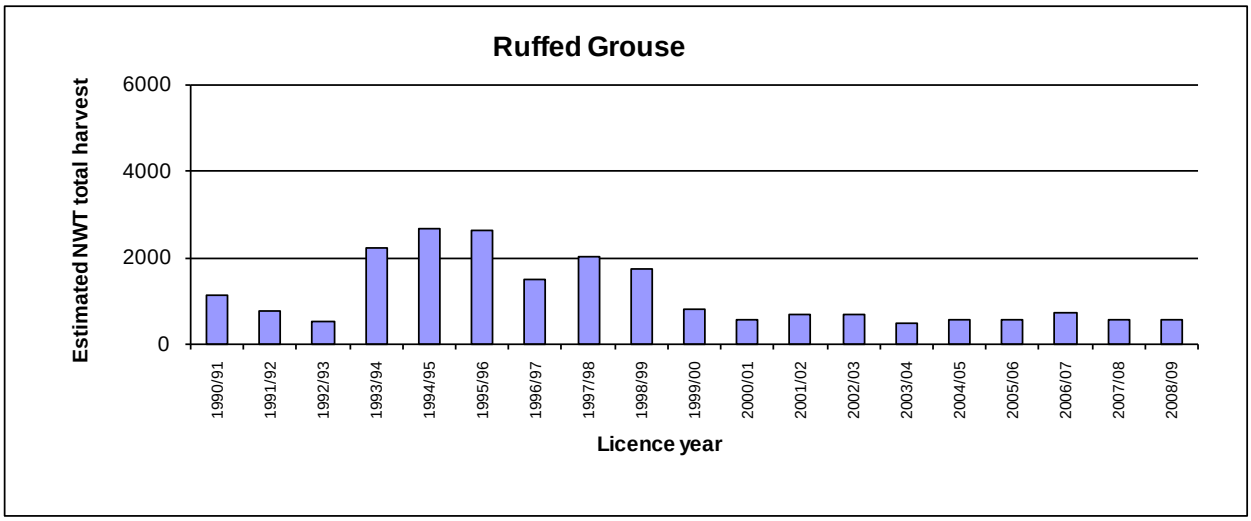
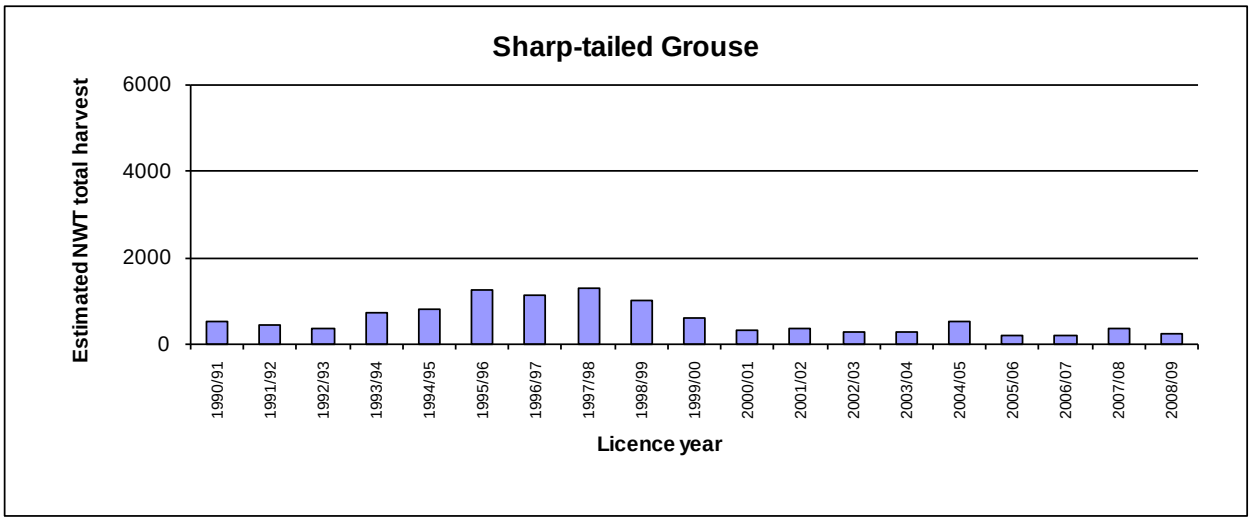
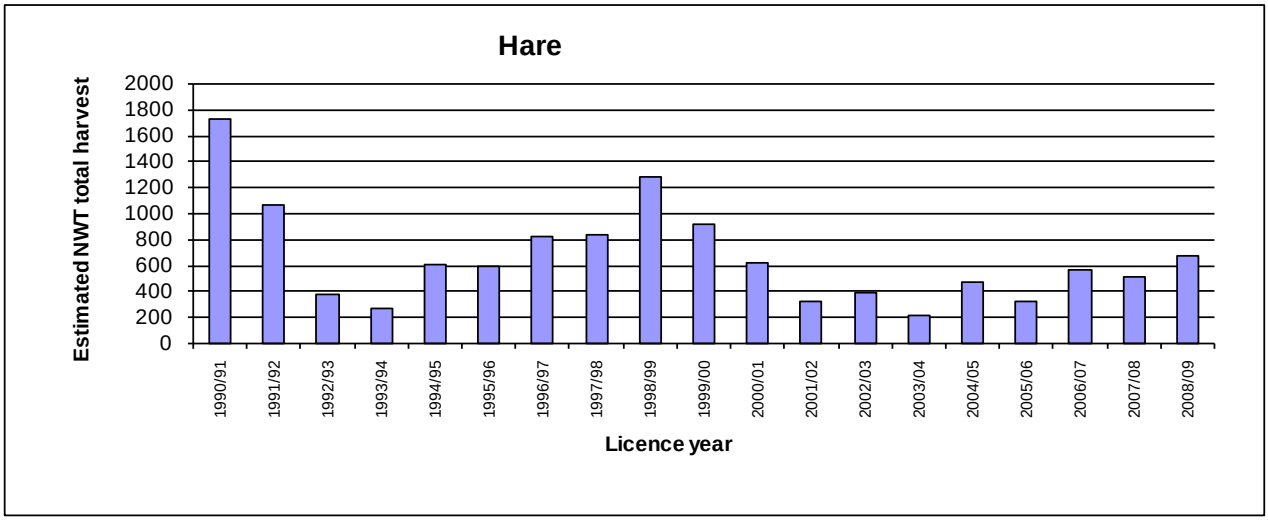


Figure 12 Estimated numbers of small game species, spruce grouse, ruffed grouse, sharp-tailed grouse, ptarmigan and hare, harvested by resident hunters in the NWT in seasons 1983/1984 to 2008/2009, all regions merged.






Sharp-tailed Grouse
Estimated NWT total harvest
6000
4000
2000
0
1990/91
1991/92
1992/93
1993/94
1994/95
1995/96
1996/97
1997/98
1998/99
1999/00
2000/01
2001/02
2002/03
2003/04
2004/05
2005/06
2006/07
2007/08
2008/09
Licence year


Hare
Estimated NWT total harvest
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1990/91
1991/92
1992/93
1993/94
1994/95
1995/96
1996/97
1997/98
1998/99
1999/00
2000/01
2001/02
2002/03
2003/04
2004/05
2005/06
2006/07
2007/08
2008/09
Licence year

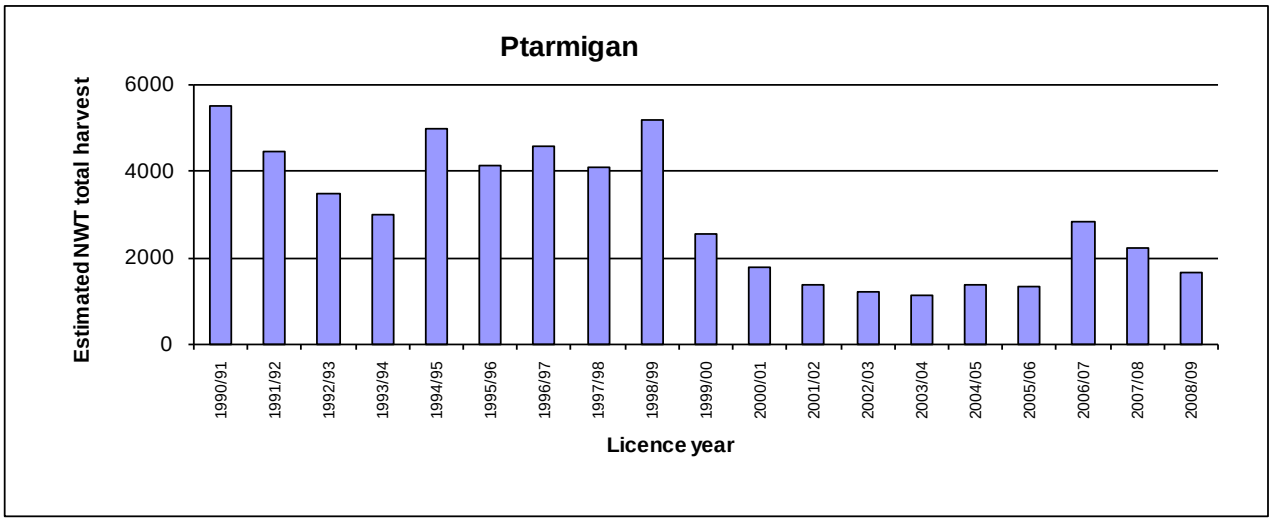

Ptarmigan
Estimated NWT total harvest
6000
4000
2000
0
1990/91
1991/92
1992/93
1993/94
1994/95
1995/96
1996/97
1997/98
1998/99
1999/00
2000/01
2001/02
2002/03
2003/04
2004/05
2005/06
2006/07
2007/08
2008/09
Licence year

Figure 13 Percent of barren-ground caribou tags sold to respondents and reported used by resident hunters in hunting seasons 1997/1998 to 2008/2009 (season 1999/2000 is missing). Regions (Fort Smith, Inuvik, and Yellowknife) are where hunters reside, not where they hunted.

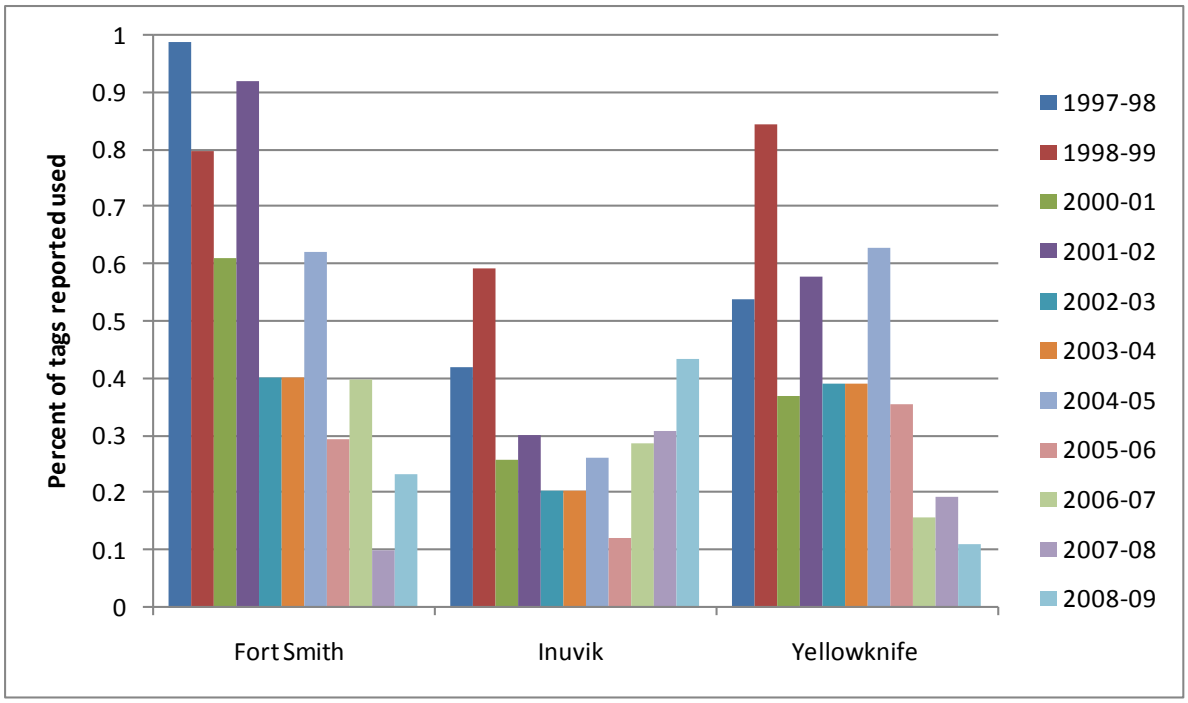
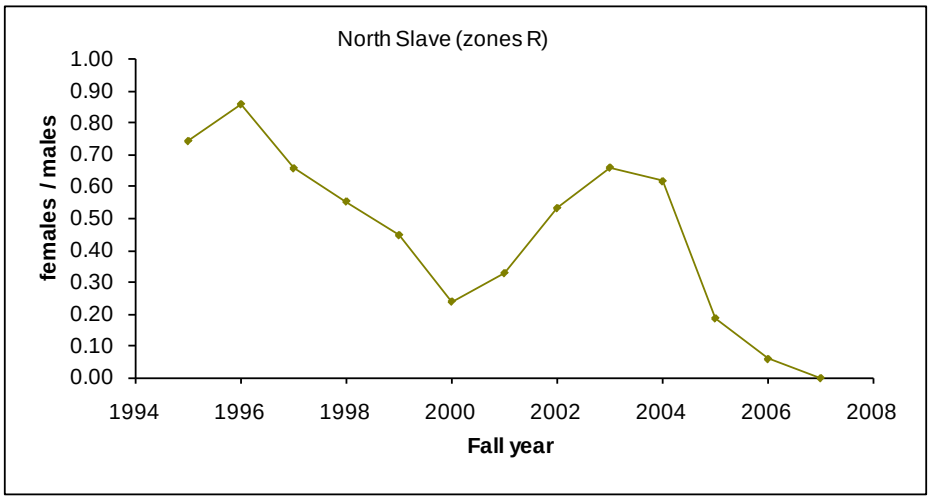
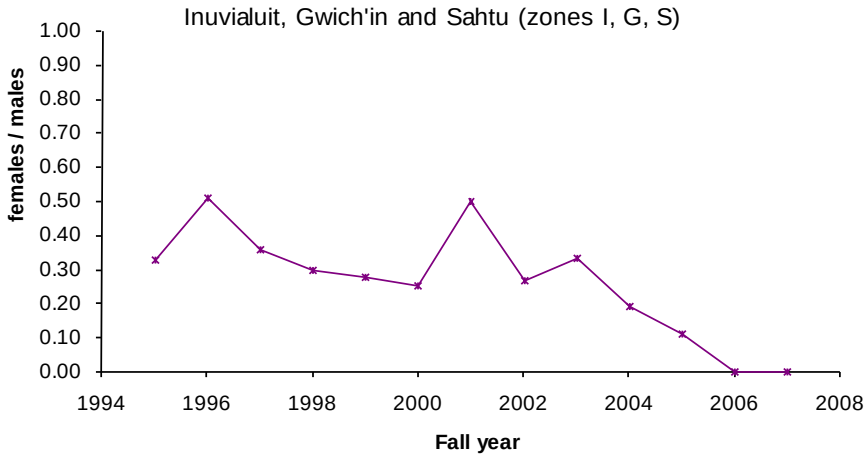


Figure 14 Ratio of female to male barren-ground caribou reported harvested in management zones R (North Slave), U (South Slave), and I,G,S (Inuvialuit, Gwich'in, Sahtu) zones by resident hunters during hunting seasons 1995/1996 to 2007/2008. Hunting by residents was banned in the zones R and U in season 2008/2009. For 1995/1996, R corresponds to old zones F1, F2; U corresponds to old zones H3; I, G, S, corresponds to old zones C, D, E, G codes.





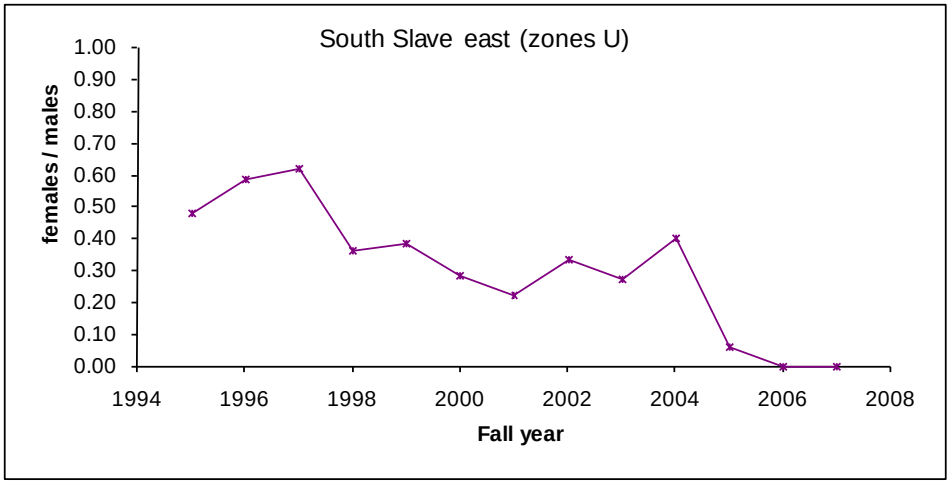


Figure 15 Number of barren-ground caribou hunts reported for each month in management zones R (North Slave) and U (South Slave) by resident hunters during hunting seasons 1995/1996 to 2007/2008. Hunting by residents was banned in these zones in season 2008/2009.

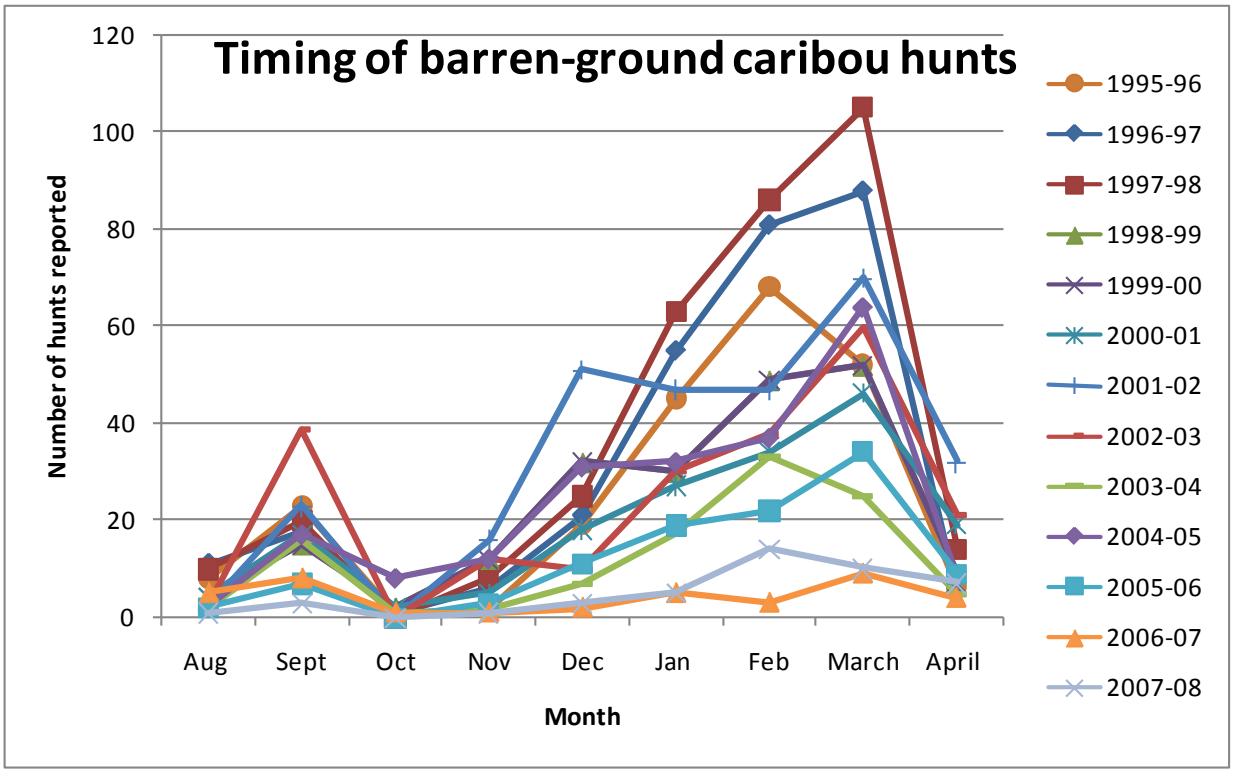


Table 1 Non-respondent bias test results comparing the proportion of respondents to waves 1, 2, and 3 who indicated that they hunted any species during the previous hunting season, 2000/2001 to 2008/2009. Chi-square tests with statistically significant differences are marked by * if p<0.05 (** if p <0.01), then followed by a chi-square test for trend. No test performed for season 2005/2006, when only two mail waves were sent.

Table 1. Non-respondent bias test results

	Wave 1		Wave 2		Wave 3							
Season	Hunting	Not Hunting	Hunting	Not Hunting	Hunting	Not Hunting	X2	p		Up trend X2	p	
2000/2001	240	96	121	44	76	22	1.458	0.482				
2001/2002	292	83	103	40	68	37	7.891	0.019	*	7.864	0.005	**
2002/2003	246	86	70	38	62	27	3.610	0.164				
2003/2004	216	81	97	48	34	16	1.765	0.414				
2004/2005	214	100	89	59	44	28	3.389	0.184				
2006/2007	184	125	91	46	61	45	2.492	0.288				
2007/2008	193	94	95	48	33	33	7.250	0.027	*	4.957	0.026	*
2008/2009	204	88	91	54	51	24	2.239	0.066				

* Statistically significant (p less or equal to 0.05)

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APPENDIX 1

Number of resident hunting licences sold per season.

NWT (post-1999 boundary) Resident Hunter Licences sold

Season (year)	Total number of hunters	Small game licences	Big game licences
82/83			1695
83/84			1505
84/85			1873
85/86			1780
86/87			1673
87/88			1897
88/89			1776
89/90	2065	1842	1769
90/91	2172	1838	1903
91/92	2091	1687	1833
92/93	2138	1598	1918
93/94	1891	1379	1663
94/95	2028	1453	1751
95/96	1702	1333	1482
96/97	1752	1300	1576
97/98	1579	1189	1385
98/99	1597	1303	1394
99/00	*	*	*
00/01	1403	1101	1225
01/02	1359	847	1269
02/03	1275	960	1139
03/04	1095	811	920
04/05	1276	942	1101
05/06	1110	801	952
06/07	1271	1015	1054
07/08	1204	1032	952
08/09	1174	1028	950

* data not available

APPENDIX 2

Reply rates per season (fall year) from 1990/1991 to 2008/2009.

Season (Fall year)	Sent	Returned to Sender	Responded	Reply rates	Reference
1990				0.67	from D'Hont a
1991 &				0.32	from D'Hont b
1992				0.68	from D'Hont c
1993				0.62	from D'Hont d
1994				0.6	from D'Hont e
1995				0.58	from D'Hont f
1996				0.57	from D'Hont g
1997 **	1803	288	888	0.59	this report
1998 n	1787	272	827	0.55	this report
1999 #	1403	227	600	0.51	this report
2000	1403	227	599	0.51	this report
2001	1359	224	623	0.55	this report
2002	1275	99	527	0.45	this report
2003	1095	197	491	0.55	this report
2004	1276	192	533	0.49	this report
2005 *	1110	139	458	0.47	this report
2006 **	1271	154	549	0.49	this report
2007 **	1204	160	475	0.45	this report
2008 **	1174	180	512	0.52	this report

& mail-out late and single wave (D'Hont 2000b)

mail-out done late with list from 2000/01

* two waves only

** Prize award offered

n = last year survey included includes Nunavut hunters (for licence numbers in NWT alone, see Appendix 1).

APPENDIX 3

Summary harvest data per region for each species for seasons 1997/1998 to 2008/2009.

1997/98 NWT Resident Hunter Big Game Kill

	BLACK BEAR				WOODLAND CARIBOU				DALLS SHEEP			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	31	15	1	2	60	37	9	15	10	7	4	6
Inuvik	18	8	0	0	41	26	3	5	34	22	4	6
Kitikmeot												
Keewatin												
Baffin	1	1	0	0								
Yellowknife	108	50	6	13	292	127	10	23	21	12	3	5
TOTALS	158	74	7	15	393	190	22	42	65	41	11	17

	MOOSE				WOLF				WOLVERINE			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	166	95	35	61	17	7	5	12	1	0	3	3
Inuvik	117	62	14	26	27	8	0	0	14	6	0	0
Kitikmeot					7	4	2	4	3	1	0	0
Keewatin					6	2	0	0	1			
Baffin	1	1	0	0	10	2	0	0				
Yellowknife	594	250	51	121	181	96	15	28	77	33	10	23
TOTALS	878	408	100	209	248	119	22	44	96	40	13	26

Barren ground caribou:

			wave 1		wave 2		accum. 2		wave 3		accum. 3		Graph method
REGION	no. hunters	tot. tags	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	EST. KILL
Fort Smith	63	136	47	62	14	17	61	79	1	5	62	84	111
Inuvik	110	226	82	30	26	18	108	48	15	4	123	52	93
Kitikmeot	38	97	46	26	7	23	53	49	1	1	54	50	80
Keewatin	40	92	17	21	24	14	41	35	7	5	48	40	83
Baffin	151	359	130	121	52	40	182	161	26	15	208	176	316
Yellowknife	540	1692	533	297	226	118	759	415	57	25	816	440	925
TOTALS	942	2602	855	557	349	230	1204	787	107	55	1311	842	1608

1997/98 NWT Resident Hunter Small Game Kill

			REPORTED KILL					ESTIMATED KILL				
REGION	TOTAL HUNTERS	RESPONDING HUNTERS	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare
Fort Smith	323	181	1103	670	411	410	121	1968	1196	733	732	216
Inuvik	141	73	237	22	133	398	120	458	42	257	769	232
Kitikmeot	16	10	0	0	0	70	0	0	0	0	112	0
Keewatin	24	16	0	0	0	118	5	0	0	0	177	8
Baffin	101	55	11	0	0	136	58	20	0	0	250	107
Yellowknife	723	331	843	353	143	1185	176	1841	771	312	2588	384
TOTAL	1328	666	2194	1045	687	2317	480	4288	2009	1303	4628	946
New NWT	1187	585	2183	1045	687	1993	417	4267	2009	1303	4089	832

1998/99 NWT Resident Hunter Big Game Kill

	BLACK BEAR				WOODLAND CARIBOU				DALLS SHEEP			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	29	16	1	2	147	86	9	15	21	11	1	2
Inuvik	14	5	0	0	43	28	3	5	22	13	2	3
Kitikmeot												
Keewatin												
Baffin	1	1	0	0	1	1	0	0				
Yellowknife	97	43	6	14	345	146	7	17	15	9	0	0
TOTALS	141	65	7	15	536	261	19	37	58	33	3	5

	MOOSE				WOLF				WOLVERINE			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	315	159	25	50	25	18	2	3	7	6	0	0
Inuvik	112	62	14	25	15	10	1	2	9	7	1	1
Kitikmeot	2	1	0	0	5	2		0	2	1	0	0
Keewatin	1	0			2	2	3	3				
Baffin	2	2	0	0	5	2		0				
Yellowknife	627	260	36	87	130	63	9	19	51	27	6	11
TOTALS	1059	484	75	162	182	97	15	26	69	41	7	13

Barren ground caribou:

			wave 1		wave 2		accum. 2		wave 3		accum. 3		Graph Method
REGION	no. hunters	tot. tags	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	EST. KILL
Fort Smith	81	312	122	86	49	41	171	127	21	26	192	153	262
Inuvik	67	146	71	46	15	3	86	49	5	5	91	54	72
Kitikmeot	31	84	26	17	6	3	32	20	6	0	38	20	32
Keewatin	15	46	23	12	3	3	26	15	1	1	27	16	35
Baffin	103	279	92	75	56	41	148	116	5	8	153	124	219
Yellowknife	545	1449	470	384	185	165	655	549	42	39	697	588	1261
TOTALS	842	2316	804	620	314	256	1118	876	80	79	1198	955	1881

1998/99 NWT Resident Hunter Small Game Kill

			REPORTED KILL					ESTIMATED KILL				
REGION	TOTAL HUNTERS	RESPONDING HUNTERS	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare
Fort Smith	363	188	1162	580	209	577	303	2244	1120	404	1114	585
Inuvik	130	73	239	32	119	434	161	426	57	212	773	287
Kitikmeot	24	15	0	0	0	65	12	0	0	0	104	19
Keewatin	16	9	0	0	0	132	19	0	0	0	235	34
Baffin	90	48	18	0	0	230	57	34	0	0	431	107
Yellowknife	809	338	857	234	167	1376	173	2051	560	400	3293	414
TOTAL	1432	671	2276	846	495	2814	725	4754	1737	1015	5950	1446
New NWT	1302	599	2258	846	495	2387	637	4720.5	1737	1015.2	5180.422	1286

1999/00 NWT Resident Hunter Big Game Kill

NOTE: Data on Total tags and number of hunters were non available - estimates done using licence information from 2000/01.

	BLACK BEAR				WOODLAND CARIBOU				DALLS SHEEP			
REGION	TOTAL HUNTERS	RESP. HUNTER	REP. KILL	EST. KILL	TOTAL HUNTERS	RESP. HUNTER	REP. KILL	EST. KILL	TOTAL HUNTERS	RESP. HUNTER	REP. KILL	EST. KILL
Fort Smith	297	156	2	4	297	156	8	15	297	156	2	4
Inuvik	143	67	0	0	143	67	2	4	143	67	3	6
Yellowknife	965	376	4	10	965	376	3	8	965	376	2	5
TOTALS	1405	599	6	14	1405	599	13	27	1405	599	7	15

	MOOSE				WOLF				WOLVERINE			
REGION	TOTAL HUNTERS	RESP. HUNTER	REP. KILL	EST. KILL	TOTAL HUNTERS	RESP. HUNTER	REP. KILL	EST. KILL	TOTAL HUNTERS	RESP. HUNTER	REP. KILL	EST. KILL
Fort Smith	297	156	26	50	297	156	1	2	297	156	0	0
Inuvik	143	67	8	17	143	67	0	0	143	67	0	0
Yellowknife	965	376	28	72	965	376	4	10	965	376	1	3
TOTALS	1405	599	62	138	1405	599	5	12	1405	599	1	3

Barren ground caribou:

REGION	TOTAL HUNTER	RESP. HUNTER	REP. KILL	EST. KILL
Fort Smith	297	156	82	156
Inuvik	143	67	18	38
Yellowknife	965	376	355	911
TOTALS	1405	599	455	1106

1999/00 NWT Resident Hunter Small Game Kill

			REPORTED KILL					ESTIMATED KILL				
REGION	TOTAL HUNTERS	RESPONDING HUNTERS	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare
Fort Smith	363	188	580	172	105	236	136	1120	332	203	456	263
Inuvik	130	73	123	7	58	204	119	219	12	103	363	212
Kitikmeot	24	15						550	181	125	699	179
Keewatin	16	9						0	0	0	0	0
Baffin	90	48						0	0	0	0	0
Yellowknife	809	338	344	113	78	437	112	823	270	187	1046	268
TOTAL	1432	671	1047	292	241	877	367	2713	796	618	2564	922
New NWT	1302	599	1047	292	241	877	367	2162.3	615.04	492.72	1864.924	742.6

2000/01 NWT Resident Hunter Big Game Kill

	BLACK BEAR				WOODLAND CARIBOU				DALLS SHEEP			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	26	11	1	2	105	55	6	11	12	10	2	2
Inuvik	19	8	0	0	41	21	2	4	25	15	1	2
Yellowknife	104	40	2	5	263	103	11	28	38	15	1	3
TOTALS	149	59	3	8	409	179	19	43	75	40	4	7

	MOOSE				WOLF				WOLVERINE			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	222	112	24	48	27	13	0	0	6	3	0	0
Inuvik	86	43	3	6	26	14	0	0	15	7	0	0
Yellowknife	532	184	30	87	127	57	2	4	70	31	0	0
TOTALS	840	339	57	140	180	84	2	4	91	41	0	0

Barren ground caribou:

			wave 1		wave 2		accum. 2		wave 3		accum. 3		Graph Method
REGION	no. hunters	tot. tags	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	EST. KILL
Fort Smith	65	221	84	57	18	4	102	61	25	13	127	74	135
Inuvik	78	191	49	13	28	8	77	21	11	0	88	21	50
Yellowknife	556	1423	351	126	177	62	528	188	115	59	643	247	527
TOTALS	699	1835	484	196	223	74	707	270	151	72	858	342	712

2000/01 NWT Resident Hunter Small Game Kill

			REPORTED KILL					ESTIMATED KILL				
REGION	TOTAL HUNTERS	RESPONDING HUNTERS	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare
Fort Smith	254	137	482	163	79	98	123	894	302	146	182	228
Inuvik	109	51	68	13	21	186	83	145	28	45	398	177
Yellowknife	649	257	310	96	53	482	84	783	242	134	1217	212
TOTAL	1012	445	860	272	153	766	290	1822	572	325	1796	618

2001/02 NWT Resident Hunter Big Game Kill

	BLACK BEAR				WOODLAND CARIBOU				DALLS SHEEP			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	27	12	1	2	110	55	7	14	15	6	2	5
Inuvik	19	9	0	0	46	27	1	2	24	16	1	2
Yellowknife	94	32	3	9	244	82	7	21	37	13	0	0
TOTALS	140	53	4	11	400	164	15	37	76	35	3	7

	MOOSE				WOLF				WOLVERINE			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	227	121	27	51	30	19	3	5	12	6	1	2
Inuvik	100	46	10	22	20	11	0	0	4	2	0	0
Yellowknife	503	182	33	91	177	69	12	31	80	34	4	9
TOTALS	830	349	70	164	227	99	15	36	96	42	5	11

Barren ground caribou:

			wave 1		wave 2		accum. 2		wave 3		accum. 3		Graph Method
REGION	no. hunters	tot. tags	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	EST. KILL
Fort Smith	53	175	73	76	27	17	100	93	14	6	114	99	161
Inuvik	85	221	73	27	27	3	100	30	33	9	133	39	67
Yellowknife	662	1817	486	298	189	94	675	392	131	62	806	454	1050
TOTALS	800	2213	632	401	243	114	875	515	178	77	1053	592	1278
		2.7663											

2001/02 NWT Resident Hunter Small Game Kill

			REPORTED KILL					ESTIMATED KILL				
REGION	TOTAL HUNTERS	RESPONDING HUNTERS	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare
Fort Smith	197	103	573	226	78	75	86	1096	432	149	143	164
Inuvik	60	27	51	15	25	89	37	113	33	56	198	82
Yellowknife	590	241	299	84	63	419	32	732	206	154	1026	78
TOTAL	847	371	923	325	166	583	155	1941	671	359	1367	325

2002/03 NWT Resident Hunter Big Game Kill

	BLACK BEAR				WOODLAND CARIBOU				DALLS SHEEP			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	32	15	0	0	108	52	6	12	12	4	1	3
Inuvik	14	7	1	2	52	26	4	8	33	19	4	7
Yellowknife	94	29	3	10	257	78	5	16	25	11	2	5
TOTALS	140	51	4	12	417	156	15	37	70	34	7	14

	MOOSE				WOLF				WOLVERINE			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	235	114	21	43	30	14	1	2	12	6	0	0
Inuvik	98	42	8	19	24	15	0	0	10	6	0	0
Yellowknife	481	163	25	74	189	54	7	25	88	30	1	3
TOTALS	814	319	54	136	243	83	8	27	110	42	1	3

Barren ground caribou:

			wave 1		wave 2		accum. 2		wave 3		accum. 3		Graph Method
REGION	no. hunters	tot. tags	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	EST. KILL
Fort Smith	58	186	53	23	17	17	70	40	23	13	93	53	102
Inuvik	87	244	68	26	28	2	96	28	11	0	107	28	72
Yellowknife	534	1480	414	156	116	35	530	191	70	38	600	229	552
TOTALS	679	1910	535	205	161	54	696	259	104	51	800	310	726
		2.81296											

2002/03 NWT Resident Hunter Small Game Kill

			REPORTED KILL					ESTIMATED KILL				
REGION	TOTAL HUNTERS	RESPONDING HUNTERS	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare
Fort Smith	266	129	515	210	35	73	84	1062	433	72	151	173
Inuvik	102	50	38	2	25	94	8	78	4	51	192	16
Yellowknife	592	210	296	84	53	303	70	834	237	149	854	197
TOTAL	960	389	849	296	113	470	162	1974	674	273	1196	387

2003/04 NWT Resident Hunter Big Game Kill

	BLACK BEAR				WOODLAND CARIBOU				DALLS SHEEP			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	27	14	1	2	97	51	4	8	10	6	1	2
Inuvik	19	10	1	2	56	24	2	5	32	16	3	6
Yellowknife	100	38	3	8	219	71	7	22	28	13	2	4
TOTALS	146	62	5	12	372	146	13	34	70	35	6	12

	MOOSE				WOLF				WOLVERINE			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	230	121	18	34	27	12	0	0	11	6	0	0
Inuvik	111	48	12	28	30	14	1	2	18	10	0	0
Yellowknife	443	161	39	107	121	40	3	9	74	28	1	3
TOTALS	784	330	69	169	178	66	4	11	103	44	1	3

Barren ground caribou:

			wave 1		wave 2		accum. 2		wave 3		accum. 3		Graph method
REGION	no. hunters	tot. tags	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	EST. KILL
Fort Smith	57	191	61	19	43	16	104	35	22	24	126	59	77
Inuvik	88	244	97	21	16	3	113	24	12	0	125	24	50
Yellowknife	343	998	284	94	102	64	386	158	44	15	430	173	390
TOTALS	488	1433	442	134	161	83	603	217	78	39	681	256	517

2.93648 tags per hunters

2003/04 NWT Resident Hunter Small Game Kill

			REPORTED KILL					ESTIMATED KILL				
REGION	TOTAL HUNTERS	RESPONDING HUNTERS	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare
Fort Smith	290	154	391	156	32	37	23	736	294	60	70	43
Inuvik	180	81	72	14	43	143	39	160	31	96	318	87
Yellowknife	622	256	256	65	49	303	37	622	158	119	736	90
TOTAL	1092	491	719	235	124	483	99	1518	483	275	1124	220

2004/05 NWT Resident Hunter Big Game Kill

	BLACK BEAR				WOODLAND CARIBOU				DALLS SHEEP			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	34	16	1	2	96	48	1	2	11	5	1	2
Inuvik	20	10	1	2	42	17	5	12	24	12	2	4
Yellowknife	74	28	3	8	124	42	8	24	21	6	0	0
TOTALS	128	54	5	12	262	107	14	38	56	23	3	6

	MOOSE				WOLF				WOLVERINE			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	226	114	21	42	23	12	0	0	8	4	0	0
Inuvik	107	43	9	22	28	12	0	0	10	4	0	0
Yellowknife	315	110	32	92	186	68	9	25	107	41	3	8
TOTALS	648	267	62	156	237	92	9	25	125	49	3	8

Barren ground caribou:

			wave 1		wave 2		accum. 2		wave 3		accum. 3		Graph Method
REGION	no. hunters	tot. tags	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	EST. KILL
Fort Smith	251	250	72	48	47	24	119	72	3	4	122	76	156
Inuvik	146	234	48	10	13	8	61	18	7	0	68	18	62
Yellowknife	704	1338	332	224	144	76	476	300	73	35	549	335	841
TOTALS	1101	1822	452	282	204	108	656	390	83	39	739	429	1058

1.65486 tags per hunters

2004/05 NWT Resident Hunter Small Game Kill

			REPORTED KILL					ESTIMATED KILL				
REGION	TOTAL HUNTERS	RESPONDING HUNTERS	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare
Fort Smith	262	130	372	205	63	178	81	750	413	127	359	163
Inuvik	119	46	65	23	88	144	77	168	60	228	373	199
Yellowknife	561	208	163	37	59	239	39	440	100	159	645	105
TOTAL	942	384	600	265	210	561	197	1358	572	514	1376	468

2005-06 NWT Resident Hunter Big Game Kill

	BLACK BEAR				WOODLAND CARIBOU				DALLS SHEEP			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	37	14	1	3	100	46	6	13	13	6	0	0
Inuvik	24	15	1	2	52	28	7	13	31	17	3	5
Yellowknife	81	30	7	19	169	57	9	27	32	14	1	2
TOTALS	142	59	9	23	321	131	22	53	76	37	4	8

	MOOSE				WOLF				WOLVERINE			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	234	112	21	44	28	11	0	0	11	2	0	0
Inuvik	122	58	15	32	45	24	3	6	11	8	0	0
Yellowknife	353	130	28	76	185	67	5	14	106	42	1	3
TOTALS	709	300	64	151	258	102	8	19	128	52	1	3

Barren ground caribou:

Ratio method BG Caribou calculations

	BGCARIBOU			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	132	71	21	39
Inuvik	193	90	11	24
Yellowknife	1113	436	155	396
TOTALS	1438	597	187	458

2005/06 NWT Resident Hunter Small Game Kill

			REPORTED KILL					ESTIMATED KILL				
REGION	TOTAL HUNTERS	RESPONDING HUNTERS	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare
Fort Smith	275	125	417	164	37	146	93	917	361	81	321	205
Inuvik	125	58	57	8	44	133	36	123	17	95	287	78
Yellowknife	401	156	183	78	17	279	15	470	201	44	717	39
TOTAL	801	339	657	250	98	558	144	1511	579	220	1325	321

2006-07 NWT Resident Hunter Big Game Kill

	BLACK BEAR				WOODLAND CARIBOU				DALLS SHEEP			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	19	2	0	0	98	44	6	13	7	2	0	0
Inuvik	19	10	0	0	49	26	5	9	34	20	3	5
Yellowknife	110	50	2	4	210	81	10	26	38	13	5	15
TOTALS	148	62	2	4	357	151	21	49	79	35	8	20

	MOOSE				WOLF				WOLVERINE			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	230	104	15	33	30	11	0	0	6	4	1	2
Inuvik	109	50	8	17	23	15	0	0	11	6	0	0
Yellowknife	499	210	47	112	135	55	3	7	72	28	1	3
TOTALS	838	364	70	162	188	81	3	7	89	38	2	4

Barren ground caribou:

			wave 1		wave 2		accum. 2		wave 3		accum. 3		**Graph Method**
REGION	no. hunters	tot. tags	resp. tags	rep. kill	resp. tag	rep. kill	resp. tag	rep. kill	resp. tag	rep. kill	resp. tag	rep. kill	EST. KILL
Fort Smith	33	55	12	5	9	4	21	9	3	0	24	9	22
Inuvik	36	64	9	2	14	5	23	7	5	1	28	8	19
Yellowknife	321	570	175	26	62	12	237	38	52	9	289	47	91
TOTALS	390	689	196	33	85	21	281	54	60	10	341	64	131

1.76667 tags per hunters

2006/07 NWT Resident Hunter Small Game Kill

			REPORTED KILL					ESTIMATED KILL				
REGION	TOTAL HUNTERS	RESPONDING HUNTERS	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare
Fort Smith	275	122	359	209	33	44	159	809	471	74	99	358
Inuvik	119	60	57	13	17	427	38	113	26	34	847	75
Yellowknife	621	254	494	97	35	780	53	1208	237	86	1907	130
TOTAL	1015	436	910	319	85	1251	250	2130	734	194	2853	563

2007-08 NWT Resident Hunter Big Game Kill

	BLACK BEAR				WOODLAND CARIBOU				DALLS SHEEP			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	30	3	0	0	91	38	7	17	13	6	1	2
Inuvik	26	6	0	0	60	31	7	14	31	15	3	6
Yellowknife	160	21	2	15	238	77	11	34	50	10	1	5
TOTALS	216	30	2	15	389	146	25	64	94	31	5	13

	MOOSE				WOLF				WOLVERINE			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	211	94	8	18	38	13	1	3	10	4	1	3
Inuvik	113	53	8	17	46	26	0	0	12	7	0	0
Yellowknife	497	168	34	101	209	67	1	3	116	38	0	0
TOTALS	821	315	50	136	293	106	2	6	138	49	1	3

Barren ground caribou:

			wave 1		wave 2		accum. 2		wave 3		accum. 3		Graph method	Ratio method
REGION	no. hunters	tot. tags	resp. tag	rep. kill	resp. tag	rep. kill	resp. tag	rep. kill	resp. tag	rep. kill	resp. tag	rep. kill	EST. KILL	EST. KILL
Fort Smith	22	41	5	2	13	0	18	2	6	0	24	2	4	3
Inuvik	31	58	6	3	5	2	11	5	9	0	20	5	18	15
Yellowknife	374	674	180	34	83	18	263	52	26	3	289	55	130	128
TOTALS	427	773	191	39	101	20	292	59	41	3	333	62	152	146

1.81 tags per hunters

2007/08 NWT Resident Hunter Small Game Kill

			REPORTED KILL					ESTIMATED KILL				
REGION	TOTAL HUNTERS	RESPONDING HUNTERS	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare
Fort Smith	250	99	295	145	30	32	107	745	366	76	81	270
Inuvik	136	57	152	1	26	276	61	363	2	62	659	146
Yellowknife	646	216	385	72	77	496	33	1151	215	230	1483	99
TOTAL	1032	372	832	218	133	804	201	2259	584	368	2223	514

2008-09 NWT Resident Hunter Big Game Kill

	BLACK BEAR				WOODLAND CARIBOU				DALLS SHEEP			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	32	14	0	0	93	50	6	11	11	2	0	0
Inuvik	22	11	0	0	42	24	1	2	20	13	2	3
Yellowknife	129	47	5	14	232	85	8	22	35	18	0	0
TOTALS	183	72	5	14	367	159	15	35	66	33	2	3

	MOOSE				WOLF				WOLVERINE			
REGION	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL	TOTAL TAGS	RESP. TAGS	REP. KILL	EST. KILL
Fort Smith	211	112	11	21	33	15	1	2	6	3	0	0
Inuvik	109	42	9	23	22	17	1	1	13	10	0	0
Yellowknife	484	187	30	78	205	67	6	18	122	38	1	3
TOTALS	804	341	50	122	260	99	8	22	141	51	1	3

Barren ground caribou:

			wave 1		wave 2		accum. 2		wave 3		accum. 3		**Ratio method**
REGION	no. hunters	tot. tags	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	resp. tags	rep. kill	EST. KILL
Fort Smith	22	41	23	6	2	0	25	6	3	0	28	6	9
Inuvik	46	81	13	5	4	2	17	7	2	2	19	9	38
Yellowknife	347	611	158	18	89	11	247	29	37	1	284	30	65
TOTALS	415	733	194	29	95	13	289	42	42	3	331	45	112

1.76627 tags per hunters

2008/09 NWT Resident Hunter Small Game Kill

			REPORTED KILL					ESTIMATED KILL				
REGION	TOTAL HUNTERS	RESPONDING HUNTERS	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare	spruce grouse	ruffed grouse	sharp tail	ptarmigan	hare
Fort Smith	246	135	408	227	63	79	213	743	414	115	144	388
Inuvik	148	55	49	14	15	91	57	132	38	40	245	153
Yellowknife	621	257	467	49	44	533	55	1128	118	106	1288	133
TOTAL	1015	447	924	290	122	703	325	2004	570	261	1677	674