

# Nunavut grizzly bear harvest monitoring

## Summary report

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## **Summary**

The purpose of this project was to monitor the geographic distribution, sex and age composition of grizzly bear harvest. Hunters were asked to return the lower jaw or whole skull, a piece of muscle and a small piece of the skin with hair (2x5cm) and to provide kill information (date, location, etc) to their local conservation officer. Tooth samples were processed to determine age of the individuals. Muscle and hair samples will be used to study grizzly bear diet. The data gathered during the 2010-2012 season will be incorporated in a long-term monitoring database to assess the status of harvested grizzly bear populations.

## **Introduction**

Currently there is no Total Allowable Harvest (TAH) on the subsistence harvest of grizzly bears (*Ursus arctos*) in Nunavut (Kitikmeot and Kivalliq). Existing quotas were set to allow sale of hides in 1987 (before Nunavut and the Nunavut Land Claims Agreement (NLCA)) and are managed differently in the Kitikmeot and the Kivalliq. Before the establishment of the NLCA Inuit could not sell hides or bear parts harvested outside a quota. However, McLoughlin (2001) mentions that current sport harvest quotas in Nunavut are not based on reliable population density estimates.

For several years, Hunters and Trappers organizations (HTOs) in the Kitikmeot have reported an increase in bear sightings. Similarly, from the early 2000s and during consultations in 2011, Kivalliq HTOs and Regional Wildlife Organization (RWO) have reported expansion in range and an increase in bear encounters and voiced their concerns over problem bears at cabins, meat caches and regarded grizzly bears as a problem animal. Consequently, organizations from both regions have requested increases to their grizzly bear quota. Most HTOs and the Kivalliq RWO were under the impression that the regional quota of 10 is the maximum number of bears that may be harvested annually. This continued until 2008 in the Kivalliq Region, when the Government of Nunavut (GN) and Nunavut Tunngavik Inc (NTI) clarified to communities that no restrictions can be placed on Inuit, and they don't need a tag to harvest a grizzly bear. The purpose of this clarification was to discuss the status of grizzly bear population and harvest levels in Kivalliq openly with RWO/HTOs so management decisions can be made jointly.

Monitoring of grizzly bear harvest numbers, sex and age composition of the harvested bears (subsistence, sport and problem kills) is fundamental to the development of a management plan that promote the conservation of the species, its sustainable use, and public safety. Every year, hunters submit on voluntary basis harvest information and samples from grizzly bears harvested in Nunavut. Grizzly bears harvested through sport hunts, kills for export of hides or any grizzly parts as well as accidental/defense kills must be reported according to the Nunavut Wildlife Act. Information on harvest locations, age and sex structure of the harvested bears, as well as the tissue samples collected will allow us to better monitor grizzly bear harvest and populations status within Nunavut. This information is crucial in order to manage grizzly bear harvest and bear-people conflicts.

## **Methods**

Hunters in the Kivalliq and Kitikmeot regions were asked to return the lower jaw or whole skull, a piece of muscle and a small piece of the skin with hair (2x5cm) and to provide kill information (date, location, etc) to their local conservation officer for each harvested grizzly bear. To determine the age of the harvested individuals, we sent the first premolar (lower PM1) to Matson's Laboratory LLC (Milltown, MT,USA) for cementum analysis. This technique is based on the cyclic nature of cementum growth in teeth forming annular patterns of different darkness depending on the season (Matson 1981). Muscle and hair samples will be analyzed to study grizzly bear diet using the stable isotope technique at the Université du Québec à Rimouski. These analyses are still ongoing and results will be presented later.

## **Results**

From 2000 to 2008, the number of grizzly bear harvested in the Kitikmeot region has been relatively stable ( $\bar{x} = 15.4$  bears/year,  $SD = 5.1$ ) with a slight decrease in the last four seasons where only 8, 4, 4 and 10 bears were harvested in 2009, 2010, 2011 and 2012 seasons respectively. In the Kivalliq region, the grizzly bear harvest has been relatively stable from 2000 to 2007 ( $\bar{x} = 5.9$  bears/year,  $SD = 3.1$ ) but a significant increase has been observed since 2008 with a total of 11, 21, 34, 17 and 12 bears harvested in 2008, 2009, 2010, 2011 and 2012 respectively (Figure 1).

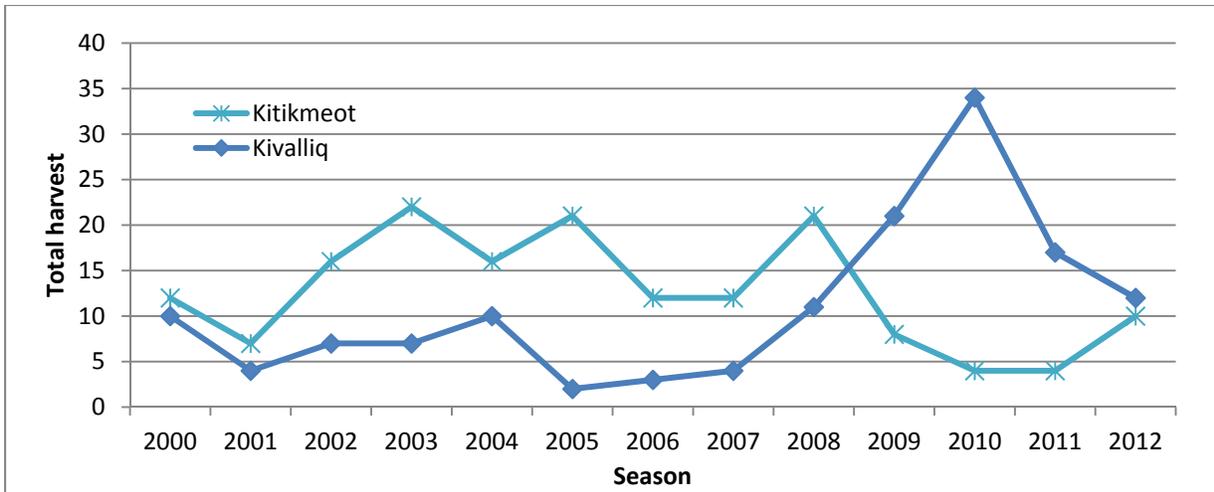


Figure 1: Reported grizzly bear harvest in Kivalliq and Kitikmeot between 2000 and 2012

The males to females ratio in the harvest has been relatively stable for the last 22 years in the Kitikmeot region with males and females representing an average of 86% and 14% of the total harvest respectively. In the Kivalliq, a similar pattern can be observed from 1990 up to 2009 with an average of 81% and 19% of males and females respectively in the harvest (Figure 2). Recently, the proportion of females in the Kivalliq harvest has increased to 32% and 71% for the 2010 and 2011 seasons respectively before dropping back to 17% in the 2011/12 season (Figure 3).

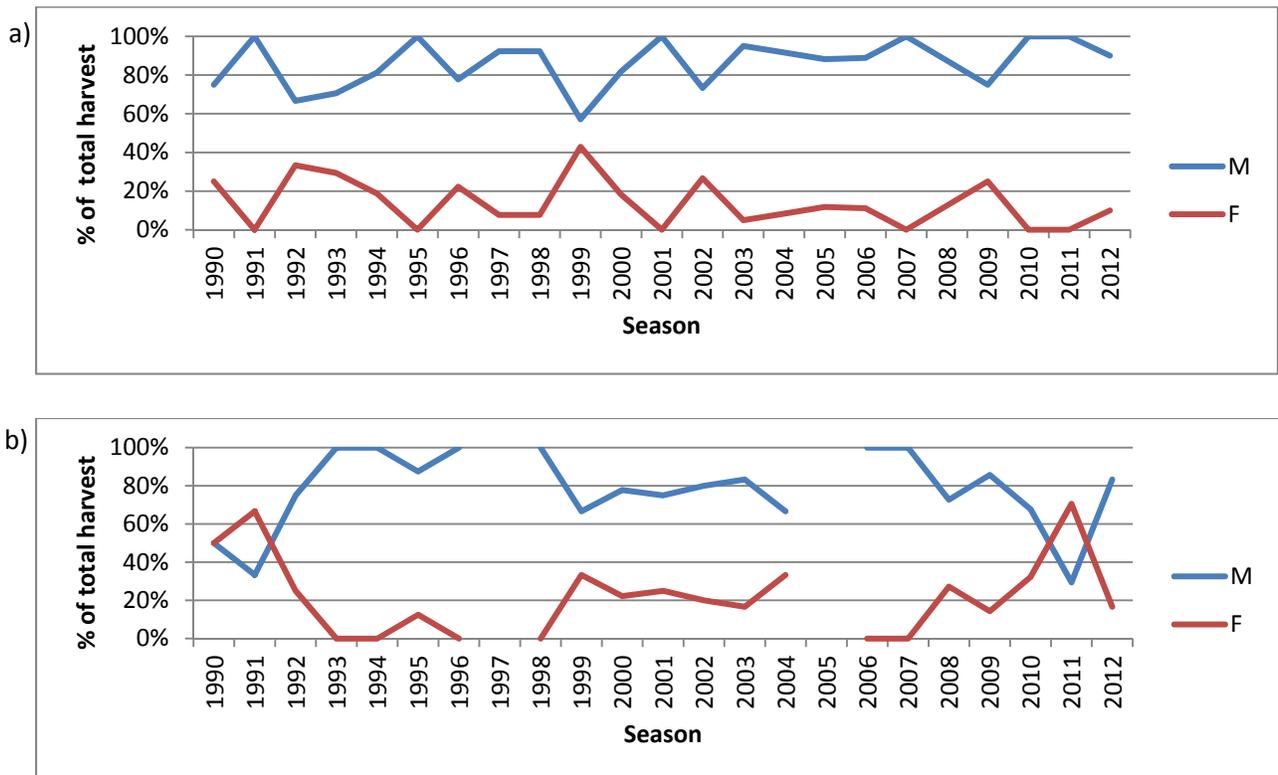


Figure 2: Proportion of males and females in reported harvest in Kitikmeot (a) and Kivalliq (b) from 1990 to 2012.

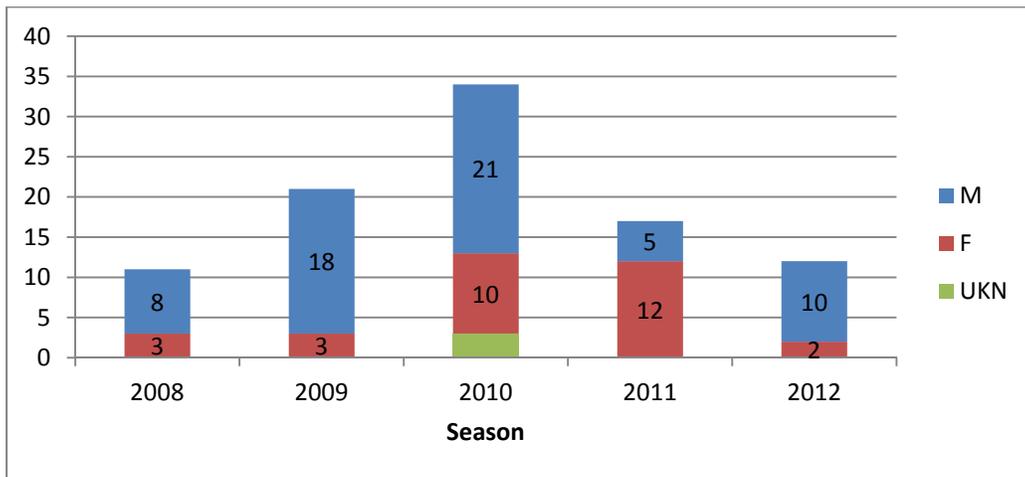


Figure 3: Proportion of males and females in the Kivalliq harvest from 2008 to 2012.

The average age of the grizzly bears harvested in the Kitikmeot was 9.4 and 7.3 years old in 2009 and 2010 seasons respectively, compared to 5.4, 7.6 and 5.3 years old in the Kivalliq for 2009, 2010 and 2011 seasons respectively. The proportion of adults in the Kivalliq harvest between 2000 and 2008 (52 %) was similar to the long-term (2000-2010) average of the Kitikmeot (51 %). Following the recent increase in the Kivalliq grizzly bear harvest, the proportion of adults in the recent harvest (2009-2011) decreased to 36 %, while cubs and subadults represented 22% and 42% of the harvest, respectively (Figure 4).

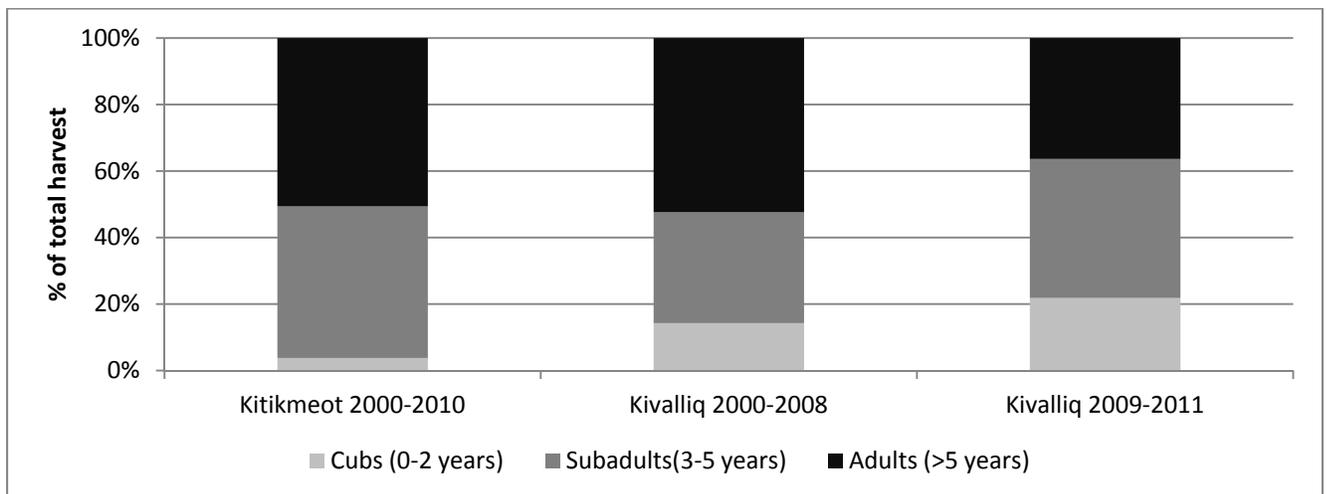


Figure 4: Proportion of age classes in the Kitikmeot and Kivalliq harvest from 2000 to 2011. The Kivalliq harvest is divided into two periods to illustrate the differences between the period before and after the recent increase in the grizzly bear harvest.

## Discussion

### *Kitikmeot*

The average harvest in the Kitikmeot from 2000 to 2008 appears to be relatively stable (average of 15.4 bears harvested/year) with a slight decrease in the last four hunting seasons. It is usually agreed that an annual human-caused mortality of 2-3% is a safe management goal for most northern grizzly bear populations (Sidorowicz and Gilbert 1981; McLoughlin et al. 2003). Density of grizzly bears was estimated at approximately 6/1,000 km<sup>2</sup> immediately west of the NWT/Kitikmeot boundary (Nagy and Branigan 1998), 6.1 /1,000km<sup>2</sup> around Kugluktuk in the western Kitikmeot (Dumond et al., unpublished data), and 3.5/1,000km<sup>2</sup> around Lac des Gras, at the North Slave/Kitikmeot boundary (McLoughlin and Messier 2001). Based on those densities and the demographic parameters of barren ground grizzly bears in the Kitikmeot region, McLoughlin and Messier (2001) suggest that a total removal of a maximum of 15 bears per year should be sustainable for that region. The current harvest thus appears to be within the recommended limits and should result in a stable population.

In the Kitikmeot region, grizzly bears are being harvested both as part of traditional/subsistence activities and as part of commercial activities (sport hunts). It is mainly males that are currently being harvested, constituting on average 86.3% of the harvest (1990-2012). The large home range of males compare to females, and the fact that their highest movement rates happen during spring (den emergence to end of June) (McLoughlin et al. 1999) probably increase their vulnerability to harvest which happens mostly in this same time of year. The continuous high proportion of males in the Kitikmeot harvest indicates that the population seems to support relatively well the current harvest despite the continuous strong bias towards the removal of males.

The average age and age distribution of the 2009 and 2010 harvest is comparable to the long-term average and appears to be relatively well distributed among the whole range of age. This also seems to point towards a stable population and a sustainable current harvest.

### *Kivalliq*

The grizzly bear harvest in the Kivalliq region has historically been relatively constant with an average of 5.9 bears being harvested annually from 2000 to 2007. Hunters from different communities have

indicated that the grizzly bear population appears to be increasing in the Kivalliq but almost no data currently exist on bear densities in the Kivalliq region. It is however usually recognized that densities are lower than in the western Kitikmeot (McLoughlin 2001). Considering the densities estimates in the Kitikmeot region mentioned above, Ross (2002) suggests a rough density of grizzly bears in the Kivalliq and eastern Kitikmeot mainland around 1/1,000 km<sup>2</sup> and yielded an estimate of 200 bears. The recent increase in the Kivalliq harvest from 2008 -2012 may not be sustainable for this population as described in Sidorowicz and Gilbert (1981) and McLoughlin et al. (2003).

Similarly to the Kitikmeot region, the sex ratio in the Kivalliq harvest has historically been bias towards male representing approximately 81% of the total harvested individuals from 1990 to 2009, however, the proportion of females increased to 32% in 2010 and 71% in 2011. The recent increase in the proportion of females in the Kivalliq harvest is concerning, but it seems that this occasional harvest is not a long term conservation concern. The grizzly bear harvest in the Kivalliq should however continue to be monitored closely to ensure the durability of this population for futures generations.

### **Conclusion and recommendations**

The grizzly bear is a sensitive species due to its low reproductive rate and relatively low density in Nunavut compared to the rest of Canada. The harvest in the Kitikmeot region seems to be sustainable and the population in this region appears to be relatively stable or slightly increasing. In the Kivalliq, the lack of information on local grizzly bear population characteristics (population delineation, density, reproductive parameters) is impeding our ability to accurately determine the status of the population and the impact of the harvest currently going on. There is therefore a need for more research to be able to assess the level of harvest which would be sustainable for this population. To manage the current high harvest, the Department of Environment (DoE) initiated in 2011 consultations with regional wildlife organizations (RWO) and local Hunting and Trapping organizations (HTO) to develop a consensus-based management plan for grizzly bears. The DoE is in the process of dealing with the issue of unregulated harvest through the by-laws. HTOs and the RWO support the development of a management plan and have urged their members to adopt local hunting rules to ensure harvest remains sustainable. The Department of Environment is working to reduce human-bear conflicts and the incidence of defense kills through a range of programs and practices. The efforts are being directed toward damage

prevention, fencing, alarms, deterrence methods, and incentives such as compensation for damaged property when best management practices are in place.

## **References**

- Matson, G. M. (1981). Workbook for cementum analysis. Milltown, Montana: 31 pp.
- McLoughlin, P. D. (2001). The ecology of barren-ground grizzly bears in Nunavut. Volume I: State of Knowledge. Edmonton, AB, Department of Biological Sciences, University of Alberta: 134 pp.
- McLoughlin, P. D., R. L. Case, et al. (1999). "Annual and Seasonal Movement Patterns of Barren-Ground Grizzly Bears in the Central Northwest Territories." *Ursus* 11: 79-86.
- McLoughlin, P. D. and F. Messier (2001). The demography of barren-ground grizzly bears (*Ursus arctos*) in Nunavut and the Northwest Territories. Yellowknife, Department of Resources, Wildlife and Economic Development, Government of the Northwest Territories: xi + 80 pp.
- McLoughlin, P. D., M. K. Taylor, et al. (2003). "Population viability of barren-ground grizzly bears in Nunavut and the Northwest Territories." *Arctic* 56(2): 185-190.
- Nagy, J. A. and M. Branigan (1998). Co-management plan for grizzly bears in the Inuvialuit Settlement Region, Yukon Territory and Northwest Territories. Inuvik, NWT, Wildlife Management Advisory Council, North Slope and Northwest Territories: 63 pp.
- Ross, P. I. (2002). Update COSEWIC status report on the grizzly bear *Ursus arctos* in Canada. COSEWIC assessment and update status report on the Grizzly Bear *Ursus arctos* in Canada. Ottawa, Committee on the Status of Endangered Wildlife in Canada: 91 pp.
- Sidorowicz, G. A. and F. F. Gilbert (1981). "The Management of Grizzly Bears in the Yukon, Canada." *Wildlife Society Bulletin* 9(2): 125-135.